Lao PDR

Ministry of Agriculture and Forestry

Agricultural Master Plan
2011 to 2015

Program Approach, Roadmap
Agriculture and Forestry for Sustainable Development, Food and Income Security

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Foreword

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List of Abbreviations

ACB  ASEAN Centre for Biodiversity
ADB  Asian Development Bank
ADS  Agricultural Development Strategy (of MAF)
AFD  Agence Française de Développement (French Development Agency)
AGPC Association des Groupements de Producteurs de Café du Plateau des Bolovens (Association of Coffee Producer Groups)
ANR / ANRD Agriculture, Natural Resources and Rural Development Sector
APB  Agriculture Promotion Bank
ASEAN Association of South-East Asian Nations
CPG/FPG Crop Production Group or Farmer Production Group (FPG)
DAFO  District Agriculture and Forestry Office
DOA  Department of Agriculture (under MAF)
DoI  Department of Irrigation (under MAF)
DoLF  Department of Livestock and Fisheries (under MAF)
DoP  Department of Planning (under MAF)
DP  Development Partner (donor organizations)
EU  European Union
FAO  Food and Agriculture Organization of the United Nations
FDI  Foreign Direct Investment
FLEGT EU legislation on Forest Law Enforcement, Governance and Trade
FPG  Farmer Production Group
GAP  Good Agricultural Practice
GDP  Gross Domestic Product
GDPRD  Global Donor Platform for Rural Development
GHG  Green House Gas
GI  Geographical Indications
GMO  Genetically Modified Organisms
GMS  Greater Mekong Subregion
GoL  Government of Laos
GTZ  German Technical Assistance
HE  His Excellency
HRD  Human Resource Development
HYV  High Yield Variety
IADP  Irrigated Agriculture Development Plan
IATSC  Irrigated Agriculture Technical Service Centre
ICT  Information and Communication Technology
IFAD  International Fund for Agriculture Development
IMT  Irrigation Management Transfer
IPM  Integrated Pest Management
RDMA  Integrated Rural Development in Mountainous Areas Program
IISD  International Institute for Sustainable Development
IFPRI  International Food Policy Research Institute
ISO  International Standard Organization
JICA  Japanese International Cooperation Agency
KIP  Lao currency; about 10,000 Kip to 1 EURO; 8,200 Kip to 1 USD
LEA  Lao Extension Approach
LEAP  Lao Extension Agricultural Project
LFAP  Land and Forest Allocation Program
LNCCI  Lao National Chamber of Commerce and Industry
LULUCF  Greenhouse gas inventory that covers direct human-induced land use, land-use change and forestry activities
LWU  Lao Women’s Union
Glossary of technical terms and concepts

**Biodiversity** is most commonly defined by biologists as the "totality of genes, species, and ecosystems of a region". An advantage of this definition is that it seems to describe most circumstances and presents a unified view of the traditional three levels at which biological variety has been identified: species diversity, ecosystem diversity and genetic diversity.

A **Cluster** is a geographic concentration of enterprises (or farmers specialized on a certain product) which are closely connected, along a value chain or as a network settling around an important buyer or industrial company. A simple definition says: A cluster is a value chain that is concentrated at the same location (see Value Chain, below).

**Certification** is a procedure by which a third party (the certifier or certification body) gives written assurance that a product, process or service conforms to specified requirements – a standard. Being certified is an asset for producers (see e.g. Global GAP, below).

The term **Climate-smart Agriculture** has been coined by the FAO in November 2009 to characterize climate-sensitive approaches in agriculture which benefit food security, development and adaptation to climate change, see FAO (2009) and [http://www.fao.org/news/story/0/item/36894/icode/en/](http://www.fao.org/news/story/0/item/36894/icode/en/)

**Commodities** are bulky (natural-resource based) products, that are internationally traded either as a raw product or after basic industrial processing. The most important agricultural commodities include grains (rice, wheat), green coffee, palm oil, cotton or white sugar. The value chains of commodities are mostly loosely integrated, although trade may be concentrated. In terms of increasing the value-added an interesting strategy is "decommodification", that is the diversification of conventional commodities into high-value variants (e.g. specialty coffee, specialty rice, aromatic cocoa or organic cotton).

Quoting FAO, **Conservation Agriculture** (CA) has emerged as an alternative to conventional agriculture as a result of losses in soil productivity due to soil degradation (e.g. erosion and compaction). CA aims to reduce soil degradation through several practices that minimize the alteration of soil composition and structure. CA maintains a permanent or semi-permanent organic soil cover consisting of a growing crop or dead mulch. – However, the line between conventional and CA often blurs as conventional agriculture utilizes many practices typical of CA, such as minimum or no-tillage. Hence, the differentiating feature of CA and conventional agriculture is the mindset of the farmer.

**Contract Farming** is a form of production in which farmer and buyer enter into a contract in advance of the growing season for a specific quantity, quality and date of delivery of an agricultural output at a price or price formula fixed in advance. The contract provides the farmer an assured sale of the crop. Sometimes, the contract includes technical assistance, credit, services, or inputs from the purchaser (see Embedded Services, below).

**Eco-systems Restoration Licenses**: Pilot programs in Indonesia in the form of long-term licenses, sold to private investors with the objective the complete restoration of natural forests and habitats over large areas, the licensee being allowed to extract recourses and realize benefits in a sustainable way. For Laos, these arrangements could have the appeal of replacing the old logging concessions by a win-win situation, in which the private investor gains a long term benefit, Government saves costs for conservation measures and – at the end of the license period – is handed back an intact forest / ecosystem which can again be sustainably used. See: [http://www.wildlifeextra.com/go/news/indonesia-ecosystem.html#cr](http://www.wildlifeextra.com/go/news/indonesia-ecosystem.html#cr)
Environmental Services are defined by OECD as “qualitative functions of natural non-produced assets of land, water and air (including related ecosystem) and their biota. There are three basic types of environmental services: (i) disposal services which reflect the functions of the natural environment as an absorptive sink for residuals, (ii) productive services which reflect the economic functions of providing natural resource inputs and space for production and consumption, and (iii) consumer or consumption services which provide for physiological as well as recreational and related needs of human beings.”

Embedded Services are business arrangements by which operational services are delivered in combination with a basic business transaction (sale of products or loans). The basic idea is to finance the service as part of the business transaction, e.g. linking technical advice to the sale of inputs. Embedded arrangements may include other business partners as the service providers, such as input dealers or processing companies, or professional service providers as third parties.

Food security exists when “...all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (World Food Summit, 1996). - The key word is “access” which implies that merely increasing food production is an insufficient concept to achieve food security. Among others, additional measures of generating cash income (market integration of producers, off-farm income opportunities, etc.) are indispensable complementary elements.

Gender refers to differences between women and men, boys and girls, in the performance of roles and responsibilities in social, economic, political and cultural spheres. These roles are learned, change over time and are influenced by perceptions and expectations arising from social and cultural, political, environmental, economic, institutional factors, as well as class, age and ethnicity. - Gender analysis is a detailed study of the different roles performed by women and men. It focuses on the access to and type of resources available as well on needs and priorities as a way to describe how these roles shape the livelihoods. - Gender mainstreaming is informed by the results of a gender analysis and refers to the systematic integration of issues pertaining to equal opportunities for men and women in institutions and all layers of society.

GlobalG.A.P. is a private sector body that sets voluntary standards for the certification of production processes of agricultural (including aquaculture) products around the globe. The GlobalG.A.P standard is primarily designed to reassure consumers about how food is produced on the farm by minimizing detrimental environmental impacts of farming operations, reducing the use of chemical inputs and ensuring a responsible approach to worker health and safety as well as animal welfare. The basis is an equal partnership of agricultural producers and retailers who wish to establish efficient certification standards and procedures. See: http://www.globalgap.org/cms/front_content.php?idcat=9

Green Value Chains: The colour word “green” is used synonymously for “environment friendly”, targeting ecological sustainability. As a label, “green” may refer to all kinds of investment projects, products and processes. A minimum requirement for the label would be the principle of “doing no harm” to the environment; more sophisticated tools include certification (e.g. GlobalGAP) and Environmental Impact Assessments (EIA). To a certain extent, the application of these instruments is the social responsibility of the private sector; to a larger extent the monitoring is a responsibility of Government. – Applied to “Green Value Chains”, the environmental standards are determined by the demand of consumers and the global market power of international lead firms. While this “pull” is the main driving force for improving “green” product standards, small producers in developing countries should receive assistance in the form of appropriate framework conditions, awareness campaigns, trainings and monitoring of “green” product standards (see also Value Chain Governance, below).
New Agriculture is a movement in the USA, joined by farmers, researchers and educators in search of solutions for sustainable and organic agriculture, see: http://www.new-ag.msu.edu/, for developing countries see http://www.new-ag.info/index.php.

Pro-poor Growth (PPG) is the most commonly quoted objective of value chain promotion. There is a relative and an absolute concept of pro-poor growth. The relative concept states that economic growth is pro-poor if poor people increase their incomes above the poverty line, even if their share in the national income does not improve (a positive growth rate for poor). The absolute concept states that growth is pro-poor, when the income of the poorest (e.g. of the lowest quintile in a population) increases at least equally or more than the average income. (such that inequality is reduced). PPG stresses the need to make the poor participate directly in the economic growth, and does not rely on social transfers. Pro-poor Value Chains is an inclusive concept of integrating the poor into economic growth.

Public-private Partnership (PPP): Whenever private companies share the public interest in economic development, public agencies may realize certain development activities jointly with a company. PPP denotes a joint project of government and a private enterprise to realize certain upgrading activities. An important criterion for a public agency engaging in a PPP is that an adequate proportion of the benefit accrues to the other Value Chain actors or to the general public, or in other terms, that no undue “windfall profits” are realized by the private company.

Region / regional: In the English version of the documents, the terms “region” or “regional” have a double connotation, referring either to a sub-national territorial entity at meso-level (e.g. group of provinces or districts defined by administrative criteria, a larger watershed defined by ecological criteria, etc) or to a larger area of a group of countries (e.g. GMS, ASEAN countries, etc). In the Agricultural Strategy (ADS), the terms “geographic area”, “territorial” or “regional economic development” refer to the meso-level of areas within Laos.

Results based Management, also referred to as “Performance Management”, is defined by the OECD-DAC (2001) as “a broad management strategy aimed at achieving important changes in the way government agencies operate, with improving performance (achieving better results) as the central orientation.

Smallholder: The exact definition of a ‘small’ farm differs widely depending on geographic context, labour structure, presence of irrigation, etc. The most obvious measure is farm size, and several sources define small farms as those with less than 2 hectares of cropland. In a similar but less precise vein, others describe small farms as those with “limited resources,” a definition that includes land as well as capital, skills, and labour. – Again others emphasize the low technology often used on small farms, the dependence on household members for most of the labour, and the subsistence orientation, where the primary aim of the farm is to produce the bulk of the household’s consumption of staple foods. However, local and regional context matters. - For the context of Laos, a legally binding definition of “smallholder” is outstanding and urgently needed, since in the implementation of the ADS and the Master Plan, the status of “smallholder” will also define access to smallholder farmer organizations, Government support in the form of training, access to credit, etc.

Smart Agriculture originates from an Israeli Agribusiness Consulting Company “SHIGAM” (Smart Agriculture Solutions, see http://www.shigam.com/Home). It is also used by other private agribusiness companies, see e.g. http://www.smartagservices.co.uk/. - For the Lao context, the idea needs to be further elaborated and refined to become an operational concept, but is seen as having a potential of successfully linking the desired investments of the private sector to a set of social and ecological conditionalities which ensure that not only the inves-
tors themselves but Lao society and rural smallholders benefit from such investments. In particular, additional investments in irrigation, rural market access roads, markets (both hardware and software), and other high-cost rural infrastructure will be required to contribute to poverty reduction, food security and environmental protection. Concessions for large-scale investments will be tied to these conditionalities and to pre-identified crops targeting pre-identified markets. On the other hand, demonstrated commitments are also required from rural communities to organize production units, to utilize and maintain the infrastructure and to comply with environmental standards.

**Supply Chain Management:** The basic concept of a supply chain is similar to the value chain. The difference is that a supply chain refers to the sequence of (upstream) sourcing and (downstream) marketing functions of individual enterprises, mostly of lead companies. Therefore, supply chain management is a business management tool rather than a development concept. It is concerned with logistics rather than market development.

**Sustainable Development:** Dating back to the Brundtland Report of the United Nations in 1987, one basic definition of sustainable development is a “development which meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since then, a number of useful and internationally recognized definitions have come up for different purposes. For the purpose of defining the long term vision of the Lao Agricultural Development Strategy (ADS), sustainable development is seen as a holistic concept, based on three pillars. Long-term sustainability is then to include all three dimensions; economic, social and ecological / environment, as illustrated.

A **Value Chain** is (i) a sequence of related business activities (functions) from the provision of specific inputs for a particular product to primary production, transformation, marketing, and up to the final sale of the particular product to consumers, and (ii) the set of enterprises (operators) performing these functions i.e. producers, processors, traders and distributors of a particular product. Enterprises are linked by a series of business transactions in which the product is passed on from primary producers to end consumers. **Value Chain upgrading** refers to a systemic approach of improving the efficiency of a value chain in the interest of all actors in the chain, not only for an individual firm or for a specific group of actors. However, specific aspects may be emphasized in the process which lead to different types of value chains, such as the above-mentioned “pro-poor” and “green” orientation, emphasizing political directions of promoting issues of social equity and environmental concerns.


**Value chain governance** refers to the power to control, influence, set the modes and rules of interaction among the actors in value chains. As opposed to the concept of supply chain management (see above), which is governed mostly by individual private companies, the development concept of value chain governance implies that Government provides an appropriate regulatory framework and ensures by appropriate measures of value chain governance that the bargaining position of upstream primary producers, smallholder farmers and local SME is strengthened vis à vis the generally more powerful domestic traders and international buyers.
Executive Summary

The present Agricultural Master Plan (AMP) for the five-year period 2011 to 2015 is based on the Agricultural Development Strategy (ADS) 2011 to 2020. The ADS provides the framework, the vision and the long term development goals of the Government of Laos (GoL) for the sustainable development of the sector, aiming at food and income security. The main points of the strategy are:

The Government's vision for the development of agriculture, forestry, natural resources management and rural development is based on the holistic concept of long-term, sustainable development, including economic, social and ecological dimensions.

The long-term development goals until 2020 for the sector are:

- Gradual introduction and increased application of modernized lowland market-oriented agricultural production, adapted to climate change and focused on smallholder farmers
- Conservation of upland ecosystems, ensuring food security and improving the livelihoods of rural communities

The four specific goals until the year 2015, and the associated intended development impacts are:

**Goal 1:** The improvement of livelihood (through agriculture and livestock activities) has food security as its first priority.

**Development Impact:** Improved food security

**Goal 2:** Increased and modernized production of agricultural commodities will lead to “pro-poor and green value chains”, targeting domestic, regional, and global markets, based on organizations of smallholder farmers and partnering investments with the private sector.

**Development Impact:** Increased production and value added of commodities

**Goal 3:** Sustainable production patterns, including the stabilization of shifting cultivation and climate change adaptation measures, are adapted to the specific socio-economic and agro-ecological conditions in each region.

**Development Impact:** Widespread application of ecologically sustainable production patterns adapted to the conditions of regions

**Goal 4:** Sustainable forest management will preserve biodiversity and will lead to significant quantitative and qualitative improvements of the national forest cover, providing valuable environmental services and fair benefits to rural communities as well as public and private forest and processing enterprises.

**Development Impact:** Forests contribute significantly to the welfare of present and future generations of the Lao people

While the ADS is a long term framework for the development of the sector, the present Agricultural Master Plan (AMP) is a roadmap for the implementation of the strategy in the coming five years. The AMP uses a Program Approach to structure the various measures and interventions. It thus resembles a conventional sub-sector approach to planning, which has the distinct advantage of a relatively easy clarification of implementation responsibilities among the respective MAF departments. On the other hand, as pointed out in the ADS, the program approach (or “Program Based Approach”, PBA) is based upon the sound evaluation of socio-economic and agro-ecological conditions, responding directly to local needs of the
stakeholders in rural areas of Laos. In a bottom-up planning and consultation process, these region-specific conditions have been considered in the overall design of the Master Plan. It is hoped that the participation of the concerned stakeholders in the regions will maximize the effectiveness of resource allocation in the agriculture and forestry sector. The geographic area approach thus has to be added as a different perspective when it comes to the local and regional adaptation of the eight programs, which is the responsibility of decentralised authorities on provincial and districts levels.

The AMP is associated with an Agricultural Investment Plan (AIP), prepared as a separate document, which calls for the Cooperation of Development Partners and the Private Sector to enter partnerships for financing the implementation of the eight programs in the different regions of the country.

The Agricultural Master Plan (AMP) as roadmap is not intended to provide operational details for the implementation of specific measures, nor can it go into details about the necessary region-specific adaptation of all the programs and measures. Like the ADS, the AMP is designed to support the resolution of the IXth Party Congress and to fit into the overall context of the 7th NSEDP and thus corresponds to the government’s wider development perspectives.

As a link between the Agricultural Strategy and the Agricultural Investment Plan, the AMP is meant to structure and optimize the recourse allocation of GoL’s public investments in the sector, as well as pipeline the contributions from Development Partners and the Private Sector. In a logical sequence, the Agricultural Investment Plan (AIP) will quantify these contributions.

The AMP is based on the eight programs identified by the Ministry of Agriculture and Forestry (MAF), which will be implemented to achieve the four goals defined by MAF for the development of the agriculture and forestry sector. The short titles of these programs are:

1. Food production
2. Commodity production and farmer organizations
3. Sustainable production patterns, land allocation and rural development
4. Forestry development
5. Irrigated agriculture
6. Other agriculture and forestry infrastructure
7. Agriculture and forestry research and extension
8. Human resource development

These eight implementation programs directly relate and contribute to the achievement of the above-mentioned four goals in the following way:

Goal 1: food security
   - Contributions by Implementation Programs:
     Program 1: Food production
     Program 6: Other agriculture and forestry infrastructure
     Program 7: Agriculture and forestry research and extension
     Program 8: Human resource development

Goal 2: agricultural commodities / pro-poor and green value chains
   - Contributions by Implementation Programs:
     Program 2: Commodity production and farmer organizations
     Program 5: Irrigated agriculture
     Program 7: Agriculture and forestry research and extension
     Program 8: Human resource development
Goal 3: **Sustainable production patterns**
- **Contributions by Implementation Programs:**
  - Program 3: Sustainable production patterns, land allocation and rural development
  - Program 7: Agriculture and forestry research and extension
  - Program 8: Human resource development

Goal 4: **Sustainable forest management**
- **Contributions by Implementation Programs:**
  - Program 4: Forestry development
  - Program 7: Agriculture and forestry research and extension
  - Program 8: Human resource development

The AMP presents for each of these eight programs the measures required to implement the program in three groups: i) key measures, ii) measures related to climate change adaptation or biodiversity, and iii) other specific investments, programs and projects. The first two groups of measures (key and climate) are presented in some detail, and in the order of priority, followed by the sequence of action needed for implementation. The third group of measures (other investments) is presented in more detail in the Agricultural Investment Plan (AIP). In the AIP, Government organizations, MAF line agencies, and other stakeholders responsible for implementing the measures, and the regions of implementation (North, Central, and South) are also identified and checked for regional balance.

In addition, the AMP formulates for each of the eight programs the objectives, expected outcomes and targets until 2015: In summary, the programs can thus be presented as follows:

**Program 1: Food production**

**Objectives:**
- Smallholder farmers will have food security based on increased productivity of rice and diversified farming systems.
- Smallholder farmers will adapt to climate change and build resilience to floods and droughts.
- Sufficient food will be accessible to ensure energy at 2400-2500 kcal/capita/day.

**Potential outcome:**
- Smallholder farmers will have food security based on increased productivity of rice and diversified farming systems that are resilient to climate change and related extreme weather events and induced disasters.

**Targets:**
- 4.2 million tons of paddy are produced annually by 2014.
- An increase in the production of meat, egg, fish and other fresh products at 5% annually (40-50 kg per capita per year) is achieved until 2015.
- An increase of food quantity produced in the 47 poorest districts (350 kg per head per year) is attained by 2015.

**Key measures:**
- (1) agricultural diversification
- (2) upgrading local breeds of livestock, fishery
- (3) irrigated production of rice
- (4) basic rural infrastructure
- (5) area-based zoning of agro-ecological areas
- (6) conservation agriculture
(7) Human Resource Development focus on food production

Measures related to Climate Change or Biodiversity:
(8) social safety nets, climate insurance program

Program 2: Commodity production and farmer organizations

Objectives:
- MAF support the instantiation and legalization of smallholder farmer organizations and engage in a network of PPPs that will facilitate the integration of smallholder farmers and their organizations into domestic, regional, and global “pro-poor and green value chains”.
- MAF will ensure by appropriate measures of value chain governance that smallholder farmers and local SME can retain a fair share of the value added.
- MAF will provide an appropriate regulatory framework, monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests.

Potential outcome:
- Upstream domestic producers and processors, in particular smallholder farmers and rural SME, will benefit over-proportionally by their integration into “pro-poor and green value chains”, while maintaining the long term production potential of their natural resources, in particular their agricultural land.

Targets:
- Agriculture and forestry sector product exports represent 1/3 of the total Lao PDR exports.
- The value of agriculture and forestry exports represents at least 3.0 billion USD.
- Establishment of smallholder producer groups, cooperatives and associations in all priority value chains
- Mobilization of substantial investments from the private sector

Key measures:
1. “Smart Agriculture”, appropriate regulatory framework of social and environmental conditionalities, in particular for large scale commercial farming
2. Analyse value chains for high-value crops
3. “pro-poor and green value chains”, value chain governance
4. Farmer Organizations, legal formalization as cooperatives and / or associations, assistance production cluster and value chain upgrading strategies
5. Program on Risk Management
6. Training for Farmer in technical, management and marketing skills
7. Cooperation with private sector investors, cooperatives equal partners in a win-win constellation
8. Support cooperatives specialized as private service providers
9. Initiate and formalize forest user groups
10. Work with regional organizations (ASEAN, GMS, MRC, and others)
11. Cooperate with the Ministry of Industry and Commerce to install modern information and communications technology (ICT)
12. Inventory of agricultural land concessions, ensuring that GOL regulations on the issuance and operations of such concessions are strictly followed
13. Rural infrastructure investments

Measures related to Climate Change or Biodiversity:
(14) Climate-smart agribusiness, „Climate Proofing for Development“, support “green labelling” of Lao products
(15) Agricultural research and extension focused on commercial agriculture, linked to strengthening resilience to climate change

**Program 3: Sustainable production patterns, land allocation and rural development**

**Objectives:**
- Principal objectives of Program 3 include establishing more sustainable production patterns, complete land and forest allocation, and support rural development in high-priority poverty districts, applying an approach to sustainable natural resource management which is based on the specific potentials, the socio-economic situation and on the agro-ecological conditions in each region.

**Potential outcome:**
- The concept of sustainable use of diminishing resources is firmly rooted in the mindset, actual behaviour and land use practices of all stakeholders.
- Eco-agricultural adaptation measures to climate change preserve the long term production potential of natural resources.

**Targets:**
- Expansion of commercial cropping systems in suitable areas
- Establishment of producer groups and cooperatives
- Land allocation is completed
- Farmer real incomes raised
- Farmers reduced shifting cultivation and adopted sustainable production systems
- Specific regulations of land use planning and monitoring system
- Farmers resilient to climate change induced disasters

**Key measures:**
1. Promote conservation agriculture
2. Participatory “Village Development Planning”
3. Promote off-farm income and employment opportunities
4. Agricultural Census
5. Intensify promoting of “Lao Extension Approach Plus” (LEA+)

**Measures related to Climate Change or Biodiversity:**
6. Sub-basin land use planning, agro-ecosystem analysis
7. Climate smart land use planning
8. Promote dissemination and use of biogas facilities

**Program 4: Forestry development**

**Objectives:**
- Deterioration of forest resources will be controlled and corrected in terms of both quantity and quality, leading to increased and protected forest cover and to livelihood improvement of poor farmers in rural areas.
- Laws and regulations related to forest management will be improved and enforcement strengthened.
- Participation of local people will be the main approach of sustainable management of all categories of forests.
Sustainable Forest Management will contribute to the conservation of biodiversity, CO₂ reduction and other internationally agreed environmental parameters.

Potential outcome:

- Increased awareness of the importance of forests in eco-system management, improved effectiveness of law enforcement, reduced illegal logging, increased rehabilitation and reforestation, innovative schemes for watershed management

Targets:

- Improving existing forest area (Forest Coverage Area) up to 65% of the total land area through the implementation of collaborative management plans for biodiversity and watershed services for conservation and protection forests and sustainable forest management in production areas
- Increase forest quality in under-stocked forests (potential forest) within and outside designated forest zones (3 forest categories) through avoidance of deforestation-cum-rehabilitation in an area of up to 6 million hectares by 2015
- Develop legislation for valuing of ecosystem services (e.g. biodiversity, water) in all forest categories
- Develop methods and procedures for assessing carbon content in all types of forest land and legislation to apply in all types of forest conversion repayment.

Key measures:

1. Agro-ecological system analysis for land management.
2. Policy framework for community forestry and for producer organizations, including recognized sustainability standards and certification
3. Secure legal recognition and ensure sustainable management of all state forest zones demarcated with the participation of local people
4. Promote domestication and sustainable management of NTFPs and tree planting for fuelwood and promote urban forestry
5. Promote a balance between wood processing and approved wood harvest volumes; promote sustainable trade in wood products by certification
6. Capacity building with government organizations and concerned parties for the implementation of the Forest Strategy 2020 (links to Programs 7 and 8).
7. Develop regulations, guidelines and institutional framework to support integrated village development (link to Program 3).

Measures related to Climate Change or Biodiversity:

8. Mobilize new climate-related finance mechanisms; REDD +, “Eco-systems Restoration Licenses”, regulatory framework for trade in CO₂ reduction certificates and derivates; network internationally in accordance with the international conventions
9. Awareness campaigns on the important role of forest in climate change mitigation; biodiversity assessment conservation program for protected areas and NBCA
10. Pilot and support community-based forest management, co-management for protected areas and forest ecosystems
11. Enforce appropriate laws, regulations and implementation guidelines related to sustainable forest management and measures in terms of climate change
Program 5: Irrigated agriculture

Objectives:
- The main objective of the National Action Plan for Irrigated Agriculture is to get new public management models implemented in the irrigated agriculture sub-sector by 2015.

Potential outcome:
- Improved production systems and public management mechanisms: In the uplands, livelihood and nutritional well-being of smallholders will be improved through increased productivity of rice and diversified farming systems that are adapted to climate change. In the lowlands and flood plains, commodity production will be increased through partnership investment aiming to develop value chains to domestic, regional and global markets.

Targets:
- 350,000 ha dry season irrigated agriculture area
- In the lowlands, the target is to attain 225,000 ha of irrigated agriculture area for commodity production of which about 180,000 ha will be under flood irrigation systems.
- In the uplands, the target is to attain 125,000 ha of irrigated agriculture for the development of livelihood and the protection of social and environmental conditions. Of this area, about 60,000 ha will be under flood irrigation.

Key measures:
1. Conducive Market Environment for Irrigated Agriculture
2. Irrigated Agriculture Technology Application
3. Irrigation Management Service and Investment
4. HRD and Vocational Training for Irrigated Agriculture
5. Community Based Watershed Programs

Measures related to Climate Change or Biodiversity:
6. Irrigated Agriculture Development for Social and Environmental Purposes
7. Flood and Drought Prevention
8. Climate Proofing of Irrigation System

Program 6: Other agriculture and forestry infrastructure

Objectives:
- Improvement of Agriculture Infrastructure (mechanization, post harvest handling, rural market access roads, market infrastructure, ITC to support marketing)
- Improvement of Forestry Infrastructure, Agro-forestry Eco-parks, demarcation of protected areas, tree seedling and nurseries for reforestation, community-based watershed protection

Potential outcome:
- More use of hand tractors and trailers, increase of agric. labour productivity, farmer groups able to retain more value-added, increased ex-farm prices
- Physical preconditions of sustainable forestry management and conservation of protected areas are in place

Targets:
- Increase of tractor use 2/ annually
- 1 crop drying pad/each village
- 1 cool storage / each province
- 50 km access roads / province
1 commodity market / each district
National market information system operational
Eco-parks nationwide
Demarcation and ground-truthing of forests completed
Reforestation fee from logs and NTFP used 100% for tree nurseries
Closure of forests in protected watersheds

Key measures:

**Agriculture infrastructure**

1. Mechanization and post-harvest handling
2. Market infrastructure, including rural market access roads and information and communications technology to support marketing

**Forestry infrastructure**

3. Demarcation:
4. Reforestation:

**Measures related to Climate Change or Biodiversity:**

5. Weather Based Farming Model for Communities, research on High Yield Seed, and Seed Banks
6. Climate resilient infrastructure facilities (electricity and water supply)

**Program 7: Agriculture and forestry research and extension**

**Objectives:**

- The General Objective is to conduct “Applied Research for Development”, and translate the results directly into the widespread dissemination of needs-based, gender and area-specific and market-oriented extension packages, covering the technical content of all 4 sector goals, referring to crop cultivation, livestock / animal husbandry, aquaculture and fisheries as well as community-based forestry.

**Potential outcomes:**

- Research results are directly used in appropriate extension packages
- Agricultural and forestry techniques, as well as marketing skills of smallholder farmers and rural SME are substantially enhanced as a result of improved AE services

**Targets:**

- Investments in agriculture research and development from all sources (i.e., overseas development assistance and foreign direct investment) increases by 25 percent over 5 years.
- 50 percent of smallholder farmers have access to improved seed varieties and improved livestock breeds to increase productivity by 20 percent over 5 years.
- 50 percent of smallholder farmers are using GAP.
- 25 percent of smallholder farmers are practicing conservation agriculture.
- 50 percent of smallholder farmers in economically lagging areas and pockets of poverty are using GAP and have access to value chains for organic and niche products.
- The volume of food and agricultural products produced for export that meets international food safety standards has increased by 30 percent.

**Key measures:**

1. Results of “Applied Research for Development” are directly translated into the widespread dissemination of needs-based, gender-specific and area-specific as well as market-oriented extension
(2) Create new units at NAFRI and NAFES to work with agro-enterprises and investors and to promote and strengthen farmer organizations
(3) Strengthen research related to irrigated agricultural production and agricultural diversification
(4) Upgrade local breeds of livestock through crossbreeding with improved and heat resistant breeds
(5) Knowledge transfer in irrigated agriculture focused on mobilizing PPP
(6) Valuable research results from other countries made available for further practical adaption to Lao conditions
(7) Cooperation with private sector for “embedded agricultural extension services”

Measures related to Climate Change or Biodiversity:
(8) Agriculture research and extension linked to climate change mitigation and adaptation measures
(9) Research programs on and gender indigenous knowledge and on local/regional downscaling of climate change impacts
(10) Tests and trials for the local and regional-specific adaptation of seed varieties resilient to climate change
(11) Climate change awareness program through the agricultural extension services.

Program 8: Human resource development

Objectives:
- Build up adequate institutional capacity and human resources among public and private service providers to facilitate the achievement of Goals 1 to 4 until 2015.
- The capacity of government organizations and concerned parties will be strengthened for implementation of the Agricultural and Forest Strategy to 2020. In this context, a reform of the public administration in several sub-sectors is to be effected.

Potential outcome:
- Strengthened institutional and human capacities (including significant progress in gender mainstreaming) to organize and manage holistic rural development, agriculture and forest-based production, processing and marketing as well as environmental services

General HRD targets Include
- 40 PhD, 50 masters, and 70 bachelor degrees;
- Training and development for technical officials in provinces: 5 PhD in each province, 10 masters, 40 bachelor degrees, 35 higher diplomas, and 5 diplomas;
- Training and development for technical officials in districts: 6 masters, 15 bachelor degrees, 40 higher diplomas, 60 diplomas, and 40 certificate level;
- Technical staff at village level: 1 technical staff per 30 families; and,
- According to the mandate given to MAF and development trends in the agriculture and forestry sector from now to 2020, MAF will require about 12,857 officials, or a 24 percent increase from 2010.

Key measures:
(1) Cooperate with other sectors to build capacity
(2) MAF personnel will require upgrading in pre- and post-harvest handling, food safety, SPS, GAP, technical and other non-tariff barriers to trade, and value chain analysis
(3) MAF procedures will require reform and modernization
(4) Pursue general HRD targets:
(5) Introduce job-performance assessment and monitoring system, a performance-based incentives scheme and a strictly performance-based job promotion scheme
(6) Introduce a leadership system of “Management by annual targets”, accompanied by a strict monitoring of annual targets and reporting to higher levels

(7) Lead Agency for each of the 8 programs of the Master Plan, formulate annually verifiable indicators on outputs and impacts, submit annual M & E Reports

(8) Participation of women will be favourably considered for staffing, leadership and training; more female candidates in the agricultural, forestry and veterinary subjects

(9) Gender Management Information System, based gender-disaggregated statistical data and qualitative indicators

Measures related to Climate Change or Biodiversity:

(10) Institutionalize in curricula on all levels of the agricultural education system training modules on climate change adaptation (CCA)
Introduction

Rational of the program approach

1. The implementation of a Program Based Approach (PBA), based upon the sound evaluation of socio-economic and agro-ecological conditions, responding directly to local needs, and with the participation of concerned stakeholders, will maximize the effectiveness of resource allocation in the agriculture and forestry sector. The application of area-based and participatory planning will facilitate (i) the identification of performance-based indicators with the participation of potential beneficiaries in target areas; and, (ii) monitoring, evaluation, and iterative planning of rural and agricultural development activities. In addition to quantitative indicators, it is expected that concerned stakeholders will be interested in monitoring and evaluating qualitative issues related to governance of development activities and of institutions responsible for local development administration.

2. The Agricultural Master Plan (AMP) is a roadmap for implementing the Agricultural Development Strategy (ADS) 2011-2020. As such, it is not intended to provide operational details for the implementation of specific measures, nor can it go into details about the necessary region-specific adaptation of all the programs and measures. Like the ADS, the AMP is designed to support the resolution of the IXth Party Congress and to fit into the overall context of the 7th NSEDP and thus corresponds to the government’s wider development perspectives.

3. As a link between the Agricultural Strategy and the Agricultural Investment Plan, the AMP is meant to structure and optimize the recourse allocation of GoL’s public investments in the sector, as well as pipeline the contributions from Development Partners and the Private Sector. In a logical sequence, the Agricultural Investment Plan (AIP) will quantify these contributions.

4. The AMP is based on the eight programs identified by the Ministry of Agriculture and Forestry (MAF), which will be implemented to achieve the four goals defined by MAF for the development of the agriculture and forestry sector. The short titles of these programs are:

   (1) Food production
   (2) Commodity production and farmer organizations
   (3) Sustainable production patterns, land allocation and rural development
   (4) Forestry development
   (5) Irrigated agriculture
   (6) Other agriculture and forestry infrastructure
   (7) Agriculture and forestry research and extension
   (8) Human resource development

5. The AMP presents for each of these eight programs the measures required to implement the program in three groups: i) key measures, ii) measures related to climate change adaptation or biodiversity, and iii) other specific investments, programs and projects. The first two groups of measures (key and climate) are presented in some detail, and in the order of priority, followed by the sequence of action needed for implementation. The third group of measures (other investments) is presented in more detail in the Agricultural Investment Plan (AIP). In the AIP, Government organizations, MAF line agencies, and other stakeholders responsible for implementing the measures, and the regions of implementation (North, Central, and South) are also identified and checked for regional balance.
6. The present document defines the program approach to be taken for enhancing the effectiveness of government and donor assistance for the implementation of the eight programs and specified measures, including the integration of foreign and domestic private sector investments. The scope of the PBA particularly covers the defined ODA assistance and the Government loans from International Funding Institutions. In a subsequent document, the Agricultural Investment Plan (AIP) 2011-2015, the investment needs and modalities will be further specified, including FDI.

**Highlights of the Agricultural Development Strategy 2020**

7. The Government's vision for the development of agriculture, forestry, natural resources management and rural development is based on the holistic concept of long-term, sustainable development, including economic, social and ecological dimensions.

