

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Ministry of Agriculture and Forestry
Department of Agriculture



Development Strategy of the Crop Sector 2025 and Vision 2030

Vision

**Crop Production by Focusing on Modernization, Clean, Safety, Quality,
Stability, Sustainability and Commercialization**

Vientiane Capital, February 2015



Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Ministry of Agriculture and Forestry

No: 0361/MAF

Vientiane Capital, Date: 2 March 2015

Agreement

on

**Endorsement and Promulgation of Development Strategy of the Crop Sector 2025
and Vision 2030**

- Pursuant to the Article 70 of the Law on Agriculture No. 01/98 NA, dated on 10 October 1998,
- Pursuant to the Article 3, Section 3.2 of the Prime Minister's Decree No. 262/PM, dated on 28 June 2012 on Organization and Function of Ministry of Agriculture and Forestry,
- Refer to the Department of Agriculture's Letter of Proposal No. 0255/DOA, dated on 11 February 2015,

Minister of Agriculture and Forestry issues the Agreement on:

- Article 1 Official endorsement and promulgation of "Development Strategy of the Crop Sector 2025 and Vision 2030".
- Article 2 Department of Agriculture in collaboration with relevant agencies at the central and local levels is designated for implementation of Development Strategy of the Crop Sector 2025.
- Article 3 Technical departments and institute attached to Ministry of Agriculture and Forestry, Provincial Agriculture and Forestry Offices, District Agriculture and Forestry Offices and relevant agencies are required for cooperation and implementation of the strategy.
- Article 4 This Agreement is effective on the date of signature.

Minister of Agriculture and Forestry

Vilayvanh PHOMKHE

Foreword

Development Strategy of the Crop Sector 2025 is one of the strategic documents which include an analysis of crop production and development of the crop sector which has been carried out recently. In spite of providing guidance, principles, approaches and measures for implementation of national socio-economic development, the strategy also promotes food security, industrialization and modernization of crop production in accordance with clean agriculture policy. In addition, the strategy contains vision, objectives and goals for development of the crop sector until 2025. The Vision of the crop sector is: **Crop Production by Focusing on Modernization, Clean, Safety, Quality, Stability, Sustainability and Commercialization.** A focus has been given to production of food and cash crops that is safe for producers, consumers and the environment, development for technical capacity, plant protection and plant quarantine, establishment of standards, regulations and information systems that can be integrated internationally and regionally. A focus has been also given to allocation of land areas for cultivation of food crops and cash crops by being based on the local conditions such as natural resources, cultures and local knowledge. A further focus has been given to sustainable management of farming systems, resources and water resources, and allocation of agriculture land in the whole country.

To ensure that the vision, goals and guidance are achieved, Development Strategy of the Crop Sector provides supporting policies and implementing measures for improving production by introducing intensive farming practice, improved seeds, farm machines and other agricultural inputs in connection with the introduction of soil improvement and agriculture technologies. In addition, the strategy focuses on an introduction of plant protection and plant quarantine, post-harvest technologies, standards of organic agriculture and good agriculture practice in consideration of climate change issues.

This strategic paper is consisted of general principles and approaches for development of the crop sector, and it does not include 8 plans of action and 58 supporting projects as they are planned to put in another publication. During the writing process of the strategic document, we inevitably met constraints and opportunities due to the fact that there was more unpublished and less science-based information for Lao PDR. However, we tried our best to find the most possible solutions to the issue and we would like to apologize for the unwanted and to accept any comments for future improvement.

On this occasion, Department of Agriculture would like to express sincere thank you to Minister and Vice Ministers of Agriculture and Forestry, Permanent Secretary (PSO), relevant technical departments and institutes, Provincial Crop Section, Provincial Agriculture and Forestry Offices, and relevant agencies as well as all groups of society such as farmers, producers and entrepreneurs for active participation and contribution that made this strategy possible.

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Introduction

Crop sector plays an important role in agriculture due to its contribution to food production, source of raw materials for agro-food processing and animal feed industries, and source of commodities for international and local market demands. Crop sector is primarily recognized as a primary factor that contributes to improved livelihood of the Lao people and 78% of the population is basically dependent on agriculture. It is noted that the agriculture and forestry sector contributes to 30.4% of the gross national products (GNP) in which 25% of those come from crop production in Lao PDR (Year 2011).

Development of crop sector takes place gradually by transforming from being semi-subsistence-based and subsistence-based to being more modernized and market-oriented. It is noted that development of agricultural infrastructures takes place step-by-step notably for development of macro, medium and small irrigation systems and community-based irrigation. This leads to two cropping seasons per year for rice cultivation and further contributes to an increase in the areas of paddy field. It is noted that a gradual increase in cash crop production (maize, sugarcane, cassava, coffee, rubber, vegetables and fruits) takes place progressively while research and development for agriculture are progressive. It is noted that crop production continues to grow gradually and in a more systematic manner with improved crop quantity and quality and recognized standards of cropping techniques (organic agriculture (OA), good agriculture practices (GAP), sanitary and phytosanitary (SPS)).

At the same time, the above-mentioned achievements are seen behind the planned targets in comparison with national socio-economic development plans or food security programme and cash crop production programme. It is noted that efforts for establishing producers' groups and crop production are reasonably ineffective in terms of the used resources. Crop production is basically dependent on the natural resources and use of high-yield and improved crop seeds and enhancement of mechanized agriculture take place slowly. It is noted that research on rice seed tends to focus more on glutinous rice rather than non-glutinous rice; therefore, non-glutinous rice is seen in lower quality. It is further noted that breeding prioritized crops such as rice is carried out slowly and at the same time regulations for development and protection of plant varieties and seeds are seen inadequate. Moreover, recent agricultural land use planning and mapping is only made at more than 1:100 000, and existing agricultural land use maps are not clear especially for specific intensive development regions at district and village levels. Furthermore, plant quarantine and protection are not reasonably extended while pre- and post-harvest operations are not considerably developed effectively and therefore, that leads to considerable loses of crop production during a process of harvest and post-harvest operations. It is noted that clean agriculture is well extended especially for commercialization. It is also noted that human resource development such as for subject specialists is reasonably observed ineffective and insufficient in comparison with the increasing demand. It is further noted that laws and regulations on agriculture are not strictly enforced and coordination among relevant agencies is not well made in specific terms of management of agricultural inputs (fertilizers, pesticides and seeds). At Moreover, development of policies and guidance of the Lao government into projects and programmes takes place slowly and it is noted that investment by the government is considerably low for research and development.

Due to the above-mentioned issues, Development Strategy of the Crop Sector is formulated with an aim of providing a policy reference for long, medium and short term development planning and for implementation of the Lao government's policies, laws, regulations, national socio-economic development plans, and regional and international integration.

Through participatory approach and discussions between public and private stakeholders, Development Strategy of the Crop Sector 2025 is formulated successfully and it provides strategic vision, objectives and targets for development of the crop sector until 2025 and it is also seen as a contribution to implementation of Agricultural Development Strategy 2025 and Vision 2030. It is noted that Development Strategy of the Crop Sector also contributes to implementation of food security programme, market-oriented production programme, rural development programme and poverty reduction programme. There are 8 plans of action, 10 measures and 6 policies which are intended to support the strategy which is formulated under the Vision: **Crop Production by Focusing on Modernization, Clean, Safety, Quality, Stability, Sustainability and Commercialization.**

Part I

Assessment of Crop Sector Performance

1.1. Review of Policies and Guidance for the Past Development of Crop Sector

After the foundation of the Lao People's Democratic Republic (Lao PDR) in 1975, the Lao People's Revolutionary Party (LPRP) and the Lao government in collaboration with the Lao population has introduced two strategies such as protection and construction of the country. In practice, the government encouraged the Lao people to reuse lowland paddy field and expand lowland paddy field, develop irrigation systems and reservoirs for expansion of irrigated areas. The promotion was to ensure that crop and livestock productions were carried out in connection with transforming from subsistence farming to collectivism farming and from being voluntary to exchange of farm labour and that led to establishment of cooperatives and state-run cooperatives.

