MINISTRY OF AGRICULTURE AND FORESTRY

NATIONAL AGRICULTURE AND FORESTRY RESEARCH INSTITUTE

Lao PDR

STRATEGIC PLAN 2005 – 2010

August, 2004
Foreword
(to be written)
Acronyms

ADB    Asian Development Bank
AEZ    Agro-ecological zone
AFMRC  Agriculture and Forestry Machinery Research Centre
AFTA   ASEAN Free Trade Area
AgGDP  Agricultural Gross Domestic Product
APPFC  Administration, Personnel, Planning, Finance and Cooperation Division (NAFRI)
ARC    Agriculture Research Centre
CRC    Coffee Research Centre
FAO    Food and Agriculture Organization of the United Nations
FRC    Forestry Research Centre
FY     Fiscal Year
GDP    Gross Domestic Product
GOL    Government of Lao PDR
HRC    Horticulture Research Centre
HRD    Human Resource Development
HRM    Human Resource Management
ISNAR   International Service for National Agricultural Research
IUARP  Integrated Upland Agricultural Research Project
Lao PDR Lao People's Democratic Republic
LARRC  Living Aquatic Resources Research Centre
LRC    Livestock Research Centre
LSUAFRP Lao Swedish Upland Agriculture and Forestry Research Project
MAF    Ministry of Agriculture and Forestry
NAFES  National Agriculture and Forestry Extension Service
NAFRC  Northern Agric. and Forestry Research Centre
NAFRI  National Agriculture and Forestry Research Institute
NGO    Non-governmental organization
NGPES  National Growth and Poverty Eradication Strategy
NUOL   National University of Laos
PM&E   Planning, Monitoring and Evaluation
S&T    Science and Technology
Sida   Swedish International Development Agency
SOE    State-owned Enterprise
SSLRC  Soil Survey and Land Classification Centre
TRIPS  Trade Related Aspects of Intellectual Property Rights
UNDP   United Nations Development Program
WTO    World Trade Organization
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Executive Summary

Agriculture and forestry play a key role in the processes of sustainable development and poverty eradication in Laos. To support the agricultural development process the Government of Laos has given high priority to agriculture and forestry research, especially through the establishment in 1999 of the National Agricultural and Forestry Research Institute (NAFRI). NAFRI has received strong support from international organizations and has, in a relatively short period, established itself as the key national organization in agricultural research with a number of notable achievements in the generation and dissemination of new technologies and in agricultural and farming systems research.

NAFRI is presently implementing a strategic plan for the period 2001 – 2005 and has started early in 2004 on the development of a new strategic plan that would reflect the many changes that have taken place at NAFRI and in the environment in which it operates and help the organization to respond to new challenges.

NAFRI has been supported by many donors, especially by the Sida funded Lao-Swedish Upland Agricultural and Forestry Research Project (LSUAFRP). Besides supporting research work in the Northern Uplands of Laos, LSUAFRP has recognized the need to support the institutional development of NAFRI, which is still an organization in its early stages of development with limited capacity in a number of important areas.

Following a visit to the International Service for National Agricultural Research (ISNAR) by a NAFRI team and external advisors in November 2003 it was decided to contract two consultant with experience in strategic planning for agricultural research organizations to assist NAFRI in developing a new strategic plan, using participatory methods developed at ISNAR. The process started in late January 2004 and was completed in June 2004.

The strategic planning exercise was undertaken by a team from NAFRI with facilitation by external consultants. The approach followed focused on the identification of strategic issues in NAFRI’s internal and external environment through a structured consultation process with internal and external stakeholders. The strategic issues formed the basis for the elaboration of strategies to address the issues. In addition, NAFRI requested to include in the strategic plan an analysis of commodity and non-commodity research areas. Participation of internal (NAFRI) and external stakeholders was achieved through three workshops: on NAFRI internal strengths and weaknesses, on NAFRI’s external environment, and on NAFRI research priorities. Technical meetings and working session were held with the strategic planning team appointed by NAFRI to develop strategies and review priorities.

This report is structured as follows:

Chapter 1 provides a brief overview of developments in the agricultural and forestry sectors in Laos. It presents key GOL policies that affect the agricultural and forestry sectors. These include policies for socio-economic development, especially the National Growth and Poverty Eradication Strategy, as well as policies that affect NAFRI as
an organization and its work in the upland areas of Laos.

Chapter 2 presents an overview of NAFRI’s current situation. It starts with a presentation of NAFRI’s most important outputs (technologies, management practices, training, dissemination, publications, and services). It then reviews NAFRI’s existing strategies; it describes the organization’s governance, organization and structure; it discusses NAFRI’s current management processes and presents a brief overview of the resources at NAFRI’s disposal.

Chapter 3 presents the analysis of strengths and weaknesses in NAFRI’s internal environment based on the result of a stakeholder workshop and technical meetings with NAFRI staff. Strengths and weaknesses are discussed in relation to NAFRI policies, governance and mandate, its structure and organization, its research management processes, its resource management, its partnerships with other organizations and its programs and activities.

Chapter 4 analyzes threats and opportunities in NAFRI’s external environment. It discusses changes in the international context (markets), national context changes (policies), and changes at the provincial and district levels that affect NAFRI. The chapter also presents an overview of the institutional and policy environment and the key actors that play a role.

In Chapter 5, NAFRI strategies are presented for internal and external issues and constraints. Internal environment strategies are presented under the following headings:

- Governance and mandate
- Structure, organization and coordination
- Research planning, monitoring and evaluation
- Human resources management
- Management of other resources
- Management of partnerships and linkages
- NAFRI Programs and activities

Strategies that address issues in NAFRI’s external environment include:

- Policy and governance issues
- Institutional and research actor issues
- Socio-economic issues
- Resource issues
- Planning and implementation issues

Chapter 6 presents the results of the national level priority setting for NAFRI, describing methods and procedures used, and the results of the commodity and non-commodity priority setting work, both overall for NAFRI, as well as for each of its Centers.

Finally, Chapter 7 provides a summary overview of the main adjustments that NAFRI will need to make in order to meet internal challenges and to reposition itself in a rapidly changing environment.
Chapter 1. Introduction

1.1. The agriculture and forestry sectors in Laos

1.1.1 The importance of agriculture and forestry in the economy

Agriculture and forestry provide the economic, social and cultural base for over 80% of the population and account for more than 50% of GDP (National Growth and Poverty Eradication Strategy, p.54). Rice is the most important crop and accounts for 40% of agricultural output. Steady production increases have made Laos self sufficient in rice. Other important crops/commodities include: tobacco, coffee, cotton, and sugarcane, of which coffee is the main export earner. Livestock and fisheries are important sources of protein as well as of cash income, with livestock and fisheries accounting for 18% of GDP or about 40% of AgGDP (1999 MAF strategy; 2002 Asian Development Bank Review of the Livestock Sector).

Agricultural production has grown steadily over the past decade, by 4-5 percent annually; it has grown primarily in response to irrigation investment and related measures. Other high growth agricultural subsectors include livestock and fisheries with growth of 50 and 160% respectively since the mid 1990s.

Lao forests make a significant contribution to the national economy and to rural livelihoods, especially those of the poor and of ethnic groups. Forestry plays an important role rural people. Rural households, especially the poor and ethnic groups depend heavily on forests for timber, non-timber forest products (NFTPs), such as food, fiber and medicine. Sales of NTFPs may account for over 50 percent of family income in rural upland areas.

Forestry and associated industries provided some 7-10 percent of the Gross National Product (GNP) in 1999 with the forestry sector itself contributing some 5 percent. Forestry’s share in national export earnings amounted to 34 percent of export value, while log royalties contribute around 10 percent to Government revenue. In the 1990s the forestry sector grew faster than the rest of the economy, reflecting an increase in log extraction. Since then, however, Government reduced the annual harvest and intends to reduce it further in the near future, while at the same time the promoting downstream processing.

The GOL is well aware of the risks of overexploitation of forest resources by logging, and unsustainable agricultural practices and has put in place policies, strategies and legal measures to ensure the conservation of forest resources and their long-term sustainable contribution to national development (Forestry Strategy to the Year 2020, 2004).

1.1.2 The resource base

It is estimated that at present around 40 percent of the national land area is under forest cover. Agriculture uses 750,000 ha or 3 percent of the land. Permanent pastures cover around 710,000 ha. Irrigated land is estimated at 156,000 ha in the wet season.
Dry season irrigation has expanded rapidly from 28,000 in 1996, to 87,000 in 1999. Upland areas are characterized by shifting cultivation as the main production system.

Water is a key resource to the national economy. There is a large potential to harness water resources for the generation of hydropower, as well as for the expansion of irrigation. To realize this potential for hydropower development in a sustainable manner, integrated water management procedures are needed to protect the forest cover in the watershed areas where schemes are planned.

Expanded irrigation is a key policy goal of the government, to increase agricultural production and productivity. In recent years in lowland areas dry season irrigation has increased rapidly allowing for more intensive production in high potential areas. A variety of large and small scale irrigation schemes is needed for different types of zones. The GOL is promoting the development of community managed irrigation systems, empowering water users through water user associations.

1.1.3 Land management
Land is state-owned and leased to farmers for long-term use. The land law arranges for the allocation of land use rights to families with a maximum of one ha for paddy rice, three ha for orchards and up to 15 ha of grassland for livestock.

In upland areas shifting cultivation forms the basis of agricultural production. It is a sustainable form of production as long as fallow periods are sufficiently long for soil fertility to be restored. Fallow periods are becoming shorter as a result of increased population pressure. The policy of the GOL is to stabilize and reduce the area under shifting cultivation through a variety of measures and schemes including resettlement of upland villages and the introduction of sustainable production systems such as agroforestry and plantation forestry.

1.1.4 Production systems
Lao agriculture is characterized by two main agroecological systems: the first based on lowland paddy rice cultivation along the Mekong River, the other based on shifting cultivation in the mountainous upland regions, in the North, East and South. More specifically six farming systems may be distinguished:

1. Rainfed paddy-based systems, mostly in flatland areas
2. Irrigated paddy-based systems in lowland areas
3. Mixed shifting cultivation and paddy systems, found at middle altitudes
4. Shifting cultivation in upland areas
5. Plateau farming system based on shifting cultivation and tree crops
6. Highland subsistence cultivation with some cash sales

Cropping systems in upland and mountainous areas are often complex and highly diversified in comparison to lowland rice based systems. Upland agriculture relies on a combination of (swidden) agriculture, livestock, wood and non-timber forest products and legal and illegal cash crops. Lao’s ethnic minorities are predominantly living in remote areas and their livelihoods are based predominantly on highly diversified farming systems.
Livestock plays an important role in all farming systems for animal traction, for manure, as an investment and as a source of food. As in most countries in Asia animal production is growing faster than crop production.

As the country has achieved self-sufficiency in rice production, and with limited prospects for exports, a key policy is to diversify agricultural production by expanding the cultivation of other crops such as maize, soybean, groundnut, vegetables and other crops for food, feed and fiber.

1.1.5 Agricultural and forestry production patterns

The most important commodities are presented in Tables 1 and 2. Basic data on livestock production are presented in table 3.

### Table 1.1 Crops area, production and yield in Lao PDR 2000-2002

<table>
<thead>
<tr>
<th>Crops</th>
<th>Harvested area (ha)</th>
<th>Production (Ton)</th>
<th>Yield (Ton/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Total</td>
<td>719,370</td>
<td>746,775</td>
<td>738,104</td>
</tr>
<tr>
<td>Lowland</td>
<td>475,470</td>
<td>486,770</td>
<td>519,471</td>
</tr>
<tr>
<td>Irrigated</td>
<td>91,800</td>
<td>102,200</td>
<td>84,000</td>
</tr>
<tr>
<td>Upland</td>
<td>152,100</td>
<td>158,005</td>
<td>134,633</td>
</tr>
<tr>
<td>Maize</td>
<td>49,000</td>
<td>43,870</td>
<td>44,956</td>
</tr>
<tr>
<td>Cassava</td>
<td>99,999</td>
<td>1,170</td>
<td>4,125</td>
</tr>
<tr>
<td>Sesame</td>
<td>5,280</td>
<td>5,509</td>
<td>3,312</td>
</tr>
<tr>
<td>Sweet potato</td>
<td>19,400</td>
<td>16,320</td>
<td>19,498</td>
</tr>
<tr>
<td>Mungbean</td>
<td>1,300</td>
<td>2,360</td>
<td>3,393</td>
</tr>
<tr>
<td>Soybean</td>
<td>6,400</td>
<td>3,280</td>
<td>3,565</td>
</tr>
<tr>
<td>Peanut</td>
<td>12,600</td>
<td>12,100</td>
<td>13,680</td>
</tr>
<tr>
<td>Other legumes</td>
<td>3,263</td>
<td>1,950</td>
<td>1,874</td>
</tr>
</tbody>
</table>

### Table 1.2 Other crops: area, production and yield in Lao PDR 2000-2002

<table>
<thead>
<tr>
<th>Industrial Crops and Vegetables</th>
<th>Harvest Area (ha)</th>
<th>Production (ton)</th>
<th>Yield (ton/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco</td>
<td>6,700</td>
<td>5,060</td>
<td>5,476</td>
</tr>
<tr>
<td>Cotton</td>
<td>4,700</td>
<td>3,510</td>
<td>3,330</td>
</tr>
<tr>
<td>Coffee</td>
<td>29,402</td>
<td>32,220</td>
<td>36,254</td>
</tr>
<tr>
<td>Tea</td>
<td>560</td>
<td>440</td>
<td>345</td>
</tr>
<tr>
<td>Sugar cane</td>
<td>8,400</td>
<td>6,590</td>
<td>6,631</td>
</tr>
</tbody>
</table>

**Vegetables**

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Harvest Area (ha)</th>
<th>Production (ton)</th>
<th>Yield (ton/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chilly</td>
<td>1,560</td>
<td>6,724</td>
<td>46,454</td>
</tr>
<tr>
<td>Water Melon</td>
<td>320</td>
<td>4,918</td>
<td>82,945</td>
</tr>
<tr>
<td>Other vegetables</td>
<td>104,700</td>
<td>109,590</td>
<td>98,241</td>
</tr>
</tbody>
</table>

August 14, 2004
Table 1.3 Number of Livestock in Lao PDR 2000-2002

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Traditional</th>
<th>Modern</th>
</tr>
</thead>
<tbody>
<tr>
<td>'000 Hd</td>
<td>2000</td>
<td>2002</td>
</tr>
<tr>
<td>Buffaloes</td>
<td>1028</td>
<td>1089</td>
</tr>
<tr>
<td>Cattle</td>
<td>1100</td>
<td>1207</td>
</tr>
<tr>
<td>Pigs</td>
<td>1425</td>
<td>1416</td>
</tr>
<tr>
<td>Goat/sheep</td>
<td>121</td>
<td>128</td>
</tr>
<tr>
<td>Poultry</td>
<td>13094</td>
<td>15274</td>
</tr>
</tbody>
</table>

1.2 Government Policies for the Agriculture and Forestry sectors

The main development objectives of GOL for the agriculture and forestry sector can be summarized as follows:

- Ensure food security for all Lao people
- Maintain an agricultural growth rate of 4-5 % p.a.
- Promote commodity production, especially for export
- Stabilize shifting cultivation, and eradicate poppy cultivation
- Diversify, and modernize the agriculture and forestry sector
- Conserve the environment, and protect species and habitats
- Maintain healthy, productive forest cover and generate a sustainable stream of forest products
- Improve rural livelihoods

The most important agricultural policies and priorities are presented in the National Growth and Poverty Eradication Strategy (NGPES):

- Transformation from subsistence to commercial farming
- Market orientation: removal of distortions for agribusiness, improve credit availability, land entitlements, grading and certification, processing, trade facilitation, cross border trade
- Decentralization and participatory planning, strengthening PAFOs and DAFOs, and transform MAF to become farmer service organization,
- Diversification, based on multisector approaches, address shifting cultivation and poppy cultivation,
- Technology transfer: integrated extension system, upgrade NAFES capacity, ensure that research (NAFRI) and extension (NAFES) are demand-driven, demonstrations in farmer fields, area based technology development
- Sustainability: capacity building, training, enforcement, control of unsustainable practices.
- Strengthen rural communities: farmer organizations, feeder roads, rural finance, farmer training, agro-processing
1.3 Role of NAFRI research for development

The National and Agriculture and Forestry Research Institute (NAFRI) was created in 1999 by combining existing agriculture, livestock, fisheries and forestry research centers, with the tasks of designing, implementing and coordinating all agriculture and forestry research in Lao PDR. NAFRI’s mandate consists mainly of the following responsibilities:

1. Organize natural resources assessments and socio-economic studies within agriculture, forestry and fisheries to support land use plans and the development of agriculture, forestry and fisheries production in accordance with the potential of the agro-ecological zones.
2. Manage plant and animal genetic resources through selection, multiplication and production of plant varieties, animal breeds, fish species and forestry varieties for increased production and processing.
3. Produce and disseminate information on agriculture, forestry and fisheries production practices and technologies.
4. Test machinery and equipment for agriculture production and do research on agriculture and forestry processing techniques and technologies, combining local knowledge with global technological knowledge.
5. Undertake research on forages and fodder trees, improved use of feed from locally available resources and manufactured feed to improve smallholder production, and promote industrial processing of livestock and fisheries products for domestic consumption and future export.
6. Adopt agriculture, forestry and fisheries research strategies with due consideration to the potentials of different agro-ecological zones and the government economic development programs.

