V. INDUSTRIAL DEVELOPMENT PLAN

CHAPTER V

INDUSTRIAL DEVELOPMENT PLAN

V-1 BACKGROUND

V-1.1 Lao Industry: An Overview

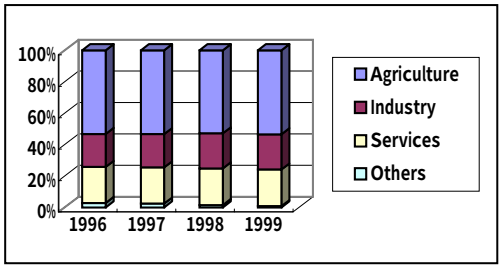
The industry sector accounted for 22.5 % of GDP in 1999 while the agriculture and the services sectors shared 53.4 % and 23.4 % respectively. The industry grew at the annual rate of 8.4 % from 1996 to 1999. The contribution of industry to the Lao economy, however, appears to be relatively modest.

Table VI-1 GDP by Industrial Origin

(Billion Kip, at 1999 constant price)

	1996	1997	1998	1999
Agriculture	4,645	4,969	5,122	5,542
Industry	1,833	1,981	2,163	2,333
Services	1,996	2,146	2,265	2,422
Others	245	219	141	75
Total	8,719	9,315	9,691	10,372

Source:SPC



The number of private enterprises registered at the Ministry of Industry and Handicraft amounted to 16,514 in 1998 with 71,000 employees and manufacturing output of 388 billion Kip. Among those enterprises, 99 were large-scale with more than 100 workers, 462 were middle-scale with 99~10 workers and the rest were small-scale with less than 10 workers.

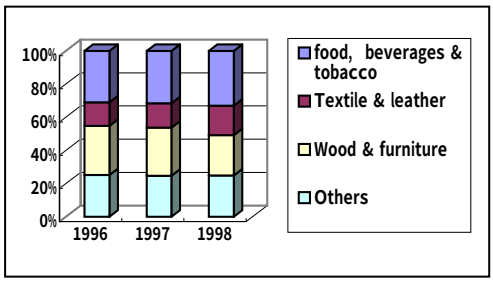
The major products of Lao industries are food, beverages and tobacco (33 % in 1998), wood and furniture (24 %), and textile and leather (18 %). Nearly 75 % of industrial output was generated by light industries. This indicates that Lao industry is in its infancy, and is waiting to mature. However, it is noteworthy that some assembly industries including motorcycle have been gradually increasing since 1996. It might be an ignition of industrialization.

Table V1-2 Manufacturing Output in Lao PDR

(Million Kip at 1990 price)

	1996	1997	1998
Food, beverages & tobacco	28,994	31,145	34,402
Textile & leather	13,260	14,404	18,521
Wood & furniture	27,712	28,639	25,398
Others	23,568	24,430	26,000
Total	93,534	98,618	104,321

Source: Lao authority



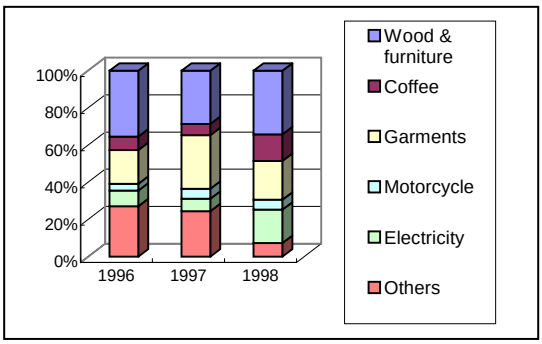
The top five foreign currency earners are wood and furniture (34.3 % in 1998), garments (20.8 %), electricity (18.0 %), coffee (14.3 %) and motorcycles (5.3 %). Lao exports still depend heavily upon either primary or less value-added products. Eventually, the balance of payment has experienced high volatility. Obviously, the exports have been intensely affected by the Asian economic crisis.

Table V1-3 Exports of Lao PDR

(Millions of US $)

	1996	1997	1998
Wood & furniture	124.6	89.7	115.4
Coffee	25	19.2	48
Garments	64.1	90.5	70.2
Motorcycle	12.5	17.1	17.8
Electricity	29.7	20.8	60.7
Others	95.2	76.9	24.6
Total	321.4	316.9	336.7

Source: Lao authority and IMF estimates



Imports are characterized by the fact that the share of investment goods (41 %) and consumer goods (42.3 %) is almost the same. The majority of materials for garment manufacturing and motorcycle assembly are imported. This has resulted in a high import of consumer goods. Obviously, not only potential export-oriented industry, but also import-substitution industry have not been well developed in Lao PDR.

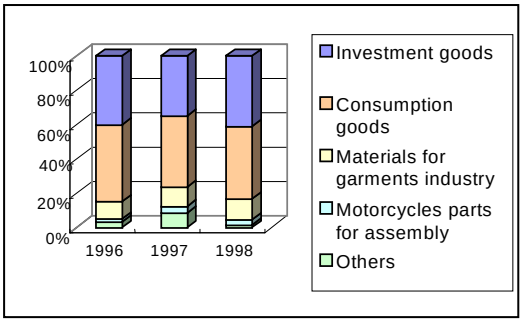
Regarding the direction of international trade, US$ 135.2 million (or 42.7 %) were exported to Vietnam, followed by US$ 70.1 million (22.1 %) to Thailand. The export to Japan was US$ 6.7 million (2.1 %). Lao PDR imported US$ 336.6 million (51.9 %) from Thailand, followed by US$ 25.1 million (3.9 %) from Vietnam. Lao PDR imported US$ 10.4 million from Japan. The trade imbalance against Thailand is approximately 1:5.

Table V1-4 Imports of Lao PDR

(Million US$)

	1996	1997	1998
Investment goods	277	226.8	226.7
Consumption goods	308	267.7	234.1
Materials for garments industry	70	73.7	66.8
Motorcycles parts for assembly	12	24.9	17
Others	22.6	54.8	8.2
Total	689.6	647.9	552.8

Source: Lao authority and IMF



Foreign investment approvals in terms of the number and the amount drastically declined after 1997. The investment, which amounted to US$ 1,292.6 million in 1996, declined to US$ 122.5 million in 1998. The major reason is attributed to a sharp decline in large-scale investments other than industry such as tourism and trade sectors. It is noted that there was an approval for a petro-chemical project worth US$ 300 million in 1996.

Table V1-5 Approved Foreign Investment in Lao PDR

(Million US$)

	1996	1997	1998
Industry Number			
Number of projects	20	19	18
Value	334.8	18.1	15.8
Total Investment			
Number of projects	63	66	68
Value	1,292.60	142.4	122.5

Source: Lao authority

Looking at the approved foreign investment by country, Thailand is the largest investor with 33 % in terms of the total number of approved projects (764), and 47 % of the investment value (US$ 5.6 billion). It is followed by USA (5.4 % and 26 %), Korea (3.3 % and 8 %), France (11 % and 5.6 %) Malaysia, and Australia. Investment by Japan stands at 3.1 % in terms of the number of approved projects and 0.3 % of approved investment value.

V-1.2 Regional Industry

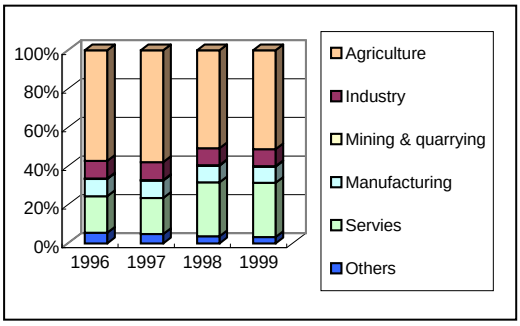
The share of the industry sector in GPP Savannakhet was 9.6 % in 1999 while the agriculture sector accounted for 56 % and the services sector accounted for 30.8 %. The contribution of Savannakhet industry toward the Lao industry was 7.8 %. The share of industry declined from 10.1 % in 1996 affected by the creeping increase in the services sector.

Table V1-6 GPP in Savannakhet

(Billion Kip at 1999 price)

	1996	1997	1998	1999
Agriculture	679	791	832	916
Industry	109	127	145	156
Mining & quarrying	3	4	4	6
Manufacturing	106	123	141	150
Services	224	254	460	502
Others	66	67	60	58
Total	1,078	1,239	1,497	1,632

Source: Data provided provincial authority



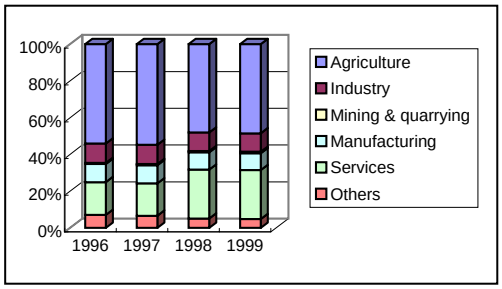
The share of the industry sector in Khammouan accounted for 11.2 % in 1999, while the agriculture sector shared 53.9 % and services sector shared 29.7 %. The contribution of Khammouan industry to Lao industry was 4.2 %. The share of industry slightly declined from 11.7 % in 1996.

Table V1-7 GPP in Khammouan

(Billion Kip at 1999 price)

	1996	1997	1998	1999
Agriculture	299	348	366	401
Industry	58	67	77	83
Mining & quarrying	4	4	5	7
Manufacturing	54	63	72	76
Services	99	112	203	221
Others	39	42	39	39
Total	495	569	685	744

Source: Data provided by Lao authority and and JICA calculation



The reason for a higher share of the services sector in Savannakhet can be attributed to the effect of East-West international trade through Route 9. It is endorsed by the fact that the revenue from customs accounted for 25.7 % of the total provincial revenue in 1998/99. On the other hand, a higher industry share in Khammouan can be explained by the sizable operation of foodstuffs, sawmills and furniture sub-sectors.

In Savannakhet, some 1,800 enterprises were registered at the Ministry of Industry and Handicraft (MOIH) in1998, out of which 10 were large-scale firms with more than 100 workers, 41 were medium-scale firms with 99~10 workers and the rest was small-scale firms with less than 10 workers. These enterprises employed approximately 6,100 workers in total. Major industries in Savannakhet

are garments and food processing. Five out of 10 large-scale enterprises are engaged in garment production.

In Khammouan, 1,735 enterprises were registered at MOIH in 1999, of which 11 were large-scale, 16 were medium and the rest were small-scale firms. The number of workers employed by those firms was 6,904. The major industries in Khammouan are foodstuffs, wood processing and furniture.

Table V1-8 Profiles of Industry in Savannakhet and Khammouan

(Million Kip 1998 price)

	Lao PDR	Savannakhet	Khammouan
No. of Firms	16,514	1,811	1,735
No. of Employees	71,002	6,108	6,904
size>100	99	10	11
99>Size>10	462	41	16
10>Size	15,953	1,760	1,735
Output	387,968	35,107	N.A.

Source: MOIH (1999)-UNIDO calculation

Note: Figures of Lao PDR and Savanakhet represent 1998 and those of Khammouan represent 1999.

The manufacturing output in Savannakhet and Khammouan is shown in the next table. The manufacturing output in the two provinces is limited to such sub-sectors as food processing, wood and furniture, and garments.

Table V1-9 Manufacturing Output in SKR

(Million Kip at 1999 price)

	Savannakhet	Khammouan
Food,beverages,tobacco	114,641	312,905
Textile & leather	151,412	47
Wood & furniture		24,194
Chemicals	29,995	
Non-metallic minerals	77,756	837
Machinery	45,013	342
Total	521,483	370,389

Source: Lao authority - JICA estimates.

The export items in Savannakhet are limited to garments and lumber with the implication that development of export-oriented industries has been marginal.

It is noted, however, that the export of garments has consistently increased since 1996.

Table V1-10 Export in Savannakhet

(Billion Kip)

	1996	1997	1998
Lumber	2.8	3.9	2.9
Gypsum	1.2	1.2	1.2
Garments	5.5	6.5	7.9

Source: Basic Statistics of Savannakhet.

The export statistics in Khammouan refer only to the quantity of export. The major export items are logs and timber, and furniture. Development of the export-oriented industries has been limited in Khammouan.

Table V1-11 Export in Khammouan

(in quantity)

		1996	1997	1998
Lumber	n	80,000	36,290	25,854
Logs	m	97,396	4,263	37,156
Furniture	Sets	N.A.	N.A.	104,416

Source: Basic Statistics of Khammouan

The export of logs and lumber has been volatile from one year to another reflecting the restriction imposed on logging.

Savannakhet received 22 foreign investments during 1990~1999, of which 15 were in the manufacturing sector, and 7 were in the tourism sector. Included in the manufacturing sector were one gold mining, one edible oil, one tobacco, four garments, two chopstick, one nail, one white goods including fans, and one motorcycle assembly project. Cumulative investments in those manufacturing projects amounted to US$ 22 million at the end of 1999. Thailand invested in four projects (one edible oil, two garments, and one white goods), China invested in two projects (one tobacco, and one nail), and one project was invested each by Australia (gold mining), France (garment), Hong Kong (garment) and Japan (garment).

Khammouan received 11 foreign investments during 1990~1999, of which 9 were in the manufacturing sector, inter-alia, three mining (one tin, two quarryings), three sawmills, two furniture components, and one pharmaceutical project. Cumulative investments in the manufacturing projects amounted to US$ 30 million. Thailand invested in three projects (one sawmill, and two quarrying), Japan invested in two projects (two sawmills), and one project was invested each by Denmark (furniture component), France (pharmaceutical), Hong Kong (furniture component), Korea and Russia (tin mining).

V-1.3 Prospects and Constraints in Industry Sector

1) Prospects

Affluent Natural Resources

The potential agricultural resources in Savannakhet leading to agro-industrial development are **rice and tobacco**. Savannakhet is one of the major rice producers in Lao PDR, accounting for approximately 20 % of total rice production in 1999. Production of tobacco represents 13 % of the national total. Tobacco has been exported to Asian markets through a joint-venture with China. Besides, there are a variety of cash crops in Savannakhet such as **nuts**, **beans, sesame, coffee, watermelon, corn, cabbage, Chinese cabbage, bracken (warabi), bamboo shoot, mint and beef stake plant (shiso)**. Among those cash crops, currently, **nuts, beans, coffee, watermelon, corn, cabbage, Chinese cabbage, bamboo shoot and bracken** will have commercial potential. In fact, 57,000 tons of coffee were exported in 1998, and the possibility of processing pickles for Japanese market is being discussed by a Japanese investor.

