

Lao PDR

Ministry of Agriculture and Forestry



**Agricultural Investment Plan
2011 to 2015**

***Embracing Cooperation
with Development Partners
and the Private Sector***

*Vientiane
15th September, 2010*

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1. Introduction

1. The present **Agricultural Investment Plan (AIP)** for the five-year period 2011 to 2015 is based on the **Agricultural Development Strategy (ADS)** 2011 to 2020 and on the **Agricultural Master Plan (AMP)** 2011 to 2015. The ADS and the AMP have been prepared as separate documents which should be read before proceeding with the present AIP.
2. The **ADS** provides the **framework**, the vision and the long term development goals of the Government of Laos (GoL) for the sustainable development of the sector, aiming at food and income security.
3. The **AMP** is a **roadmap** for the implementation of the strategy in the coming five years. The AMP uses a **Program Approach** to structure the various measures and interventions. It thus resembles a conventional sub-sector approach to planning, which has the distinct advantage of a relatively easy clarification of implementation responsibilities among the respective MAF departments. On the other hand, the program approach is based upon the sound evaluation of socio-economic and agro-ecological conditions, responding directly to local needs of the stakeholders in rural areas of Laos. In a bottom-up planning and consultation process, these region-specific conditions have been considered in the overall design of the Master Plan. It is hoped that the participation of the concerned stakeholders in the regions will maximize the effectiveness of resource allocation in the agriculture and forestry sector. The **geographic area approach** thus has to be added as a different perspective when it comes to the local and regional adaptation of the eight programs, which is the responsibility of decentralised authorities on provincial and districts levels.
4. The present **Agricultural Investment Plan (AIP)** calls for the **Cooperation of Development Partners and the Private Sector** to enter partnerships for financing the implementation of the eight programs in the different regions of the country.
5. The AIP simulates **three Investment Scenarios** for the coming five years, which are termed (i) realistic, (ii) conservative and (iii) optimistic. Breakdowns of investment budgets by “Sources of Finance” and by “Implementation Programs” are presented for all three scenarios, while the additional breakdowns by “Category of Measures” (key measures, climate-related, other measures), by “Region” and by “Lead Agency” are presented for the “realistic” Scenario 1 only.
6. While the main report of the **AIP is a simplified summary presentation**, the core content of the data and budget calculations is presented in the **Annexes**, for the Scenario 1 only, for all the eight investment programs and for all measures. Since the present version of the AIP is a draft, it is bound to see a number of modifications until its final version is approved. Any modifications should be made first in the Excel calculation tables which are the basis for the Annexes and for the aggregated presentations in the main report of the AIP.

2. Overview of three Investment Scenarios

2.1. Assumptions Scenario 1

7. The **basic assumptions of Scenario 1**, termed “realistic”, have been:
- (1) Even considering that with the projected overall GDP growth of about 8.0 percent annually over the next five years, GoL’s tax revenues will increase significantly, the available budget for investments into the ANR sector will remain limited. The Public Investment Program (PIP) will continue to be able contributing only a modest share of the overall investments in the sector, even if – in addition to tax revenues - the direct contributions of rural communities in cash or kind are included in the calculation.
 - (2) As from 2011, Lao PDR will become eligible to concessional loans from International Finance Institutions, such as World Bank, IFC, Asian Development, and others. The Implementation Programs, measures, programs and projects outlined in the Agricultural Master Plan (AMP) and in the present Agricultural Investment Plan (AIP) can then be partly financed a by mix of ODA grants and concessional ODA loans of substantial volume. Compared to the implementation period of the last five year plan, a very substantial increase in the overall volume of ODA funding (grants plus concessional loans) is therefore assumed for the period 2011 to 2015.
 - (3) Being eligible to concessional loans from International Finance Institutions would have the additional effect of improving the rating of Lao PDR by International Rating Institutions, and will thus lower the interest to be paid by GoL on commercial loans on the international financial markets which then allow an additional source of finance “of last resort”.
 - (4) Improved regulatory framework conditions, a “level playing field” and a generally improved investment climate in the Lao PDR will lead in the ANR sector to substantially increased investments from the private sector, both from foreign as from domestic private investors. The above points 2 and 3 would further ease the access of the private sector to commercial loans. For the present Scenario 1, a relatively prudent assumption has been made as to the total volume of these investments over the next five years, based on a simple linear extrapolation of the positive trends in FDI in recent years. The major targets are assumed to be the sub-sector programs on “irrigated agriculture”, “commodity production” and “other agriculture and forestry infrastructure”, in this order of importance.

2.2. Assumptions Scenario 2

8. The **basic assumptions of Scenario 2**, termed “conservative”, have been:
- (1) As compared to the above Scenario 1, the Scenario 2 is extremely conservative about the likely influx of private investments, and has actually set the total volume of private investments from private foreign as well as from domestic investors to Zero over the full period of the next five years. While this might seem overly pessimistic, it is not entirely unrealistic, given the possibility of another regional or global economic and/or financial crisis which might – for some time to come – bring private investments in the Lao ANR sector to a standstill. However, even if – hopefully – this extremely conservative assumption does not materialize, various scenarios in between 1 and 2 are thinkable, with the effect of significantly reducing the total investment volume, and thus substantially decreasing the financial viability of a number of investments proposed.
 - (2) For Scenario 2, the above assumptions 1, 2 and 3 of Scenario 1 remain unchanged.

2.3. Assumptions Scenario 3

9. The **basic assumptions of Scenario 3**, termed “optimistic”, have been:

- (1) As compared to the above Scenario 1, the Scenario 3 is somewhat more optimistic about the incoming ODA funds in the next five years, and is very optimistic about the likely influx of private investments which are assumed to increase exponentially instead of only linear.
- (2) Substantial increases of ODA funds are notably assumed for certain investments measures related to sustainable forestry, climate change adaptation and biodiversity. Even though the procedures of mobilizing and distributing funds under the REDD mechanism (see ADS and AMP) are not yet entirely clear, the international pressure is on to find appropriate solutions to substitute the Kyoto protocol before it expires by 2012. This will mean that regulations on the reduction of CO₂ emissions will continue to be compulsory, and related to global subsidy mechanisms for the poorer developing countries, such as Lao PDR. – Combined with the introduction of a conducive regulatory framework, GoL will introduce “eco-systems rehabilitation licences” and enter the global carbon market with internationally certified “CO₂ sink” projects which will mobilize very substantial amounts from international private investors.
- (3) In the optimistic Scenario 3, the greatest potential for an increase of FDI is seen in “irrigated agriculture”, notably referring to irrigation infrastructure which on large scale commercial plantations and concessions is likely to generate very attractive returns on investments.
- (4) The assumption referring to the limited possibilities of the PIP remains largely unchanged, even in the optimistic Scenario 3.

2.4. Overview by Source of Finance

Table 1: Overview of Three Investment Scenarios

Scenarios by Source of Finance	Investment Volume (in million USD) Source of Finance ¹⁾			
	PIP	ODA	FDI	TOTAL
Scenario 1 (realistic)				
Total	120	898	858	1,876
by Source of Finance in percent of TOTAL	6%	48%	46%	
Scenario 2 (conservative)				
Total	120	886	0	1,006
by Source of Finance in percent of TOTAL	12%	88%	0%	
Scenario 3 (optimistic)				
Total	132	1,368	2,560	4,060
by Source of Finance in percent of TOTAL	3%	34%	63%	

1) Note: PIP includes GoL investments from tax revenues as well as direct contributions from rural communities; ODA includes grants and concessional loans from Development Banks; FDI includes foreign direct investments and private domestic investments

10. As shown in Table 1, the total investment volume for the next five years in the “realistic” Scenario 1 is somewhat below 2.0 billion US \$. With modest contributions from PIP, the contributions from ODA and FDI are about even.
11. In the conservative Scenario 2, the total investment volume is around 1.0 billion US \$. Compared to Scenario 1, the contributions from PIP and ODA remain unchanged in nominal terms. However, due to FDI being assumed as Zero, the relative share of ODA is almost 90 % of the total investment volume.
12. In the optimistic Scenario 3, the total investment volume is around 4.0 billion US \$. With an over-proportional increase in FDI, the share of FDI increases to almost two thirds of the total volume, while ODA comprises about one third.

2.5. Probability Assessment

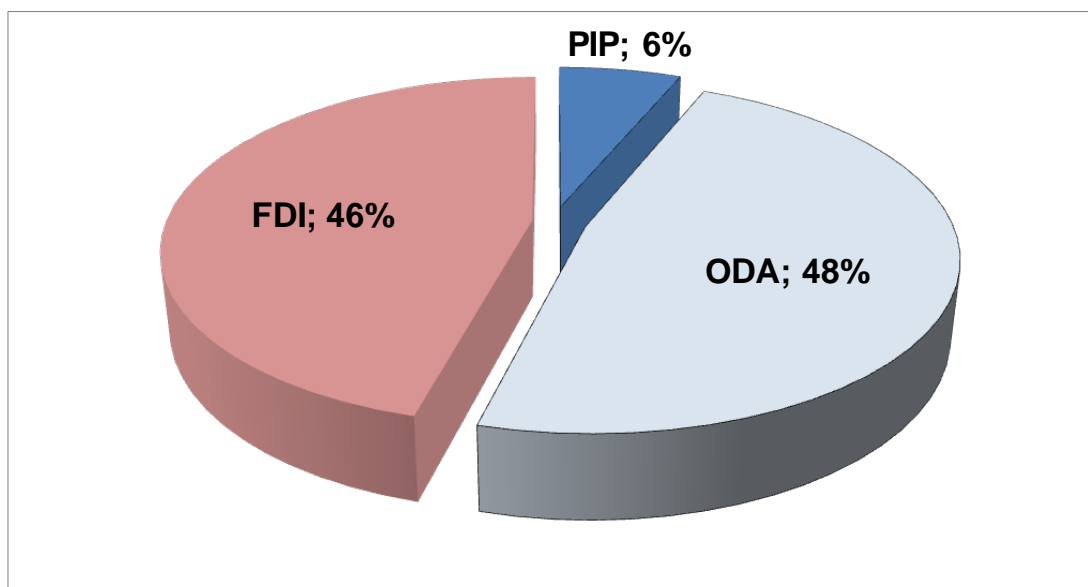
13. In the light of an increasingly dynamic and globalized economy, in view of the increased exposure of Laos as a country and of its farmers, SME and larger private investors to the fluctuations in this global context, in view also of the possibility of a renewed global and/or regional economic crisis or just another burst of an “investment bubble”, but not least in view of the tremendous untapped potential of Lao’s natural resources for domestic and foreign investors, it is virtually impossible to come up with a reliable forecast on future investments trends over as long a period as the next five years.
14. Nevertheless, after numerous consultations with domestic and international expert economists, it has been decided to accept the Scenario 1 (or some condition near this scenario) as the most likely investment profile for the next 5 year period for the ANR sector in Lao PDR.
15. However, neither the conservative, nor the optimistic scenario can be entirely excluded. They simply represent the extreme poles on a continuum of likely investment scenarios. After all, the real outcome will also be the result of a successful appeal to international Development Partners and the Private Sector to actually “Embrace Cooperation”.

3. Scenario 1: realistic

3.1. Breakdown by Source of Finance

16. For Scenario 1, the shares of PIP, ODA and FDI in percent of the total investment volume (1.86 billion US\$) are illustrated in Figure 1.