NAFRI will also play a major role in the National Growth and Poverty Eradication Strategy (NGPES) with research and services that improve agricultural productivity by providing improved technologies and information for crops, livestock, forestry and aquatic resource production. These research outputs will address poverty by raising productivity at household levels to achieve food security and income increases, diversifying farmer production, and promoting biodiversity and natural resource sustainability.

NAFRI, at its Headquarters outside Vientiane, has three supporting divisions to assist in the operation and administration of the institute:

1. Administration, Personnel, Planning, Finance and Cooperation Division (APPFC)
2. Research Management Division
3. Information Management and Strategic Planning Division

NAFRI’s research work is done in nine agricultural and forestry research centers

1. Forestry Research Centre (FRC)
2. Soil Survey and Land Classification Centre (SSLC)
3. Agriculture Research Centre (ARC)
4. Livestock Research Centre (LRC)
5. Living Aquatic Resources Research Centre (LARReC)
6. Horticulture Research Centre (HRC)
7. Coffee Research Centre (CRC)
8. Northern Agriculture Research Centre (NAFRC)
9. Agriculture and Forestry Machinery Research Program (AFMRP)

The Centers are located in and around Vientiane, with the exception of the NAFRC in the North and CRC in the South. NAFRC was designated a regional research center for the northern part of Laos in 2003. It has been given expanded responsibilities for applied research and dissemination for the northern region, and research stations and experimental fields formerly used by national centers have been reallocated for their use. These include the agricultural research station at Houaykhot, the forestry research station at Kengben, and the agroforestry research station at Thongkhang.

Chapter 2 presents more detail about NAFRI’s current resources and programs.
Chapter 2  NAFRI – The Current Situation

2.1 Research, service and production outputs

NAFRI has recently celebrated its 5th anniversary and still is a relatively young institution. Yet, the organization has made significant progress in building its capacity from a limited base, and establishing its research and service activities. NAFRI is recognized as the key organization in the emerging national research and technology system in Laos. NAFRI has received strong support from the international donor community. GOL support to NAFRI has been strong as witnessed by the fact that NAFRI is the largest unit of the MAF. In recent years however Government support appears to have declined somewhat as a result of zero growth policies for the public sector and budgetary constraints.

NAFRI’s outputs are mainly achieved through the research and service activities undertaken at the nine research centers. Irrespective of their mandate, most agricultural research organizations, including NAFRI, produce a variety of outputs including new technology, information, dissemination, training and public services and production activities. As will be discussed below most of NAFRI’s Centers have limited capacity to produce outputs. Still, NAFRI Centers are producing important outputs as may be seen from Table 2.1, which presents research outputs under five categories: technology, information, dissemination, training and production/service activities.

NAFRI Centers produce a wide range of technology outputs. Recommendations on improved varieties for different regions and production systems are the most important output in this category. Production system technologies, land management technologies and improved cultural practices are also important outputs. In addition there are feeding and nutrition recommendations for animals and fish, soil maps, and other studies. Except for rice and maize, little breeding work seems to be on-going either in the crops or the livestock sector. All Centers are involved in providing information through publication such as research and technical reports, and materials for extension and farmers.

Most Centers are directly involved in technology transfer activities through on-station and on-farm demonstration trials, farmer-to-farmer visits, farmer technology testing etc. Also most Centers are involved in training activities for farmers and extension workers; and they frequently provide on-the-job training opportunities and internships for university students.

Finally, most Centers are involved in production activities providing improved seeds and planting material for a wide range of commodities including rice, maize, vegetables, coffee, fruit trees, teak and other agroforestry species, fish fingerlings, piglets and others. Most materials are provided free of charge to small farmers and at cost to private sector and projects. As long as there is limited activity from private sector seed and breeding companies in Laos there is an important role for NAFRI to provide farmers with improved genetic plant and animal materials. NAFRI should however anticipate and plan for the time that the private commercial sector can provide improved inputs.
2.2 Analysis of existing strategies for NAFRI

Since 2000 MAF and NAFRI have presented a number of development and research policy and strategy documents that provide an important background for the development of new strategies in 2004. NAFRI has developed an overall research strategy and, with support of the LSUAFRP produced strategies for selected NAFRI Units. A few NAFRI Centers (LARRGeC and FRC) have also produced strategic plans which are not reviewed here.

It needs to be mentioned that the status of the documents reviewed is often unclear. In most cases the most recent version appears to be a draft document that has not (yet) been approved and published by NAFRI or MAF. The most important documents are:

- NAFRI Research strategy 2001-2005
- Forestry Strategy to the Year 2020 (MAF, 2004)
- Master Plan for Integrated Agricultural Development (MAF, 2002)
- NAFRI Human resources strategy 2003-2010
- NAFRI Information development strategy 2003 -2010
- Strategic vision for the Socio-Economic Unit of NAFRI

The NAFRI strategy 2001-2005 focuses exclusively on research strategies (excluding organizational development strategies). The main strategies are presented in summary form.

Strategies for the management of natural resources address:
- the classification of agricultural and forest land
- Definition of technical measures for maintaining and improving soil fertility in relation to soil type.
- techniques in forest management and planting of different forest types
- Identification of suitable temperate and tropical crops and fruit trees
- Research on management of natural and irrigation water resources
- The balance between the use of biological and chemical (pesticide, herbicide and fertilizer) measures

Strategies for genetic improvement and management are presented for different subsectors. For crops research the main strategies are:
- Do research on selection and crossing of rice lines for intensive lowland cultivation
- Selection of varieties of maize, beans, vegetables, and fruit trees for use in intensive cultivation in focal lowland areas, and mountainous and sloping lands
- Do research on industrial crops such as coffee, cardamom, tea, cotton, sugar cane, tobacco, and other crops

For livestock research the following strategies are presented:
- Research and recommend improved management practices for the breeding and production of cattle, goats, pigs, chicken, and ducks under extensive conditions
- Research on improved management practices for cattle and buffalo used for draft, and milk and meat production

For fish species the following strategies are identified:
- Research on fish integrated with farming systems, fish nutrition and feeding.
• Research and introduce food-processing techniques for fish products as a source of protein for livestock production.
• Research and identify ways to manage fishing in water catchment areas of the Mekong and its tributaries to preserve and develop existing resources.

**Forestry** research should focus on:
• Tree species and production forest areas to supply raw materials for processing industries.
• Trees and technical inputs for planting different tree species, e.g. for mountainous areas, to ensure rapid coverage and prevent soil erosion.
• Forestry products and non-timber forest products which can be used to produce high value consumer goods.

Non-commodity research on **technical inputs** requires research on:
• Technical improvements in producing organic fertilizer and compost from various sources.
• Improved technical measures related to the use of chemical fertilizer.
• Utilization of locally available feed resources, such as industrial and agricultural by-products.
• Integrated pest management.
• Mechanization of agricultural production to reduce labor input and costs.

The **Forestry Strategy** to the Year 2020 (MAF, 2004) presents the main objectives for the sector and specifies some research and extension priorities. The main sector objectives are:
• Build capacity with GOL and stakeholders in the forestry field.
• Control processes that have led to reduced forest cover.
• Improve of rural poor who depend on forests for their livelihoods.
• Develop and enforce effective legislation and regulation.
• Establish sustainable forest management.
• Protect resources and biodiversity and ensure sustainable management of NTFPs.

In forestry research capacity building, coordination, information exchange, and the development of research plans are highlighted as key tasks.

The **Master Plan for Integrated Agricultural Development** in Lao PDR (October 2001) defines 11 high priority agricultural development projects. NAFRI would play a role in only some of these.
1. Aquaculture improvement and extension.
2. Fish seed center rehabilitation.
3. Animal health and quarantine.
5. Rural Aquaculture development.
6. Sustainable management and use of NTFPs.
7. Outer city horticulture promotion.
8. Rice seed multiplication and improvement.
9. Processing and marketing of NTFPs.
10. Basic seed production technology improvement.
11. National animal health center improvement.
NAFRI’s Human Resources Development Strategy for 2003 to 2010 (final draft) presents the staff situation at NAFRI (see also section 2.4.2 below). The strategy distinguishes between human resource management (HRM) and human resource development (HRD) issues, and indicates that an important part of the HRM function is controlled by the Department of Personnel of the MAF. Similarly, staff based in the provinces are administratively attached to the relevant PAFO office, while they are technically under NAFRI. This gives NAFRI the responsibility for HRD issues, while it has little control over HRM.

The most important training and development needs for NAFRI staff were identified as: English language training, training in research methodologies, and training in management techniques (including HRD capacity at NAFRI).

A constraint is that NAFRI has no specialized HRD Department (these functions being part of the responsibilities of the Administration, Personnel, Planning, Finance and Cooperation Division (APPFC) as HRM issues are handled at MAF level.

The strategy document presents a number of different types of non-formal and formal, short-term and long-term, national and international training activities, but does not present specific proposals for numbers of staff to be trained at different levels in different years and by subject area; nor does it present budgetary requirements and donor funding opportunities for training and staff development.

NAFRI’s Information Service Strategy (2003-2010) presents four main objectives for the period:

- Improve NAFRI’s capacity to manage information needed for research.
- Develop information communication technology
- Promote learning within NAFRI by establishing information exchange and communication mechanisms.
- Improve the capacity of NAFRI staff to use and deliver information.

Overall strategies include the creation of a learning environment to build information capacity, the establishment of mechanisms for feedback and communication, improving NAFRI’s ability to access and use information, and integrate information with the broader NAFRI institutional change process.

The information strategy is built around three core components:

1. Information Management Systems – including library, MIS, and scientific information, especially on natural resources,
2. Information technology – networks and infrastructure development, internet and email establishment, and training
3. Documentation, dissemination and communication – capacity development for researchers to document and disseminate research results for improved research and decision-making

The information strategy highlights the key role of different types of information (technology) for NAFRI, identifies priority areas for development, relates information issues to the wider NAFRI institutional capacity building process and presents some proposals for strategy implementation, notably on organizational set-up and training needs.
The **Strategic Vision for the NAFRI Socio-Economic Unit** was published in 2003. It has a Social Team and an Economic Team, consisting of two staff each, a Team Head and a Technical Advisor. There are more demands for the research and service support than the Unit can provide. The current program of work focuses mainly on the northern provinces, especially on the districts where LSUAFRP is working. The main activities of the Unit include:

- Diagnostic research and livelihood studies in the North
- Base-line surveys
- Marketing studies (e.g. on the prospects for rubber)
- Village level studies on shock coping mechanisms
- Studies on Land Use Planning and Land Allocation
- Adoption studies

Service activities include research monitoring and evaluation, methodology development, gender mainstreaming, and network coordination.

The Unit plans to expand significantly in capacity over the coming 5-10 years, expanding the scope of its work significantly. Its main strategies include:

- On the job training and technical assistance to upgrade capacity in the short run
- Human resource development to expand longer-term capacity
- Networking to attract research collaboration, add technical assistance and build capacity.

### 2.3 Current structure and organization

#### 2.3.1 NAFRI Governance

NAFRI governance is about the way that the organization is steered and directed to achieve its policy goals and objectives. Governance can be discussed at two levels: external governance which relates to guidance provided by the organization’s parent body, and internal governance of the NAFRI system, which relates mainly to steering and coordination between its Headquarters and its research centers,

**External governance**

NAFRI was established in 1999 as part of overall restructuring of agriculture and natural resource management sectors in Laos. It belongs to the Ministry of Agriculture and Forestry (MAF) and is equal in status to other Technical Line Departments under the MAF.

NAFRI external governance is provided mainly by the MAF. Policy guidance is provided by the Vice Minister and the Permanent Secretary’s Office. The Department of Operations and Personnel has certain responsibilities in relation to NAFRI’s human resource management, including the appointment of Center Heads. The Department of Planning provides guidance on strategy, resource allocation and regulation. The Departments of Agriculture, Forestry, Livestock and Fisheries have management responsibilities for development programs in the provinces, but do not play a governance role with regard to NAFRI.
Internal governance

As a Technical Line Department of MAF, NAFRI has no governance body such as a Board or management committee. Matters related to governance are handled by the office of the Director General and NAFRI Administration. Other bodies involved with providing guidance on different aspects include the Science Council, the Party, the Youth Association, the Women’s Union and the Labor Union.

NAFRI has a Code of Conduct and staff regulations, which follow those of MAF. Each research center establishes its own rules for such things as vehicle and equipment use, lab access, and production activities.

2.3.2 NAFRI Organization and structure

As presented in Chapter 1 the NAFRI system includes a Headquarters near Vientiane and nine research Centers. At Headquarters there are three divisions:

1. Administration, Personnel, Planning, Finance and Cooperation Division (APPFC)
2. Research Management Division
3. Strategy and Information Management Division

The first two are exclusively involved in research management and administration; the third also is involved in doing research related work e.g. in GIS and in socio-economics through the Socio-Economic Unit (SEU).

Of the nine research Centers seven are located in or at a short distance from Vientiane. Two are located far away from the capital: the Coffee Research Center (CRC) in the South, and the Northern Agriculture Research Centre (NAFRC) near Luang Prabang. As such, the NAFRI research system is highly centralized. Given the limited budgets for research the centers cannot expect to respond very well to the needs of the farmers in the different agro-ecological zones in the country.

Most Centers have a commodity or disciplinary basis. The only Center with a regional focus and a system, rather than a commodity or disciplinary orientation is NAFRC. Recognizing the need to improve responsiveness to farmer needs in the different regions a proposal is being discussed to reorient the tasks and responsibilities of the CRC to become a regional, multi-commodity and system oriented Center, based on the NAFRC model. Such a possible reorientation can be highly significant, but should be part of a broader, systematic review of the tasks and responsibilities of all Centers, with a view to making the system more responsive to client needs.

2.4 Current Management Processes

2.4.1 Planning, Monitoring and Evaluation

The Council of Science and Technology of NAFRI, composed of directors, senior researchers and experienced technical staff as proposed by NAFRI centers and divisions is the principal planning body. The DG serves as Chair, and 2 vice chairs are elected each 5 years. It meets
twice a year, with the possibility of additional special meetings. It is open for attendance by all professional staff. There are 4 sub-committees:
1. Natural resources and environment studies and surveys
2. Varieties and breeds
3. Technology and production systems
4. Socio-economics

The Council has the tasks of
1. Reviewing and approving research strategy and plans, including donors projects
2. Reviewing and evaluating research results
3. Reviewing and approving research proposals from scientists
4. Reviewing and approving technical norms proposed by individual NAFRI researchers, centers, or divisions
5. Approving and naming varieties and breeds
6. Evaluating and proposing to MAF awards and recognition for outstanding researchers
7. Cooperating and sharing information with other scientific councils within the country and abroad.

Most planning is related to donor projects, which have monitoring and evaluation procedures and requirements defined by each donor. These are normally carried out by donor staff, but the national staff assigned to the donor projects often assist with evaluation processes. Reviews of research progress are carried out within each donor project, once or twice a year.

Each center makes an annual plan for its government funded research, based on individual researcher plans. The NAFRI Council reviews and approves the annual plan but they are monitored by the MAF Department of Planning. There is no effective monitoring and progress reporting on individual and center research plans.