8. The long-term development goals for the sector are:
   - Gradual introduction and increased application of modernized lowland market-oriented agricultural production, adapted to climate change and focused on smallholder farmers
   - Conservation of upland ecosystems, ensuring food security and improving the livelihoods of rural communities

9. The strategic direction given to the Ministry of Agriculture and Forestry for the ANR sector strategy is to ensure a successful gradual transition from subsistence into commercial smallholder production. This can be achieved by applying innovative technologies for high quality production for value-added agro-processing and domestic, regional, and world markets. As well, modern farmer organisations need to be built up such as cooperatives, commodity associations, boards in order to ensure economies of scale, and an effective regulation for the sector. Smallholder farming systems and the economies of rural communities will become more diversified and be upgraded to increase production for food security and to improve rural living standards. The aim is to contribute to reducing rural poverty by creating rural employment opportunities, transferring modern technologies to increase productivity, channelling agricultural production inputs and finance, and facilitating linkages to regional and global value chains.

10. MAF will provide an appropriate regulatory framework, monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests. In operational terms, the framework will translate into appropriate measures of value chain governance ensuring that smallholder farmers and local SME can retain a fair share of the value added. Additional investments in irrigation, rural market access roads, and other high-cost rural infrastructure will be linked to a set of social and ecological conditionalities to ensure that not only the investors themselves but Lao society and rural smallholders benefit from such investments.

11. Major themes of the Agricultural Development Strategy include a strong focus on modernizing agricultural production and creating value-added food and agricultural products aimed at reducing rural poverty, maintaining food security, and applying results-based management to the natural resources that provide the foundation for sustainable agricultural and rural development. ANR sector development themes
will contribute to articulating national economic development objectives in terms more closely aligned with the United Nations Millennium Development Goals.

12. While women account for 54 % of the agricultural work force and participate in a variety of agricultural services, their significant contribution to the national economy and to the sector often remains unaccounted for. **Women’s effective integration** remains a challenge for the coming decade, as sector performance and the achievement of sector goals highly depend on closing the gender gap. The current ADS highlights approaches ensuring that men and women are given equal opportunity to benefit from the intended development of the sector.

13. The structure of the ANR sector projected to 2020 can be broadly grouped by two different but highly inter-dependent systems: **lowland and upland agricultural production**. Derived from these broad categories of production modes, **more specific area-based approaches** are to be elaborated which take into account the comparative advantages and potentials within the context of each region. Region-specific strategies, production systems and action plans for support measures would then take the form of modular, integrated packages which aim to maximize the specific locational advantages (or mitigate respective disadvantages).

14. Agricultural policy makers fully recognize the importance of maintaining the **integrity of natural resources as the basic building block for rural development**, the agriculture sector, and the livelihood of smallholder farmers; foundation of expanded trade and increased foreign exchange earnings from exports of food and agricultural products; source of biological diversity to support expansion of nature-based tourism and exports of hydropower; and, essence of the Lao Nation. They further recognize that life sustaining ecological services, including clean water, pollutant elimination in wet zones, pest control, pollination, and erosion control can only take place when biological diversity is intact. Environmental services play an important role in defining culture; thus preserving the biodiversity of fauna and flora, which is **directly linked with preserving the Lao national identity and cultural diversity**.

15. The Agricultural Development Strategy (ADS) 2011-2020 is based on the foundation established by the ‘Four Goals and Thirteen Measures’ (4/13) implemented by MAF since 2007, in support of the ‘11 Programs and 111 Projects of the Elaborated Plan’ adopted by the 8th Party Congress in 2006. While retaining the correct thinking and spirit of the 4/13, the ADS adopts a new perspective to respond to changing national needs and the necessity to modernize in **response to an increasingly challenging regional and global situation**. The ADS also addresses agriculture and natural resources issues as they impact on rural development, making an effort to **balance** the stressful forces of globalization and modernization, with **traditional Lao society and natural livelihood systems**.

**Goals and Programs for the Period 2011-2015**

16. The Agricultural Development Strategy (ADS) for the period 2011 to 2010 will be realized through the achievement of the **four goals** which have been re-formulated to better address the changing regional and global situation. The **eight programs** of the PBM used in the present Agricultural Master Plan (AMP) for the period 2011 to 2015 directly relate to the four goals in the following way:

**Goal 1**: The improvement of livelihood (through agriculture and livestock activities) has **food security** as its first priority.

- **Contributions by Implementation Programs:**
  - Program 1: Food production
Program 6: Other agriculture and forestry infrastructure  
Program 7: Agriculture and forestry research and extension  
Program 8: Human resource development

**Goal 2:** Increased and modernized production of *agricultural commodities* will lead to “*pro-poor and green value chains*”, targeting domestic, regional, and global markets, based on organizations of smallholder farmers and partnering investments with the private sector.

- **Contributions by Implementation Programs:**
  - Program 2: Commodity production and farmer organizations
  - Program 5: Irrigated agriculture
  - Program 7: Agriculture and forestry research and extension
  - Program 8: Human resource development

**Goal 3:** *Sustainable production patterns*, including the stabilization of shifting cultivation and climate change adaptation measures, are adapted to the specific socio-economic and agro-ecological conditions in each region.

- **Contributions by Implementation Programs:**
  - Program 3: Sustainable production patterns, land allocation and rural development
  - Program 7: Agriculture and forestry research and extension
  - Program 8: Human resource development

**Goal 4:** *Sustainable forest management* will preserve biodiversity and will lead to significant quantitative and qualitative improvements of the national forest cover, providing valuable environmental services and fair benefits to rural communities as well as public and private forest and processing enterprises.

- **Contributions by Implementation Programs:**
  - Program 4: Forestry development
  - Program 7: Agriculture and forestry research and extension
  - Program 8: Human resource development
1. Program 1: Food Production

1.1. Situation analysis

17. **Food security** is the highest priority in the agriculture sector. Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept at the family level, with individuals within households as the focus of concern. Similarly, food insecurity exists when people do not have adequate physical, social, or economic access to food.

18. Agricultural and forestry are growing 3.4 percent annually as a share of GDP. In current **food production**, annual rice production is estimated at 3.3 million tons, with an average of 400-500 kg available per person per year. Efforts are focused on increasing rice production in the 47 poorest districts, aiming to provide an average of 350 kg per person per year. Other food products including meat, eggs, fish, and milk are growing 5 percent per year, producing an average of 40-50 kg per person per year.

19. From a **nutritional perspective**, at the national level, approximately 270,000 or 37 percent of the children under 5 remain underweight and over the past ten years, this rate has not declined. Chronic malnutrition remains the biggest problem with nearly 300,000 or 40 percent of children under 5 being stunted. The most significant constraint to food availability is the low level of domestic production of food items, resulting from low productivity and high risks in the agricultural sector.

20. The areas of rain-fed rice fields destroyed by an increased frequency of flooding averaged more than 60,000 ha in the period 1995 to 2005, with an increasing trend in recent years. The **impacts of climate change** have already been experienced through an increase in floods and droughts. Increasing severity, duration and frequency of floods and droughts is the most probable risk posed by climate change in Lao PDR. Approximately 80% of the population still relies on agriculture for their livelihoods, and an increase in the incidence of floods or droughts will have a significant impact on the sector and particularly on the livelihoods of vulnerable groups with low adaptive capacity. The geographical zones of Lao PDR which are most prone to flooding are the plain areas along the Mekong River Basin in the Central and Southern regions, including the capital Vientiane; whereas areas in the North and Northwest are more prone to droughts or rice insufficiency.

1.2. Key areas to be addressed

21. To have an impact on national poverty reduction, macroeconomic planners are planning for GDP growth of 7.5 percent annually during the 2011-2015 period. MAF planners are expecting that the agriculture sector will grow and estimated 3-4 percent annually, to contribute to rural poverty reduction, particularly in the 47 poverty districts. Within the framework of the Agricultural Development Strategy, the following **food production issues** are addressed by the AMP:

- Improved management of irrigation systems will be achieved through the strengthening of smallholder farmer capacity for irrigated agricultural production and the simultaneous development of public-private partnerships for medium- and large-scale irrigation projects.
- Crop intensification on lowland areas of the Mekong corridor and on existing irrigated land.
- Diversification of agricultural production, through horticulture, livestock raising (cattle, poultry, and pig production), tree planting, aquaculture, and other food and agricultural products (e.g., non-timber forest products); as well as production of non-glutinous rice varieties to substitute for imports in response to increased demand from domestic consumers and tourists.
- Reducing pre- and post-harvest losses by adopting improved plant husbandry (fertilizing, irrigating, pruning, and spraying) and post-harvest handling technologies (applied immediately following harvest, including drying, cleaning, sorting, cooling, storage, and packing).
- Improved food safety for domestic consumption through the application of good agriculture practices (GAP).
- Community-based food preservation and processing to meet increases in domestic demand for processed food products.
- Adaptive crops cultivation in the flood and drought prone areas
- Changing seeds and crops calendar to adapt to climate change

22. **Agricultural diversification** among smallholder farmers will be promoted in order to improve the nutritional well-being of the Lao people (*an element of food security*), strengthen the resilience of agriculture to climate change, and respond to increasing demand for Lao food and agricultural products in local and regional markets. Food security and livelihood improvement is linked to ensuring good management of agricultural land. This can best be achieved by focusing on ‘production basics’ including good soils management, use of improved seed, application of suitable fertilizer packages, and integrated pest management (IPM). Farmers practicing irrigated agriculture will be given more training in on-farm and in-field water use and community management of irrigation structures, to intensify production and increase yields. Further, local breeds of livestock will be cross-bred to increase productivity while retaining important disease resistance traits to ensure resilience to climate change and resistance to indigenous diseases. Basic veterinary services and vaccination programs will be strengthened to support animal disease control. Agricultural research, extension, and development, as well as livestock improvement measures will aim to increase productivity, reduce costs of production, and enhance quality to improve market competitiveness.

23. To ensure enhanced food security, the AMP emphasizes ‘production basics’ including investments in good soils management, use of improved seed and livestock breeds, application of suitable fertilizer packages, and integrated pest management (IPM). Irrigated agriculture is given a higher priority, with more training in on-farm and in-field water use and community management of irrigation structures, to intensify production and increase yields. Further, cross-breeding of improved and local breeds of livestock will be intensified to increase productivity while retaining important disease resistance traits to ensure resilience to climate change and resistance to indigenous diseases. Basic veterinary services and vaccination programs will be strengthened to support animal disease control.

24. Agricultural constraints are centered on the dominance of subsistence agriculture with rice as the main crop, occupying 68 percent of the total cultivated area of 1.8 million ha. Input use is very low. Rice yields are low by Asian standards; national average yields are within the range of 1.5 to 3.5 tons per hectare.1 Agricultural research, extension, and development, as well as livestock improvement measures will aim to increase productivity, reduce costs of production, and enhance quality to improve market competitiveness.

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1 This is compared with 2.5-3.5 tons/ha/crop in Thailand, and 3.5 to 4.2 tons/ha/crop in Vietnam.
1.3. Objectives, outcomes and targets

25. Objectives:

- Smallholder farmers will have food security based on increased productivity of rice and diversified farming systems.
- Smallholder farmers will adapt to climate change and build resilience to floods and droughts.
- Sufficient food will be accessible to ensure energy at 2400-2500 kcal/capita/day.

Potential outcome:

- Smallholder farmers will have food security based on increased productivity of rice and diversified farming systems that are resilient to climate change and related extreme weather events and induced disasters.

26. The key sector targets associated with Program 1 are:

- 4.2 million tons of paddy are produced annually by 2014.
- An increase in the production of meat, egg, fish and other fresh products at 5% annually (40-50 kg per capita per year) is achieved until 2015.
- An increase of food quantity produced in the 47 poorest districts (350 kg per head per year) is attained by 2015.

27. The food production targets above will provide the expanding population with enhanced food security during the period 2011-2015. Agricultural diversification among smallholder farmers will be emphasized to minimize risk, improve the nutritional well-being of the Lao people, and strengthen the resilience of agriculture to climate change. Food security and improved quality of life is linked to ensuring good management of agricultural land, particularly irrigated land, and improved management of livestock.

1.4. Priority measures and sequence of actions

28. Program 1 (food production) is the core element for achieving Goal 1 (food security).

In the order of their relative importance, the key measures of Program 1 include the following, among others:

1. To strengthen the resilience of agriculture and ensure food security, NAFRI, NAFES, the Department of Livestock and Fisheries and DOA will collaborate to implement measures for agricultural diversification, including mixed farming, agroforestry, and blending of indigenous knowledge with modern agricultural techniques.

2. The Department of Livestock and Fisheries (DOLF) will focus its resources on (i) upgrading local breeds of livestock through crossbreeding with improved and heat resistant breeds; and, (ii) disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network to maximize livestock productivity. In a similar way, this applies to fishery.

3. The Department of Irrigation (DOI), the Department of Agriculture (DOA) and NAFES will work together to promote the irrigated production of rice, including organic rice and non-glutinous rice, and high potential diversified other crops, including fruit and vegetables, for food security (link to Program 2).

4. Improvement of basic rural infrastructure in remote areas (irrigation, post harvest handling, access roads, market places, market information systems) (link to Programs 5 and 6)
(5) Survey and designate land capability and production zones (area-based zoning of agro-ecological areas) on macro and meso levels, according to their specific potentials and comparative advantages, participatory land use planning on micro level), and grant agricultural land use rights and titles (land registration) to rural households (link to Program 3)

(6) Agricultural research and extension with a focus on conservation agriculture\(^2\) linked to strengthening resilience to climate change to ensure food security, (links to Programs 3 and 7)

(7) Human Resource Development (notably of agricultural extension staff on village level) and the promotion of farmer organizations with a focus on food production (link to Program 8)

The measures of Program 1 related to Climate Change or Biodiversity, include:

(8) To mitigate the foreseeable negative impacts of climate change, MAF will enhance the economic resilience of smallholders through social safety nets by a climate insurance program, which will be coordinated with appropriate private sector initiatives on micro credit and micro insurance.

29. **Agricultural diversification** would include mixed farming, agroforestry, and blending indigenous knowledge with modern agricultural techniques: The four key MAF research, development and extension agencies would collaborate to design extension packages and training courses for community leaders and lead farmers on increasing crop and livestock productivity of smallholder farmers. These extension packages will also take into account the expressed needs of rural women in terms of selection of topics, contents and didactical approach, as well as in terms of recruiting female extension workers. This will be achieved by intensifying the application of chemical fertilizer packages as appropriate, particularly in irrigated lowland areas already familiar with the use of fertilizer; use of compost and biomass as natural fertilizer; use of improved (non-genetically modified) seeds; and, application of advanced technology on rice and cash crops. The four agencies would develop extension measures, messages, and packages that support the intensive use of innovative agricultural technology to increase land, forestry, and animal productivity. Activities will include expansion and acceleration of on-farm and in-field research and development of mixed farming models, with a focus on integrating crop, livestock, and fisheries activities that generate on-farm income the year-round, allow for recycling of agricultural wastes and residues, and include outputs used for renewable energy. To ensure the sustainability of research and extension services, MAF will propose that the Ministry of Finance impose an export tax on selected bulk commodity export crops (e.g., fodder maize, rubber, cassava), the proceeds of which would be allocated to support agricultural research and extension operations.

30. The **irrigated production of rice** includes organic rice and non-glutinous rice, and diversified crops for food security. Sub-district (village cluster/’kum baan’) extension workers and farmer water user group leaders will be provided with intensive training in on-farm and in-field irrigation water use and management and irrigated agriculture techniques, including pre- and post-harvest handling of crops produced under irrigated conditions. Personnel from DOI, DOA, and NAFES will be provided training in the socio-economic and agro-ecological aspects of irrigated agriculture.

31. In the context of improving smallholder livelihoods, maximizing return on rural investments, and building resilience in the agriculture sector, with the objective of

\(^2\) See Glossary and AFD (2010)
enhancing food security as the first priority, the following **priority actions of Program 1** are planned.

32. Domestic and regional experience demonstrates that farmers who have legally secure land titles are more likely to make investments in land and soil conservation; providing good stewardship to land and land-based resources (e.g., NTFPs, forests, water sources). As in the case of Vietnam, the **granting of legally secure, individual titles to agricultural is also likely to boost agricultural production of Lao smallholder farmers** (as part of Program 3) and is therefore seen as a necessary precondition and as a high priority for MAF. This is also the case with **women's ownership of land** and the legal recognition of women's traditional land rights in land titling, and in the resolution of land disputes. Working in close collaboration with the National Land Management Authority (NLMA), MAF will undertake the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Accelerate participatory land use planning at the sub-basin level, capitalizing on lessons learned from similar previous operations;
  - Document and inventory (computer-based database) the status of existing natural resources at the sub-basin level; and,
  - Survey and designate land capability and production zones in consultation with local communities, respecting customary land-use.

- **Medium-term priorities (2013-2015)**
  - Grant agricultural land use rights to qualified rural households; and,
  - Introduce and monitor conservation agriculture technology packages.

- **Key responsible agencies:** NLMA, MAF (POP, DOF, PAFO; DAFO; NAFRI; NAFES)

33. **Promote indigenous varieties of glutinous rice** (e.g., khao kai noy) for climate change resilience, increased productivity, and enhanced food security; and, diversified farming (mixed farming and agroforestry) for enhanced access to food for improved nutrition and food security. MAF line agencies will act with a greater social orientation by blending indigenous knowledge with innovative technology; a better understanding of irrigated agriculture and holistic development based on recent experience; and, an appreciation of capitalizing on lessons learned in the rural and agriculture sectors over the past ten years of engagement with the market, globalization, and development partners. In consultation with the Ministry of Industry and Commerce (MOIC), Department of Promotion and Commodity Development (DPCD) and the Agriculture Promotion Bank and other interested commercial banks and micro-finance units, MAF will undertake the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Multiplication of sufficient supplies of indigenous varieties of rice seed;
  - Identify or establish qualified farmer organizations for production of rice seed and specific varieties of rice (as suitable, based on agro-ecological conditions);
  - Organization of credit for qualified farmer organizations;
  - Distribution of rice seed for production;
  - Intensify rice production in irrigated areas; and,
  - Consultations with Ministry of Industry and Commerce, DPCD, to arrange for market outlets for surplus rice seed or production of all varieties of rice.

- **Medium-term priorities (2013-2015)**
  - Organize contract farming arrangements between qualified farmer organizations and suitable enterprises and traders to meet domestic demand, with special attention on the 47 poverty districts.
  - Prepare feasibility studies, and implement post-harvest handling operations in partnership with agribusiness and qualified farmer organizations, including drying, storage, and modern trading facilities.

- **Key responsible agencies:** MOIC, MAF(DOP, DOA, DOI, PAFO;; NAFRI; NAFES)
34. The Department of Livestock and Fisheries (DLF) will focus its resources on (i) **upgrading local breeds of livestock** through crossbreeding with improved and heat resistant breeds in response to climate change; and, (ii) disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network, to maximize livestock productivity. Projects will be formulated to implement livestock identification and tagging that is harmonized with regional (ASEAN) and sub-regional (GMS) programs with the aim of controlling transboundary animal diseases (TADs) control programs to minimize impacts on domestic livestock and maintain the quality of the national herd. Fisheries technicians will focus their efforts in impacted areas of hydropower projects to expand the production of fingerlings and promote community-based small-scale pond fisheries to off-set losses from impacts on river fisheries. These measures will (i) increase fish and livestock productivity for enhanced food security, including the access to adequate food at all times and utilization of food for nutritional well-being; and, (ii) increase productivity to control costs and maintain trade competitiveness. MAF will undertake the specific sequence of measures below in consultation with the MOIC-DPCD and the Agriculture Promotion Bank and other interested commercial banks and microfinance units. MAF also will work in partnership with the numerous hydropower projects to implement measures to minimize the impacts on fisheries of hydropower development in rural areas.

- **Immediate / short-term priorities (2011-2013):**
  - Establish 2 modern regional livestock breeding facilities in collaboration with agribusiness to ensure survival of imported breeds, using a mega-project approach;
  - Import improved breeds of cattle and buffalo for breeding with native herds;
  - Examine or review and apply (if feasible) artificial insemination in rural areas;
  - Identify or establish qualified farmer organizations with suitable herds for breeding in appropriate locations (considering availability of forage and fodder, agro-ecological conditions, and access to markets);
  - Identify or establish qualified farmer organizations with interest and capacity to operate fish farms, including the cage culture of river fish, with an emphasis on downstream areas impacted by hydropower projects;
  - Organization of credit for qualified farmer organizations;
  - Implementation of livestock cross-breeding program in all regions; and,
  - Consultations with Ministry of Industry and Commerce, DPCD, to arrange for market outlets for surplus fish and livestock production.

- **Medium-term priorities (2013-2015)**
  - Organize contract farming arrangements between qualified farmer organizations and suitable enterprises and traders to meet domestic demand for fish and livestock, with special attention on the 47 poverty districts.
  - Initiate a TAD control program that includes registration and tagging of livestock.
  - Initiate an indigenous fisheries registration, protection, and breeding program to ensure resilience to the fisheries sub-sector to climate change and conservation of indigenous fish species.

- **Key responsible agencies:**
  - Ministry of Industry and Commerce: Department of Promotion and Commodity Development
  - MAF: Departments of Planning, Livestock and Fisheries; PAFO; DAFO; NAFRI; NAFES.

35. The agricultural sector is one of the most vulnerable to the adverse impacts of climate change: By increasing the risk of crop losses, climate change can threaten sustainable agriculture and rural livelihoods and may result in land abandonment and desertification.

The insurance industry plays a fundamental role in coping with the consequences of adverse weather events. **Increased use of insurance** can be considered as a form of adaptation. **Risk management instruments** that allow for the transfer of risk from
farmers, whether smallholders or industrial farms, to financial markets, coupled with other investment activities in the agricultural sector, could strengthen the resilience of agricultural stakeholders to weather shocks and other adverse impacts of climate change.

Aside improved management practices, cropland insurance can constitute a valuable tool for climate change adaptation by reducing risk for the farmers. Insurances help stabilizing agricultural businesses and reduce income risk to rural communities. Insurances have been recognized as a key-stone of adaptation to climate change and sustainable rural development.

- **Immediate / short-term priorities (2011-2013):**
  - Enhance sustainability in livelihood sectors of the farmers;
  - Reducing the direct loss of agriculture product due to climate variability and extreme events;
  - Forecasting system for crop yield;
  - Tools on water balance, data interpolation in time and space;

- **Medium-term priorities (2013-2015)**
  - Develop a precise and redundant forecasting system;
  - Insurance program is to enhance a resilient system to ensure farmers livelihood, and thereby contributing to sustainable food production.
  - Raise farmers’ awareness

- **Key responsible agencies:**
  - Ministry of Industry and Commerce: Department of Promotion and Commodity Development
  - Agriculture Promotion Bank
  - MAF: Departments of Planning, Livestock and Fisheries; PAFO; DAFO; NAFRI; NAFES
2. Program 2: Commodity production and Farmer Organizations

2.1. Situation analysis

36. Seasonal or annual crops and permanent crops account for only a minor part of the total agricultural output (9 and 8 percent respectively), highlighting the predominant role of rice and subsistence farming in the agricultural economy. Agricultural productivity is low due to inefficient practices, low input use, and little farm mechanization. The low intensity and low productivity of agriculture is attributed to several factors, namely:

- Rural household risk aversion livelihood strategies;
- Limited number of input suppliers;
- The lack of information concerning input use due to the absence of viable extension;
- Inadequate working capital and access to credit and other financial services; and,
- Limited access to markets due to physical barriers created by poor roads, high transport costs, poor logistics, and a marketing system where a limited number of traders tend to dominate market transactions constraining downstream movement to the next links in the marketing chain.

37. The current rapid expansion of contract farming and plantation- and concession-based agricultural development in Lao PDR is, with the exception of coffee, largely foreign-driven: mainly by investors from neighbouring countries, but also including investors from Japan, Korea, and Europe. Although the lowland areas have been the principal target of investment to date, expansion into upland areas, such as the Bolovens Plateaux in Champasack Province and the Plain of Jars in Xieng Khouang Province, also is increasing.\(^3\)

38. In addition, changes in dietary patterns of regional consumers resulting from increased incomes and urbanization, is causing demand for meat products to grow 3.5 to 4.0 percent annually, which will lead to expanded livestock production in the region. Increased cross-border livestock trade requires greater control of transboundary animal diseases (TADs) and invasive species. This will be accompanied by higher prices for feed grains, energy, and labour costs that will require producers to improve productivity and competitiveness.

39. In international agri-food trade, consumers, retailers, processors, and exporters are demanding higher levels of food safety requirements, resulting in the formulation of food safety measures by importing countries and creation of private food safety standards. Since consumers in many food importing and developed countries are purchasing greater volumes of processed food, they are increasingly demanding quality assurance, traceability, transparency, and accountability of food supplies. Trade in food and agricultural products increasingly reflect food safety measures such as GLOBAL-GAP and ASEAN-GAP, which assure traceability from ‘farm to fork’ or producer to consumer. Global trade also is increasingly dependent on logistics linked to information and communications technology (ICT). In addition, ethical consumerism is rising, where people purchase healthier, greener, and more socially-friendly products that require certification and labelling.

40. Lao Rural women play vital roles as farmers and agro-processors, raisers of small

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\(^3\) This trend brings opportunities, but also new challenges, see: World Bank (2010 b “In the light of the deficiencies” „investments” „failed to live up to expectations and” „left local people worse off than they would have been without the investments.” p 51); see also Dwyer, M. (2007), Kenney-Lazar, M. (2010), IISD (2008), BBC (2010)
livestock, harvesters of NTFPs, producers of handicrafts and of other non-farm products and as traders. Modernization of agricultural production, processing and marketing bares the risk of marginalizing rural women, since it is related to more capital and knowledge intensive modes of production. Access to capital / credit and to market information, however, are areas in which Lao women remain to be disadvantaged. Strong and pro-active action will therefore be undertaken by MAF to ensure women’s participating in market-oriented commodity production on an even footing with men.

41. Despite a number of challenges, the volume and value of food, agricultural and forestry products being exported from Lao PDR are expected to continue to increase over the short, medium, and long-term, with international and notably regional markets becoming more important. Governments in the region have joined together to organize political-economic, trade, and development groupings to facilitate regionalization mechanisms that capitalize on cross-border comparative advantage and mobilize synergies, while aiming to narrow the development gap among states and reduce poverty and socio-economic disparities in the region. The ASEAN Free Trade Area (AFTA) that became effective in January 2010 allows trade among most ASEAN countries at a zero tax rate.\textsuperscript{4} Given the customary political and economic sensitivity to unhindered flows of food and agricultural products across sub-regional national borders, non-tariff barriers to trade (NTB) may emerge and be imposed more rigorously. NTBs could include SPS measures, new technical requirements, labelling, standards, and testing.

2.2. Key areas to be addressed

42. Within the framework of the Agricultural Development Strategy 2020 (ADS), the following commodity production issues are addressed by the present Agricultural Master Plan 2015 (AMP):

- MAF will build Public-Private Partnerships (PPP) with farmer organizations and private enterprises as well as with interested governments to leverage funds with agribusiness and private enterprises, communities, and interested governments, to promote more intensive production and the value-added processing of products at the local level. PPPs, particularly with large-scale enterprises and foreign direct investment in mega-projects, will aim to improve the effectiveness of irrigation systems. Farmer organizations are seen as key partners in the strengthening of smallholder farmer capacity for irrigated agricultural production.

- In cooperation with the MOIC, MAF will support more efficient cross-border, regional and global value chains through dialogue with small, medium, and large-scale agribusiness and farmer organizations. MAF will support the upgrading of market infrastructure, modernization of trade procedures, and improvement of logistics for cross-border and regional trade.

- MAF will mobilize human and capital resources to improve the quality and competitiveness of agri-food products. Promotion, dissemination, and adoption of GAP at the field level will be a high priority linked to expansion of agricultural markets beyond neighbouring countries; with GAP harmonized at the regional level and with major trading partners. Regional cooperation is necessary to harmonize sanitary and phytosanitary (SPS) measures. Public-private partnerships will be developed to accelerate accreditation of individual Lao professionals and qualified Lao organizations to provide certification of food and agricultural products for export.

\textsuperscript{4} Until 2015, Cambodia, Lao PDR, Myanmar, and Vietnam are excluded.
43. **Policy framework**: MAF will set the policy framework for line agencies to facilitate and coordinate the creation of, and provide institutional strengthening for community-based producer and marketing organizations in rural areas. Such organizational development is a process that will take time and will require careful facilitation. **Rural-based farmer organizations** are expected to evolve, from “learning groups” or “clubs” to ‘informal producer groups’ to more formalized “pre-cooperatives” and eventually to legally recognized full “cooperatives” and “associations”, with capacity-building happening all along the way. With the measures of the Master Plan, MAF will support the creation of strong and independent organizations of smallholder farmers among others by appropriate measures of **value chain governance** so that farmer organizations and local SME can retain a fair share of the value added. In a facilitating role, MAF will support to the initiation of producer groups and their **legal formalization**, and proved training and assistance in the self-determined formulation of **production cluster and value chain upgrading strategies** (medium to long term) and annual work plans, including identification of market niches, local and regional branding and quality certification, monitoring and corrective action follow-up. The key principles used to strengthen farmer groups can be highlighted as follows:

<table>
<thead>
<tr>
<th>Key principles for smallholder farmer organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-determined and clearly defined rules</strong> for voluntary membership (defining rights, benefits and obligations of individual members), cost-covering membership fees, services proved to members, internal sanctions, geographical boundaries, external relations to other actors of the value chain and for the acquisition of external support</td>
</tr>
<tr>
<td>The right of members to devise their own <strong>rules is respected</strong> by external authorities. Individuals affected by these rules can participate in modifying the rules.</td>
</tr>
<tr>
<td>Self-determined formulation of <strong>value chain upgrading strategies</strong> (medium to long term) and annual work plans, including identification of market niches, local and regional branding and quality certification, monitoring and corrective action follow-up.</td>
</tr>
<tr>
<td>The implementation of upgrading strategies is the responsibility of the farmer organization. However, <strong>external support</strong> will be provided by technical and management training, market information, product and certification standards, etc.</td>
</tr>
<tr>
<td>A system for <strong>self-monitoring</strong> members' behaviour, the performance of the group and the performance of the value chain in general has been established.</td>
</tr>
<tr>
<td>Group members have access to low-cost <strong>conflict-resolution</strong> mechanisms.</td>
</tr>
<tr>
<td><strong>Internal governance</strong> activities of the groups referring to, e.g. fraud, specifications, monitoring and sanctioning, conflict resolution, and other administrative activities are organized inside the group.</td>
</tr>
<tr>
<td>MAF and other authorities will support farmer organizations and all other actors of value chains by appropriate measures of <strong>value chain governance</strong> so that farmer organizations and local SME can retain a fair share of the value added.</td>
</tr>
<tr>
<td>In all other aspects, the regulatory role of government is limited to that of an <strong>“honest broker”</strong>, i.e. facilitation, or stimulating discussion among farmer group members and with other key stakeholders. Authorities will not influence the decision making processes, applying the principles of democracy and transparency</td>
</tr>
</tbody>
</table>
2.3. Objectives, outcome, and targets

44. Objectives:

- MAF supports the instantiation and legalization of smallholder farmer organizations and engage in a network of PPPs that will facilitate the integration of smallholder farmers and their organizations into domestic, regional, and global "pro-poor and green value chains".
- MAF will ensure by appropriate measures of value chain governance that smallholder farmers and local SME can retain a fair share of the value added.
- MAF will provide an appropriate regulatory framework, monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests.

Potential outcome:

- Upstream domestic producers and processors, in particular smallholder farmers and rural SME, will benefit over-proportionally by their integration into “pro-poor and green value chains”, while maintaining the long term production potential of their natural resources, in particular their agricultural land.

45. The key sector targets associated with Program 2 are:

- Agriculture and forestry sector product exports represent 1/3 of the total Lao PDR exports.
- The value of agriculture and forestry exports represents at least 3.0 billion USD.
- Establishment of smallholder producer groups, cooperatives and associations in all priority value chains
- Mobilization of substantial investments from the private sector

46. The commodity production program aims to increase the agriculture and forestry sector’s share of exports to more than 30 percent of export value (or approximately US$3,000 million by 2015). The targets above will be primarily in response to market-pull from increased demand from domestic consumers, neighbour countries and East Asian regional markets during the period 2011-2015. Targets will be met through agricultural diversification among smallholder farmers and farmer organizations who engage in contract farming with small-, medium-, and large-scale agro-enterprises.

47. Smallholder farmers will be assisted in the creation and operation of voluntary farmer organizations, which are based on the expressed needs and on the proven value-added for the individual farmer, such as formally legalized producer groups, cooperative groups or full cooperatives and commodity associations. To provide both economies of scale and fair terms of trade, these emerging farmer organizations will be supported by technical and management training, credit facilities and other measures in playing a strong role as equal trading partners, linked to regional and global value chains. Farmer organizations, particularly in irrigated areas, and foreign direct investment (FDI) in mega-projects will form PPPs with the Government and ensure that GlobalGAP standards (certified good agricultural practices) are applied for sustainable management of agricultural land, improved rearing techniques for livestock, and food safety.

48. Through the promotion of large-scale investments, production targets are expected to be exceeded with surpluses making available potentially one million tons for export. However, additional investments in irrigation (link to Program 5), rural market access roads, and other high-cost rural infrastructure (link to Program 6, e.g., markets, trade zones, drying pads, and storage, processing, handling, and cooling facilities)
will be linked to “Smart Agriculture”, which will be further developed into an operational concept for the Lao context. The concept is about successfully linking the desired investments of the private sector to a set of social and ecological conditionalities to ensure that not only the investors themselves but Lao society and rural smallholders benefit from such investments (see Glossary).

The preliminary concept of “Smart Agriculture” implies the following operational elements, which need to be further discussed and elaborated. Among others, it is suggested that:

• The development and/or rehabilitation of irrigation systems will be determined by the commitment of each community to participate in the development and rehabilitation of each system. Both specific crops and markets need to be identified prior to any investment in irrigation improvement. DOI will demonstrate how each investment is will be managed, comply with social and environmental standards and contribute to food security, commodity production, and value-added export of food and agricultural products.

• The foundation and operation of farmer organizations will be only supported when their production is linked to specific pre-identified markets.

• In areas of intensive production of food security linked crops (rice in food deficit areas) and high-value cash crops for export (e.g., Bolovens Plateaux), district agriculture and forestry officials will prepare cropping calendars that will systematize planting on a rotational basis so as not to flood markets with one crop and causing local prices to fall. Cropping calendars will be adjusted to specific markets.

• Since communities in remote areas often do not have the financial resources to use advanced agricultural techniques and agricultural chemicals, organic agriculture (OA), which requires not using agricultural chemicals, should be introduced on a selective basis; to interested communities; and, where a value chain can be organized to ensure access to markets for organic products.

• Contract farming (CF) will be introduced to some existing agricultural land concessions, where communities and private investors can agree on arrangements for a systematic and continuous supply of high quality products for processing. These arrangements are subject to Government approval, tied to a set of social and environmental conditions. Their implementation will be closely monitored by Government authorities for compliance with these conditions and with fair terms of trade for all parties.

2.4. Priority measures and sequence of actions

49. Program 2 (commodity production) is the core element for achieving Goal 2 (commodity production), which aims at initiating and legally formalizing organizations of smallholder farmers as reliable partners as well as at the systematic partnering of investment for commodity production to link “pro-poor and green value chains” to domestic, regional, and global markets.

In the order of their relative importance, the key measures of Program 2 include the following, among others:

(1) MAF will ensure that commodity production, and in particular large scale private investments are linked to the social and ecological conditionalities of “Smart Agriculture” and provide an appropriate regulatory framework, monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests.
(2) MAF will analyse value chains for high-value crops for local value-added processing and export; to identify gaps in production technology, market infrastructure, trade procedures, and logistics.

(3) MAF will build and strengthen links between producers and existing domestic and regional agricultural traders, processors, with access to domestic, cross-border, regional, and global “pro-poor and green value chains”. MAF will ensure by appropriate measures of value chain governance that smallholder farmers and their organizations (producer groups, cooperatives, associations) and local SME can retain a fair share of the value added.