Under the First Five-Year National Socio-Economic Development Plan (1981-1985), the crop sector focused on promotion of food crop production, aiming at food self sufficiency, contributing to agro-food processing industries, and supporting exportation. It is noted that lowland paddy field increased by 15% during 1976-1985 and there was a double increase in the irrigated areas and a 5 time increase for the use of farm machines.

Since the Fourth Congress of the LPRP in 1986, the New Economic Mechanism (NEM) has been introduced by applying a multi-sector socio-economic development approach and under the Second National Socio-Economic Development Plan the food security was the top priority for agricultural production. The First National Meeting of the Agriculture and Forestry Sector in June, 1988 focused on agricultural development through development of irrigation, basic agricultural infrastructures, introduction of intensive farming systems, and reduction of slash-and-burn cultivation. The basic aim was to transform subsistence-based to being more market-oriented farming in line with the NEM and directed by the LPRP and the Lao government.

Since 1996 development of the crop sector has taken place step-by-step with improved management systems and regulations. It is noted that Law on Agriculture which was

promulgated in 1998 has been used as a policy tool for improved management of the crop sector and promotion of crop production. The crop sector has developed increasingly through improved development planning and measurable targeting which is developed from 8 prioritized programmes of the government and 6 prioritized programmes of Ministry of Agriculture and Forestry. Among those programmes, the crop sector is basically responsible for 2 main programmes such as food production programme and cash crop production programme.

Due to the clear policy directives of the Party and improved regulations of the government for promotion of the socio-economic growth, improved management of the crop sector takes place progressively at the macro level while improved decentralization of the crop sector is also progressive. It is noted that the crop sector contributes to the Gross Domestic Products (GDP) by 3,5% - 4% for the agriculture and forestry sector which shares 23% of the GDP of the country and contributes to the national economic growth by 8% per year.

1.2. The Outcomes of Development of the Crop Sector for the Past 10 Years

1.2.1. Food Crop Production

Since the introduction of the NEM and through challenges, food self-sufficiency has improved gradually. It is noted that rice self-sufficiency has been achieved since 2000. It is also noted that there have been the continuous growth of crop production, improved food sufficiency, stock and commodities in Lao PDR. During the past 10 years, food crop production contributed to improved livelihoods of the Lao people, poverty reduction and the GDP growth by 30.4%, and crop production shared 25% of the GDP for the Agriculture and Forestry Sector (an annual growth of 7%).

1. Rice Production

During the past 5 years, rice production grew up to 2.9 million tones which comprised 80% of the lowland rainy season rice, 14% of the lowland drying season rice and 6% of the upland rice. It is noted that improved rice production could meet domestic demand with an estimated consumption of 450 kg - 457 kg/person/year, and the rest was for export.

2. Food Crop Production

Apart from the improved rice outcome, there was a gradual increase in the production of other food crops when compared with the 2005-2010 production. It is noted that there was an increase in the number of the production of sweet corn by 105,705 tones (increased by 56.8%), roots and tubers by 725,925 tones (increased by 300%), fruits by 801,545 tones (increased by 125%), beans by 11,435 tones (increased by 30%), vegetables by 947,670 tones (increased by 27%) and sesame by 19,560 tones (increased by 125%).

1.2.2. Cash Crop Production

Cash crop production such as rice, maize, coffee, tea, sugarcane, tobacco, cassava and vegetables grew dramatically. It is noted that factors behind the growth included an availability of natural resources, hardworking culture of the Lao farmers, more use of improved seeds and cultivation techniques, and high market demand for those crops. When comparing the cash crop production

in 2006 and 2010, it is noted that with rising cash crop production especially rice, the exported rice volume rose between 300,000 tones and 400,000 tones per year (border trades) while there was also an increase in the annual exported volumes of other cash crops such as 1 million tones for maize (increased by 126%), 818,675 tones for sugarcane (increased by 275%), 50,595 tones for coffee (increased by 17%), 2,600 tones for tea (increased by 326%), 83,795 tones for tobacco (increased by 238%), 500,090 tones for cassava (increased by 186%), 74,550 tones for beans (increased by 69%), 947,670 tones for vegetables (increased by 42%) and 801,545 tones for fruits.

1.2.3. Agriculture Techniques and Infrastructures

Infrastructure development in the crop sector focused on rehabilitation, expansion and construction of irrigation systems, aiming at ensuring sufficient water supply for crop production. It is noted that the irrigated area rose to 150,000 ha in 2010 with a rise of 136% when compared with the irrigated area in 2005. It is further noted that there were totally 9,036 irrigation projects which comprised 891 weirs, 69 gabion weirs, 184 reservoirs, 147 dike and water gate project types, 1,581 electric- and fuel-used pump project types, and 6,164 traditional weirs. Furthermore, the expanded irrigation was responsible for the rising crop production by 33% from 2,566,222 tones to 3,414,560 tones in 2005 and 2013 respectively. Apart from the improved irrigation and crop production, rice research and development take place progressively with improved rice productivity and the progress in rice was connected with an establishment of producers' groups such as rice producer's group, rice seed producer's group, industrial crop producer's group and organic farmer's group. In 2010, 41% of improved rice seed was cultivated and many types of agricultural machines such as tractors were used and these agricultural inputs were used by 64% of the total farmers in the country.

1.2.4. Investment and Cooperation in the Agriculture Sector

Investment in agriculture was promoted by the Lao government through the introduction of multi-sector development approaches such as public and private partnership that is controlled by the government. The investment in agriculture was supported with three main financial sources such as public investment by 385 billion Kip, Official Development Assistance (ODA) and loans by 12,030 billion Kip, and domestic and foreign direct investments (FDI) by 4,900 billion Kip.

1.2.5. Capacity Building and Human Resource Development in the Crop Sector

The crop sector focused on formulating and developing macro policy tools such as laws and regulations that contributed to improved management of the sector and crop production. It is noted that the achievement for this included formulation and promulgation of two laws, two decrees and regulations. Improved organization of the crop sector continued to take place at the central level and decentralization of the sector was also progressive especially in accordance with Sam Sang Directive. At the present time, therefore, there are 1,229 staffs in the crop sector in which 140 staffs work at the central level while 1,159 staffs work at the local level.

1.3. Causes of the Achievements

- 1). It is noted that the government's appropriate policies, strategies, laws and regulations which focused on national development through introduction of multi-sector development approach were a key factor that is basically responsible for the achievements.
- 2). It is noted that the active contribution of producers and farmers are a basic factor for the achievements as they actively tried to improve crop productivity and cultivation, form farmer's group and association, access information and markets, and apply improved agricultural techniques and technologies that were promoted by improved agricultural extension network.
- 3). It is noted that improved agricultural infrastructures such as irrigation, research centers, seed centers, testing bodies, agriculture and forestry service centers were undeniably responsible for the achievements.
- 4). Improved structures for the crop sector and for the agriculture and forestry sector which were connected with human resource development were an undeniable factor that contributed to the achievements. The human resource development through participation in international and local technical training courses focused on improving and upgrading technical skills for staffs.
- 5). More invested through domestic investment, FDI and ODA.