Wood is an outstanding revenue generator in Khammouan. Cypress (hinoki), pine, Chinese quince (karin) and rose wood are being exported to the world markets.

Savannakhet is endowed with a variety of metallic and non-metallic minerals such as **gold, copper, gypsum, granite and salt**. In Sepon district, an Australian investor has been extensively exploring gold associated copper deposit. Recently, the estimated reserve of one million tons of copper and 3.5 million ounce of gold has been identified. The proven reserve of gypsum, locating 60 km east of Savannakhet, is estimated to be 18 million tons. Currently Dong Heng Mine is producing annually some 140,000 tons of gypsum and exporting it to Vietnam. According to the Vietnamese exploration, the estimated reserve of 100 million tons has been identified. Other potential and popular minerals are granite and salt which are widely available, although the reserves have not been systematically explored.

Potential minerals in Khammouan are tin and non-metallic minerals including limestone and granite. An estimated tin reserve of approximately 133,000 tons was reported by ESCAP in 1990 in Nam Pathene Valley. Korean and Russian firms have been producing 1,000~1,500 tons of tin per annum. It is known that there is a huge limestone deposit in Khammouan, and three Thai companies are exploiting limestone in a small scale.

Strategic Location Advantage

Savannakhet and Khammouan are located at the junction of the north-south and east-west transportation axis. The East-West corridors serve for efficient flows of commodities and industrial products among Lao PDR, Thailand and Vietnam.

The New Mekong Bridge connecting Savannakhet and Mukdahan in Thailand will be constructed by the end of 2004. It will bring multiplied economic effects to Savannakhet and Khammouan including a reduction of sizable transportation costs and time for exports through Thailand.

The locational advantage of Savannakhet and Khammouan should be fully utilized. For instance, Savannakhet is suitable for construction of **an economic zone** attached with hybrid functions such as industrial processing zone, bonded warehousing, duty and tax free zone, marketing, convention, and tourism zone. A catalyst for industrialization has to be sought through construction of the special economic zone.

2) Constraints

The major constraints cited by the private sector in Savannakhet and Khammouan Region are similar to those at the national level. According to the magnitude of influence, the major constraints are as follows:

Legal, administrative and institutional constraints

An official exchange rate of US$ = Kip 971 in May 1997 was drastically devaluated to US$= Kip 1,990 in December 1997 and US$ = Kip 8,100 in the fall of 1999. Volatility of the exchange rate with high inflation, a 12 month rate of 142 % in December 1998, has made investment decisions problematical, especially amongst foreign investors.

As imports surged in the past few years, the Bank of Laos experienced a serious shortage of foreign currency reserves since the middle of 1997, resulting in the adoption of import quota over automobile and other luxury items from 1998. Obviously, due to the prevailing import restrictions, not only motorcycle assemblers, but also other manufacturers depending on imported raw materials have been obliged to shrink their operations. A foreign currency control forcing 50 % of hard currencies remitted from abroad to convert to Kip account has made profitability of foreign investors uncertain. This procedure impedes export promotion, especially for foreign investors. The government attitude toward foreign investors is inconsistent. For instance, the 1994 Foreign Investment Law prescribed that foreign investors get preferential income tax treatment (20 % flat rate) and profits could be freely repatriated. However, the 1995 Domestic

Investment Law also provides domestic industries with preferential income tax rate. In addition, frequent changes to the Foreign Investment Law through government decrees is another constraint that foreign investors encounter. The enforcement of such practices is not informed to the concerned parties in advance.

Commercial loans with the maturity of more than two years are scarcely available and the interest rate has been elevated from 17.25 % in December 1997 to 19~25 % by December 1998. Obviously, few investors are encouraged to take out loans. Besides, there is no development financing institution to support an aggressive entrepreneurship.

Inadequate supply of raw materials and small production capacity

Many cash crops, which can be potential resource for agro-industries, are supplied in small and inconsistent quantity. For example, an edible oil producer in Savannakhet is suffering from insufficient supply of raw materials. Generally, in the hotel business, 60 % of foodstuff, 80 % of beverages and 100 % of guest supplies are imported, mainly from Thailand. Coffee is usually produced by individual farmers in a small quantity, and the supply can not meet the high level demand in overseas market.

In Khammouan, most sawmills are obliged to operate on a seasonal basis with a low working ratio due to a limited and sporadic supply of logs. Obviously, this is one of the reasons why value-added furniture manufacturers cannot grow.

Despite there being large deposits of gypsum, limestone and other non-metallic minerals, which could be powerful export earners, they have only been mined on a marginal scale. For instance, annual production of gypsum has stagnated at about 130,000 ton, in spite of an identified deposit of one billion tons. The major reasons for this can be attributed to the lack of systematic mineral exploration and the lack of a financing facility to modernize industrial production.

In short, the most critical constraints surrounding Lao industry are insufficient supply of raw material and small production capacity. Perpetually, these two factors have hindered Lao industry to enter the market economy in the real meaning.

Lower accumulation of entrepreneurship

The accumulation of entrepreneurship in Lao PDR is quite limited, and it is a reason why industrial development has stagnated in Lao PDR. One can scarcely find a company that has operated with a business strategy or planning as to how

the firm can achieve production targets. Actually, many firms are working in a day-to-day business manner. Many enterprises still don't fully understand how essential is **quality control or productivity improvement** in the international market as they have just exported either raw materials or less processed goods.

In short, due to the insufficient supply of raw materials, the lack of quality infrastructure, the lack of an appropriate financing scheme, immature entrepreneurship and more importantly the lack of an appropriate and consistent government policy, all the valuable and abundantly available indigenous resources have only brought a limited value-added and wealth to Lao people.

V-2 LOCAL INDUSTRY DEVELOPMENT PLAN

V-2.1 Overview

1) Definition of Local Industry

The local industry is not defined by its scale, amount of profit, or number of employees engaged in the activities. Local industry is assumed to be an industrial activity as defined below.

Definition of "Local Industry"

① Processing activity of raw materials by which merchantability is improved.
② Industry that uses indigenous raw materials, and processing is done locally.
③ Industry that supports or hedge the risks of major production activities in village (e.g., agriculture, forestry, livestock, etc.)
④ Industrial activity through which village life and activity are supported.

2) Local Industry: An Overview

According to the latest Development Plan for the industrial sector, Lao PDR intends to promote small to medium scale industries and handicrafts to reduce income disparities within and among regions. In particular, processing industries that enhance value added to agricultural and forestry products, as well as industries that manufacture consumer goods based on local resources, can curtail or substitute unnecessary imports.

Local industry is a processing industry. However, in SKR and in Lao PDR as a whole, agricultural and forestry products are not processed and marketed as raw materials, domestically or for exports, though they are major industries of the region.

The textile industry, for example, is one of the local industries in SKR. The production activities of the textile industry are wide, ranging from raw cotton and cocoon product, to reeling, dyeing, and weaving activities. Because the region has a traditional craft for dyeing and weaving, and employment opportunities are offered, the textile production is a desirable local industry candidate in SKR.

Generally, local industry in SKR faces certain promotional problems under the current status. The major problems are listed in the following.

Problems in Promoting Local Industry

- Lack of knowledge and/or information
- Lack of manpower and/or skills
- Lack of fund and/or investment
- Undeveloped market and/or customer
- Low quality and variety shortage

To overcome these problems, the Ministry of Industry and Handicrafts is extending institutional support to promote local industry. Some organizations have been established (e.g., Lao Handicraft Group or Lao Textile and Garment Industry Group) and they exhibit the local products, having a permanent exhibition space.

3) Potential Local Products in SKR

Savannakhet and Khammouan provinces are rich in flora and fauna. There is a huge potential for making local products by utilizing there natural resources. In the course of the Study, public hearings were held in Savannakhet and Khammouan provinces, together with DPS, DAF, DIH, DCTPC, DCT, DEDU, DCUL, and Lao Women's Union. At these hearings, a total of 88 local products were listed as shown in Table V2-1.

Local people are well aware of the potential local products in SKR. It is notable, in particular, that these local products involve a number of industries for processing unused or under-utilized resources and waste materials of the region. Use of waste materials could play a significant role in environmental protection of SKR.

Table V2-1 List of Local Products

Note: k/s S=Savannakhet K=Khammouan

Note: DP=Department, LWU=Lao Woman's Union, DPC=Department for Planning and Cooperation

No,	k/s	DP	Item to be Promoted				Major Reason for Promote	Expected Effect	Possible Site
			Resource			Product			
			Field	Specific	Material				
1	k	LWU	A:Biodiversity	Fertilizer	Leaves, etc.	Bio Fertilizer	Abundant material	Increase in income	Xebangfay
2	s	DPC	A:Biodiversity	Fertilizer	Leaves, etc.	Bio Fertilizer	Environmentaly Sustainable	Better Environment	Everywhere
3	s	DTT	A:Biodiversity	Fertilizer	Leaves, Rice Skin, etc.	Bio Fertilizer	Sustainable farming	Increase in harvest	Everywhere
4	s	LWU	A:Biodiversity	compost	Excreta, Leaves, etc.	Bio compost	Environmentaly Sustainable	Better Environment	Champone,
5	s	DAF	A:Biodiversity	compost	Excreta, Leaves, etc.	Bio compost	Environmentaly Sustainable	Better Environment	Everywhere
6	s	DPC	A:Biodiversity	Pesticide	"Kadao Plants"	Bio Pesticide	Environmentaly Sustainable	Better Environment	Everywhere
7	k	DHI	A:Biodiversity	Bee-Culture	Honey	Honey	High land area product support	Increase in income, export promotion	Xebangfay, Nakay, Xaybouathong, Boualapa
8	s	DPC	A:Biodiversity	Bee-Culture	Honey	Honey	High land area product support	Increase in income, export promotion	
9	k	DE	B:Forestry	Non- Wood Pulp	Bamboo	Bamboo Paper	Abundant material	Increase in export	Everywhere
10	s	DAF	B:Forestry	Non- Wood Pulp	Bamboo	Bamboo Paper	Abundant material	Increase in export	Everywhere
11	s	GO	B:Forestry	Handicraft	wood	Wood handicraft	Promote Traditional art	Increase in export	Ban Nakoy, Outhoumphone
12	s	LWU	B:Forestry	Handicraft	Branches, roots	Wood handicraft	Abundant material	Increase in export	Ban Nakoy, Outhoumphone
13	s	DTT	B:Forestry	Handicraft	Branches, roots	Wood handicraft	Promote Traditional art	Increase in export	Everywhere
14	k	DIH	B:Forestry	Handicraft	Branches, roots	Wood handicraft	Abundant material	Increase in export	Thakhek, Mahaxay
15	s	art	B:Forestry	Handicraft	Branches, roots	Wood carving	Art-school student	Create Employment	Art school
16	k	DIH	B:Forestry	Bamboo Products	Bamboo	Rice Basket, Saucer	Promote Traditional art	Increase in income, export promotion	Ban Phosytha
17	k	LWU	B:Forestry	Bamboo Products	Bamboo	Bamboo handicraft	Abundant material	Increase in export	Nakay, Mahaxay, Xaybouathong
18	s	DPC	B:Forestry	Bamboo Products	Bamboo	Bamboo handicraft	Reduce Shifting Cultivation	Increase in income, export promotion	Vilabuly, Xepone, Nong, Phine
19	s	DIH	B:Forestry	Bamboo Products	Bamboo	Bamboo handicraft	Abundant material	Increase in income, export promotion	Vilabuly, Xepone, Nong, Phine
20	k	DPC	B:Forestry	Charcoal	Sawdust	Charcoal	Reduce Shifting Cultivation	Develop the economy and society	Thakhek, Sawmill Company

Table V2-1 (continued)

No,	k/s	DP	Item to be Promoted				Major Reason for Promote	Expected Effect	Possible Site
			Resource			Product			
			Field	Specific	Material				
21	k	DTT	B:Forestry	Pulp	Sawdust	Paper	Abundant material	Reduce imported paper	Sawmill Company
22	s	DAF	B:Forestry	Pulp	Sawdust	Carton	Abundant material	Reduce imported Carton	Sawmill Company
23	k	DIH	B:Forestry	Herbal	Grass, "Phu"	Carpet	Promote Traditional work	Increase in income	Nongbok, Mahaxay, Hinboun
24	s	DIH	B:Forestry	Herbal	Banana, "Lam kok"	Carpet	Promote Traditional work	Increase in income	Xaibuly, Khantabuly, Champhone
25	s	DE	B:Forestry	Herbal	"Phu"	Carpet	Promote Traditional work	Increase in income	Xaibuly
26	s	DIH	B:Forestry	Herbal	"Banana, Lam kok"	Carpet	Promote Traditional work	Increase in income	Xaibuly, Khantabuly, Champhone
27	k	DIH	B:Forestry	Wood processing	Wood	Wood product	Abundant material	Increase in export	Thakhek, Mahaxay
28	s	DTT	B:Forestry	Wood processing	Wood	Wood product	Increase country incomes	Reduce the lumber export	
29	k	DIH	C:Textile	Weaving	Cotton, Silk	Textile	Traditional work, WID	Increase in export	Ban Nasa-Ad, Thakhek
30	k	LWU	C:Textile	Weaving	Cotton, Silk	Textile	Traditional work, WID	Increase in export	Hinboun, Thakhek, Nongbok, Xebangfay,
31	s	LWU	C:Textile	Weaving	Cotton, Silk	Textile	Traditional work, WID	Increase in income, export promotion	Ban Xok Khantabuly
32	k	DIH	C:Textile	Sericulture	Mulberry	Silk	Traditional work, WID	Increase in income, export promotion	Xaybouathong
33	k	DCTPC	C:Textile	Sericulture	Mulberry	Silk	Traditional work, WID	Increase in income, export promotion	Nongbok, Xebangfay
34	k	LWU	C:Textile	Sericulture	Wild Silk	Wild Silk	Abundant material	Increase in income	Nakay, Xaybouathong, Nhommalad, Mahaxay
35	k	LWU	C:Textile	Sericulture	Wild Silk	Eri Silk	Abundant material	Increase in income	Everywhere
36	s	DIH	C:Textile	Sericulture	Mulberry	Silk	Traditional work, WID	Increase in income, export promotion	Xaiphouthong, Champhone, Outhoumphone,
37	s	LWU	C:Textile	Sericulture	Mulberry	Silk	Traditional work, WID	Increase in income, export promotion	Ban Bak Champone
38	s	DAF	C:Textile	Sericulture	Mulberry	Silk	Promote Traditional work	Reduce the silk import	
39	s	DIH	C:Textile	Sericulture	Mulberry	Silk	Promote Traditional work	Increase in income	Xaiphouthong
40	s	DI	C:Textile	Sericulture	Cocoon	Cocoon handicraft	Added the value	Increase in income, export promotion	
41	s	DPC	C:Textile	Cotton Plantation	Cotton	Cotton	Promote Traditional work	Create Employment	Champhone
42	s	LWU	C:Textile	Cotton Plantation	Cotton	Cotton	Promote Traditional work	Increase in export	Xaiphouthong, Songkhone, Xepone
43	s	DTT	C:Textile	Paper Fabric	Bamboo	Bamboo Paper Fabric	Abundant material	Increase in export	Everywhere