(4) Farmer Organizations: support to the initiation of producer groups and their legal formalization as cooperatives and / or associations, and assistance in the self-determined formulation of production cluster and value chain upgrading strategies (medium to long term) and annual work plans, including identification of market niches, local and regional branding and quality certification, monitoring and corrective action follow-up. Rural women will be particularly encouraged and supported to participate in these farmer organizations or to establish their own organizations.

(5) Risk Management: For commercial smallholder farmers and their organizations, MAF will launch a comprehensive Program on Risk Management with the objective of buffering increased risks of fluctuating world market prices, market failures, increasing effects of climate change and natural calamities. The program will include region-specific risk assessments, the analysis of asymmetries and transaction costs and specify the scope for Government intervention. Based on this, region-specific training and insurance programs will be implemented.

(6) Training for key members of producer groups, cooperatives and associations in technical, management and marketing skills to strengthen their position, linkages, vertical integration and governance of value chains (link to Program 8).

(7) Cooperation with private sector investors / larger scale plantations (PPP) for out-grower systems, in designing, financing and implementing rules, regulations and monitoring of contract farming schemes, rendering the cooperatives equal partners in a win-win constellation

(8) Initiate and support cooperatives which are specialized as private service providers in various fields (e.g. pooling the purchase of agricultural inputs, supplying mechanized rental equipment to other farmers / cooperatives, post-harvest handling, mobilizing local experts for farmer-to-farmer field schools, sharing market price information, legal know-how and experience in contract negotiations, provide master trainers on sustainable indigenous agricultural practices and modern niche products, etc.)

(9) Initiate and formalize forest user groups and strengthen these in their functions for sustainable community forestry, train key members in participatory land use planning on micro level (PLUP), participatory forest inventory (PFI), forest protection and development regulation (FPDR), sustainable cultivation and marketing of non-timber forest products (NTFP) and the selection of fast growing (yet soil-friendly) tree species as well as slow growing (high value) indigenous species; quality certification of tree seedlings and small-scale nursery techniques

(10) MAF will work with regional organizations (ASEAN, GMS, MRC, and others), ODA partners, regional trade and business organizations and associations, and individual neighbour-country governments, to harmonize and complement agricultural development strategies, action plans, and road-maps.

(11) MAF will cooperate with the Ministry of Industry and Commerce (MOIC) and the Science and Technology Agency (STA) and collaborate with private sector organisations to design, develop, and install modern information and communications technology (ICT) to modernize and facilitate connectivity with
cross-border trading partners at high priority border trading points (link to Program 6).

(12) MAF/ NLMA will initiate an inventory of agricultural land concessions throughout the country using PAFO and DAFO staff (link to Program 3) and ensure that GOL regulations on the issuance and operations of such concessions are strictly followed.

(13) In cooperation with line departments, Development Partners and private investors, MAF will ensure that additional rural infrastructure investments are in place and maintained in irrigation (link to Program 5), rural market access roads, and other high-cost rural infrastructure (link to Program 6, e.g., markets, trade zones, drying pads, and storage, processing, handling, and cooling facilities).

The measures of Program 2 related to Climate Change or Biodiversity, include:

(14) MAF will facilitate the expansion of climate-smart agribusiness, processing agricultural raw materials for domestic use (to substitute for food imports) and for export; and will support the strengthening of the capacity of these enterprises to compete successfully in international markets; monitoring instruments will include „Climate Proofing for Development“. In this context, MAF will support “green labelling” of Lao products.

(15) Agricultural research and extension on the level of farmers and their organisations will focus on commercial agriculture, linked to strengthening resilience to climate change and enhancing market connectivity (link to Program 7).

50. Linkage to global value chains: Agricultural market development will be undertaken through a sequenced process of market research (identifying who to sell to and where), marketing extension to smallholders (teaching farmers what and when to sell), and market development (linking traders with producers and learning how to sell). Over the medium and long-term, associations of Lao producers will be formed based on successful farmer producer and marketing groups. MAF will work with concerned agencies to obtain certification of IPM (crops produced utilizing integrated pest management or IPM techniques) organic, fair trade, and carbon-neutral products for export to high value markets. Selected products will be registered with geographic indicators (GIs) (e.g., Arabica and robusta coffee grown on the Bolovens Plateaux). High quality food and agricultural products can be promoted with a unique Lao brand and qualify for Global Fair Trade certification (e.g., AGPC coffee).

51. MAF will work with the Ministry of Finance and the Ministry of Planning and Investment (MPI) to develop criteria for selecting agribusiness investors, including land concessionaires, in an effort to attract more effective investment (i.e., investment that will promote environmentally neutral and equitable growth, while contributing to rural poverty reduction. Suitable investors could benefit from a package of fiscal policy measures will provide incentives to encourage agribusiness enterprises to expand local processing of crops to retain maximum value-added in-country and to make contract farming arrangements with nearby rural communities. (See case studies in Annex 2, Agro Industry in Vientiane Province and in Sekong Province).

52. Strengthening agribusiness enterprises: Small- and medium-scale agro-processing enterprises that have access to global value chains will have the highest priority. MAF will work with existing agribusiness enterprises to strengthen farmer organizations through technical training, facilitating agricultural credit and micro-finance, and initiating SPS procedures (required by global value chains). Contract farming arrangements between interested farmer groups and associations in nearby commu-

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5 AGPC: Association des Groupements de Producteurs de Café du Plateaux des Bolovens
nities, and agro-processors with land concessions will be established based on existing successful models of contract farming in Lao PDR. The structure of the contract farming arrangements (2+3, 4+1, etc.) will be negotiated between farmer organizations and agro-processors, with representatives of the Government acting as an honest broker. (See case studies in Annex 2, Vientiane Province, Champasak Province; Savannakhet Province).

53. MAF will provide gender-specific support for rural women who intend to or are already engaged in agri-business enterprises. To this effect and in cooperation with the private sector and the Women's Union, guidelines will be issued and gender-specific trainings on technical and management issues will be provided. Access to credit and micro-finance will be facilitated through specially trained female extension workers.

54. **Value chain analysis:** In close cooperation with farmers, their organizations, traders, processors, exporters and other stakeholders and actors, the value chain analysis will initially be led by NAFRI's Policy Research Centre (PRC) and be undertaken in partnership with the Department of Production and Trade Promotion (DPTP), MOIC, with participation of MAF line agencies as appropriate. The analyses of potential sub-sectors and value chains will be pragmatic and limited to the needed information in order not to generate “data cemeteries”. The outcome of the value chain analysis will be a sequence of tasks and practical recommendations for interventions to modernize agriculture production, trade, and agribusiness development, aimed at product development and improved quality control. The line agencies of MAF will introduce pre- and post-harvest technologies; intensify application of GAP harmonized with ASEAN-GAP, and form public-private partnerships (PPPs) to produce food and agricultural products that meet cross-border SPS standards and that can be certified as GAP, IPM, OA, Global Free Trade, and carbon-neutral.

However, even initially in the driver’s seat, MAF and its line agencies will increasingly limit their roles in the process of formulating; implementing and monitoring value chain upgrading strategies. This process has to be increasingly owned by the Value Chain actors themselves, with the energy for change eventually coming from the farmers and investors themselves. Too rapid and ambitious goals set in this process by government authorities may send the wrong signal and distort incentives for investing. The main upgrading action has to come from the investors.

55. **Regional cooperation:** Areas of specific cooperation will include SPS measures, regional certification of organic agricultural products, agricultural trade and investment, academic exchanges related to research and development, and biodiversity protection (specifically protection of globally threatened species by providing appropriate living environment or corridors between transboundary protected areas and National Parks, particularly around zones of fast economic growth).

56. **Inter-agency cooperation:** Cooperation will require streamlining procedures and institutional arrangements for issuing phytosanitary (‘phyto’) certificates (by provincial agriculture and forestry offices) and technical (‘techno’) certificates (by provincial science and technology agency). More efficient procedures will be accompanied by computer-based logistics to facilitate the planning and control of the flow of food and agricultural products through key border trading centres.

57. **Inventory of land concessions:** The inventory will examine foreign and domestic land concessions, including reviews of business plans, and conducting investment impacts assessments (IIA), to determine the local impacts of the investment on the socio-economic and agro-ecological conditions. Such inspections can be repeated as necessary.
58. In the context of improving smallholder livelihoods, maximizing return on rural investments, and expanding agricultural trade and agribusiness, with the goal of generating 3-4 percent annual growth in the agriculture sector, the following priority actions of Program 2 are planned.

59. In the context of an estimated 1.5 million hectares of land having been allocated to investors and agro-enterprises to operate as large-scale commercial farms (plantations), MAF will work to strengthen links between farmer organizations and concessionaires, traders, and processors to use contract farming as a tool to (i) access regional and global value chains for food and agricultural products; (ii) transfer innovative techniques of agricultural production, pre- and post-harvest handling, and food safety technology to smallholder farmers; and, (iii) access micro-finance to support systematic and continuous production of high quality agricultural raw materials for value-added processing in-country and export. In consultation with the Ministry of Industry and Commerce - DPCD, interested commercial banks and micro-finance units, and small-, medium-, and large-scale agro-enterprises, including foreign direct investment and mega-projects, MAF will undertake the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Establish a central database of domestic and foreign investors with land concessions and agro-enterprises; apply criteria to identify the quality of each investment based on their financial, social, and technical performance, corporate governance, and willingness to collaborate with the Government and farmer organizations to expand contract farming and community-based value-added processing of commodities;
  - Establish a central database of farmer organizations; apply criteria to identify the quality of each farmer organization based on their financial and technical performance and demonstrated ability to engage in contract farming;
  - In consultation with the MOIC–DPCD, prepare value chain analyses for priority food and agricultural products for export; identify strengths, weaknesses, opportunities, and threats to strengthening linkages between farmer organizations and agro-enterprises with access to regional and global value chains;
  - Identify and delineate using GIS technology (now being made available at the provincial level), crop-specific production zones based upon agro-ecological and socioeconomic conditions in each region; and,
  - Seed production of high priority agricultural export commodities.

- **Medium-term priorities (2013-2015):**
  - Through provincial and district agriculture and forestry offices (PAFO and DAFO), work with local business groups and individual agro-enterprises to develop contract farming projects for high priority food and agricultural products for export.
  - Develop production-based and post-harvest activities at the farm-level that will strengthen the capacity of smallholder farmers to implement GAP and meet international food safety and SPS standards that will modernize the agriculture sector.
  - MAF will cooperate with the MOIC and the Science and Technology Agency (STA) and collaborate with agro-enterprises to streamline procedures and institutional arrangements for issuing phytosanitary (‘phyto’) certificates (by provincial agriculture and forestry offices) and technical (‘techno’) certificates (by provincial science and technology agency). Procedures that are more efficient will be accompanied by computer-based logistics to facilitate the planning and control of the flow of food and agricultural products through key border trading centres.
  - MAF will cooperate with the MOIC and STA and collaborate with agro-enterprises to design, develop, and install ICT to modernize and facilitate connectivity with cross-border trading partners at high priority border trading points.
  - Develop irrigated agricultural production projects to maximize investments in irrigation infrastructure in collaboration with farmer organizations and foreign investors.
  - Monitor and evaluate farmer organizations, agro-enterprises, and export-oriented agribusiness activities.
Key responsible agencies: Ministry of Industry and Commerce: Department of Promotion and Commodity Development, Lao National Chamber of Commerce and Industry, Lao Agribusiness Association, MAF: Departments of Planning, Irrigation, Agriculture, Livestock and Fisheries, Inspection; NAFRI; NAFES

60. MAF will strengthen the capacity of agribusiness and farmer organizations to undertake **value-added processing** of raw materials for domestic and export markets, in collaboration with the Ministry of Industry and Commerce-DPCD and the Lao Chamber of Commerce and Industry, and in consultation with foreign direct investment in agro-enterprises. The commodity production program will emphasize food safety (‘clean agriculture’) and expanding local agribusiness to retain the maximum value-added in-country. Qualified farmer organizations will be further strengthened to form agricultural cooperatives to facilitate the production, marketing, and processing of food and agricultural products. Agribusiness investors will be encouraged to work with farmer organizations to reduce production costs and improve competitiveness of export commodities through expanded mechanization of on-farm production. To this end, MAF will undertake the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Organize one or more national and provincial level workshops with members of the Lao Agribusiness Association and provincial and district business groups to identify the constraints to and opportunities for expanding value-added processing of food and agricultural commodities in-country;
  - Organize one or more workshops with representatives of farmer organizations to identify constraints to and opportunities for expanded contract farming, post-harvest handling, marketing, and community-based value-added processing of agricultural commodities at the local level;
  - Prepare an assessment of farmer organizations and determine the fiscal policies and public investment required to develop agricultural cooperatives;
  - Review and prepare an action plan for upgrading qualified farmer organizations to adopt GAP and create certification clubs, using a participatory community-based approach; and,
  - Develop an agricultural mechanization action plan for lowland production areas in the Mekong corridor with fiscal policy incentives for smallholder farmer mechanization.

- **Medium-term priorities (2013-2015):**
  - Formulate an ‘agricultural exports production action plan’ based on GAP with specific roles identified for smallholder farmers, farmer organizations, SMEs, large-scale agro-enterprises, traders and exporters, and foreign direct investment, based on the value chain analysis.
  - Advise and facilitate the Lao Agribusiness Association in implementing the ‘agricultural exports promotion action plan.’
  - Monitor and evaluate the expansion of commodity production for export.

- **Key responsible agencies:** MOIC-DCPD, Ministry of Finance (fiscal policy unit), Ministry of Planning and Investment (MPI), MAF: Departments of Planning, Irrigation, Agriculture, Livestock and Fisheries, Inspection; PAFO; DAFO; NAFRI; NAFES.

61. For smallholder farmers choosing not to engage in contract farming or who are unprepared or lack the resources to engage in contract farming, MAF will analyze value chains for high-value crops to maximize opportunities for community-based value-added processing and provide information related to access to domestic markets. These farmers will be encouraged to visit and learn from lead farmers in the community and to join farmer organizations to improve their competitiveness. These farmers will focus their efforts on producing crops in season to meet household and community food security needs. MAF will coordinate and facilitate the following specific sequence of measures in support of smallholder farmers:

- **Immediate / short-term priorities (2011-2013):**
  - Identify vulnerable, marginal, and resource-deficient smallholder farmers in each community to establish a provincial-based database of target farmers;
- Prepare agriculture technology packages for the marginal farmers, adjusted to community socioeconomic and agro-ecological conditions;
- Support the organic farming, to maximize the comparative advantage of marginal farmers who have little experience in using capital intensive agricultural production inputs (agricultural chemicals);
- Link organic farmers to organic agriculture value chains through local small- and medium-scale enterprises (SMEs); and,
- Introduce improved seeds, bio-fertilizer packages, and improved breeds of livestock and fish to interested marginal farmers and technologies to ensure the effective use of these inputs.

- **Medium-term priorities (2013-2015)**
  - Through refresher training and extension activities, develop the farm management capacity of marginal farmers to enable them to join farmer organizations and produce a surplus of farm products for sale in domestic and regional markets.
  - Through home economics training for women, promote household participation in community-based micro-finance savings and loan programs.
  - Monitor key social and economic factors for this group of smallholder farmers to determine the impacts of extension and commercialization.
  - **Key responsible agencies**: MAF: Departments of Agriculture, Livestock and Fisheries, and Inspection; PAFO; DAFO; NAFES

62. An **increasing number of food safety problems** occurring worldwide have heightened consumers' food safety awareness of food contaminants. Beyond contamination from pesticides and heavy metal residues, GMS countries are particularly prone to increased risk related to mycotoxins\(^6\) and bacterial contamination due to high temperatures and humidity. Expected temperature increases from global warming will increase this risk significantly. Increasingly, food safety assurance systems in the form of certification, labelling, and traceability procedures are required in international trade. Food quality standards are being strengthened in the form of more strict SPS measures and inspections. Private sector standards also have emerged, including GLOBAL-GAP\(^7\) and ASEAN-GAP, which assure traceability from producer to consumer. The private standards are in part a consequence of the inability of the GMS national governments to upgrade their infrastructure, legislation, and capacity to certify products. Without active participation in these programs, Lao food and agricultural products will lose market share and cannot be competitive in regional and global markets.

63. MAF is obligated under regional trade agreements and the terms and conditions of membership in the World Trade Organization (WTO), to **harmonize bio-safety and SPS standards** at the regional level. This can best be achieved through harmonizing agricultural development strategies and plans, to ensure that policy measures are consistent with GMS and ASEAN member countries and major trade partners. At a technical level, harmonizing regional standards for organic agricultural products, integrated pest management, conservation agriculture, and low carbon emission production are among the types of interventions that are non-contentious; and, therefore can serve as a basis for building trust among regional trading partners that can expand to other more controversial agricultural trade topics. Factors critical to increasing productivity will include additional investments in agriculture research and development for adoption of technologies related to GAP and renewable rural energy (RRE); improved soils, land, and water management; pre- and post-harvest handling and household- and community-based value-added processing; organization of

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6 Aflatoxin is the most prevalent, being found on cereal grains, oil seeds, and other food crops.
7 GLOBAL-GAP (global good agricultural practices) was organized by 37 chains of food retailers that guarantee 'farm to fork assurance' to consumers. The system is a certification program that operates in 90 countries representing 130 certification bodies. It operates on behalf of retailers to harmonize food safety standards.
producer groups and associations to cluster (defragment) production; and, the education not only of farmers, but also traders, processors, and SMEs. In cooperation with regional mechanisms operated through ASEAN and the GMS program, MAF will undertake the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Identify and document the location, quantity, and quality of food and agricultural products for export that are subject to plant and animal quarantine inspections and that require technical scientific and SPS certification;
  - Establish a task force for each agricultural product for export to formulate detailed recommendations for upgrading the quality of each product to meet regional and global GAP and SPS standards;
  - Develop a national program for implementation in each region, to inform agricultural technicians, lead farmers, farmer organizations, the Lao Agribusiness Association, and local agribusiness groups about (i) GAP and SPS standards and measures being applied to Lao food and agricultural products; and, (ii) recommendations of each MAF crop-specific task force; and,
  - Upgrade qualified farmer organizations to establish clusters of GAP, to produce a critical mass and continuous supply of high-quality raw materials, and to promote credible certification clubs, thereby using community participation to support the production of high quality food and agricultural products.

- **Medium-term priorities (2013-2015)**
  - Implement the recommendations of each MAF crop-specific task force.
  - Monitor and evaluate the application of task force recommendations and modify the program as required to ensure increased demand for Lao products, in particular organic and natural products.
  - **Key responsible agencies:** MOIC (agencies responsible with SPS issues), Ministry of Public Health (agencies responsible for SPS issues), Lao National Chamber of Commerce and Industry, Lao Agribusiness Association, MAF: Departments of Planning, Agriculture, Livestock and Fisheries, and Inspection; PAFO; DAFO; NAFRI; NAFES.

64. The **innovative businesses field of eco-efficiency and climate change** will require concerted efforts by all business stakeholders and MAF to develop **climate smart agro business**. The green certifications, known as eco-labels, verify that a product meets specific standards. To facilitate the market of green products, it needs to be included in the public awareness campaign by MAF and its partners. Policy research is required to make decisive judgment on diversifying climate resilient commodities. Action is required to diversify the risk by introducing less climate-induced commodities and ensure their widespread dissemination and production.

- **Immediate / short-term priorities (2011-2013):**
  - Pilot companies starting climate smart agro business
  - Public awareness campaigns on green labelling

- **Medium-term priorities (2013-2015)**
  - An aware market for the green products in the agro-business
  - A policy framework to promote long term climate smart agro-business
  - An enabling environment for diverse climate resilient commodity
  - **Key responsible agencies:** Ministry of Industry and Commerce: Department of Promotion and Commodity Development, PIP (Public Investment Program) and
  - Foreign Direct Investment (FDI), Ministry of Industry and Commerce, Agriculture Promotion Bank, Chambers of Commerce, Lao National Chamber of Commerce and Industry, Lao Agribusiness Association
3. Program 3: Sustainable production patterns, land allocation, and rural development

3.1. Situation analysis

65. The Forestry Strategy to the year 2020 of the Lao PDR (2005) states that shifting cultivation has been one of the main causes of forest loss. The halting of shifting cultivation and development of sustainable production patterns through land allocation and rural development therefore continues to be a high priority of the Government. It is reflected in Party Congress resolutions, national plans, and sector strategies. Significant efforts have been made to stop shifting cultivation completely by 2010.\(^8\)

66. Among others, the Village Land and Forest Management for Poverty Eradication program is working with many farmers living in mountainous and remote areas (uplands) who live below the basic poverty line. A cultivation stabilization program has been underway since 1989 (PM’s Decree 117/1989), with the objectives of stabilizing shifting cultivation; stopping indiscriminate logging, regenerating forests and generally improving the living standards of upland people through permanent land use systems.

67. The remaining extent of shifting cultivation is, however, by no means the most important reason for forest loss and land degradation in general. Uncontrolled and illegal logging over large areas and the powerful position of investors from neighbouring countries have lead to the issuance of large land concessions against the explicit moratorium of the Central Government. This in turn has lead to cases of deprivation of indigenous land use rights and has exposed a severe transparency problem of some provincial and local authorities. The lack of a proper land registry and the inappropriate legal frame work for land management in rural areas are among the more important reasons why “Rural Land Rights” remain an example of the limitations of Government policies, as exemplified in the ADS.\(^9\)

68. To improve the situation, the Ministry of Agriculture and Forestry together with the National Land Management Authority collaborated in 2009 to issue an improved version of a participatory land use planning manual for use at the village and village cluster levels on arable land and forests. This manual capitalizes on the land use planning work that MAF has undertaken at the sub-basin level to protect watersheds. Nevertheless, participatory land use planning remains to be a key issue to be addressed in practical terms in the field.

69. Climate change is seen as having an increasingly negative impact on land degradation. Increased precipitation resulting from climate change could cause increased erosion, especially on steep slopes.\(^10\) Erosion effects are most significant in areas where shifting cultivation has already led to soil degradation, particularly in those areas where population pressure has led to a significant decrease in the

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\(^8\) As stated in the ADS, quantifying the remaining extent of shifting cultivation poses methodological problems and is a sensitive issue. Most households which used to practice shifting cultivation now practice a more sustainable rotational system. While it is claimed that less than 3,000 households all over the country still practice shifting cultivation (which would be insignificant and negligible), scientific evidence suggests that swidden agricultural landscapes, involving 17% of the population, dominate 29% of the country” (Messerli, P. et al., 2009); see also Decree 0022 GoL-MAF (2010 d).

\(^9\) This, however, is by no means only a problem in Lao PDR. A long awaited World Bank study, published September 7th, 2010 provides ample empirical data on large scale land acquisitions with the aim to confront widespread speculation and inform the debate. Among others, it concludes (p. 51) that „In the light of the deficiencies, investments “failed to live up to expectations and „left local people worse off than they would have been without the investments. “

\(^10\) The recent dramatic events of August 2010 in several parts of China, with large mudslides going downhill causing thousands of causalities and the irreversible loss of valuable cultivation land, should be seen as a very strong warning signal against unsustainable production patterns.
rotation period or where traditional lowland farmers encroach on neighbouring uplands to make up for low and often declining yields on their lowland paddy fields. Increased land degradation leading to lower productivity may also increase desertification.

3.2. Key areas to be addressed

Within the framework of the Agricultural Development Strategy, the following key issues are addressed by Program 3 of the Agricultural Master Plan:

70. **Participatory land use planning** at the sub-basin level will be continued and supplemented by elements of climate smart land use planning. MAF will support land allocation by the issuance of legally secure land titles to rural households, user groups and communities.

71. **Upland rice production** will be stabilized and, where flatland is available, reduced. In locations where farmers are dependent on upland rice for food security, support will be provided with improved seed varieties and fertilizer packages (focused on the use of bio-fertilizer).

72. **Poverty eradication** in the 47 poverty districts will be a high priority. Capitalizing on lessons learned from ten years of experience, rural development programs will be strengthened through the promotion of voluntary farmer organizations; micro-finance schemes; small-scale irrigation development; benefit sharing of income from forestry with nearby communities; creation of value chains for organic products (minimizing the use of capital intensive agricultural production inputs); and, promotion of agroforestry (including the domestication of non-timber forest products-NTFPs).

73. **Environmental conservation**, notably in upland areas, will be linked to “conservation agriculture” and enhancing the resilience of the agriculture sector to climate change and natural disasters. Climate Change Adaptation (CCA) measures will require research and development, including improved crop and grazing land management (e.g., improved agronomic practices, nutrient use, tillage, and residue management); restoration of degraded forest lands; improved water and rice management; holding land in conservation; agro-forestry and improved livestock practices. MAF will promote agricultural diversification, inter-cropping, integrated farming systems, and modified cropping practices, including conservation agriculture already practiced by many farmers. In this context, MAF will also promote the dissemination and use of biogas facilities.

74. **Inclusive rural development**: Rural households will be encouraged to actively participate in planning procedures. In cooperation with local authorities, participatory “Village Development Planning” will identify articulated needs of the rural population, thereby integrating rural men and women into a process of “grass roots democracy”, aggregate the collected data in a “bottom-up” planning process on the kumban and district levels, and use the data to optimize the allocation of scare investment resources (public and private) according to expressed real needs in rural development and for specific sector planning.

75. **Mixed rural economy**: Rural households, especially in remote areas, are in their vast majority not “farmers” in the strict sense of the profession, but rely on a “mixed economy” with various sources of income, fuelled by family labour, men and women. To supplement food and cash revenues from agriculture and forestry, off-farm income and employment opportunities, will therefore be actively promoted, including processing and trading of agricultural and forestry products, handicrafts, agro- and eco-tourism (home stays and cultural expose programs).
3.3. Objectives, outcome, and targets

76. Objectives:
Principal objectives of Program 3 include establishing more sustainable production patterns, complete land and forest allocation, and support rural development in high-priority poverty districts, applying an approach to sustainable natural resource management which is based on the specific potentials, the socio-economic situation and on the agro-ecological conditions in each region.

Potential outcomes:
- The concept of sustainable use of diminishing resources is firmly rooted in the mind set, actual behaviour and land use practices of all stakeholders.
- Eco-agricultural adaptation measures to climate change preserve the long term production potential of natural resources.

77. The key sector targets associated with Program 3 are:
- Expansion of commercial cropping systems in suitable areas
- Establishment of producer groups and cooperatives
- Land allocation is completed
- Farmer real incomes raised
- Farmers reduced shifting cultivation and adopted sustainable production systems
- Specific regulations of land use planning and monitoring system
- Farmers resilient to climate change induced disasters

3.4. Priority measures and sequence of actions

78. Program 3 (sustainable production patterns) is the core element for achieving Goal 3 (sustainable production patterns), which mainly aims at introducing sustainable production patterns, completing land and forest allocation, and improving rural smallholder livelihoods. The key measures of Program 3 are all linked to Program 7 and to Program 8, and include the following, among others:

(1) MAF will rigorously promote conservation agriculture techniques, as developed by a number of International Organizations (e.g. FAO) and adapted to Lao conditions by NAFRI, agroforestry, and eco-agriculture technologies already proven effective in stabilizing shifting cultivation throughout the country.

(2) In cooperation with local authorities, participatory “Village Development Planning” will identify articulated needs of the rural population, thereby integrating rural men and women into a process of “grass roots democracy”, aggregate the collected data in a “bottom-up” planning process on the kumban and district levels, and use the data to optimize the allocation of scare investment resources (public and private) according to expressed real needs in rural development and for specific sector planning.

(3) Based on identified needs and market opportunities, MAF - in cooperation with local authorities and the private sector - will actively promote off-farm income and employment opportunities, especially in the more remote areas, including processing and trading of agricultural and forestry products, handicrafts, agro- and eco-tourism (home stays and cultural expose programs).

(4) To demonstrate the impacts of mitigation and adaptation measures to address climate change, MAF will work with the Food and Agricultural Organization of the United Nations (FAO) to conduct an Agricultural Census that will serve as a baseline against which progress can be measured.
(5) Based on the assessment of local agro-ecological potentials, empirical surveys on needs of the local population and on the analysis of market demand for specific agricultural products, NAFES will intensify promoting the concept of the “Lao Extension Approach Plus” (‘LEA+’), to be implemented by adequately qualified agricultural extension staff on the local level (link to Programs 7).

The measures of Program 3 related to **Climate Change or Biodiversity**, include:

(6) MAF will expand its **sub-basin land use planning** program to include the principles of **agro-ecosystem analysis** linked to proposing climate change mitigation and adaptation measures that will contribute to stabilizing shifting cultivation and adoption of eco-agriculture by upland communities.

(7) Facilitate and accelerate implementation of climate change adaptation measures, such as: **climate smart land use planning**, awareness programs on slash and burn land use change, remote sensing analysis for sustainable land management

(8) MAF will promote the dissemination and use of **biogas facilities** to partly replace fire wood with intended positive impacts not only on the environment, but also on the living situation of rural women (link to Program 6).

79. **Conservation agriculture**: NAFRI and NAFES will support the research, development, and dissemination of climate change adaptation measures suitable for upland and mountainous areas focusing on agroforestry and domestication of non-timber forest products. In consultation with key stakeholders, the MAF Department of Planning (DOP) will take the lead in formulating, proposing, and implementing fiscal policy measures that will be offered to rural communities in exchange for adopting livelihood practices that halt deforestation and land degradation, and reflect good environmental stewardship. Uplands rural women will be included as stakeholders in these consultations. These policy measures will include granting land use rights and benefit-sharing from community management of forests.

- **Land use rights** also will be linked to reforestation and establishment of tree plantations. DOP will work with the Ministry of Finance to examine potential fiscal policy changes to produce sustainable revenue from agro-biodiversity. Fiscal policy changes could include modifications of the custom fee structure and custom procedures, resource and export taxes, limited-term tax-holidays, and investment procedures. Related to domestication and trading of NTFPs, farmers’ groups or producers’ associations will be established and governed directly by farmers themselves, to organize community-based contract-farming type arrangements for domesticating NTFPs (associated with size limits to prevent large actors from dominating the market), development of appropriate infrastructure, post-harvest processing and value-added activities, and participatory organic and sustainability certification.

- **Forest plantations will support upland livelihoods based on agroforestry principles**. Forest plantations will not be commercially exploited; thus allowing for modified spacing and intercropping with NTFPs, crops needed for food security, or cash crops. The upland forest plantations of fast-growing indigenous species will be maintained as carbon pools, watersheds, and providing benefits to the national, regional, and global ecosystem. Such areas will be proposed for consideration under various schemes being developed by the United Nations including Reduced Emissions from Deforestation and Degradation (REDD) and Land Use, Land Use Change, & Forestry (LULUCF). (See SUFORD case study in Annex 2).

80. **Land use planning**: NAFRI will modify its conservation agriculture research and development program to focus on developing short- and medium-term soils, land, and forest conservation management practices that are carbon-neutral and that incorporate the principles of rural renewable energy (RRE). In modifying its conservation
agriculture research and development program, NAFRI will work in partnership with the Water Resources and Environment Agency’s (WREA) and the Department of Meteorology to coordinate with regional agriculture and forestry research institutes to put in place the equipment, procedures, and institutions necessary to install and operate a system of micro-climate monitors that will provide the data required to define sub-regional weather circulation models that will provide advance warning on climate change and disaster-level weather patterns.

81. Lao Extension Approach Plus” (‘LEA+) will focus on three key components, namely:

- The ‘Basic LEA’ that consists of a series of activities that can be applied in almost all circumstances. These activities include participatory needs assessment, formation of ‘learning groups,’ conduct a series of practical training sessions, self assessment, and farmer-to-farmer exchanges.
- Optional modules can be added to the LEA depending on local circumstances, including: participatory land use planning, agro-enterprise development, establishment of revolving funds, and facilitating development of farmer organizations.
- A bottom-up planning process at the sub-district (‘kumban’) level leads to decisions being taken about: i) the menu of topics to be offered as learning activities within the Basic LEA; and, ii) optional modules that can be added to the basic LEA. Some planning tools are already available such as agro-ecosystem analysis, rapid market assessment, and the farmer best-practice process.

82. Agricultural Census: The census that will be conducted will be consistent with the Ninth World Program for the Census of Agriculture (WCA 2010) to help countries plan and conduct their national census of agriculture to be carried out in any year of the decade 2006-2015. The census will be useful in the following ways:

- As a benchmark against which to judge the success of government policies and development programs;
- As a benchmark to diagnose constraints in the agricultural sector;
- In providing comprehensive statistics help governments to act more objectively when setting agricultural priorities;
- In helping policy makers analyze poverty, food security and gender issues;
- Measuring progress towards the Millennium Development Goals;
- Targeting policy even down to the level of small communities;
- Costing policy options more accurately;
- Quantify why farmers make certain decisions and their likely response to policy actions;
- Provide a basis for forecasting crop areas, livestock numbers, agricultural production and food supply; and,
- Help the private sector, including farmers, make commercial decisions.

83. Consistent with the Forestry Strategy to the year 2020 of the Lao PDR (2005) a Village Land and Forest Management Program will be extended to complete land and forest allocation. MAF will work with the NLMA to accelerate the process of granting land use rights to rural communities. Households that practice shifting cultivation and agree to change their farming practices by adopting rotational upland farming, will be given special consideration, and be granted land use rights more quickly. MAF will work closely with the NLMA to implement the following specific sequence of measures:

- Immediate / short-term priorities (2011-2013):
  - Review and re-visit the 45,420 households practicing rotational upland agriculture and the 2,805 households who continue to practice shifting cultivation, to determine eligibility for being given special consideration for receiving land use rights;
- In collaboration with the NLMA, formulate an action plan for accelerating the granting of land use rights to individual households and communities who stabilize shifting cultivation; and,
- Working with village cluster leaders, design a participatory community-based land certification process in which communities take responsibility for regulating agricultural land use.

**Medium-term priorities (2013-2015)**
- Working with domestic civil society groups and domestic and international non-governmental organizations (NGOs), provide technical assistance to village cluster leaders to implement, monitor, and evaluate (including reporting on) the participatory community-based land certification process.
- Define and promote agroforestry systems, including domestication of NTFPs that take into consideration the socioeconomic and agro-ecological conditions of each community, providing sustainable livelihood development alternatives for communities obligated to practice rotational upland agriculture.

**Key responsible agencies**: Civil society groups, NLMA, PMO, National Committee for Rural Development and Poverty Eradication, MAF (DOP, DOI, DOF, PAFO; DAFO; NAFRI; NAFES)

84. The Government will use **fiscal policy incentives** to reward smallholder farmers who use environmentally-friendly agricultural practices and provide eco-services, including afforestation, reforestation, avoided deforestation, and good land management practices, including agroforestry. The Government will reward farmers for good stewardship of land and other natural resources by providing secure land tenure; reduced land taxes; low interest loans from Government banks in support of agricultural activities that also provide eco-services; grants for village development funds; and, public investment in community infrastructure (e.g., irrigation, road projects, water pumps, agricultural equipment, etc.). MAF will work in collaboration with the Ministry of Finance, the Water Resources and Environment Administration (WREA), and other concerned Government of Lao PDR (GoL) agencies to develop and implement the following specific sequence of measures:

**Immediate / short-term priorities (2011-2013):**
- Establish a multi-departmental MAF task force for ‘Good Agricultural Stewardship’ (GAS) that will (i) formulate a criteria for good agriculture stewardship; (ii) define incentives and rewards for cooperating communities; and, (iii) liaise with the Ministry of Finance, WREA, and other concerned GoL agencies regarding development of a participatory community-based approach to natural resources management;
- Identify communities practicing good stewardship to natural resources by conducting a district-by-district survey; and,
- Establish an inter-ministerial Task Force for a Permanent Commission for Agricultural Stewardship, with a secretariat at the MAF Department of Inspection, to monitor agricultural practices and publish an annual report on the status of national agricultural resources.

**Medium-term priorities (2013-2015)**
- Review and enhance the legal framework for rewarding communities for ecosystem services.
- Formulate a legal framework and legislation for an inter-ministerial Permanent Commission for Agricultural Stewardship.