1.4. Constraints and Their Causes

- 1). It is noted that the government's policies, strategies, laws and regulations regarding crop production were not well disseminated, implemented and enforced at both central and local levels. Therefore, application of promoted techniques and technologies were low.
- 2). It is noted that agricultural land which was planned and allocated for use with low consideration of its potentials was not well managed especially in the 7 large-scale plains and other small plains. In case that land and forest allocation completed, the allocated plots were not well monitored and promoted for the effective use.
- 3). It is noted that coordination was not well done between and among relevant agencies at the central and local levels while planned activities, human capitals and budgets were not well integrated.
- 4). It is noted that crop production which remained scattered without intensification was not well developed and mainly implemented in a form of subsistence farming practices and there were lack of model farmers. It is also noted that improvement of agricultural productivity and value chain especially through improved organization of farmer's group was not well extended. In areas where farmers' groups were reasonably improved, it is noted that those groups were not well promoted especially through introduction of reasonable incentives such as provision of necessary agricultural inputs and micro credits.
- 5). It is noted that crop production, plant protection, seed multiplication for rice and other crops, and animal breeding were well extended through improved networking. It is also noted that crop

production were not well connected with value chain and thus unstable quantity and low quality of production took place commonly.

6). It is noted that research centers and technical service centers were not well strengthened and fully functioned while lacks of qualified and experienced technical staffs and lacks of financial support were mainly observed in those centers.

7). It is noted that with low competition, the agricultural commodities were mainly traded along the border and limitedly exported within the Great Mekong Sub-region (GMS). There were lacks of incentives that were needed for promotion of production such as improved sanitary and phytosanitary.

8). It is noted that there was low foreign and domestic investment in crop production in comparison with other fields within the agriculture and forestry sector while public investment was tended to focus more on infrastructure development such as irrigation whereas the investment that focused on improving research and production of crops was considerably low.

1.5. Lessons Learned

1). It is noted that active dissemination and implementation of the government's policies, national socio-economic development plans and regulations are key factor that are basically responsible for improved crop sector. It is also noted that active participation by local authorities, all relevant sectors and the public are considerably responsible for the achievements of the crop sector.

2). It is noted that implementation, monitoring and improvement of the policies and regulations related to development, industrialization and modernization of agriculture contribute to the achievements of the crop sector.

3). It is noted that agricultural production in connection with industrialization, modernization, agro-food processing, marketing, establishment of improved farmer's group and introduction of multi-sector development approach is primarily responsible for the achievement of the crop sector.

4). It is noted that improved coordination and integration between and among all central and local relevant agencies such as industry and commerce sector, finance, banks and transport is key factor that contributes to improved agricultural production.

5). It is learned that applying intensive agricultural development in connection with introduction of site-based development approach and consideration of local potentials such as natural resources, political stability and hardworking culture is responsible for improved agricultural production.

6). It is learned that application of appropriate agriculture innovations and farm inputs such as farm machineries, improved seeds, irrigation, soil management, GAP is considerably responsible for improved agricultural yield and quality.

7). It is learned that improved research and demonstration centers, and more decentralization of the crop sector are a key factor that contributes to improved agricultural production.

8). It is learned that agricultural development in connection with more reliable agro-information systems with science-based and updated information is primarily responsible for improved and effective agricultural production.

9). It is learned that encouraging all stakeholders in value chain in a reasonable manner is a key factor that contributes to the achievements of the crop sector and sustainability of agricultural production.

1.6. Opportunities and Challenges

In the Development Strategy of the Crop Sector, the world population is estimated at 7 billion and among those 925 billion need additional and supplementary foods, and the world population is estimated to reach 7,5 billion, 8 billion and 9,2 billion in 2015, 2020 and 2050 respectively. At the same time, the world hunger and population with the severe undernourishment are estimated to rise over 1 billion. In Lao PDR, the population is forecasted to reach 7,5 million and 8,3 million in 2020 and 2025 respectively and these figures do not include tourists who visit the country by 3 million times per year. To support the world population growth, countries around the world are requested to increase 60% of the current world food production by Food and Agriculture Organization.

According to the United Nations, the world and regional economies are possibly known to improve. It is noted that the economies of China and India continue to grow with a high rate contributing to driving the world economy. Member countries of the Association of Southeast Asian Nations (ASEAN), development and dialogue partners, and international agencies keep active supports for least-developed countries for improving development gap between and among countries. Lao PDR is a member of the World Trade Organization (WTO), and participates in the ASEAN Free Trade Areas and the ASEAN Plus Three Free Trade Areas. This will enable the country to access international markets and modern agricultural technologies that can be applied to improved agricultural production. When being integrated with international and regional economies, Lao PDR needs a strong support to the agriculture and forestry sector.

Accompanying with the opportunities, there are challenges:

1). Land Use Change: More land under food and cash crops keeps changing to other crops such as industrial crops and the changes leads to land use conflicts. Changes in crop land will continue until relevant regulations and land tuners are strictly enforced.

2). Climate Change: An average amount of rainfall is estimated to increase by 4,2% with more natural calamities (floods and droughts) that result in rice insufficiency and food insecurity, and further result in a delay in planting and lower production in some areas along the Mekong River and its tributaries. It is noted that an increase in temperature (greenhouse gas) will have detrimental effects on crop productivity especially crops that prefer low temperature. It is also noted that the rising temperature is a possible cause for a higher incidence of pests and weeds that leads to more investment and results in a higher food price.

3). **Change in Social Food Consumption:** Changes in rice consumption takes place slowly. The urban group of society who has more incomes tends to consume less rice while they more intake other food items than rice such as meat, fish, vegetables, fruits and milk. It is noted that food preference keeps changing by being more aware of food safety and thus only high quality products are more needed. This kind of change will lead to difficulty for market access as agricultural products of Lao PDR are reasonably seen with low quality. One reason is that the low quality agricultural products in Lao PDR result from a scattered farming, low farm infrastructures and technology, and less quality control and those products will not be traded and exported.

4). **International and Regional Economic Integration:** Integrating the Lao economy into the world and regional economies is an important factor that contributes to growth of the agriculture sector and that provides an opportunity for agricultural products of Lao PDR to enter international and regional markets. At the same period, agricultural products and commodities from countries will enter Lao PDR and they will share domestic markets. It is, therefore, necessary to improve quality of agricultural products and commodities of Lao PDR to meet international and regional market requirements such as food safety. It is noted that relevant regulations on sanitary and phytosanitary, quality control and certification need to be strictly enforced for meeting the requirements applied by WTO.

5). **Need for Quality Certification:** Agricultural products and commodities need to be certified for quality and food safety, and thus quality certification and control for organic agriculture (OA), Good Agriculture Practice (GAP) and other forms of farming are key measure for exporting commodities. In this connection, the crop sector needs to formulate and develop policies and regulations for improving farming practices that ensures food safety and acceptable quality.

6). **Free Trade Barriers:** Taxation will be soon cancelled in WTO and ASEAN member countries especially when the ASEAN Free Trade Areas (AFTA) takes place. It is noted that the countries need to apply different measures to replace taxation such as trade barriers or Technical Barriers to Trade (TBT) or standard requirements. At the present time, the countries need to formulate regulations and measures to protect their farmers and those include sanitary and phytosanitary (SPS) strongly required by WTO.