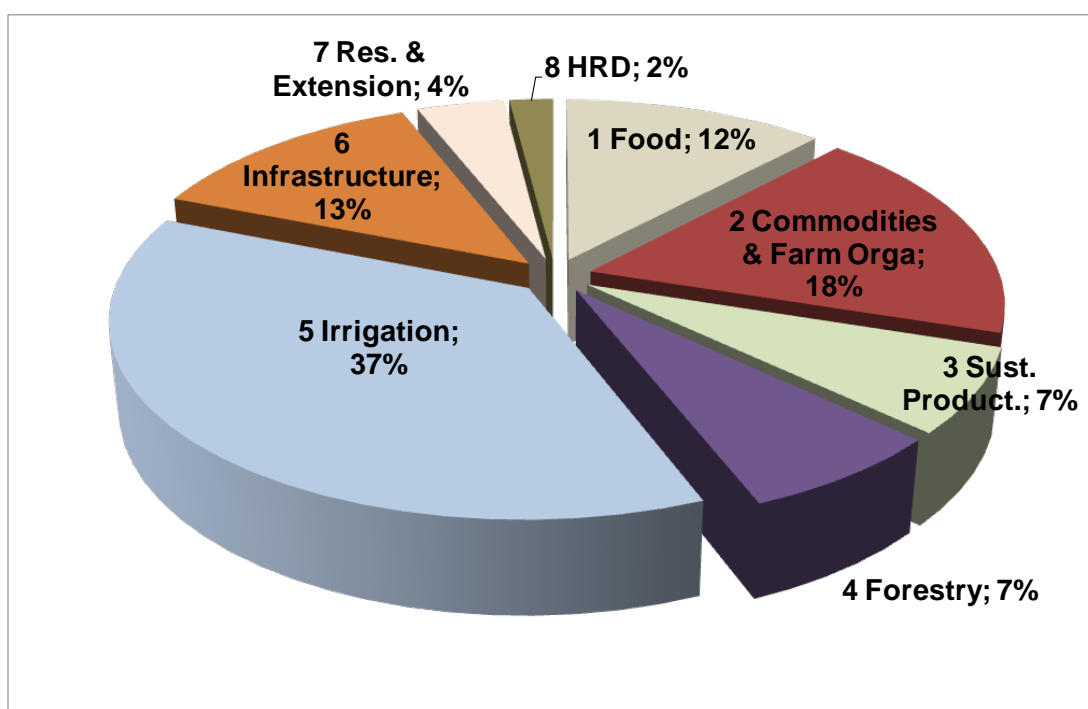
Fig. 1: Scenario 1: Shares of Investments by Source of Finance



3.2. Breakdown by Implementation Programs

17. The shares of the eight investment programs in percent of the total investment volume under Scenario 1 are illustrated in Figure 2.

Fig. 2: Scenario 1: Shares of Investments by 8 Implementation Programs



18. As can be seen in Figure 2, by far the largest share of the total investments is foreseen for Program 5 (Irrigated Agriculture) with 37 %, followed by Program 2 (Commodity Production and Farmer Organizations) with 18 %, and Program 6 (Other Infrastructure) with 13 %.

19. An overview of the projected investments for the eight implementation programs in nominal and percentage terms is provided by Table 2.

Table 2: Scenario 1: Overview of 8 Programs

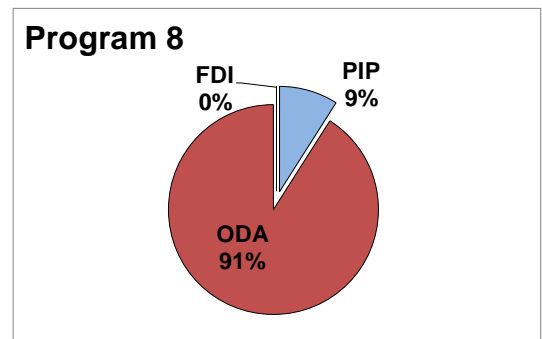
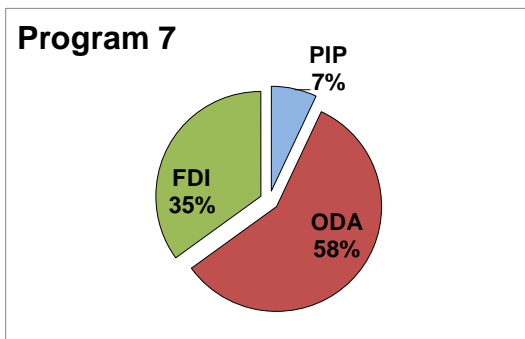
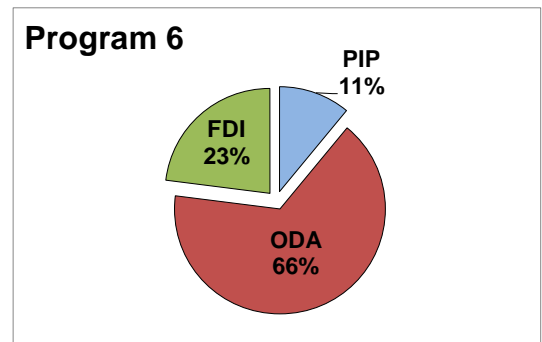
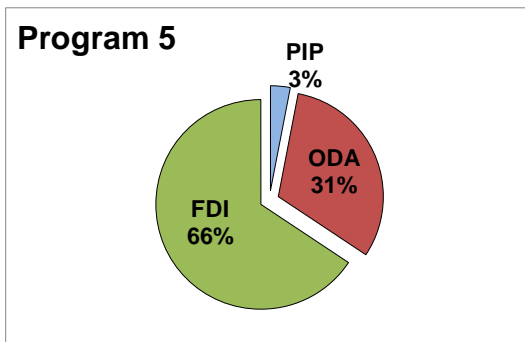
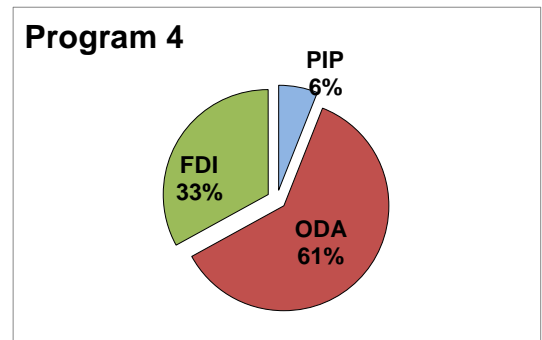
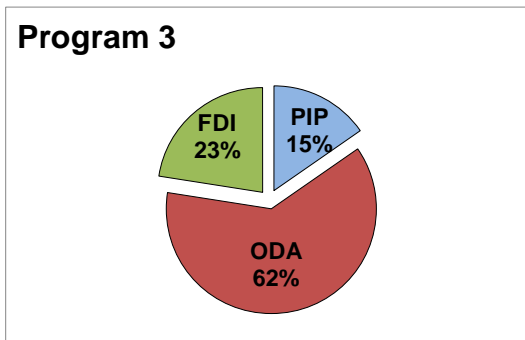
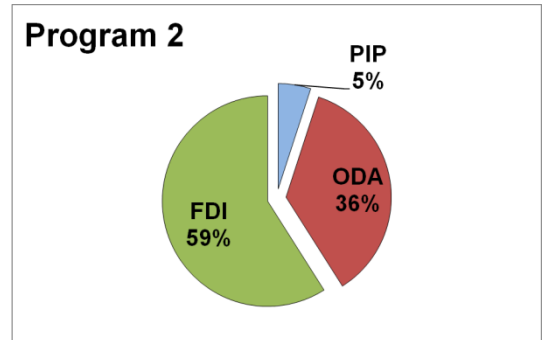
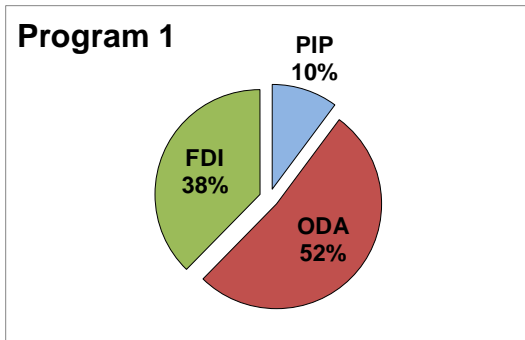
Programs by Source of Finance	Percent of TOTAL	Investment Volume (in million USD)			
		Source of Finance ¹⁾			
		PIP	ODA	FDI	TOTAL
Total		120.27	898.26	857.75	1,876.27
by Source of Finance in percent of TOTAL		6%	48%	46%	
Program 1: Food Production	12%	15.57	154.65	61.00	231.22
Sub-Total in percent of Total		13%	17%	7%	12%
Program 2: Commodity Production and Farmer Organizations	18%	17.62	121.70	200.25	339.57
Sub-Total in percent of TOTAL		15%	14%	23%	18%
Program 3: Sustainable Production and Rural Development	7%	21.45	88.50	19.00	128.95
Sub-Total in percent of TOTAL		18%	10%	2%	7%
Program 4: Forestry Development	7%	8.54	85.40	46.00	139.94
Sub-Total in percent of TOTAL		7%	10%	5%	7%
Program 5: Irrigated Agriculture	37%	23.26	215.66	451.00	689.92
Sub-Total in percent of TOTAL		19%	24%	53%	37%
Program 6: Other Agriculture and Forestry Infrastructure	13%	25.75	159.50	56.00	241.25
Sub-Total in percent of TOTAL		21%	18%	7%	13%
Program 7: Agriculture and Forestry Research and Extension	4%	4.90	41.05	24.50	70.45
Sub-Total in percent of TOTAL		4%	5%	3%	4%
Program 8: Human Resource Development	2%	3.18	31.80	0.00	34.98
Sub-Total in percent of TOTAL		3%	4%	0%	2%

20. As shown in Table 2, the 37 % share of Program 5 (Irrigated Agriculture) translates into almost 700 million US \$ in nominal terms, of which about 450 million US \$ are expected to come from FDI and about 215 million US \$ from ODA. The 18 % share of Program 2 (Commodity Production and Farmer Organizations) translates into 340 million US \$ in nominal terms, of which by far the largest part of 200 million US \$ is expected to come from FDI and about 120 million US \$ from ODA. By contrast, the roughly 240 million US \$ for Program 6 (Other Infrastructure) are expected to be mainly mobilized from ODA (160 million US \$).

21. The details of all eight Investment Programs are presented in the Annexes.

22. Figure 3 below illustrates for each of the eight programs the projected contributions to the program budgets by Source of Finance (PIP, ODA, FDI).

Fig. 3: Scenario 1: Program Budgets by Source of Finance



3.3. Breakdown by Category of Measures

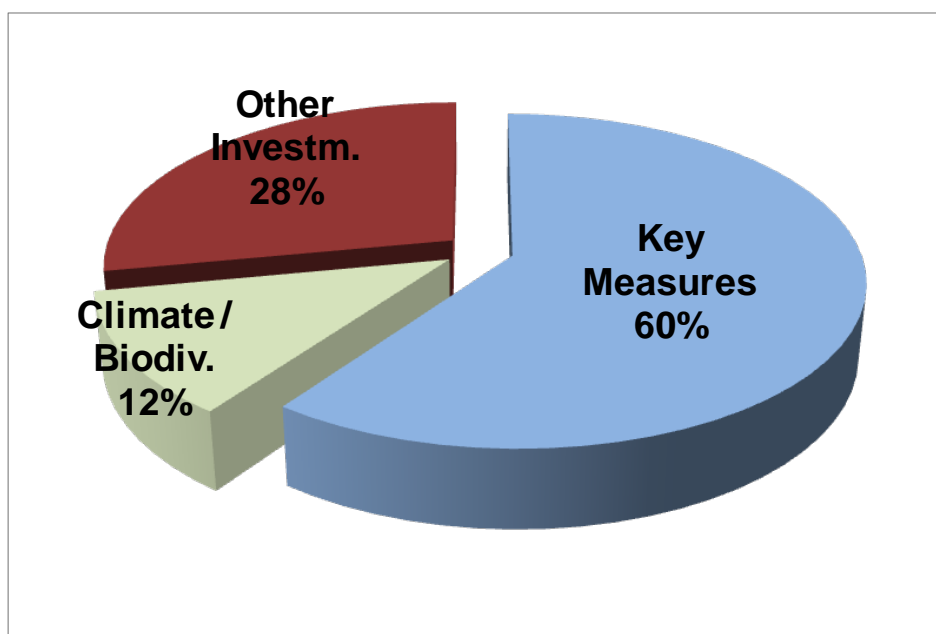
23. For each of the programs, all investment measures have been grouped in 3 categories: (i) key measures, (ii) measures related to Climate Change Adaptation or Biodiversity and (iii) other specific Investments, Programs and Projects. Table 3 indicates the split of the total investment volume under Scenario 1 among these 3 categories.