**Key responsible agencies**: MI, Nayobai Bank, Agriculture Promotion Bank, NLMA, WREA, National Committee for Rural Development and Poverty Eradication, MAF (DOP, DOI, DOF, PAFO; DAFO; NAFRI; NAFES)

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11 Afforestation refers to planting of seeds and trees in order to transform open land into a forest or woodland.
12 Reforestation refers to restocking of existing forests and woodlands that have been depleted.
13 Avoided deforestation refers to the use of financial incentives to reduce rates of deforestation and forest degradation.
85. MAF will use an Integrated Watershed Management (IWM) planning approach for upland agricultural development with the objective of decreasing the vulnerability of farmers living in drought and flood prone areas through livelihood diversification and the development of secondary occupations. To this end, MAF has developed a multi-sectoral, bottom-up participatory planning process for area-based socioeconomic and integrated agricultural development aimed at alleviating poverty. Where donor funding is available, IWM is applied in high priority poverty districts. In upland and highland areas the sub-catchment is used as the basic planning unit (whereas in lowland / flatland areas, districts are the basic planning unit). This planning process conforms to GoL policies for administrative decentralisation and integrated rural development. Development objectives include: (i) reducing rural poverty and improving the standard of living in rural areas through alternative livelihood opportunities; (ii) improving conservation and protection of forest areas that are important for preserving biodiversity and stewardship of water resources; (iii) improving watershed management; and, (iv) increasing marginal productivity values of all natural resources.

86. The resulting community land use plans will ensure that indigenous farming techniques and indigenous knowledge will be applied in combination with modern technology to promote environmentally friendly agricultural livelihood alternatives. Measures will be incorporated to reduce risk from flood and other natural disasters and that contribute to sustainable agricultural production and food security, aiming to reduce the vulnerability of the poor. Working with WREA and other concerned GoL agencies when appropriate, MAF will develop and implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Coordinated with WREA, review existing Integrated Watershed Management plans and formulate recommendations for modifying the sub-basin participatory land use planning approach to capitalize on lessons learned;
  - Working with the Mekong River Commission, develop a criteria to prioritize the sub-basins in terms of their importance to the agriculture and hydropower sectors; and,
  - Consult with on-going hydropower projects to develop public-private partnerships (PPP) for financing participatory land use planning at the sub-basin level in critical watersheds providing ecosystem services to hydropower generation.

- **Medium-term priorities (2013-2015)**
  - Using the IWM approach, prepare participatory land use plans in the principal watersheds serving hydropower projects on a first priority basis. Land use plans will include enhancement of village-based forest management and agroforestry as an integral part of rural livelihoods.
  - Apply eco-agricultural analysis for land use planning.
  - Develop an action plan for watershed rehabilitation through natural regeneration and enrichment planting in high priority watersheds, with support from hydropower companies with concessions to develop hydropower projects.

- **Key responsible agencies:** MRC, WREA, Ministry of Energy and Mines, MAF (DOP, DOF, PAFO; DAFO; NAFES

87. MAF will promote sustainable production patterns, land allocation, and rural development to enhance the resilience of the agriculture sector, with an emphasis on smallholder farmers. Climate change is forecasted to increase the occurrence of flooding and drought throughout Southeast Asia, resulting in reduced crop yields. To ensure food security and the competitiveness of food and agricultural products, MAF will facilitate increased support to smallholder farmers to increase productivity by accelerating farm mechanization, application of environment-friendly ("green") agricultural technologies, and blending indigenous farming techniques and indigenous knowledge with modern technology. MAF line agencies will be restructured, reformed, and modernized to implement climate change mitigation and adaptation measures, to make the agriculture sector more resilient; to ensure food security;
and, to provide systematic and continuous environmental services to other key income generating sectors of the economy. Working in cooperation with agriculture scientists, researchers, and technicians from other ASEAN and GMS member countries, MAF will develop and implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Survey and register in a computer-based database, indigenous varieties of food plants and livestock.
  - Survey and record in a computer-based database, farmer- and community-based indigenous knowledge used by smallholder farmers to manage flood and drought conditions.
  - Based on current knowledge of indigenous varieties of crops that are resilient to flood and drought conditions, accelerate the multiplication and distribution of seed varieties and livestock breeds that are more resilient to flood and drought.
  - Conduct an internal review of the role and responsibility of MAF line agencies with the objective of achieving institutional reform and modernization in response to accelerated growth, globalization, and significantly changed mandates.

- **Medium-term priorities (2013-2015)**
  - Cooperate with ASEAN and GMS member countries at the regional level to implement measures to improve the collection of meteorological data (using micro-climate monitors) in pre-identified regional hot-spots to develop one or more sub-regional weather circulation models. The models will be linked to existing food security monitoring systems.
  - Study the feasibility of providing weather-based risk insurance to smallholder farmers who are members of farmer organizations.

- **Key responsible agencies:** WREA, MAF (DOP, DOF, DOI, PAFO; DAFO; NAFRI, NAFES)

88. MAF will promote **climate smart land use planning** in context of climate change adaptation for agriculture systems. Sustainable land management through appropriate usage is the key for this. So far, MAF, WREA and NLMA have followed different approaches and have elaborated different land use plans for almost 100 districts. Of highest urgency and priority would to be harmonize these approaches and plans to render them operational. On this basis, plan implementation is to take off soonest. Climate smart land use planning is essential for successful production and rural development. Awareness programs on slash and burn consequences will be continued. Remote sensing (RS) will continue to provide the basic data to undertake land use inventories\(^\text{14}\), as well as the temporal information required to monitor sustainable land management practices. MAF and its partners will promote to set up a nationwide RS database for improved land management.

- **Immediate / short-term priorities (2011-2013):**
  - Review report of existing land use plan
  - Policy papers, workshops, conferences on the related sectors
  - Educational materials, videos
  - Field notes and people’s experiences
  - Remote sensing database
  - Decision making tools

- **Medium-term priorities (2013-2015)**
  - Specific regulations of land use planning and monitoring system
  - Aware community and local stakeholders
  - By using the remote sensing data, setting up a monitoring system of sustainable land management

- **Key responsible agencies:** MAF (DOP, DOF, DOI, NAFRI, NAFES), National Land Agency, Remote sensing Centre/ Institute, Local governments

\(^{14}\) E.g. Messerli, P. et al. (2009)
4. Program 4: Forestry development

4.1. Situation analysis

89. GoL has officially approved and established production forests in 16 provinces, consisting of 51 production forest areas with a total area of 3.089 million ha. Further plans are to establish production forests in 11 provinces with an additional total area of 716,357 ha. Approved by the Provincial Governors, there currently 264 official protected forest areas with a total area of about 4,902.106 ha.\(^\text{16}\)

90. Overall, the fragmentation of forested areas has increased, density has decreased, and areas dominated by large trees and pole size trees have decreased, while areas containing only small trees have increased. In general, the rate of deforestation is high and may be accelerating. If deforestation continues at the current rate, it is estimated that by 2020 only 7.4 million ha of current forest (with more than 20% of canopy density) will remain, marginally above 30% of total land area.\(^\text{16}\)

91. Non-timber forest products (NTFPs) play a central role in the rural economy, in particular for rural women. Proceeds from NTFP sales may account for more than a third of village cash income, rising as over a half in forest-rich areas. At the national level, the estimated value of NTFPs is some US$320 per household per year in rural areas. NTFP harvesting plans, specified by product, are set annually by PM Decree and allocated to the provinces by MAF.

92. Some 146,600 ha of tree plantations have been established, mostly in the central region. It is estimated that about 66 percent have survived. Individual farmers and investors contribute the largest area to national total planted area (47.5 percent), with an average planted area of between 20 and 30 ha.

93. Apart from the quantitative aspects, the qualitative aspects of the density of the forests and notably the sustainability of forest management remain important issues. Outstanding, among others, is the alignment with the regional reference framework for the verification of timber legality in ASEAN member states (ASEAN C&I) which would be a milestone towards forest certification according to sustainability standards, such as the certificate of the “Forest Stewardship Council (FSC). This will be a precondition to ensure long-term access to the legal international markets for timber, NTFP and wood products (to at least partly replace the currently widespread practice of illegal exports to neighbouring countries).\(^\text{17}\)

94. Ownership of wood processing factories is dominated by the private sector. Wood processing constitutes approximately 6 percent of GDP. The industry has difficulty in complying with international sustainability standards (such as FSC and CoC) and finds it impossible to compete against established facilities in neighbouring countries\(^\text{18}\) when paying international parity prices for logs.

\(^{15}\) Phongsaly province has 424,901 ha, Oudomxay has 358,550 ha, Luangnamtha holds 310,920 ha, Bokeo has 142,894 ha, Houaphan has 250,082 ha, Xiengkhouang 626,676 ha, Luangprabang has 703,746 ha, Xayabouly has 320,262 ha, Vientiane has 309,508 ha, Vientiane capital has 16,934 ha, Bolikhamxay has 315,525 ha, Khommoun has 73,898 ha, Savannakhet has 108,020 ha, Champasack has 260,897 ha, Saravan has 107,959 ha, Xekong has 252,854 ha, and Attapue has 318,486 ha.

\(^{16}\) Forestry Strategy to the year 2020 of the Lao PDR, 2005

\(^{17}\) With reference to the European “Forest Law Enforcement, Governance and Trade” (FLEGT) legislation, this practice might see a limitation soon, see “EU moves to eradicate illegally sourced timber”, in Vientiane Times, 14\(^{\text{th}}\) Sept. 2010.

\(^{18}\) The export value of the Vietnamese furniture industry was close to 3.0 billion USD in 2008, dropped in 2009 due to the global crisis, and is currently approaching previous levels. It is estimated that between 30 to 60 percent of the raw timber originates from Laos, mostly by illegal trade.
95. The **preservation of the natural diversity of fauna and flora in Laos** is gradually being accepted as a development goal in its own right, independent of (and if necessary even against) the economic interests of using and exploiting natural resources. There are seven **National Biodiversity Conservation Areas (NBCA)** of high international biodiversity conservation significance. Remaining forests are rich in species with a high degree of endemism and biological distinctiveness: at least 8,100 plant species, 166 species of reptiles and amphibians, 700 bird species, and 100 mammal species. A national biodiversity conservation system was created in 1989. Prime Minister’s Decree Nº 164/1993 established 18 NBCAs, later increased to 21, in addition to two biodiversity corridors, NBCA and protected areas. The current area covers 3.4 million hectares or 14.3 percent of the country’s area. Provinces and districts have designated their own conservation areas and protection forests, bringing the overall national total to 5.3 million ha or 22.6 percent of the total land area. Provincial and district protection forests cover around 0.6 million ha.

96. Since a number of years, however, numerous studies have indicated that the **biodiversity of Lao forests is severely threatened** by various factors contributing to over-exploitation and destruction of natural habitats, and that effective measures of preservation are urgently in order before this trend becomes irreversible. Major programs have recently been launched, and further donor support is being sought for the effective management of protected areas and National Parks, as well as for awareness campaigns for the wider public.

97. Apart from the direct economic benefits to be gained from the exploitation of forests, the more indirect **environmental services provided by forests** have so far been largely neglected or under-rated. Among others, forests which are intact and dense enough, effectively protect watersheds and thus the catchment areas for the mega hydropower projects of which around 50 are in the pipeline for the foreseeable future. Without the protection by forests, the investments in these hydropower projects may come under severe threat by rapidly increasing amounts of inflowing sediments and large mudslides. For the same reason, downstream irrigation schemes and settlements will be endangered if the buffer and protection functions of surrounding forests continue to be under-valued. A new legal framework is therefore to ensure that the investors in hydropower and irrigation projects realize the value of the services provided by forests and will - as beneficiaries of these services - contribute adequately to the costs related to maintaining and improving the forest cover.

98. In the same sense of environmental services, **Lao forests absorb very large amounts of Carbon Dioxide (CO₂)**, which in the context of the global climate debate is about to develop into a very significant emerging market. GoL and MAF have realized the enormous potential of this market for Lao PDR and have started to undertake preparatory steps for participating in this market with potential new sources of finance for forest development potentially coming both from the international donor community (REDD) and from new mechanisms in the international financial markets (trade in carbon certificates and derivates).

99. To address all these issues above, the **different modes of sustainable forest management** need to be further clarified by an appropriate legal framework and implementation guidelines. These modes would include large-scale management concepts by state-owned and private forest enterprises as well as smaller-scale ownership and management structures by individual smallholders, forest user groups, or cooperatives. In the context of payment for environmental services and of potential benefits for CO₂ reduction, the sensitive issue of **benefit sharing** will again become pertinent.
4.1. Key areas to be addressed

Within the framework of the Forest Development Strategy, the following forestry development issues are addressed by the present Master Plan:

- **Forestry issues:**
  - Degraded forest land is allocated to private investors as long-term land concessions, closing off land to farmers for crop production, grazing, and tree planting.
  - Multiple uses of forest lands are conflicting.
  - Long-term use rights on land concessions are subject to a land development / business plan, but such plans often are not implemented.
  - Concessionaires often misuse allocations leading to illegal logging.
  - Land Law lacks provisions on land-use planning and coordination among land related sectors at all levels.
  - Coordination among concerned sectors within forest areas is insufficient.
  - Lack of management at field level results in deforestation going unnoticed.
  - There are no clear criteria for delineation of agriculture areas and classification of village forest.
  - Lack of clear forest land titles for individual smallholders, forest producer groups and communities.
  - Lack of forest co-management arrangements with communities.
  - Lack of benefit-sharing arrangements with local population.

- **NTFP issues:**
  - Marketing regulations for NTFPs are lacking.
  - The few officials who are responsible for NTFP development are scattered among a several agencies with limited capacity to undertake tasks required.
  - Iterant traders / collectors appear in villages and pay villagers to collect unsustainable quantities of NTFPs for export to neighbour country markets.

- **Tree plantation issues:**
  - Selection of tree species in favour of fast growing, often with negative impacts on soils
  - Productivity and profitability of plantations is low.
  - Inadequate tree-growing technology.
  - Seed and seedlings quality is low, no reliable certification.
  - Legal and regulatory framework is unclear.

- **Timber harvesting issues:**
  - Illegal logging is widespread and not effectively sanctioned
  - Illegal timber trade is rampant and not effectively controlled
  - Lack of benefit-sharing arrangements with local population.

- **Wood processing issues:**
  - Confusion caused by two ministries having power to set operating standards and register wood processing machinery.
  - Many factories operate at less than one-half of installed capacity and log recovery rate is around 50%.
  - High technology processing equipment is unavailable.

- **Biodiversity conservation issues:**
  - NBCAs are relatively well preserved but are also under pressure from unauthorized and development activities.
  - National Parks poorly managed
  - Existing laws and regulations to prevent unauthorized use of wildlife are not strongly enforced.

- **Protection forests and watershed management issues:**
  - Inadequate funding for establishment, demarcation, and management of protection forests.
  - Watershed classes 1, 2, and 3 are severely degraded.

- **Village land and forest management for poverty eradication issues:**
  - Upland people are directly dependent on nearby forests for subsistence and for generation of vital income.

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10 Forestry Strategy to the year 2020 of the Lao PDR, 2005
- Due to lack of village forest management plans, many villagers make extensive use of nearby forests despite classification and rules.
- Shortages of funds, equipment, and technical staff are the main causes of both delay in program implementation and its modest effectiveness.
- Shifting cultivation has been one of the main causes of forest loss.
- Land allocation in mountainous areas where shifting cultivation dominates will not achieve objectives because of lack of market access.

101. In addition to these conventional issues, the new issues as mentioned in the situation analysis will be addressed, such as
- the lack of inclusion of rural women in co-management and benefit-sharing arrangements,
- indigenous people rights,
- timber legality and weak enforcement of forest law and regulations,
- certification of timber and of trade in timber and wood products,
- payment for environmental services,
- REDD and the international carbon market,
- sharing of “old and new benefits”,
- eco-systems restoration schemes.

4.2. Objectives, outcomes and targets

102. To engage the market and globalization, MAF and other GoL agencies concerned with external trade and foreign investment will be obligated to modernize public institutions and administrative procedures in order to remain attractive to FDI and competitive in regional and global markets. Measures of Public Administration Reform (PAR) in the forestry sub-sector will also be needed to ensure that domestic SMEs are managed by effective entrepreneurs. The MAF and the Ministry of Finance will provide fiscal incentives to support adoption of “green technologies” by business, particularly technologies that will lead to increased production or unique products that would potentially have economic value. At the same time, GoL procedures to sustainably manage forests, ensuring a balance between exploitation, utilization, and protection, will need to be reviewed and adapted to emerging programs related to managing carbon pools and applying climate change mitigation and adaptation measures. The concept of managing forests as a natural resource for exploitation will require reconsideration. Instead, the GOL, led by DOF will manage forests scientifically and professionally, to provide environmental services to the Nation; services that support income generating activities, in particular:
- NTFPs, for consumption to ensure food security and for sale;
- Biodiversity conservation for eco-tourism;
- Watershed conservation to sustain hydropower production and water supply,
- Participation in income-generating international carbon pools (e.g., REDD and LULUCF), and
- Introduction of payment for ecosystem services.

103. Objectives concerning national forests and forest land:
- Deterioration of forest resources will be controlled and corrected in terms of both quantity and quality, leading to increase in forest cover and to livelihood improvement of poor farmers in rural areas and for protection of the forest cover.
- Laws and regulations related to forest management will be improved and enforcement strengthened.
- Participation of local people will be the main approach of sustainable management of all categories of forests.
• Sustainable Forest Management will contribute to the conservation of biodiversity, CO₂ reduction and other internationally agreed environmental parameters.

Potential outcome:
- Increased awareness of the importance of forests in eco-system management, improved effectiveness of law enforcement, reduced illegal logging, increased rehabilitation and reforestation, innovate schemes for watershed management

104. The key sector targets associated with Program 4 are:
- Improving existing forest area (Forest Coverage Area) up to 65% of the total land area through the implementation of collaborative management plans for biodiversity and watershed services for conservation and protection forests and sustainable forest management in production areas
- Increase forest quality in under-stocked forests (potential forest) within and outside designated forest zones (3 forest categories) through avoidance of deforestation-cum-rehabilitation in an area of up to 6 million hectares by 2015
- Develop legislation for valuing of ecosystem services (e.g. biodiversity, water) in all forest categories
- Develop methods and procedures for assessing carbon content in all types of forest land and legislation to apply in all types of forest conversion repayment.

4.3. Priority measures and sequence of actions

105. Program 4 (forestry development) is the core element for achieving Goal 4 (sustainable forest management).
The key measures of Program 4 include the following, among others:
(1) MAF will expand the use of agro-ecological system analysis for land management.
(2) Set the policy framework for line agencies to facilitate and coordinate the creation of, and provide institutional strengthening for community forestry and for community-based producer and marketing organizations in rural areas, including the introduction of internationally recognized sustainability standards and certification (e.g. SFC) and the promotion of commercial tree planting by individuals, groups, organizations, and SME.
(3) Secure legal recognition and ensure sustainable management of all state forest zones demarcated (all categories of forests) with the participation of local people,
(4) In areas outside state forests, strongly promote domestication and sustainable management of NTFPs and tree planting for fuelwood and other benefits/services, and promote urban forestry
(5) Promote a balance between wood processing industries and annually approved wood harvest volumes; strongly promote domestic processing of wood, promote sustainable trade in wood products by certification (e.g. the requirements of “Chain of Custody”, CoC)
(6) Capacity building with government organizations and concerned parties for the implementation of the Forest Strategy 2020 (links to Programs 7 and 8).
(7) Develop supportive regulations, implementation guidelines and institutional framework to support integrated village development within which village level land use planning, agriculture development and community forestry are important integral parts.

The measures of Program 4 related to Climate Change or Biodiversity, include:
(8) **Mobilize new climate-related finance mechanisms;** implement pilot and “Readiness Programs” on Reduced Emissions from Deforestation and Degradation (REDD plus), including the development of a REDD + strategy, the organizational setup and institutional framework for REDD+ (including the development of a national carbon registry, financial arrangements, benefit sharing and distribution systems, and the MRV system), pilot and upscale “Eco-systems Restoration Licenses”, develop regulatory framework for trade in CO\textsubscript{2} reduction certificates (private sector), pilot and upscale trade in CO\textsubscript{2} reduction certificates and derivates to global financial markets; network internationally in accordance with the principles of international conventions on forests, biodiversity and climate change (UNFCCC, UNFF, CCD, CBD)

(9) More effective control and corrective action to prevent the further deterioration of forest resources in terms of quantity and quality and for protection of forest cover, accompanied by public **awareness campaigns** on the important role of forest in climate change mitigation; establish a comprehensive **biodiversity assessment** and launch a conservation program for **protected areas** and National Biodiversity Conservation Areas (NBCA)

(10) Pilot and support by specific investment measures different models of sustainable **community-based forest management**, collaborative or **co-management** arrangements for protected areas and National Biodiversity Conservation Areas (NBCA), thereby contributing to the conservation of **forest ecosystems and biodiversity**.

(11) Develop and **enforce appropriate laws, regulations and implementation guidelines** related to sustainable forest management and strict regulatory measures in terms of climate change

106. **Lessons learned:** MAF personnel will be trained to use participatory land use planning techniques to maximize the comparative advantage of unique ecosystems and plan and implement sustainable livelihood development of remote rural areas. The longer-term objective is to maintain the quality of biodiversity protection to support eco-tourism; watersheds for hydropower production; carbon-pools for REDD and LULUCF related programs; production forests for benefit sharing and NTFPs for food security and niche markets. Land use plans will support carbon-neutral rural and agricultural development activities that will bring the highest returns on investments, while minimizing negative impacts on socio-economic and eco-agricultural systems. Training for MAF personnel will emphasize improved governance of projects and programs. Training also will be provided in community and institutional participation and consultation techniques to include diverse stakeholders as well as to link policy researchers and policy decision makers at the central level and provincial authorities at the local level.

107. As for the opportunities, **new international finance mechanisms**, if effectively tapped, may turn the tremendous potential of the Lao forests as CO\textsubscript{2} absorbing “sinks” into a very significant source of revenue for the GoL, for the rural population as well as for large scale private investors. In this context, the “**Clean Development Mechanism**” (CDM) is so far of limited value for Laos, since it mainly refers to the reforestation of areas which are barren for more than 20 years, and targets the introduction of energy-efficient technologies. The **REDD (and REDD plus) mechanism** on “Reducing Emissions from Deforestation and Forest Degradation” still suffers from unclear procedures of fund mobilization and distribution. However, the validity of Kyoto protocol (UN 1998) is running out in 2012, and even though the Copenhagen Conference of December 2009 is largely seen as a failure, the international pressure of finding solutions in due time is on. In the meantime, so-called “**REDD Readiness Programs**” are on the way in Laos and elsewhere to prepare for the
period in the hopefully not too distant future when the mechanism is in full operation.\textsuperscript{20}

108. GoL-MAF is pro-actively preparing for this future, among others by simulating a number of emission scenarios: As an example, if all agricultural expansion, both commercial and smallholder, could be directed onto unstocked forest land instead of clearing degraded forest, emissions would be reduced substantially and the degraded forest would re-grow and sequester CO\textsubscript{2}. The model suggests that such a scenario would reduce emission by about 12 million tons annually. – Another scenario where logging could be restricted to sustainably managed production forests would reduce emissions in CO\textsubscript{2} in the short-term by 8 million tons. These two scenarios could generate REDD payments of up to US100 million annually (at an estimated price of 5 Dollar per ton).\textsuperscript{21}

109. As an additional source of finance, the private sector Carbon Market\textsuperscript{22} is so far seen as having the highest potential for capitalizing on the environmental services provided by the Lao forests: On a global scale, this market is characterized by a demonstrated resilience to the recent global economic down-turn, keeping the same level by the end of 2009 as in 2008 (US\$130 billion annually). Most of this value is attributed to financial transactions, given the large appeal of emissions trading to European banks. At approximately US\$95 billion, transactions of allowances and derivatives under the European Union Emissions Trading Scheme (EU ETS) continue to dominate the market in 2010, primarily led by a large increase in the volume of allowances traded. Those trades are used by the European players for compliance, arbitrage and profit-making purposes. The secondary market for Certified Emissions Reductions (CERs) remains as the second largest carbon market, although its value decreased compared to 2008, influenced by the large retraction in overall prices. The recent economic crisis has eased the compliance needs from countries and companies, thus reducing the overall demand for primary offsets. The lack of clarity on the post-2012 front (Kyoto) contributed to the retraction of both the supply and the demand of existing regimes. At the same time, new initiatives in developing and developed countries are emerging, such as Program of Activities, exploring market approaches for climate finance solutions.

As for Laos, this private carbon market is not yet developed, mainly due to lacking or unclear legal framework conditions, laws and implementation guidelines as well as lacking international certification and close Government monitoring. In addition to the clarification of these issues, successful international experience and pilot programs will be studied and adapted to Lao conditions, such as the Indonesian example of “Eco-systems Restoration Licenses”.\textsuperscript{23} These long-term licenses, sold to private investors, have as objectives the complete restoration of natural forests and habitats over large areas, with the licensee being allowed to extract recourses and realize benefits in a sustainable way. Implementation is closely monitored by Government, and independent international external experts. For Laos (and other countries), these arrangements do have the appeal of replacing the old logging concessions (where in the near future no more money can be made) by a win-win situation, in which the private investor gains a long term benefit, Government saves costs for conservation measures and – at the end of the license period – is handed back an intact forest / ecosystem which can again be sustainably used.

\textsuperscript{20} See GoL-MAF (2010 c), GTZ (2010); on the ongoing international discussion: REDD+ Partnership (2010), UNFCCC (2010)
\textsuperscript{21} GoL-MAF (2010 c), with additional potential from forest rehabilitation and reforestation, based on hard data of World Bank, see also Vientiane Times (2010 b)
\textsuperscript{22} World Bank (2009 a)
\textsuperscript{23} See Glossary and Wildlife Extra (2010)
110. **Capacity building**: Farmer leaders, communities, and sub-district and district agriculture technicians will require training and additional information related adaptation to climate change and integrating with markets. Human resources development and institutional strengthening is necessary to introduce and demonstrate the adaptation measures that will make the ANR sector resilient to climate change. Similarly, key stakeholders in the timber and NTFP value chains will require access to information systems that enhance adaptive capacity to global dynamics such as market price volatility and instability in commodity markets. Farmers will be provided with direct access to information about prices, weather, availability of inputs, and what other farmers are doing. This will be in the form of pre-packaged technical recommendations and policy instructions as well as data that can be used in their own analysis, allowing them to assess options. Great emphasis will be given to including rural women in capacity building measures and providing them with access to early warning mechanisms.

111. In the context of forestry development aiming at sustainable forest management, the following **priority actions of Program 4** are planned.

112. **Cross-sectoral coordination and cooperation** mechanisms are necessary to guide processes from the preparation of land related legislation to implementation at the field level. Consistent with the Forestry Strategy to the year 2020 to establish an inter-sectoral coordination mechanism for effective forest and watershed management, a permanent national forest management commission will be created comprised of representatives of all key stakeholders to assess forestry management problems, review options for resolving problems, and making recommendations to the Government for further consideration. Creation of the commission will demonstrate strong commitment at the highest level of Government to more sustainable forest management. The commission will provide a forum for coordinating concerned all sectors; scrutinize forest management at all levels; provide criteria for delineation of agriculture areas and classification of village forest; formulate guidelines for NTFP development; recommend forestry legislation incorporating precautionary principles to the Government for consideration; harmonize operating standards for registering wood processing machinery; authorize the use of Government resources to strictly enforce existing forestry laws and regulations; review and advise on the progress of establishing, demarcating, and managing protection forests and watersheds; and, review village forest management plans. MAF will develop and implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - MAF will consult with the Prime Minister’s Office and WREA to establish a permanent national forest management commission chaired by a deputy prime minister to provide policy level guidance to forest management;
  - MAF may emphasize on drafting instructions and guidelines plus incentive mechanism for village forest management and for urban and social/community forestry.
  - MAF will draft criteria for delineation of agriculture areas and classification of village forest; and,
  - MAF will draft guidelines for NTFP development
- **Medium-term priorities (2013-2015)**
  - MAF will review the progress of establishing, demarcating, and managing protection forests and watersheds.
  - Working with the Ministry of Industry and Commerce and the Lao Chamber of Commerce and Industry, MAF will draft operating standards for registering wood processing machinery.
- **Key responsible agencies**: PMO, WREA, MOCI, Lao National Chamber of Commerce and Industry, MAF (DOP, DOF, DOFI)
113. **To improve awareness among relevant government agencies** about sustainable natural resource management and strengthen the understanding of local people and district level forestry officers about the new forestry law, MAF will disseminate information or knowledge on the contribution of forests to poverty reduction and their role in producing national, regional and global goods and eco-system services. **Civil society organizations and private enterprises** will be recruited to support improved forest management initiatives through corporate social responsibility; in particular foreign multinational companies with land concessions. MAF will employ a public involvement approach to establish a two-way flow of information: dissemination and reception. The outcome of public consultations, concerns of government officers, local traders, and other stakeholders, will be used in planning of forest management measures. In addition, MAF will engage in dialogue with ASEAN and GMS member countries at the regional level to build a consensus and develop collective actions to protect valuable natural resources. To resolve issues related to forestry development, MAF will implement the following **specific sequence of measures**:

- **Immediate / short-term priorities (2011-2013):**
  - Working with support from the Sub-working Group on Forestry, establish a cross-sectoral Forest Management Task Force within the Department of Forestry (DOF), with a deputy minister of agriculture serving as the chairperson;
  - The Task Force within DOF will (i) formulate a public involvement program; (ii) prepare a roadmap for cross-sectoral coordination and cooperation mechanisms to guide processes from the preparation of land related legislation to implementation at the field level, with objectively verifiable benchmarks to measure improvements in forest management; and, (iii) formulate procedures for active inter-agency cooperation including non-binding cooperation agreements between line agencies; and, mandated cooperation through provincial administrations and basin-specific management bodies.
  - Organize a national conference on sustainable forest management in collaboration with hydropower and mining companies and with concessions to organize inter-sectoral discussions on financial incentives, social and environmental conditionalities for future issuance of licenses, payment for environmental services, etc., develop proposals for further consideration by the Government.

- **Medium-term priorities (2013-2015)**
  - Undertake a “road show” to publicize the importance of forest management in all regions of the country.
  - Define village areas and their rights to and responsibilities for the land and forest within their villages in the Land Law and the Forestry Law.
  - Draft legislation to remove restrictions on saw mills to process logs from planted forests.
  - Equilibrate the legal rights that different planters have with respect to land for forest plantations.
  - Adjust the regulatory framework to support sound operations and growth of the wood processing industry.
  - Prepare a law on biodiversity conservation, including improved wildlife regulations for use of wetlands for fish raising, ecotourism, regulations for protection of forest genetic resources, and intellectual property rights.

- **Key responsible agencies:**
  - Prime Minister’s Office, National Committee for Rural Development and Poverty Eradication
  - NLMA
  - Public Administration and Civil Service Authority
  - Ministry of Energy and Mines
  - Ministry of Industry and Commerce
  - MAF: Departments of Planning, Forestry, Forestry Inspection, Inspection; PAFO; DAFO; NAFES.
  - WREA
  - Ministry of Justice
  - Ministry of Finance
  - Lao Chamber of Commerce and Industry

114. **Forest ecosystems** are very sensitive to climatic change. To preserve their **biodiversity**, strict regulation for forest protection as well as enforcement and compliance are. To achieve compliance, awareness campaigns and participatory processes are required to involve local communities in the decision making process. This
is best be done by a step-wise approach including the sensitization of people and communities who sustain on forest products, developing alternative livelihoods, develop community forest management programs and transferring the ownership and part of the responsibility to local communities. Reducing deforestation and forest degradation may have a significant positive impact on local climate change mitigation and adaptation, which can yield significant sustainable development benefits, and can generate a new financing stream for sustainable forest management. If cost-efficient carbon benefits can be achieved through REDD (Reduce Emissions from Deforestation and Forest Degradation), increases in atmospheric CO₂ concentrations will be slowed. Respective pilot and “REDD Readiness Programs” are currently being prepared, and need to be up-scaled in a big way, involving smallholder farmers, state enterprises and private investors. Investors will be addressed with “Eco- systems Restoration Licenses”. The global carbon markets will be addressed with internationally certified large-scale CO₂ reduction areas. - MAF will develop and implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Aware communities and vulnerable groups
  - Develop national carbon registry
  - Formulate appropriate regulatory framework for effective forest protection, including allocation mechanism of REDD funds and private trade in carbon certificates
  - Train local authorities for monitoring
  - Aware communities and vulnerable groups
  - Develop alternative livelihoods
  - Pilot programs on “REDD Readiness” / REDD plus
  - Provide concrete and applicable tools for forest management and climate change
  - Pilot “Eco-systems Restoration Licenses”
  - Ensure independent international certification of large-scale CO₂ reduction areas, and offer CO₂ reduction certificates to global financial markets

- **Medium-term priorities (2013-2015)**
  - Implementation of regulatory measures for forest management
  - Sustainable management of forest by the local communities
  - Sustainable management of forest supported by research and development
  - Upscale “Eco-systems Restoration Licenses”
  - Upscale trade in CO₂ reduction certificates to global financial markets

- **Key responsible agencies:**
  - Prime Minister’s Office
  - MAF in cooperation with the private sector
  - Related authorized and NGOs and Laos National University
5. Program 5: Irrigated Agriculture

5.1. Situation analysis

115. The Ministry of Agriculture and Forestry (MAF), Department of Irrigation (DOI) has recently formulated a long term subsector strategy for irrigated agriculture, and an Irrigated Agriculture National Action Plan. In this subsector strategy and plan, the major current challenges for irrigated agriculture in Lao PDR are summarized as follows:

116. The first challenge concerns the conduciveness of the business environment in irrigated agriculture. Currently, farmers and other private entrepreneurs face a high level of risk and uncertainty, which makes it economically unattractive for them to invest in irrigated agriculture production. This is one of the reasons for farmers to focus on low-input / low output irrigated paddy production, just to meet subsistence needs in their household and locality. Inherently, farmers generate very few income resources just enough for their household basic spending, and they are not in a position to use the resources for development and management of irrigation infrastructure systems.

117. There are three important factors that influence the risk and uncertainty in Lao irrigated agriculture; (1) markets and trade, (2) technology application, and (3) infrastructure development and management.

(1) Markets and trade is the major factor influencing the risk and uncertainty in irrigated agriculture. Currently, prices for inputs and outputs are unstable because of weak market and trade environment and mechanisms. Prices of input supplies tend to increase and are not affordable during the production season. On the other hand, the price for products is low when farmers need to sell. The saturation of the domestic market and the low level of competition among traders are the important reasons for this situation. For many production areas, the cost of transport to/from the markets is high and this reduces the potential margin on crop production.

(2) Technology application: Existing agricultural extension services lack resources to provide efficient production technology advisory services in irrigated agriculture. Currently, technologies for irrigated paddy and for other commercial crops are not or not correctly applied.

(3) Infrastructure development and management: Existing irrigation services lack resources to provide efficient and acceptable quality irrigation infrastructure development and management services. Many irrigation schemes cannot deliver effective and affordable water for dry season production because of problems and constraints related to design, the management of the investment for the scheme construction, water management concept and technology and water users’ organisation ownership. Improving the two latter factors, agriculture technology and irrigation services, would only make sense when there is an actual demand for them. For this demand to emerge, market and trade conditions need to be predictable and promising.

118. The second challenge concerns the effectiveness of public management. Improvement of the business environment for irrigated agriculture will require concerted action in a range of public management areas, such as Agriculture and Forestry (agriculture, research, extension); Industry and Commerce; Natural Resources; Water and Environment; Public Works and Transportation; Energy and Mines; Land

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24 GoL-MAF (2010 b)
Management; Planning and Investment; and Finance. Public management systems were developed in the past to fit the central planning system and in the Agriculture and Forestry Sector they were directed towards ensuring domestic food supply. Adjustment to the requirements of a market-oriented economy has started, but capacity and processes are not yet sufficiently geared to support effective management of the business environment.

119. The third challenge concerns **households’ vulnerability to drought** which is proportional to their livelihoods’ exposure (non irrigated agriculture, farm labour) to drought, and to the resilience of the household. According to WFP estimates, 46 percent of the rural population in Lao PDR are vulnerable to drought, most of whom are located in the lowlands, especially in the Southern regions and in the provinces of Savanakhet, Xayabury and Luang Prabang. This is in addition to the 2 percent that are already chronically food insecure. Most households vulnerable to drought are farmers or unskilled labourers. 12 percent of agro-pastoralists are also considered vulnerable to drought. It is estimated that nationwide around 188,000 households are at risk of food insecurity caused by drought. These vulnerable households are mostly located in Khammuane, Savannakhet, Saravane, Champasack, Xayabury and Vientiane provinces.