Part II

Vision and Goals

2.1. Vision

Vision 2025 for development of the crop sector is: **Crop Production with A Special Focus on Modernization, Cleanness, Safety, Quality, Stability, Sustainability and Commercialization.**

Vision 2030 for development of the crop sector is: **Crop Production with A Special Focus on Modernization, Cleanness, Safety, Stability and Sustainability.**

2.2. Goals

2.2.1. Overall Goals

- 1). To ensure that production of prioritized crops such as cassava, sugarcane, tobacco, coffee and maize are safe and developed in light with the clean agriculture and connected to food security and agro-food processing and commercialization and required by international and local markets. It is noted that estimated exporting value of crop products is targeted at US\$1 billion.
- 2). To ensure that the crop sector by roles and functions is strengthened and improved with coordination at the central and local levels by principles for improved enforcement of relevant laws and regulations, and for improved information system integrated with the international and local systems.
- 3). To ensure that clean agriculture is well managed and developed through improved and enforced standards with international and local acceptance. Clean agriculture is targeted at 20% of the total crop-planted area and half of the clean agriculture area is certified.
- 4). Strengthen plant protection by focusing on improvement and expansion of plant protection network across the country in order that this will contribute to improvement of crop production, trade facilitation, and sanitary and phytosanitary systems that are internationally and regionally recognized.
- 5). To allocate land areas for intensive food and cash crops production in both upland and lowland areas by being based on local potentials such as natural resources, culture and knowledge.
- 6). To utilize natural resources in a sustainable manner by improving management of farming systems, water resources and preparedness for adaptation to climate change.

2.2.2. Expected Targets 2020

1). Food Crop Production: Food consumption is basically targeted at 160kg of milled rice/head/year (280kg of paddy/head/year, 5kg of cereal/head/year, 50kg of vegetables/head/year, 2kg of beans and sesame types/head/year, 2,5kg of maize/head/year, 2,5kg of roots and tubers/head/year, 30kg of fruits/head/year, 1kg of sugar/head/year and 23kg of eatable oil/head/year. It is expected that targeted food sufficiency and stocks are promoted through improving food production as follows:

- Efforts are given to paddy production which is targeted not lower than 4,7 million tones with an average annual growth of 5% from the present time to 2020. The rising paddy outputs are expected to come from expansion of new crop areas by 2% and from a improving yield by 3-3,5%. It is estimated that glutinous rice is targeted to share 70% of the total paddy production while the rest is non-glutinous rice. Among those targeted paddy production, 2,5 million tones of paddy are targeted to support food security (in which 2,1 million tones are targeted for local consumption and 400,000 tones are targeted for stock that can last for 2-3 months), between

500,000 and 600,000 tones of rice are targeted for domestic market supply where 1 million tones of rice are targeted for export. It is expected that rice seeds are targeted at 100,000 tones.

- Targeted products include bean-sesame, vegetables and fruits: 228,000 tones for maize, 304,000 tones for roots and tubers, 800,000 tones for fruits and 1,5 million tones for other crops.

2). Cash Crop Production: Efforts are given to increase cash crop production with improving quantity and quality in connection with promotion of farmer's group, associations and agro-food processing. Details are as follow:

- Efforts are given to promotion of commercialized paddy production for international and local markets by targeting 1 million tones in which 35% of that production is non-glutinous rice. A focus is given to promotion of rice such as Khao Khum (Black grained rice) and Khao Kai Noi which is grown in specific areas, and promotion of rice that are grown by using improved seeds such as Thadokkham, Thasano, Phongam and other jasmine rice. A further focus is given to promotion of rice produced for international and regional markets by application of GAP standard. In the upland areas of the northern provinces, rice production is promoted for Chinese market.

- Other crops targeted at: 1,3 million tones for maize, 120 tones for coffee, 2 million tones for sugarcane, 1,5 million for cassava and 50,000 tones for bean type and other crops that have comparative potentials.

2.2.3. Expected Targets 2025

1). Food Crop Production: Efforts are given to improving nutrition by producing energetic and nutritional food crops and by targeting food consumption at 140kg/head/year for milled rice (paddy: 234kg/head/year), 4,5kg/head/year for cereal, 80kg/head/year for vegetables, 2kg/head/year for bean-sesame, 2kg/head/year for maize, 2,1kg/head/year for roots and tubers, and 25kg/head/year for eatable oil. Specific efforts are given to sufficient production of the crops for supply and stock:

- Efforts are given to rice production which is targeted at not lower than 5 million tones of paddy with proportions of glutinous rice by 70% and non-glutinous rice by 30%. Among the production, 2,5 million tones is targeted for food security (consumption: 2,1 million tones of paddy and stock: 400,000 tones of paddy or 240,00 tones of milled rice that the stock can last for 2-3 months). Further efforts are given to production of rice seeds by 100,000 tones (in which 50,000 tones of rice seeds are planned to produce in Khammouan and Savannakhet Provinces). More efforts are given to production of paddy for local markets by 500,000 - 600,00 tones and for export by 1,5 million tones.

- Efforts are given to production of maize by 306,000 tones, roots and tubers by 327,000 tones, fruits by 825,000 tones and other crops and vegetables by 1,57 million tones.

2). Cash Crop Production: Efforts are given to expansion of market-oriented crop production with improving quantity and quality in connection with improvement of farmer's group, producer's association and agro-food processing:

- Efforts are given to increasing production of paddy by 1,5 million tones for international and local markets mainly by promoting rice with specific potentials such as Khao Kum (Black grained rice), Khao Kai Noi and jasmine rice (Hauphanh and Xiengkhouang Provinces). Further efforts are given to promotion of rice that is grown by using improved seeds such as Thadokkham, Thasano, Phongam and other jasmine rice types with a proportion of non-glutinous rice by 30%. With the GAP model, a focus is given to promotion of rice for export mainly in seven large-scale lowland paddy fields while medium-scale and small-scale plains in the northern provinces such as Xayabouly and Laungnumtha are also promoted for rice cultivation. It is expected that the rice production is targeted at international and local markets such as China and other neighboring countries.

- Efforts are given to promotion of crops by 1,4 million tones for maize, 280,000 tone for coffee (Bolovent Plateau), 2,4 million tones for sugarcane (Attapeu, Champassak, Savannakhet and Khammouan Provinces), 1,6 million tones for cassava (in the central and southern regions), and 52,000 tones for soybean (in the northern region). Further efforts are given to promotion of market-oriented crop production with comparative advantages.

Part III

Strategy

The Development Strategy of the Crop Sector 2025 is part for management by rule of law, aiming at formulating and improving relevant laws and regulations especially for management of agricultural inputs such as seeds, fertilizers and pesticides. A focus is given to promoting farmers and entrepreneurs to run their business in accordance with relevant regulations and principles mainly stated in clean agriculture such as OA, GAP and common agriculture practices. A further focus is given to promotion of plant protection, plant quarantine, sanitary and phytosanitary, and improvement of plant quarantine check points, laboratories and plant protection network. All those aim at contributing to development of the crop sector through the Vision: **Crop Production by Focusing on Modernization, Cleanness, Safety, Quality, Stability, Sustainability and Commercialization.**

To meet the Crop Sector's 2025 Vision and Development Strategy's goals, the sector focuses on formulating and implementing 8 plans of action, 10 implementing measures and 6 incentive policies. Details are given below:

3.1. Plan of Action for Development of the Crop Sector 2025

3.1.1. Plan of Action for Agriculture Land Development in Connection with Site-based Land Use Planning

A focus is given to zoning, planning and allocating agricultural land use by being based on local conditions and potentials in order that outcomes of the activities will be further developed and applied into formulation of development strategy for the crop sector at the central and local levels in connection with clean agriculture, modernization and promotion of farm business and enterprises.

In the upland and mountainous areas, a focus is given to promotion of integrated farming systems by planting rice, vegetables and fruits for upland food and nutrition security in connection with prioritization of crops that are more suitable for local conditions such as rice (Khao Kai Noi, Khao Kum, Sangthong jasmine rice, ...), coffee, Paksong tea, 400-year Phongsaly tea and other crops and that are possibly commercialized, and that further contribute to slash-and-burn and poverty reduction.

A focus is given to improving yield by 3,5-4 tones/hectare in average with improving yield for wet season rice by 4-5 tones/hectare in seven large-, medium- and small-scale plains and lowland paddy fields. In areas where irrigation is available, a focus is given to promoting intensive rice-based farming system and improving rice yield by 5-6 tones/hectare in both dry and wet seasons. A focus is also given to growing more non-glutinous rice, vegetables, fruit trees and other high valued crops in connection with promotion of agro-food processing for international and regional markets.