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Table V2-1 (continued)

No,	k/s	DP	Item to be Promoted				Major Reason for Promote	Expected Effect	Possible Site
			Resource			Product			
			Field	Specific	Material				
44	k	DIH	C:Textile	Natural Dye	Trees, Leaves, Roots, etc.	Natural dye materials	Abundant material	Reduce the import	Everywhere
45	s	LWU	C:Textile	Natural Dye	Trees, Leaves, Roots, etc.	Natural dye materials	Abundant material	Increase Marketing power	Lahanam, Phonsim, Bak
46	s	DIH	C:Textile	Natural Dye	Trees, Leaves, Roots, etc.	Natural dye materials	Abundant material	Increase Marketing power	
47	s	PID	D:Agriculture	Rice Plantation	Rice	Rice	Rice is basic food	Increase in export	Khantabuly
48	s	DPC	D:Agriculture	Rice Plantation	Rice	Rice	Reduce Shift-Cultivating	Increase in income	Champhone, Songkhone
49	k	DAF	D:Agriculture	Agri-Processing	Tomatoes	Tomato Juice	Reduce Imported	Increase in income	Hinboun, Thakhek, Nongbok, Xebangfay
50	s	DPC	D:Agriculture	Agri-Processing	Mushroom	Mushroom	Easy cultivation	Increase in income	Khantabuly
51	s	DIH	D:Agriculture	Agri-Processing	Mushroom	Mushroom	Market Promising	Increase in income	
52	s	DPC	D:Agriculture	Agri-Processing	Sugar	Sugar	High land area product support	Increase in income	Xaibuly
53	s	DAF	D:Agriculture	Beans Plantation	Soybean, Muug Bean	Soybean, Mung Bean	Reduce Imported	Increase in income	
54	s	DE	D:Agriculture	Agri-Processing	Cassava	Cassava	High land area product support	Increase in income	Xepone
55	s	DPC	D:Agriculture	Agri-Processing	Fruits, Leaves, Roots	Fruits, pulp, medical	Easy cultivation	Increase in income, export promotion	Everywhere
56	k	LWU	D:Agriculture	Agri-Processing	Fruits	Fruits Juice	Long term Consumption	Import subst, export promotion	
57	s	DAF	D:Agriculture	Agri-Processing	Fruits	Fruits Juice	Long term Consumption	Import subst, export promotion	
58	s	DPC	D:Agriculture	Agri-Processing	Fruits	Fruits Juice	Abundant material	Import subst, export promotion	Khantabuly
59	k	DIH	D:Agriculture	Agri-Processing	Fruits	Canned fruits	Long term Consumption	Import subst, export promotion	Nongbok, Thakhek
60	s	DAF	D:Agriculture	Agri-Processing	Fruits	Canned fruits	Long term Consumption	Import subst, export promotion	
61	s	DAF	D:Agriculture	Agri-Processing	Fruits	Canned fruits	Long term Consumption	Import subst, export promotion	
62	k	DIH	D:Agriculture	Agri-Processing	Fruits	Canned fruits, etc.	Long term Consumption	Import subst, export promotion	Nongbok, Thakhek, Hinboun
63	s	DE	D:Agriculture	Agri-Processing	Fruits	Canned fruits, etc.	Long term Consumption	Import subst, export promotion	Phine, Xepone, Nong
64	s	LWU	D:Agriculture	Agri-Processing	Fruits	Canned fruits, etc.	Long term Consumption	Import subst, export promotion	Champhone
65	k	DPC	D:Agriculture	Agri-Processing	Tomatoes	Tomato Juice	Reduce Imported	Increase in income	Thakhek, Nongbok
66	s	DC	D:Agriculture	Agri-Processing	Tomatoes	Tomato Juice	Reduce Imported	Increase in income	

Table V2-1 (continued)

No,	k/s	DP	Item to be Promoted				Major Reason for Promote	Expected Effect	Possible Site
			Resource			Product			
			Field	Specific	Material				
67	k	DIH	D:Agriculture	Agri-Processing	Cassava, Fruits	Cookie	Reduce Imported	Increase in income, export promotion	Thakhek
68	s	PID	D:Agriculture	Agri-Processing	Cassava, Rice, Fruits	Cookie	Reduce Imported	Increase in income, export promotion	
69	s	DIH	D:Agriculture	Mill Factory	Mill, Powder	Noodle	Expand Productivity	Expand Market	
70	s	DIH	D:Agriculture	Mill Factory	Mill, Powder	Noodle	Expand Productivity	Import subst, export promotion	
71	k	DAF	E:Fishery	Fish Feeding	Fish	Fish	Expand Productivity	Increase in income	
72	k	DAF	E:Fishery	Carp Feeding	Carp	Fish	Expand Productivity	Increase in income	
73	s	DPC	E:Fishery	Fish Feeding	Fish	Fish	Expand Productivity	Increase in income	
74	s	DPC	E:Fishery	Fish Feeding	Fish	Fish	Expand Productivity	Increase in income	Ban Phakha Noy. Khantabuly
75	k	DAF	F:Livestock	Livestock Feeding	Pig	Baby Pig	Reduce Imported	Increase in income	
76	s	DPC	F:Livestock	Livestock Feeding	Cow	Cow	Wide green land	Increase in income, export promotion	Houery nak nhas, Champhone
77	k	DAF	F:Livestock	Livestock Feeding	Duck	Baby Duck	Reduce Imported	Increase in income	
78	s	DPC	F:Livestock	Livestock Feeding	Duck	Duck	Many Irrigation canal	Increase in income, export promotion	
79	s	DPC	F:Livestock	Livestock Feeding	Goat	Goat	Easy Feeding	Increase in income, export promotion	Nong Deun. Khantabuly
80	k	AGF	F:Livestock	Food Factory	Crops: Beans, Rice, etc	Animal Food	Reduce Imported	Expand Livestock	
81	k	DIH	G:Mining	Ceramic	Clay	Ceramic	Existing Product	Increase Marketing power	Nongbok
82	s	LWU	G:Mining	Ceramic	Clay	Clay pot: Jar	Good material	Increase in income	Ban Phalong Phine
83	k	DIH	G:Mining	Cement Factory	Limestone, Gypsum, etc	Cement	Abundant material	Import subst, export promotion	Thakhek, Mahaxay
84	k	DPC	G:Mining	Cement Factory	Limestone, Gypsum, etc	Cement	Abundant material	Import subst, export promotion	Hin Phon Mountain
85	s	DTT	G:Mining	Cement Factory	Limestone, Gypsum, etc	Cement	Abundant material	Import subst, export promotion	Atsaphangthong
86	k	DIH	G:Mining	Gypsum Factory	Gypsum	Ceramic, etc	Abundant material	Increase in income, export promotion	Xebangfay, Thakhek
87	s	DIH	G:Mining	Gypsum Factory	Gypsum	Ceramic, etc	Abundant material	Increase in income, export promotion	
88	s	DE	G:Mining	Mining Factory	Gypsum, Granite, Iron	Construction material	Abundant material	Increase in income, export promotion	

Source: JICA Study Team

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4) Prospects and Constraints

From the viewpoint of local industry promotion, SKR has the following prospects and constraints:

【Prospects】

① Abundant natural resources; animals, insects, plants, and mining.
② Waste materials and by-product obtainable through promotion of, forestry, agriculture, fishery, livestock, and mining industries.
③ An improved transportation network, especially, after completion of the East-West Corridor and the New Mekong Bridge.
④ Expanded demand and markets by a increased number of travelers and business persons.
⑤ Improved technology through joint research and training with neighboring countries.

【Constraints】

① A modest traffic and communications infrastructure.
② A modest education and training systems.
③ Poor market information.
④ Lack of a sales promotion approach.
⑤ Undeveloped industrial system from raw material production for processing and sales.

5) Issues to be Addressed

In view of the prospects and constraints, as well as in the light of 88 potential products listed by local people, several issues should be addressed in formulating a master plan for local industry development in SKR. These issues are summarized below.

① Enhancement of the spirits of entrepreneurship and incubation through demonstration, education and training.
② Establishment of producers' organizations or cooperative relationships.
③ Establishment of systems to support local industry promotion support.
④ Establishment of systems to promote cross-sector linkage.

V-2.2 Perspectives for Local Industry Promotion

1) Objectives

In view of the current settings and potentials for development in SKR, the objectives for local industry promotion are proposed as follows:

① Local industry is promoted to generate income in the rural area and to enhance the standard of living in the rural society.
② Local industry is promoted to diversify activities in villages, preventing a mono-culture and innovation of low-priced mass products.
③ Local industry is promoted to prevent unnecessary out-migration from villages to the urban areas and to establish self-reliance in rural society.
④ Local industry is promoted in conjunction with the “New Village Initiative” to enhance the quality of life in the rural areas.
⑤ Local industry is promoted to create niche products for the world niche markets.

2) Development Scenarios

With above objectives in mind and in the light of potential local products (88 products) listed by local people in SKR, the following scenarios are proposed:

<Short-term scenario>

① Local industry is created in the light of characteristic of districts and villages (e.g., life styles, legend, tradition, culture, food, and medicine).
② Local industry is created making utmost use of by-product, unused resources, and waste materials as raw materials, decreasing the production cost and the investment amount at the initial stage.
③ Local industry is created and promoted through the use of by-product generated from the main industry promoted in rural villages, from unused natural materials, and a knowledge of consumer goods that are imported and used in the rural area.
④ Products of the local industry are marketed through the establishment of cooperative relationships among producers and with the related local products.
⑤ New products and markets are explored by setting up a Local Product Market Promotion Center.

< Mid-term scenario >

① Technology of the local industry is to be elevated through research and training, as well as through cooperation and/or competition with neighboring countries such as Thailand and Vietnam.

② New products and markets are to be expanded in cooperation with neighboring countries.

<Long-term scenario >

① Local industry is promoted as a new global industry for niche products made from local resource.

3) Local Industry Development Strategy

The concept and pattern of industrial development in SKR are different from the ones in the neighboring countries where a mass production type of industrialization has been pursued. The development pattern of industries in SKR is to produce niche products of high quality and high value added, supported by product design.

In identifying the local industries for SKR, some basic concepts are to be applied. They are:

(1) Potential products are to be found from locally available natural resources, and
(2) New products are to be created by utilizing unused local resources.

An image of creating new local products, for instance, the potential from a fruit tree plantation, is illustrated in Figure V3.1.

Some strategies are proposed to promote local industries in SKR, as follows:

① Strategy to motivate villagers/producers:
   (1) To exchange opinions and ideas to create a local product, by organizing a group of interested parties.
   (2) To introduce the cases in which, depending upon ideas, use of waste material will generate income through the local industry.
   (3) To set up a support system by which ideas are promoted as local products.
   (4) To prepare a fund for promotion of local industry.

② Strategies to promote cooperative relationships:

(1) To integrate the local industry into the new village development initiative.

(2) To take an approach for overall enhancement of the society and the environment.

(3) To cooperate with other sectors and introduce cross-over thinking for pioneering the new industry.

③ Strategies to improve marketing of local products:

(1) To develop niche products of high competitiveness

(2) To reduce production cost by making use of unused resources and wasted materials.

(3) To improve the products, adjusting to market demand (e.g., combination of traditional skills and new technology).

By applying these strategies, 100 products conceivable for promotion in SKR have been prepared as shown on Table V2-2. These products are earmarked by type (urban or rural), by region (lowland, mid-land and highland), by market (local or export) and by development terms (short-, medium- and long-term).