There appears to be a need for establishing a planning, monitoring and evaluation cycle for the NAFRI system of research centers that addresses program planning and priority setting, a researcher reporting cycle, monitoring to adjust planned activities and periodic evaluation of achievements against plans. These should ideally replace the different procedures now in place for the donor projects.

2.4.2 Human resource management

NAFRI follows the GOL career advancement system based on time in service and education level. The GOL staff evaluation system is also used and is applied annually for each staff member. The procedure within each center is a staff member self-evaluation, followed by a group evaluation that results in a grade based on civil service guidelines. These reports are sent to NAFRI for review and possible reconsideration, and are then forwarded to MAF.

Recruitment follows two paths: new staff are contracted by NAFRI for the duration of donor projects; permanent and government contract staff are recruited through a civil service procedure to replace staff lost through retirement or departure, or to fill a staffing need on a temporary contract basis. NAFRI is developing a job description for posts at NAFRI, based on Public Service guidelines for job description preparation, which will guide the government recruitment process. All recruitment decisions are made by NAFRI for project contract staff. The Department of Public Services, Office of the Prime Minister sets quotas each year for the number of new contract and permanent recruitments.
2.4.3 Linkage planning and management

Linkages have been established with PAFO and DAFO, Asian regional organizations (NAFRI is a member of many regional and international organizations, including APAARI), and international research centers. These linkages establish institutional cooperation (Vietnam, Thailand etc), project partnerships, networks focused on various subject areas (e.g. NTFP). Many of linkages are initiated by the individual research centers and are related to specific commodities and subject areas.

Once a linkage need is identified, formal procedures are followed in reaching agreement with specific partners, such as PAFO, NAFES. The agreements include what should be done by each partner, and defined responsibilities including costs. Such linkage agreements (signed) exist with some departments of the MAF for assisting in joint activities and facilitating communications.

Recently, a partnership agreement and MOU have been formalized between the Department of Forestry (MAF), NAFRI, and the Faculty of Forestry, National University of Laos. The agreement establishes formal cooperation in upgrading the knowledge of teachers and forestry officers; curricula development; participation in workshops, meetings and training programs; facilitation of student theses; facilitation of research work; information sharing; and cooperation in English training.

MAF has taken important steps to establish linkage mechanisms between NAFRI and NAFES. These include joint meetings of directors and senior staff each three months to discuss issues, enhancement of information exchange, invitations to important events organized by either partner, permanent participation of both organizations in MAF planning and monitoring sessions and joint working tasks.

However, NAFRI has a significant number of other key partners including donor agencies; NGOs; GoL policy and decision makers; other regional, international and national actors; and the commercial sector. For these, there is an opportunity to systematically plan or update the linkages most important for interaction and cooperation, and to establish the responsibilities for their implementation and maintenance. There is a particularly urgent need to establish better overall coordination between NAFRI and its donors.

2.4.4 Information Management

Information management includes activities related to library services, internet, scientific information, management information, information dissemination, geographical information systems, and information and communication technology. At NAFRI these are the responsibility of the Information Management and Strategic Planning Division based at NARI Headquarters.

At Headquarters, NAFRI has a small library, email and internet facilities, and an organizational website. Significant progress has also been made in establishing GIS systems in collaboration with SSLC. At the Centers telephone, email and internet access depends on location and remote Centers lack basic facilities.

NAFRI provides information on its technology advances to NAFES and other transfer agencies through training of extension personnel at the PAFO level, and the circulation of
extension brochures and pamphlets. Scientific articles are published in the NAFRI journal and in other national and international journals. NAFRI researchers also attend national and international seminars where results are presented and information exchanged. The centers and researchers participate in a number of networks that have been established through regional projects.

NAFRI is lacking in a number of important information systems, notably a basic Management Information System that supports decision making by providing accurate and timely information on staff numbers and qualifications, budgets and budget allocation to activities, and information relevant for the monitoring of on-going research activities. NAFRI also does not yet produce an annual report of its activities for wider dissemination.

2.4.5 Financial management and accounting

The financial management cycle at NAFRI starts at the level of the Centers which prepare annual workplans and budgets. These are submitted to NAFRI, where they are reviewed, consolidated and approved. Implementation takes place through quarterly plans, which form the basis for activity plans at Center level. Centers submit monthly financial reports and quarterly progress reports which allow NAFRI monitoring of research progress and budget expenditure.

Financial management is the responsibility of the Administration, Personnel, Planning, Finance and Cooperation Division (APPFC) at NAFRI Headquarters. The Centers do not have bank accounts and depend on Headquarters for disbursement of funds. The same financial procedures apply for Government funds and for those donor funds which are handled by NAFRI, including the large Sida fund. Some donors maintain their own accounts.

Financial management information (e.g. expenditures by Center and by donor project) is not readily available due to the lack of a financial information system that allows multiple accounts, currencies and cost centers to be handled.

2.5 The NAFRI resource base

In 2004 NAFRI’s total budget amounted to almost $1,385,000 consisting of $83,000 from GOL and just over $1,300,000 from international donors, of which Sida is by far the largest (Table 2.2). Centers also have some revenue from sales of products and services, which is mainly used to pay staff directly contracted by the Center.

Total staff numbers in 2004 amounted to 387 (263 permanent, and 124 on contract). In addition in 2004, twenty staff were away on long term degree study leave. Overall, and consistent with the GOL no-growth policy with regard to civil service staff, the number of permanent staff is declining and NAFRI has to increase its capacity by recruiting additional numbers of contract staff. Most of these contracted staff are paid for by donor projects, a few also by revenues generated by the Centers.
Table 2.2 NAFRI Budget by Source of Funding

<table>
<thead>
<tr>
<th>Budget Source</th>
<th>Budget in USD</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salaries</td>
<td>45,645</td>
<td>62,783</td>
</tr>
<tr>
<td>Operation</td>
<td>57,913</td>
<td>62,516</td>
</tr>
<tr>
<td>Total</td>
<td>103,558</td>
<td>125,299</td>
</tr>
<tr>
<td>Sida Fund</td>
<td>1,943,529</td>
<td>1,238,823</td>
</tr>
<tr>
<td>Donors</td>
<td>197,000</td>
<td>156,000</td>
</tr>
<tr>
<td>Grand Total</td>
<td>207,116</td>
<td>2,194,127</td>
</tr>
</tbody>
</table>
Table 2.1 NAFRI Center Outputs

<table>
<thead>
<tr>
<th>NAFRI Center</th>
<th>Technology</th>
<th>Information</th>
<th>Dissemination</th>
<th>Training</th>
<th>Production/Service</th>
</tr>
</thead>
</table>
| Agriculture and Forestry Machinery Res. Program (AFMRP) | - Land preparation  
- Tillage  
- Post harvest  
- Livestock machinery  
- Agro-electricity  
- Water supply | - Technical reports  
- Manuals | - On-station demonstrations  
- On–farm demonstrations (harrow, barrel rice seeder, manual corn grinder for animal feed, manual cassava slicer) | - Some farmer training | - Equipment testing |
| Agriculture Research Centre (ARC) | - Rice germplasm collected  
- Recommended rice varieties released:  
- Varieties selected: sweet potato, cotton, sugar cane, etc.  
- Hybrid variety evaluation  
- Plant protection: entomology, pathology, etc. | - Technical reports  
- Manuals  
- Curriculum training course | - On-farm demonstrations  
- Leaflets, posters | - Staff/farmer training (> 3000) (rice production, nutrient, soil management, IPM/FSR)  
- Student supervision 25-30 per year | Seed multiplication  
- Breeder seed  
- Foundation seed (rice, maize, bean, cotton, sugarcane) |
| Coffee Research Centre (CRC) | - Select new varieties from abroad for local suitability  
- Select and multiply improved planting material for target areas  
- Improve yield and quality of coffee crop (organic)  
- Introduction of other crops to improve farmer income | - Technical reports  
- Manuals for farmers | Extension for farmers and DAFO | - Training of officials and farmers | - Coffee seedling production  
- Fruit tree seedlings |
| Forestry Research Centre (FRC) | - Rattan production  
- Bamboo mgt technology  
- Seed mgt (collection, drying storage)  
- Forest species evaluation  
- Forest management practices  
- Agroforestry systems  
- Plantation mgt. practices | - Research documents, technical reports (80)  
- Field manuals  
- Workshop proceedings  
- Monographs  
- NTFP database  
- Information sheets, calendar | - Cross visits, agroforestry  
- Bamboo rattan production techniques  
- Demonstration; on-farm adaptive trials  
- Technical workshops, seminars | - Non-timber forest product inventory course  
- Training events for Lao tree seed project  
- PRA courses  
- Nursery techniques  
- Plantation management | - Farmer advice (bamboo mgt)  
- Surveys for Govt departments  
- Seedling production  
- Inventory NTFP |
<table>
<thead>
<tr>
<th>NAFRI Center</th>
<th>Technology</th>
<th>Information</th>
<th>Dissemination</th>
<th>Training</th>
<th>Production/Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horticulture Research Centre (HRC)</td>
<td>- Germplasm (varieties) evaluated</td>
<td>- Technical reports (3-4 p.a.)</td>
<td>- Leaflets for farmers (AVRDC support)</td>
<td>- Provincial staff under project funding</td>
<td>- Farmer advice</td>
</tr>
<tr>
<td></td>
<td>- Improved varieties selected:</td>
<td></td>
<td>- Exchange visits between farmer groups</td>
<td>- Farmer training</td>
<td>- Vegetable seed production: distributed to farmers free (paksoi, coriander, eggplant, yardlong bean, vegetable soybean)</td>
</tr>
<tr>
<td></td>
<td>landraces of mustard, cucumber, vegetable soybean, mustard, improved AVRDC</td>
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<tr>
<td></td>
<td>varieties of eggplant, chilies)</td>
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<td></td>
<td>- Extended planting season for vegetables</td>
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<tr>
<td></td>
<td>- North: peach and plum varieties, cabbage asparagus</td>
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<tr>
<td></td>
<td>- South: durian, rambutan</td>
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<tr>
<td>Livestock Research Centre (LRC)</td>
<td>- Identify suitable forage species</td>
<td>- Technical reports (mainly)</td>
<td>- Farmer testing of technology</td>
<td>- Farmer training</td>
<td>- Seed provision (sales)</td>
</tr>
<tr>
<td></td>
<td>- Research papers on forage species</td>
<td>- Articles</td>
<td></td>
<td></td>
<td>- Bulls (15 p.a.)</td>
</tr>
<tr>
<td></td>
<td>- Improved practices of animal raising</td>
<td>- Reports</td>
<td></td>
<td></td>
<td>- Poultry sale</td>
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<td></td>
<td>- Parasite treatment techniques</td>
<td></td>
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<td></td>
<td>- Vaccination of animals</td>
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<td></td>
<td>- Breeding capacity of local chicken</td>
<td></td>
<td></td>
<td></td>
<td>(in projects)</td>
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<td></td>
<td>- Cross breeds</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>- Feeding techniques</td>
<td></td>
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<tr>
<td>Living Aquatic Resources Research Centre (LARReC)</td>
<td>- Freshwater fish, prawn, shrimp, frogs.</td>
<td>- Research reports</td>
<td>- Dissemination materials</td>
<td>- Training materials and courses</td>
<td>- Fingerling production</td>
</tr>
<tr>
<td></td>
<td>- Fish and duck/chicken systems;</td>
<td>- Databases</td>
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<tr>
<td></td>
<td>- Upland aquaculture</td>
<td>- GIS tools</td>
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<tr>
<td></td>
<td>- Feeds for species</td>
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<td></td>
<td>- Water quality</td>
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<tr>
<td></td>
<td>- Testing of species</td>
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<tr>
<td>NAFRI Center</td>
<td>Technology</td>
<td>Information</td>
<td>Dissemination</td>
<td>Training</td>
<td>Production/Service</td>
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</tr>
</tbody>
</table>
| Northern Agric. and Forestry Research Centre (NAFRC) | - Integrated land use technology, sloping land  
- Upland rice, suitable varieties  
- Fruit trees, grafting, seedlings  
- Maize varieties, selection  
- Grass and forage technology  
- Piglets, cross-breeds | - Research reports (10)  
- Technical sheets (7) | - Demonstrations on-station (5 p.a.)  
- On-farm demonstrations (7) | - short courses for farmers (150),  
- courses for students, agric school (22),  
- longer term practice periods for Faculty of Ag. (14) and Faculty of Forestry (20) students  
- short course for DAFO staff | - rice seed  
- grass and forage seed  
- teak seedlings  
- fruit tree seedlings  
- grafting |
| Soil Survey and Land Classification Centre (SSLC) | - Soil map, slope map, land suitability map, optimal land use map (250k)  
- Field tests, recommendations  
- Soil conservation practices  
- Soil fertility improvement practices | - Soil reports (province)  
- Research reports (erosion, fertility)  
- Leaflets, brochures  
- articles | Field days for farmers and DAFO (2-3 p.a.) | - Farmer training soil conservation / fertility (10 evnts p.a)  
- Student thesis supervision (6-8 p.a.) | - Soil fertility lab tests  
- Soil analyses, leaf analyses, fertilizer analyses (500-600 p.a)  
- Printed maps  
- Consultancies (2-3 p.a.) |
Table 2.3 NAFRI Research, Management and Support Staff (2004) – Permanent and Contract Staff

<table>
<thead>
<tr>
<th>NAFRI staff 2004</th>
<th>Research and Management Staff</th>
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<tbody>
<tr>
<td></td>
<td>Permanent</td>
<td>Contract</td>
<td>Total</td>
<td>Total</td>
<td>Study</td>
<td>Grand</td>
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<tr>
<td>Ag. and Forestry Machinery Res. Program (AFMRP)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<tr>
<td>Agriculture Research Centre (ARC)</td>
<td>14</td>
<td>11</td>
<td>6</td>
<td>20</td>
<td>11</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>31</td>
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<tr>
<td>Coffee Research Centre (CRC)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Forestry Research Centre (FRC)</td>
<td>9</td>
<td>6</td>
<td>0</td>
<td>8</td>
<td>17</td>
<td>6</td>
<td>23</td>
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Chapter 3. Internal environment analysis - NAFRI strengths and weaknesses

3.1 NAFRI Strengths

3.1.1 NAFRI Policy, governance and mandate

NAFRI’s mandate clearly defines three research areas for NAFRI: 1) assessment of natural resources for improved management, 2) development of improved varieties 3) development of technology packages and production system approaches. NAFRI is working in accordance with its mandate. The NAFRI overall mandate forms the basis for the Centers to develop their own mandates, roles and responsibilities. The mandate is flexible: NAFRI can request MAF to make changes in its mandate whenever improvements are needed.

Internal policies:
Internal policies for NAFRI have been developed. Within the framework provided by Government Rules, NAFRI has elaborated its own rules, policies and procedures. Rules for NAFRI staff exist, based on Government rule number 82. NAFRI has developed a strategy for human resources development, and has rules for use and management of vehicles and other resources. Based on the Human Resources Development plan, job descriptions for all NAFRI staff have been, or are being developed.

Internal governance and management:
NAFRI has a participatory management system, where decisions are made based on a consensus reached in committees. Responsibility for implementation is given to a Center, a team, or an individual. NAFRI has internal weekly meetings with all Center Directors and NAFRI Division Heads. The meetings are used for information, progress reporting and to help the NAFRI DG in decision-making. NAFRI appoints specialized ad-hoc committees to address urgent emerging issues.

NAFRI has a Council for Science and Technology which reviews research proposals, assists in prioritizing research and in research evaluation (consisting of senior staff members). Its meetings are however irregular and some of its intended tasks (see section 2.4.1) are not routinely carried out, indicating a need to strengthen the council.

In addition to the weekly meetings, there is a progress reporting system on the implementation of the Centers research plans (monthly, quarterly, semi-annual and annual). Research planning follows a bottom-up procedure. Plans are developed by individual researchers or by units and are sent to Centers and NAFRI for approval.

NAFRI has a well established system of newsletters and a periodic reporting system.

3.1.2 Structure, organization and coordination
NAFRI’s organizational structure and administrative system are generally appropriate for the size and type of organization. NAFRI’s research Centers cover a wide range of subjects. Most of the Centers are located in or close to Vientiane and have a commodity or disciplinary basis. A regional Center (NAFRC) has been established in the North to achieve better integration of activities and improve relevance to farmer needs.