This Plan of Action is mainly supported by 4 projects namely 1) Agricultural Land Regulation Improvement Project, 2) Agricultural Land Use Planning, Zoning and Surveying Project, 3) Agricultural Soil Management Project, and 4) Institutional Capacity Development Project.

3.1.2. Plan of Action for Infrastructure Development

Efforts are given to building and developing infrastructures for irrigation, agriculture centers and laboratories that can be integrated into international systems such as laboratories that can be used for diagnosis of plants and agrochemicals, and acceptable for sanitary and phytosanitary requirements by ISO17025.

This Plan of Action is primarily supported by 4 projects namely 1) Irrigation Development Project, 2) Agricultural Service Development Project, 3) R & D Infrastructure Improvement Project, and 4) ISO17025-based Plant Laboratory Development Project.

3.1.3. Plan of Action for Clean Agriculture Development

A focus is given to transforming farming practices into clean agriculture principles such as OA and GAP and enhancing clean agriculture, developing standards for different types of clean agriculture, and promoting harmonization with international principles.

This Plan of Action is basically supported by 9 projects namely 1) Clean Agriculture Standard Development Project (OA, GAP, ...), Registration for Prohibited Plants in Lao PDR, Registration for Site-based Crops and GI Products, 2) Clean Agriculture Demonstration Project (GAP, OA, ...), 3) Internationally and Regionally Accepted Clean Agriculture Certification Project, 4) Cash Crop Standard Development Project, 5) Crop Product Standard Development Project, 6) Clean Agriculture Product Regulation Project, 7) Clean Agriculture Infrastructure

Development Project, 8) Clean Agriculture Capacity and System Control Development Project, and 9) Market-oriented Vegetable and Fruit Crop Promotion Project.

3.1.4. Plan of Action for Promotion and Management of Crop Production

A focus is given to effective use and management of agricultural inputs in accordance with relevant technical guidelines and regulations through improving process of registering, testing and inspecting of product quality for export, import, distribution, use, storage and disposal of the products. A focus is also given to building, improving and updating technical guidelines and infrastructures for effective contribution.

This Plan of Action is primarily supported by 9 projects namely 1) Farmer Registration Project, 2) Export-oriented Crop Producers and Farms Registration Project, 3) Agricultural Inputs Management Project (seeds, fertilizers and pesticides), 4) Post-Harvest Handling and Agro-Processing Development Project, 5) Crop Sector Regulation Awareness Raising Project, 6) Crop Sector Investment Monitoring Project, 7) Natural Disaster-Induced Crop Loss Reduction Project, 8) Post-Harvest Technology Development Project, and 9) Policies, Strategies, Regulations and Technical Guidelines Improvement Project.

3.1.5. Plan of Action for Development of Plant Protection and Plant Quarantine

A focus is given to improvement and development of effective plant protection in order to improve plant health and biodiversity for sustainable food security and cash crop production and in compliance with relevant international conventions and sanitary and phytosanitary requirements.

This Plan of Action is primarily supported by 11 projects namely 1) Plant Protection and Plant Quarantine Awareness Project, 2) Sanitary and Phytosanitary Improvement Project (SPS-WTO), 3) Plant Protection Strategy Formulation Project, 4) National Plant Protection Development Project, 5) Trade-Supported Pest Risk Assessment Project, 6) Agricultural Products Treatment Project (fumigation, heat treatment and irradiation), 7) Common Pest Listing and Assessment Project, 8) Chemical Residue and Quality Testing Project, 9) Pest Forecasting and Surveillance Project, 10) Village-Level Plant Protection Network Development Project, and 11) Plant Quarantine Check-point Improvement Project.

3.1.6. Plan of Action for Research on Crops

A focus is given to promotion of research and development on value chains, rice and cash crop seeds in order for improving food and cash crop production by promoting public investment and public and private partnership.

This Plan of Action is mainly supported by 9 projects namely 1) Product Price and Cost Study Project, 2) Agricultural Product Value Chain Study Project, 3) Agricultural Modernization Project, 4) Agricultural Credit and Investment Study Project, 5) Rice Seed Improvement Project, 6) Seed Production Project (maize, cassava, coffee, banana, ...), 7) Vegetable and Fruit Seed Improvement Project, 8) Cropping Technique Improvement Project, and 9) Post-Harvest Technology Development Project.

3.1.7. Plan of Action for Cash Crop Production

A focus is given to prioritization and production of crops for export by being based on local conditions and the requirements by importing countries. A focus is also given to improvement of value chain and agro-processing that meets requirements for food safety and quality control. A further focus is given to formulation of regulations and technical guidelines for supporting producers and other stakeholders in value chain.

This Plan of Action is basically supported by 6 projects namely 1) Market-oriented Rice Production Project, 2) Market-oriented Crop Production Project (coffee, maize, cassava, banana, ...), 3) Farmer's Group Development Project, 4) Agricultural Enterprise Promotion Project, 5) Agricultural Information Support Project, and 6) Agricultural Modernization Promotion Project.

3.1.8. Plan of Action for Human Resources Development in Agronomy, Plant Protection, Plant Quarantine, and Laboratory Analyst

A focus is given to development of capacity of the crop sector at the central and local levels by focusing on development of human resources for needed fields and improvement of institutions and policy tools such as regulations and roles and functions of the sector, and decentralization of the sector, and this is to ensure that the sector is fully functioned at all time.

To follow introduction of governance by rule of law, the crop sector needs to focus on formulation and development of relevant regulations and legal frameworks for management of clean agriculture, plant protection, agricultural inputs, and agro business and enterprises. At the same time, mechanisms for management, support and monitoring need to be established for effective implementation by the crop sector at the central and local levels.

This Plan of Action is basically supported by 6 projects namely 1) Subject-Specialist Human Resource Development Project (insects, plant diseases, lab analysts, crop specialist, breeders, ...), 2) Plant Quarantine Capacity Building Project, 3) Management Capacity Development Project, 4) Agricultural Skill Development Project, 5) Farmer Management Project, 6) Pilot Project for Production Cost Reduction and Productivity Promotion in Rural Areas by Using Agricultural Machines.

3.2. Implementing Measures

3.2.1. Productivity Improvement Measures

1) A focus is given to expansion of agricultural land and prioritization of crops by being based on local conditions and potentials such as land productivity, agro-biodiversity, suitability for agricultural machines and irrigation. In upland areas, expansion of crop land for upland food security and promotion of GI crops for market are a main focus.

2) A focus is given to improving yield per unit area by introducing intensive farming, improved seeds, fertilizers and pesticides in accordance with technical guidelines, and use of improved farm machines and technologies, integrated pest management (IPM) and improved post-harvest operations.

3) A focus is given to promotion of crop cultivation in two cropping seasons in the areas where irrigation is available by focusing on cultivating rice, high valued crops and introducing crop rotation techniques and prioritizing crops that possibly meet water condition.

4) A focus is given to promotion of rice production by focusing on intensive farming (smart agriculture) and applying modern technologies that are adaptable to local conditions. A further focus is given to production of agricultural inputs such as fertilizers, pesticides, machines and tools that can be possibly made in the country and the aim is to reduce importation of those items, production costs and environmental protection.

3.2.2. Intensive Agriculture Measure

1) Seeds

- A focus is given to control and certification of seed quality, and promotion of use of seeds that are more adaptable to local conditions (mountainous, upland and lowland areas) and that are required by markets, and contribution to promotion of seed business. A focus is also given to encouraging research centers to produce R1 seeds by 100 - 150 tones and R2 seeds by 2,000 – 2,500 tones and in collaboration with private companies to produce R3 seeds by 60,000 tones (non-glutinous rice seed by 30%).