Source: JICA Study Team

Figure V2-1 Potential for Local Industry Promotion

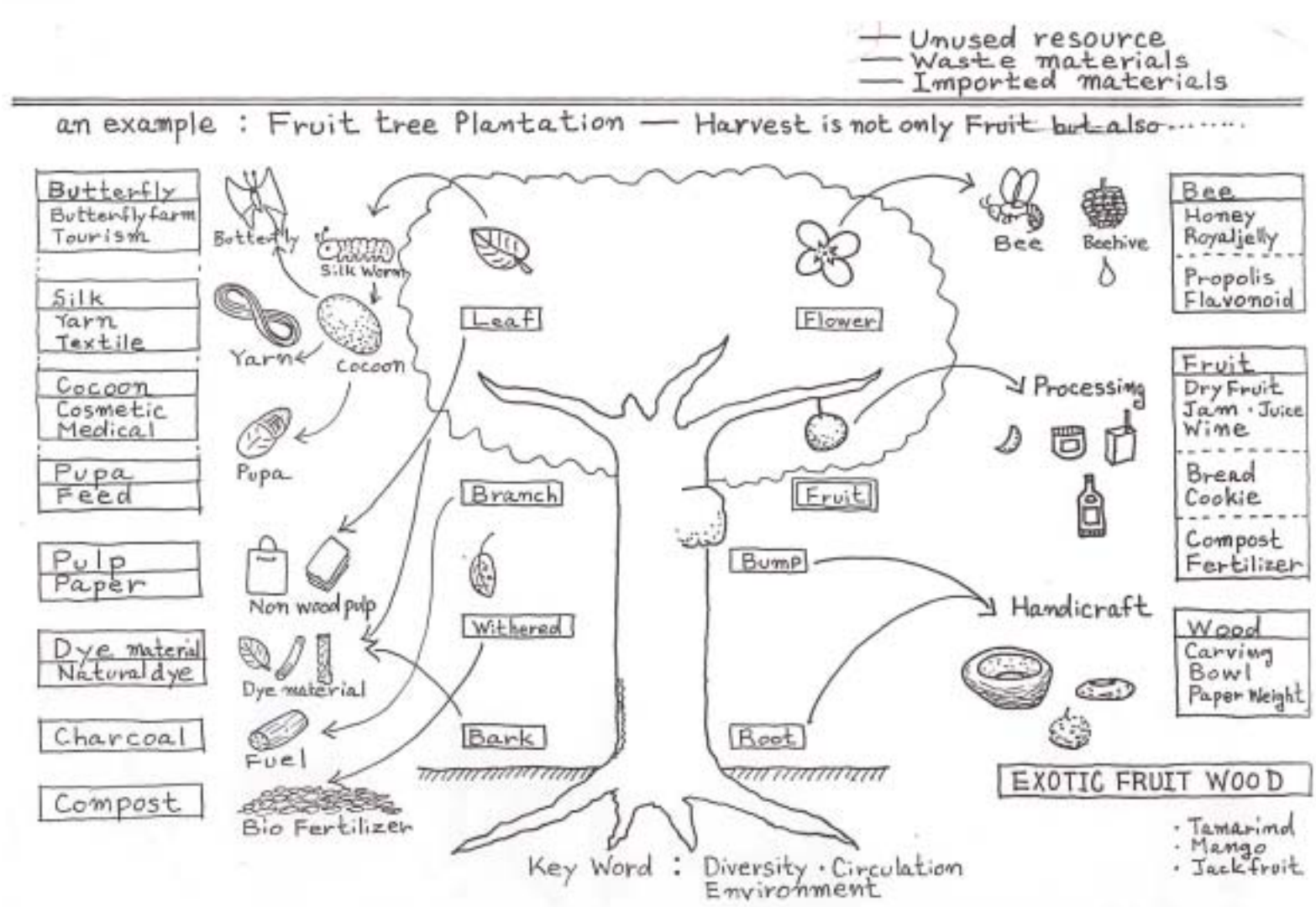


Table V2-2 100 Products to be Potentially Promoted in SKR

No,	Promoted Item				Scale		Region			Term			Market		
	Resource			Product	Urban	Rural	Low land	Mid land	High land	Short term	Middle term	Long term	Local	Export	Tourism
	Field	Specific	Material												
1	A:Biodiversity	compost	Excreta, Leaves, etc.	Bio compost		○	○	○		○			○		
2	A:Biodiversity	compost	Excreta, Leaves, etc.	Fermented Heat		○	○	○			○		○		
3	A:Biodiversity	compost	Excreta, Leaves, etc.	Insect cultivation	○	○	○	○			○		○	○	
4	A:Biodiversity	Fertilizer	Leaves, Rice Skin	Bio Fertilizer	○	○	○	○			○	○	○	○	
5	A:Biodiversity	Pesticide	Kadao Plants, etc.	Bio Pesticide	○	○	○	○			○		○	○	
6	A:Biodiversity	Biomass	Cassava, etc.	Bio Alcohol	○		○	○				○	○	○	
7	A:Biodiversity	Biomass	Excreta, Leaves, etc.	Bio Gas	○		○	○				○	○	○	
8	A:Biodiversity	Insect Cultivation	Insect	Medicinal Insect	○	○		○	○			○	○	○	
9	A:Biodiversity	Bee-Culture	Honey	Honey, Royaljelly		○		○	○		○		○	○	○
10	A:Biodiversity	Bee-Culture	Honey	Propolis, Flavonoid		○		○	○			○		○	○
11	A:Biodiversity	Bee-Culture	Honey, Nest	Beewax		○		○	○		○		○		
12	A:Biodiversity	Medical	Leaves, Roots, etc.	Medicinal Herb	○	○		○	○		○		○	○	○
13	A:Biodiversity	Medical	Fruits, etc.	Medicinal Fruits	○	○		○	○			○	○	○	○
14	A:Biodiversity	Fiber	Bamboo, Leaves, etc.	Bio Fiber	○			○	○			○	○	○	○
15	A:Biodiversity	Paper	Leaves, Stem, etc.	Non-Wood Paper	○	○	○	○	○	○			○	○	○
16	A:Biodiversity	Natural Dye	Leaves, Roots, etc.	Natural Dye material	○	○		○	○	○			○	○	○
17	B:Forestry	Pulp	Bamboo	Pulp	○		○					○	○	○	
18	B:Forestry	Paper	Bamboo	Bamboo Paper		○		○	○	○			○	○	○
19	B:Forestry	Charcoal	Bamboo	Charcoal		○		○	○	○			○	○	
20	B:Forestry	Medical	Bamboo	"Chikusakueki"Liqui d		○		○	○	○				○	
21	B:Forestry	Handicraft	Bamboo	Bamboo handicraft		○	○	○	○	○			○	○	○
22	B:Forestry	Handicraft	Bamboo	Chopsticks		○		○	○	○			○	○	
23	B:Forestry	Handicraft	Bamboo	Tableware		○		○	○	○			○	○	
24	B:Forestry	Furniture	Bamboo	Bamboo Furniture		○	○	○		○			○	○	○

Table V2-2 (Continued)

No,	Promoted Item				Scale		Region			Term			Market		
	Resource			Product	Urban	Rural	Low land	Mid land	High land	Short term	Middle term	Long term	Local	Export	Tourism
	Field	Specific	Material												
25	B:Forestry	Construction	Bamboo	Construction material		○	○	○	○	○			○		
26	B:Forestry	Construction	Bamboo	Floor Bord	○		○				○		○	○	
27	B:Forestry	Construction	Bamboo	Wall Paper	○		○				○		○	○	
28	B:Forestry	Foodstuffs	Bamboo	Bamboo shoot		○		○	○	○			○		
29	B:Forestry	Foodstuffs	Bamboo	Dry Bamboo shoot		○		○	○	○			○	○	
30	B:Forestry	Pulp	Sawdust, Wood chip.	Pulp Carton	○		○					○	○	○	
31	B:Forestry	Charcoal	Sawdust, Wood chip.	Charcoal	○		○				○		○	○	
32	B:Forestry	Environment	Sawdust, Wood chip.	Water Purification	○		○					○	○		
33	B:Forestry	Construction	Sawdust, Wood chip.	Chip Board	○		○					○	○	○	
34	B:Forestry	Construction	Sawdust, Wood chip.	Pavement materials	○		○					○	○	○	
35	B:Forestry	Mushroom	Sawdust, Wood chip.	Cultivation bed	○		○	○			○		○		
36	B:Forestry	Livestock raising	Sawdust, Wood chip.	Raising bed	○		○	○			○		○		
37	B:Forestry	Handicraft	wood, Branches, roots	Wood handicraft		○	○	○		○			○	○	○
38	B:Forestry	Handicraft	Herbal "Lam kok"	Herbal handicraft		○	○	○		○			○		○
39	B:Forestry	Furniture	Wood Rattan	Wooden Furniture	○	○	○			○			○	○	
40	B:Forestry	Eucalyptus	Eucalyptus	Pulp	○		○	○		○			○	○	
41	B:Forestry	Eucalyptus	Eucalyptus flower	Honey		○	○	○			○		○	○	○
42	B:Forestry	Eucalyptus	Eucalyptus Leaves	Natural Oil		○	○	○			○		○	○	○
43	B:Forestry	Eucalyptus	Eucalyptus Leaves	Insecticide		○	○	○			○		○		
44	C:Textile	Sericulture	Mulberry	Mulberry Silk		○	○	○		○			○	○	○
45	C:Textile	Sericulture	Mulberry	Local Silk "Kanboju"		○	○	○	○	○			○	○	○
46	C:Textile	Sericulture	Cassava, etc.	Eri Silk		○		○	○		○		○	○	○
47	C:Textile	Sericulture	Mahogany, etc	Wild Silk		○		○	○		○		○	○	○
48	C:Textile	Silk Spining	Cocoon	Hand Spun Yarn		○	○	○	○	○	○		○	○	○
49	C:Textile	Silk Reeling	Cocoon	Hand Reeling Yarn		○	○	○	○	○			○	○	○
50	C:Textile	Silk Weaving	Silk Yarn	Textile		○	○	○	○	○			○	○	○

Table V2-2 (Continued)

No,	Promoted Item				Scale		Region			Term			Market		
	Resource			Product	Urban	Rural	Low land	Mid land	High land	Short term	Middle term	Long term	Local	Export	Tourism
	Field	Specific	Material												
51	C:Textile	Silk Powder	Cocoon	Cosmetic	○		○					○		○	
52	C:Textile	Silk Powder	Cocoon	Medical	○		○					○		○	
53	C:Textile	Silk Powder	Cocoon	Food additive	○		○				○		○	○	
54	C:Textile	Silk Handicraft	Cocoon	Cocoon handicraft		○	○	○		○					○
55	C:Textile	Livestock	Pupa	Feedstuff		○	○	○	○	○			○		
56	C:Textile	Cotton Plantation	Cotton	Cotton		○		○	○	○			○		
57	C:Textile	Spining	Cotton	Hand Spun Yarn		○		○	○	○			○	○	○
58	C:Textile	Weaving	Cotton	Textile	○	○		○	○	○			○	○	○
59	C:Textile	Weaving	New natural Fiber	Textile	○	○		○	○		○		○	○	○
60	C:Textile	Weaving	wool	Textile	○	○		○	○		○		○	○	○
61	C:Textile	Stuffing	Kapok	Stuffing		○	○	○	○	○			○	○	
62	D:Agriculture	Fruit	Fruit	Jam, Wine, Juice etc		○		○		○			○	○	○
63	D:Agriculture	Fruit	Dry Fruit	Bread, Cookie		○		○		○			○	○	○
64	D:Agriculture	Fruit	Damaged Fruit	Fodder		○		○		○			○		
65	D:Agriculture	Mushroom	Mushroom	Dried Mushroom		○		○	○	○			○	○	
66	D:Agriculture	Soybeans	Soybeans	Bean curd : Tofu		○	○	○		○			○	○	
67	D:Agriculture	Soybeans	Soybeans	Soybeans milk	○		○			○			○	○	
68	D:Agriculture	Peanut	Peanut	Peanut Oil	○		○	○		○			○	○	
69	D:Agriculture	Seasoning	Leaves, Roots, etc.	Seasoning, Spice		○	○	○		○			○	○	○
70	D:Agriculture	Cassava	Cassava Potato	Tapioca		○	○	○	○	○			○	○	
71	D:Agriculture	Cassava	Cassava Potato	Fodder		○	○	○	○	○			○		
72	D:Agriculture	Mulbery	Leaves	Mulberry tea		○	○	○	○	○			○	○	○
73	D:Agriculture	Mulbery	Leaves	Chlorophyll	○		○					○		○	
74	D:Agriculture	Mulbery	Fruits	Jam, Wine		○	○	○	○	○			○	○	
75	D:Agriculture	Mulbery	Branch	New Fiber		○	○	○	○		○		○	○	○
76	D:Agriculture	Flower	Flower	Ornamental Flower		○	○	○		○			○	○	○

Table V2-2 (Continued)

No,	Promoted Item				Scale		Region			Term			Market		
	Resource			Product	Urban	Rural	Low land	Mid land	High land	Short term	Middle term	Long term	Local	Export	Tourism
	Field	Specific	Material												
77	D:Agriculture	Flower	Flower	Flower tea		○	○	○		○			○	○	○
78	D:Agriculture	Flower	Ornamental Flower	Dry Flower		○	○	○			○		○	○	○
79	D:Agriculture	Flower	Flower	Flower handicraft		○	○	○			○		○	○	○
80	D:Agriculture	Milling Factory	Beans, Peanut, etc	Powder	○	○	○				○		○	○	
81	D:Agriculture	Canning Factory	Fruit, Vegetable, etc	Canned food	○	○	○				○		○	○	
82	D:Agriculture	Drying Factory	Fruit, Vegetable, etc	Dry food	○	○	○				○		○	○	
83	E:Fishry	Hatchery	Fish 's egg, fry	Fry for Breeding	○	○	○	○		○			○		
84	E:Fishry	Fish Processing	Fish	Dried Fish		○	○	○		○			○		
85	E:Fishry	Fish Processing	Fish	Fermented Fish		○	○	○			○		○		
86	E:Fishry	Fish Processing	Fish	Seasoning Sauce		○	○				○		○		
87	E:Fishry	Fish	Damaged Fish	Fodder		○	○	○		○			○		
88	E:Fishry	Ornamental fish	Ornamental fish	Ornamental fish		○	○	○		○			○	○	
89	F:Livestock	Breeding	Meat	Dried Meat		○		○	○	○			○	○	○
90	F:Livestock	Handicraft	Horn, Bone, Wing	Handicraft		○		○	○	○			○	○	○
91	F:Livestock	Handicraft	Skin	Leather Craft		○		○	○	○			○	○	○
92	F:Livestock	By-product	Excreta	Fertilizer		○		○		○			○		
93	G:Mining	Clay Product	Clay	Brick and tile		○	○	○		○			○		
94	G:Mining	Clay Product	Clay	Pottery		○	○	○		○			○		
95	G:Mining	Clay Product	Clay	Ceramic		○	○	○		○			○		
96	G:Mining	Limestone	Limestone	Feedstock		○		○	○	○			○		
97	G:Mining	Limestone	Limestone	Soil Improvement	○			○	○	○			○		
98	G:Mining	Gypsum	Gypsum	Molding for Pottery	○	○		○	○	○			○		
99	G:Mining	Tin	Tin	Tin Craft		○		○	○	○			○	○	○
100	G:Mining	Handicraft	Semi-precious stones	Stone Craft		○		○	○		○		○	○	○

Source: JICA Study Team

V-2.3 Examination of Selected Local Industries

Out of 100 local products identified as being potentially promising in SKR, dozens of products have been examined on the basis of their production background, possibility for promotion and preliminary evaluation. The selected products are tabulated below.