The research coordination system is fairly good, but actual practical operations are not always systematically performed.

### 3.1.3 Research planning, monitoring and evaluation

**Strategy and priority setting:**
MAF and NAFRI have developed a number of strategy and vision documents. These include the 1999 Strategic Vision document of the Ministry, the NAFRI 2001-2005 research strategy document, and the Master Plan for Agricultural Development (2001), which presents priority development projects. Presently a strategy and legal framework for the forestry sector are under development, which will provide guidance for research activities. At the wider policy level it is important to note the general guidance provided by the GoL National Growth and Poverty Eradication Strategy (2004).

NAFRI Centers and Units have also developed strategies or strategic vision documents. Some centers score and rank priorities by research themes.

**Program, project planning and implementation:**
Strengths indicated in this area include a significant shift towards identification of research topics with and for farmers, a process which has been initiated, but needs to be expanded. There is a NAFRI research decentralization policy for the different Centers which will support the development of a user-driven research agenda.

NAFRI has made significant progress in developing an information basis for its research work with general data on natural resources (soil maps) being available. A good number of farm level surveys, livelihood studies and market analyses have also been completed.

Donor support for NAFRI’s research and development work is strong, allowing the organization to build its capacity and expand the coverage of its programs.

**Monitoring, evaluation and impact/ outcome assessment:**
Although NAFRI does not yet monitor and evaluate its research activities and programs in a systematic manner, progress is being made especially in donor funded projects. Farmers and local authorities participate in evaluation activities and indigenous knowledge of farmers is used in monitoring and evaluation. As a result, some of NAFRI’s products have found interest with different groups of farmers

Centers provide information to NAFRI on a regular basis and, similarly, NAFRI provides research information to MAF.
3.1.4. Human resources

Human Resources Management:
NAFRI’s human resources management responsibilities are handled to a large extent at the level of MAF, including recruitment, contracting and performance evaluation. Quotas are established at GOL level for permanent staff posts and some types of contracted staff. Annually, a very limited number of additional permanent staff posts (1-4) are authorized. NAFRI also recruits contract staff to compensate for lack of permanent staff. The contracts are of two types: those paid through donor projects (no limits are set for these), and those paid by GOL (limited numbers are authorized each year).

NAFRI is making significant efforts to ensure good decision making on staffing and other HRM issues, but is constrained by the fact that key decisions are made at higher levels.

Human Resources Development and Training:
NAFRI has prepared a Human Resource Development strategy which aims to expand significantly the number of trained staff and their qualifications. A new NAFRI-wide staff development plan is being prepared, to replace earlier plans of individual Centers, and which will include job descriptions for most staff categories.

There are many training opportunities for all categories of staff (research and non-research). Training is often appropriate to Lao conditions. Donor support from HRD activities is very strong.

Staff Evaluation
NAFRI managers have the responsibility and capacity to evaluate staff based on their output, quality of work and timeliness. Annual performance appraisals are carried out following MAF and GOL procedures.

The system of weekly and monthly research progress reporting can identify individuals that need to change activities or improve performance.

Incentives, sanctions and motivation
NAFRI staff are generally well motivated towards work despite low salaries. Low salaries do not appear to be a deterrent in attracting new staff. Secondary benefits exist such as staff retirement benefits, which are paid at 95% of salary. Increasingly there are also opportunities for staff to benefit from participation in contract research activities and other research related income generating activities.

NAFRI provides opportunities for training, for access to vehicles, office facilities and equipment that motivate staff.

There are GOL sanction rules for all government staff and they are applied in a flexible way. Termination procedures exist, but are seldom if ever applied.

Staff behavior and attitudes:
NAFRI staff have good work related attitudes and behavior, and show strong solidarity. NAFRI staff have a positive attitude towards working with farmers, and are generally open to ideas from abroad.
3.1.5. Other Resource Management

NAFRI receives funding from Government and from foreign assistance. While Government support to individual Centers has declined in recent years, donor support is strong. NAFRI has basic facilities to undertake research, but basic lab and scientific equipment is often old and outdated.

NAFRI has a functioning administrative system which allows for good filing of documents, and is supported by a division for information management. NAFRI has established a financial management unit, and uses an existing financial management system, which is based on the financial system of the Ministry of Finance. The administrative system needs further strengthening, including the financial unit.

NAFRI has staff available for ICT activities, and produces an array of information products and services. These include research and technical reports, a newsletter and journal, extension materials, databases, and CDs.

3.1.6 Linkages and alliances

NAFRI has significantly improved its capacity to work with partners, both international (donors, research and development organizations) and national (e.g. extension, farmers, NGOs). NAFRI now has the capacity to produce good documents with further expansion of information products and services foreseen in the future. It has a growing capacity to use IT for gathering and disseminating knowledge. NAFRI is also starting to provide consultancy and training services on a contract basis to field organizations (clients). This helps diversify the funding base for the organization and increase its resources.

**Linkages with donors, international organizations, regional institutions, and NGOs:**
Improved cooperation and increased linkages are being developed with institutional actors for research collaboration, funding, exchange of information and transfer of technology. There is an increasing level of partner involvement in NAFRI’s research agenda.

**Linkages with line departments and NAFES:**
A national research network which is the basis for appropriate linkages now exists in the country, but it is recent and needs strengthening. Increased coordination efforts with partners are being made. Good research and extension linkages in some districts and villages, especially where projects operate.

Coordinated efforts in area-based development exist between departments, NAFRI and NAFES within MAF.

**Linkages with NUoL; STEA; MOH and other ministries:**
There is a coordinated effort in HRD, collaborative research, student thesis supervision, and resource sharing.

**Linkages with private sector industry:**
The limited development of the private sector has been a fundamental reason for the lack of NAFRI linkages with these potential partners.
Linkages with provinces, districts, and farmers:
Increased efforts in on-farm research have been made. Farmers, district and provincial staff are involved in on-farm research (planning, implementation, monitoring and evaluation).

3.1.7. NAFRI Programs and Activities

In recent years NAFRI and its Centers have had a number of notable achievements which have benefited its main clients, the poor farmers. NAFRI has increased its work in upland areas, has increasingly worked with clients in a participatory manner, has produced a number of new methods and technologies, and has strengthened its on-farm research. NAFRI aims to further develop its client-driven agenda, to disseminate its knowledge better, and to improve its capacity. An overview of NAFRI’s research and service outputs is presented in Table 2.1.

Livestock sector:
In the livestock sector NAFRI has developed improved forage production systems which have over 800 families and which have the potential for much wider adoption. It also plays an important role in the delivery of forage seed.

Forestry sector:
In forestry FRC has helped to improve the NTFP knowledge base and NTFP management systems and has promoted tree seed propagation, appropriate nursery techniques, and natural forest management by communities. NAFRI has also made available to NAFES planting material such as mother trees for nurseries (teak, rosewood). NAFRI has provided many farmers with seedlings of fruit trees and vegetables, which allows farmers to earn money from trees and crops.

Coffee sector:
Achievements in the coffee sector include the development, dissemination and adoption of new varieties and technologies (e.g. rejuvenation technology, pruning, fertilizer use, quality improvement). The Coffee Research Centre (CRC) is also involved in dissemination and training through the organization of field trips and exchanges, training workshops; leaflets; TV & newspaper coverage, etc.

Fisheries:
In the fisheries sector LARReC has been involved in studies on understanding the aquatic ecosystem of the Mekong River, the importance of capture fisheries, and sustainable fishery management. In the aquaculture sector research focuses on fish, shrimp, and frogs. Integrated systems are being developed with emphasis given to upland aquaculture. Other achievements include the development of quality feeds, the production of fingerlings, research on water quality, and fish diseases. LARReC has developed a large number of partnerships and is participating in international projects e.g. on wetlands conservation and sustainable use.

Crops Sector:
In the crops sector new technologies and management practices have been developed in food crops (especially rice and tubers) with emphasis on crop improvement, agronomy, farming systems, and seed multiplication. In industrial crops (fiber crops, maize, sugar cane, grain legumes) emphasis has been on plant protection, biodiversity, and training.
Horticulture:
In horticulture work has concentrated on evaluation and selection of improved varieties (landraces of mustard and cucumber, vegetable soybean, improved AVRDC varieties of eggplant, vegetable soybean, chillies). For the North suitable peach and plum, cabbage, and asparagus varieties have been identified. For the South new durian and rambutan varieties were identified. In cropping research in to extending the planting season for vegetables has received priority. Services to farmers include providing advice, production of seedlings of fruit trees, and vegetable seed production (paksoi, coriander, eggplant, yardlong bean, vegetable soybean).

3.2 NAFRI Weaknesses

3.2.1. NAFRI Policy, governance and mandate

Mandate:
NAFRI’s present mandate does not give sufficient attention to market-oriented research, limiting the organization’s ability to improve farmers’ income generation. Although farmer-oriented research receives high priority, there are still difficulties in reaching poor farmers, especially those in remote areas of the country.

Leadership:
An important governance issue is related to leadership. In this respect it was observed that NAFRI managers have limited experience in both technical and management issues, affecting their capacity to provide scientific and management leadership.

Internal policies:
Internal policy weaknesses include the fact that rules and regulations of the civil service are not strictly implemented and sanctions are not always applied. Procedures are sometimes not well known and sometimes ignored.

3.2.2 Structure, organization and coordination

NAFRI structure and organization:
NAFRI operates as a line department of the MAF, which limits its autonomy in decision-making. Some key management functions, such as HRM are handled at Ministry level. Responsibilities for research and resource management are not always clearly defined between MAF and NAFRI. NAFRI capacity for research and resource management is constrained by lack of qualified staff and sufficient budget for these tasks.

The NAFRI system remains highly centralized which limits its potential to provide useful technologies and services to farmers in the many different production systems of the country.

Research coordination:
Although a number of important committees are in place as coordination mechanisms, NAFRI’s activities are still sometimes compartmentalized and in need of improved
coordination. While coordination at the planning level is fairly good, actual implementation of coordinated activities is often difficult.

Information about on-going and new research activities is not widely shared amongst Centers; therefore staff do not know what is being implemented at other Centers. NAFRI needs to further improve building a system of Centers that addresses research on commodities, disciplines and systems in an integrated manner.

3.2.3 Research Planning, Monitoring and evaluation

Strategy and priority setting:
Some priorities are established by individual Centers, sometimes without consultation with NAFRI. Priorities are discussed mainly within donor projects. NAFRI system wide priority setting for commodities and non-commodity research areas has been done in 2004 for the first time.

Program, project planning and implementation:
Due to low Government funding for research operations NAFRI’s research agenda consists mainly of donor-funded projects. Lack of coordination between donor funded projects is sometimes a problem. Some donor funded research topics are not responsive to the national NAFRI research agenda, this is often the case in regional research projects.

Although progress is being made, NAFRI needs to improve its capacity to identify research topics with and for farmers. While research planning is often adequately performed, there is a lack of coordinated implementation of projects, especially in on-farm research.

Monitoring, evaluation and impact/ outcome assessment
No established procedures and M&E system exist for NAFRI. Occasionally, evaluation and impact studies are carried out for donor funded projects (e.g. rice research project; land allocation assessment), but each project has its own procedures. A more systematic, NAFRI wide approach is needed. A key constraint is the lack of staff, budget and skills for M&E. As a consequence research results are not widely disseminated.

3.2.4 Human resources

A key problem in managing NAFRI resources is the limited number of qualified staff at all levels, which constrains very seriously its ability to achieve organizational objectives. Very low civil service salaries and benefits do not appear to affect NAFRI’s capacity to recruit new staff, though although retaining high quality staff is increasingly difficult as new job opportunities with international organizations, NGO’s and private sector develop. A zero growth policy severely limits the number of new staff that can be recruited. Training opportunities are available, but many staff cannot benefit for various reasons (e.g. lack of English language knowledge, non-eligibility of contract staff)

Staff planning and recruitment:
Tasks and responsibilities of MAF and NAFRI, and of different NAFRI units are not clearly defined, therefore it is difficult to specify and obtain the number and qualifications of staff
required for specific positions at the different Centers. A meaningful training needs assessments is therefore difficult to carry out.

NAFRI has a staffing plan, but it cannot be fully implemented because of low quota for recruiting new staff, which is the result of the GOL zero growth policy for public sector staff.

Job descriptions at unit level are not available for many NAFRI Centers. Attempts are being made to develop job descriptions at unit level. These will need to be updated if the NAFRI structure is revised.

Staff Evaluation:
NAFRI does not yet have an effective staff performance evaluation system. It follows the general civil service system for performance appraisal, which is not tailored to the needs of research organizations. NAFRI does not receive feedback from other organizations on staff performance.

Incentives, sanctions and motivation:
NAFRI has its rules, but sanctions cannot always be enforced (e.g. no punishments are defined for absenteeism or for low performance) due to lack implementation guidelines and lack of authority of managers.

Low salary and benefit levels (i.e. health insurance) limit staff incentives to perform well in their research tasks. Center revenue from production activities can be used for staff rewards, but the amounts are very small.

There is no clear system which defines the criteria for promotion, and the annual staff performance evaluation system is not linked to promotion.

Training:
Many training opportunities exist and donors strongly support NAFRI’s training activities. Many NAFRI staff are presently undergoing training, at some Centers the number of staff away on long-term training may limit the capacity to implementing on-going research activities. A serious problem is that under current MAF regulations non-permanent (contract) staff cannot go for training.

Training supervision and management needs to be improved: sometimes training is not relevant for the trainee’s work; some trainees go for many training activities, but no results can be seen; there is no systematic reporting and follow-up after training; and some staff fail to complete training activities they began.

English language capacity is a major constraint for staff to benefit from international training opportunities. At the same time there appear to be few opportunities for conducting in-country training for those who cannot go abroad because of language difficulties.

In general NAFRI does not have a comprehensive Human Resources Development Plan, based on a systematic training needs assessment. Such a training needs assessment should be based on NAFRI Center objectives and activities, which are not yet well developed.

Staff behavior and attitudes:
Some problems observed in this category include the fact that some staff show limited professional responsibility towards their work (e.g. providing information on activities). In general, staff reading behavior is not well developed.

### 3.2.5. Other Resource Management

With regard to funding research activities, Government investments in agricultural research are very low, although the lack of investment is compensated to a large extent by the availability of significant donor funding, which drives the national agricultural research agenda. The allocation of Government and donor funds to projects and Centers does not take place in a balanced way and affects system research priorities. NAFRI has limited capacity to absorb foreign funding for research activities, affecting the quality and quantity of research outputs (due to limited staff capacity, and lack of counterpart funding).

As a result of donor support significant progress has been made in recent years to expand on-farm and client oriented research. At the same time, as a result of very limited Government investment, most NAFRI Centers are suffering from a serious shortage of key research facilities and equipment, which severely limits the possibilities for Centers to undertake their programs of research work and provide public services.

Limited access to communication facilities makes it difficult to develop an effective information network between NAFRI Centers and Headquarters, and restricts the flow of information in the NAFRI system. NAFRI lacks good filing systems and research databases which makes it difficult for researchers to find earlier research results and leads to duplication of efforts.

### 3.2.6 NAFRI Center level resource constraints

NAFRI Centers have received very limited investment in equipment and facilities: some Centers lack the most basic equipment. In many cases this is a serious constraint on these Centers for delivering the outputs which clients, Government and donors expect them to produce. There is a need for NAFRI to systematically review the tasks and responsibilities of each of the Centers, to identify mission-critical facilities and equipment, and to draw up Center rehabilitation and investment plans accordingly. Table 3.1 provides an overview of essential equipment that is critical to the performance of the Centers, and which is not presently available.

### 3.2.7 Linkages and alliances

Linkages with donors, international organizations, regional institutions, and NGOs:
At present there is still high degree of donor oriented research, which is not always to the benefit of the national research agenda. Networking and cooperation with non-research partners is limited and inefficient. Information sharing can be improved significantly.

Linkages with line departments and NAFES:
Inter-sectoral coordination within MAF is still weak. An important consequence is that clear and systematic linkages and coordination between research and extension are lacking.
Duplication of efforts with NAFRI line departments still exists. The roles and responsibilities of NAFRI are not always well understood.

The potential to use development projects operating in different part of the country to disseminate information is not sufficiently utilized. Similarly, development activities in focal areas can be used more adequately to improve research-extension-farmer/producer-business/private linkages.