120. The current irrigation area in the lowland plains is 190,000 ha in the wet season and 136,000 ha in the dry season. Most irrigation water is pumped directly from rivers, by over 4,000 small to medium scale projects. GoL aims to double the irrigated area by 2020.25

121. The **objective** of the subsector plan for irrigated agriculture is therefore to create a more conducive environment for irrigated agriculture development. The long term strategy covers the period of **2011-2020**. Its direction will be towards re-modelling and re-orienting the mechanisms of the various areas of public management that relate to the irrigated agriculture subsector. The new model for public management will need to be shaped around a **holistic perception of irrigation**, namely as “irrigated agriculture”, a business activity undertaken by farming households and the private sector, and governed by economic incentives.

122. The strategy provides direction and **guidance to government agencies** on (i) how to align their public management of the Irrigated Agriculture Subsector to the requirements of an open and market-oriented economy and (ii) how to create conducive conditions that will result in the desired increase in commodity production, in a responsible way, and while maintaining food security. In a market-economy, commodity production takes place in response to market demand with all steps in the value chain providing adequate economic incentives to make farmers and private entrepreneurs interested in undertaking them. Public management affects many of the factors in the value chain, and therefore needs to base its decision-making for action on value chain information and public-private sector dialogue. The value chain **factors are highly locality-specific**.

5.2. **Key areas to be addressed**

123. It is considered essential for the public management of Irrigated Agriculture to have the following **features**:

- Public management agencies understand the farmers and private sector business of irrigated agriculture, so that they can identify and manage the factors that determine the conduciveness of business environment

25 (MRC- 2009).
- Public management action takes place at all levels, in concert, to result in comprehensive solutions
- Because of the variation among localities, it is important that planning and decision making are based at the local government level, where the production processes take place and agencies can best identify the needs and opportunities, and thus ensure that actions and use of related public resources are effective and efficient.

124. For these features to materialize, the following **key areas of change** have to be addressed:

- **Public sector and private sector roles**: The private sector is the engine of economic development and the government is regulator and enabler. For tuning of regulation the two need to engage each other in a public-private sector dialogue. Agencies need to have adequate regulatory capacity and should spin-off tasks that the private sector can do.
- **Market structure**: A competitive environment and access to support services are essential for a development of a strong private sector. Government regulation and public investment need to support this. Where the market fails to provide the services, the public sector will need to step in.
- **Education and research**: Working in a competitive environment, the private sector needs to have access to the latest knowledge and technology. In addition, changes in government arrangements require staff to develop their capacity. The government will need to make sure that relevant education opportunities are on offer and research is undertaken in response to this demand.
- **Central government and local government roles**: Production processes in the subsector are affected strongly by local factors. Therefore, the mandate for formulating and implementing irrigated agriculture development initiatives will need to rest with local government. Central government creates the larger framework and its agencies are in a supportive and guiding role relative to local government.
- **Inter-agency cooperation**: The local factors that affect the subsector’s production processes belong to various fields of public management. The different agencies managing these fields need to act in concert in order for their individual actions to be effective. Actions by agencies responsible for agriculture and by agencies responsible for industry & commerce need to be planned and implemented under effective coordination, and be guided and supported by agencies responsible for planning and investment and for finance.

125. From an **institutional perspective**, the key areas of change for improved public management in irrigation agriculture mainly concern the following agencies:

The **Department of Irrigation (MAF/DoI)** and the **Provincial Irrigation Services (PIS)** with a mandate of public management of irrigation services to ensure that farmers have access to good quality and affordable irrigation services for paddy as well as for a range of commodity crops. DoI’s main tools will be regulation and oversight of the services, ensure the effectiveness and efficiency of public investments in irrigation infrastructure. This includes adherence to the public investment, procurement and contract laws and regulations and the development of sector-specific regulations in irrigation infrastructure investment and management, including norms and standards, certification of organisations and personnel, technical guidelines for survey and design, feasibility assessment, construction management, investment management and financing.

The **National Agriculture and Forestry Extension Service (MAF/NAFES)** and the **Agriculture Technical Services Centre (ATSC)** with the mandate for arranging, supporting and providing agriculture extension services. Because value chain analy-
sis and monitoring will be at the centre of public management of the subsector, there is a need for a continuous inflow of information on the cost factors in production and on market prices. ATSCs would need to play a role in generating and processing this information NAFES would need to guide the ATSCs in reviewing and adjusting their work approaches and arrangements.

126. **Public-Private Dialogue (PPD) and Public-Private Partnerships (PPP)** is essential issues to be addressed in irrigated agriculture. These concern not only the stage of initial investments, but also the operation of irrigations schemes and the provision of services. The cooperation with the private sector refers to, among others:

**Private sector producer organisations**, cooperative groups and agriculture cooperatives: Farmers in an irrigation scheme need to plan and implement their activities in a coordinated fashion. They also need to interact with a large number of other operators and actors in the value chain, such as suppliers, traders, and the government. Being well organised, will help these producers to inter-act effectively and efficiently. A well-developed producers’ group would be expected to have set up specialist committees and/or teams, among which one is for irrigation services. Supporting a demand driven approach to irrigated agriculture development, the government would expect a producer community to develop its organisation gradually in response to actual needs.

In essence, and at a minimum, getting organised means for a producer community that it has mechanisms for (i) decision-making among themselves, and (ii) for representation in contact with outsiders. In some schemes, communities have long-established traditional mechanisms and these generally offer a stable basis for production organisation. In response to a developing need for better internal management, the initial arrangements for organisation would see diversification of roles and responsibilities, more specified tasks and rewards, and a shift towards formalised relations. This may result in adoption of a formal form of organisation that can act as a legal body, such as a business association or agriculture co-operative.

**Irrigation services organisation**: Key arrangements to ensure satisfactory delivery of water are (i) a scheme governance arrangement, (ii) a specification of the services, and (iii) the appointment of a service provider, including specification of performance expectations and rewards. The scheme governance arrangement decides the service specifications which can take many forms. The strategy expects a government voice in the governance arrangement, but also the voice of the producer groups to be strong. The service provider can be an individual, a team, a water users’ association, a cooperative, or an enterprise, as suitable for the type, size, and production purpose of the scheme.

127. **Irrigation Management Transfer (IMT)** is the key mechanism for irrigation services. In principle, scheme management is the responsibility of the producer community. However, where a community’s capacity and resources are insufficient to ensure a sustained provision of adequate quality and affordable irrigation services, the IMT process will include a co-management arrangement between government and the community. In this context, the status of asset ownership upon construction completion, and the desirability of and legal requirements for the transfer of ownership to the community needs to be reviewed.

128. **Co-management arrangements** will specify criteria for (i) the levels of public and community contributions to the cost and effort of management, (ii) the incremental transfer of management responsibility to the community, and (iii) for any cost recovery charges. These criteria need to reflect the actually prevailing management and technical capacity of the water users, as well as their financial capacity, as deter-
mined by the income that they derive from their production. An important indicator for the latter would be the NPNV in the scheme, relative to the required cost of management. Seasonally, the co-management partners would agree a management action plan. The cost of co-management will be included in the investment plan and the local government commitment to periodical contributions will be explicit in its budget. The legal and regulatory framework needs to be updated so that it supports these adjustments.

129. Further operational details on how to address the key areas are laid out in the National Action Plan for Irrigated Agriculture for the period 2011 to 2015. 26

5.3. Objectives, outcomes and targets

130. The objective concerning irrigated agriculture is:

- The main objective of the National Action Plan for Irrigated Agriculture is to get new public management models implemented in the irrigated agriculture sub-sector by 2015.

Potential outcome:

- Improved production systems and public management mechanisms: In the uplands, livelihood and nutritional well-being of smallholders will be improved though increased productivity of rice and diversified farming systems that are adapted to climate change. In the lowlands and flood plains, commodity production will be increased through partnership investment aiming to develop value chains to domestic, regional and global markets.

131. The key sector targets until 2015 associated with Program 5 are:

- 350,000 ha dry season irrigated agriculture area
- In the lowlands, the target is to attain 225,000 ha of irrigated agriculture area for commodity production of which about 180,000 ha will be under flood irrigation systems. The area covers the administration of 41 districts that are defined as irrigated agriculture commodity focus districts. The focus area comprises of an actual dry season cropping area of 76,630 Ha. Through investments the dry season irrigated area in the focus districts will be increased to 177,390 ha (or by 131%) in 2015. In the focus area the Net Production Value (NPV) will not be less than 10 Million Kip/ha for dry season production.
- In the uplands, the target is to attain 125,000 ha of irrigated agriculture for the development of livelihood and the protection of social and environmental conditions. Of this area, about 60,000 ha will be under flood irrigation. The area for livelihood development covers the administration of 101 uplands and urban districts. The area comprises of an actual dry season cropping area of 22,713 that will be increased to 69,324 ha (or by 205%).

5.4. Priority measures and sequence of actions

132. Program 5 (irrigated agriculture) significantly contributes to the achievement of Goal 1 (food production) and of Goal 2 (commodity production). Hence, the links to the programs 1 (food production) and 2 (commodity production) are as evident as the links to program 7 (Research and Extension) and to program 8 (HRD).

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26 GoL-MAF (2010 b) DOI: Irrigated Agriculture National Action Plan
As further detailed in the National Action Plan for Irrigated Agriculture for the period 2011 to 2015, the key measures of program 7 include the following, among others:

(1) **Conducive Market Environment for Irrigated Agriculture**:
- Measures that focus on re-modelling public management for strengthening the capacity of public agencies and legal regulatory framework for the promotion of agriculture value chains.
- Measures that focus on developing model and strengthening the capacity of production groups, agriculture cooperatives and associations; and producers associations.
- Measures that focus on developing model for contract farming and other type of market structures such as “agriculture auction market”.
- Measures (in the form of credit facilities) that focus on developing the capacity of SMEs and private entrepreneurs, agribusiness associations in modernizing agro-industry and agri-business, transport, logistic and trade

(2) **Irrigated Agriculture Technology Application**:
- Measures that focus on developing models for strengthening irrigated agriculture technical services for commodity production.
- Measures that focus on the development of integrated irrigated agriculture development in the focus areas. A number of regional clusters are indentified:
  - Integrated Irrigated Agriculture Development program (IIADPg) for the Vientiane Plain (Vientiane Capital and Vientiane Province).
  - IIADPg for the Central Plains (Bolikhamxay and Khammouane provinces)
  - IIADPg for the Southern Plains (Savannakhet, Saravane, Champasak, Sekong and Attapeu provinces).
  - IIADPg for the Northern Plains (Sayabury, Bokeo, Luangprabang, Luangnamtha, Oudomxay, Huaphan, Xiengkhouang and Phongsaly provinces).

(3) **Irrigation Management Service and Investment**:
- Measures that focus on re-modelling the organization, institutions of the Department of Irrigation and related agencies.
- Measures that focus on the planning, monitoring and evaluation of irrigated agriculture programs and projects. This includes the establishment of irrigated agriculture information data base.
- Measures that focus on strengthening the capacity to conduct feasibility studies, survey and design of integrated agriculture programs and projects.
- Measures that focus on strengthening local authorities (provinces and districts) to prepare, monitor and evaluate IIADPs.
- Measures that focus on re-modelling irrigation management services under co-management concept.
- Measures that focus on enhancing the capacity of WUOs, including the institutionalization of WUA.

(4) **Human Resource Development and Vocational and Technical Education Development for Irrigated Agriculture**
- Investment measure that focus on assessing irrigated agriculture and irrigation service management skill and knowledge requirement; and the capacity of existing training and education institutions.
- Investment measure to assist in the development of competency standards for irrigated agriculture work force.
- Investment measure to assist in the development of new curriculum, course plan, teaching aids.
- Investment measure to finance the rehabilitation of school facilities, training materials and equipment, teacher training, and other.

(5) Community Based Watershed Programs
- In many countries, agro-forestry systems have been used successfully to protect watersheds and allow farmers to maintain their livelihoods. Such systems are known but not widely practiced by farmers living in the upper watersheds in most countries. Although NAPA identified this as one of the priority projects, there has been only a selective level of implementation. The promotion and development of these systems has the potential to help rural communities to develop sustainable livelihoods that are not adversely affected by soil erosion and decreasing land productivity. MAF will develop and promote agro-forestry systems that conserve the watersheds and the downhill irrigation systems through soil protection.

The measures of Program 5 related to **Climate Change or Biodiversity**, include:

(6) Irrigated Agriculture Development for Social and Environmental Purposes
- Measures that focus on the development of community managed irrigation in the uplands.
- Measures that focus on livelihood development and income generation in the uplands.
- Measures that focus in improving and expanding reservoir systems.

(7) Flood and Drought Prevention
- Measures that focus on the assessment and development planning for drought and flood protection facilities.
- Measures that focus in improving and expanding reservoir systems.
- Measures that focus in improving and expanding flood prevention and drainage systems.

(8) Climate Proofing of Irrigation System:
- Irrigation systems so far were based on the past climate related data. However, due to climatic changes, the operation of irrigation systems is becoming more uncertain. Therefore, climate proofing by proper assessment of the irrigation system is extremely important. One of the first steps is to develop guidelines and a framework for climate proofing, followed by pilot implementation activities.
- Introduction of measures specifically targeted on climate change adaptation, such as **weather based farming models for communities**
133. The suggested *sequence of actions until 2015*, sorted by outputs, is:27

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6. Program 6: Other agriculture and forestry Infrastructure

6.1. Situation analysis

134. Development of a sound technological and industrial base; human resources in science and technology, administration, and management and physical and institutional infrastructure are required for the development of commodity-based value chains with upstream linkages to smallholder farmers and SMEs and downstream linkages to high-value global markets. Value chain analysis is an important tool for identifying the need for infrastructure investments that create linkages along the value chain. MAF has applied value chain analysis for several high priority export crops to identify gaps, including infrastructure gaps, and to target inputs of scarce human and capital resources to facilitate agricultural development.

135. Reliable electricity and water supplies are vital for agro-processing and export of fresh produce. Good market access roads are particularly important for perishable crops for export and for crops that require processing soon after harvest. The absence or inadequacy of market infrastructure, particularly assembly markets, raises transaction costs and prevents smallholder farmers from accessing markets and traders from accessing suppliers. Public investments for infrastructure are equally important to provide an enabling environment for agribusiness development.

136. Establishment of basic infrastructure such as irrigation (see Program 5), agro-industrial parks, rural roads, water supply, drainage and power are essential for the growth of the agriculture sector and value-added agro-processing industries in particular. The lack of post-harvest facilities like drying pads and cool stores, and market access roads delay delivery of raw materials to processing facilities. Although the Government has been successful in fostering food self-sufficiency through increased rice production, this has been at a high cost and has depended on significant investment in irrigation infrastructure (an estimated 70 percent of the MAF budget).

137. The rate of agricultural mechanization remains low. Lao PDR had just over 1,000 tractors in 1996 and the rate of tractor use has increased slowly, at 0.28 percent annually between 1996 and 2006.

138. Studies in the northern region have shown that additional investment in infrastructure is required to serve those who live in remote areas with limited market access and few alternatives for ensuring food security and generating income other than traditional shifting cultivation. Investments such as road infrastructure and rural electrification remain critically important for regional integration and commercialization. The penetration of ‘market pull’ into the northern uplands is associated with the increasing availability of road infrastructure and market proximity. Good transportation and communications infrastructure facilitates access to Chinese markets as well as penetration of Chinese entrepreneurs into the region. Market pull from Thailand and Vietnam has been facilitated by infrastructure improvements planned.

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6.2. **Key areas to be addressed**

139. Related to agriculture and forestry infrastructure, the following **key areas** are addressed by the present Program 6 of the Master Plan:

- **Agriculture infrastructure:**
  - Mechanization
  - Irrigation (covered by Program 5)
  - Post-harvest handling
  - Rural market access roads
  - Market infrastructure
  - Information and communications technology to support marketing

- **Forestry infrastructure:**
  - Demarcation of protected areas
  - Tree seedling nurseries for reforestation
  - Community based forest and watershed protection

6.3. **Objectives, outcomes and targets**

140. The principal objectives and potential outcomes of Program 6 include the following for **Agriculture infrastructure** (excluding irrigation) and for **Forestry infrastructure**:

**Objectives:**

- Improvement of Agriculture Infrastructure (mechanization, post harvest handling, rural market access roads, market infrastructure, ITC to support marketing)
- Improvement of Forestry Infrastructure, Agro-forestry Eco-parks, demarcation of protected areas, tree seedling and nurseries for reforestation, community-based watershed protection

**Potential outcomes:**

- More use of hand tractors and trailers, increase of agric. labour productivity, farmer groups able to retain more value-added, increased ex-farm prices
- Physical preconditions of sustainable forestry management and conservation of protected areas are in place

141. The **key sector targets** associated with Program 6 are:

- Increase of tractor use 2/ annually
- 1 crop drying pad/each village
- 1 cool storage / each province
- 50 km access roads / province
- 1 commodity market /each district
- National market information system operational
- Eco-parks nationwide
- Demarcation and ground-truthing of forests completed
- Reforestation fee from logs and NTFP used 100% for tree nurseries
- Closure of forests in protected watersheds

6.4. **Priority measures and sequence of actions**

142. **Program 6** (agricultural and forestry infrastructure) contributes to achieving all four **Goals of the Agricultural Development Strategy (ADS)** and is linked to all other Programs of the Master Plan.
The key measures under Program 6 include the following, among others:

**Agriculture infrastructure**

1. **Mechanization and post-harvest handling:**
   - MAF will work with farmer organizations and village clusters to facilitate procurement, management, and maintenance of small-scale farm equipment (hand tractors, land preparation equipment, rice threshers, rice mills, crop dryers, small trucks, etc.) to (i) reduce the need for hired labour; (ii) increase productivity, improve post-harvest handling; and, (iii) increase local capacity to retain the maximum value-added at the village level.
   - MAF will work with farmer organizations to facilitate investments to support community-based post-harvest handling of crops including (i) constructing warehouses, drying pads, storage silos and bins (for rice and other field crops); and, (ii) provisions for cleaning, washing, grading, packing, and fumigating.
   - To support mechanization and improve community-based post-harvest handling of food and agricultural products, MAF will implement the following specific sequence of measures:
     - **Immediate / short-term priorities (2011-2013):**
       - MAF will identify and facilitate the registration of farmer organizations enabling them to access a line of credit from the Agriculture Promotion Bank (APB) to procure small-scale farm equipment and to invest in buildings and equipment in support of post-harvest handling of crops.
       - Interested and qualified groups of MAF officers and technicians will be trained in cooperatives management. Training will be conducted by trainers available from international NGOs based in-country; combined with study visits to successful cooperatives in neighbouring countries.
     - **Medium-term priorities (2013-2015)**
       - MAF will work with interested farmer organizations to establish agricultural cooperatives focused on savings and loans, marketing, and community-based value-added processing.
   - **Key responsible agencies:** MAF: NAFES; PAFO; DAFO

2. **Market infrastructure, including rural market access roads and information and communications technology to support marketing:**
   - MAF will formulate and promote fiscal and non-fiscal policy measures to create clusters of GAP crop production to supply high quality agricultural raw materials for agro-processing facilities and for cross-border markets.
   - MAF will work with farmer organizations to identify road access, marketing, and market information needs.
   - To support the development of market infrastructure for expanded agricultural trade linked to poverty alleviation, MAF will implement the following specific sequence of measures:
     - **Immediate / short-term priorities (2011-2013):**
       - MAF will coordinate with the Ministry of Industry and Commerce-DPCP to systematically identify appropriate sites for constructing modern commodity assembly points and wholesale and primary markets at priority border crossings; and,
       - MAF will work with DPCP to design a cell phone-based agricultural market information system (AMIS) that is user-friendly and can be used by farmers; based on a similar system designed under the Smallholder Development Project (NAFES) in 2008-9.
     - **Medium-term priorities (2013-2015)**
       - MAF will work with interested farmer organizations and DPCP to establish and operate agro-industrial clusters linked to community-based value-added processing in regions that have sufficient agricultural raw materials to support an agro-processing zone.
MAF will work with the Ministry of Communications and Transport to systematically identify appropriate sites for constructing rural market access roads that will facilitate linkages to wholesale and primary markets at priority border crossings.

**Key responsible agencies:** MOIC-DPCP, MAF: Departments of Planning, Agriculture; NAFES; PAFO; DAFO.

### Forestry infrastructure

#### (3) Demarcation:
- MAF will seek funding from ODA and the business sector to support the Department of Forestry’s (DOF’s) program of demarcating protected areas for improved community based forest and watershed protection. The Forest Strategy to 2020 mandates DOF to continue zoning and demarcation of boundaries for each category of forests for the five all forest categories designated in the Land Law and the Forest Law. To support forest demarcation, MAF will implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - MAF will use the Permanent Commission for Agricultural Stewardship (see above) to work with farmer organizations, communities, and the business sector to (i) identify effective methods of demarcation based on local, regional, and international experience; and, (ii) conceive projects for consideration by development partners to support demarcation of protected forests and watersheds.

- **Medium-term priorities (2013-2015):**
  - MAF will coordinate with development partners and concerned GoL agencies to target technical and financial support and implement projects in high priority protected areas (for tourism) and watersheds (for hydropower).

- **Key responsible agencies:** WREA, Ministry of Energy and Mines, MAF: Departments of Planning, Forestry; NAFRI; NAFES; PAFO; DAFO

#### (4) Reforestation:
- MAF will work with concerned GoL agencies to support accelerated natural rehabilitation of protected areas, watersheds, and production forests, to ensure long-term sustainability of the forestry sub-sector. Reforestation will require the upgrading of regional tree seedling nurseries and support for PAFO, DAFO, and ATSC’s to work with farmer organizations to undertake reforestation. Development partners in this endeavour will include logging companies, hydropower investors, farmer organizations, and private companies.
- MAF will consult with the Ministry of Finance and WREA to formulate fiscal policy incentives for farmer organizations, domestic enterprises, and foreign investors to promote reforestation in high priority forests.

- **Immediate / short-term priorities (2011-2013):**
  - MAF will use the Permanent Commission for Agricultural Stewardship (see above) to work with farmer organizations, communities, and the business sector to process projects that support accelerated natural rehabilitation of forests; with an emphasis on the use of indigenous species.
  - Based on a recommendation from the Permanent Commission for Agricultural Stewardship, the Prime Minister’s Office may instruct the closure of forests; temporary closure where heavy logging beyond supply capacity of forests continued for a long time and permanent closure for riparian or watershed areas.29
  - The Ministry of Finance will mandate that MAF use 100 percent of the reforestation fee levied on logs and NTFPs harvested from natural forests for nursery construction, seedling production, and reforestation.
  - GoL funds will be used to improve, rehabilitate, and establish tree seedling nurseries to support reforestation in each region.

29 GoL-MAF (2005) Forest Strategy to 2020
MAF will cooperate with concerned GoL agencies and development partners to prepare projects that will increase investments in reforestation; including using the Clean Development Mechanism (CDM), Reduced Emissions from Deforestation and Degradation (REDD).

- **Medium-term priorities (2013-2015)**
  - MAF will work with development partners to implement reforestation projects.

- **Key responsible agencies:** Prime Minister’s Office, Ministry of Finance, MAF: Departments of Planning, Forestry; NAFRI; NAFES; PAFO; DAFO

The measures of Program 6 related to **Climate Change or Biodiversity**, include:

(5) **Weather Based Farming Model for Communities, research on High Yield Seed, and Seed Banks:**

MAF will work with relevant partners to build local level capacities for the farming communities to cope with agro-meteorological crop production risks, and to develop an efficient system of storage and diversification of seeds, which will enhance farmers' ability to buffer environmental and economic stress factors.

- **Immediate / short-term priorities (2011-2013):**
  - Pilot weather based farming model for the community developed
  - Aware and empowered communities
  - High yield seed varieties
  - System of seed bank to be implemented in pilot areas

- **Medium-term priorities (2013-2015)**
  - System development for community based weather and farming system
  - Sustainable management of forest seeds for the development of irrigated agriculture system

- **Key responsible agencies:** MAF/NAFRI, National University of Laos

(6) **Climate resilient infrastructure facilities (electricity and water supply)**

MAF will seek funding from ODA and the business sector to support the Climate Resilient Infrastructures in order to ensure that the other agriculture and forestry infrastructures can perform in a sustainable manner and cope with changing climatic conditions.

- **Immediate / short-term priorities (2011-2013):**
  - Guidelines and framework for climate proofing of water and electricity system
  - One pilot climate proofing project with water and electricity system

- **Medium-term priorities (2013-2015)**
  - Sustainable use of agriculture and forestry infrastructures system

- **Key responsible agencies:** MAF/NAFRI, National University of Laos
7. Program 7: Agriculture and Forestry Research and Extension

7.1. Situation analysis

143. The agriculture and forest research sub-sector includes research and development in the following areas: agriculture (crops), livestock, aquaculture and fisheries, and forestry. The National Agriculture and Forestry Research Institute (NAFRI) carries out important non-commodity based research such as method development for land use planning, socioeconomic and policy-based research, and providing information services to a range of actors. The Geographic Information System (GIS) Unit has a range of data sets related to land, soil, forest, fisheries and agricultural production and works closely with MAF and provincial and district authorities to carry out land capability analysis and zoning. NAFRI operates ten research centres that are broken into three categories to better reflect the range of research and services that NAFRI carries out: commodity-based research; non-commodity based research; and, regional centres (two – north and south).

144. NAFRI has developed a strong information and communication system that is considered one of the leading efforts within MAF. In 2008, the Information Management Division was upgraded creating two new centres: (i) the Centre for Agriculture and Forestry Research Information (CAFRI); and, (ii) the Agriculture and Forestry Policy Research Centre (AFPRC). Through CAFRI, NAFRI has developed a range of information and communication systems focused on four main areas:

- **Information and knowledge management**: Development of a research library system, Lao Research document repository and a research management information system (ReMIS);
- **Information and communications technology (ICT) systems**: IT infrastructure for all of NAFRI and its centres; a centralized website and server farm and a number of web-based knowledge sharing activities;
- **Production and outreach**: Transformation of research results into different materials for use by different target audiences (particularly, policy-makers and extension agents); including policy briefs, reference materials, publications, etc. It also includes holding workshops on important topics to bring different actors together;
- **NAFRI-NAFES Working Group on Agriculture Information Management (AIM)**: One of the few inter-institutional working groups between NAFRI and NAFES focused on improving coordination and development of materials and information for extension agents and farmers.

145. Public investments in agricultural research, development, and technology transfer to enhance the value-addition of food and agricultural products are deficient. Research and extension services tend to be dependent on development partners to provide the support needed to develop technologies to increase farm productivity and accelerate adoption of post-harvest handling techniques. While consumers, retailers, processors, and exporters are becoming increasingly aware of “green” technologies of production, processing and trade, investment to enhance capacity in agricultural science and technology remains low. Although the need to build agricultural competitiveness through regional initiatives in research, training, and extension through existing institutions are encouraged by development partners, progress remains slow.
7.2. **Key areas to be addressed**

146. Within the framework of the Agricultural Development Strategy, the following agriculture and forestry research issues are addressed by the present Master Plan:

- Significant additional investment in agricultural research and development is required to strengthen the resilience of agriculture to climate change.
- Donor funded projects using different systems are often not easy to follow by an organization with limited capacity as NAFRI and serious attempts have to be made to have donor organizations to comply with NAFRI’s rules and regulations right at project development stage and not after project funding is granted.
- The lack of a proper research recording system and inadequate research facilities has affected the quality of monitoring and evaluation of the research work. This problem has been intensified by insufficient human capacity and the different systems that donor funded projects use, and the lack of coordination among them.

147. Agriculture research and extension organizations will require significant attention to develop the capacity to implement climate change mitigation and adaptation measures. In addition, although the Department of Agriculture has taken the lead in promoting the production and marketing of organic vegetables, other issues related to food safety, SPS, GAP, and plant and animal quarantine require its urgent attention. The Department of Agriculture needs to respond to increasing demands from regional and global traders for bio-safety certification of food products sourced in Lao PDR based on a transparent food traceability system. Officials will require training in the tracking of food, feed, food-producing animals, or substances that will be used for consumption, through all stages of production, processing and distribution, used to identify and address risks and protect public health.

148. More effective emphasis will be required to address current knowledge gaps in agricultural research on the contribution of rural women to the ANR sector. In the sense of “**Applied Research for Development**”, the results of such research will be immediately translated into practical, needs-based, gender-specific and market oriented training packages. The Lao Extension Approach (LEA) already provides a framework methodology, which is based as a first step on a participatory needs assessment of trainees. Given the significant contribution of rural women to the sector, this needs assessment and the identification of trainees and their training needs in terms of topics, content and didactical approach is to include to at least 50 % women and their specific training needs. The capacity of the extension services will be strengthen to address current gender gaps by recruiting more and better qualified female extension staff.

149. To join the World Trade Organization, the Government is obligated to sign the SPS Agreement that establishes international rules, regulations, and procedures for trade in food and agricultural products. Due to the complexity of administering SPS measures at the national level, cooperation among concerned ministries is essential, namely the Ministry of Industry and Commerce, MAF, and the Food and Drug Department, Ministry of Health must collaborate closely to facilitate procedures and protect the reputation of Lao food products. Officials of all three ministries will require frequent refresher training to ensure familiarity with the latest developments in enforcement of SPS measures. Specific training needs related to SPS include the following areas:

- monitoring / surveillance of hazards in food safety, plant health and animal health;
- exchange of information;
- controlling trans-boundary animal and plant pests and diseases;
- diagnostic capacity;
- harmonization of standards and equivalence; and,
- developing and implementing mutually agreed SPS border procedures.

7.3. Objectives, outcomes, and targets

150. The general and specific objectives, targets, and potential outcomes of Program 7 include the following:

General Objective:

Conduct “Applied Research for Development”, and translate the results directly into the widespread dissemination of needs-based, gender and area-specific and market-oriented extension packages, covering the technical content of all 4 sector goals, referring to crop cultivation, livestock / animal husbandry, aquaculture and fisheries as well as community-based forestry.

Specific Objectives:

- **Agriculture:**
  - Research will be conducted to identify indigenous and hybrid seed varieties that will lead to yield increases while minimizing the use of agricultural production inputs.
  - Tests and trials will be undertaken of seed varieties that are resilient to climate change for rice and commercial food and agricultural commodities.
  - In addition, agriculture research objectives will be broadened to strengthen the resilience agriculture to climate change, with an emphasis on conservation agriculture. Specifically, resources will be invested to enhance productivity by blending indigenous knowledge with modern agricultural technologies; especially among smallholder farmers, the poor, and most vulnerable.
  - Additional research will be needed to prepare agricultural extension packages linked to application of international standards for food and agricultural products, including SPS, ISO, HACCP, GLOBAL-GAP, ASEAN-GAP, OIE, Codex Alimentarius, and others still emerging.

- **Livestock:**
  - Research will be conducted on livestock feed, feed crops, and the use of agricultural and industrial wastes as livestock feed.
  - Research will be conducted on ruminants (cattle and buffalo) breeding stock; pigs; and, poultry; with the goal of preserving indigenous varieties for use in cross-breeding with improved breeds, to upgrade the national herd.
  - Livestock research will aim to (i) increase productivity to ensure food security, including the access to adequate food at all times and utilization of food for nutritional well-being; and, (ii) reduce costs of livestock raising to ensure the competitiveness any surpluses in domestic and regional markets.

- **Aquaculture and fisheries:**
  - Research will be conducted fisheries economics.
  - Research will be conducted on conserving traditional fish species, using fish aquaculture, and fishing techniques.
  - Research will be conducted on fish diseases and nutrition.
  - Research will be conducted on the management of water resources for fisheries and preserving natural wetlands.
• **Forestry:**
  - Research will be conducted on fast-growing tree species using 100 different seeding sources.
  - Research conducted on industrial tree species including agar wood, rubber, and NTFPs, namely medicinal plants, herbs, rattan, and bamboo.
  - Continue surveys nationwide to identify suitable locations for Agroforestry Eco-Parks.

• **Climate change scenarios and climate change impacts:**
  - Research will be conducted on policy implications of indigenous knowledge and CCA.
  - Research will be conducted on Higher Education Curriculum on CCA and Agriculture, and on downscaling of climate change impacts in the agricultural sector.

The Forestry Strategy to the Year 2020 presents the specific objectives for the forestry sector and specifies some research priorities, namely:

- Control processes that have led to reduced forest cover;
- Improve of rural poor who depend on forests;
- Develop and enforce effective legislation and regulation on forest management;
- Establish sustainable forest management practices; and,
- Protect biodiversity of resources and ensure sustainable management of NTFPs.

**Potential outcomes:**

- Research results are directly used in appropriate extension packages
- Agricultural and forestry techniques, as well as marketing skills of smallholder farmers and rural SME are substantially enhanced as a result of improved AE services

151. The targets for agricultural and forestry research include:

- Investments in agriculture research and development from all sources (i.e., overseas development assistance and foreign direct investment) increases by 25 percent over 5 years.
- 50 percent of smallholder farmers have access to improved seed varieties and improved livestock breeds to increase productivity by 20 percent over 5 years.
- 50 percent of smallholder farmers are using GAP.
- 25 percent of smallholder farmers are practicing conservation agriculture.
- 50 percent of smallholder farmers in economically lagging areas and pockets of poverty are using GAP and have access to value chains for organic and niche products.
- The volume of food and agricultural products produced for export that meets international food safety standards has increased by 30 percent.

**7.4. Priority measures and sequence of actions**

152. In the context of adjusting agriculture and forestry research emerging agricultural, forestry, and agribusiness development needs, the priority actions below are planned.

Research and extension are cross-cutting issues. Therefore, the key measures of Program 7 are linked to all other programs and include the following, among others:
Restructure agriculture and forestry research and extension functions to ensure that the results of “Applied Research for Development” are directly translated into the widespread dissemination of needs-based, gender-specific and area-specific as well as market-oriented extension packages.

(2) Create new units at NAFRI and NAFES providing them the flexibility to work with agro-enterprises and investors and to promote and strengthen farmer organizations.

(3) Strengthen research related to irrigated agricultural production and agricultural diversification, including mixed farming, agroforestry (including agro-silvo-pastoral), and blending indigenous knowledge with modern agricultural techniques.

(4) Based upon research results, upgrade local breeds of livestock through crossbreeding with improved and heat resistant breeds; and address disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network.

(5) Investments and knowledge transfer in irrigated agriculture will be focused on mobilizing partnerships between several key stakeholders in the rural sector, namely between government and government; government and business; business and producers.

(6) Cooperation with Research Institutes and Science & Technology Centres in other countries of the region and world-wide to make valuable research results available for further practical adaption to Lao conditions. These will include gender knowledge networking and research exchanges.

(7) Cooperation with private sector for “embedded agricultural extension services” (e.g. supplier of agricultural inputs to provide training on how to safely and economically use agro-chemicals).

The measures of Program 7 related to Climate Change or Biodiversity, include:

(8) Agriculture research and extension organizations will require significant upgrading to develop the capacity to implement integrated watershed management (IWM) that are linked to climate change mitigation and adaptation measures.

(9) Research programs on policy implications of indigenous and gender knowledge and climate change adaptation, and on local/regional downscaling of climate change impacts on the agriculture sector.

(10) NAFRI will undertake climate-related research, in particular tests and trials for the local and regional-specific adaptation of seed varieties that are resilient to climate change for rice and commercial food and agricultural commodities, as well as on crop yield forecasting.

(11) NAFES will launch a climate change awareness program through the agricultural extension services.