Table V2-3 Local Products Selected for Examination

	A Bio-diversity	B Forestry	C Textile	D Agriculture	E Fishery	F Livestock	G Mining
1	Bio-diversity	Handicraft	Sericulture	Mushroom	Processing	Processing	Ceramic
2	Insect cultivation	Wood processing	Cotton/ natural dyes	Bee-Culture	By-product use	By-product use	Brick and tile
3	Non wood pulp	Bamboo processing	Kapok fiber	Milling factory			Pottery
4	Non-wood products	Charcoal					Lime burning
5	Natural Dye Material	Wood-chip					
6	Medical Herbal	Eucalyptus processing					
7		Poles					

Source: JICA Study Team

The results of examination on the selected local products are presented below.

(A) Bio-diversity

A-1: Bio-diversity

Background

Bio-diversity is not only confined to natural habitats, but also used to boost agricultural production. Use of nitrogen fixing plants to encourage natural predators on pests and promote insect pollinators is practiced in many countries to improve agricultural productivity. Application of natural fertilizers such as manure, compost, mulch and nitrogen fixing plants, together with the use lime and natural predators will maintain soil fertility of small farmers' land and contribute to promote organic farming.

Possibilities

Bio-fertilizer factories are planned at various locations, and the first factory was established in Pakse. Such bio-fertilizer factories require a large volume of raw materials. An alternative is small-scale production at the farm level, though it requires tapping of indigenous knowledge and considerable training. As there are

potential export markets for organically grown fruit and vegetables, it is proposed to first apply bio-fertilizes to cultivate vegetables and fruit and then gradually expand to other crops.

Preliminary Evaluation

Collection of agricultural and animal waste will be an issue to be addressed. One solution is to establish an organic fertilizer manufacture at the farm or community level. Most biomass material can be used from dung to silkworm's chrysalises. In parallel with organic fertilizers, natural plant and predators may be promoted to reduce input of chemical insecticides and herbicides and to expand organic farming. Bio-diversity is ideal for promotion as a local industry.

A-2: Insect cultivation

Background

Endowed with rich flora, SKR has a variety of insects. Currently several species of insects are sold for food or used to produce wax, lacquer and other products. Likewise, some insects are used to fertilize crops and prevent harmful pests. If the use of insecticides and herbicides is expanded, it will destroy many beneficial insects. It is therefore important to preserve existing beneficial insects to foster their natural advantage.

Possibilities

Such beneficial insects can be used for domestic animal's fodder. They might be also used to produce medicine if their effects are verified.

Preliminary Evaluation

Comprehensive analysis of insects, both beneficial and harmful, should be conducted and potential markets, price, and impacts on the local habitat should be investigated. It should start with small-scale development.

A-3: Non wood pulp

Background

All paper is imported small-scale specialized paper from non-wood materials. Such paper could be used for wrapping, especially for handicraft goods and silk.

Possibilities

There is a large volume of agricultural wastes (e.g., rice straw, corn, supercane, banana loaf), naturally grown plants (bamboo, grasses etc.) and forestry waste (wood chip, branches etc.), which could be used as raw material to produce specialized paper. Small-scale non-wood paper projects can produce handmade paper for wrapping craft goods or artworks. They might be developed to

manufacture cardboard and wrapping paper for packing locally produced fruit and vegetables.

Preliminary evaluation

Small-scale production may be feasible, judging from the availability of raw materials. Use of forestry waste should be further investigated.

A-4: Non-wood products

Background

Non-wood products include plant oils, resins, rosins, dyes, flowers, fodder, fruit, edible fungi, meat, medicines, nuts, plants, rattan, tannin and thatch. These non-wood products are available widely in SKR, especially in the natural forest areas. They would serve as an important source of income and food for many rural people, especially for small land holdings.

Possibilities

Resources are plentiful and the possibilities for expanding local industries are considerable. It will also enhance the tourism potential in SKR.

Preliminary Evaluation

Potential products should be listed by volume, price and markets, ensuring that people do not over-exploit such resources and that they receive an adequate price for their products.

A-5: Natural Dye Material

Background

Natural dye materials have been traditionally used to dye textile in Lao PDR.
Accumulated knowledge is abundant, ranging from fruits, leaves, stalks, branches, to roots. UNDP trained technology of natural dye as a local industry in villages. However, protection of natural dye medicine has not been executed and there is a danger that the materials are lost even if the technology succeeds. Some public organizations and the private business are searching for natural dye materials and dye methods.

Possibilities

Attention is paid increasingly to natural dye materials as dyestuff instead of chemical dyestuff. Market can be secured for high-quality product to make traditional textile in villages. Many minority people in Lao PDR are using traditional natural dye materials, and their promotion is promising. Dye materials could be exported to Thailand, Japan, and Europe.

Preliminary Evaluation

Linkage between agriculture and forestry, as well as orchard and flower cultivation, is required for protection of dye material. Investigation of dye materials that have been traditionally successful in each village is required. A method of non-chemical medicine discoloration prevention of natural dye materials should be established.

Photo-1 Natural Dye Material/Product

Photo-2 Traditional Textile with Dye

A-6: Medical Herbal

Background

Medical herbs have been traditionally used in Lao PDR. Knowledge of medical herb materials has accumulated, including materials made of fruits, leaves, stalks, branches, and roots. However, medical herbs have been only successful as a private treatment method. It is feared that knowledge and materials accumulated for long years will be lost. Medical herbs have been investigated to some extent at the Bureau of Public Health in provinces.

Possibilities

Attention is paid to medical herbs as an alternative to chemical medicine. Knowledge has been accumulated as a private medicine and it could be developed a local industry. Medical herbs have been searched for widely in Thailand, but materials are not obtained easily in Thailand. Medical herbs are therefore expected to be exported to Thailand, Japan, and Europe.

Preliminary Evaluation

Linkage between agriculture and forestry, as well as orchard and flower cultivation, is required to protect medical herbs. Knowledge on medical herbs traditionally cultivated in villages is to be investigated.

From Indochina to the World Herbal Medicine Market

There is a particular emerging trend of enforcing research and development on herbal medicines worldwide. Such a trend is pushed by the quest of unidentified medical effects of natural herbs on incurable or inveterate diseases. Various indigenous herbal medicines in tropical areas such have potentials to be sovereign remedies to certain diseases. Also, herbal medicines are gaining popularity for their calm and positive effects on improving our health.

It is already identified that thousands of medically effective herbs are naturally grown in Lao PDR and the surrounding Indochina countries. Many of them, however, have not been utilized for commercially producing natural medicines, due mainly to lack of public and private initiatives on promoting herbal medicines, lack of scientifically proven knowledge and information in the local area, and limited markets to sell such herbs other than the small local market.

When our study team had an interview with an Ubon Ratchahtani-based herbal medicine company, the managing director explained that he saw an opportunity of expanding his business by utilizing natural herbs from all over the Indochina countries, particularly from Khammouan and Savannakhet provinces in Lao PDR. The quality of naturally grown herbs in these two provinces is better than that of other southern provinces in Lao PDR, according to him. Currently, his company is purchasing naturally grown herbs from Lao PDR through Thai middlemen located along the borders, and selling its products to the local market. When the East-West corridor is completed, marketability of indigenous herbal medicines in and around the border area will be increased. In his opinion, if he, as an entrepreneur, selects a factory location around Mukdahan, he would plant herbs for his factory in Lao PDR.

B-1: Handicraft

Background

A large volume of wood is being exploited in SKR. Usually, only straight stem wood of large diameter is extracted from the forest and processed into sawn wood. A bulk of fallen trees are abandoned in the forest. Also, trees unsuitable for lumber or unknown species are left in the forest. Thus, there is a big potential to make use of abandoned wood and unknown species for other purposes, especially for handicraft. (The use of small-sized wood is also discussed in the Resource management Initiative in Chapter III-2.4.④)

Possibilities

In addition to a considerable volume of “waste wood” left in the forest, there are also many roots and boles left unused. Unused root and bump are easily obtained and utilized for production of high-value craft goods. Handicraft manufacturing has a high potential as local industry in SKR.

Preliminary Evaluation

Training of skilled workers and a steady supply of raw materials should be secured. This should be achieved to make utmost use of the abandoned fallen trees as discussed in the Forest Resource Management (Chapter III).

Photo-3 Handicraft of Root/Bump

Photo-4 Handicraft of Root/Bump

B-2: Wood processing

Background

Small-scale furniture, construction materials, joinery and handicraft are manufactured in many communities, mainly for the local market. (The use of commercial and non-commercial species of forest resources is also discussed in the Resource Management Initiative in Chapter III-2.4.③ and ④.)

Possibilities

Expansion of wood processing industries is envisaged, keeping pace with the increased production of local sawmills. Maximum use of the abandoned fallen trees will be practicable.

Preliminary Evaluation

Efforts have to be made to train processors in manufacturing and marketing. Improved tool should be introduced, and markets for products have to be expanded.

B-3: Bamboo processing

Background

Bamboo is being processed into food, baskets, mats, chopsticks and poles, but it is under-utilized. Moreover, currently produced baskets, mats and chopsticks, are unsuitable, however, for large markets as quality and design is less developed.

Possibilities

Bamboo can be used for multiple products such as food, food container, handicrafts, building material, feedstock for paper and charcoal production. The by-products from charcoal are also used for multiple purposes. For instance, tar liquid has sterilization properties, and activated charcoal made from bamboo can be used to de-putrefy meat, purify water and remove poisonous chemicals.

Preliminary Evaluation

Several different types of bamboo are planted to maintain a stable supply of raw materials. Several potential by-products, such as activated charcoal and tar liquid may be uneconomical yet due to production costs and marketability. Further studies are required to verify viable products of bamboo.

B-4: Charcoal

Background

Fuelwood is a dominant energy source, and charcoal is the largest traded fuel. Most of charcoal production is carried out by small-scale entrepreneurs with obsolete equipment and little training. The raw materials (branch, lumber waste material and bamboo) are available abundantly. (refer to Chapter III-2.4.④)

Possibilities

Where there are concentrations of forestry residues, it may be economical to establish permanent charcoal kilns for normal or activated charcoal and collect such by-products as wood tars and liquid distillates (mokusaku liquid), as well as activated charcoal (e.g., smell extinguishing, water quality purification, purification function of air pollution).

Preliminary Evaluation

In order to keep charcoal competitive, efforts must be made to improve productivity and end-use devices for stoves, brick, lime and pottery kilns, bakery ovens, tobacco barns and crop/beverage/fish drying devices. Investigations should be carried out to appraise viability of activated charcoal production.

B-5: Wood-chip

Background

Wood chip and sawdust are produced as waste material in lumber factories. Likewise, there are considerable volumes of woody materials wasted near farm land.

Possibilities

Wood chip and sawdust are used for the pulp and paper industry, as well as for bedding material of domestic animals, mushroom cultivation and chipboard/particle board manufacturing.

Preliminary Evaluation

Profitability of different end-uses has to be investigated, together with applicability of mobile or stationary chippers.

B-6: Eucalyptus processing

Background

The eucalyptus is being planted mainly for the pulp industry. Processing for other purposes is not considered yet in SKR.

Possibilities

Use of eucalyptus as handicap handicraft materials is to be examined. Likewise, the honey collected from eucalyptus flower contains high calcium, potassium and magnesium. The eucalyptus honey is a supplementary nourishing meal of abundant minerals. Further, the eucalyptus oil is reported to have actions for sterilization, anti—inflammation, and anti-infection.

Preliminary Evaluation

Technical soundness and financed viability should be evaluated for the eucalyptus honey and oil. A processing plant may be established nearby the pulp manufacture factory.

B-7: Poles

Background

Poles are one of the principal building materials in the rural areas. They are also used in the urban areas for roofing joists, scaffolding, construction work and power transmission poles.

Possibilities

Demands for poles will increase, and there is a room for farmers to grow poles commercially from bamboo, eucalyptus and other fast growing species, to satisfy local and regional demand.

Preliminary Evaluation

Farmers will be reluctant to plant species for pole production if market ability is uncertain and/or prices are unfavorable. Therefore, market research is needed to determine the size, species, and profitability.

(C) Textile

C-1: Sericulture

Background

Traditionally, sericulture and weaving culture have been developed as a home industry. Sericulture offers household employment for village women. Currently, three kinds of house silkworm are bred in Lao PDR; white cocoon, cream-coloured cocoon, and yellow cocoon. Wild silkworms are also used. Attacus (Attacus atlas) and Erisilk (Samia ricini Boisdual) are also found.

Possibilities

Sericulture and weaving have a long tradition, and it is ideal as a local industry. Given good quality and increased production, it is possible to cater for the world market by producing a special and high quality silk.

Photo-5 Local Yellow Cocoon

Photo-6 Silk made from Yellow Cocoon

Preliminary Evaluation

It is necessary to improve quality and quantity of cocoons and mulberry feedstock. The Sericulture Research Center in Vientiane (established in 1970 with JICA assistance) is providing support activity for the sericulture business. The Center is undertaking research on:

- tolerance of silkworm species to the climatic conditions;
- commercial production of worm eggs;
- dissemination of sericulture in the remote areas; and
- Research into high productivity varieties of mulberry for sale to silkworm producers nation-wide.

To market Lao silk worldwide, four aspects of the sericulture industry should be examined; i.e.,

1) Mulberry silkworm quality is to be improved, and silk of international standards is to be produced (white and cream-colored cocoons);
2) Regional yellow cocoon silkworm is to be promoted.
3) Eri silkworm is to be promoted as healthy and easily raised wild silkworms.
4) Regional wild silkworm is bred, and market development is undertaken to make use of its uniqueness.

Mulberry silkworm eats leaf of mulberry, and wild silkworms eat leaves of a wide range of plants. Various qualities of textiles can be produced from the proposed four kinds of silkworms. Wild silk yarn comes in many colours like green, brown, and gold.