**Linkages with NUoL, STEA, MOH and other ministries:**
Collaboration exists but is especially limited between sectors (eg, health and agriculture). Tapping into and making use of the potentials that exist in different organizations (human resources and facilities) is not sufficiently well developed.

**Linkages with Private sector, business, trade, industry:**
There is limited cooperation with the private sector. NAFRI research is not well linked to market demand. The private sector does not participate in research planning.

**Linkages with Provinces, districts, and farmers:**
Research-extension linkage at province and central levels is especially weak. Coverage is limited to a small number of pilot project areas. There is an urgent need to scale up technology transfer activities and cover a much larger number of farmers.

### 3.2.8. NAFRI Programs and Activities

A key weakness identified is that - despite recent progress - NAFRI’s programs still lack a strong basis in the identified needs of farmers in different agro-ecological areas. Research is not always relevant to specific locations and sites, is not production and market oriented, and sometimes ignores social issues, while concentrating on technical ones. As a result farmers are not effectively reached and technologies are not widely adopted. Generally there is a lack of attention to post-harvest and processing related research. There is an urgent need to identify priorities for NAFRI’s programs in direct interaction with its key stakeholders.

Research quality and relevance are often weak because of lack of incentives for quality research, limited staff capacities and lack of facilities and equipment. Research does not always follow established scientific procedures, affecting the quality of results. Information on earlier research is not widely disseminated throughout the NAFRI system. Demonstration and research are sometimes confused, leading to uncertainty for farmers. Research projects often remain unfinished: data are not analyzed, and no research reports are produced. Both the skills and incentives for writing research reports are inadequate. The general lack of English language knowledge among staff is a major contributing factor. Many users of research results cannot read or write Lao, which creates a further need for English language capacity at NAFRI.

There is a lack of coordination between researchers and staff involved in extension, dissemination and information. As a result important non-research tasks such as extension and farmer training, dissemination, demonstration and information provision are often poorly performed. Researchers often have limited capacity in performing training, dissemination, and other tasks. Again, language barriers are important causal factors, since many end users
cannot read or write and often cannot speak Lao. In addition, staff abilities in non-Lao tribal languages are limited.

Table 3.1 Key facility and equipment requirements for NAFRI Centers

<table>
<thead>
<tr>
<th>AFMRP Facilities and equipment</th>
<th>FRC Facilities and equipment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No lab equipment</td>
<td>• Tissue culture lab needed</td>
</tr>
<tr>
<td>• Unable to test machinery because can’t buy machinery</td>
<td>• NTFP processing</td>
</tr>
<tr>
<td>ARC Facilities and equipment:</td>
<td>HRC Facilities and equipment:</td>
</tr>
<tr>
<td>• No seed processing lab,</td>
<td>• Lab for disease analysis</td>
</tr>
<tr>
<td>• No drying rooms.</td>
<td>• Drip irrigation system for vegetable and fruit trees research plots</td>
</tr>
<tr>
<td>• Inadequate storage and cold storage rooms and backup generators</td>
<td>• Cold storage for seedbank</td>
</tr>
<tr>
<td>• No green house for rice research</td>
<td>• Chemical residue analysis</td>
</tr>
<tr>
<td>• No chemistry equipment</td>
<td>• Replacement of very old tractor</td>
</tr>
<tr>
<td>• Small capacity for seed multiplication, small seed cleaner, small thresher, no seed fumigation capacity.</td>
<td>• No capacity to assess nutrient deficiencies.</td>
</tr>
<tr>
<td>• No computers</td>
<td>• Glass/screen house for vegetable breeding</td>
</tr>
<tr>
<td>• No bicycles or motorcycles for mobility</td>
<td></td>
</tr>
<tr>
<td>CRC Facilities and equipment:</td>
<td>NAFRC Facilities and equipment:</td>
</tr>
<tr>
<td>• Coffee quality control lab (safety, toxicity, taste) for certification</td>
<td>• laboratory building</td>
</tr>
<tr>
<td>• Irrigation system for the station</td>
<td>• seed quality testing equipment</td>
</tr>
<tr>
<td>LARREC facilities and equipment:</td>
<td>• seed drying equipment, cool room</td>
</tr>
<tr>
<td>• No lab equipment for chemical analysis in lab or field, or pathology</td>
<td>• microscope</td>
</tr>
<tr>
<td>• Limited pathology capacity, need pathology lab</td>
<td></td>
</tr>
<tr>
<td>LRC Facilities and equipment:</td>
<td>SSLC Facilities and equipment:</td>
</tr>
<tr>
<td>• Inability to do animal breeding research (breeding capacity)</td>
<td>• Equipment for micro-nutrient analysis</td>
</tr>
<tr>
<td>• Feed processing</td>
<td>• GIS equipment</td>
</tr>
<tr>
<td>• Feed analysis laboratory</td>
<td>• Survey equipment</td>
</tr>
<tr>
<td>• Lack of breeding materials (semen, breeding animals)</td>
<td>• Mapping equipment is old</td>
</tr>
<tr>
<td>• Utilization of genetic resources</td>
<td></td>
</tr>
<tr>
<td>• AI not available as a research tool</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4. The external environment of NAFRI

4.1 The external context: trends and factors

4.1.1 International context changes

After a period of relative isolation Laos is now becoming integrated in the regional and world economy. It is a member of ASEAN, it has entered the ASEAN Free Trade Area (AFTA) and participates in the Mekong River Commission and other regional initiatives. Processes of internationalization and globalization process will affect the social and economic development of Laos. With regard to the impact of globalization on agricultural policies and agricultural research three key trends should be highlighted:

First, markets for products and inputs are becoming more open. Under AFTA tariffs are being reduced to low levels (although some exceptions apply for Laos as a low-income country), reducing disincentives for production, such as taxes and tariffs. This will cause increased competition for Lao farmers with regard to specific commodities, but there will also be opportunities, especially in the export of livestock, coffee and others. In general, production will increasingly be determined by comparative advantage; especially small countries like Laos will have to go through a process of repositioning and niche-finding. This is already happening in Laos where a consensus appears to be developing that the country cannot internationally compete with its in the production and export of commodities such as rice, but that it may well build on the country’s natural resource base to develop a comparative advantage in horticulture, non-traditional and organic products.

Second, internationally determined rules and regulations will increasingly affect local production and processing of agricultural commodities. Concerns about food safety (fueled by the recent outbreak of avian influenza in Asia) have led to tightening of regulations and use of safety standards with which exporters must comply. Also, buyers in importing developed countries increasingly specify quality demands using privately determined standards (e.g. for organic products). The World Trade Organization (WTO) of which Laos aspires to become a member, has brought in a range of binding rules on Trade Related Aspects of Intellectual Property Rights (TRIPS). This means member countries must implement most existing forms of intellectual property protection which will affect the use of agricultural technology directly.

Third, access to and availability of agricultural technology is changing in different ways. On the one hand more information than ever is becoming readily available on the internet. But on the other hand public (international) agricultural research is no longer playing the key role that it used to have. Private sector developed technology, for the use of which royalties must be paid, is becoming more important especially in new areas such as biotechnology.

These developments will have very significant impact on the agricultural research agenda and should be actively monitored and responded to by NAFRI and its donors.
4.1.2 National context changes

The GOL has recently adopted a National Growth and Poverty Eradication Strategy (NGPES) which provides the broad overall policy guidelines and for priority sectors such as agriculture and forestry. The GOL development objectives for the agriculture and forestry sector are to:

- Ensure food security for all Lao people.
- Maintain a growth rate in agricultural output of 4-5 per cent annually.
- Promote commodity production, especially for export.
- Stabilize shifting cultivation and eradicate poppy cultivation.
- Diversify and modernize the agricultural and forestry sector.
- Conserve the natural environment and protect threatened species and habitats.
- Maintain a healthy and productive forest cover as an integral part of the rural livelihood system, and generate a sustainable stream of forest products.
- Improve rural livelihoods.

Key changes in the national context with direct implications for agricultural research and development include the following:

- Adoption of market-oriented policies will increase the roles of the private sector changing agricultural production and in the longer run the role of public sector organizations such as NAFRI.
- Decentralization, with distinct roles for national, provincial, district and village level, affects the way in which agricultural research is planned and implemented.
- Budgetary constraints: low and declining salaries (in real terms) and incentives for researcher and management staff are government policy constraints that affect research performance.
- Government policies related to agricultural prices and subsidies policies are changing and have significant implications for research planning and investment decisions.
- Diversification of the agricultural economy to promote cash crops, horticulture and livestock in addition to rice requires a reconsideration of the research agenda.
- Similarly, the promotion of sustainable forest management through increasing of forest cover, stabilizing shifting cultivation and eradication of opium production are issues to which NAFRI is expected to respond.

4.1.3 Province and district level context changes

Decentralization focuses development efforts specifically on the district level. The NGPES, for example gives special attention to improving the living conditions in the 47 poorest districts. Many donors also focus their programs on specific districts.

The government policy (Decree 01/PM) on decentralization initiated the re-allocation of staff from PAFO to DAFO level. Expectations of results from NAFRI are high, and the government has asked NAFRI to enter new areas of agriculture and forestry research and service, focusing on increased productivity and technology for the uplands.

There is a growing farmer demand for extension services in agriculture and forestry technology and information. Some changes may take place at DAFO level, including
adjustments in fund and staff allocations. Since extension is not well developed at district level there may be changes in DAFO mandate and structure. Mandate clarity will need to be achieved between PAFO and DAFO levels, considering the human resource limitations in the districts. The districts will be the budget and planning units, as part of decentralization.

4.2 The institutional and policy environment

The changes involved in opening up the economy, moving from central planning towards a market oriented system and a specific focus on poverty eradication have had important implications. The most important agricultural policy priorities as presented in the NGPES can be summarized as follows:

- **Transformation**: from subsistence to commercial farming.
- **Market orientation**: removal of distortions for agribusiness, improve credit availability, land entitlements, training MAF staff, grading and certification, processing, trade facilitation, cross border trade.
- **Decentralization**: participatory planning, strengthen PAFOs and DAFOs, and transform MAF to become farmer service organization.
- **Diversification**: multisector approaches, address shifting cultivation and poppy cultivation, irrigation systems, seed multiplication, animal health control, meat inspection, assist private sector in animal improvement and breeding inland fisheries, plantation forestry, agroforestry NTFPs.
- **Technology transfer**: integrated extension system, upgrade NAFES capacity, ensure that research (NAFRI) and extension (NAFES) are demand-driven, demonstrations in farmer fields, area-based technology, integrated watershed management
- **Sustainability**: capacity building, training, enforcement, control of unsustainable practices.

The new, poverty focused priorities that have direct relevance for agricultural research include the following:

- **Achievement of food security** through the distribution of improved paddy seeds, the effective use of irrigation systems, the improvement of animal health control, strengthening of district level extension for crops, livestock and fisheries, farmer training, and information networks on markets
- **Reduction in vulnerability** through improved agricultural practices and land management, the control of unsustainable harvesting of NFTPs, the rehabilitation of irrigation systems, flood protection, infrastructure, roads, credit, and market information.
- **Increasing the value of outputs** through the provision of market incentives, the development of grading and classification systems for improved product quality, contract farming, participatory resource management, and the introduction of new crops.
- **Strengthen rural communities** through the promotion of farmer organizations, the expansion of feeder roads, the development of rural finance system, farmer training, and agro-processing.
4.3 Key actors in agricultural research and extension

The most important stakeholders in agricultural research and extension in Laos include farmers and farmer organizations, extension, universities, private sector commercial enterprises, NGOs and donors.

Farmers and farmer organizations are the most important clients for agricultural research. They benefit from new technologies and provide feedback to research about the effectiveness of new technology. NAFRI has made considerable progress in understanding farmer needs and increasing farmer participation in recent years. Several of its projects (e.g. the LSSUAFRP and the IUARP) have invested heavily in farming systems research and extension (FSR/E) activities using diagnostic surveys and participatory approaches, in complex upland agricultural production systems undertaking socio-economics and land management studies.

The Government extension system has three levels: the National Agriculture and Forestry Extension Service (NAFES, the Provincial Agriculture and Forestry Extension Service (PAFES) and the District Agriculture and Forestry Office (DAFO). The village level extension system includes authorities, village extension workers and production groups. NAFES was established at the same time as NAFRI, but compared to NAFRI, NAFES is still a small organization. Improving the collaboration between NAFRI and NAFES to ensure an effective process of technology generation and dissemination is a key concern of policy makers in the MAF.

Government policy is to introduce a village based extension system throughout the country. But extension is mostly done on a pilot scale, as part of donor funded projects. A key problem for extension, therefore is to scale up from pilot project to significantly increase extension program coverage of farmers.

NAFES receives support from the Lao Extension for Agriculture Project (LEAP). The new phase of the LEAP project, due to start in 2005, will seek to strengthen the links between NAFES and NAFRI and with other partners to achieve its key objective of scaling up the pilot approaches developed under its first phase.

NAFRI has close links with the National University of Laos (NUOL) and with the Agricultural Colleges. With NUOL it shares part of its ICT infrastructure. NAFRI supervises students from the University and the College on a regular basis. Perhaps most importantly NAFRI and NUOL staff participate in joint activities. NAFRI uses university staff on a contract basis to increase its capacity to develop and deliver products and services.

The commercial private sector is still quite underdeveloped in Laos. A number of state-owned enterprises (SOE) exist in the agricultural input (fertilizers) and agro-industry sector. Very few SOEs make a profit, but private sector agro-industry appears to be struggling as well. Key issues highlighted by representatives from the commercial sector\(^1\) include difficulties to get permits for start up and operation, absence of standardized tax laws, taxation of traders, and limited cooperation with development projects and the research and

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\(^1\) At the workshop on “Poverty Reduction and Shifting Cultivation Stabilization in the Uplands of Lao PDR: Technologies, approaches and methods for improving upland livelihoods”, Luang Prabang, 27-31 January 2004
extension system. Opportunities include a growing demand for processed products as incomes rise, and increased possibilities for exports as trade barriers are reduced. The latter will however also lead to increased imports, which will affect the possibilities for national agro-industry.

Non-governmental organizations (NGOs) are playing a major role in agricultural technology and development. They are involved in rural development, agriculture, education and social development focusing on participatory approaches, gender issues, often working with non Lao speaking minorities in remote parts of the country. Many NGOs are interested in developing closer collaboration with NAFRI as witnessed by their strong representation at the Luang Prabang Uplands workshop. A major challenge is how to coordinate the activities of NGOs and scale up their coverage using effective methods. NAFRI and NAFES have an important role to play in this process.

Donors play a key role for NAFRI. Government funding to the agricultural research system is low and declining (see Table 2.2) and the donor community has contributed very generously to agricultural research and development in general and to NAFRI programs and projects. Most donors focus their activities on field related research programs which allows them to demonstrate impact on poverty and improvement in rural livelihoods. Coordination of donor activities and projects is an important challenge for NAFRI to ensure that coherent approaches are used and that donor activity contributes effectively to national priorities.

A key concern is that donor emphasis on field-oriented programs, combined with very limited government investment in infrastructure at the NAFRI Centers, and the absence of a private sector agricultural input industry, is leading to a situation where new technologies, inputs, and new management practices are not available. There is a great and unmet demand for new varieties and breeds for a large number of commodities and animal species to cover the needs of farmers in Laos’ many different and highly diverse production systems. Most NAFRI Centers lack the basic capacity for key tasks such as varietal evaluation (in multiple locations), seed multiplication, and animal production to effectively support the on-farm research effort which is the core of NAFRI’s applied and adaptive research work.

Sida through the LSUAFRP provides key support to NAFRI’s institutional and capacity development which has been instrumental in enabling it to move towards achieving its objectives. LSUAFRP institutional development support through TA and training activities aims to enhance NAFRI capacities and skills in a number of areas including research management, information management, socio-economic research, English language and technical training, as well as building FSR/E capacity.
Chapter 5. Strategies for NAFRI

Based on an analysis of the internal and external environment analyses with stakeholders, the NAFRI strategy team identified key issues that are of concern to the institute and its stakeholders, and formulated strategies and actions to address these issues.

The current chapter is divided into two sections. The first addresses internal (organizational) issues, while the second examines NAFRI issues related to challenges, opportunities and conditions in its external environment.