Table 3: Scenario 1: Investments by Category of Measures

Investments by Category of Measures	Investment Volume (in million USD) Source of Finance ¹⁾			
	PIP	ODA	FDI	TOTAL
Total	120	898	858	1,876
by Source of Finance in % of TOTAL	6%	48%	46%	
Key Measures	54	438	666	1,158
Sub-Total in percent of Total	45%	49%	78%	62%
Measures related to Climate Change Adaptation or Biodiversity	15	152	67	234
Sub-Total in percent of Total	13%	17%	8%	12%
Other specific Investments, Programs and Projects	53	326	154	532
Sub-Total in percent of Total	44%	36%	18%	28%

24. As shown in Table 3 and illustrated in Figure 4 below, about 60 % of the investments are categorized as “key measures”, while only a relatively small percentage of 13 % is specifically targeted to measures related to climate change adaptation or biodiversity. – In the optimistic Scenario 3, this latter percentage of “green measures” is by far higher, since more optimistic assumptions were made on the mobilization of additional funds for climate-related programs, financed both from ODA (e.g. REDD) and FDI (eco-systems restoration licences, carbon trade).

Fig. 4: Scenario 1: Investment Shares by Category of Measures



3.4. Breakdown by Region

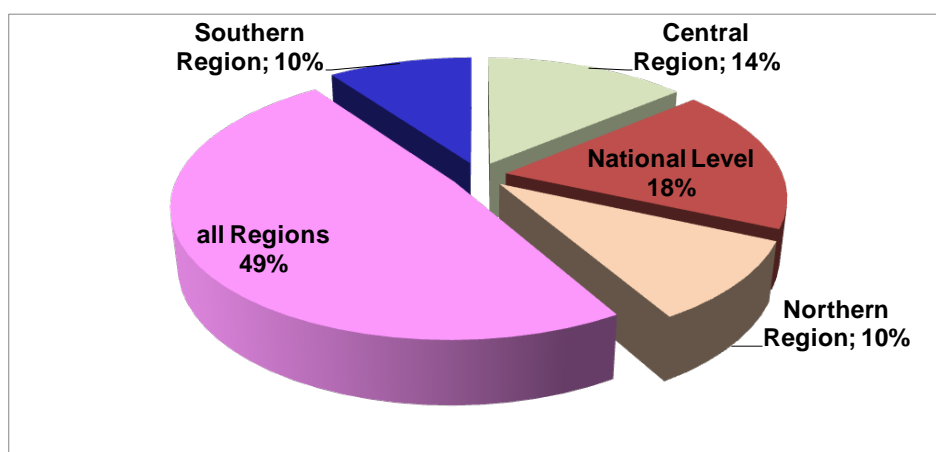
25. The central Government of Lao PDR has a responsibility for the people in all parts and regions of the country. Following the “geographic area approach” outlined in the Agriculture Development Strategy (ADS), the present AIP therefore implies the pursuance of reducing regional disparities, and maintaining a regional balance of the investments proposed with the AIP (in all 3 scenarios).

26. For the Scenario 1, Table 4 and Figure 5 show the breakdown of the total investment volume by geographic area or region. As a methodological problem, it should be noted that by far not all investment measures can be associated with a specific region (for simplicity here only categorized as North, Central and South). In fact, most of the planned measures are foreseen to be implemented in more than one of the geographic regions, some of them in all three regions. Therefore, a residual category of “Implementation in all Regions” has been created to express this fact.

Table 4: Scenario 1: Investments by Region

Investments by Region	Investment Volume (in million USD)			
	Source of Finance ¹⁾			
	PIP	ODA	FDI	TOTAL
Total	120	898	858	1,876
by Source of Finance in % of TOTAL	6%	48%	46%	
Central Region	6	57	201	263
Sub-Total in percent of Total	5%	6%	23%	14%
National Level	22	202	117	341
Sub-Total in percent of Total	19%	22%	14%	18%
Northern Region	24	102	62	188
Sub-Total in percent of Total	20%	11%	7%	10%
Implementation in all Regions (Northern, Central and Southern)	66	517	351	928
Sub-Total in percent of Total	55%	58%	41%	49%
Southern Region	3	35	154	192
Sub-Total in percent of Total	3%	4%	18%	10%

Fig. 5: Scenario 1: Investment Shares by Region



3.5. Breakdown by Lead Agency

27. The Ministry of Agriculture and Forestry (MAF) is organized in a number of technical departments and associated institutions, such as the “National Agriculture and Forestry Research Institute” (NAFRI) and the “National Agriculture and Forestry Extension Service” (NAFES). In accordance with its specific mandate, each department or institution has a certain responsibility for the implementation of the investment measures outlined in the Agricultural Master Plan (AMP). The financial resources for the implementation for these measures go along with the specific technical responsibilities. The institutional unit with the main responsibility for implementing a certain investment measure is termed in the present AIP the “lead agency”.
28. However, there is overlap in the mandates of some departments. For a considerable number of investment measures, two or more of the departments have to closely cooperate within MAF; other measures even require inter-ministerial cooperation. As mentioned in the AMP, several measures of re-organizing the mandates and responsibilities of departments are planned in the near future, some of which are already on the way (e.g. NAFES). Not least, final decisions about responsibilities for certain measures and programs are not yet taken and will eventually be the result of a negotiation process, and have to be approved by the Minister.
29. Keeping these reservations in mind, the distribution of the “Investment Pie” under Scenario 1 can be illustrated by Figure 6 and is shown in percentage and nominal terms in Table 5, below.
30. Apart from NAFRI and NAES, the abbreviations used for the departments are:

PAFO DAFO	Provincial / District Agriculture and Forestry Office	DOI	Dept of Irrigation
DOA	Dept of Agriculture	DOLF	Dept of Livestock and Fisheries
DOF	Dept of Forestry	DOP	Dept of Planning
DOFI	Dept of Forest Inspection	DOPer	Dept of Personnel

Fig. 6: Scenario 1: Investment Shares by Lead Agency

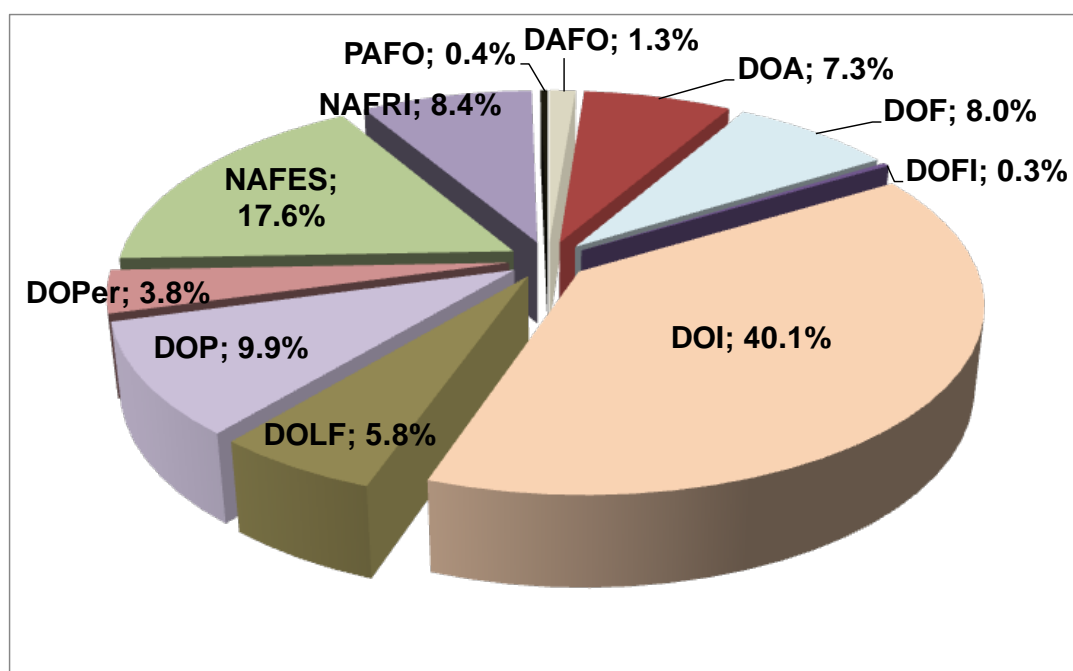


Table 5: Scenario 1: Investments by Lead Agency

Investments by Lead Agency	Investment Volume (in million USD)			
	Source of Finance ¹⁾			
	PIP	ODA	FDI	TOTAL
Total	120	898	858	1,876
by Source of Finance in % of TOTAL	6%	48%	46%	
DAFO	2	22	0	24
Sub-Total in percent of Total	2%	2%	0%	1%
DOA	6	41	89	136
Sub-Total in percent of Total	5%	5%	10%	7%
DOF	19	88	42	148
Sub-Total in percent of Total	16%	10%	5%	8%
DOFI	1	6	0	6
Sub-Total in percent of Total	0%	1%	0%	0%
DOI	26	242	478	745
Sub-Total in percent of Total	21%	27%	56%	40%
DOLF	5	46	57	108
Sub-Total in percent of Total	4%	5%	7%	6%
DOP	12	111	61	185
Sub-Total in percent of Total	10%	12%	7%	10%
DOPer	6	62	2	70
Sub-Total in percent of Total	5%	7%	0%	4%
NAFES	32	178	116	327
Sub-Total in percent of Total	27%	20%	14%	17%
NAFRI	11	106	39	157
Sub-Total in percent of Total	9%	12%	5%	8%
PAFO, others	1	10	1	7
Sub-Total in percent of Total	1%	1%	0%	0%

4. Scenario 2: conservative

31. For the conservative Scenario 2, an overview of the Investments (with a total volume of about 1.0 billion US\$) by Source of Finance and by Implementation Programs is presented in percentage and nominal terms with Table 6.