C-2: Cotton

Background

Cultivation of raw cotton and traditional weaving have evolved into a small-scale cottage industry. Farmers, especially the upland farmers, cultivate and weave cotton. Weaving offers opportunities for village women to generate income in the household.

Possibilities

At present, cotton is grown without using agricultural chemicals. Traditional cotton textile uses natural dyes and creates additional value. Demand for natural fibers and natural dyes will increase, though they are in niche markets.

Preliminary Evaluation

Classification of natural dye materials including indigo is required. It is also necessary to ensure that materials for natural dyes are preserved and not exhausted.

Photo-7 Weaving of Local cotton

Photo-8 Weaving of Local Cotton (natural dye)

C-3: Kapok

Background

Kapok trees are grown in many villages and round homesteads. Fibers from kapok fruit are used as stuffing for mattresses, pillows and cushions as an alternative to cotton, feathers and man-made fibers.

Possibilities

Kapok trees are easy to grow, and offer a wide range of products. Oil can be extracted from seeds, and husk are used as a dye material. It is also possible to use the wood in local industries.

Preliminary Evaluation

Volume of kapok trees there and current production of kapok fiber are yet unknown, and it will be investigated in the later phase of the study.

(D) Agriculture

D-1: Mushroom (edible fungi).

Background

Mushroom and other edible fungi are widely available, but they are seasonal. Some kinds of mushroom such as "Jew's-yar" and "Dry-Shiitake" are imported from Thailand and China.

Possibilities

Mushrooms are cultivated for year round production. Mushrooms can be dried, powdered or tinned, depending on demand and market prices.

Preliminary Evaluation

Information is available on mushroom cultivation, but it is necessary to investigate marketable species and their profitability. Market research is required to determine the varieties of mushroom and marketing system.

D-2: Apiculture (Bee-culture)

Background

Although collecting and selling of wild honey is reported in SKR, production system of agriculture is yet unknown.

Possibilities

Apiculture has considerable potential, and certain kinds of honey are highly prized. Eucalyptus honey is competitive if compared with Chinese milk vetch honey become it contains higher calcium, potassium and magnesium than vetch honey. Moreover, royal jelly, pollen and bees wax can be expected from apiculture.

Preliminary Evaluation

Apiculture promotion in combination with orchards and promotion of local industry in the upland communities should be further investigated.

D-3: Mill factory

Background

There exist small grain milling machines in most of towns and villages. There is also a milling factory in Savannakhet where soybean, peanut, and wheat are processed.

Possibilities

Grain processing produces value added to harvested grain, and enables its storage and preservation. In addition, the wastes from processed grains or beans can be used as animal feed, and compost.

Preliminary Evaluation

Milling can lead to production of various products such as noodles, bread, cookies, and cakes. Possible industrial development should be examined in combination with agricultural development.

(E) Fishery

E-1: Fish-processing

Background

Most fish products are sold fresh but some surplus is dried. Principal methods of processing are sun drying and smoking on trays over wood fires. Also, fish are fermented and processed into fish sauce.

Possibilities

Fish processing is an infant industry, but it will become more important when fish output is increased over the next 20 years. In addition to fish drying, there are more possibilities in freezing, cooking, canning and fermenting, as well as processing for animal feed for poultry.

Preliminary Evaluation

Promotion of fish breeding and fish production are prerequisites. Then, it is necessary to undertake market research on the kinds of processed fish in demand.

E-2: By-product use

Background

There are no existing processing factories, but future promotion of fish cultivation will bring about possibility of by-product processing. Fish offal can be used as fertilizers and animal feed etc.

Possibilities

Expansion of the fish by-products industry depends on expansion of fish processing. Potential of promoting by-product use should be examined together with fisheries development.

Preliminary Evaluation

Lack of market opportunities may curtail by-product development. Therefore, research is needed on possible uses and market demands for by-products.

(F) Livestock

F-1: Livestock-processing

Background

Most animal butchering is done in houses or villages in an unorganized way. There is a slaughterhouse in Savannakhet, but its processing is still in its infancy.

Possibilities

Livestock is one of the competitive industries in SKR, and it is envisaged to develop livestock breeding. Thus the number and kind of processing factories will increase.

Preliminary Evaluation

A processing factory is to be developed after promotion of animal breeding and animal production. Export market of meat and modern slaughtering will be first found in Thailand, but in the medium to long term, processing will be promoted in SKR.

F-2: By-product use

Background

Poultry are raised for egg production, and some other animals for milk production. Also, animal skins are used for various purposes. Animal offal can be used as fertilizers and feed.

Possibilities

Expansion of the animal by-products industry should be planned together with expansion of animal processing. Research should be done on profitable ways to use animal by-products.

Preliminary Evaluation

Lack of market opportunities may curtail by-product development. Therefore, research is needed on possible uses and market demand for by-products.

(G) Mining

G-1: Ceramic

Background

Raw materials for ceramic, i.e., clay, stone and glaze are available throughout SKR. Local products, however, have to compete with imported ceramic ware. Unglazed pottery appears to be comparable to imports, though glazed pottery is less competitive.

Possibilities

There will be an increased demand for bricks, tiles and pottery. If local ware is competitive with imports, like unglazed pottery, development sites and product mix are to be defined.

Preliminary Evaluation

Sufficient quality and quantity of raw materials for different types of ceramic should be secured. A survey should be undertaken to find out suitable sites.

G-2: Brick and tile manufacture

Background

Bricks and tiles are manufactured in a relatively small scale using simple moulds. Bricks are piled in stacks or clamps covered with soil/clay mixture and then fired with wood or other biomass fuels. Alternatively, small kilns are used.

Possibilities

There will be an increasing demand for building materials. Bricks are substitute for cement blocks and tiles for corrugated iron roofing. They are more environmentally friendly than cement or iron roofing.

Preliminary Evaluation

Suitable raw materials should be identified, and firing techniques should be acquired. Development of markets is another task with which local villagers will require assistance.

G-3: Pottery

Background

Pottery is manufactured in simple kilns usually with wood or rice husks as firing materials. In most cases, quality of pottery is the key for marketing.

Possibilities

There will be an increasing demand for pottery. Markets can be expanded for cooking pots, water containers, ceramic charcoal, wood stoves, plant pots and decorative items.

Preliminary Evaluation

Suitable raw materials should be identified, and firing techniques should be acquired. Quality control is quite important. Pottery items are environmentally friendly and substitute for metal and plastic containers of all kinds.

G-4: Lime burning

Background

Lime or calcium hydroxide is a chemical used to make soils neutral or alkaline. It is also used as raw material in cement and sugar industries, as well as for a cement substitute by mixing it with an aggregate to form mortar. Small-scale manufacturing may be in open kilns with wood as a heat source.

Possibilities

Application of lime to acid soils will maintain, if not improve agricultural productivity. Lime can also be used for construction of rural roads to bind the road aggregate. Khammouan province has large deposits of limestone, and any scale of lime production are promising.

Preliminary Evaluation

Technical assistance is required to develop large limestone resources in environmentally sound manners, to improve firing techniques, introduce quality control, and to develop new markets for the products.

V-2.4 Recommendable Local Products

1) Selection of Recommendable Products

100 local products listed in Table V.2-2 have been identified as potential industries in SKR. These products have been selected on the basis of the following criteria:

(1) Raw materials are easily obtainable at the local level,
(2) Products have marketability (domestic and/or international),
(3) Transportation of products are less difficult,
(4) Production activities are matched to nature and the environment, and
(5) Production is profitable and sustainable.

Further, out of 100 products, a dozen of products are to be selected as recommendable for implementation at the initial stage of the New Village Initiative. These products have been selected on the basis of the following criteria:

(1) Products are suitable from the view point of physical and social characteristics at the district level,
(2) Production activities have multiple impacts on social and economic life in the rural areas,
(3) Products have synergy effects on promotion of other industries.

As a result, 11 local products have been selected as promising industries to be implemented in the rural area under the New Village Initiative, as shown on Table V.2-4. Location or districts in Savannakhet and Khammouan provinces for promotion of these local industries are also noted in this table.

2) Linkage of Local Industry

Local industries are recommended for promotion in a form integrated with other sector development, as they are designed to make use of unused resources and waste materials. Integration with other sectors will also be required to have a synergy effect and to reduce the production costs. Likewise, it will promote self-reliance of societies in the rural area.

An example of linkage of local products is illustrated on Figure V2-2 attached. In this case, the cattle breeding and local industries are integrated to have multiple effects in the rural area.

In Tables V2-5 to V2-10, presented are linkages of local industries selected for implementation under the New Village Initiative. As seen in these figures, the proposed local industries have a wide range of production linkage with other

sectors, and development potential is enlarged through promotion of such an integration.

3) Recommendations

Local industries is to be promoted at the village level. It is recommended that promotion of 11 selected local products be implemented in combination with the proposed New Village Initiative (NVI). It is further recommended that a local product promotion center be set up in Savannakhet to support dissemination and marketing of local products.

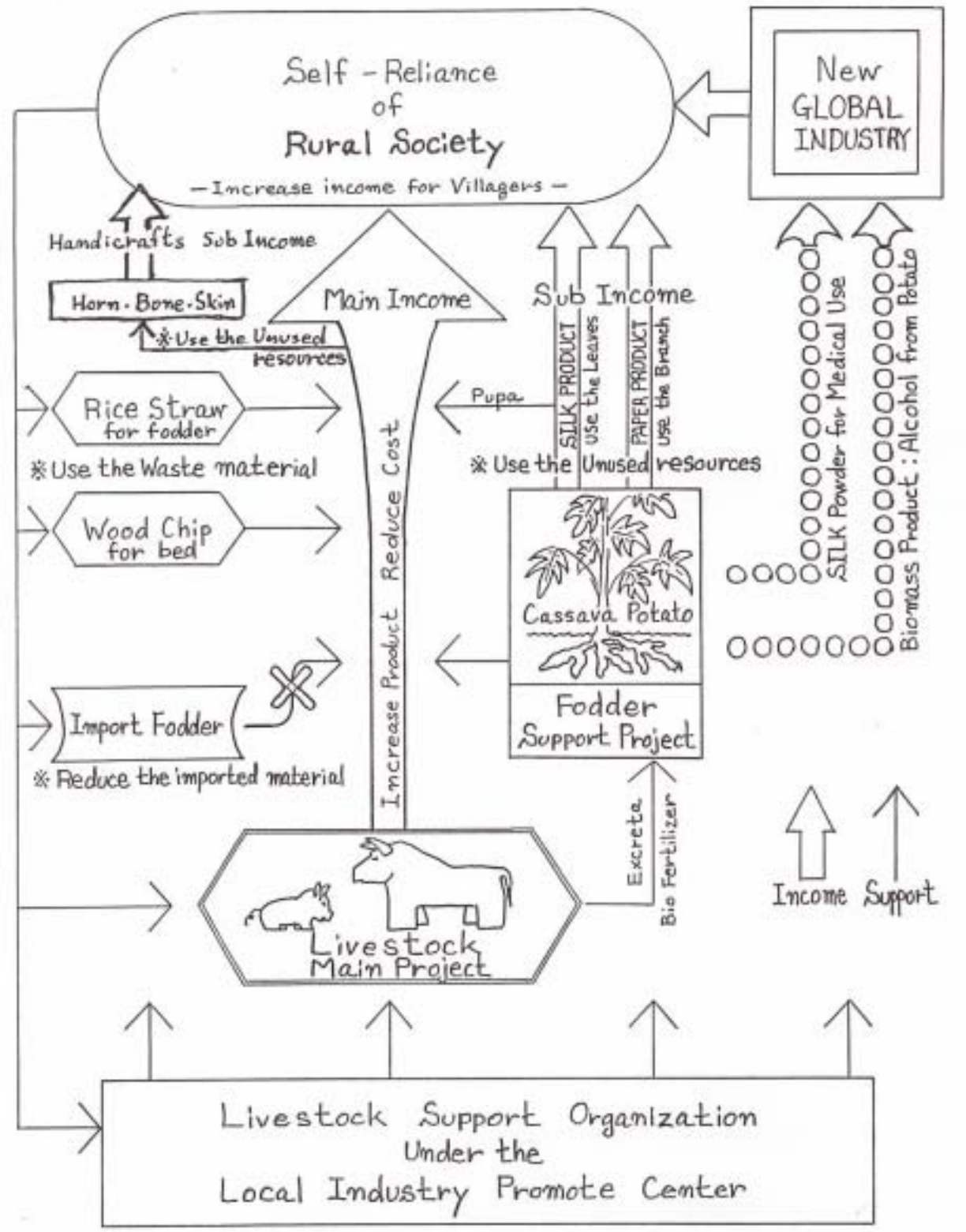
The plan for implementation of local industries is therefore studied further and incorporated into the NVI, as presented in Part 3: Priority Program Study Report, Chapter I.