5.1 Strategies for Internal Issues and Constraints

In this section, issues and strategies are categorized under the following major headings:

- Governance and mandate
- Structure, organization and coordination
- Research planning, monitoring and evaluation
- Human resource management
- Other resource management
- Partnership and linkage management
- NAFRI programs\ and activity

Each issue is marked high, moderate or low, indicating its relative urgency or importance. These rankings were established by a NAFRI team. It should be noted, however, that all issues are important in the sense that they were developed in response to internal and external stakeholder concerns. The indication of relative importance refers to the order in which each issue will be addressed and the related strategies carried out.

5.1.1 Governance and Mandate

Internal Governance

Issue 1. High. NAFRI managers have limited experience in technical and management issues, which affects their capacity to provide scientific and management guidance.

Strategy 1.1. Provide courses on research management and communication skills for NAFRI, Division and program leaders, and research center directors.

Strategy 1.2. Learn from and share experiences with other research organizations in Laos and abroad.

Issue 2. High. NAFRI’s activities are sometimes compartmentalized and NAFRI needs further improvements toward building a system of Centers that address research on commodities, disciplines and systems in an integrated manner.

Strategy 2.1. Establish a number of national research programs / subprograms on key problems or commodities, involving different NAFRI Research Centers.
Strategy 2.2. Continue and expand the area-based research approaches involving staff from different Research Centers in interdisciplinary approaches.

Strategy 2.3. Improve information sharing by establishing a system and information infrastructure at all NAFRI Centers.

**Existing Mandate:**

| Issue 3. High. The existing NAFRI mandate statement does not refer to some research areas that are important for farmer income, including biodiversity, aquatic resources and market-oriented themes. |

Strategy 3.1. After assessment of the current mandate statement with center directors and MAF, NAFRI will update the wording of its mandate to include high priority themes.

### 5.1.2 Structure, organization, and coordination

| Issue 4. High. The administrative system procedures are not precisely elaborated in some areas – e.g. for fund transfer, or contracting procedures to support activities are not precisely defined. |

Strategy 4.1. Develop specific guidelines within NAFRI for unclear procedures.

| Issue 5. Moderate. The multi-disciplinary approach isn’t reflected in the NAFRI structure and tasks are not clearly enough differentiated at different levels. |

Strategy 5.1. Add one multi-disciplinary regional research center in the south at the CRC location.

Strategy 5.2. Reorient the structure of the NAFRI system and differentiate detailed tasks/responsibilities of research centers and regional centers.

| Issue 6. Low. Agreement on coordination and cooperation in research is often reached but actual implementation of activities is difficult because proposals do not follow good development and approval processes. |

Strategy 6.1. Procedures for proposal preparation, the approval process for proposals, and budgets based on detailed action plans need to be improved, and delegation of the process to the research center level should be considered.

Strategy 6.2. Develop and insist on a procedure: plan research activities ➔ develop proposals ➔ Scientific Research Committee ➔ approval ➔ budget staff time and costs for activities.
5.1.3 Research Planning, Monitoring and Evaluation

Strategic Planning and Priority setting:

Issue 7. High. The 2001-2005 NAFRI strategy does not give attention to organizational and management issues, and few improvements for the organization have been planned in these areas.

Strategy 7.1. Develop a new strategic plan that addresses organizational, management and program issues.

Issue 8. High. Priorities are sometimes established at the level of individual research centers and may not address NAFRI research system priorities.

Strategy 8.1. Carry out priority setting at commodity and research activity levels, with internal stakeholders and representatives of key partners.

Program, project planning and implementation

Issue 9. High. Motivation to design and prepare projects is low among the scientists with the skills, and directors’ time is used for much of this work.

Strategy 9.1 Link project preparation work to rewards by specifying such work as a criterion in the staff evaluation system.

Issue 10. Moderate. Key NAFRI staff are involved in many different donor projects, including small projects that have similar administration, management and staffing demands, with possible risk of their over commitment.

Strategy 10.1. NAFRI will develop more effective planning and coordination mechanisms with its donors to match staffing capacity with project demands, and request that lighter administrative procedures be established for small projects.

Strategy 10.2. NAFRI will delegate authority for project management and administration to center program levels, including project financial and decision making authority (for example, based on quarterly plans).

Strategy 10.3. Smaller scale projects will be evaluated and screened, in the interest of efficiency in resource use and implementation.

Strategy 10.4. Form a group from NAFRI centers and other partners (universities, NAFES) that are available to work on donor projects.

Strategy 10.5. To the fullest possible extent, send more staff for long-term studies / training to build the NAFRI’s capacity to cover research needs, including donor project counterpart assignments.
Monitoring, evaluation and impact assessment:

**Issue 11. Moderate.** No evaluation is carried out at project activity level, only at the program or project level.

Strategy 11.1. Use personnel from other projects in NAFRI to carry out external evaluations at activity level (for more objective results).

**Issue 12. Moderate.** There are no established procedures or efforts for monitoring, evaluation and impact assessment at NAFRI.

Strategy 12.1. Define the methods, procedures and unit responsibilities at NAFRI HQ for impact assessment and improve NAFRI M&E procedures.

Strategy 12.2. Build funding into donor projects for training in M&E and impact assessment methods, and the implementation of impact studies.

**5.1.4 Human Resources Management**

Staff Evaluation, incentives, sanctions and motivation

**Issue 13. Moderate.** Evaluation criteria are not fully linked to promotion or pay grade increases, and sanctions for staff are ineffective.

Strategy 13.1. Develop and implement evaluation criteria and establish a reward system as an alternative means of motivating staff, for submission to the personnel department of MAF.

**Issue 14. High.** Staff rules and regulations exist but are difficult to implement, and existing procedures for staff sanctions, incentives and motivation are ineffective, and affect research performance.

Strategy 14.1. NAFRI will expand incentive and reward mechanisms (monetary and non-monetary) to motivate staff, including the expansion of training opportunities, and granting additional leave days in recognition of performance.

Strategy 14.2. Public recognition of high performance individuals will be improved through the NAFRI newsletters, and posting of announcements with photos.

Strategy 14.3. Establish a special annual science reward for outstanding research contributions.

**Issue 15. Moderate.** Rules and regulations of the civil service are not strictly implemented and sanctions are not always applied within NAFRI.

Strategy 15.1. Increase awareness and understanding of civil service rules and regulations through internal seminars or briefings.
Strategy 15.2. Impose a deduction of incentive rewards if rules are repeatedly broken by individual researchers or directors.

**Training**

<table>
<thead>
<tr>
<th>Issue 16. <strong>High</strong>. Existing NAFRI and Center level training plans cannot be fully implemented due to: 1) funding constraints for specific studies/training areas; 2) a mismatch between outside training offers and NAFRI needs, as specified in the training plan.</th>
</tr>
</thead>
</table>

Strategy 16.1 NAFRI will prepare an updated training plan to use in negotiations with donors/providers for training opportunities, with an official copy circulated to MAF, partners and donors.

**Staff planning and recruitment**

<table>
<thead>
<tr>
<th>Issue 17. <strong>Moderate</strong>. Recruitment plans are developed for NAFRI centers, but they can’t be implemented because of recruitment restrictions established by MAF.</th>
</tr>
</thead>
</table>

Strategy 17.1. Continue to hire contract staff paid directly by Centers or by projects.

Strategy 17.2. Involve staff from other research institutes through collaborative agreements.

Strategy 17.3 Ensure a better match between staff requirements (qualifications, skills) at the NAFRI Centers and the staff posted to the Centers through improved consultation with MAF

**5.1.5 Other Resource Management**

<table>
<thead>
<tr>
<th>Issue 18. <strong>High</strong>. The allocation of Government and donor funds to Centers does not take place in a balanced way, affecting NAFRI level research priorities.</th>
</tr>
</thead>
</table>

Strategy 18.1. Develop a national research program framework for agricultural and forestry research, which can be used to coordinate investments and the research activities of NAFRI and its partners.

<table>
<thead>
<tr>
<th>Issue 19. <strong>High</strong>. Some NAFRI Centers are lacking the key infrastructure and equipment needed to adequately carry out their research and service responsibilities.</th>
</tr>
</thead>
</table>

Strategy 19.1. NAFRI will develop a rehabilitation plan for the redefined responsibilities of national centers, focusing on essential facilities and equipment for their tasks, and seek donor funding for the investments.

Strategy 19.2. Develop an investment plan for high-priority research equipment and facilities needed for NAFRI’s core research programs and its public responsibilities, and increase donor awareness of its importance.

<table>
<thead>
<tr>
<th>Issue 20. <strong>Moderate</strong>. NAFRI has a limited number of qualified technicians for work in its research labs, constraining its ability to achieve its objectives.</th>
</tr>
</thead>
</table>
Strategy 20.1. Expand HRD activities in technical areas required for lab technicians.

**Issue 21. Moderate.** Limited access to communication facilities makes it difficult to develop an effective information network between NAFRI Centers and Headquarters, and restricts the flow of information in the NAFRI system.

Strategy 21.1. Improve communication, email and databases across NAFRI.

**Issue 22. Moderate.** NAFRI has limited capacity to use foreign funding for research activities in an effective manner, affecting the quality and quantity of research outputs.

Strategy 22.1. Optimize the use of donor assistance through the development and implementation of a national research program framework (refer also to Strategy 18.1).

### 5.1.6 Partnership/linkage management

**Linkages with donors, international organizations, regional institutions, and NGOs**

**Issue 23. Moderate.** Limited and inefficient networking capacity by NAFRI affects its ability to benefit from technology and information available at other national and international organizations.

Strategy 23.1. Improve networking capacity through English language training and improved ICT infrastructure.

Strategy 23.2. Encourage NAFRI staff to participate in scientific networks.

**Linkages with line departments and NAFES:**

**Issue 24. High.** Lack of systematic linkages for collaboration and coordination of efforts between research and extension at national and provincial levels are affecting the flow of tested technology and information to farmers, and limiting technical backstopping.

Strategy 24.1. NAFRI will carry out systematic linkage planning with extension partners (NAFES, NGOs).

Strategy 24.2. NAFRI will undertake systematic planning and budgeting of linkages with PAFOS.

Strategy 24.3. Involve NAFES staff in NAFRI on-farm research.

**Issue 25. Low.** Lack of clarity and awareness about tasks and responsibilities between NAFRI, MAF (line departments, PAFO, DAFO), and NAFES causes duplication of effort in project implementation and reduces resource use efficiency.

Strategy 25.1. Develop with partners an agreement on tasks to be carried out or shared at different levels (research centers, regional centers, NAFES extension services)
Issue 26. Low. The potential to use development projects to disseminate information to farmers is not realized.

Strategy 26.1. Use development projects in different parts of the country for dissemination of information and technologies through improved coordination efforts.

Linkages with NUoL; STEA; MOH and other ministries:

Issue 27. Moderate. Collaboration with the University and other government agencies needs to be improved to increase the possibilities for joint capacity building, research and dissemination.

Strategy 27.1 Develop a forum for discussion and planning of joint initiatives.

Linkages with Private sector, business, trade, industry:

Issue 28. High. NAFRI research is not sufficiently linked to market, agro-industry demand or cooperation with the private sector to produce relevant technologies for producers and processors.

Strategy 28.1. Involve representatives from the commercial sector (traders, processors) in NAFRI research planning at appropriate meetings

Strategy 28.2. Systematically plan and budget linkages in cooperation with commercial sector representatives.

Strategy 28.3. Initiate NAFRI program activities that address market and processor needs.

Linkages with Provinces, districts, and farmers:

Issue 29. High. NAFRI staff and other resources are not sufficient to respond to producer and farming system needs as defined by the PAFO and DAFO strategies in different parts of the country.

Strategy 29.1 Focus research on problems important for different provinces and regions, through representative site selection.

Issue 30. Moderate. NAFRI Research program planning does not give enough attention to the strategies developed at PAFO level.

Strategy 30.1. Study and use the PAFO strategies, in addition to MAF strategies, to plan NAFRI research activities that address shared production problems in different provinces (include consultation with PAFO).
5.1.7 NAFRI Programs and Activities

**Issue 31.** High. The capacity and motivation of researchers to design and formulate projects addressing national priorities and needs, for donor consideration, is limited.

Strategy 31.1 Build capacity of staff in project formulation through training in project design and appraisal.

Strategy 31.2 Establish a joint project review and approval process, involving both researchers and donors.

Strategy 31.3 Establish incentives to motivate staff for project preparation, and consider establishing a special unit or committee for project formulation.

**Issue 32.** High. NAFRI research has limited relevance for farmers because it is not effectively targeted to different production systems and locations (sites), and is too focused on technical rather than important social issues.

Strategy 32.1. Improve diagnostic surveys to better identify farmer needs and problems, especially in poor districts.

Strategy 32.2. Improve understanding of existing production systems to form a basis for the introduction of new technologies, production practices and cropping systems and to allow dissemination of technologies and practices (scaling up of research).

Strategy 32.3. Research topics for on-farm research need to be agreed between farmers and researchers (avoiding a top-down approach).

Strategy 32.4. Strengthen understanding of social issues in relation to technology development in the context of production system and rural livelihoods.

Strategy 32.5. In staff capacity building efforts for NAFRI staff, strengthen socio-economics expertise.

Strategy 32.5. Develop a sourcebook that provides a synthesis of knowledge about upland systems and relevant research approaches for wide dissemination and consensus building.

**Issue 33.** High. NAFRI research is not adequately prioritized, leading to lack of resources for important research areas.

Strategy 33.1. Review NAFRI and Center research priorities.

Strategy 33.2. Develop a national research agenda based on a consensus between NAFRI, Government and donors.

**Issue 34.** Moderate. NAFRI research is sometimes lacking in quality, because of limited incentives and limited staff capacity to produce high quality research.
Strategy 34.1. Incentives for staff need to be research output related.

Strategy 34.2. Provide training to improve researcher capacity and skills in project design, research methods, and report preparation.

**Issue 35. Moderate.** English language proficiency is a bottleneck in working with donors and donor projects, and lack of English knowledge limits the possibility of NAFRI staff benefiting from training opportunities and participating in projects.

Strategy 35.1. Improve tailoring of English courses by adapting content and level to researcher needs and capabilities.

Strategy 35.2. Relate English test results to international standards and levels.

Strategy 35.3. Expand the English training initiative within NAFRI, and send staff for scientific training to countries that use English in the course work.

**Issue 36. High.** Research projects do not always analyze data and produce quality research reports; this leads to the unavailability of research results and to duplication of efforts.

Strategy 36.1. Ensure that research proposals and project documents contain a review of earlier research and literature as a basis for the proposed new research.

Strategy. 36.2. Ensure that research reports are produced by providing adequate training, incentives and sanctions.

Strategy 36.3. Improve availability of research results by making a database and website of ongoing and completed research, available to Centers and other stakeholders.

**Issue 37. High.** Due to limited government funding there is a need to improve opportunities and establish procedures for obtaining more funds for research.

Strategy 37.1. NAFRI will develop policies to maximize funding, including contracts with private sector, cost recovery and overheads for services and cost sharing through collaborative projects, and ensure that there is a balance between mandated research activities and income generating activities.

Strategy 37.2. NAFRI will establish procedures for contracting with its client organizations (e.g. enterprises, international organizations, provincial governments) for providing research and services.
5.2 Strategies for External Issues and Constraints

Issues and strategies related to the external environment of NAFRI are categorized under the following major headings:

- Policy and governance
- Institutional actors/partners
- Socio-economics
- Resources
- Planning and implementation

5.2.1. Policy and governance issues

<table>
<thead>
<tr>
<th>Issue 1. Moderate. NAFRI should provide more input for policy development in agricultural research and development.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 1.1. NAFRI recommendations and briefs on policies will be periodically provided to MAF, to assist in policy formulation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issue 2. High. Coordination of research efforts and continuity of funding by NAFRI and donors is needed to ensure the coherence, sustainability and completion of research program objectives and longer term initiatives.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 2.1. In partnership with donor representatives, partners and other key stakeholders, NAFRI will develop an agricultural and forestry research program framework to guide research actors, and government and donor investments that promote the achievement of priority and long-term research objectives.</td>
</tr>
<tr>
<td>Strategy 2.2. NAFRI will organize with key donors a regularly scheduled forum (twice a year) to discuss and agree on the funding and implementation of a coordinated national agricultural and forestry research program with shared goals. Funding for the meetings would need to be provided by the donors.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issue 3. Moderate. There is a gap between stakeholder expectations and NAFRI’s capacity to respond in a timely manner to a variety of different demands. This may cause unfair criticism of NAFRI’s performance and possible loss of funding.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 3.1. NAFRI will initiate communications, information services and awareness building with stakeholders to keep them informed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Issue 4. Low. Planning and implementation of NAFRI research and dissemination activities at provincial and district level requires capacity building and adequate qualified staff at PAFO and DAFO levels to achieve good results.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy 4.1. NAFRI will continue to provide hands-on training for NAFES, PAFO and DAFO staff involved in research implementation, and support for degree training as part of donor project activity.</td>
</tr>
</tbody>
</table>
Issue 5. High. Decentralization of NAFRI research is necessary to bring research closer to its clients in different agro-ecological zones, and respond to their needs.