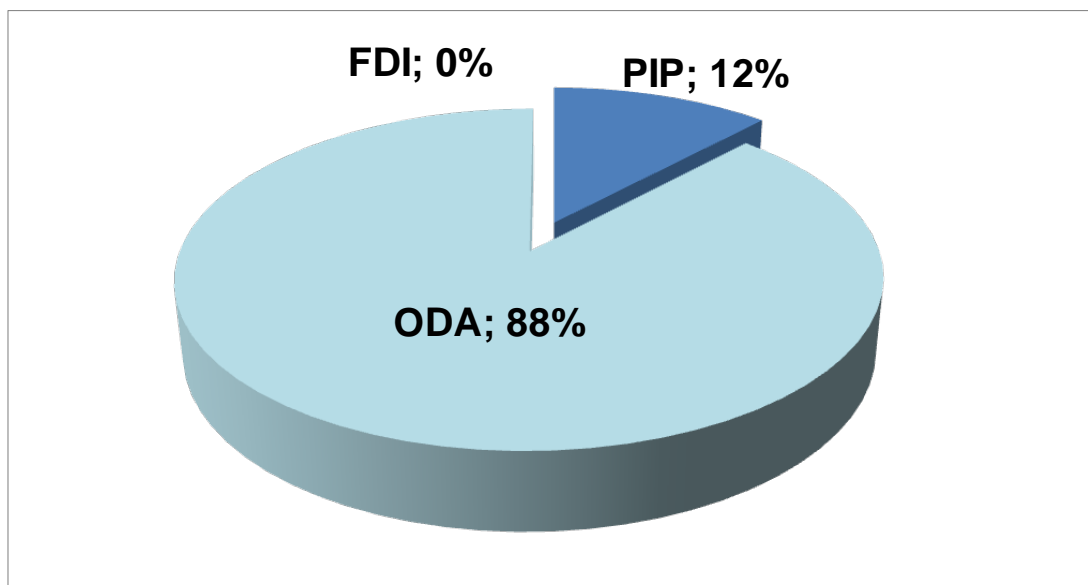
Table 6: Scenario 2: Overview of 8 Programs

Programs by Source of Finance	Percent of TOTAL	Investment Volume (in million USD) Source of Finance ¹⁾			
		PIP	ODA	FDI	TOTAL
Total		119.62	891.76	0.00	1,005.87
by Source of Finance in percent of TOTAL		12%	89%	0%	
Program 1: Food Production	17%	15.57	154.65	0.00	170.22
Sub-Total in percent of Total		13%	17%	0%	17%
Program 2: Commodity Production and Farmer Organizations	13%	17.17	117.20	0.00	134.37
Sub-Total in percent of TOTAL		14%	13%	0%	13%
Program 3: Sustainable Production and Rural Development	10%	21.55	89.50	0.00	105.55
Sub-Total in percent of TOTAL		18%	10%	0%	10%
Program 4: Forestry Development	9%	8.24	82.40	0.00	90.64
Sub-Total in percent of TOTAL		7%	9%	0%	9%
Program 5: Irrigated Agriculture	24%	23.26	215.66	0.00	238.92
Sub-Total in percent of TOTAL		19%	24%	0%	24%
Program 6: Other Agriculture and Forestry Infrastructure	18%	25.75	159.50	0.00	185.25
Sub-Total in percent of TOTAL		22%	18%	0%	18%
Program 7: Agriculture and Forestry Research and Extension	5%	4.90	41.05	0.00	45.95
Sub-Total in percent of TOTAL		4%	5%	0%	5%
Program 8: Human Resource Development	3%	3.18	31.80	0.00	34.98
Sub-Total in percent of TOTAL		3%	4%	0%	3%

4.1. Breakdown by Source of Finance

32. For Scenario 2, the shares of PIP, ODA and FDI in percent of the total investment volume are illustrated in Figure 7, below. Since in this conservative scenario it is assumed that no FDI is forthcoming, the relative share of ODA is almost 90 %.

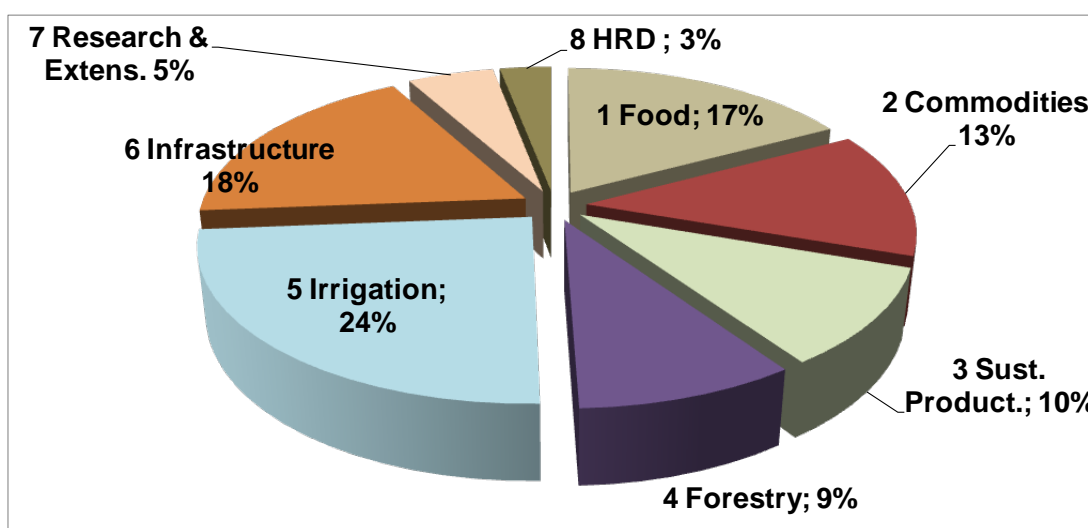
Fig. 7: Scenario 2: Shares of Investments by Source of Finance



4.2. Breakdown by Implementation Programs

33. The shares of the eight investment programs in percent of the total investment volume under Scenario 2 are illustrated in Figure 8.

Fig. 8: Scenario 2: Shares of Investments by 8 Implementation Programs



5. Scenario 3: optimistic

34. For the optimistic Scenario 3, an overview of the Investments (with a total volume of about 4.0 billion US\$) by Source of Finance and by Implementation Programs is presented in percentage and nominal terms with Table 7.

Table 7: Scenario 3: Overview of 8 Programs

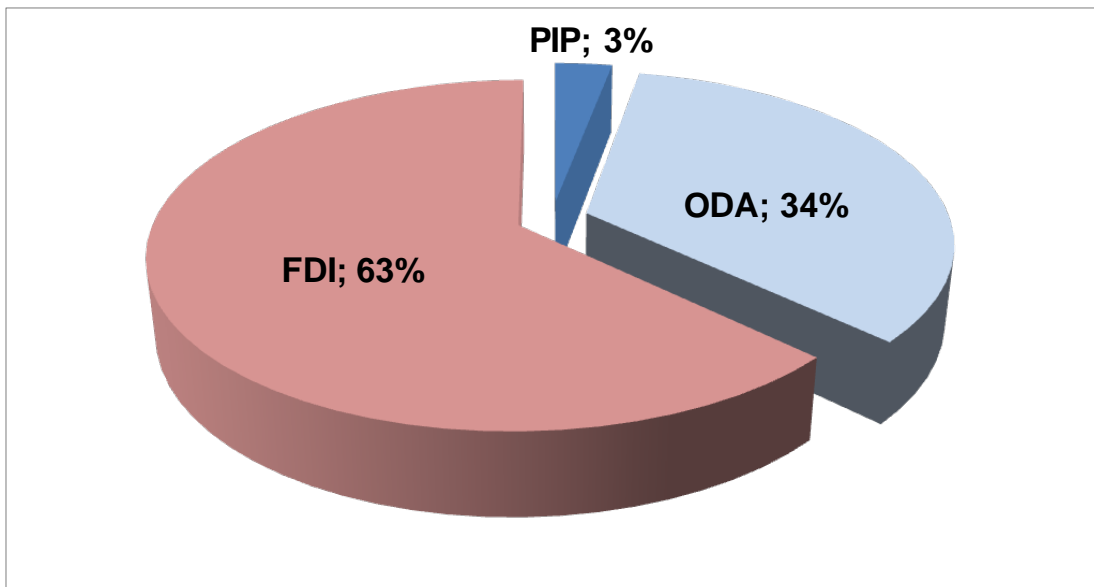
Programs by Source of Finance	Percent of TOTAL	Investment Volume (in million USD)			
		Source of Finance ¹⁾			
		PIP	ODA	FDI	TOTAL
Total		132.92	1,370.76	2,561.75	4,059.92
by Source of Finance in % of TOTAL		3%	34%	63%	
Program 1: Food Production	6%	15.57	154.65	61.00	231.22
Sub-Total in percent of Total		12%	11%	2%	6%
Program 2: Commodity Production and Farmer Organizations	8%	17.17	117.20	200.25	334.62
Sub-Total in percent of TOTAL		13%	9%	8%	8%
Program 3: Sustainable Production and Rural Development	3%	21.05	84.50	13.00	113.05
Sub-Total in percent of TOTAL		16%	6%	1%	3%
Program 4: Forestry Development	19%	12.24	217.40	526.00	755.64
Sub-Total in percent of TOTAL		9%	16%	21%	19%
Program 5: Irrigated Agriculture	56%	33.06	564.66	1,681.00	2,278.72
Sub-Total in percent of TOTAL		25%	41%	66%	56%
Program 6: Other Agriculture and Forestry Infrastructure	6%	25.75	159.50	56.00	241.25
Sub-Total in percent of TOTAL		19%	12%	2%	6%
Program 7: Agriculture and Forestry Research and Extension	2%	4.90	41.05	24.50	70.45
Sub-Total in percent of TOTAL		4%	3%	1%	2%
Program 8: Human Resource Development	1%	3.18	31.80	0.00	34.98
Sub-Total in percent of TOTAL		2%	2%	0%	1%

5.1. Breakdown by Source of Finance

35. For Scenario 3, the shares of PIP, ODA and FDI in percent of the total investment volume are illustrated in Figure 9, below.

36. In this optimistic scenario it is assumed, among others, that FDI is substantially increased. Thus, the relative share of FDI is almost two thirds of the total investment volume, with ODA comprising about one third.

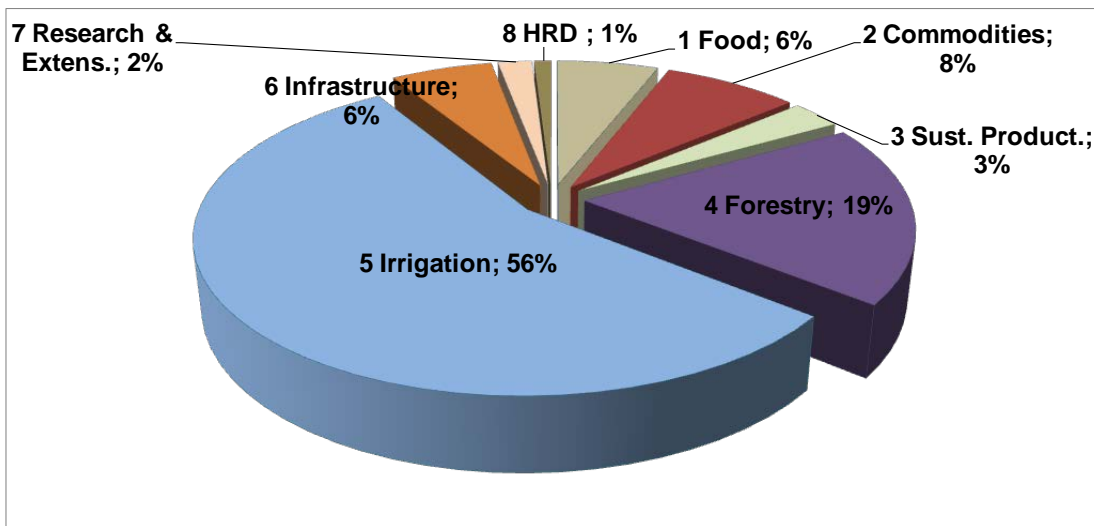
Fig. 9: Scenario 3: Shares of Investments by Source of Finance



5.2. Breakdown by Implementation Programs

37. The shares of the eight investment programs in percent of the total investment volume under Scenario 3 are illustrated in Figure 10.