- A focus is given to encouraging seed producers to invest more in seed packaging and distribution of seeds and promoting seed certification and registration in accordance with relevant regulations and technical guidelines.

- A focus is given to encouraging private seed producers to participate in a process of seed quality control for R3 seeds in accordance with relevant seed regulations and promoting research & development for seeds and varieties of crops. A focus is also given to protection of plants and biodiversity in accordance with relevant international conventions, and promotion of plant variety and seed registration by mainly establishing national seeds board.

- A focus is given to promoting farmers to use improved seeds by 80 - 90% for the rainy season rice cultivation and more than 10% of improved seeds are certified. A focus is also given to promoting farmers to produce vegetable and fruit seeds and seedlings for reducing import of those products by 20%.

- A focus is given to encouraging farmers, farmer's group and associations which involve in GAP, OA, GI and conservative agriculture to follow the clean agriculture principles. A focus is also given to promotion of local rice such as Khao Kai Noi, and coffee, tea and other crops by promoting research & development especially for improving yield.

- A focus is given to promotion of logo-branded and trade-marked products when being certified for GAP, OA, GI and conservative agriculture.

2) Fertilizers and Pesticides

- A focus is given to improving fertilizer and pesticide registration mechanisms by establishing testing and inspecting bodies at a provincial level, and strengthening human resource

development at the central and local levels. A focus is also given to improving and developing technical guidelines, testing laboratories and standards for fertilizers and pesticides in connection with management, export-import, distribution and disposal of the products by being based on relevant regulations and technical guidelines. A further focus is given to promotion of an effective use of fertilizers and pesticides by mainly focusing on encouraging producers and traders to provide fertilizers and pesticides in adequacy and possibly through introduction of contract farming model.

- A focus is given to promoting private sector to invest in bio and chemical fertilizers in the country by providing incentives that favor the investment.

- A focus is given to reducing pesticide risks by improving a process and procedure of pesticide registration and issuance of permission for production, export, import, distribution, storage, use and disposal of pesticides that is compliant with relevant international and ASEAN requirements. A focus is also given to establishing pesticide monitoring systems, and improving training curriculums on pesticide risks reduction.

3) Soil Fertility Improvement

- A focus is given to promoting application of organic, bio and chemical fertilizers (composts, bio extracts, ...), animal dung, and promoting legume and crop rotation to improve soil fertility.

4) Promotion of Agriculture Machines

- A focus is given to surveying and registering agriculture machines and promoting the use of farm machines to reduce and replace human labours in agricultural production.

- A focus is given to promoting a private sector to participate in agricultural innovation and provide agricultural machinery services by facilitating an import of farm machines and provision of farm machine services and this is to improve agricultural outcome.

3.2.3. Plant Protection Measures

- 1) A focus is given to strengthening of sanitary and phytosanitary inspection systems for being integrated international and regional systems by focusing on improving pest listing, diagnosis and surveillance. A focus is also given to establishing and developing pest forecasting and surveillance, pest information systems, sanitary and phytosanitary requirements for pre- and post-importation of plants and seeds.

- 2) A focus is given to regularly following international and regional needs by establishing quarantined-plant sites and premises for monitoring AIS after being imported into Lao PDR.

- 3) A focus is given to managing and developing threat techniques and services (fumigation, heat and radiation threats).

- 4) A focus is given to upgrading and improving the laboratory at Plant Protection Center to meet the requirements of ISO 17025 and extending plant protection network from the central level to the village level, and developing human resources in areas of pests, plant diseases, grasses, viruses and bio control.

3.2.4. Crop Land Management Measure

- 1) A focus is given to promoting an effective use of crop land under the irrigated areas, and encouraging private sector to invest in empty and unfertile land by providing different incentives.
- 2) A focus is given to improving decentralization of land management between the central, provincial and district authorities, and collaboration among relevant agencies by more disseminating relevant information regarding management and use of crop land.
- 3) A focus is given to collaborating with relevant agencies to promote public and private investment for management and use of crop land.
- 4) A focus is given to promoting on-job-training courses in areas of soil improvement and soil fertility management at the provincial, district and village cluster levels.
- 5) A focus is given to promoting an introduction of scientific-based information and technologies for land use planning and soil fertility management such as soil type mapping and land use mapping for improving crop production and for protection of agricultural land. A focus is also given to promoting the activities for prioritized areas that need to be conserved such as Boloven plateau where is suitable for coffee and vegetable production, and that need to protected from cultivation of inappropriate crops such as crops that cause high soil degradation and more acid soil.

3.2.5. Clean Agriculture Measure

- 1) A focus is given to allocating agricultural land area for promoting clean agriculture by being based on local conditions especially in large, medium and small plains and other suitable areas, and promoting GAP-related farms and enterprises by 3% or 100,000 farms and OA farms and enterprises by 2% or 70,000 farms, and conducting data collection and survey, need assessment and development planning for GAP and OA.
- 2) A focus is given to formulating and developing standards of clean agriculture to become national standards by focusing on improving the existing standards of clean agriculture (OA, GAP), disseminating relevant information and regulations, and monitoring implementation of those standards and regulations through bilateral and multi-sector approaches.
- 3) A focus is given to establishing accreditation system that meets the requirements of ISO/IEC 17011 and certification system that meets the requirements of ISO/IEC 17065. A specific focus is given to establishing a national laboratory that meets the requirements of ISO/IEC 17025, building auditors at the central level, inspectors at the provincial level in accordance with ISO/IEC 19011, and farm advisors at the district level and internal control system (ICS) specialists.
- 4) A focus is given to disseminating and enhancing clean agriculture by developing basic infrastructures such as national and provincial clean agriculture demonstration plots (where appropriate) and human resources such as facilitators for promoting implementation of clean agriculture at the international and regional levels. A focus is also given to promoting clean agriculture by trainings, seminars, information, trade fairs and clean agriculture day. A further

focus is given to formulating standards for individual crops, ICS technical guidelines for farmer's group, promoting farmers and entrepreneurs to have more participation, and to access more markets.

3.3.6. Measure for Cropping Techniques and Technologies

1) A focus is given to promoting crops and seeds for specific areas in the upland and lowland areas by being based on prioritized crops, and promoting fertilizers and pesticides by being based on specific crops, areas and amount of application.

2) A focus is given to promoting cropping techniques for specific areas and cultural practices for the environmental protection and soil erosion, applying intensive farming system, improving paddy fields for agriculture machines, promoting yield improvement, and conducting studies on GI and specific crops.

3) A focus is given to promoting integrated farming system especially in the rural upland areas for upland food security, climate change risk reduction and production of GI crops for markets. A focus is also given to promoting the use and conservation of local knowledge and promoting modern technologies that are adaptive for local conditions.

4) A focus is given to promoting and developing post-harvest technologies for specific crops for keeping food quality and safety, and reducing post-harvest losses.

3.2.7. Agro-Processing and Post-Harvest Measure

1) A focus is given to promoting and supporting clean agriculture techniques and standards to farmer's group to produce crops in a certain standard as raw materials for agro-processing industries in connection with development of value chain and contract farming by being based on market chain.

2) A focus is given to promoting innovation of farming systems, post harvest and agro-processing operations in accordance with the international standards such as GAP, GMP, GHP, HACCP, ... and that are later developed into large-scale farming. A focus is also given to promoting more investment by providing an investment opportunity for farmers and investors to invest in developing infrastructures and by promoting a value chain especially for post-harvest operations (drying areas, grader, packaging houses, cool storages, logistics and processing facilities) for agro-processing operations and improvement of farm products quality.