MAF will restructure agriculture and forestry research and extension functions to ensure food security and services to smallholder farmers, in particular the poor and vulnerable, and to align agricultural production systems more closely to local and regional socioeconomic and agro-ecological conditions, and in response to domestic and regional market demand. Similarly, MAF will better define how the National Agriculture and Forestry Extension Service (NAFES) will carry out the Lao Extension Approach program (LEAP), to achieve the four goals of the master plan effectively. An updated strategy for NAFES will define a series of programs, sub-programs, and extension priorities to which LEAP will be applied. NAFES will focus on dissemination and technical transfer of extension messages and technical packages to both farmer organizations and individual smallholder farmers; particularly the poor and vulnerable.
MAF: Agricultural Master Plan 2015

Final Draft, 15th September 2010

154. **MAF will create new units at NAFRI and NAFES providing them the flexibility to work with agro-enterprises and investors and to promote and strengthen farmer organizations.** Two new units will be created within NAFRI, namely: (i) agro-enterprise research unit; and, (ii) business management unit. The existing NAFES Task Force on Agribusiness will become a new agribusiness unit that will liaise with agro-enterprises and foreign investors on issues related to micro-finance, contract farming arrangements, and farmer organizations. NAFES also will establish a farmer organization unit to work with farmer groups to develop them into farmer associations and agricultural cooperatives. To strengthen the linkages between agriculture and forestry research and extension, and provide flexibility for MAF to work with agro-enterprises, MAF will implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Prepare a business plan for NAFRI that sets forth the financial terms and conditions for implementing the NAFRI Sub-sector Strategy: Based on NAFRI Strategic Plan for 2007-2012;
  - Prepare an extension sub-sector strategy for NAFES that is consistent with NAFRI’s research strategy and the strategy for farmer organizations; and,
  - Prepare an institutional restructuring plan for MAF that provides the flexibility to work with business enterprises while continuing to provide support services to smallholder farmers.

- **Medium-term priorities (2013-2015)**
  - Implementation of the NAFRI business plan.
  - Implementation of the NAFES sub-sector extension strategy and business plan.
  - Execution of the institutional restructuring plan for MAF.

- **Key responsible agencies:**
  - Ministry of Industry and Commerce: Department of Promotion and Commodity Development
  - MAF: Departments of Planning; NAFES; NAFRI.

155. **To strengthen the resilience of agriculture to climate change and ensure food security, NAFRI and NAFES, and the departments of Forestry, Irrigation, Livestock and Fisheries, and Agriculture will collaborate on research related to irrigated agricultural production and agricultural diversification, including mixed farming, agroforestry (including agro-silvo-pastoral), and blending indigenous and gender knowledge with modern agricultural techniques.** To ensure food security and protect land and soil as valuable natural resources, particularly in upland areas, research and extension will focus on conservation agriculture linked to strengthening resilience to climate change. NAFES will focus on implementing conservation agriculture techniques provided in extension packages and technology messages prepared by NAFRI. These messages will focus on techniques that will contribute to resilience to climate change, decreasing production costs, and increasing productivity. This will include transferring technologies related to soils management through rotational cropping (with legumes) and application of mulch, compost, and other biomass; use of improved seed and fertilizer packages; and, integrated pest management (IPM). To strengthen resilience to climate change in the agriculture sector, MAF will implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Identify hazard prone and areas likely to be affected by climate change;
  - Agriculture, livestock, fisheries: Preparation of a climate change mitigation and adaptation action to include, for example promotion of short-duration paddy and other cash crops in natural hazard prone areas; strengthened technical capacities of local agricultural officers in natural hazard prone areas; development of improved crop

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30 GoL - National Environment Committee (2009) National Adaptation Program of Action to Climate Change, April 2009
varieties and animal species that are better adapted to natural hazard prone areas; and,
- Forestry: Prepare a plan to strengthen the capacity of village forestry volunteers in forest planting, caring and management techniques, and the use of village forests.

- **Medium-term priorities (2013-2015)**
  - Agriculture, livestock, fisheries: Establishment and strengthening of farmers groups in natural hazard prone areas; promote soil improvement using locally available organic fertilizer and existing agricultural waste; promote integrated pest management (IPM) and use of herbal medicines in pest management and livestock treatment; develop capacity of technical staff in organic fertilizer research; research and promote a diversity of crop varieties and animal species that are adapted to the stressful environmental conditions that characterize natural hazard prone areas; strengthen technical capacities in the diagnosis of crop and animal diseases and improve associated laboratory facilities.
  - Forestry: Promote and establish tree nurseries to provide saplings to areas at high risk from flooding or drought; raise public awareness on wildlife conservation and forest-fire prevention; conservation and development of major watersheds.

- **Key responsible agencies:**
  - MAF: Departments of Planning, Irrigation, Forestry, Livestock and Fisheries, and Agriculture; NAFES; NAFRI; PAFO; DAFO

156. *Based upon research results from NAFRI, the Department of Livestock and Fisheries (DLF) will (i) upgrade local breeds of livestock through crossbreeding with improved and heat resistant breeds; and, (ii) address disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network, to maximize livestock productivity.*

The DLF will operate one or more community-based prototype livestock identification and tagging projects harmonized with regional programs supported by ASEAN and the GMS. The department will operate one or more community-based prototype livestock nutrition and disease control projects to upgrade the quality and productivity of livestock. The department will participate in regional trans-boundary animal disease control programs to minimize impacts on livestock and maintain the quality of the national herd. Fisheries technicians will collaborate with foreign investors in hydropower projects to expand the production of fingerlings, with an emphasis on indigenous species; and, promote community-based small-scale pond fisheries to off-set losses from impacts on river fisheries. MAF will implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Design one or more community-based prototype livestock identification and tagging projects harmonized with regional programs supported by ASEAN and the GMS;
  - Design a community-based livestock nutrition and disease control program to upgrade the quality and productivity of livestock;
  - Define a role for DLF in regional trans-boundary animal disease (TAD) control programs; and,
  - Investigate and contact foreign investors in hydropower projects to develop collaborative activities (public-private partnerships) to produce fingerlings and promote community-based small-scale pond fisheries to off-set losses from impacts on river fisheries from hydropower dams.
  - The fisheries division of DLF will prepare an indigenous fisheries multiplication plan in the reservoir and downstream areas of existing and planned hydropower projects.

- **Medium-term priorities (2013-2015):**
  - Implement one or more community-based prototype livestock identification and tagging projects harmonized with regional programs supported by ASEAN and the GMS.
  - Implement a community-based prototype livestock nutrition and disease control program to upgrade the quality and productivity of livestock.
- As a major livestock producing country in the GMS, take the lead in controlling regional trans-boundary animal diseases.
- Using the PPP mechanism, implement one or more projects with private hydropower project investors to expand the production of fingerlings and promote community-based small-scale pond fisheries to off-set losses from impacts on river fisheries.

**Key responsible agencies:**
- Hydropower projects: e.g., Nam Theun 2; Theun-Hinboun Expansion; Nam Ngum 3; Nam Ngiep 1 Hydropower; Sepian-Xenamnoi Hydropower; Nam Mo Hydropower; etc.
- MAF: Departments of Planning, Livestock and Fisheries; NAFES; PAFO; DAFO

157. **To facilitate internal execution of the WTO SPS Agreement, application of international SPS standards, and implementation of SPS measures**, MAF will implement the following specific sequence of measures:

**Immediate / short-term priorities (2011-2013):**
- Working with concerned GoL agencies and development partners, and with guidance from the World Trade Organization, identify immediate as well as short-, medium-, and long-term institutional changes and procedural reforms required at MAF to modernize MAF institutions and comply with WTO membership.
- MAF will establish a ministerial level unit in the Cabinet, directed by a vice-minister to integrate MAF operations and make them consistent with specifications of the SPS Agreement.

**Medium-term priorities (2013-2015)**
- 5-10 MAF economists will be trained as agricultural trade specialists to facilitate MAF’s interactions with the WTO obligations.
- MAF will monitor and periodically report on the institutional restructuring to conform to WTO requirements.

**Key responsible agencies:**
- Ministry of Industry and Commerce
- Ministry of Health, Food and Drug Department
- MAF: Departments of Planning, Personnel, Inspection; NAFRI/PRC

158. **Agriculture research and extension organizations will require significant upgrading to develop the capacity to implement integrated watershed management (IWM) that are linked to climate change mitigation and adaptation measures.** In addition, to improve coordination and execution of ODA supported projects, and to prepare for more complex PPP type projects, MAF will consider establishing a National Implementation Unit, similar to that created at MOIC to implement a program supported by the multi-donor Trade Development Facility. To facilitate the reform and modernization of research and extension institutes, and streamline and improve governance of ODA and FDI, MAF will implement the following specific sequence of measures:

**Immediate / short-term priorities (2011-2013):**
- MAF will study the restructuring of NAFRI and NAFES to reflect emerging development needs in terms of climate change mitigation and adaptation, including more intensive integrated watershed management operations; agribusiness development; and, strengthening of farmer organizations.
- MAF will work with NUOL and the Ministry of Education to develop courses of study that lead to diplomas, higher diplomas, or bachelor degrees in the following technical areas: land classification and participatory land use planning; agroforestry; measures to address climate change.
- MAF will investigate creation of a National Implementation Unit (NIU) within the Department of Planning to take responsibility for coordinating all ODA and FDI projects.

**Medium-term priorities (2013-2015)**
- MAF will implement the restructuring of both NAFRI and NAFES to allow greater focus on integrated watershed management.
MAF technicians with suitable educational qualifications will be provided with additional training in climate change mitigation and adaptation and integrated watershed management.

MAF will create a National Implementation Unit to coordinate and execute ODA and FDI supported projects.

- **Key responsible agencies:**
  - National University of Lao PDR
  - Ministry of Education
  - MAF: Departments of Planning, Personnel, Forestry; NAFRI; NAFES

### 159. Agro-forestry and Watershed Development Research:

NAFRI and Laos National University will conduct the research on social solution for watershed development, research on technological solution for watershed development, and combining social and technological solutions to make implementation oriented research results piloted in certain areas.

- **Immediate / short-term priorities (2011-2013):**
  - Implementation oriented research solution
  - Workshops and conferences

- **Medium-term priorities (2013-2015):**
  - System development for watershed management programs

- **Key responsible agencies:**
  - MAF/NAFRI
  - National University of Laos

### 160. While climate change is a global phenomenon, its impacts are local.

While climate change is a global phenomenon, its impacts are local. It is important to understand the future impacts of climate change on the agriculture sector in specific time periods and spatial scales (like districts or local level, and short term projections). The challenge is a deeper understanding of local impacts, which needs more precise data as well as tools and models.

- **Immediate / short-term priorities (2011-2013):**
  - Date collection and model customization
  - Development of scenario
  - Decide on specific downscale model with local uncertainties

- **Medium-term priorities (2013-2015):**
  - Contribution to the professional and knowledge development in the field of CCA and agriculture

- **Key responsible agencies:**
  - NAFRI
  - National University of Laos
  - Meteo-hydrological centre
8. Program 8: Human Resource Development

8.1. Situation analysis

161. Technical training of officials has been conducted over many years, including long-term study for certificates, diplomas, and higher degrees. In addition, a significant number of officials have been sent for short-term training, study visits, and exchange programs. Training also has been provided to a large number of farmers and model families who engage in agriculture.

162. In May 2009, there were 7,304 officials in the agriculture and forestry sector, of which 20.21 percent were women. About one-half of all officials were based at the district level: 3,692 officials or 50.55% in 140 district agriculture and forestry offices (DAFOs). There were 2,370 officials or 32.45% at the provincial level; and, 1,242 officials or 17 percent at the central level (departments and equivalent). There were 220 officials or 3.01 percent at four agriculture and forestry vocational schools and one irrigation vocational school under MAF. The largest number of officials at the central level was at NAFRI: 329 officials or 32.19 percent of the total number of officials at ministry level. The Department of Forestry had the same number as NAFES, 116 officials or 11.35 percent; and, the Department of Irrigation had 99 officials or 9.69 percent. Officials at other departments were as follows:
- Department of Agriculture: 78 officials or 7.63 percent;
- Department of Livestock and Fishery: 93 officials or 9.10 percent;
- Department of Forest Inspection: 25 officials or 2.45 percent; and,
- Supporting departments including Cabinet, Organization and Personnel Department, Planning and Inspection Department, there are in total 166 officials or 16.24 percent.

8.2. Key areas to be addressed

163. Related to human resources development and institutional strengthening in the agriculture and forestry sector, the following key areas will be addressed by the Master Plan.

164. Institutional modernization and strengthening are required to prepare key players in the agriculture sector to engage regional and global markets on terms that allow Lao export commodities to compete with neighbouring countries and other developing regions.
- Institutional capacity must be strengthened in areas related to pre- and post-harvest handling, food safety, sanitary and phyto-sanitary standards (SPS), Good Agricultural Practises (GAP), and value-chain analysis. Officials also need to have an understanding of technical and other non-tariff barriers to trade.
- Institutional capacity also must be strengthened to prepare officials to deal with the business sector; positioning the Government to facilitate investment but also acting as a fair broker to ensure that producers’ interests are protected.
- Institutional capacity of MAF must be strengthened to conceive, formulate, execute, implement, monitor, and evaluate an increasing number and complexity of projects; from classical ODA supported projects, to emerging PPPs, with significant private sector participation, particularly in mega-projects.
- Human resources capacity must be strengthened to include building leadership in younger officials over the short-, medium-, and long-term.
165. In terms of **gender** sensitivity in the agriculture and forestry sector, gender analysis and needs assessments are needed in the preparation, implementation and monitoring of projects. Efforts are needed to increase women’s participation in farmer groups and in agricultural extension activities. When monitoring projects and the implementation of MAF policies, indicators should be disaggregated by gender. There is a need for increased representation of women in provincial and district offices including extension workers. When implementing agricultural extension programs, woman farmers should be used as gender focal points in villages to improve agricultural practices. Women can play an important role in the vaccination of small livestock. In addition, greater attention is needed to women’s traditional land rights in land allocation, land titling, and the resolution of land disputes. Additional assistance is needed to women to facilitate access to rural savings and credit schemes.

Institutional change will guarantee that opportunities will remain available for both women and men to benefit from the planned modernization and strengthening of the sector. As such, assessments will be conducted to identify adequate gender-related needs and gaps and address them. Institutional capacity of MAF will be strengthened with a gender-responsive MIS and an organizational mechanism to inform annual planning processes. Sex disaggregated statistical data and gender-related qualitative and quantitative indicators will be formulated and monitored to reflect the actual trends and results and be utilised for evaluation purposes.

When referring to “MAF personnel”, an inclusive and systematic reference will be made for each target to the participation of women in all HRD initiatives, either in country or abroad. Incentives will be designed, i.e. in conjunction with other educational institutions via the Ministry of Education, to improve enrolment and retention rates of female candidates in the agricultural, forestry and veterinary subjects.

**8.3. Objectives, outcomes and targets**

**Objectives:**

- Build up adequate institutional capacity and human resources among public and private service providers to facilitate the achievement of Goals 1 to 4 until 2015.
- The capacity of government organizations and concerned parties will be strengthened for implementation of the Agricultural and Forest Strategy to 2020. In this context, a reform of the public administration in several sub-sectors is to be effected.

**Potential outcome:**

- Strengthened institutional and human capacities (including significant progress in gender mainstreaming) to organize and manage holistic rural development, agriculture and forest-based production, processing and marketing as well as environmental services

166. The **key sector targets** associated with Program 8 are:

**1**. **Personnel and HRD targets for 2010-2020 include the following:**

- 40 PhD, 50 masters, and 70 bachelor degrees;
- Training and development for technical officials in provinces: 5 PhD in each province, 10 masters, 40 bachelor degrees, 35 higher diplomas, and 5 diplomas;
Training and development for technical officials in districts: 6 masters, 15 bachelor degrees, 40 higher diplomas, 60 diplomas, and 40 certificate level;

Technical staff at village level: 1 technical staff per 30 families; and,

According to the mandate given to MAF and development trends in the agriculture and forestry sector from now to 2020, MAF will require about 12,857 officials, or a 24 percent increase from 2010.

(2) Targets for 2010-2020 for officials working in animal husbandry, veterinary science, and fisheries include:

- 12 PhD, 20 masters, and 30 bachelor degrees;
- Training and development for technical officials in provinces: 3 PhD, 4 masters, 18 bachelor degrees, 25 higher diplomas, and 10 diplomas;
- Training and development for technical officials in districts: 2 PhD, 3 masters, 5 bachelor degrees, 10 higher diplomas, and 12 diplomas and 15 certificate level; and,
- Technical staff at village level: 2-4 in each village; average 1 technical staff per 30 families.

(3) The estimated numbers of technical officials who will be sent to study for higher diplomas, bachelor, and masters, degrees in country (institutes under the Ministry of Education), 2010-2020, are:

- Higher diploma: 3500
- Bachelor degree: 750
- Master degree: 50

(4) Estimated number of technical officials who will be sent to study for higher diplomas, bachelor, and masters, degrees abroad, 2010-2020, are:

- Higher diploma: 5300
- Bachelor degree: 50
- Master degree: 250
- PhD: 55

(5) The targets for 2010-2020 for officials working in the irrigation sub-sector are:

- 8 PhD, 12 masters, 40 bachelor degrees, 40 higher diplomas, and 20 diplomas;
- Training and development for technical officials in provinces: 4 PhD, 8 masters, 40 bachelor degrees, 40 higher diplomas, 20 diplomas, and 10 certificate level; and,
- Training and development for technical officials in districts: 2 PhD, 5 masters, 35 bachelor degrees, 40 higher diplomas, 35 diplomas, and 50 certificate level.

(6) The targets for 2010-2020 for officials working in the forestry sub-sector:

- 8 PhD, 25 masters, 15 bachelor degrees, and 20 higher diplomas;
- Training and development for technical officials in provinces: 4 PhD, 8 masters, 20 bachelor degrees, 30 higher diplomas, and 30 diplomas;
- Training and development for technical officials in districts: 2 PhD, 5 masters, 10 bachelor degrees, 15 higher diplomas, and 30 diplomas; and,
Technical staff at village level: 2-4 forestry staff in each village, in total 30,000 village forestry staff

(7) The targets for agricultural extension include the following:
- Improve the organizational structure and recruit a sufficient number of officials to be able to work effectively both at central and local levels;
- Train and provide experience to extension workers at provincial, district and village levels to enable them to lead implementation and become development practitioners in agriculture and forestry, with the ability to coordinate and assist in planning processes and to be a bridge between public organizations, NAFRI, and farmers.
  - Employ 25-35 extension workers in each province;
  - Employ 35-45 extension workers in each district; and,
  - One extension worker will be responsible for 30-50 families.
- There will be a significant increase in the representation of women at provincial and district level and an improvement in the way communication is maintained with women farmers. Women farmers will be involved as communicators to assist extension farmers at village level.

8.4. Priority measures and sequence of action

167. Like research and extension, Human Resource Development (HRD) is a cross-cutting issue. Therefore, the key measures of Program 8 are linked to all other programs and include the following, among others:

(1) **Cooperate with other sectors to build capacity** including the Ministry of Education, National University of Lao PDR (NUOL), and other institutes as well as with selected international NGOs and foreign technical assistance agencies

(2) **MAF personnel will require upgrading** in the following areas: pre- and post-harvest handling, food safety, SPS, GAP, technical and other non-tariff barriers to trade, and value chain analysis.

(3) **MAF procedures will require reform** and modernization to facilitate internal execution of the WTO SPS Agreement, application of international SPS standards, and implementation of SPS measures

(4) **Pursue general HRD targets:**
   - 40 PhD, 50 masters, and 70 bachelor degrees;
   - Training for technical officials in provinces: 5 PhD in each province, 10 masters, 40 bachelor degrees, 35 higher diplomas, and 5 diplomas;
   - Training and development for technical officials in districts: 6 masters, 15 bachelor degrees, 40 higher diplomas, 60 diplomas, and 40 certificate level;
   - Technical staff at village level: 1 technical staff per 30 families; and,
   - According to the mandate given to MAF and development trends in the agriculture and forestry sector, MAF will require about 12,857 officials, or a 24 percent increase from 2010

(5) **Introduce for all staff of MAF a job-performance assessment and monitoring system** (management by personal targets), based on clear job descriptions and tied to a performance-based incentives scheme and a strictly performance-based job promotion scheme.

(6) **Introduce for all departments of MAF, a leadership system of “Management by annual targets”,** accompanied by a strict monitoring of annual targets and reporting to higher levels.

(7) **Nominate for each of the 8 programs of the Master Plan a Lead Agency** (department within MAF), formulate for each program annually verifiable indicators on outputs and impacts, and submit to the Minister annual **M & E Reports** on the achievements of the Agricultural master Plan.
(8) Institutional capacity of MAF will be strengthened with a **Gender Management Information System** and an organizational mechanism to inform annual planning processes. Gender-disaggregated statistical data and qualitative indicators will be collected to reflect the actual trends and results and be utilised for monitoring and evaluation purposes.

(9) For each target set by MAF on staffing, leadership and training, the participation of **women will be favourably considered** and whenever necessary incentives will be designed; i.e. in conjunction with other educational institutions (e.g. MoE) to improve enrolment and retention rates of female candidates in the agricultural, forestry and veterinary subjects.

The measures of Program 8 related to **Climate Change or Biodiversity**, include:

(10) **Institutionalize in curricula on all levels** of the agricultural education system **training modules on climate change adaptation** (CCA), in particular higher education curricula on agriculture.

168. In the context of **strengthening institutional and human resources** at MAF, the priority actions below are planned.

169. **To meet the basic needs of the agriculture and forestry sector, MAF will cooperate with other sectors to build capacity including the Ministry of Education, National University of Lao PDR (NUOL), and other institutes as well as with selected international NGOs and foreign technical assistance agencies to implement MAF’s human resources development plan.** MAF will coordinate with the Ministry of Education and development partners to plan domestic training on agriculture, animal husbandry, fisheries, veterinary science, irrigation, agriculture economics and other subjects for which there is a shortage as well as scholarships for masters and doctoral degrees overseas. To support human resources development and institutional strengthening, MAF will implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Study and improve job descriptions of each sector to be specific and accurate;
  - Assign and transfer officials based on job description;
  - Establish a Human Resources and Institutional Development Policy Committee within the Department of Organization and Personnel, to include representatives from the planning divisions of all departments in MAF, as well as representatives from the Ministry of Education and the NUOL.
  - Conduct a training needs assessment in each MAF department to take into consideration institutional modernization, globalization, and policy reforms.

- **Medium-term priorities (2013-2015)**
  - Prepare a systematic plan for short term training in-country and abroad; to increase officials’ knowledge and working performance, to improve quality and achieve targets.
  - Conduct regular performance evaluations and training needs assessments.

- **Key responsible agencies:** Ministry of Education, National University of Lao PDR, MAF: Departments of Planning, Personnel

170. **To meet the needs of institutional modernization and strengthening to engage regional and global markets on international terms and allow Lao agricultural exports to compete in global markets, MAF personnel will require upgrading in the following areas:** pre- and post-harvest handling, food safety, SPS, GAP, technical and other non-tariff barriers to trade, and value chain analysis. Based on the Direction and Strategic Plan on Human Resources Development in the Agriculture and Forestry Sector, 2001-2020 for the Ministry of Agriculture and Forestry, Department of Organization and Personnel, No. 125/DOP, and the Draft Manpower Plan of the Ministry of Agriculture and Forestry to the Year 2020: continue
to support departments, institutes, provincial divisions, and district offices that have completed organizational restructuring to perform their duties accurately and effectively, based on their responsibilities. To support human resources development and institutional modernization and strengthening to engage regional and global markets on international terms, MAF will implement the following specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - Working with concerned GoL agencies and development partners, and with guidance from the World Trade Organization, identify immediate as well as short-, medium-, and long-term technical needs related to membership in the WTO.
  - Prepare a systematic training needs assessment and human resources development plan that is consistent with WTO needs. Ensure that at least 50 percent of all officials trained are women.

- **Medium-term priorities (2013-2015):**
  - 10-12 agriculture (crops) and livestock officials will be trained, certified, accredited, and audited by a not-for-profit certification and accreditation organization or an internationally recognized survey and inspection company.
  - MAF will monitor and periodically report on the restructuring of central, provincial, and district agriculture and forestry offices.

- **Key responsible agencies:** Ministry of Education, National University of Lao PDR, MAF: Departments of Planning, Personnel, Inspection

**171. MAF personnel and procedures will require reform and modernization to facilitate internal execution of the WTO SPS Agreement, application of international SPS standards, and implementation of SPS measures.** As an institution, MAF is obligated by the SPS Agreement to work in close collaboration with other concerned agencies, namely the Ministry of Industry and Commerce and the Ministry of Health (Food and Drug Department) to establish and facilitate the following activities:

- Exchange of information about major food safety risks.
- Preparing lists of plant products with high, moderate, and low risks in bilateral trade as the basis for border control measures.
- Joint preparation of priority plant pest lists.
- Joint cross-border programs for the containment and reduction of priority animal diseases.
- Joint monitoring programs on the use of agrochemicals.
- A joint assessment of needed laboratory and other diagnostic facilities and designation of ASEAN sub-regional centres for expensive tests and highly specialized tasks.
- Developing and implementing mutually agreed SPS border procedures for GMS.

**172. Investments in irrigated agricultural development will be focused on mobilizing partnerships between several key stakeholders in the rural sector, namely between GoL, other governments, producer groups and the private business sector.** This public-private partnership (PPP) approach will require officials to be more flexible and to adopt innovative management processes. The Government anticipates that foreign direct investment will be used more frequently to intensify the use of existing irrigation systems and to construct new irrigation schemes. Production and marketing will be based on a value-chain analysis. The PPP approach and value-chain analysis will require management by officials and technicians who have significant field experience and a depth and breadth of understanding not generally present at the provincial and district levels. Special courses and training will be required to familiarize officials and technicians to the principles, details, and adaptive management techniques required to implement modern irrigated agricultural development projects. To facilitate investments in irrigated agricultural development and
the PPP approach to irrigation system management, MAF will implement the follow-
ing specific sequence of measures:

- **Immediate / short-term priorities (2011-2013):**
  - MAF will prepare an official ‘white paper’ on the PPP approach for endorsement by senior Government officials.
  - MAF will organize a series of regional workshops to introduce the PPP approach to irrigated agricultural development for provincial and district agriculture and forestry officials.
  - MAF will engage the NUOL or an INGO or the Mekong Institute to design a course on PPP linked directly to irrigated agricultural development.

- **Medium-term priorities (2013-2015)**
  - MAF will recruit officials and technicians from high priority areas for irrigated agricultural development for familiarization and training on the PPP approach to irrigated agricultural development.
  - MAF will prepare and disseminate materials to publicize its readiness to engage domestic and foreign direct investors and farmer organizations in developing irrigated agriculture using the PPP approach.

- **Key responsible agencies:** National University of Lao PDR, International NGOs, Mekong Institute, MAF: Departments of Planning, Personnel, Irrigation, Agriculture; NAFRI; NAFES

173. Specific capacity building programs and policy options at national and local levels are required to enhance implementation of agriculture and forestry research. **Indigenous and traditional knowledge** are useful for practical purposes and often practiced in the field. MAF should cooperate with academic institutions and policy makers to issue Policy Implication of Indigenous Knowledge and CCA in order to bring the policy dimensions of traditional knowledge in agriculture and its implication to climate change adaptation.

- **Immediate / short-term priorities (2011-2013):**
  - Documentation of tested and transferable indigenous knowledge
  - Policy notes on indigenous knowledge in agriculture sectors

- **Medium-term priorities (2013-2015)**
  - Local and traditional knowledge system properly incorporated in the policies

- **Key responsible agencies:** National University of Lao PDR, International NGOs, MAF

174. One of the key issues of CCA and agriculture is a **higher education program on CCA** that aims to develop a pool of trained professionals and individuals. So far, there is no specific program on higher education module on CCA, although the National University of Laos has undertaken certain measures to incorporate CCA in some of their courses. Appropriate curriculum development is important and essential for this, which is directly linked to field practices and applications.

- **Immediate / short-term priorities (2011-2013):**
  - Consultation workshop on curriculum and review
  - Pilot testing of curriculum
  - Incorporation in certain courses in the universities
  - Curriculum of higher education
  - Trained professionals

- **Medium-term priorities (2013-2015)**
  - Contribution to the professional development in the field of CCA and agriculture

- **Key responsible agencies:** NAFRI, National University of Laos, Meteo-hydrological centre
Annexes

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   2.7 Lao Agro Industry Company, Ltd., Thoulakhom District, Vientiane Province A 30
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### Annex 1: Overview Matrix

<table>
<thead>
<tr>
<th>Vision</th>
<th>Impact</th>
<th>Contributions by Implementation Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainable development</strong> for agriculture, forestry, natural resources management and rural development, based on a holistic concept with economic, social and ecological dimensions</td>
<td></td>
<td></td>
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<tr>
<td><strong>Development Goals 2020</strong></td>
<td></td>
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<tr>
<td>- Gradual introduction and increased application of <em>modernized lowland market-oriented agricultural production</em>, adapted to climate change and focused on smallholder farmers</td>
<td>1. Food production</td>
<td></td>
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<tr>
<td>- <em>Conservation of upland ecosystems</em>, ensuring food security and improving the livelhoods of rural communities</td>
<td>2. Commodity production and farmer organizations</td>
<td></td>
</tr>
<tr>
<td><strong>Specific Goals 2015:</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Goal 1:</strong> The improvement of livelihoods (through agriculture and livestock activities) has <em>food security</em> as its first priority.</td>
<td>Improved food security</td>
<td></td>
</tr>
<tr>
<td><strong>Goal 2:</strong> Increased and modernized production of <em>agricultural commodities</em> will lead to “pro-poor and green value chains”, targeting domestic, regional, and global markets, based on organizations of smallholder farmers and partnering investments with the private sector.</td>
<td>Increased production and value added of commodities</td>
<td></td>
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<tr>
<td><strong>Goal 3:</strong> <em>Sustainable production patterns</em>, including the stabilization of shifting cultivation and climate change adaptation measures, are adapted to the specific socio-economic and agro-ecological conditions in each region.</td>
<td>Widespread application of ecologically sustainable production patterns adapted to the conditions of regions</td>
<td></td>
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<td><strong>Goal 4:</strong> <em>Sustainable forest management</em> will preserve biodiversity and will lead to significant quantitative and qualitative improvements of the national forest cover, providing valuable environmental services and fair benefits to rural communities as well as public and private forest and processing enterprises.</td>
<td>Forests contribute significantly to the welfare of present and future generations of the Lao people</td>
<td></td>
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**ANNEX 2**
### Implementation Programs

<table>
<thead>
<tr>
<th>Program 1: Food Production</th>
<th>Outcome</th>
<th>Targets 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives and Key Measures</strong></td>
<td>Food security of smallholder farmers based on increased productivity and diversified farming systems, resilient to climate change and related extreme weather events and induced disasters</td>
<td>- 4.2 million tons of paddy produced annually</td>
</tr>
<tr>
<td>(1) To strengthen the resilience of agriculture and ensure food security, NAFRI, NAFES, the Department of Livestock and Fisheries and DOA will collaborate to implement measures for agricultural diversification, including mixed farming, agroforestry, and blending of indigenous knowledge with modern agricultural techniques.</td>
<td>- increase in the production of meat, egg, fish and other fresh products at 5% annually (40-50 kg per capita per year)</td>
<td></td>
</tr>
<tr>
<td>(2) The Department of Livestock and Fisheries (DOLF) will focus its resources on (i) upgrading local breeds of livestock through crossbreeding with improved and heat resistant breeds; and, (ii) disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network to maximize livestock productivity. In a similar way, this applies to fishery.</td>
<td>- increase of food quantity produced in the 47 poorest districts (350 kg per head per year)</td>
<td></td>
</tr>
<tr>
<td>(3) The Department of Irrigation (DOI), the Department of Agriculture (DOA) and NAFES will work together to promote the irrigated production of rice, including organic rice and non-glutinous rice, and high potential diversified other crops, including fruit and vegetables, for food security (link to Program 2)</td>
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<tr>
<td>(4) Improvement of basic rural infrastructure in remote areas (irrigation, post harvest handling, access roads, market places, market information systems) (link to Programs 5 and 6)</td>
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<tr>
<td>(5) Survey and designate land capability and production zones (area-based zoning of agro-ecological areas on macro and meso levels, according to their specific potentials and comparative advantages, participatory land use planning on micro level), and grant agricultural land use rights and titles (land registration) to rural households (link to Program 3)</td>
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<tr>
<td>(6) Agricultural research and extension with a focus on conservation agriculture linked to strengthening resilience to climate change to ensure food security, (links to Programs 3 and 7)</td>
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<tr>
<td>(7) Human Resource Development (notably of agricultural extension staff on village level) and the promotion of farmer organizations with a focus on food production (link to Program 8)</td>
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<tr>
<td>(8) To mitigate the foreseeable negative impacts of climate change, MAF will enhance the economic resilience of smallholders through social safety nets by a climate insurance program, which will be coordinated with appropriate private sector initiatives on micro credit and micro insurance.</td>
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</table>

### Key Measures of Program 1:

1. To strengthen the resilience of agriculture and ensure food security, NAFRI, NAFES, the Department of Livestock and Fisheries and DOA will collaborate to implement measures for **agricultural diversification**, including mixed farming, agroforestry, and blending of indigenous knowledge with modern agricultural techniques.

2. The Department of Livestock and Fisheries (DOLF) will focus its resources on (i) **upgrading local breeds** of livestock through crossbreeding with improved and heat resistant breeds; and, (ii) disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network to maximize livestock productivity. In a similar way, this applies to **fishery**.

3. The Department of Irrigation (DOI), the Department of Agriculture (DOA) and NAFES will work together to promote the **irrigated production** of rice, including organic rice and non-glutinous rice, and high potential diversified other crops, including fruit and vegetables, for food security (link to Program 2).

4. Improvement of basic **rural infrastructure** in remote areas (irrigation, post harvest handling, access roads, market places, market information systems) (link to Programs 5 and 6).

5. Survey and designate land capability and production zones (area-based zoning of agro-ecological areas on macro and meso levels, according to their specific potentials and comparative advantages, participatory land use planning on micro level), and grant agricultural land use rights and titles (land registration) to rural households (link to Program 3).

6. Agricultural research and extension with a focus on **conservation agriculture** linked to strengthening resilience to climate change to ensure food security, (links to Programs 3 and 7).

7. **Human Resource Development** (notably of agricultural extension staff on village level) and the promotion of farmer organizations with a focus on food production (link to Program 8).