Fig. 10: Scenario 3: Shares of Investments by 8 Implementation Programs



Annexes

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Annex 1: Scenario 1, Details of Program 1: Food Production

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		119.47	890.26	851.75	1,855.97
Program 1: Food Production		15.6	154.7	61.0	231.2
No.	Sub-Total in percent of TOTAL	13%	17%	7%	12%
	by Source of Finance in percent of TOTAL	7%	67%	26%	
Key Measures					
1. 1	Program of agricultural diversification , including mixed farming, agroforestry, and blending of indigenous knowledge with modern agricultural techniques	0.20	2.00	3.00	5.20
1. 2	Livestock Program of (i) upgrading local breeds of livestock through crossbreeding with improved and heat resistant breeds; and, (ii) disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network to maximize livestock productivity	0.20	2.00	3.00	5.20
1. 3	Fishery Program of upgrading local species	0.10	1.00	1.50	2.60
1. 4	Program of irrigated production of rice for food security, including organic and non-glutinous rice, and high potential diversified other crops, including fruit and vegetables, (link to Program 5)	0.30	3.00	4.50	7.80
1. 5	Improvement of basic rural infrastructure in remote areas (link to Programs 5 & 6: irrigation, post harvest handling, access roads, market places, market information systems)	2.00	20.00		22.00
1. 6	Survey and designate land capability and production zones (area-based zoning of agro-ecological areas on macro and micro levels, according to their specific potentials and comparative advantages, participatory land use planning on micro level), and grant agricultural land use rights to rural households (link to Program 3)	1.50	15.00		16.50
1. 7	Program of conservation agriculture with a focus on agricultural research and extension, linked to strengthening resilience to climate change to ensure food security (link to Programs 3 & 7)	0.40	4.00		4.40
1. 8	Human Resource Development (notably of agricultural extension staff on village level) and the promotion of farmer organizations with a focus on food production (link to Program 8)	0.40	4.00		4.40

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
	Measures related to Climate Change Adaptation or Biodiversity				
1. 9	To mitigate the foreseeable negative impacts of climate change, MAF will enhance the economic resilience of small holders through social safety nets by a climate insurance program , which will be coordinated with appropriate private sector initiatives on micro credit and micro insurance.	1.00	10.00	15.0	26.00
1. 10	Promotion of short-duration paddy and other cash crops in natural hazard-prone areas	0.07	0.65		0.72
1. 11	Promotion of soil improvement using local available organic fertilizer and agricultural waste	0.05	0.50		0.55
1. 12	Promotion of Integrated Pest Management (IPM) and use of herbal medicines in pest management and livestock treatment	0.05	0.50		0.55
	Other specific Investments, Programs and Projects				
1. 13	Promotion and Monitoring of Drought and Flood Protection Implementation Project	0.60	6.00		6.60
1. 14	Participatory Rice Varieties Production Project	0.10	1.00	2.00	3.10
1. 15	Animals Varieties (sheep, goat, and poultry) Improvement Project	0.10	1.00	2.00	3.10
1. 16	Fishery and Aquatic Multiplication Project	0.10	1.00	2.00	3.10
1. 17	Hybrid Vegetables Varieties (cabbage and Chinese Cabbage) Multiplication Project	0.10	1.00	2.00	3.10
1. 18	F2 and F3 Seed Varieties Multiplication Project in Northern Region	0.10	1.00	5.00	6.10
1. 19	Food Security Project in Northern Region	0.60	6.00		6.60
1. 20	Lao Dried Rice Variety Improvement Project	0.10	1.00		1.10
1. 21	F2 Lao Dried Rice Variety Production Project	0.10		3.00	3.10
1. 22	National Animal Vaccination Project	0.20	2.00	3.00	5.20
1. 23	Regulation Establishment for Fishery management for food security	0.10	1.00		1.10
1. 24	Establishment of Foot and Mouth Disease Free Zones	0.10	1.00		1.10
1. 25	Cattle grazing project for villagers' Livelihood in upland areas	0.30	3.00		3.30
1. 26	Villagers' Supporting project of animal husbandry in Xiengkhouang and Bolaven plateau	0.20	2.00		2.20
1. 27	Improvement and Up scaling of Fish processing techniques for food consumption	0.10	1.00	2.00	3.10

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
1. 28	Rice Reserve establishment project in 7 flat plains	0.20	2.00	10.0	12.20
1. 29	Cattle species improvement project	0.20	2.00		2.20
1. 30	Corn varieties improvement project	0.20	2.00		2.20
1. 31	Livelihood improvement project in Northern region	2.00	20.00		22.00
1. 32	Rural livelihood improvement project in Xayabury and Attapue provinces	2.00	20.00		22.00
1. 33	Promote crops resistant to pests, droughts and flood	0.20	2.00	3.00	5.20
1. 34	Promote and diversify homestead food production (incl. home gardens, fish ponds, livestock, insect farms) including nutrition education	0.40	4.00		4.40
1. 35	Improve immediate access to food of chronically vulnerable groups; support to villagers in expanding and diversifying food production through cash/ food for work schemes	1.00	10.00		11.00
1. 36	Establish National Food Security information Unit (incl. Laboratory, surveillance and information system, strengthen health information system)	0.20	2.00		2.20

Annex 2: Scenario 1, Details of Program 2: Commodity Production

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		119.42	889.76	851.75	1,855.42
Program 2: Commodity Production		17.6	121.7	200.3	339.6
No.	Sub-Total in percent of TOTAL	15%	14%	24%	18%
	by Source of Finance in percent of TOTAL	5%	36%	59%	
Key Measures					
2. 1	Ensure that commodity production, and in particular large scale private investments are linked to the social and ecological conditions of " Smart Agriculture " and provide an appropriate regulatory framework , monitoring instruments and a set of effective sanctions to ensure that commercial agriculture and processing will have no negative impacts on the natural environment, human health or other aspects of national interests	0.20	2.00	3.00	5.20
2. 2	Value chains analysis for high-value crops for local value-added processing and export; to identify gaps in production technology, market infrastructure, trade procedures, and logistics	0.05	0.50	0.75	1.30
2. 3	Build and strengthen links between producers and existing domestic and regional agricultural traders, processors, with access to domestic, cross-border, regional, and global " pro-poor and green value chains ". Ensure value chain governance so that smallholder farmers and local SME can retain a fair share of the value added	0.10	1.00	2.00	3.10
2. 4	Harmonize and complement agricultural development strategies , action plans, and road-maps with regional organizations (ASEAN, GMS, MRC, and others), ODA partners, regional trade and business organizations and associations, and individual neighbor-country governments	0.10	1.00	1.00	2.10
2. 5	In cooperation with the Ministry of Industry and Commerce (MOIC) and the Science and Technology Agency (STA) and with private sector organizations design, develop, and install modern information and communications technology (ICT) to facilitate connectivity with cross-border trading partners (link to Program 6)	0.05	0.50	0.75	1.30

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
2. 6	Initiate an inventory of agricultural land concessions throughout the country using PAFO and DAFO staff (link to Program 3) and ensure that GOL regulations on the issuance and operations of such concessions are strictly followed.	0.05	0.50	1.00	1.55
2. 7	In cooperation with line departments, Development Partners and private investors, ensure that additional rural infrastructure investments are in place and maintained in irrigation (link to Program 5), rural market access roads, and other high-cost rural infrastructure (link to Program 6)	0.50	5.00	10.00	15.50
2. 8	Agricultural research and extension on the level of farmers and their organizations with a focus on commercial agriculture linked to strengthening resilience to climate change and to enhance market connectivity (link to Program 7).	0.20	2.00	3.00	5.20
2. 9	Credit Facilities for Rice Mills Modernization	2.00	20.00	50.00	72.00
2. 10	Farmer Organizations: support to the initiation of producer groups and their legal formalization as cooperatives and / or associations, and assistance in the self-determined formulation of production cluster and value chain upgrading strategies (medium to long term) and annual work plans, including identification of market niches, local and regional branding and quality certification, monitoring and corrective action follow-up	0.50	5.00	5.00	10.50
2. 11	Risk Management: For commercial small holder farmers and their organizations, MAF will launch a comprehensive Program on Risk Management with the objective of buffering increased risks of fluctuating world market prices, market failures, increasing effects of climate change and natural calamities. The program will include region-specific risk assessments, the analysis of asymmetries and transaction costs and specify the scope for Government intervention. Based on this, region-specific training and insurance programs will be implemented.	0.50	5.00		5.50
2. 12	Training for key members of producer groups, cooperatives and associations in technical, management and marketing skills to strengthen their position, linkages, vertical integration and governance of value chains	0.50	5.00		5.50
2. 13	Cooperation with private sector investors / larger scale plantations (PPP) for out-grower systems, in designing, financing and implementing rules, regulations and monitoring of contract farming schemes, rendering the cooperatives equal partners in a win-win constellation	0.50		5.00	5.50

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
2. 14	Initiate and support cooperatives which are specialized as private service providers in various fields (e.g. pooling the purchase of agricultural inputs, supplying mechanized rental equipment to other farmers / cooperatives, post-harvest handling, mobilizing local experts for farmer-to farmer field schools, sharing market price information, legal know-how and experience in contract negotiations, provide master trainers on sustainable indigenous agricultural practices and modern niche products, etc.)	0.50	5.00	5.00	10.50
2. 15	Initiate and formalize forest user groups and strengthen these in their functions for sustainable community forestry, train key members in participatory land use planning on micro level (PLUP), participatory forest inventory (PFI), forest protection and development regulation (FPDR), sustainable cultivation and marketing of non-timber forest products (NTFP) and the selection of fast growing (yet soil-friendly) tree species as well as slow growing (high value) indigenous species; quality certification of tree seedlings and small-scale nursery techniques	0.50	5.00		5.50
Measures related to Climate Change Adaptation or Biodiversity					
2. 16	Facilitate the expansion of climate-smart agribusiness , processing agricultural raw materials for domestic use (to substitute for food imports) and for export; and will support the strengthening of the capacity of these enterprises to compete successfully in international markets; monitoring instruments will include „ Climate Proofing for Development “	0.30	3.00	12.00	15.30
2. 17	Establishment and strengthening of farmers groups in natural hazard-prone areas	0.05	0.50		0.55
Other specific Investments, Programs and Projects					
2. 18	Set up MAF farmer organizations promoting body	0.05	0.50		0.55
2. 19	Set up MAF farmer organizations regulatory body	0.05	0.50		0.55
2. 20	Create farmer organization promotion body at Province level	0.30	3.00		3.30
2. 21	Conduct mass awareness raising campaign on new legal framework for farmer organizations	0.05	0.50		0.55
2. 22	Prepare and disseminate Manual on Farmer organizations based on best practice cases	0.10	1.00		1.10
2. 23	Pilot farmer organizations promotion funds in 6 Provinces	0.20	2.00	4.00	6.20
2. 24	Develop implementation guidelines for Association and cooperative decree	0.02	0.20		0.22