3) A focus is given to development of value chain by promoting farming standards such as OA and GAP in connection with promotion of pre- and post-harvest operations and development of post-harvest infrastructures for reducing post-harvest losses. A focus is also given to promoting value addition for exporting products by introducing modern rice milling facilities for improving quality of milled rice and food safety in accordance with the GMP standard. A further focus is given to development of agro-processing operations in connection with promotion of industries and services.

3.2.8. Farm Labour Measure

- 1) A focus is given to promoting agriculture production by developing farmer's group, cooperatives or collectivism and enterprises, by transforming subsistence farmers into farmers with a certain level of professional skills, promoting the use of modern farm machines and facilities, and by reducing a production capital in terms of human labour by 30-40%.
- 2) A focus is given to following the concept of new rural development by developing big village into small city through development of farming systems in connection with promotion of agro-processing and services for attracting more investment and farm workers.

3.2.9. Measure for Adaption to Climate Change

1) Responses to Climate Change

- A focus is given to integrating natural disaster management plan into agriculture development plan for disaster risk reduction (DRR) in agriculture sector, and promoting public awareness and institutional capacity development as a response to climate change.
- A focus is given to collaborating with relevant agencies to develop measures as a response to climate change by promotion of exchange of information and experience, development of farming systems and practices, production of crop calendar, use of agricultural inputs such as improved seeds with more adaption to climate change, and improvement of soil fertility.
- A focus is given to promoting assessment of climate change risks, establishment of warning systems, mapping of vulnerable areas, categorization of vulnerable group, and development of measures as a response to climate change.

2. Climate Change Impact Reduction

- A focus is given to application of the environment-friendly farming practice (OA, GAP and IPM), promotion of sustainable resource utilization such as crop residues for animal feeds and animal residues for soil improvement.
- A focus is given to assessing climate change risks such as common flood and drought areas, landslide, soil erosion, and outbreak of animal and plant diseases (insect pests, rats, ...) by using modern assessment technologies and approaches such as satellite images, warning systems and other technologies. A focus is also given to researching, improving and introducing improved seeds of rice with more adaption to climate change such as flood and drought tolerance, and introducing and developing farming practices that are more adaptive to climate change.
- In areas with common drought such as the upland paddy fields without the irrigation, a focus is given to promoting construction of water dikes, small reservoirs and water ponds for keeping water for the local use. In areas where building basic infrastructures such as monitoring, controlling and protecting systems is impossible, a focus is given to production of crop calendars for rice and other prioritized crops for being planted during a certain period of time and at a specific location, and promotion of mapping of areas that are more vulnerable to natural disasters (floods and droughts).

- A focus is given to introduction and management of basic infrastructures such as reservoirs and catchments for adaptation to climate change especially in the catchments of Nam Ngeum I Dam, Num Mung III Dam, Num Theun II Dam, Se Pian-Se Num Noi Dam, Se Kha Marn Dam and other dams. A focus is also given to an orientation of water flowing, construction of dikes and water gates, installation of water pumps, construction of irrigation and drainage canals, and introduction of modern technology for monitoring a water level. A further focus is given to an establishment of emergency warning systems (Level: 1, 2 and 3) in hydrology stations, and an establishment of water control centers.

- A focus is given to an innovation of responses to climate change by establishing emergency seed reserves, establishing and developing coordination bodies as a response to climate change.

3.2.10. Regulatory Measure

To manage the crop sector by rule of law in accordance with the Lao PDR state of law, a focus is given, from now to 2025, to improvement of relevant laws and regulations such as Law on Agriculture (1998) and Law on Plant Protection (2008), and formulation of law on plant varieties, law on fertilizers and pesticides, prime minister's decrees on GAP, planting materials, fertilizers and pesticides and plant protection networks. A focus is also given to formulation of MAF-level regulations such as orders, agreements, instructions and notices that are basically developed from the higher-level regulations.

3.3. Necessary Incentives

3.3.1. Incentives for Improving Production, Yield and Soil Fertility

1) A focus is given to introduction of tariff exemption of imported fertilizers by 0% and for imported farm machines through the case-by-case consideration. A focus is also given to improving management of pesticides by introducing and improving a process of pesticide registration while registered pesticides can be possibly applied for tariff exemption and reduction.

2) A focus is given to an establishment, development and monitoring of registration systems for crop land and agriculture land by formulating, improving and enforcing relevant regulations, legal frameworks and technical guidelines for crops and for soil improvement.

3.3.2. Institutional Improvement

A focus is given to encouraging farming to follow relevant regulations and technical guidelines such as Law on Agriculture, Law on Plant Protection, Agreement on Management of Planting Materials and Agreement on Pesticide Control in the Lao PDR. A focus is also given to structural and organizational improvement for the provincial crop sector and development of human resources in the required fields such as plant protection and plant quarantine. A further focus is given to improvement of quota of staffs for the crop sector due to the fact that many staffs of the crop sector were transferred to relevant sectors such as the agricultural extension and cooperatives sector and the agricultural land development and management sector during the recent institutional improvement.

3.3.3. Clean Agriculture

A focus is given to promoting farming practice to meet GAP and OA standards in line with sustainable agriculture by supporting farmers who are certified for GAP and OA being exempted for fee payment for a letter of certification, for an exemption of land taxation during the first 5 year period, and low-interest incentives by being considered case by case.

3.3.4. Increasing Farmers' Income by 30%

1) To benefit farmers by 30% of the production cost, a focus is given to controlling of rice price especially by introducing interventions when fluctuation of the global rice price takes place. The government is required to establish and support a rice information support body whose key roles are to monitor, analyze and provide rice market information and that is integrated with international and regional information systems.

2) A focus is given to a reduction of the production cost by transforming human-labour-based to mechanized farming by introducing tax and fee reduction incentives for imported farm machines and machines that are used for rice farming. The first priority for this is given to farmer's group or agricultural cooperatives and investors who invest in agriculture and farming-related business are considered case by case.

3) A focus is given to an exemption of normal taxation and value added taxation for agricultural inputs including the collectivized farm machines owned by rice farmer's group, promotion of use of R3 seeds by 100%, and promotion of the one-year low-interest loans for rice cultivation.

3.3.5. Incentives for Agriculture and Agriculture-Related Entrepreneurs and Investors

1) Rice Production in Areas Allocated for National Food Security:

- Domestic Investment: Entrepreneurs and investors who need to import sets of farm machines (tractors, transplantors, harvesters, ...) will receive low-interest loans by 50% of the total imported amount of the farm machines during the three initial years. Farmers, farmer's group, cooperatives, entrepreneurs and investors in areas of the prioritized development projects who have 1 ha of paddy field that can be used for rice cultivation in the two cropping seasons will be considered to receive the one-year loans without interests for the total amount of the costs invested.

- Foreign Investment: Investors who invest in building factories and relevant facilities for chemical fertilizers, bio-fertilizers, dryers, storages, rice milling, grain grading, farm tools, farm machines and other farm inputs will be considered to receive the 15-year fee exemption for land concession for the areas where main factory offices and premises are constructed and to receive low electric charge in the case that the constructed factory premises are not located at and replaced the paddy fields. A focus is also given to promotion of the investors by being exempted for the 10-year income taxation, by being considered to receive the 3-year interest free loans for 30% of the total invested amount when construction of the factory offices and premises are completed.

2) Cast Crop Production in Normal Areas: Incentives which will be considered case by case include a reduction in tariff and the consumer taxation for farm machines. In case of following GAP and OA principles, prioritized incentives will be awarded in accordance with the clean agriculture policy.

3.3.6. Financial Incentives

1) For Research on Seeds and Plant Varieties: The government has financial incentives to invest by 100% in building basic infrastructures to ensure effective researching on seeds and plant varieties, production and multiplication of R1 and R2 seeds. The government also has financial incentives for supporting capacity development for staffs and researchers whose key responsibilities focus on seeds.