8. To mitigate the foreseeable negative impacts of climate change, MAF will enhance the economic resilience of smallholders through social safety nets by a **climate insurance program**, which will be coordinated with appropriate private sector initiatives on micro credit and micro insurance.
### Implementation Programs

#### Objectives and Key Measures

<table>
<thead>
<tr>
<th>Program 2: Commodity Production and Farmer Organizations</th>
<th>Outcome</th>
<th>Targets 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives:</strong></td>
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<tr>
<td>• MAF support the instantiation and legalization of smallholder farmer organizations and engage in a network of PPPs that will facilitate the integration of smallholder farmers and their organizations into domestic, regional, and global “pro-poor and green value chains”.</td>
<td>Upstream domestic producers and processors, in particular smallholder farmers and rural SME, will benefit over-proportionally by their integration into “pro-poor and green value chains”, while maintaining the long term production potential of their natural resources, in particular their agricultural land.</td>
<td>- Agriculture and forestry sector product exports represent 1/3 of the total Lao PDR exports.</td>
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<tr>
<td>• MAF will ensure by appropriate measures of value chain governance that smallholder farmers and local SME can retain a fair share of the value added.</td>
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<td>- The value of agriculture and forestry exports represents at least 3.0 billion USD.</td>
</tr>
<tr>
<td>• MAF will provide an appropriate regulatory framework, monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests.</td>
<td></td>
<td>- Establishment of smallholder producer groups, cooperatives and associations in all priority value chains</td>
</tr>
<tr>
<td><strong>Key Measures of Program 2:</strong></td>
<td></td>
<td>- Mobilization of substantial investments from the private sector</td>
</tr>
<tr>
<td>(1) MAF will ensure that commodity production, and in particular large scale private investments are linked to the social and ecological conditionalities of “Smart Agriculture” and provide an appropriate regulatory framework, monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests.</td>
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<tr>
<td>(2) MAF will analyse value chains for high-value crops for local value-added processing and export; to identify gaps in production technology, market infrastructure, trade procedures, and logistics.</td>
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<tr>
<td>(3) MAF will build and strengthen links between producers and existing domestic and regional agricultural traders, processors, with access to domestic, cross-border, regional, and global “pro-poor and green value chains”. MAF will ensure by appropriate measures of value chain governance that smallholder farmers and their organizations (producer groups, cooperatives, associations) and local SME can retain a fair share of the value added</td>
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<tr>
<td>(4) MAF will facilitate the expansion of climate-smart agribusiness, processing agricultural raw materials for domestic use (to substitute for food imports) and for export; and will support the strengthening of the capacity of these enterprises to compete successfully in international markets; monitoring instruments will include „Climate Proofing for Development“. In this context, MAF will support “green labelling” of Lao products.</td>
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<tr>
<td>(5) Farmer Organizations: support to the initiation of producer groups and their legal formalization as cooperatives and / or associations, and assistance in the self-determined formulation of production cluster and value chain upgrading strategies (medium to long term) and annual work plans, including identification of market niches, local and regional branding and quality certification, monitoring and corrective action follow-up</td>
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<tr>
<td>(6) Risk Management: For commercial smallholder farmers and their organizations, MAF will launch a comprehensive Program on Risk Management with the objective of buffering increased risks of fluctuating world market prices, market failures, increasing effects of climate change and natural calamities. The program will include region-specific risk assessments, the analysis of asymmetries and transaction costs and specify the scope for Government intervention. Based on this, region-specific training and insurance programs will be implemented.</td>
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</table>
### Implementation Programs

<table>
<thead>
<tr>
<th>Objectives and Key Measures</th>
<th>Outcome</th>
<th>Targets 2015</th>
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<tbody>
<tr>
<td><strong>Key Measures of Program 2 (continued):</strong></td>
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<tr>
<td>(7) Training for key members of producer groups, cooperatives and associations in <strong>technical, management and marketing skills</strong> to strengthen their position, linkages, vertical integration and governance of value chains (link to Program 8).</td>
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<tr>
<td>(8) <strong>Cooperation with private sector investors</strong> / larger scale plantations (PPP) for out-grower systems, in designing, financing and implementing rules, regulations and monitoring of contract farming schemes, rendering the cooperatives equal partners in a win-win constellation</td>
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<tr>
<td>(9) Initiate and support <strong>cooperatives which are specialized as private service providers</strong> in various fields (e.g. pooling the purchase of agricultural inputs, supplying mechanized rental equipment to other farmers / cooperatives, post-harvest handling, mobilizing local experts for farmer-to-farmer field schools, sharing market price information, legal know-how and experience in contract negotiations, provide master trainers on sustainable indigenous agricultural practices and modern niche products, etc.)</td>
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<tr>
<td>(10) Initiate and formalize <strong>forest user groups</strong> and strengthen these in their functions for sustainable community forestry, train key members in participatory land use planning on micro level (PLUP), participatory forest inventory (PFI), forest protection and development regulation (FPDR), sustainable cultivation and marketing of non-timber forest products (NTFP) and the selection of fast growing (yet soil-friendly) tree species as well as slow growing (high value) indigenous species; quality certification of tree seedlings and small-scale nursery techniques</td>
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<tr>
<td>(11) MAF will work with <strong>regional organizations</strong> (ASEAN, GMS, MRC, and others), ODA partners, regional trade and business organizations and associations, and individual neighbour-country governments, to harmonize and complement agricultural development strategies, action plans, and road-maps.</td>
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<td>(12) MAF will <strong>cooperate with the Ministry of Industry and Commerce</strong> (MOIC) and the Science and Technology Agency (STA) and collaborate with private sector organisations to design, develop, and install modern information and communications technology (ICT) to modernize and facilitate connectivity with cross-border trading partners at high priority border trading points (link to Program 6).</td>
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<td>(13) MAF/ NLMA will initiate an inventory of agricultural land concessions throughout the country using PAFO and DAFO staff (link to Program 3) and ensure that GOL regulations on the issuance and operations of such concessions are strictly followed.</td>
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<td>(14) In cooperation with line departments, Development Partners and private investors, MAF will ensure that additional <strong>rural infrastructure investments</strong> are in place and maintained in <strong>irrigation</strong> (link to Program 5), rural market access roads, and other high-cost <strong>rural infrastructure</strong> (link to Program 6, e.g., markets, trade zones, drying pads, and storage, processing, handling, and cooling facilities).</td>
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<tr>
<td>(15) Agricultural research and extension on the level of farmers and their organisations will focus on <strong>commercial agriculture</strong>, linked to strengthening resilience to climate change and enhancing market connectivity (link to Program 7).</td>
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</table>
### Program 3: Sustainable production patterns, land allocation and rural development

**Objectives:**
- Principal objectives of Program 3 include establishing more sustainable production patterns, complete land and forest allocation, and support rural development in high-priority poverty districts, applying an approach to sustainable natural resource management which is based on the specific potentials, the socio-economic situation and on the agro-ecological conditions in each region.

**Outcome:**
- The concept of sustainable use of diminishing resources is firmly rooted in the mind set, actual behaviour and land use practices of all stakeholders.
- Eco-agricultural adaptation measures to climate change preserve the long term production potential of natural resources.

**Targets 2015:**
- Expansion of commercial cropping systems in suitable areas
- Land allocation is completed
- Farmers’ real incomes raised
- Farmers in upland areas have fully adopted sustainable rotational production systems
- Specific regulations of land use planning and monitoring system
- Farmers resilient to climate change induced disasters

### Key Measures of Program 3:

1. MAF will rigorously promote conservation agriculture techniques, as developed by a number of International Organizations (e.g. FAO) and adapted to Lao conditions by NAFRI, agroforestry, and eco-agriculture technologies already proven effective in stabilizing shifting cultivation throughout the country.

2. MAF will expand its sub-basin land use planning program to include the principles of agro-ecosystem analysis linked to proposing climate change mitigation and adaptation measures that will contribute to stabilizing shifting cultivation and adoption of eco-agriculture by upland communities.

3. In cooperation with local authorities, participatory “Village Development Planning” will identify articulated needs of the rural population, thereby integrating rural men and women into a process of “grass roots democracy”, aggregate the collected data in a “bottom-up” planning process on the kumban and district levels, and use the data to optimize the allocation of scare investment resource (public and private) according to expressed real needs in rural development and for specific sector planning.

4. Based on identified needs and market opportunities, MAF - in cooperation with local authorities and the private sector - will actively promote off-farm income and employment opportunities, especially in the more remote areas, including processing and trading of agricultural and forestry products, handicrafts, agro- and eco-tourism (home stays and cultural expose programs).

5. Facilitate and accelerate implementation of climate change adaptation measures, such as: climate smart land use planning, awareness programs on slash and burn land use change, remote sensing analysis for sustainable land management.

6. Demonstrate the impacts of mitigation and adaptation measures to address climate change, MAF will work with the Food and Agricultural Organization of the United Nations (FAO) to conduct an Agricultural Census that will serve as a baseline against which progress can be measured.

7. MAF will promote the dissemination and use of biogas facilities to partly replace fire wood with intended positive impacts not only on the environment, but also on the living situation of rural women (link to Program 6).

8. Based on the assessment of local agro-ecological potentials, empirical surveys on needs of the local population and on the analysis of market demand for specific agricultural products, NAFES will intensify promoting the concept of the “Lao Extension Approach Plus” (‘LEA+’), to be implemented by adequately qualified agricultural extension staff on the local level (link to Programs 7).
<table>
<thead>
<tr>
<th>Implementation Programs Objectives and Key Measures</th>
<th>Outcome</th>
<th>Targets 2015</th>
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</thead>
<tbody>
<tr>
<td><strong>Program 4: Forestry Development</strong></td>
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<tr>
<td><strong>Objectives:</strong></td>
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<tr>
<td>• Deterioration of forest resources will be controlled and corrected in terms of both quantity and quality, leading to increase in forest cover and to livelihood improvement of poor farmers in rural areas and for protection of the forest cover.</td>
<td>Increased awareness of the importance of forests in eco-system management, improved effectiveness of law enforcement, reduced illegal logging, increased reforestation, innovate schemes for watershed management</td>
<td>- Improving existing forest area up to 65% of the total land area through the implementation of management plans for biodiversity and watershed services and sustainable forest management - Increase forest quality in under-stocked forests within and outside designated forest zones through avoidance of deforestation-cum-rehabilitation in an area of up to 6 million ha - Develop legislation for valuing of ecosystem services in all forest categories - Develop methods and procedures for assessing carbon content in all types of forest land and legislation to apply in all types of forest conversion repayment.</td>
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<tr>
<td>• Laws and regulations related to forest management will be improved and enforcement strengthened.</td>
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<tr>
<td>• Participation of local people will be the main approach of sustainable management of all categories of forests.</td>
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<tr>
<td>• Sustainable Forest Management will contribute to the conservation of biodiversity, CO₂ reduction and other internationally agreed environmental parameters.</td>
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**Key Measures of Program 4:**

1. MAF will expand the use of **agro-ecological system analysis** for land management.
2. Set the **policy framework** for line agencies to facilitate and coordinate the creation of, and provide institutional strengthening for **community forestry** and for community-based producer and marketing organizations in rural areas, including the introduction of internationally recognized sustainability standards and certification (e.g. SFC) and the promotion of commercial tree planting by individuals, groups, organizations, and SME.
3. Secure legal recognition and ensure sustainable management of all state forest zones demarcated with the participation of local people,
4. In areas outside state forests, strongly promote domestication and sustainable management of NTFPs and tree planting for fuelwood and other benefits/services, and promote urban forestry
5. Promote a balance between wood processing industries and annually approved wood harvest volumes; strongly promote domestic processing of wood, promote sustainable trade in wood products by certification (e.g. the requirements of “Chain of Custody”, CoC)
6. **Capacity building** with government organizations and concerned parties for the implementation of the Forest Strategy 2020 (links to Programs 7 and 8).
7. Develop supportive regulations, implementation guidelines and institutional framework to support **integrated village development** within which village level land use planning, agriculture development and community forestry are important integral parts (link to Program 3).
8. **Mobilize new climate-related finance mechanisms;** including “Readiness Programs” (REDD plus), “Eco-systems Restoration Licenses”, develop regulatory framework for **trade in CO₂ reduction certificates**, and upscale trade in CO₂ reduction certificates and derivatives; network internationally on forests, biodiversity and climate change (UNFCCC, UNFF, CCD, CBD)
9. More effective control and corrective action to prevent the further deterioration of forest resources in terms of quantity and quality and for protection of forest cover, accompanied by public **awareness campaigns** on the important role of forest in climate change mitigation; establish a comprehensive **biodiversity assessment** and launch a conservation program for **protected areas and National Biodiversity Conservation Areas (NBCA)**,
10. **Pilot and support different models of sustainable community-based forest management,** collaborative or co-management arrangements for protected areas and National Biodiversity Conservation Areas (NBCA), thereby contributing to the conservation of **forest ecosystems and biodiversity.**
11. Develop and **enforce appropriate laws, regulations** and implementation guidelines related to sustainable forest management and strict regulatory measures in terms of climate change.
### Implementation Programs

#### Objectives and Key Measures

<table>
<thead>
<tr>
<th>Program 5: Irrigated Agriculture</th>
<th>Outcome</th>
<th>Targets 2015</th>
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</thead>
</table>
| **Objective:**                  | Improved production systems and public management mechanisms: In the uplands, livelihood and nutritional well-being of smallholders will be improved though increased productivity of rice and diversified farming systems adapted to climate change. In the lowlands and flood plains, commodity production will be increased through partnership investment aiming to develop value chain. | – 350,000 ha dry season irrigated agriculture area  
– In the lowlands, attain 225,000 ha of irrigated agriculture area for commodity production of which about 180,000 ha under flood irrigation systems in 41 districts  
– In the uplands, attain 125,000 ha of irrigated agriculture for the development of livelihood and the protection of social and environmental conditions. Of this area, about 60,000 ha will be under flood irrigation |

**Key Measures of Program 5:**

1. **Conducive Market Environment** for Irrigated Agriculture: re-modelling public management, strengthening the capacity of public agencies, legal regulatory framework for the promotion of agriculture value chains, strengthening the capacity of production groups, agriculture cooperatives and associations; and producers associations, developing model for contract farming and other type of market structures, credit facilities for SMEs and private entrepreneurs, agribusiness associations in modernizing agro-industry and agri-business, transport, logistic and trade

2. **Irrigated Agriculture Technology Application:** models for strengthening irrigated agriculture technical services, focus on indentified regional clusters

3. **Irrigation Management Service and Investment:** re-modelling the organization, institutions of the Department of Irrigation and related agencies, M&E, information data base, feasibility studies, survey and design of integrated agriculture programs, strengthening local authorities (provinces and districts) to prepare, monitor and evaluate, co-management concepts, enhancing the capacity of WUOs, including the institutionalization of WUA

4. **Irrigated Agriculture Development for Social and Environmental Purposes:** community managed irrigation in the uplands, livelihood development and income generation in the uplands, improving and expanding reservoir systems, monitoring instruments will include Strategic Environmental Assessments (SEA) and „Climate Proofing for Development“

5. Region-specific programs of decentralized small-scale reservoirs and ponds on household and community levels for various purposes, including irrigated crop cultivation, fish cultivation, drought mitigation and flood protection, household food security in general, link to Program 1

6. **Flood and Drought Prevention:** drought and flood protection facilities, expanding reservoir systems, flood prevention and drainage systems

7. Human Resource Development and Vocational and Technical Education: assessing skill and knowledge requirement, capacity of existing training and education institutions, development of competency standards for irrigated agriculture work force, new curriculum, course plan, teaching aids, rehabilitation of school facilities, training materials and equipment, teacher training, link to Programs 7 and 8

8. Introduction of measures specifically targeted on climate change adaptation, such as weather based farming models for communities
**Program 6: Other agriculture and forestry Infrastructure**

**Objectives:**
- Improvement of Agriculture Infrastructure (mechanization, post harvest handling, rural market access roads, market infrastructure, ITC to support marketing)
- Improvement of Forestry Infrastructure, Agro-forestry Eco-parks, demarcation of protected areas, tree seedling and nurseries for reforestation, community-based watershed protection

**Outcome:**
- More use of hand tractors and trailers, increase of agric. labour productivity, farmer groups able to retain more value-added, increased ex-farm prices
- Physical preconditions of sustainable forestry management and conservation of protected areas are in place

**Targets 2015:**
- Increase of tractor use 2/ annually
- 1 crop drying pad/each village
- 1 cool storage / each province
- 50 km access roads / province
- 1 commodity market /each district
- National market information system operational
- Eco-parks nationwide
- Demarcation and ground-truthing of forests completed
- Reforestation fee from logs and NTFP used 100% for tree nurseries
- Closure of forests in protected watersheds

**Key Measures of Program 6:**

**Agriculture infrastructure:** (Irrigation covered by Program 5)
1. Mechanization (facilitate procurement, management, and maintenance of small-scale farm equipment)
2. Post-harvest handling (facilitate investments to support community-based post-harvest handling of crops)
3. Rural market access roads (farmer organizations to identify road access, marketing, and market information needs)
4. Market infrastructure (formulate and promote fiscal and non-fiscal policy measures to create clusters of GAP crop production)
5. Information and communications technology to support marketing (set up and operate market price information system)
6. Climate resilient infrastructure (electricity, water supply) and **Community-based watershed programs**

**Forestry infrastructure:**
7. Demarcation of protected areas (program of demarcating protected areas for improved community based forest and watershed protection)
8. Tree seedling nurseries for reforestation (fiscal incentives, reforestation fee from logs and NTFP used 100% for tree nurseries)
9. Community based forest and watershed protection (support accelerated natural rehabilitation of protected areas, watersheds, and production forests, to ensure long-term sustainability of the forestry sub-sector)
# Implementation Programs

## Objectives and Key Measures

### Program 7: Agriculture and Forestry Research and Extension

**Objective:**
- Conduct “Applied Research for Development”, and translate the results directly into the widespread dissemination of needs-based, gender and area-specific and market-oriented extension packages, covering the technical content of all 4 sector goals, referring to crop cultivation, livestock / animal husbandry, aquaculture and fisheries as well as community-based forestry.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Targets 2015</th>
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<tbody>
<tr>
<td>Research results are directly used in appropriate extension packages</td>
<td>- Investments in agriculture research and development from all sources increased by 25 percent.</td>
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<tr>
<td>Agricultural and forestry techniques, as well as marketing skills of smallholder farmers and rural SME are substantially enhanced as a result of improved AE services</td>
<td>- 50 percent of smallholder farmers have access to improved seed varieties and improved livestock breeds</td>
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<td>- 50 percent of smallholder farmers are using GAP.</td>
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<td></td>
<td>- 25 percent of smallholder farmers are practicing conservation agriculture.</td>
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<td></td>
<td>- 50 percent of smallholder farmers in economically lagging have access to value chains for organic and niche products.</td>
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</tbody>
</table>

**Key Measures of Program 7:**

1. **Restructure agriculture and forestry research and extension** functions to ensure that the results of “Applied Research for Development” are directly translated into the widespread dissemination of needs-based, gender-specific and area-specific as well as market-oriented extension packages.
2. Create new units at NAFRI and NAFES with the flexibility to work with agro-enterprises and investors and to promote and strengthen farmer organizations.
3. **Strengthen research related to irrigated agricultural production and agricultural diversification**, including mixed farming, agroforestry (including agro-silvo-pastoral), and blending indigenous knowledge with modern agricultural techniques.
4. Based upon research results, **upgrade local breeds of livestock** through crossbreeding with improved and heat resistant breeds; and address disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network.
5. Agriculture research and extension organizations will require significant upgrading to develop the capacity to implement integrated watershed management (IWM) that are linked to climate change mitigation and adaptation measures.
7. Investments and knowledge transfer in irrigated agriculture will be focused on **mobilizing partnerships** between several key stakeholders in the rural sector, namely between government and government; government and business; business and producers.
8. Cooperation with Research Institutes and Science & Technology Centres in other countries of the region and world-wide to make valuable research results available for further practical adaption to Lao conditions.
9. Cooperation with private sector for “**embedded agricultural extension services**” (e.g. supplier of agricultural inputs to provide training on how to safely and economically use agro-chemicals).
10. NAFRI will undertake **climate-related** research, in particular tests and trials for the local and regional-specific adaptation of **seed varieties that are resilient to climate change** for rice and commercial food and agricultural commodities, as well as on crop yield forecasting.
11. NAFES will launch a **climate change awareness program** through the agricultural extension services.
### Implementation Programs

<table>
<thead>
<tr>
<th>Objectives and Key Measures</th>
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<tbody>
<tr>
<td><strong>Program 8: Human resource development</strong></td>
<td><strong>Strengthened institutional and human capacities (including significant progress in gender mainstreaming) to organize and manage holistic rural development, agriculture and forest-based production, processing and marketing as well as environmental services</strong></td>
<td><strong>General HRD targets, see key measures below</strong></td>
</tr>
<tr>
<td><strong>Objectives:</strong></td>
<td><strong>- Sub-sector specific targets for outputs of professional training programs of MAF staff on all levels, see master Plan</strong></td>
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<tr>
<td>• Build up adequate institutional capacity and human resources among public and private service providers to facilitate the achievement of Goals 1 to 4 until 2015.</td>
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<tr>
<td>• The capacity of government organizations and concerned parties will be strengthened for implementation of the Agricultural and Forest Strategy to 2020. In this context, a reform of the public administration in several sub-sectors is to be effected.</td>
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#### Key Measures of Program 8:

1. **Cooperate with other sectors to build capacity** including the Ministry of Education, National University of Lao PDR (NUOL), and other institutes as well as with selected international NGOs and foreign technical assistance agencies
2. **MAF personnel will require upgrading** in the following areas: pre- and post-harvest handling, food safety, SPS, GAP, technical and other non-tariff barriers to trade, and value chain analysis.
3. **MAF procedures will require reform** and modernization to facilitate internal execution of the WTO SPS Agreement, application of international SPS standards, and implementation of SPS measures
4. **Institutionalize in curricula on all levels** of the agricultural education system **training modules on climate change adaptation (CCA)**, in particular higher education curricula on agriculture
5. **General HRD targets**: 40 PhD, 50 masters, and 70 bachelor degrees; Training for technical officials in provinces: 5 PhD in each province, 10 masters, 40 bachelor degrees, 35 higher diplomas, and 5 diplomas; Training and development for technical officials in districts: 6 masters, 15 bachelor degrees, 40 higher diplomas, 60 diplomas, and 40 certificate level; Technical staff at village level: 1 technical staff per 30 families; and, According to the mandate given to MAF and development trends in the agriculture and forestry sector, MAF will require about 12,857 officials, or a 24 percent increase from 2010
6. Introduce for all staff of MAF a **job-performance assessment and monitoring system** (management by personal targets), based on clear job descriptions and tied to a **performance-based incentives scheme** and a strictly **performance-based job promotion scheme**.
7. Introduce for all departments of MAF, a leadership system of “Management by annual targets”, accompanied by a strict monitoring of annual targets and reporting to higher levels.
8. Nominate for each of the 8 programs of the Master Plan a **Lead Agency** (department within MAF), formulate for each program annually verifiable indicators on outputs and impacts, and submit to the Minister annual **M & E Reports** on the achievements of the Agricultural master Plan.
9. Institutional capacity of MAF will be strengthened with a **Gender Management Information System** and an organizational mechanism to inform annual planning processes. Gender-disaggregated statistical data and qualitative indicators will be collected to reflect the actual trends and results and be utilised for monitoring and evaluation purposes.
10. For each target set by MAF on staffing, leadership and training, the participation of **women will be favourably considered** and whenever necessary incentives will be designed; i.e. in conjunction with other educational institutions (e.g. MoE) to improve enrolment and retention rates of female candidates in the agricultural, forestry and veterinary subjects.
Annex 2:

Selected Case Studies

1. Pakxong Central Market Case Study in Champasak Province
2. Mitr Lao Sugar in Savannakhet Province
3. Community Based Rural Development Project for Conservation of the Nam Beng / Nam Mau, and Nam Phak Watersheds, Oudomxay, Lao
4. Coffee Case Study in Champasak Province
5. Sustainable Forestry for Rural Development - SUFORD Case Study
6. Taniyama-Siam Okra Production in Sekong Province
7. Lao Agro Industry Company, Ltd., Thoulakhom District, Vientiane Province
8. Jasmine Rice in the Weeping Plain: Adapting Rice Farming to Climate Change in Northeast Thailand
9. Changing crops calendar to adapt to climate change in Quang Tri province, Vietnam
Case Study 1:

Pakxong District Wholesale Market, Champasack Province

1. In Pakxong District, Champasack Province, a wholesale market has operated since 2006. It was initiated through the Ayeyawady - Chao Phraya - Mekong Economic Cooperation Strategy (ACMECS), a Thai Government initiative for promoting contract farming among neighbouring countries with the specific aim of providing raw materials to Thai agroindustries. To date, ten Lao companies and four Thai companies that traditionally have traded at the Champasack (Lao PDR) – Ubon Ratchathani (Thailand) border (at Vang Tao) have registered with Thai and Lao authorities to purchase agricultural products at the Pakxong wholesale market, which has been operational since June 2007. Upgrading of the Pakxong wholesale market facility is underway with support from the ADB financed Smallholder Development Project and is expected to be completed in May 2010.

2. Before the wholesale market concept was operational, farmers were obligated to transport their produce (mostly cabbages and bananas) to the Lao-Thai border at Vang Tao-Chong Mek, a distance of more than 100 km from the Pakxong District town. Farmers had no advance knowledge of the price they would receive for their produce, nor were they sure that they would be able to sell their crops. Often they were obligated to 'dump' their produce.

3. The Pakxong Market Management Group (MMG) was established to administer the wholesale market. It is registered with Pakxong District officials. To cover the operational costs of the market fees are collected from users. A schedule of fees has been established as follows:

<table>
<thead>
<tr>
<th>Wholesale Market User</th>
<th>Fees Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Farmer</strong>: fee for sanitary maintenance of market facility &amp; tax waiver certificate</td>
<td>Delivery fee for a 2-3 ton truck = 3,000 kip</td>
</tr>
<tr>
<td><strong>Trader</strong>: fees for market administration, central fund for production promotion, &amp; commodity movement tax (paid to the District Finance Office)</td>
<td>Delivery fee for a 5-7 ton truck = 5,000 kip</td>
</tr>
<tr>
<td></td>
<td>Total fee: 14 kip / kg, broken down as follows:</td>
</tr>
<tr>
<td></td>
<td>Administration costs = 7.79 kip / kg</td>
</tr>
<tr>
<td></td>
<td>Production promotion fund = 5.00 kip / kg</td>
</tr>
<tr>
<td></td>
<td>Commodity movement tax = 1.25 kip / kg</td>
</tr>
</tbody>
</table>

4. The MMG is providing the following services through the wholesale market:
- A local primary market venue for smallholder farmers on the Bolovens Plateaux; saving farmers a 100 km (each way) trip to the Lao-Thai border;
- Issuing of the “ASEAN Integration of Preference” (AISP) Form to Thai traders, allowing tax free movement of produce from Laos to Thailand;
- Certification of weights and measures; later to be upgraded to include inspection and certification of quality;
- A sanitary area where traders and farmers can conduct trade;
- Booths for Lao and Thai traders to purchase food and agricultural products from farmers and sell agricultural production inputs to farmers;
- Identifying, screening, and registering of Thai companies (and enterprises of other nationalities) interested in purchasing produce from producer groups in Pakxong District (and neighbouring districts); and;

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Support for DAFO staff to promote crop production in response to the needs of local and regional traders, using the production promotion fund.

5. The formation of trading joint ventures between Lao and Thai traders has been facilitated by the Pakxong wholesale market enabling Thai traders to operate more easily. In the past, Lao traders and transporters operated as middlemen for the Thai traders based at the border at Vang Tau-Chong Mek. As a result of working more closely at the wholesale market, these relationships have been formalized and four joint venture companies are now registered at the district level. The Lao partners take responsibility for the administrative paperwork required by district officials and for transporting the raw materials to the Thai border. The Thai traders, working out of the same booth as their Lao partners (at the wholesale market), handle the purchasing, weighing, measuring, grading, and packing of the produce; as well as all financial transactions, including cash payments and credit (in kind) to producers.

6. Informal contract farming is taking place through the wholesale market facility. Thai traders who have purchased produce from Lao farmers at the Lao-Thai border for many years continue to trade with the same farmers through the wholesale market. DAFO and District Industry and Commerce Office (DICO) staff report that Thai traders provide credit in kind to approximately 30 percent of the Lao farmers trading at the wholesale market; in the form of seeds, chemical fertilizer, and pesticides. There are no written contracts but the arrangements are organized on trust between the two parties that has developed over many years of trading.

7. Linked to the Pakxong District wholesale market and supported by the Smallholder Development Project, DAFO has organized 23 producer groups currently producing coffee, cabbage, Chinese cabbage, and bananas that utilize the wholesale market. Other crops that can be marketed through this facility in the 2008-2009 season include castor beans, maize, and ginger.

8. DAFO and DICO staff point out that the wholesale market system has several weaknesses as it currently functions, namely:
   - The role of Lao traders has changed. Lao entrepreneurs are no longer traders but act as shipping agents for the Thai traders.
   - When market prices fall (in Thailand), Lao traders have insufficient cash to intervene and pay a previously agreed minimum price to farmers for their produce.
   - A producer revolving fund is needed to purchase seed and fertilizer in bulk at lower prices that can be passed on to Lao farmers.
   - MMG staff lack transportation to follow up on production promotion funds and provide administrative tasks related to operating the wholesale market.
   - The wholesale market lacks cool store facilities for fresh produce to enable price hedging.
   - The MMG (and DAFO and DICO) lacks the knowledge and capacity to undertake certification of produce (for SPS, bio-safety, organic certification, fair trade certification, etc.) being sold to Thai traders.
   - Not all producers and producer groups are trading with Thai traders through the wholesale market. AISP certificates were issued for 7,000 tons of produce shipped to Thailand in 2007; whereas, as of November 2007, 12,000 tons of produce had been shipped to Thailand from Pakxong District (figures are based on collection of district commodity movement tax at Kilometre 28, on Route 16E, between Pakxong and Paksé).

9. Benefits from wholesale market operations include the following:
   - Exports to Thailand from Pakxong District have increased (no figures were available).
   - The provincial officials at Ubon Ratchatanee assist with negotiations with Thai companies that trade at the wholesale market when requested by Lao authorities.
   - Thai trading companies tend to cheat less, particularly since the MMG is responsible for administering standards for weights and measures at the wholesale market.
Case Study 2: Mitr Lao Sugar Co., Xayboury District, Savannakhet Province

1. The Mitr Lao Sugar Company’s investment application was approved by the GOL in February 2005. The company, a wholly owned unit of the Mitr Phol Sugar Company of Thailand, was granted a land concession of 10,000 ha for 40 years, with a concession fee of US$6.00 per ha per year (with an option to extend for an additional 20 years) to grow sugar cane. Its original request for 25,000 ha was not approved, but it was authorized to establish contract farming arrangements with farmers in Xayboury and Champon districts, Savannakhet Province, on an additional 15,000 ha using the ‘2+3’ formula (see above). Operations began in Savannakhet Province in 2006 with the establishment of 100 ha of sugar cane trials.

   - In August 2007, the company announced that 10 percent of the Mitr Lao Company would be sold to Tate & Lyle, a respected British food ingredients company, for £2 million (US$4 million). Mitr Lao Sugar plans to invest a total of US$116 million to produce sugar from sugar cane grown on its plantations and by contract farming, and construct and operate a sugar mill in Xayboury District. The mill will have an initial capacity of 5,000 tons rising to 10,000 tons of cane per day. Lao PDR will be eligible to export sugar duty free into the EU under the Everything But Arms initiative, effective from 1 July 2009. Raw sugar shipped to the EU by Mitr Lao Sugar will be refined by Tate & Lyle.

   - Although the land concession fee is US$6.00 per ha per year, managers at the Mitr Lao Company stated that the transaction costs of doing business in Laos had resulted in a concession rental fee equivalent to US$50 per ha per year. These transaction costs include the cost of payments for land surveys, public infrastructure requested by the government and villagers (including village schools, roads, weirs, and pumps along the Mekong River) in exchange for the concession, various study visits to Thailand, as well as other special requests from the GOL.

2. The Mitr Lao Company operates its concession as a nucleus estate. It initially adopted the GOL’s ‘2+3’ formula for contract farming with villagers in Xayboury and Champon districts, in Savannakhet Province, and was planning to expand to Xaybouthong and Mahaxay districts in neighbouring Khammouane Province using the same approach. In practice, the company has signed written contracts with 660 contract farmers and provides 100 percent of the investment costs without collateral. Although government officials are present when contracts are signed, the GOL will not witness or otherwise acknowledge the agreement between the company and the farmers.

   - The criteria applied by the company when selecting contract farmers includes the following:
     - The producer has documents (a tax receipt) showing the legal right to occupy the land;
     - The producer must cultivate a minimum of one hectare of cane;
     - The land for cultivating sugar cane should have access to water for irrigation if necessary;
     - The land can be no further than 20 km from the Mitr Lao processing factory (but in fact this criterion has been modified so that farmers as far as 50 km from the factory can be contracted); and,
     - A farmer must demonstrate a commitment to producing a quality product.
   - Using the ‘2+3’ approach, the company provides 3,845 Thai baht (approximately US$120) per ha of credit to each contract farmer consisting of the following:
     - Support for land preparation

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– Chemical fertilizer
– Cost of labour for weeding
– Other labour costs
– In addition, the company provides training to contract farmers at every stage of cane production as well as market access. The company also loans agricultural equipment to more progressive contract farmers for planting and harvesting in areas with labour shortages. The equipment is on loan to the farmers who can purchase the equipment, paying on an instalment basis.

3. The best performing contract farmers are producing 100 tons of cane per ha compared to others who are producing only 20-30 tons (The average yield in Thailand is 50 tons per ha, which is about 20 percent lower than the average world yield; Australia has an average yield of 90 tons per ha). Mitr Lao sees the potential for achieving higher cane yields in Laos than in Thailand and is thus attracted to producing in Laos.
– Many contract farmers have experienced significant production losses due to the natural grazing of cattle and buffalo. In 2007, an estimated 10 million baht (some US$312,000) worth of cane was lost to livestock; an additional 50 ha was lost to wild fires lit by farmers burning off nearby paddy fields. In addition, yields of many contract farmers are low due to the refusal of farmers to weed the cane crops (even though funding is provided for the weeding). Farmers want to be paid an additional fee for weeding their own crops.
– In 2007-2008, the company achieved only 45 percent of its target for cane production through contract farmers. It is seeking the GOL’s assistance in the formation of producer groups, particularly in areas where cane cultivation is scattered. However, the GOL has not committed to providing the requested assistance, saying only that the farmers cannot be convinced to participate in the contract farming program.

4. As a result of the situation described above, Mitr Lao management has initiated discussions with the GOL to adopt the ‘1+4’ formula for producing the sugar cane required by their new factory. Under this method, farmers would rent out their land to the company and be paid as labourers to produce sugar cane that belongs to the company. To date, the company has signed rental contracts for 128 ha of land in Xayboury District for a period of from 10 to 12 years; at a fee of US$6.00 per ha per year.
Case Study 3:
Community Based Rural Development Project for Conservation of the Nam Beng / Nam Mau, and Nam Phak Watersheds, Oudomxay, Lao PDR

Introduction

1. Oudomxay Province, with Mouang Xay as the district centre, is an emerging trade hub in northern Lao PDR, located near the border with China, at the junction of Lao national routes 1, 2, and 4. Its colourful history includes being: a centre for the illicit drug trade during the Lao civil war (1965 -1975), and for a short period following; a base for Chinese military and civilian technical assistance to Lao revolutionaries during the civil war; and, the start off point for two major strategic military roads, namely Lao national routes 1 and 6 linking southern Yunnan, China, to Viet Nam (via Xam Neua), and national route 2, linking Yunnan to the Mekong River at Pak Beng District, and aimed at northern Thailand. Prior to 1975, Mouang Xay was a district of Luang Prabang Province.

2. Although it is among the best endowed provinces in the north, with hundreds of rivers and streams, high forest cover, and low population density, Oudomxay is one of the least developed of the northern Lao provinces. Constraints to development include a large number of ethnic groups with high rates of illiteracy, low farm productivity, a significant rice deficiency in upland areas, and mountainous topography. Modernization and commercialization of agriculture are underway and are creating a cash economy among traditionally non-monetized and barter trading ethnic groups. The result is the widespread sale of agricultural produce (mainly rice, but also soybeans and increasingly maize) and unsustainable collection and sale of non-timber forest products (NTFPs) (mostly for sale to Chinese traders). The subsequent expansion of upland rice fields using Swidden (slash and burn) agricultural practices and shifting cultivation has led to extensive watershed degradation. The Government of Lao PDR (GOL) recognizes the serious negative impacts of shifting cultivation on watersheds, and has adopted policies aimed at introducing stabilized agricultural practices in key river basins throughout the country.

3. In response to the GOL's efforts, the Deutsche Welthungerhilfe / German Agro Action (GAA), a private voluntary organization (PVO), is implementing the Community Based Rural Development Project for Conservation of the Nam Beng / Nam Mau, and Nam Phak Watersheds Project, in cooperation with the Provincial Agriculture and Forestry Office (PAFO) of Oudomxay Province.

   - The project aims at reducing vulnerability of the participating ethnic groups (Khamu, Hmong, Tai Lu, and Akha), some living in mixed settlements, in 19 villages, who practice upland agriculture in portions of three river basins, namely the Nam Beng, Nam Mau, and Nam Phak. The project aims to empower people by decreasing their dependency on upland rice production. A diversity of upland crops and NTFPs are being introduced in agroforestry systems. Food and agricultural products harvested can be processed at the family and village level, thus increasing the producers' share of any value-added received.

   - Occupational training is provided to all villagers, giving them new skills that can reduce their dependency on upland rice cultivation. They can apply their training to practice alternative livelihoods, helping them to augment income to meet food security needs and to achieve food self-sufficiency. In this manner, the project adds value to household assets, namely: (i) land allocated through the GOL's Land and Forest Allocation Program, for which a three year usufruct certificate has been provided; and, (ii) food and agricultural outputs produced on the distributed land.

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4. A project document provided by GAA\textsuperscript{34} points out that:

“The project development goal is the efficient and sustainable use of the natural resources to improve food security and living conditions of the local population and for conservation of the watershed function of the designated headwaters and provincial conservation areas.”