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
2. 25	Upscale number of Coffee groups on Bolovens plateau	0.25	2.50	3.75	6.50
2. 26	Lao - Vietnamese, Lao - Chinese Cooperation Development Project	0.20	2.00		2.20
2. 27	Animal Disease Outbreak Control and Monitor in Border	0.10	1.00	2.00	3.10
2. 28	Medicine and Vaccine Production System Improvement Project	0.10	1.00	2.00	3.10
2. 29	Capacity building of veterinary service networking	0.10	1.00	2.00	3.10
2. 30	Support and Inspection of standard processing technique and feed formulation	0.10	1.00	2.00	3.10
2. 31	Community Fishery Management and Development in Small Water Reservoir	0.10	1.00		1.10
2. 32	Development of grazing lands, forage and processing Project	0.10	1.00	3.00	4.10
2. 33	Support and Promotion of livestock farms in suburban areas	0.10	1.00	3.00	4.10
2. 34	Dissemination of management techniques for pond fishery and wetlands	0.10	1.00		1.10
2. 35	Establishment of Livestock and fishery Information System	0.10	1.00	2.00	3.10
2. 36	Support of rice productivity improvement in 7 main flatlands and in 14 small flatlands	0.20	2.00	4.00	6.20
2. 37	Monitoring of Industrial plantations	0.05	0.50		0.55
2. 38	Monitoring of agricultural inputs factors (fertilizers, chemical products and crop seeds)	0.05	0.50		0.55
2. 39	Monitoring of Agricultural land use	0.05	0.50		0.55
2. 40	Monitoring of agribusiness units	0.05	0.50		0.55
2. 41	Monitoring of agricultural mechanization	0.05	0.50		0.55
2. 42	Monitoring of organic vegetable and rice production for commodity	0.10	1.00		1.10
2. 43	Development of standards and certification system for organic production, GAP	0.10	1.00	3.00	4.10
2. 44	Project of mushroom spore multiplication for commodity	0.05	0.50	2.00	2.55
2. 45	Surveying and listing of plant pests in target economic crops	0.10	0.50	0.50	1.10
2. 46	Promotion of sweet corn and groundnut production	0.10	0.50	2.00	2.60
2. 47	Development of postharvest technology and crop product processing	0.10	0.50	2.00	2.60
2. 48	Support of agro processing at Family scale level	0.30	3.00		3.30
2. 49	Promotion of Local rice varieties for commodity	0.10	0.50	2.00	2.60
2. 50	Agricultural promotion project of LEAP	1.70	7.00	10.00	18.70

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
2. 51	Commercial crop and fruit production	1.70	7.00	10.00	18.70
2. 52	Lao-Japanese Cooperation project of Rice multiplication (F2 and F3)	0.60	3.00	3.00	6.60
2. 53	Promotion of artificial insemination in cattle grazing	0.10	0.50	0.50	1.10
2. 54	Promotion of stallholder commercial fruit production	0.20	2.00	3.00	5.20
2. 55	Promotion of Leguminous production for commodity	0.20	2.00	3.00	5.20
2. 56	Supporting and development for animal husbandry and fisheries in 6 focal areas	0.20	2.00	3.00	5.20
2. 57	Promotion and Development of crop production in 6 focal areas	0.20	2.00	3.00	5.20
2. 58	Fruit tree and crop varieties commodity improvement project	0.20	2.00	3.00	5.20
2. 59	PPP project Creation and Multiplication of Lao Hybrid Maize	0.20		2.00	2.20
2. 60	PPP project multiplication of soybean	0.20		2.00	2.20
2. 61	PPP project swine-poultry varieties multiplication projects	0.20		2.00	2.20
2. 62	PPP project Cattle grazing development project for commodity	0.20		2.00	2.20
2. 63	PPP project on aquatic variety production and multiplication	0.20		2.00	2.20
2. 64	PPP project on Crop and fruit Multiplication	0.20		2.00	2.20
2. 65	PPP project on vegetable and industrial crops multiplication	0.20		2.00	2.20
2. 66	PPP project on Rice productivity improvement	0.20		2.00	2.20
2. 67	PPP project on cattle production in Northern region	0.20		2.00	2.20
2. 68	PPP project on commodity production in northern region	0.20		2.00	2.20
2. 69	PPP projects on Cattle production in Xiengkhouang and Bolovens plateau	0.20		2.00	2.20
2. 70	PPP projects on Production Techniques for contract farming	0.20		2.00	2.20

Annex 3: Scenario 1

Details of Program 3: Sustainable Production Patterns, Land Allocation and Rural Development

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		119.82	893.76	857.75	1,871.32
Program 3: Sustain. production patterns, land allocation, rural development		21.5	88.5	19.0	129.0
No.	Sub-Total in percent of TOTAL	18%	10%	2%	7%
	by Source of Finance in percent of TOTAL	17%	69%	15%	
	Key Measures				
3. 1	Promote conservation agriculture techniques, as developed by a number of International Organizations (e.g. FAO) and adapted to Lao conditions by NAFRI, agroforestry, and eco-agriculture technologies already proven effective in stabilizing shifting cultivation throughout the country.	0.20	2.00	3.00	5.20
3. 2	In cooperation with local authorities, participatory " Village Development Planning " will identify articulated needs of the rural population, thereby integrating rural men and women into a process of "grass roots democracy", aggregate the collected data in a "bottom-up" planning process on the <i>kumban</i> and district levels, and use the data to optimize the allocation of scarce investment resources (public and private) according to expressed real needs in rural development and for specific sector planning.	0.50	5.00		5.50
3. 3	Based on identified needs and market opportunities, MAF - in cooperation with local authorities and the private sector - will actively promote off-farm income and employment opportunities , especially in the more remote areas, including processing and trading of agricultural and forestry products, handicrafts, agro- and eco-tourism (home stays and cultural expose programs).	0.40	4.00	6.00	10.40
3. 4	To demonstrate the impacts of mitigation and adaptation measures to address climate change, work with the Food and Agricultural Organization of the United Nations (FAO) to conduct an Agricultural Census that will serve as a baseline against which progress can be measured	0.50	5.00		5.50

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
3. 5	To facilitate and accelerate implementation of climate change adaptation measures, NAFES will intensify promoting the concept of the “ Lao Extension Approach Plus ” (‘LEA+’).	0.50	5.00		5.50
	Measures related to Climate Change Adaptation or Biodiversity				
3. 6	Expand sub-basin land use planning program to include the principles of agro-ecosystem analysis linked to proposing climate change mitigation and adaptation measures that will contribute to stabilizing shifting cultivation and adoption of eco-agriculture by upland communities	0.50	5.00		5.50
3. 7	Facilitate and accelerate implementation of climate change adaptation measures, such as: climate smart land use planning , awareness programs on slash and burn land use change, remote sensing analysis for sustainable land management	1.50	15.00		16.50
3. 8	Promote the dissemination and use of biogas facilities to partly replace fire wood with intended positive impacts not only on the environment, but also on the living situation of rural women (link to Program 6).	0.20	2.00	10.00	12.20
3. 9	Mapping of flood-prone areas	0.07	0.65		0.72
3. 10	Survey ground water sources in drought-prone areas	0.20	2.00		2.20
3. 11	Land use planning in natural hazard-prone and affected areas	0.07	0.65		0.72
3. 12	Development of appropriate river bank erosion protection systems for agricultural land in flood-prone areas	0.22	2.20		2.42
3. 13	Public awareness campaigns on wildlife conservation and forest fire prevention	0.25	2.50		2.75
3. 14	Develop agro-forestry systems for watershed protection and erosion reduction in steep areas	0.16	1.60		1.76
3. 15	Nam Ha National Biodiversity Conservation Management Project	0.40	4.00		4.40
3. 16	Phou Hin Poun National Biodiversity Conservation Management Project	0.40	4.00		4.40
3. 17	Feasibility Study on Sepian National Biodiversity Conservation management	0.05	0.50		0.55
3. 18	Feasibility Study on Nam Ad National Biodiversity Conservation management	0.05	0.50		0.55
3. 19	Feasibility Study on Nam Ad National Biodiversity Conservation management	0.05	0.50		0.55
3. 20	Nam Pouy Biodiversity Conservation Management Project	0.40	4.00		4.40

Investment Measures		Investment Volume (in million USD) Source of Finance				
		PIP	ODA	FDI	TOTAL	
	Other specific Investments, Programs and Projects					
3.	21	Promotion of Alternative Agricultural Production to Slash and Burn Agriculture Project	0.20	2.00		2.20
3.	22	Lao - Viet Cooperation for Agricultural Land Classification Project	0.12	1.20		1.32
3.	23	Agricultural Land Classification Survey Project	0.50	5.00		5.50
3.	24	Project for Modernization to Reduce Input in Agro Eco-system	0.12	1.20		1.32
3.	25	Area-Based Rural Development Management Project	0.20	2.00		2.20
3.	26	Promotion of alternative production modes to replace rice shifting cultivation	0.20	2.00		2.20
3.	27	Promotion of conservation agriculture (SCV) for grazing lands in upland area	0.40	4.00		4.40
3.	28	Poverty reduction and Cattle grazing in rural areas	0.30	3.00		3.30
3.	29	Shifting Cultivation Stabilization and permanent occupation arrangement for villagers in 3 focused forestry areas	12.60	0.00		12.60
3.	30	Feasibility Study on Sekhaman catchment area in Sekong and Attapue provinces	0.05	0.50		0.55
3.	31	Feasibility Study on Nam Ou catchment area in Phonsaly, Oudomxay and Luangprabang provinces	0.05	0.50		0.55
3.	32	Feasibility Study on Bolovens Plateau catchment area in Saravan, Champasak, and Sekong provinces	0.05	0.50		0.55
3.	33	Feasibility Study on Gnum river catchment area	0.05	0.50		0.55

Annex 4: Scenario 1, Details of Program 4: Forestry Development

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		120.12	896.76	857.75	1,874.62
Program 4: Forestry Development		8.5	85.4	46.0	139.9
No.	Sub-Total	8.5	85.4	46.0	139.9
	Sub-Total in percent of TOTAL	7%	10%	5%	7%
	by Source of Finance in percent of TOTAL	6%	61%	33%	
	Key Measures				
4. 1	MAF will expand the use of agro-ecological system analysis for land management	0.30	3.00		3.30
4. 2	Set the policy framework for line agencies to facilitate and coordinate the creation of, and provide institutional strengthening for community forestry and for community-based producer and marketing organizations in rural areas, including the introduction of internationally recognized sustainability standards and certification (e.g. SFC) and the promotion of commercial tree planting by individuals, groups, organizations, and SME	0.30	3.00	4.50	7.80
4. 3	Secure legal recognition and ensure sustainable management of all state forest zones demarcated (all categories of forests) with the participation of local people	0.10	1.00	2.00	3.10
4. 4	In areas outside state forests, strongly promote domestication and sustainable management of NTFPs and tree planting for fuelwood and other benefits/services, and promote urban forestry	0.40	4.00	9.00	13.40
4. 5	Promote a balance between wood processing industries and annually approved wood harvest volumes; strongly promote domestic processing of wood, promote sustainable trade in wood products by certification (e.g. the requirements of “Chain of Custody”, CoC)	0.20	2.00	3.00	5.20
4. 6	Capacity building with government organizations and concerned parties for the implementation of the Forest Strategy 2020 (link to Programs 7 and 8)	0.20	2.00	3.00	5.20
4. 7	Develop supportive regulations, implementation guidelines and institutional framework to support integrated village development within which village level land use planning, agriculture development and community forestry are important integral parts.	0.30	3.00		3.30
	Measures related to Climate Change Adaptation or Biodiversity				