Table V2-4 Promising Local Industries for Implementation

Savannakhet DISTRICT		A : Bio diversity					B : Forestry			C : Textile		
		Bio Compost	Non wood paper	Natural Dye material	Medical Herbal	Bee-Culture	Charcoal	Bamboo	Wood handicraft	Sericulture	Cotton	Natural fibers
Lowland	Khantabuly	○	○						○	○	○	○
	Songkhone	○	○								○	
	Champhone	○	○							○	○	○
	Xaibuly	○	○									○
	Xaiphouthong	○	○							○	○	○
Midland	Outhoumphone	○	○	○	○	○	○		○	○		
	Atsaphangthong	○	○	○	○	○	○					
	Thapangthong	○	○	○	○	○	○					
	Xonnabuly	○	○	○	○	○	○					
	Atsaphone	○	○	○	○	○	○					
	Phalanxai	○	○	○	○	○	○					
Highland	Phine				○	○	○	○		○		○
	Xepone				○	○	○	○		○	○	○
	Nong				○	○	○	○		○		○
	Vilabuly				○	○	○	○		○		○

Khammouan DISTRICT		A : Bio diversity					B : Forestry			C : Textile		
		Bio Compost	Non wood paper	Natural Dye material	Medical Herbal	Bee-Culture	Charcoal	Bamboo	Wood handicraft	Sericulture	Cotton	Natural fibers
Lowland	Thakhek	○	○						○	○	○	○
	Nongbok	○	○							○	○	○
	Xebangfay	○	○							○	○	
Midland	Mahaxay	○	○	○	○	○	○	○	○	○		○
	Hinboun	○	○	○	○	○	○			○	○	○
	Xaybouathong	○	○	○	○	○	○			○	○	
Highland	Nhommalad				○	○	○	○		○		○
	Boualapa				○	○	○	○		○		○
	Nakay				○	○	○	○		○		○

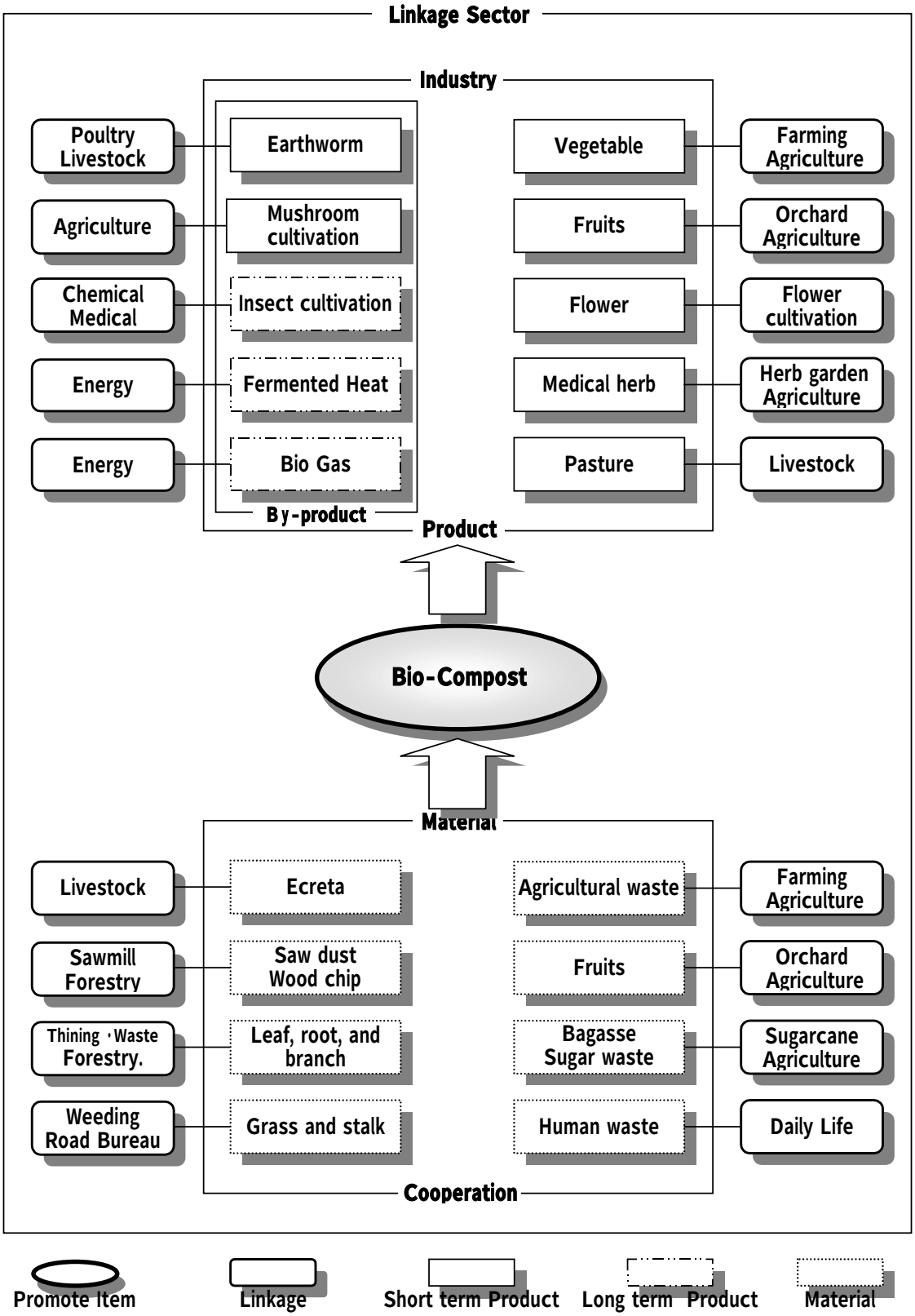
Source: JICA Study Team



Source: JICA Study Team

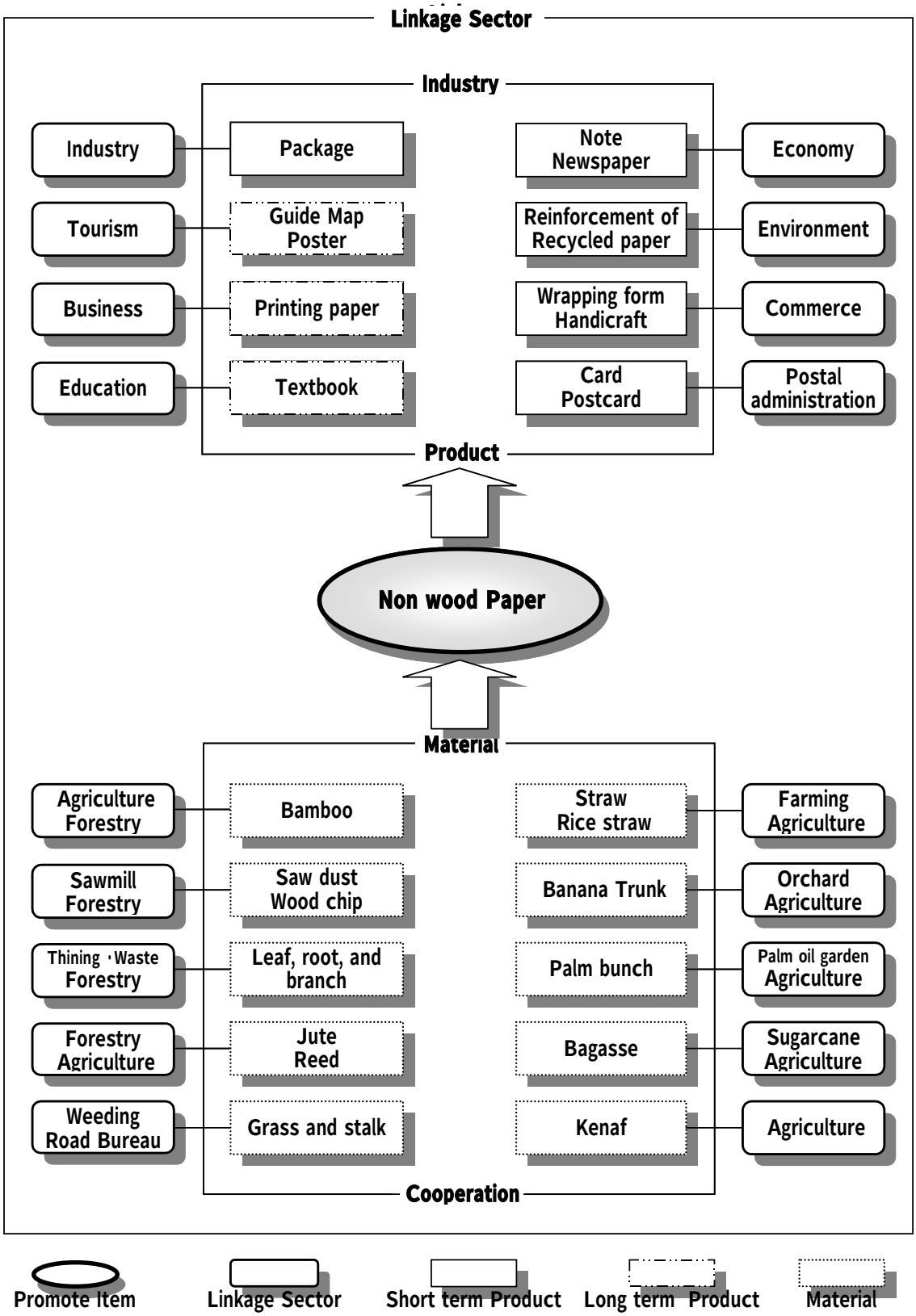
Figure V2-2 An Image of Local Industry Linkage: Livestock
[Start from Local, think Global]