5. The project is a comprehensive rural development project, which includes the following activities:

- Developing agricultural production areas and sustainable farming systems;
- Improving access to sanitation facilities, including water supply and latrines;
- Primary health care, including village pharmacies;
- Education and communication facilities;
- Community-based savings and credit schemes; and,
- Capacity strengthening of project staff and village institutions through participatory planning and implementation processes.

6. The principal focus of the project is on developing agricultural production areas and sustainable farming systems through the creation of paddy areas, irrigation, and establishment of permanent upland farming plots. This is augmented by improving and integrating livestock production and the domestication of NTFPs.

7. The project’s target villages are located along main highways in Oudomxay Province, namely national routes 2 west and 13 north, from Mouang Xay the principal provincial and district town. As a result of the easy access to the project villages via all-weather roads, villagers have benefited from Chinese traders from Yunnan, who have commercially penetrated the area and are exporting food and agricultural products and NTFPs from Oudomxay to Yunnan for processing and sale.

8. Prior to implementing any development activities, the project conducted a participatory rural appraisal (PRA) in the target villages over a one year period. This was followed by a series of planning workshops during which each village defined the development model appropriate for the community. The GAA technicians provided technical inputs to the planning process, with an emphasis on farming systems that had proven successful elsewhere. These include:

- SRI, or system of rice intensification (in existing paddies) and the expansion of rice paddy areas;
- Farmer managed small scale irrigation systems;
- Domestication of NTFPs, accompanied by training in basketry, weaving, and broom making to enhance the value of NTFPs through family- and community-based value-added processing;
- Establishment of permanent crops in upland areas, including fruit and forest trees, as well as NTFPs that are regularly sourced from natural forests;
- Livestock raising combined with the introduction of forage and fodder crops, using hedgerows for erosion control and supported by funding for a vaccine program;
- Freshwater fisheries; and,
- Micro-credit schemes through a village-based revolving fund

\textsuperscript{34} A “Project Progress Report” was provided by the GAA Project Management Assistant during a visit to the project site on 4 November 2004, covering the period March-August 2004.
Table 1: Upland Agronomy at Ban Khon Kaen, Xay District, Oudomxay Province

<table>
<thead>
<tr>
<th>Forest trees</th>
<th>Fruit trees</th>
<th>NTFPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Agar Wood / Eagle Wood <em>(Aquilaria crassna)</em></td>
<td>• Incense bark <em>(Boehmeria malabarica)</em></td>
<td>• Ma Kha <em>(Castanopsis sp.)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fruit trees</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Banana</td>
<td>• Mango</td>
<td>• Jackfruit</td>
</tr>
<tr>
<td>• Guava</td>
<td>• Lime</td>
<td>• Longan</td>
</tr>
<tr>
<td>• Papaya</td>
<td>• Pomello</td>
<td>• Lychee</td>
</tr>
<tr>
<td>• Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NTFPs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cardamom <em>(Amomum villosum)</em></td>
<td>• Kalouk <em>(Khamu/Lao)</em></td>
<td>• Ginger <em>(for tubers &amp; fruit)</em></td>
</tr>
<tr>
<td>• Sweet potato <em>(Ipomoea batatas)</em></td>
<td>• Rattan <em>(for shoots and wicker)</em> <em>(Calamus sp.)</em></td>
<td>• Trumpet Creeper* <em>(mak lin mai - Lao)</em> <em>(Oroxylum indicum Vent.)</em></td>
</tr>
<tr>
<td>• Citronella <em>(Cymbopogon nardus)</em></td>
<td>• Arrowroot <em>(sa khou – Lao)</em> <em>(Maranta arundinacea L.)</em></td>
<td></td>
</tr>
<tr>
<td><strong>Permanent crops</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pineapple</td>
<td>• Pigeon pea</td>
<td></td>
</tr>
<tr>
<td>• Cassava</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* May also be referred to as Damocles tree.

Discussion

9. The GAA intervention is consistent with the GOL’s policy on stabilizing shifting cultivation on sloped lands. This is being achieved through the promotion of both on-farm and off-farm activities related to agricultural development that will result in the creation of job opportunities and income generating activities. It is clearly recognized that shifting cultivation will not be halted without activities that will compensate for the loss of traditional sources of food and income. Therefore, the GAA supported project, working in collaboration with district extension workers, is promoting alternative rural livelihoods aimed at the poor.

10. Highland agriculture is practised in all upland areas of the country and is characterised by shifting cultivation in which farmers distribute crops over many pieces of land, using each plot one or two years before moving on and returning after 5 to 6 years. During the fallow period, the land and forest are left to rest and regenerate. Increasing population pressure in shifting cultivation areas have resulted in shorter fallow times between subsequent rice crops (down from 15+ year fallows to 4-6 year fallows now). As fallow periods get shorter, soil fertility declines, crop yields decline and weeding requirements increase (since the vegetation consists more of shrubs than trees). The area cultivated by a family is frequently limited by the amount of labour available for weeding (which can take up to 200 labour-days per hectare), so shortening fallow times can also result in reduced areas cultivated by each household. The regeneration ability depends on the species, some are able to regenerate, some not. This age-old method practised by the various ethnic groups was a natural way to preserve the forest and keep an ecological balance. However, in many cases the necessary fallow periods are shortening, thus not permitting the
land to recover. Under no circumstances, is a fallow period of only 5-6 years sufficient to restore a forest.

11. In Laos, with a traditional fallow cycle of 15 years to 25 years, the sustainability of this technique is in jeopardy when the density of the population exceeds 20 persons per square km. The net result is reduced food security (in some areas farmers can only produce enough rice to feed their families for 6 -8 months of the year). Farmers in this situation are forced to rely more heavily on other sources of income or food.

12. It is in this context that the GAA project is being implemented. Specific attention is being given to the protection of watersheds that are being threatened by increasingly intensive shifting cultivation with shortened fallow periods. Based on the baseline PRA work undertaken in the first year of the GAA supported project and the village development plans formulated by the villagers during the second year of the project, technical assistance has been made available to farmers who are changing cropping patterns and adopting more sustainable farming systems.

Agricultural activity

13. It was evident from the field visit (to Ban Khon Kaen) that the replanting of sloped lands with fruit, forest, and forage trees, with a ground cover of permanent crops and domesticated NTFPs is considerably more environmentally friendly than the previous practice of cultivating one crop of rice during the wet season. As pointed out above (Table 1), a diversity of tree crops, tubers, and NTFPs (e.g., cardamom) has been planted. While these crops mature, the villagers earn the cash needed to purchase rice for consumption from two main sources:

   (i) selling labour services in the village and to neighbouring villages; and,
   (ii) selling vegetables in the nearby provincial market during the dry season.

14. The lowland areas used for wet season rice cultivation are used to cultivate vegetables during the dry season. Although the GAA Progress Report35 mentions a small-scale irrigation system in the village (serving five families), no irrigation system was in evidence during the field visit, indicating that the vegetables likely were watered by-hand, with water being drawn from a stream that traverses the low lying areas.

15. The farming system adopted by producers in this village is an agroforestry system that uses sloped lands for planting trees that provide productive and protective forest functions in support of sustainable forest and land management, with crops or pasture for multiple benefits. Agroforestry has the ability to provide short-term economic benefits while the farmer waits for traditional longer-term forestry products. Agroforestry practices contribute to the quality of biological diversity, healthy ecosystems, protection of soil and water resources, and terrestrial carbon storage. While agro-forests are less diverse than native forest, they do contain a much greater number of plant and animal species than forest plantations.

35 Project Progress Report, for the period March-August 2004.
(Castanopsis sp.), agar wood (Aquilaria crassna), and fruit trees (see Table 1 above for a complete list).

- Medium-term crops have also been planted (e.g., banana, papaya, guava, cardamom, citronella, etc).

16. It should be noted that the crops being cultivated are those with which the villagers are familiar and that were chosen by producers. The village development plan adopted by the community selected the agroforestry option as one with which they were familiar and which they felt would meet their immediate food security needs and provides cash income. After meeting the food needs of the family and community, any surplus harvested is expected to be sold in the nearby provincial market at Xay district; to Chinese traders, for export to China/Yunnan through the Oudomxay border crossing at Ban Ai / Ban Khouang or at Ban Boten, Luang Namtha Province; or, to middlemen for sale in other provincial markets, such as the tourist centre at Luang Prabang.

Producer awareness

17. It is noteworthy that the villagers had sufficient trust in their development plan and in the project that some were willing to forego the planting of upland rice traditionally planted on the sloped lands; which was replaced with the tree, forage, and tuber crops, and forest trees and NTFPs used to control erosion. It is likely that several factors contributed to their willingness to halt shifting cultivation, namely:

- Strict enforcement by local government officials of instructions to halt slash and burn agricultural practices and stabilize shifting cultivation;
- Implementation of the Land and Forest Allocation Program, which requires that land classifications be respected by the community; and,
- The training provided by the project, which raised community awareness of the need to provide better stewardship to the land allocated to the village, with the realization that there would be no additional land made available for cultivation through expansion on to sloped and forested lands.

18. Through the comprehensive PRA and the village planning process undertaken with the project’s assistance, the villagers are likely to have assumed a strong sense of ownership of the agricultural and community development elements of their village development plan. Since the decision to practice agroforestry on sloped lands was their own, using plants and crops with which they were familiar, it is apparent, having seen the results of their willingness to continue, that they had a strong sense of commitment to their actions and believed that the adoption of the new practices would lead to improvements in their lives.

- Although it is not currently apparent that their food security situation has improved --- if anything, with the cultivation of permanent crops in place of upland rice on the sloped lands it is likely that it has become more tenuous --- the community has adapted to a changing situation. They are selling their labour services and growing more vegetables during the dry season.
- The fact that the villagers have been granted usufruct certificates valid for three years for lands allocated to them through the GOL’s Land and Forest Allocation Program also is likely to be a factor in farmers’ decisions to adopt improved land and soil conservation practices. The temporary land use certificates can be renewed by the GOL if the occupant demonstrates his family’s ability to use and develop the land consistent with the land classification system adopted for each village. The opportunity of receiving
more secure title to land is an important incentive for farmers to adopt more sustainable land management practices and to use their land productively.

Being familiar with the crops being cultivated on sloped areas and being aware of the opportunities for their sale in nearby markets and to traders, possibly also served as an incentive for farm families to adopt agroforestry systems. It is expected that women in the community --- in light of their known influence in making decisions related to home finances, food security, and trading of any surpluses from the family farm and of NTFPs --- played a key role in deciding the type and mix of crops planted on the sloped areas. Basically, if the crop could not be consumed by the family, or could not be sold in the market or to traders, it was not planted. However, the planting of the ma kha (Castanopsis sp.), trees were seen as a long-term investment. When questioned why this slow growing indigenous species of forest tree was planted as part of their agroforestry system, the farmers at Ban Khon Kaen responded that the wood would be used by their children and grandchildren to build houses in the future.

Technology
19. Most of the tuber and medium-term crops currently consumed by villagers are harvested from nearby natural forests. The agroforestry model adopted by the farmers and established on their allocated agricultural lands, replicates to some degree the ecological conditions of natural forests. The model contains an integrated diversity of tree and cover crops with which the farmers are familiar. The model is supported by technical assistance from the district extension agents and agricultural technicians assigned to the GAA project.

- In adopting the agroforestry system observed during the site visit, producers are utilizing local wisdom (indigenous technical knowledge-ITK) and blending it with modern technology introduced by the project, to cultivate crops (i) that have proven ready markets, based upon previous experience with the collection and sale of NTFPs; and, (ii) that have the potential for community-based value-added processing, which can provide them with additional income.

Key development factors
20. The key factors that have contributed to the success of the GAA supported project are discussed below.

21. Ownership: The project conducted a baseline survey against which progress can be measured. This was undertaken through the PRA process, in which the villagers played a major role. Subsequent benchmark surveys will demonstrate to the villagers the progress that they have made. The follow up planning process was also village focused, providing ample opportunity for participation by the target beneficiaries and contributing to a sense of ownership of both the resulting development plan and the process of its formulation.

22. Permanence of technical assistance: The long-term presence of the technical assistance provided through the project also is an essential factor contributing to the sense of trust in project decision-making and the commitment of the project to the villagers’ situation. In addition, the fact that 15 district extension agents are assigned to work with the project demonstrates to the communities that even if the project was required to withdraw for some reason, the district extension workers who had been trained by the project, who had participated in the PRA and planning processes, and who were familiar with local conditions as well as the agroforestry system supported by the project, would remain. They would continue to at least be available at the district office for technical consultations if necessary.
23. **Application of indigenous technical knowledge:** The agroforestry model introduced on the sloped lands is one that the farmers designed themselves, largely based on their experiences with NTFPs. They are familiar with the crops planted and are certain that they can consume the output harvested --- thus contributing to family and community food security --- and can sell surplus output in local markets and to traders.

- The fact that they have invested in their land in a sustainable manner and have thus demonstrated good land management techniques, are supplementary benefits of the agroforestry system. They can thus look forward to being granted more secure title to their land from the GOL when the three year usufruct certificates expire.

24. **Accessibility:** The villages in which the GAA supported project is working are located in watersheds, but are accessible via a constantly improving road system in Oudomxay Province and throughout Northern Lao PDR. The improved transport and communications infrastructure facilitates access to local markets for surplus products from the communities and encourages penetration by traders.

25. **Role of the Government:** The GOL has seconded personnel to work with the project. The 15 district agricultural extension agents assigned to the GAA supported project are receiving in-service and on-the-job training and experience that they would otherwise not be able to acquire. They represent permanence to the target groups, who see the presence of GOL staff as an endorsement of the activities being promoted by GAA and a long-term commitment to the agricultural and rural development process. They also provide confidence in terms of the farmers having access to technical information through the extension agents if needed.

26. **Role of the Project:** The GAA approach to development is best summarized in the *Project Progress Report* (for the period March-August 2004) as follows:

> “Enhancing the capacity of project staff and village institutions through participatory planning and implementation processes, as well as building up technical and management capabilities at the village level is meant to increase local participation and ownership in the development process.”

27. The project provides financial and administrative support, management of inputs, and technical assistance in a manner that is not intrusive, but is accommodating to each community's needs, plans, and aspirations. The project responds to the expressed needs of the villagers that are consistent with the objectives of the project; conform to GOL policies; and, enhance sustainable socioeconomic development in the context of cultural integrity and continuity.
**Case Study 4:**

**Agribusiness networking: Coffee Case Study, Champasak Province**

1. Coffee is the largest agricultural export from Lao PDR. Currently an estimated 23,000 families depend on coffee production for a livelihood. For the most part, these producers sell to some 29 companies that are members of the Association of Coffee Exporters, which sells over 10,000 tons of Lao coffee abroad every year, comprising about 3 percent of Lao exports. Coffee production areas in Laos in 2007 covered some 45,000 ha, with 99 percent derived from the south and the majority on the Bolovens Plateaux and in Pakxong District, Champasack Province (from 400 m.a.s.l. to 1400 m.a.s.l.). The principal varieties produced are Arabica and upland robusta (globally unique). In April 2008, the local price of parchment coffee was 20,000 kip / kg and an estimated 10,000 tons was exported from the region in 2007, with a market value of about US$22.9 million.

2. Many coffee farmers participate in contract farming arrangements with local well-known traders and processors. They often sell all or a portion of their crop in advance, while it is still on the bush, for which they receive a significantly lower price, which serves as the interest on the (loan) advance payment. They are then obligated to sell their coffee to these buyers at harvest.

3. The Association des Groupements de Producteurs de Café du Plateaux des Bolovens (AGPC), not yet a member of the Coffee Exporters Association, was organized in November 2006 through the Point d’Application des Bolovens (PAB) with support from the GOL and Agence Française de Développement (AFD). The PAB has made significant progress toward launching Lao coffee as a global brand. For example, AGPC’s coffee recently was granted both ‘Fair Trade’ and ‘Certified Organic’ status by European certifying organizations and is being marketed in Europe. AGPC’s membership consists of 51 producer groups (2,725 families), located in 84 coffee producing villages in three districts of Champasack, Saravane, & Sekong provinces. They produce Arabica coffee on 3,300 ha and robusta coffee on 16,000 ha located on the Bolovens Plateaux (1,100-1,300 m.a.s.l.). Membership fees are 100,000 kip per producer group per year and 20,000 kip per producer per year. Investment in the project has been US$25,000 per group (or per village; not including technical assistance). The AGPC’s objective is to make coffee producers self-sufficient by introducing collective wet mills. The PAB project has plans to obtain a geographic indicator (GI) for coffee sourced on the Bolovens Plateaux to establish an ‘origin’ for the coffee.

4. The AGPC operates through a network of village representatives and officers of each member group. These units are supported by 14 coffee technicians paid by the association (currently supported by the PAB project). In the longer-term, the AGPC aims to resolve the two most serious problems: securing markets for quality Lao coffee; and, identifying sources of credit for use by its members. It also hopes to be able to negotiate higher prices for its members by ensuring volumes and guaranteeing the quality of coffee being sold through the association. Currently, the services provided by the association include:
   - Surveying the production of coffee each season to determine the volume that members can be expected to provide for marketing through the association;
   - Regulating the quality of coffee being provided to buyers by groups and their members;
   - Negotiating prices and signing contracts with buyers on behalf of AGPC members;

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− Monitoring international coffee prices and marketing trends and disseminating this information to members; and,
− Linking farmers to technical advice, advanced coffee production, and processing techniques.

76. Although the institutional capacity and strength of such commodity associations has yet to be conclusively tested, provincial authorities and investors are keenly interest in having them play a greater role in coordinating production with farmers. AGPC members have benefited by moving up the coffee value chain. By adopting improved production technologies, farmers have increased the productivity of their coffee trees, a farm asset. By processing their raw coffee using the wet mills, they are able to add value to their assets and to create wealth, thus alleviating poverty. Working as a group, AGPC members have been economically empowered and are in a better position to negotiate with buyers than they were when they were selling raw coffee beans as individual growers.
Case Study 5: Sustainable Forestry for Rural Development Project

Project Background

1. SUFORD was formulated based on: (a) implementation experiences of the earlier Forest Management and Conservation Project (1995-2000), which successfully demonstrated a highly innovative village forestry approach and the capacity of poor communities to manage high value natural production forests, and (b) the Bank-led Lao PDR Production Forestry Policy Review (2001) and related policy dialogue, which established a consensus with Government on the importance of the country's forest resources for poverty reduction. SUFORD is currently financed by an IDA Credit with parallel financing provided by the Government of Finland.

Project Development Objective

2. The PDO is to assist the Borrower to achieve the sustainable management of production forests to alleviate rural poverty in the Project Provinces by implementing the forest policy reform actions and policies set forth in its Letter of Forest Management Policy.

3. Specific objectives are to: (a) improve the policy, legal and incentive framework enabling the expansion of PSFM throughout the country; (b) bring the country's priority natural production forests under PSFM; and (c) improve villagers' well-being and livelihoods through benefits from sustainable forestry, community development, and development of viable livelihood systems. The project is comprehensive in scope and covers national policy development, field implementation, and capacity development. It is designed along the following four components:
   (a) Support Services of Sustainable Forest Management;
   (b) Sustainable Forest Management and Village Development;
   (c) Forest Sector Monitoring and Control; and
   (d) Project Management.

4. Achievements and Project Performance. Project achievements to date include the establishment of a nationwide Production Forest Area system consisting of 51 PFAs covering about 3.6 million hectares; the development of a national code of practice for production forests and guidelines on revenue sharing and competitive timber sales; and successful implementation of PSFM in eight priority PFAs of four provinces covering about 650,000 hectares. Of these 50,000 hectares (in five sub-forest management areas in two provinces) have been certified in compliance with international standards of the Forest Stewardship Council (FSC)-the only international forest certification of tropical production forests in continental Southeast Asia. Independent audits have reconfirmed the sustainability of demonstrated forest management practices. In addition, village institutions for PSFM implementation and village development (VD) have been established and are functioning in all 18 project districts and 412 villages, with communities participating in all forest management and village development activities, which are funded by timber revenues and supplemental village grants provided by the project. Forest monitoring and control systems have been developed and piloted at a significant scale.

5. Overall implementation performance and progress towards achieving the project objectives have been satisfactory since late 2005 after an initial period of poor implementation during 2004-2005 when the project suffered from weak management and
implementation delays. In response to the agreements reached during the Mid-Term Review of late 2005, important changes were made by the Government that included the appointment of a new Project Director, changes in the technical assistance support staff, simplification of government financial management (FM) and procurement procedures, and improvements in annual planning and coordination between centre and provinces. These changes led to continued improvements in project management as well as field implementation and brought the project fully back on track. Project ratings were subsequently upgraded from unsatisfactory status in late 2005 to satisfactory for both Development Objective and Implementation Progress.

Expected Outcomes

6. The expected outcomes of the project include: (a) strengthened government capacity to effectively lead forest policy formulation and implementation and to provide forest management services at national, provincial and district levels; (b) improved forest management of natural production forests and PFA system as verified through independent forest management certification; (c) community development and improved rural livelihoods through participatory planning and the institution of equitable and fair benefit sharing arrangements from timber sales; and (d) the establishment of efficient forest sector monitoring and control mechanisms.

7. Under the Village Development sub-component, the project will continue to finance incremental operating costs, training for provincial, district staff, and villagers in the preparation of village development plans and provide for village development (VD) grants for the implementation of small-scale village infrastructure and income-generating activities. Implementation of VD grants will be embedded in the PSFM approach and guided by the project VD Manual, including Community Participation in Procurement. Under this component, the project will also develop mechanisms to document and certify transactions for livelihood support carried under the VD grants for inclusion into the VD Manual, such as list of recipients and assistance received and inventories of provided livelihood assets.

8. Forest Cover Monitoring. This sub-component will build on existing work of the Forest Inventory and Planning Division (FIPD) and the recent forest cover surveys and will include: (i) training for FIPD staff in forest cover monitoring based on newly available satellite imagery and point sampling interpretation to most recent forest cover changes for selected ‘hot spot’ provinces; and (ii) development of a comprehensive technical design for an integrated forest inventory and cover monitoring and data management system. This design will take the needs and requirements for monitoring forest cover, forest quality, and, to the extent possible, biomass and forest carbon stocks into consideration to provide inputs into the REDD process. Implementation of such technical design and system may be financed separately under Forest Carbon Partnership Facility (FCPF) or other donors and discussed under the umbrella of the working group on REDD set up by the Government.

9. Internal Control and Management Information System (MIS). This sub-component will support the development of internal control and reporting systems covering forest management operations, conduct of timber sales procedures, and revenue flows. It will support the formulation of management standards to be attained in routine operations and the development of guidelines and protocols for internal control procedures, including field inspections, monitoring of corrective actions, reconciliations of physical and financial projections and realizations, generation of exception reports, and clarification of staff responsibilities at all levels. It will also support the further development of a MIS where all forest management and timber sales information is stored, analyzed, and disseminated along with internal control information for decision-making purposes. This sub-component will be closely integrated with the following sub-component.
10. **External Control and Awareness Building on the Enforcement of the Forest Law.** This sub-component will build basic capacity in the Department of Forest Inspection (DOFI) to become – in partnership with other agencies - effective in preventing, detecting and suppressing crime across the range of forest landscapes and forest products value chains. Project activities will include: (i) Intelligence Systems Development, to establish information tools and capacity to manage and disseminate law enforcement intelligence. This will include the formulation of "red flag" indicators; development of a Case Tracking System to enable case management and handling; and development of procedures for disseminating intelligence to law enforcement agencies and policy making authorities; (ii) Interagency Agreements and Operations, to develop partnerships and engage with other law enforcement agencies (e.g. Customs, Economic Police, the Bank of Lao PDR Anti-Money Laundering Unit, etc.) in their appropriate roles in forest law enforcement. A specific focus will be the development of arrangements with DOF with regard to divisions of labour and protocols that conform with the mandates of each agency; (iii) Law Enforcement Training and Public Forest Awareness, including specialized training to DOFI and DOF (and other agency) staff at national, provincial and district levels, and development and dissemination of public awareness material for the general public and private sector audiences (such as forest industry and agro-industry and mining enterprises) on Lao forest law and law enforcement policies; and (iv) Forest Law Enforcement Strategy, entailing the integration of project experiences and from other sources and the formulation of a long-term and formally endorsed strategy for forest law enforcement in Lao PDR. A detailed technical report on sub-component implementation will be provided separately.

11. **Independent Management Certification.** This sub-component will cover the cost associated with the maintenance of the FSC group certificate held at the DOF and the expansion of the pool of certified sub-FMAs in project areas that have attained PSFM standards.

12. **Project Management.** This component will continue to provide support to facilitate efficient project implementation and coordination between the various government agencies at national, provincial, and local levels under the supervision and guidance of the NSC, DOF, and NPMO. Specifically, the component will support: (i) the establishment of Provincial Implementation Units and capacity building in new project provinces; coordination of annual work planning with other central level agencies and the provinces; (ii) planning for transition to routine operations; (iii) overall financial and procurement management; (iv) annual reporting; and (v) monitoring and evaluation of project activities and updates to the project baseline and indicators.
Case Study 6:

Taniyama-Siam Okra Production, Thateng District, Sekong Province

1. The Taniyama Siam-Advance Agro Company is a Thailand-Japan joint venture located in Thateng District, Sekong Province. The Taniyama Siam Company has had a successful joint venture in Thailand for the production and export of vegetables to Japan for several years before deciding to expand their program to more fertile land in Lao PDR. Taniyama Siam took over the Advance Agro investment in Lao PDR in May 2007, investing approximately US$1.88 - $2.19 million in a 62 ha 30 year land concession. Currently, the company is cultivating okra (*Abelmoschus esculentus*) on the land, which is processed at a small facility located at the site. The okra is processed, packaged, and chilled prior to export to Japan, via the cross-border check point at Vang Tao and Bangkok International Airport. The facility currently processes approximately 500 kilograms of okra daily. The commodity is not organic but integrated pest management (IPM) technology and reduced application of pesticides is employed. The operation utilizes about 200 local labourers and 85 Lao technicians regularly. The target is to raise production to 2.5 tons per year to meet standing orders from Japan of one ton per day.

2. According to the project managers, the local labourers have become increasingly capable okra producers and are able to work without the intensive level of supervision that was required when the project began. The company is planning to expand okra production through contract farming with local farmers using the labourers trained at the project, using the ‘2+3’ approach. This also will allow the company to use the land concession to experiment with other crops, including asparagus and carrots; for export to the Japanese market.

3. This model demonstrates how a relatively small investment was effective in developing a product previously unknown in Laos: okra, which has a niche market in Japan. Some of the critical factors for success would likely include:
   - Previous experience of the company with large-scale okra production in Thailand;
   - Facility in obtaining a land concession in an area with fertile soils;
   - Satisfactory road infrastructure to facilitate the transport of processed okra from Thateng District to the international airport in Bangkok; and,
   - Japanese and Thai technical assistance was available for a reasonable period to train Lao labourers to cultivate a crop previously unknown to them.

4. Although the model is relatively self-contained, it provides a vision of future plantation-style agricultural production, Lao style; with on-site or local value-added processing for export, linked to producers trained in advanced agricultural production techniques by private agribusiness. Farmers who are trained in producing one or more crops at a land concession (or on land rented from local farmers who are then trained and paid to work their own land as company workers) soon realize that they are able to earn more by producing a crop under contract to a company than working as a daily labourer. The straightforward Taniyama-Siam model has the potential to be replicated successfully elsewhere in Lao PDR.

38 The ‘2+3’ approach means that farmers provide land and labor (‘2’) while the investor provides credit, technology, and market access (‘3’).
39 This model is used successfully by the Lao Agro Industry Company to produce sweet corn for export from Thoulakhom District, Vientiane Province)
Case Study 7:

Lao Agro Industry Company, Ltd., Thoulakhom District, Vientiane Province

1. Lao Agro Industry Company, Ltd is located in Thoulakhom District, Vientiane Province. This Lao-Thai joint venture (with River Kwai Farms in Thailand) produces processed vegetables for export to Thailand and Europe with a value of US$1.8 million annually (2007). This firm has been operating in Lao PDR since 1994 and requires approximately 2,000 tons of raw materials annually. Until recently the company was unsuccessful in getting nearby producers to respect contract farming arrangements for the production of sweet corn for canning and export.

2. To introduce the concept of contract farming to farmers, the company began by renting land from local farmers and paying them as day labourers to produce the crop for the company. The farmers receive crop-specific technical training from company technicians during each phase of the production cycle and are paid for their labour on a per hectare basis. The farmers benefit by being paid for their labour and renting their land, as well as learning industry-best crop production techniques.

3. After three years, participating farmers observed a significant increase in the productivity of their land used for the promoted crops. This is a result of the systematic application of a package of improved seeds, organic matter, and chemical fertilizers. In addition, when farmers realize that they can increase on-farm household income by becoming contract farmers to the company, most stop being agricultural labourers and return to being contract producers of a high quality crop for sale to the local processing company. The company prefers to contract with farmers who are nearby so as to have a large area of land that is easily monitored and managed.
Case study 8

Jasmine Rice in the Weeping Plain: Adapting Rice Farming to Climate Change in Northeast Thailand

1. Yasothorn Province located in north-east Thailand is one of the 10 poorest provinces in Thailand. In 2007, farmers in Yasothorn experienced the longest dry spell during a rainy season in decades. The dry spell, lasting from June until late August, reduced crop yields, lowering farmers’ income and reducing their food security. Rainfall records for Yasothorn in the last decade show that the rains are arriving later and later each year, from a few days late to many weeks. Almost 90 per cent of people living in Yasothorn province are farmers, and most of their cultures are rain-fed, with no irrigation facilities. In Thailand, farmers often grow sticky rice for home consumption and jasmine rice for commercial sale.

2. Jasmine rice is light-sensitive and has to be grown during particular months of the year; so when there is no rain, rice plants are left to wither in the scorching sun. When seasons start late and rain does not fall, the impact on rice yields is significant. Combined with rises in temperature, this means that Thailand’s biggest production hub suffers greatly. Irregular weather in the form of hot and cold spells also causes pest attacks on rice crops and fungal disease, reducing the quantity and quality of the crops.

3. Under the project implemented by Oxfam corporated by local organisation Earth Net Foundation (ENF) since 2004, organic agricultural production and fair-trade marketing with farmers in Yasothorn province has been promoting. The project has provided climate-change information to farmers with participatory decision making, provided loans to project participants, set up on-farm water-management systems; in particular, crop diversification has been adopted as a way to attain food security and economic security in times of rice production uncertainty.

4. Farmers, especially women, planted fruits and vegetables during and after rice cultivation; the produce not consumed by their households could be sold at local markets, earning them around 500–1,500 baht (US$ 15–40) a week. More than 90 different types of plant were grown across the project area, and trees were used to shade certain plants from the harsh temperatures, with an apparent improvement in growing conditions.

5. Benefit from the project, farmers could:
   - Participate from the beginning of the project, and the participatory evaluation system also enabled farmers to effectively solve problems together as a group, rather than trying to cope alone;
   - Provided loans of up to 30,000 baht (US$ 880), which is offered at low interest rates (1–3%) for 1–6 years with the fund from the Water Management in Organic Agriculture Fund established by ENF;
   - Take part in managing the budget of the water management fund. The returned money from this farmer will be lent to new farmers to invest in their own water-management systems, and to existing members to develop their systems further.

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40 Supaporn Anuchiracheeva, Tul Pinkaew. Case Study: Jasmine Rice in the Weeping Plain: Adapting Rice Farming to Climate Change in Northeast Thailand. Oxfam Disaster Risk Reduction and Climate Change Adaptation Resources)
• Improve their knowledge continually and apply this to their existing experience and practice. This enabled them to design and implement appropriate and effective farming and water-management systems.

4. The efficiency of the project:

• The satisfaction level on learning process support was as high as 96.4%, as a result of farmers’ participation in designing the learning process;
• All households were more food secure than before;
• Rice, vegetables, meat, and fruits consumed, more than 90% was grown by the families, and less than 10% purchased from outside;
• 100% of the farmers who took part in managing the budget of the water management fund were able to return the money as agreed;
• More than 90% of participants agreed that the water management systems reduced the impacts of drought and long dry spells.
Case study 9

Changing crops calendar to adapt to climate change in Quang Tri province, Vietnam

1. The central coastal province of Quang Tri is one of the most vulnerable to natural disasters in the whole of Viet Nam. The province is also environmentally fragile. It is not just flooding and drought. A hot and dry strong wind known as the Lao wind blows through the province from late April to mid September setting the temperature above 37°C some days. The wind dries up trees, plants, ponds and lakes, increasing the risks of fire. Deforestation, saline intrusion and regular typhoons compound the fragility.

2. The project called “changing crops calendar” was conducted by local government with support from local NGOs is a success measure in order to help local community adapt to climate change. The primary measures for adapting to climate change in agriculture are enhancing the varieties and changing the harvest time. Farmers in Quang Tri province were adapting their agricultural cycles to try and harvest rice and other crops before the main flooding season. This was helped by using a different type of rice seed that had a shorter crop cycle, or planting more resilient crops like lotus plants. Besides, villagers try to sell their livestock before the main flooding season, rather than keeping them for the TET celebrations (usually in February). Some farmers had swapped the second rice crop for cassava and green peppers because it can survive the seasons better.
Case study 10

Village Forest Protection Regulations in Vietnam: strengthening participation in natural resource management

1. The method of protecting forests reported here was introduced by the Social Forestry Development Project Song Da, a technical cooperation project between the Governments of Vietnam and Germany in the provinces of Lai Chau and So La in Northwest Vietnam. The area is inhabited mainly by Thai and Hmong ethnic minorities, who together represent almost 65% of the population. The rest are mostly members of the Kinh majority.

2. Traditionally, forest areas regarded as important for watershed protection have been maintained, keeping their ecological functions intact. Locally, where forest resources had become scarce, indigenous systems of forest protection and regulated utilization evolved. Their system of shifting cultivation intersperses forest and upland plots and incorporates various species of useful trees. Tree ownership may be distinct from land ownership, particularly in the case of host trees (Dalbergia hupeana) on which the insects that produce the resin used in shellac production live. Remaining forest areas are located on steep slopes and on limestone mountains. These forests provide timber for house building and fuelwood, and NTFP. Traditionally, there is a common understanding that the forest is a resource to which everyone has free access. However, traditional rules limited unsustainable resource utilization.

3. With the cooperation of the Forest Protection Department of Son La province, the SFDP began in late 1998 to develop a method of protecting forests and regulating their exploitation at village level. The government had identified such a need, and wished to improve farmers ability to analyse their forest resources and traditional rules. The aim of the project was to develop and adopt regulations that would respond to the needs of both farmers and the government and which could realistically be enforced. Consequently, traditional rules and resource management techniques were identified and integrated into the regulations. Primary responsibility was handed over to the community itself rather than to external agencies. Up to now, over 500 villages have developed and adopted their own sets of regulations.

4. To date, Forest Protection and Development Regulations have been approved and have legal force in both provinces. They are implemented by the Forest Protection Department, drawing on the national budget. This institutionalization of the process is considered crucial to ensuring continuation even after the project has ended.

5. The regulations have been established in more than 500 villages in the two provinces so far and implementation is continuing. Experience shows that villagers have become more aware of their forest resources and are committing far fewer violations. Incorporating existing and traditional rules of the community into the regulations increased their acceptance among villagers and ensured an independent commitment. Once regulations have been established, farmers feel responsible for their enforcement, since they drafted them themselves. This reduces the costs of external monitoring and ensures the long-term sustainability of the approach. Many villagers are concerned enough to protect certain forest areas voluntarily, without financial reward. The quality of the forests has improved remarkably; the incidence of forest fires in the dry season has fallen substantially and uncontrolled logging no longer takes place. For the people, the regulations combine responsibilities with benefits, so that forest protection and development becomes a concern of all.

Source: [http://www.unesco.org/most/bpik11-2.htm](http://www.unesco.org/most/bpik11-2.htm)
Annex 3: Documentation of Consultative Processes

Workshops, meetings, written comments, matrixes, other feedback from

- MAF Depts
- Other Ministries
- Provinces and districts
- Development partners
- Private sector
- other

To be updated continuously until end of the process (approval by Minister)

About 2 pages to be inserted
# Annex 4: List of References

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