2) For Farmer's Group, Cooperatives and Entrepreneurs for Rice Seed Multiplication: A focus is given to an exemption of normal taxation and value added taxation for tools, machines and infrastructure facilities for the R3 seed multiplication, and an exemption of value-added taxation for the R3 seed distribution. A focus is also given to provision of short-term low interest loans (equal or shorter than a one-year period) for purchasing farm inputs and for multiplication of R3 seed. A further focus is given to provision of medium-term loans (1-5 years) for investing in farm machines and basic infrastructures for multiplication of R3 seed. In addition, a focus is given to provision of long-term loans (more than a 5-year period) for investing in farm machines and basic infrastructure for promoting multiplication and quality improvement of R3 seed.

3) For Farmers, Investors and Entrepreneurs for Production and Supply of Agricultural Machines and Inputs: A focus is given to an exemption of normal taxation and value added taxation for agricultural tools and machines, and for construction of plants and factories for production, supply and manufacturing of farm inputs which cannot be produced or produced adequately in Lao PDR.

4) For Investors and Entrepreneurs for Agro-Processing (Rice Millers): A focus is given to an exemption of normal taxation and value added taxation for agro-processing tools and machines and for construction of agro-processing plants and factories especially the rice milling and processing. A focus is also given to provision of a one-year low-interest loans and interest-free loans for agro-processing business and for improved rice value addition by considering case by case.

PART IV

Implementing Approaches

To ensure effective implementation of the Development Strategy of the Crop Sector 2025, proper measures and approaches are needed:

1) The crop sector at all levels is required to collaborate with relevant agencies at all level for dissemination of this strategy to farmers, producers, investors, entrepreneurs and other

stakeholders as well as all groups of society for ensuring their cooperation and effective implementation.

- 2) In collaboration with relevant agencies, Department of Agriculture is required to develop this strategy including the plans of action, the measures and the incentives into more detail activities and by innovating indicators, timeframe and bodies in charge for each activity for being implemented.
- 3) Responsibilities for the crop sector at the central and local levels:
 - **At the central level:** 1) Focus on development of the Party's policy guidance into strategy, programmes, plans and projects; 2) Provide policy tools and supports such as technical guidelines and regulations for management of the crop sector and crop production; 3) Focus on human resource development for the sector in accordance with the central and local needs; 4) Promote international cooperation for international assistance such as Foreign Direct Investment (FDI) and Official Development Assistance (ODA); 5) Focus on proper allocation of budgets, vehicles and other facilities necessary in the crop sector; and 6) Focus on structural improvement of the crop sector for promoting and facilitating crop production implemented by farmers and entrepreneurs.
 - **At the local level:** 1) Focus on development of this strategy into more detail workplans and projects by being based on the local conditions such as infrastructures, demography and other local basis; 2) Formulate a five-year master plan for investment with financial need for capacity building and for development of the sector; 3) Formulate a set of plans such as plans for implementing, budgeting, staffing and other supporting for smooth and effective implementation of this strategy; 4) Propose staffing plans by being based on near-future and current needs; 5) Collaborate with international and local relevant agencies to focus more on implementation of the activities of the sector at the local level; 6) Focus on effective management of budgets, vehicles and other facilities; and 7) Focus on improving management mechanisms of the crop sector for facilitating farmers and agriculture-related stakeholders at the local level.
- 4) Department of Agriculture is responsible for formulating and improving monitoring mechanisms for implementation of this strategy in collaboration with relevant agencies at central and local levels, and development partners by regularly producing reliable information and reports that can be used for a process of decision making.
- 5) A focus is given to formulation and development of reliable and applicable crop and crop-related information systems for supporting and protecting farmers, entrepreneurs and other stakeholders. A further focus is given to promotion of participation by farmers, entrepreneurs and other stakeholders for implementation of this strategy.

ANNEX

Plans of Action and Supporting Projects 2025 (8 Plans of Action and 58 Supporting Projects)

Plan of Action for Agricultural Land Development

1. Agricultural Land Regulation and Management Project
2. Agricultural Land Use Planning and Zoning Project
3. Agricultural Soil Fertility Management Project, and
4. Institutional Capacity and Network Development Project.

Plan of Action for Infrastructure Development

5. Irrigation Development Project
6. Agricultural Service Development Project
7. Research and Laboratory Infrastructure Development Project, and
8. ISO17025-based Plant Laboratory Development Project.

Plan of Action for Clean Agriculture Development

9. Clean Agriculture Standard Development Project (OA, GAP, ...), Registration for Prohibited Plants in Lao PDR, Registration for Site-based Crops and GI Products,
10. Clean Agriculture Demonstration Project (GAP, OA, ...)
11. Clean Agriculture Certification Project (that can be linked internationally and regionally)
12. Cash Crop Standard Development Project
13. Plant Product Standard Development Project
14. Clean Agriculture Products Management and Regulation Support Project
15. Clean Agriculture Infrastructure Development Project
16. Clean Agriculture System Control and Capacity Development Project, and
17. Market-oriented Vegetable and Fruit Crop Promotion Project.

Plan of Action for Promotion and Management of Crop Production

18. Farmer Registration Project
19. Export-oriented Crop Producers and Farms Registration Project

20. Agricultural Inputs Management Project (seeds, fertilizers and pesticides)
21. Post-Harvest Handling and Processing Development Project
22. Crop Sector Regulation Awareness Project
23. Crop Sector Investment Monitoring and Promotion Project
24. Natural Disaster-Induced Crop Lose Reduction Project
25. Post-Harvest Technology Development Project, and
26. Policies, Strategies, Regulations and Technical Guidelines Development and Improvement Project

Plan of Action for Development of Plant Protection and Plant Quarantine

27. Plant Protection and Plant Quarantine Awareness Raising Project
28. Sanitary and Phytosanitary System Improvement Project (SPS-WTO)
29. Plant Protection Strategy Formulation Project
30. National Plant Protection System and Network Development Project
31. Trade Negotiation-based Pest Risk Assessment Project
32. Agricultural Products Treatment Project (fumigation, heat treatment and irradiation)
33. Common Pest Listing and Assessment Project
34. Agricultural Input Quality and Chemical Residues Testing Project
35. Pest Forecasting and Surveillance Project
36. Village-Level Plant Protection and Networking Project, and
37. Plant Quarantine Check-Point Improvement Project

Plan of Action for Crop Research

38. Products Pricing and Production Costing Analysis Project
39. Agricultural Product Value Chain Study Project
40. Agricultural Modernization Project
41. Agricultural Credit and Investment Research Project
42. Rice Seed Improvement Project
43. Seed Production Project (maize, cassava, coffee, banana, ...)
44. Fruit and Vegetable Seed Improvement Project

45. Farming Practice Improvement Project, and
46. Post-Harvest Technology Development Project

Plan of Action for Cash Crop Production

47. Market-oriented Rice Production Project
48. Market-oriented Cash Crop Production Project (coffee, maize, cassava, banana, ...)
49. Farmer's Group Development and Support Project
50. Agricultural Enterprise Promotion Project
51. Agricultural Information Support Project, and
52. Agricultural Modernization Promotion Project

Plan of Action for Human Resources Development for Agronomy, Plant Protection and Plant Quarantine, and Laboratory Analyst

53. Subject-Specialist Human Resource Development Project (insects, plant diseases, lab analysts, crop specialist, breeders, ...)
54. Plant Quarantine Staff Capacity Development Project
55. Management Capacity Development Project
56. Farm Skill Development Project
57. Farmer Management Project, and
58. Pilot Project for Production Cost Reduction and Productivity Promotion in Rural Areas by Using Agricultural Machines