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
4. 8	Mobilize new climate-related finance mechanisms ; implement pilot and “Readiness Programs” on Reduced Emissions from Deforestation and Degradation (REDD plus), including the development of a REDD + strategy, the organizational setup and institutional framework for REDD+ (including the development of a national carbon registry , financial arrangements, benefit sharing and distribution systems, and the MRV system), pilot and upscale “ Eco-systems Restoration Licenses ”, develop regulatory framework for trade in CO₂ reduction certificates (private sector), pilot and upscale trade in CO ₂ reduction certificates and derivatives to global financial markets ; network internationally in accordance with the principles of international conventions on forests, biodiversity and climate change (UNFCCC, UNFF, CCD, CBD)	0.50	5.00	24.5	30.00
4. 9	More effective control and corrective action to prevent the further deterioration of forest resources in terms of quantity and quality and for protection of forest cover, accompanied by public awareness campaigns on the important role of forest in climate change mitigation; establish a comprehensive biodiversity assessment and launch a conservation program for protected areas and National Biodiversity Conservation Areas (NBCA)	0.50	5.00		5.50
4. 10	Pilot and support by specific investment measures different models of sustainable community-based forest management , collaborative or co-management arrangements for protected areas and NBCA , thereby contributing to the conservation of forest ecosystems and biodiversity.	0.40	4.00		4.40
4. 11	Develop and enforce appropriate laws, regulations and implementation guidelines related to sustainable forest management and strict regulatory measures in terms of climate change	0.20	2.00		2.20
4. 12	Region-specific Mirco Projects on Biodiversity and preservation forests management	1.00	10.00		11.00
	Other specific Investments, Programs and Projects				
4. 13	Promotion of smallholder forest plantations	0.40	4.00		4.40

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
4. 14	Surveying and Allocation of District agricultural and forestry land (link to Program 3)	0.55	5.50		6.05
4. 15	Monitoring and Evaluation of Agricultural and Forestry land use and resource management	0.30	3.00		3.30
4. 16	Production forests and reforestation management	0.40	4.00		4.40
4. 17	NTFP Restoration land management	0.40	4.00		4.40
4. 18	Forest and Forestry resource restoration for economic goals and environmental conservation	0.40	4.00		4.40
4. 19	Survey and development of forest areas suitable for tree seed production, to be carried out by provincial Forestry Research Centres in Vientiane, Borikhamxay and Savannakhet Provinces	0.10	1.00		1.10
4. 20	Promote and establish tree nurseries to provide saplings to areas at high risk from flooding or drought	0.07	0.70		0.77
4. 21	Set up and further strengthen technical capacity of forest fire management teams at provincial, district and village levels	0.30	3.00		3.30
4. 22	Public awareness campaigns to disseminate information on forest and wildlife regulations and laws to strengthen the implementation of these regulations	0.22	2.20		2.42
4. 23	Development of small water reservoirs in upland areas for wildlife / aquatic animals and plants during the dry season	0.38	3.80		4.18
4. 24	Public awareness campaigns on pest and disease outbreaks in wildlife cause by natural disasters, and associated preventive measures	0.17	1.70		1.87
4. 25	Extension campaign on integrated forest plantation management for crop pest and disease control	0.07	0.70		0.77
4. 26	Construction of bush fire barriers / forest fire protection buffer zones in forest conservation areas	0.38	3.80		4.18

Annex 5: Scenario 1, Details of Program 5: Irrigated Agriculture

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		120.12	896.76	857.75	1,874.62
Program 5: Irrigated Agriculture Sub-Total		23.3	215.7	451.0	689.9
No.	Sub-Total in percent of TOTAL	19%	24%	53%	37%
	by Source of Finance in percent of TOTAL	3%	31%	65%	
Key Measures					
5. 1	Conducive Market Environment for Irrigated Agriculture: re-modelling public management, strengthening the capacity of public agencies, legal regulatory framework for the promotion of agriculture value chains, strengthening the capacity of production groups, agriculture cooperatives and associations; and producers associations, developing model for contract farming and other type of market structures, credit facilities for SMEs and private entrepreneurs, agribusiness associations in modernizing agro-industry and agri-business, transport, logistic and trade	1.00	10.00	15.00	26.00
5. 2	Irrigated Agriculture Technology Application: models for strengthening irrigated agriculture technical services, focus on indentified regional clusters	1.00	10.00	15.00	26.00
5. 3	Irrigation Management Service and Investment: re-modelling the organization, institutions of the Department of Irrigation and related agencies, M&E, information data base, feasibility studies, survey and design of integrated agriculture programs, strengthening local authorities (provinces and districts) to prepare, monitor and evaluate, co-management concepts, enhancing the capacity of WUOs, including the institutionalization of WUA	0.40	4.00		4.40
5. 4	Vientiane Plain Integrated Irrigated Agriculture Project	1.70	17.00	100.00	118.70
5. 5	Central Plains Integrated Irrigated Agriculture Project	1.70	17.00	100.00	118.70
5. 6	Southern Plains Integrated Irrigated Agriculture Project	2.30	23.00	150.00	175.30
5. 7	Northern Plains Integrated Irrigated Agriculture Project	1.70	17.00	50.00	68.70
5. 8	Flood and Drought Prevention: drought and flood protection facilities, expanding reservoir systems, flood prevention and drainage systems	1.00	10.00		11.00

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
5. 9	Region-specific programs of decentralized small-scale reservoirs and ponds on household and community levels for various purposes, including irrigated crop cultivation, fish cultivation, drought mitigation and flood protection, household food security in general (link to Program 1)	1.00	10.00	15.00	26.00
5. 10	Pressurized Irrigation Technology Development Pilot Project	0.56	5.60	4.00	10.16
5. 11	Pilot program on the introduction of technology to produce electric power from the water flowing in irrigation canals	0.60	6.00	4.00	10.60
5. 12	Animal Raising and Irrigated Pasture Development Pilot Project	0.70	7.00	4.00	11.70
5. 13	Human Resource Development and Vocational and Technical Education: assessing skill and knowledge requirement, capacity of existing training and education institutions, development of competency standards for irrigated agriculture work force, new curriculum, course plan, teaching aids, rehabilitation of school facilities, training materials and equipment, teacher training (links to Programs 7 and 8)	0.40	4.00	6.00	10.40
	Measures related to Climate Change Adaptation or Biodiversity				
5. 14	Irrigated Agriculture Development for Social and Environmental Purposes: community managed irrigation in the uplands, livelihood development and income generation in the uplands, improving and expanding reservoir systems, ; monitoring instruments will include Strategic Environmental Assessments (SEA) and „ Climate Proofing for Development “ (link to Programs 1 and3)	1.50	15.00		16.50
5. 15	Climate proofing of irrigation systems for large scale commercial production	0.10	1.00	10.00	11.10
5. 16	Introduction of measures specifically targeted on climate change adaptation, such as weather based farming models for communities	0.30	3.00		3.30
5. 17	Build and improve flood protection barriers to protect existing irrigation systems	0.20	2.00		2.20
5. 18	TA Adapting Irrigated Agriculture to Changing Climate Condition	0.40	4.00		4.40
	Other specific Investments, Programs and Projects				
5. 19	Lao - ADB Cooperation for Irrigation Development Project	1.20	7.81		9.02

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
5. 20	Lao - WB Cooperation for Irrigation Project	1.20	7.81		9.02
5. 21	Lao - JICA Cooperation for Irrigation Development Project	1.20	7.81		9.02
5. 22	Lao - Indian Cooperation for Feasibility Study of Six Projects	0.10	1.00		1.10
5. 23	Lao-Kuwait Cooperation for Feasibility Study of Nabong-Khoksa Irrigation Project	0.05	0.50		0.55
5. 24	Lao - Chinese Cooperation for Irrigation Project	1.20	7.81		9.02
5. 25	Lao-Austria Cooperation for Establishing Spray Irrigation Farm Model	0.10	1.00		1.10
5. 26	Monitoring and evaluation of priority irrigation construction and maintenance project	0.06	0.60		0.66
5. 27	TA Strengthening the Capacity of DoI and Irrigation Services	0.12	1.20		1.32
5. 28	TA Irrigated Agriculture M&E and Information System Development	0.04	0.40		0.44
5. 29	TA Strengthening the capacity of ISDC	0.04	0.40		0.44
5. 30	TA Assessment and Development of Irrigated Agriculture Legal framework	0.04	0.40		0.44
5. 31	TA Development of Irrigation Public Service Law	0.04	0.40		0.44
5. 32	TA Developing Irrigation Co-Management Services	0.08	0.80		0.88
5. 33	TA Developing IMT and Strengthening WUAs	0.08	0.80		0.88
5. 34	TA Irrigated Agriculture Value Chain Development	0.08	0.80		0.88
5. 35	TA Irrigated Agriculture Technical Service Centers Development	0.12	1.20		1.32
5. 36	TA for Producers' Association and Cooperatives Development	0.12	1.20		1.32
5. 37	PPP: Rice-Crop Intensification and Diversification Pilot Project	0.10	1.00	4.00	5.10
5. 38	PPP: Rice Seed Multiplication and Certification Pilot Project	0.10	1.00	4.00	5.10
5. 39	Irrigated Agric. For Livelihood Development in Northern Provinces	1.20	12.00		13.20
5. 40	Irrigated Agric. For Livelihood Development in Central Provinces	0.70	7.00		7.70
5. 41	Irrigated Agric. For Livelihood Development in Southern Provinces	0.70	7.00		7.70
5. 42	TA Planning Flood and Drought Protection Facilities	0.10	1.00		1.10
5. 43	TA Curriculum Development of Tha Ngone Irrigation College	0.08	0.80		0.88
5. 44	TA Curriculum Development of Agriculture and Forestry Colleges	0.08	0.80		0.88
5. 45	Development of Tha Ngone Irrigation College facilities	0.15	1.50		1.65

Annex 6: Scenario 1, Details of Program 6: Other Agriculture and Forestry Infrastructure

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		120.12	896.76	857.75	1,874.62
Program 6: Other agriculture and forestry Infrastructure Sub-Total		25.8	159.5	56.0	241.3
No.	Sub-Total in percent of TOTAL	21%	18%	7%	13%
	by Source of Finance in percent of TOTAL	11%	66%	23%	
Key Measures Agriculture Infrastructure					
6. 1	Facilitate mechanization (procurement, management, and maintenance of small-scale farm equipment)	0.20	2.00	12.00	14.20
6. 2	Facilitate post-harvest handling (investments to support community-based post-harvest handling of crops)	0.10	1.00	10.00	11.10
6. 3	Rural market access roads in focal areas (farmer organizations to identify road access, marketing, and market information needs)	3.60	36.00		39.60
6. 4	Market infrastructure (formulate and promote fiscal and non-fiscal policy measures to create clusters of GAP crop production)	0.20	2.00		2.20
6. 5	Information and communications technology to support marketing (set up and operate market price information system)	0.10	1.00	4.00	5.10
6. 6	Technical service center improvement project (all districts)	2.00	22.00		24.00
6. 7	Database establishment for monitoring large scale concessions and PPP	0.20	2.00		2.20
Key Measures Forestry Infrastructure					
6. 8	Improvement projects of Agricultural and Forestry schools and training centers (link to Program 8)	3.60	36.00		39.60
6. 9	Demarcation of protected areas (program of demarcating protected areas for improved community based forest and watershed protection)	0.60	6.00		6.60
6. 10	Tree seedling nurseries for reforestation (fiscal incentives, reforestation fee from logs and NTFP used 100% for tree nurseries)	10.00	0.00	20.00	30.00