Strategy 5.1 NAFRI will establish additional regional centers (one more in the south) that focus on integrated research, and adjust the national research center responsibilities to emphasize support of the regional centers.

Issue 6. Moderate. There is a need to examine the existing NAFRI and centers structure and consider necessary changes through adding and/or merging of national agricultural and forestry research centers.

Strategy 6.1. The structure and effectiveness of individual research centers will be reviewed, the possibility of restructuring the system and rationalizing the number and type of units in each center will be considered.

Strategy 6.2 The structure of individual research centers will be reviewed, and

Issue 7. Low. Biotechnology and biosafety issues for agriculture and forestry need to be addressed by Laos and this will need the involvement of NAFRI scientists.

Strategy 7.1 NAFRI will work with STEA on identifying urgent issues for Lao agriculture and forestry biotechnology and biosafety, and build capacity for addressing biosafety issues within NAFRI.

Strategy 7.2 NAFRI will cooperate with regional and international research organizations in the development of biotechnology capacity.

Issue 8. High. Low salaries and poor benefits (e.g.; low level of medical insurance) can affect motivation, cause some loss of skilled management / scientific staff, and are a future threat for research performance, and for attracting and retaining research staff.

Strategy 8.1. Salaries and benefits are determined by civil service, but the development of an incentives system based on an improved staff evaluation system will improve the situation.

Strategy 8.2. NAFRI will continue to raise awareness of the problems for economic development caused by low pay for its staff – e.g.; continue the special campaigns of presentations and briefings for investors and decision makers.

5.2.2. Institutional and research actor issues

Issue 9. High. More effective communications and information sharing between NAFRI, clients, stakeholders and research-extension organizations is needed to improve coordination.

Strategy 9.1. NAFRI will establish and regularly update a website with reports, publications and information about its research – service activities and results.

Strategy 9.2. NAFRI will review and update its report and publications distribution list to ensure wider availability of research results to stakeholders.
Strategy 9.3. Build a network of NAFRI clients and partners using email, invitations to technical meetings and seminars, and exchange of publications.

**Issue 10. Moderate.** Key partners and stakeholders are not adequately involved in the identification of research needs, planning of research objectives, and the review of results.

Strategy 10.1. NAFRI will continue to hold workshops in different regions of Laos to determine needs and production constraints that can be addressed by agricultural research and services.

Strategy 10.2. As its major approach for identifying clients’ constraints and needs NAFRI will capture secondary source data from different sources, and carry out additional diagnostic surveys (e.g. market, household and production/farming systems) with the participation of relevant representatives of PAFES, DAFO, processors and producers.

Strategy 10.3. NAFRI will invite key stakeholders (e.g. NAFES, NUOL representatives) as members of the Scientific Research Council.

**Issue 11. High.** Decentralization of research requires additional staff and capacity building at regional levels (regional centers).

Strategy 11.1. NAFRI will continue to provide technical backstopping and support training activities to PAFO and DAFO through partnership agreements.

Strategy 11.2 Human resource capacity will be built at regional research center(s) through training and re-assignment.

**Issue 12. Low.** NAFRI does not sufficiently use opportunities for resource sharing that may be available through partnerships with other organizations.

Strategy 12.1 NAFRI will make agreements on joint collaborative research including resource sharing (staff, equipment, and facilities) with specific partners (e.g. NUoL), based on the proposed agricultural and forestry research program framework.

### 5.2.3. Socioeconomic issues

**Issue 13. Moderate.** Socio-economic research capacity and studies are limited, but are needed to understand livelihood situations and socio-economic conditions, and to design research relevant for different types of producers.

Strategy 13.1. NAFRI will train and assign staff to conduct baseline studies, and will develop and promote integrated, system approaches for different producer types/agro-ecosystems.

**Issue 14. High.** NAFRI does not carry out enough research on market constraints, conditions, trends and opportunities that may increase incomes for farmers and communities.
Strategy 14.1. Over the longer term staff capacity for market related studies will be built through degree training in appropriate market related subject areas.

Strategy 14.2. NAFRI will hire consultants when needed, to carry out market related studies on market trends, demands, and opportunities.

Issue 15. High. Regional and bilateral trade treaties, as well as fast growing Asian markets, will have important consequences for Lao producers in terms of competition and opportunities and will be a challenge for NAFRI’s research.

Strategy 15.1. NAFRI will conduct research on export markets and the comparative advantage of Lao agriculture, using consultants and technical assistance.

Issue 16. Moderate. Agricultural production diversification and intensification requires NAFRI to address additional subject areas or commodities, for which it may need to build capacity.

Strategy 16.1. NAFRI will review and update its research programs more frequently to meet the changing needs of farmers.

Strategy 16.2. NAFRI will build expertise and capacity in subject areas identified as important for diversification, intensification and sustainability (e.g. IPM)

Issue 17. Moderate. NAFRI needs to provide support to farmers and industry for the production of agricultural and forestry products that meet standards of high quality, safety, and niche markets such as organic food products

Strategy 17.1. NAFRI will be actively involved in the development of criteria and indicators for sustainable forest management, including certification.

Strategy 17.2. Build awareness of the need for quality and safety standards among producers and agro-industry through extension messages and seminars.

Strategy 17.3. Assist MAF with the development of the quality and safety standards for agricultural and forestry products.

Strategy 17.4. Build NAFRI capacity to address quality and safety issues in its research programs and through technical assistance and training.

Strategy 17.5. Assist with the development of coordination mechanisms for the promotion of internal and export markets for high quality, safe agricultural and forestry products.

5.2.4. Resource Issues

Issue 18. Low. NAFRI does not have intellectual property rights protection for its products and information.
Strategy 18.1 NAFRI will clarify the IPR issues for agricultural research, build awareness among its researchers, and liaise with STEA in the development IPR protection.

<table>
<thead>
<tr>
<th>Issue 19. High. NAFRI has limited numbers of qualified staff in research and management, which constrains its ability to achieve its research objectives and the development goals of Government.</th>
</tr>
</thead>
</table>

Strategy 19.1. NAFRI will continue to contract national and international consultants to carry out research that requires additional expertise and staff.

Strategy 19.2. Involve as much as possible national and international university students in carrying out research that supports NAFRI program objectives.

5.2.5 Planning and implementation Issues

<table>
<thead>
<tr>
<th>Issue 20. High. Farm level impact is difficult to achieve because of the complexity and diversity of upland farming systems, and the long-term nature of the required research.</th>
</tr>
</thead>
</table>

Strategy 20.1 NAFRI will define the projects for integrated approaches to production and farming systems research, including the activities, time frames and funding required to achieve results.

Strategy 20.2. NAFRI will develop recommendations for methods to extend the coverage of successful pilot or project research approaches and results (scaling up).

<table>
<thead>
<tr>
<th>Issue 21. High. NAFRI needs to effectively involve stakeholders in readjusting its research priorities to focus on key research objectives and the development goals of poverty eradication, environmental protection (including shifting cultivation stabilization), and economic development.</th>
</tr>
</thead>
</table>

Strategy 21.1. NAFRI will periodically carry out priority setting for research themes and activities using criteria that include the development goals that can be addressed by research as a means of advancing their realization through its research programs.

Strategy 21.2. NAFRI will involve stakeholder representatives at key points in its priority setting processes.

<table>
<thead>
<tr>
<th>Issue 22. High. More priority needs to be given to post-harvest research, processing and value addition for priority commodities in order to reduce losses, and improve incomes and profit.</th>
</tr>
</thead>
</table>

Strategy 22.1. NAFRI will review its research programs for post harvest, processing and value addition content, and add relevant research in the subject areas identified as high priority.

Strategy 22.2. NAFRI will hire consultants and build future capacity to address the priorities identified for post harvest, processing and value addition research.
Issue 23. High. NAFRI needs to maximize the benefits of involvement in long-term or regional research since the high level of donor oriented research sometimes results in projects that do not contribute to the agreed priorities of the national research program agenda, or match the capacities of the national research system.

Strategy 23.1. NAFRI will evaluate potential regional initiatives (research projects, networks, information exchange) and long term commitments in relation to their contributions to NAFRI program objectives, considering staff resources and capacity constraints.
Chapter 6. Priorities for NAFRI Research

Priority setting is the process of using objective means to select the most important targets for agricultural research. It is hierarchical in nature and can be applied at national research system level and then at the research activity or project level for the research centers.

6.1 Background

NAFRI has significant limiting factors in its capacity to carry out agricultural research and services, including available staff, and some key laboratory facilities, equipment, and infrastructure needed to carry out its tasks and responsibilities. The most serious limitation is adequate numbers of researchers with the scientific training and disciplinary qualifications for diverse research needs, a constraint which is established by the GOL.

Priority setting focuses resource investments on the most essential research activities using objective criteria rather than intuition, and it establishes the logic for making the choices about resource investments. There are many possible research objectives, and since no research system can afford to address all of them, it is necessary to select the most important. For these reasons, NAFRI has implemented priority setting at the research system level for the first time.

After priority setting is completed, decisions about what research to undertake should be made based on relative importance (using the ranked scoring results). Which of these will be undertaken and when will depend primarily on the NAFRI centers’ ability to provide scientists and technicians for research. Priority setting is a learning process; and as this is the first time that NAFRI has undertaken national level commodity and non-commodity priority setting, it is important that the results be examined with a critical eye and that they be checked for mis-scoring. Adjustments or re-scoring of some priorities may be needed. The results provide a guide for program planning and resource investments, but it must be remembered that system level priority setting is indicative and broad in nature. Priorities that are responsive to regional farmer production constraints will need to be established at the research project or activity level for each of the NAFRI research centers as a next step.

6.2 Methods

Priority setting is not an intuitive process, but an application of pre-selected objective criteria. A scoring method was used for commodities and non-commodity research areas, based on criteria that addressed government policy goals, research contribution to productivity, and research feasibility objectives appropriate for agricultural research. The criteria were applied to lists of commodities and research areas considered appropriate for the NAFRI research system. Other priority setting methods are not supported by the types of data needed and in any event are seriously lacking in terms of transparency, the ability to apply differential weights and possibilities of broad participation.

The criteria were established by a NAFRI preparation team for both commodity and non-commodity research. Weights were applied to each criteria, based on their relative importance.
In working sessions, approximately 40 participants (NAFRI and external) provided criteria scores related to the policy and productivity objectives for listed commodities and non-commodity research areas. Research feasibility scores were established by a group of 30 researchers. The scores were entered into Excel spreadsheets, and average weighted scores were established. These were sorted from high to low, and the results were grouped into high, moderate and low categories for commodities, and into high and moderate categories for non-commodity research areas.

### 6.3 Results

The preliminary results of scoring were presented and discussed in a plenary working session with the participants using a projector, and a researcher team was assigned to make adjustments.

The priority setting results are presented below. These results have been checked for obvious mis-scoring and preliminary adjustments have been made. They will be examined again by relevant research specialists, and then used as input for future research planning. The level of priority may be further adjusted if the ranges for high, moderate or low scores are changed.

#### 6.3.1 Commodity Results

The following table gives the results of commodity scoring for high, moderate and lower scores.

<table>
<thead>
<tr>
<th>High Priority</th>
<th>Moderate Priority</th>
<th>Lower Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed/forage crops</td>
<td>Threatened species</td>
<td>Onions</td>
</tr>
</tbody>
</table>

Table 6.3 Commodity Priorities
### 6.3.2 Non-Commodity Results

Non-commodity scores have been separated into high and moderate categories, and are presented below.

#### Table 6.4 Non-Commodity Priorities

<table>
<thead>
<tr>
<th>High Priority</th>
<th>Moderate Priority</th>
<th>Lower Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle, beef/ Buffalo</td>
<td>Sheep</td>
<td>Pears</td>
</tr>
<tr>
<td>Soybeans</td>
<td>Tomatoes</td>
<td>Macadamia</td>
</tr>
<tr>
<td>Medicinal plants.</td>
<td>Flowers</td>
<td>Mak Souveu</td>
</tr>
<tr>
<td>Commercial NTFP product sp.</td>
<td>Beans</td>
<td>Plum</td>
</tr>
<tr>
<td>Swine/Pig</td>
<td>Taro</td>
<td>Sweet Potato/Yam</td>
</tr>
<tr>
<td>Chickens</td>
<td>Black Pepper</td>
<td>Lemons</td>
</tr>
<tr>
<td>NTFP for household consumption sp</td>
<td>Orange</td>
<td>Melons</td>
</tr>
<tr>
<td>Goat</td>
<td>Mangoes</td>
<td>Cattle, dairy</td>
</tr>
<tr>
<td>Rice</td>
<td>Castor Beans</td>
<td>Cotton</td>
</tr>
<tr>
<td>Carp/tilapia</td>
<td>Coconut</td>
<td>Peas</td>
</tr>
<tr>
<td>Frog</td>
<td>Chilli</td>
<td>Sunflowers</td>
</tr>
<tr>
<td>Bamboo, canes &amp; rattan</td>
<td>Mung bean</td>
<td>Sweet Peppers</td>
</tr>
<tr>
<td>Export lumber</td>
<td>Papayas</td>
<td>Bees</td>
</tr>
<tr>
<td>Sugar cane</td>
<td>Garlic</td>
<td>Eggplant</td>
</tr>
<tr>
<td>Construction lumber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pineapples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cassava</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cashews</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duck</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multipurpose trees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rubber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabbage &amp; lettuce</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catfish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tamarind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundnuts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal husbandry</td>
<td>Soil survey, classification &amp; mapping</td>
<td></td>
</tr>
<tr>
<td>Animal nutrition &amp; feeds</td>
<td>Capture fishery</td>
<td></td>
</tr>
<tr>
<td>Aquaculture (fish farming)</td>
<td>Forest product processing &amp; value addition</td>
<td></td>
</tr>
<tr>
<td>Farming systems</td>
<td>Gender studies</td>
<td></td>
</tr>
</tbody>
</table>
### High Priority

| 4.121-3.250 |  
|-------------------------|-------------------------|
| Irrigation & water management | Evaluation & impact assessment |
| Soil fertility & chemistry | Tree genetic resources/seed |
| Cropping system | Tree domestication |
| Forest management | Policy studies |
| Forest/tree protection and inventory | Structures |
| Agroforestry | Wetland management |
| Machinery & tools | Wood energy |
| Market studies | Zoonotic diseases |
| Plant genetic resources and improvement | Post harvest preservation & storage technology |
| Food processing and value addition | Artificial insemination |
| Soil conservation and management | Village forestry |
| Agronomy | Weeds and weed control |
| Sociology | Biotechnology |
| Land use planning and allocation | Statistics and biometrics |
| IPM | |
| Ag. Economics | |
| Watershed management | |
| Plant pests and diseases | |
| Aquatic ecology | |
| Forestry production & certification | |
| Animal health (pests & diseases) | |
| Biodiversity | |
| Animal genetic resources & breeding | |

### Moderate Priority

| 3.200-2.450 |  
|-------------------------|-------------------------|
| Irrigation & water management | Evaluation & impact assessment |
| Soil fertility & chemistry | Tree genetic resources/seed |
| Cropping system | Tree domestication |
| Forest management | Policy studies |
| Forest/tree protection and inventory | Structures |
| Agroforestry | Wetland management |
| Machinery & tools | Wood energy |
| Market studies | Zoonotic diseases |
| Plant genetic resources and improvement | Post harvest preservation & storage technology |
| Food processing and value addition | Artificial insemination |
| Soil conservation and management | Village forestry |
| Agronomy | Weeds and weed control |
| Sociology | Biotechnology |
| Land use planning and allocation | Statistics and biometrics |
| IPM | |
| Ag. Economics | |
| Watershed management | |
| Plant pests and diseases | |
| Aquatic ecology | |
| Forestry production & certification | |
| Animal health (pests & diseases) | |
| Biodiversity | |
| Animal genetic resources & breeding | |

#### 6.3.3 Priorities by NAFRI Center

The priorities were also sorted by research center for commodities. The following tables show the results.