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
6. 11	Community based forest and watershed protection (support accelerated natural rehabilitation of protected areas, watersheds, and production forests, to ensure long-term sustainability of the forestry sub-sector)	0.60	6.00		6.60
	Measures related to Climate Change Adaptation or Biodiversity				
6. 12	Rehabilitate infrastructure and utilities damaged by floods in agricultural areas	0.55	5.50		6.05
6. 13	Climate resilient infrastructure (electricity, water supply)	0.70	7.00		7.70
6. 14	Community-based watershed programs	0.20	2.00		2.20
	Other specific Investments, Programs and Projects				
6. 15	Agriculture and Forestry Information Production and Dissemination Project	0.20	2.00		2.20
6. 16	Information Service and Management Project	0.10	1.00		1.10
6. 17	Agriculture and Forestry Information Database Management Project	0.20	2.00		2.20
6. 18	Agriculture and Forestry Sector Investment Management Project	0.10	1.00		1.10
6. 19	Agriculture and Forestry Sector Cooperation Management Project	0.10	1.00		1.10
6. 20	National Budget Planning and Sectoral Planning Implementation Linkage Project	0.10	1.00		1.10
6. 21	National Agriculture and Forestry Monitoring and Evaluation Project	0.10	1.00		1.10
6. 22	Infrastructure and techniques improvement of animal slaughterhouses	0.10	1.00	10.00	11.10
6. 23	Sanitation inspection of meat, animal and fish products	0.20	2.00		2.20
6. 24	Improvement of crop sanitation system (SPS) in entire country	0.60	6.00		6.60
6. 25	Improvement of certification system for crop sanitation in entire country	0.30	3.00		3.30
6. 26	Supervision project of plant pests damage	0.20	2.00		2.20
6. 27	Establishment and Improvement of plant protection networks in entire country	0.10	1.00		1.10
6. 28	Improvement of Agricultural and Forestry Information Technology	0.10	1.00		1.10
6. 29	Improvement project for Animal Sanitation (SPS) and Animal Diseases Laboratory	0.60	6.00		6.60

Annex 7: Scenario 1, Details of Program 7: Agriculture and Forestry Research and Extension

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		120.12	896.76	857.75	1,874.62
Program 7: Agriculture and Forestry Research and Capacity Building Sub-Total		4.9	41.1	24.5	70.5
No.	Sub-Total in percent of TOTAL	4%	5%	3%	4%
	by Source of Finance in percent of TOTAL	7%	58%	35%	
	Key Measures				
7. 1	Restructure agriculture and forestry research and extension functions to ensure that the results of “ Applied Research for Development ” are directly translated into the widespread dissemination of needs-based, gender-specific and area-specific as well as market-oriented extension packages	0.10	1.00		1.10
7. 2	Create new units at NAFRI and NAFES providing them the flexibility to work with agro-enterprises and investors and to promote and strengthen farmer organizations	0.10	1.00	1.00	2.10
7. 3	Strengthen research related to irrigated agricultural production and agricultural diversification, including mixed farming, agroforestry (including agro-silvo-pastoral), and blending indigenous knowledge with modern agricultural techniques	0.05	0.50		0.55
7. 4	Based upon research results, upgrade local breeds of livestock through crossbreeding with improved and heat resistant breeds; and address disease prevention through formulation and dissemination of improved nutrition practices and strengthening the vaccine network	0.50	5.00	7.50	13.00
7. 5	PPP: Investments and knowledge transfer in irrigated agriculture will be focused on mobilizing partnerships between several key stakeholders in the rural sector, namely between government and business; business and producers.	0.40	4.00	6.00	10.40
7. 6	Cooperation with Research Institutes and Science & Technology Centers in other countries of the region and world-wide to make valuable research results available for further practical adaption to Lao conditions. These will include gender knowledge networking and research exchanges	0.10	1.00		1.10

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
7. 7	Cooperation with private sector for “embedded agricultural extension services” (e.g. supplier of agricultural inputs to provide training on how to safely and economically use agro-chemicals)	0.10	1.00	10.0	11.10
	Measures related to Climate Change Adaptation or Biodiversity				
7. 8	Agriculture research and extension organizations will require significant upgrading to develop the capacity to implement integrated watershed management (IWM) that are linked to climate change mitigation and adaptation measures.	0.50	5.00		5.50
7. 9	Research programs on policy implications of indigenous and gender knowledge and climate change adaptation , and on local/regional downscaling of climate change impacts on the agriculture sector	0.20	2.00		2.20
7. 10	NAFRI will undertake climate-related research , in particular tests and trials for the local and regional-specific adaptation of seed varieties that are resilient to climate change for rice and commercial food and agricultural commodities, as well as on crop yield forecasting	0.50	5.00		5.50
7. 11	NAFES will launch a climate change awareness program through the agricultural extension services.	0.20	2.00		2.20
7. 12	Promotion of secondary professions in order to improve the livelihoods of farmers affected by natural disasters induced by climate change	0.04	0.40		0.44
7. 13	Improvement and development of crop varieties and animal species that are better adapted to natural hazard-prone areas	0.03	0.30		0.33
7. 14	Training of farmers on the processing and storage of human and animal food staff	0.05	0.50		0.55
7. 15	Capacity development of staff in organic fertilizer research	0.01	0.10		0.11
7. 16	Research and selection of seeds of plant species suitable for flood and drought-prone areas	0.05	0.50		0.55
					0.00
	Other specific Investments, Programs and Projects				
7. 17	Strengthen research work on farmer organizations	0.01	0.10		0.11
7. 18	Lao - Viet Cooperation for Information Network and Database Technology Improvement Project	0.12	1.20		1.32
7. 19	Drainage and Irrigation Development Research Project	0.12	1.20		1.32
7. 20	Lao - Swedish Cooperation for Upland Agriculture and Forestry Research Project	1.20	4.05		5.25

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
7. 21	Agricultural Policy and Regulation Research Project	0.01	0.10		0.11
7. 22	Upland Agriculture and Forestry Research Project	0.01	0.10		0.11
7. 23	F1 Potato Multiplication Project	0.05	0.50		0.55
7. 24	Coffee Quality Improvement Research Project	0.05	0.50		0.55
7. 25	Post-Harvest Technology Research Project	0.05	0.50		0.55
7. 26	Beneficial Insects for Vegetable and Fruit Tree Survey Project	0.01	0.10		0.11
7. 27	Pure Seed and F1 Multiplication and Research Project	0.01	0.10		0.11
7. 28	F2 Rice Seed Multiplication Project	0.01	0.10		0.11
7. 29	Establishment and Improvement of Aquatic Varieties Research Institution Project	0.01	0.10		0.11
7. 30	Aquatic Varieties Quality (foreign fish varieties) Improvement Project	0.01	0.10		0.11
7. 31	Fruit Tree and Vegetables Variety Experiment Project	0.01	0.10		0.11
7. 32	Agro-ecological Technique Expansion Project	0.10	1.00		1.10
7. 33	Rice Varieties Adoption Research Project in the Northern Region	0.01	0.10		0.11
7. 34	Research on Standard Animal Husbandry Techniques Project	0.01	0.10		0.11
7. 35	Development of Fish and Aquatic production techniques	0.01	0.10		0.11
7. 36	Productivity Improvement of animal and fish varieties	0.01	0.10		0.11
7. 37	Research and Multiplication of Micro-organism in plant protection	0.01	0.10		0.11
7. 38	Development of herbal pesticide in plant protection	0.05	0.50		0.55
7. 39	Research on organic crop production for commodity	0.05	0.50		0.55
7. 40	Research on Damaging insects of forest and forestry resource	0.01	0.10		0.11
7. 41	Upgrading rice productivity research project	0.01	0.10		0.11
7. 42	Cassava varieties research project	0.02	0.20		0.22

Annex 8: Scenario 1, Details of Program 8: Human Resource Development

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
Total of all 8 Programs		120.27	898.26	857.75	1,876.27
Program 8: Human Resource Development		3.2	31.8	0.00	35.0
Sub-Total		3.2	31.8	0.00	35.0
Sub-Total in percent of TOTAL		3%	4%	0%	2%
by Source of Finance in percent of TOTAL		9%	91%	0%	
Key Measures					
8. 1	Cooperate with other sectors to build capacity including the Ministry of Education, National University of Lao PDR (NUOL), and other institutes as well as with selected international NGOs and foreign technical assistance agencies	0.10	1.00		1.10
8. 2	Upgrading of MAF personnel in the following areas: pre- and post-harvest handling, food safety, SPS, science-based production, GAP, technical and other non-tariff barriers to trade, and value chain analysis	0.20	2.00		2.20
8. 3	Reform and modernization of MAF procedures to facilitate internal execution of the WTO SPS Agreement, application of international SPS standards, and implementation of SPS measures	0.05	0.50		0.55
8. 4	General HRD targets: 40 PhD, 50 masters, and 70 bachelor degrees; Training and development for technical officials in provinces: 5 PhD in each province, 10 masters, 40 bachelor degrees, 35 higher diplomas, and 5 diplomas; Training and development for technical officials in districts: 6 masters, 15 bachelor degrees, 40 higher diplomas, 60 diplomas, and 40 certificate level; Technical staff at village level: 1 technical staff per 30 families; and, according to the mandate given to MAF and development trends in the agriculture and forestry sector, MAF will require about 12,857 officials, or a 24 percent increase from 2010	1.00	10.00		11.00
8. 5	Introduce for all staff of MAF a job-performance assessment and monitoring system (management by personal targets), based on clear job descriptions and tied to a performance-based incentives scheme and a strictly performance-based job promotion scheme .	0.50	5.00		5.50
8. 6	Introduce for all departments of MAF, a leadership system of "Management by annual targets" , accompanied by a strict monitoring of annual targets and reporting to higher levels.	0.10	1.00		1.10

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
8. 7	Nominate for each of the 8 programs of the Master Plan a Lead Agency (department within MAF), formulate for each of the programs annually verifiable indicators on outputs and impacts, and submit to the Minister annual Monitoring and Evaluation Reports on the achievements of the Agricultural Master Plan.	0.10	1.00		1.10
8. 8	Institutional capacity of MAF will be strengthened with a Gender Management Information System and an organizational mechanism to inform annual planning processes. Gender-disaggregated statistical data and qualitative indicators will be collected to reflect the actual trends and results and be utilized for monitoring and evaluation purposes	0.10	1.00		1.10
8. 9	For each target set by MAF on staffing, leadership and training, the participation of women will be favourably considered and whenever necessary incentives will be designed; i.e. in conjunction with other educational institutions (e.g. MoE) to improve enrolment and retention rates of female candidates in the agricultural, forestry and veterinary subjects	0.05	0.50		0.55
	Measures related to Climate Change Adaptation or Biodiversity				
8. 8	Institutionalize in curricula on all levels of the agricultural education system training modules on climate change adaptation (CCA) , in particular higher education curricula on agriculture	0.04	0.40		0.44
8. 9	Promotion of technical capacities of local agricultural officers in natural hazard-prone areas	0.02	0.20		0.22
8. 10	Capacity development of staff in organic fertilizer research	0.01	0.10		0.11
	Other specific Investments, Programs and Projects				
8. 11	Train Farmer Organization Subject Matter Specialist in at least 10 provinces	0.10	1.00		1.10
8. 12	MAF staff conduct PhD on farmer organizations theme	0.05	0.50		0.55
8. 13	Establish partnership with training centres in Thailand and Vietnam on farmer organization topic. Send PAFO/DAFOs staff on training courses	0.02	0.20		0.22
8. 14	National Producer Group Promotion Project	0.20	2.00		2.20
8. 15	Irrigation Law Development Project	0.01	0.10		0.11
8. 16	Agro-ecology Training Project	0.10	1.00		1.10

Investment Measures		Investment Volume (in million USD) Source of Finance			
		PIP	ODA	FDI	TOTAL
8. 17	Capacity building of Animal Diseases Laboratory in Central and Provincial levels	0.10	1.00		1.10
8. 18	Capacity building in implementing the treaty of crop and animal sanitation (SPS)	0.01	0.10		0.11
8. 19	Capacity building of specialized production techniques	0.10	1.00		1.10
8. 20	Capacity building of training skills (TOT)	0.05	0.50		0.55
8. 21	Capacity building for value added agricultural processing	0.05	0.50		0.55
8. 22	Capacity building for official staffs in 6 focal areas	0.12	1.20		1.32