### Agriculture Research Center

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Total Score</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans</td>
<td>3.831</td>
<td>Soybeans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>3.510</td>
<td>Rice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar cane</td>
<td>3.479</td>
<td>Sugar cane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>3.415</td>
<td>Maize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pineapples</td>
<td>3.380</td>
<td>Pineapples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cassava</td>
<td>3.378</td>
<td>Cassava</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato</td>
<td>3.326</td>
<td>Potato</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundnuts</td>
<td>3.271</td>
<td>Groundnuts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco</td>
<td>3.271</td>
<td>Tobacco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taro</td>
<td>3.106</td>
<td>Taro</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Castor Beans</td>
<td>3.048</td>
<td>Castor Beans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mung bean</td>
<td>2.999</td>
<td>Mung bean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet Potato/Yam</td>
<td>2.854</td>
<td>Sweet Potato/Yam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>2.768</td>
<td>Cotton</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunflowers</td>
<td>2.727</td>
<td>Sunflowers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Coffee Research Center

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Total Score</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>3.397</td>
<td>Coffee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td>3.315</td>
<td>Tea</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Forestry Research Center

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Total Score</th>
<th>High</th>
<th>Moderate</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicinal sp.</td>
<td>3.819</td>
<td>Medicinal sp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial NTFP sp.</td>
<td>3.708</td>
<td>Commercial product sp.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTFP for household consumption sp</td>
<td>3.674</td>
<td>NTFP for household consumption sp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bamboo, canes &amp; rattan</td>
<td>3.487</td>
<td>Bamboo, canes &amp; rattan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Export lumber</td>
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### Horticulture Research Center

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**Living Aquatic Resources Research Center**

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**Livestock Research Center**

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**Non-commodity Sort by Centers**

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<td>Ag. Eng - structures</td>
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<td>ARC</td>
<td>Agronomy</td>
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### 6.4 Implementing Priorities

Priorities are implemented by changing resource allocations for research. Shelving low priority work and shifting resources to higher priority research is an effective means of focusing NAFRI’s limited staff, equipment and other resources.

Once priorities are established through objective means and adjusted, they should be implemented since this is the step that focuses research and addresses policy and development goals. There are however constraints to the implementation of priorities that need to be recognized and confronted. The most common include:

- Limited government budget and dependency on external funding sources that may have other priorities;
- Opportunistic pursuit of projects for any commodity or non-commodity research due to funding limitations;
- Donor influence on the research agenda; different perceptions of donors;
- Bias of researchers in research planning;
- Ad hoc changes in priorities and the research agenda;
• Limited integration and linkage between priority setting results and program planning.

The results of the workshop for commodity and non-commodity priorities are valuable input from the participants, and will be used for adjusting research program content. As a first step, the scores will be further analyzed by NAFRI staff to determine if errors or mis-scoring have seriously affected results. Some additional adjustments may be necessary.

Priority setting for research is a multi-level process, and the next steps for the NAFRI research system are to

1. ensure follow-through and communication of priority setting results;
2. review the program projects/activities of the centers to determine congruence to newly defined priorities;
3. implement activity/project priority setting with regional stakeholders for center programs. This will require the development of center research portfolios to be used by the participants during priority setting. Over time, the portfolios should become ‘demand driven’. This level of priority setting will need to be carried out periodically as a means of ensuring responsiveness to farmers and industry in different regions of the Laos.
Chapter 7. Repositioning NAFRI – Overview of Major Adjustments

The strategic planning process used by NAFRI emphasizes re-positioning the organization in relation to external environment realities, and the improvement of its performance through strategies that respond to issues and constraints in the internal and external environment. The sections in this chapter summarize the most significant, adjustments and changes identified in response to external and internal stakeholders concerns (see Chapter 5 for details of issues and response strategies). They address NAFRI internal weaknesses, as well as factors in the external environment, and are regarded as necessary by the NAFRI strategic planning team. Implementing these changes will improve NAFRI’s ability to respond to opportunities and challenges, and to perform in its environment.

7.1 NAFRI Research System Building

The most important issues for improving performance of the NAFRI system of research centers are related to decentralization, structure and organization, better coordination and communication between centers, the establishment of shared research objectives, funding for the sustainability of research, adequate numbers of researchers and other staff, and levels of pay and benefits that can attract and retain staff.

A high priority issue is *decentralization* for improved responsiveness to farmer needs in different regions and agro-ecological zones in Laos. A NAFRI system strategy to address this concern will be the establishment of another regional center (one in the south in addition to NAFRC in the north) that focuses integrated and adaptive research, and to adjust the national research center responsibilities to emphasize support of the regional centers.

The current *structure and organization* for the NAFRI system of centers and for individual centers needs to be assessed, and changes made if necessary to improve the effectiveness and efficiency of infrastructure. NAFRI will review the status and viability of smaller centers and consider the possibility of merging them into other centers as units. The structure of individual research centers will also be reviewed and changes to rationalize the number and type of units will be considered.

A significant issue for the NAFRI system is *compartmentalization of research activities* at center level, and the need to improve the integration of research on commodities, disciplines and farming systems/production systems. The strategies will be the creation of system research programs or a *system wide program framework* focused on key, shared objectives, and the expansion of area based research using staff from different centers in interdisciplinary approaches.

*Sustainability* and continuity of NAFRI’s research are needed to provide research and services that contribute to economic development, but funding is unstable and pay levels are inadequate to attract and retain researcher and management staff. NAFRI will develop policies to maximize funding, including contracts with the private sector, cost and overhead recovery for services and cost sharing through collaborative projects, and ensure a balance between research activities and fund generation. Procedures will also be established for contracting with international organizations, provincial governments and enterprises for NAFRI research and services.
7.2 Partnerships and Linkages

Linkages with research and technology transfer partners, international and regional organizations, government agencies and the commercial sector were identified as problems by stakeholders. As an overall strategy, NAFRI will implement with key partners systematic partner/linkage planning to identify linkage needs and plan cost effective linkage mechanisms.

Linkages with NAFES and line departments are necessary for the flow of tested technologies and information to farmers. One of the most important future initiatives for NAFRI will be building effective partnerships for technology generation and dissemination. Currently, linkages for collaboration and cooperation with these partners, including NGOs, are weak. NAFRI needs to adopt a multi-linear and collaborative approach to the dissemination of its research results, and will meet with extension and line departments to agree on appropriate linkage management and budgets for more effective collaboration.

Linkages with NUoL, STEA, MOH and other ministries need to be improved to increase possibilities for joint capacity building, research and dissemination. NAFRI will develop a forum for discussion and planning of joint initiatives with these partners.

NAFRI linkages with business, trade and industry are not sufficient for cooperation or to meet their research needs. Meetings with representatives of key partners will be initiated to identify research areas, and reach agreements on arrangements for appropriate research activities. These agreements will be subject to the availability of appropriate NAFRI expertise.

7.3 Capacity Development

NAFRI capacity development concerns include various types of training, as well as adequate facilities and equipment for the research centers to carry out their research and service responsibilities.

For human resource training, the elements that most need improved capacity are post-graduate degrees in selected disciplines, research management, research lab technicians, project design, research methods, scientific report preparation, and English proficiency. Implementation of training in these areas will improve research quality and NAFRI’s performance.

The decentralization of research requires improved human resource capacity at the regional research center, and at PAFO and DAFO levels. NAFRI strategies to assist with building this capacity will be the continuation of support for training and technical backstopping for the provinces and districts, and reassignment of staff to the regional research center.

Many centers lack the facilities and equipment to carry out some of their assigned tasks. Center capacity needs to be improved through the provision of labs and lab equipment, seed preparation facilities, some field machinery, and information and communication infrastructure. NAFRI will assess and redefine the research and service responsibilities at
each center, prepare plans for necessary facility and equipment improvements, and seek donor funding for the investments.

### 7. 4 Research Management

Many of the adjustments needed for successful NAFRI responses to internal and external challenges and opportunities are best approached through changes in planning and management procedures. This section presents the higher priority actions that have been discussed by national researchers most involved in the strategy development.

In the area of program planning, monitoring and evaluation the principal concerns are the absence of monitoring, evaluation and impact assessment, the need for systematic program and project planning at center level, for effective research priority setting at different levels and for attention to PAFO and DAFO strategies. Improvements in these areas will result in responsiveness to user challenges, and the ability to plan and adjust activities in the light of increasingly scarce resources or changing farmer needs. It may also be useful to consider setting up a system of “advisory groups” to different research themes with representation from different stakeholders as a mechanism to broaden participation in research planning, monitoring and evaluation.

Research project reporting does not always result in quality reports or include data analysis, leading to unavailability of results and duplication of effort. Actions related to improvement of the situation include provision of incentives for quality reporting, creation of a database and website that summarize research results, and ensuring that proposals and project documents contain a review of relevant earlier research and literature.

For project planning and coordination, an important concern is related to the involvement of a few key NAFRI staff in the management of many projects, both small and large. Reduction of administrative requirements for small projects, delegation of project management including financial and decision making authority to center programme level, better planning with donors to match staff availability with project demands, and more effective screening of projects for efficiency in resource use will avoid problems of over-commitment.

Farm level project planning that results in impact is identified as an important issue. The complexity and diversity of upland farming systems, and the long-term nature of the required research require special attention during project design. Building integrated approaches into these projects, providing realistic estimations of time frames, activities and funding and including recommendations for the means of scaling up will improve results from these projects.

The limited numbers of qualified staff for research severely constrain NAFRI’s ability to achieve its research objectives and the development goals of government. Its strategies to overcome the constraint will be to continue contracting of national and international consultants to cover the needs, and to involve national and international university students in research activities.
7.5 Resource Management

The issues identified as most important in the area of resource management are related to human and information resources.

*Human resource management* in NAFRI is difficult because procedures for recruiting, training selection, evaluation, reward and promotion are largely determined by public servant rules and regulations or MAF. Motivation is affected because evaluation for promotion, rewards or sanctions is not fully linked to evaluation criteria. NAFRI is considering the development of a staff evaluation system for use internally, a parallel system to guide rewards, promotion recommendation, and sanctions.

The existing staff rules and regulations are difficult to implement and the procedures related to staff incentives, motivation or sanction are not effective. NAFRI will respond to this situation in several ways; it will expand its monetary and non-monetary incentive and reward mechanisms, possibly by granting extra leave days, and through public recognition. For sanctions within NAFRI, a deduction of incentive awards will be applied when rules are broken. Recruitment plans and Human Resource Development plans have been developed by some centers, but they are not implemented because of restrictions imposed by MAF. The result is too few researchers to carry out the plans. NAFRI strategies to overcome this include involving staff from other institutes in research activities through collaborative agreements, and continuing to contract researchers or managers that can be paid directly by centers or projects.

The management of *information resources* is critically important to any scientific research organization, but remains weak at NAFRI. Information management at NAFRI is necessary for communications results and sharing information with clients, stakeholders and extension. This issue will be addressed through strategies that focus on building networks for information and publication exchange, establishing and updating a website, ensuring that research documents can be retrieved at research centers and headquarters and updating its report and publications distribution list. *Communication* and information sharing among the research centers will be improved by making email / internet facilities available at all centers.

Information for managers at NAFRI is needed to improve data and record retrieval for management and reporting purposes. NAFRI is currently establishing an AGIRIS data base for basic results. It will establish a Management Information System database that can be used to maintain records for personnel, and their interactions with research projects, a strategy which will make reporting on resource and project status much easier.

7.6 Relevance and Responsiveness

*Relevance and responsiveness* to farmer research needs is constrained by the NAFRI focus predominantly on technical rather than social factors, and its limited capacity to target different production systems, farming systems and site locations in Laos. The strategies to address the problem are to improve diagnostic surveys, analyze existing production systems so that appropriate technologies can be introduced, and reaching agreement with farmers for on-farm research topics. Increased emphasis on the analysis of social aspects of technology development in the context of rural livelihoods and different production systems will be a complementary strategy for the improvement of relevance for different types of farmers.
Responsiveness to commercial sector needs (traders, processors etc.) will be approached by involving them in research planning at appropriate NAFRI meetings, and initiating NAFRI program activities that address priority needs, provide there are adequate resources.

7.7 Donor Coordination

Coordination with donors is a strategic issue related to the coherence, sustainability and completion of research program objectives at NAFRI and national research system levels. The development of a coordinated national agricultural and forestry research program that defines shared objectives will guide research actors and investors toward the achievement of priority and long term objectives. Coordination with NAFRI can be also be promoted by establishing a regularly scheduled forum for discussion and agreement on research objectives and activities.

7.8 NAFRI Program Adjustments

Meeting the expectations and needs of clients and stakeholders in a context of rapid change and increased competition for resources is a major challenge for public agricultural research organizations in any country. This section describes NAFRI’s responses to new research needs and priorities, in terms of program content to be undertaken. The information here is based on the results from the strategy and priority setting processes recently undertaken by NAFRI.

7.8.1 New or expanded research areas identified in the NAFRI strategies.

Internal and external stakeholders during different phases of the strategic planning identified the need for new or expanded research in:

- Socio-economics
- Farming and production systems
- Diagnostic surveys
- External and internal market conditions, constraints, trends, and opportunities
- Export markets, niche markets and comparative advantages of Lao producers
- Post harvest storage, processing and value addition
- Agricultural and forestry product quality and safety standards

7.8.2 Commodity and subject area research identified in NAFRI priority setting

The commodities identified for the NAFRI system as high priorities include:

- Feed and forage crops
- Livestock (buffalo, beef cattle, pig, chicken, duck, goat)
- Food and oil crops (rice, maize, soybeans, groundnut, cabbage, lettuce)
- Forestry species (multipurpose trees, export lumber and medicinal plants;
- NTFP species (commercial and household consumption species; bamboo, canes and rattan)
- Aquatic species (carp and tilapia, catfish, frog)
- Root crops (cassava, potato)
- Fruit and nut crops (pineapple, cashew, banana, tamarind)
- Cash crops (coffee, tobacco)
- Plantation crops (sugar cane, rubber, tea)

For non-commodity research, priority setting indicates the following areas as top priorities for the NAFRI system.

- Animal sciences (animal husbandry, animal nutrition and feed, animal health, pest and disease, animal genetic resources and breeding)
- Aquatic resources (aquaculture (fish farming) and aquatic ecology)
- Farming systems / cropping systems
- Irrigation and water management
- Plant sciences (plant genetic resources and improvement, agronomy, IPM, plant pests and diseases)
- Forestry (forest management, forest/tree protection, forest inventory, agroforestry, forestry production and certification)
- Socio-economics (market studies, sociology, agricultural economics)
- Natural resources (watershed management, land use planning and allocation, soil fertility and chemistry, soil conservation and management, biodiversity)
- Agriculture machinery and tools

Some of the strategies and program adjustments cannot be successfully implemented by NAFRI management and staff unless they are also addressed by external actors. The prospects of improvement in the external environment are promising, but restrictions on resources and funding will continue for the medium term. Building capacity for NAFRI and establishing an enabling external environment will be a longer-term process. The most important external conditions required for implementing these strategies and research priorities are those related to government commitment and support, and additional resources.

Adequate funding by government recognizes the economic and social importance and the essential role of research and extension in maximizing production and profitability. As a public sector organization, NAFRI is primarily dependent on government and donor funding. If NAFRI is to successfully implement the strategies related to program changes, research system building, institution capacity building (staff training, adequate facilities, and equipment etc.), establishing effective linkages, there must be sufficient funding commitment from government and donors. There is an imbalance between the high levels of donor funding and the very low and declining (see table 2.2) levels of Government funding. At present a situation exists where NAFRI has difficulty using available donor funding effectively. To increase NAFRI’s capacity to absorb donor funds it is necessary for the Government to increase the number, quality and motivation of staff available to work in national and donor funded projects. Investment in facilities that donors cannot provide is also necessary to build synergies between national and donor funding.