Table V2-5 Linkage with Other Sectors: Bio-Compost Industry



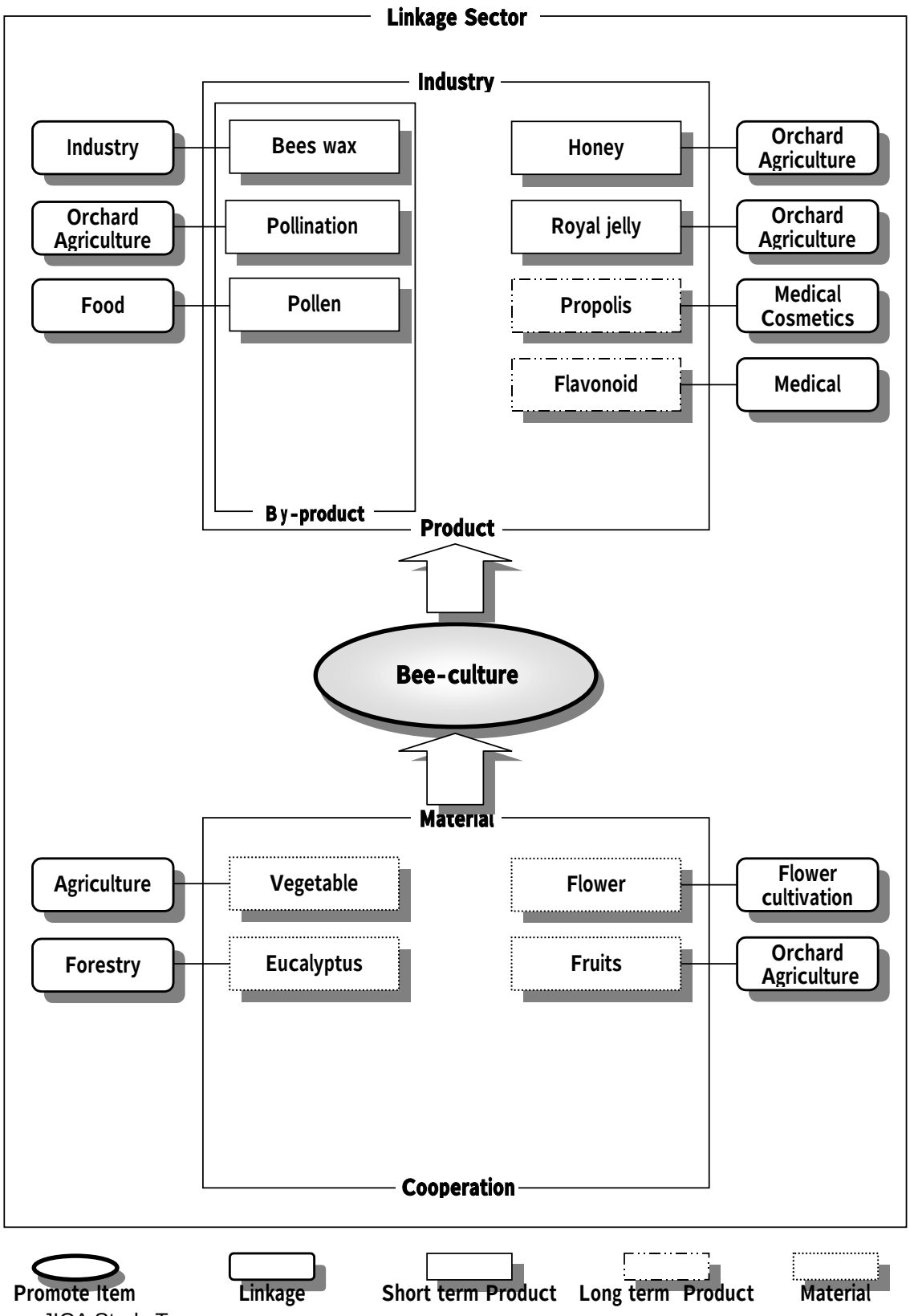
Source: JICA Study Team

Table V2-6 Linkage with Other Sectors: Non Wood Paper Industry



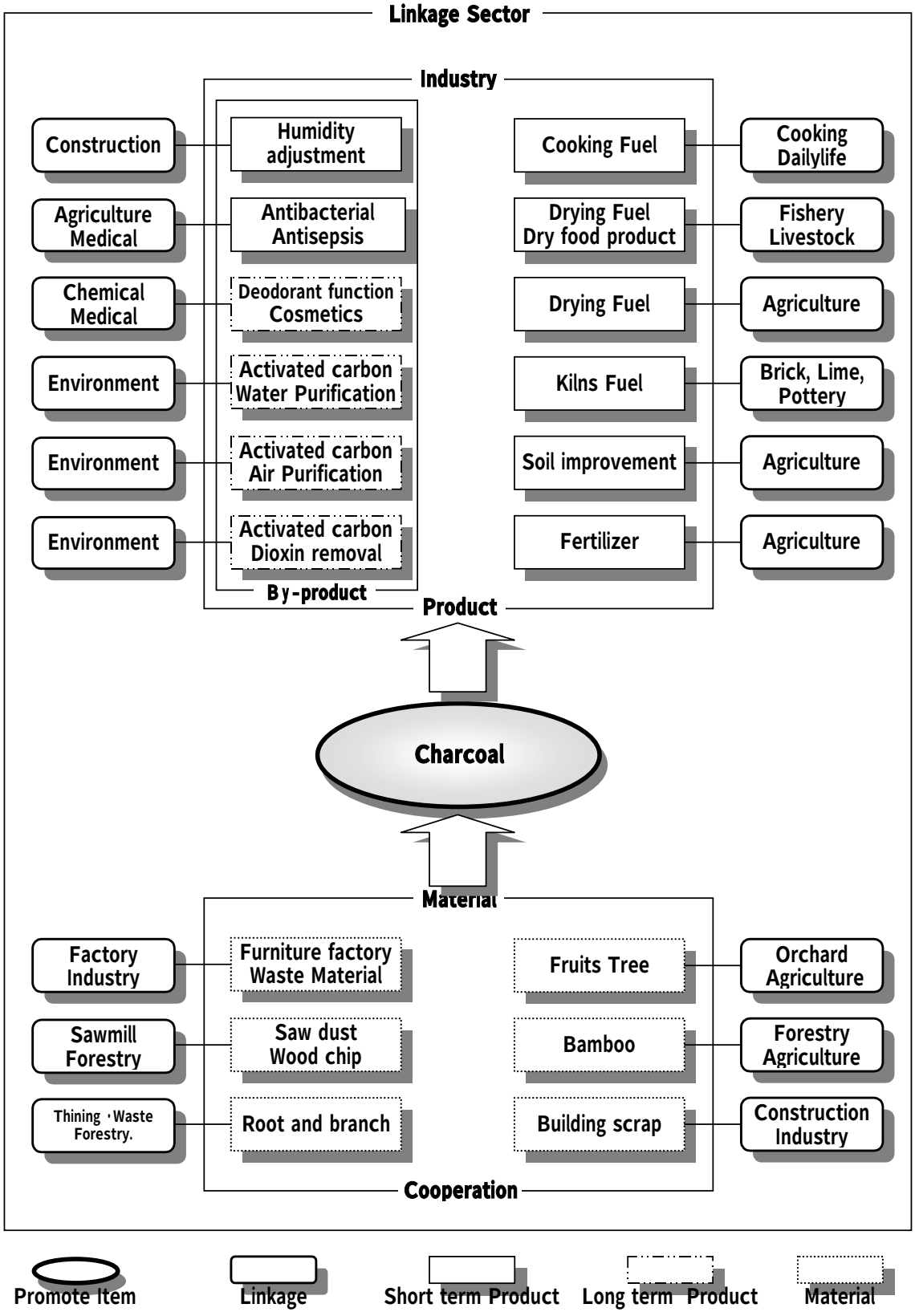
Source: JICA Study Team

Table V2-7 Linkage with Other Sectors: Bee-Culture Industry



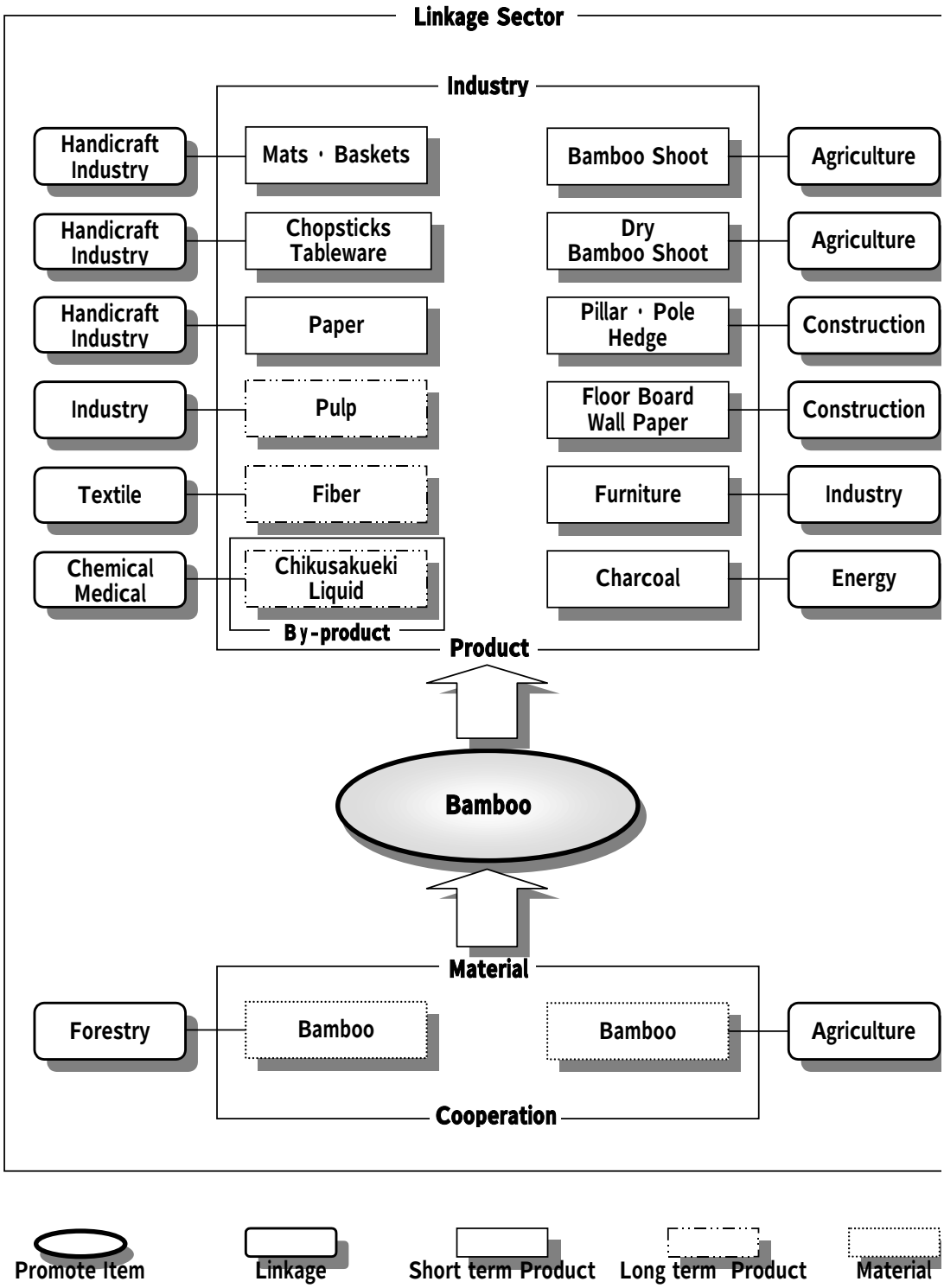
Source: JICA Study Team

Table V2-8 Linkage with Other Sectors: Charcoal Industry



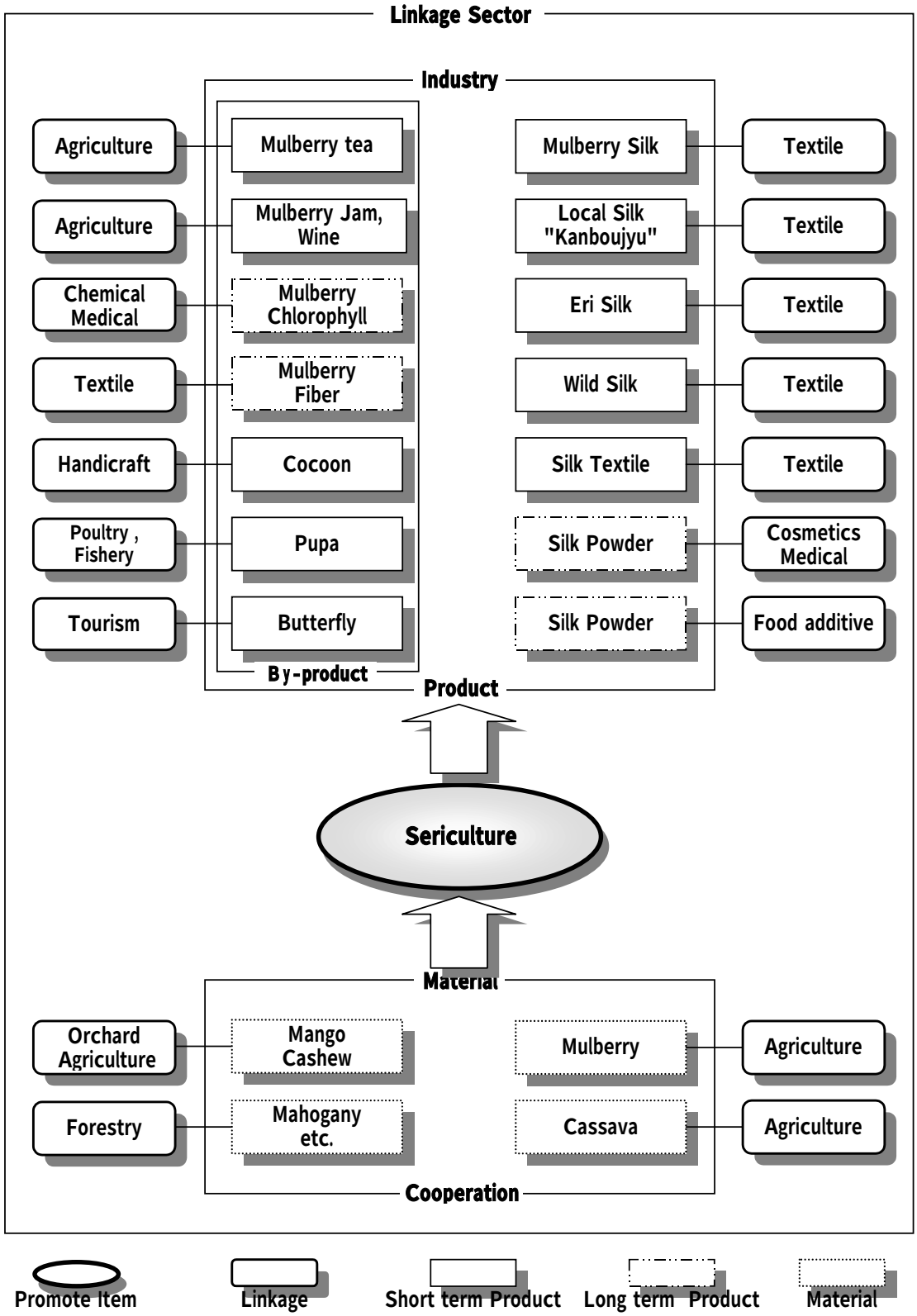
Source: JICA Study Team

Table V2-9 Linkage with Other Sectors: Bamboo Industry



Source: JICA Study Team

Table V2-10 Linkage with Other Sectors: Sericulture Industry



Source: JICA Study Team

V-3 FACTORY INDUSTRY DEVELOPMENT PLAN

V-3.1 Socio-Economic Development Plans

The 1996~2000 Socio-Economic Development Plan has been reviewed with regard to the industrial issues as summarized below.

The objectives of the National Plan were set to build up a balanced sectoral and regional economic structures focusing on the natural environment, and to gradually reduce the gap among urban, rural and mountainous areas. In order to achieve these objectives, the following growth targets were set:

(i) An annual average economic growth rate of 8~8.5 %;
(ii) An annual average growth rate of 12 % in the industry and handicraft sector;
(iii) The contribution of the industry and handicraft sector of 22 % to GDP by 2000; and
(iv) An annual increase in export and import by 12 % and 10.5 % respectively; and to hold down the external trade deficit to the level of no more than 12 % of GDP.

According to the Basic Statistics issued by the National Statistical Center, annual GDP growth rate was 6.8 % (1996), 6.9 % (1997) and 4.0 % (1998), while the annual growth rate of industry and handicraft was 19.3 % (1996), 9.2 % (1997) and 9.8 % (1998). On the other hand, exports increased by 2.6 % in 1996, went down to –1.4 % in 1997, and rebounded to 6.7 % in 1998. These figures are far below the growth target set by the plan. The reasons for such a low achievement can be attributed to the occurrence of the Asian economic crisis in 1997 on one hand, and administrative, institutional and legal constraints, as well as the immaturity of entrepreneurship in Lao PDR, on the other.

The 2001~2005 Socio-Economic Development Plan (2001~2005 Plan) is defined by the relevant authorities. The objectives of the 2001~2005 Plan include; (i) balanced distribution of income; (ii) promotion of domestic production capacity; (iii) improvement to the quality of industrial goods; and (iv) conservation of the environment; and (v) human resources development for industry.

The 2001~2005 Plan sets the growth targets in the following manner:

(i) To increase per capita GDP to the level of US$ 500 by 2005;
(ii) To attain an annual average GDP growth rate of 10.2 %;
(iii) To increase share of the industry to the level of 27 % of GDP; and

(iv) To attain an annual average industrial and handicraft sector growth rate of 10.8 %; and the minerals and quarrying sector growth rate of 11.2 %.

The provincial level plan is also being defined. For instance, Khammouan province sets an annual GPP growth rate of 11.5 %.

V-3.2 Objectives and Strategy of Factory Industry Development

1) Objectives

In view of the industrial prospects and constraints of SKR, as well as in the light of principles set under the 1996~2000 and 2001~2005 Socio-economic Development Plans, the objectives of the Factory Industry Development Plan for SKR are proposed to include the following:

(i) Utilization of envisaged population increase for industrial development;
(ii) Utilization of industrial development as a foundation to enhance the quality of life in SKR;
(iii) Establishment of a linkage between the primary and secondary sector, thus elevating the value-added and narrowing down of income disparity between the urban and rural areas;
(iv) Promotion of foreign currency earnings; and
(v) Establishment of international competitiveness in the industrial products.

The first objective is established on the basis that the population in SKR will grow at a fairly high average rate of 2.3 % toward 2020. Under the estimate, the current regional population of 1.07 million in 2000 will increase to 1.36 million in 2010 and 1.68 million in 2020. Rural population will increase by 221,000 in 2010 and by 443,000 in 2020, while urban population is increased by 69,000 in 2010 and 165,000 in 2020. The increase in the rural area is not expected to serve as work forces for the factory industry by 2010 because large-scale mechanization in agriculture is not anticipated in the forthcoming decade.

Contrary to the situation in the rural area, a proportion of the urban population is anticipated to work for the industry and services sectors. Assuming that 50% of the increased urban population would serve as the workforce, 30,000~35,000 in 2010 and 70,000~75,000 in 2020. This implies that a sizable number of industries can be established.

The second objective means that industrial development in SKR is limited to the food, beverages and tobacco, lumber, and garments sub-sectors. Eventually, the share of industry against total GPP both in Savannakhet and Khammouan has

been stagnated at around 10 % in the past. The current industries are insufficient to support a sizable growth of population by 2020. Therefore, the industrial development plan aims at setting a foundation to enhance the quality of life for SKR people.

The third objective is set to promote a linkage between the primary processing facilities, inter-alia, an up-stream facility based on local agricultural and industrial resources and the subsequent production facilities or a down-stream facility in the urban area. Thus, the primary and secondary sectors can be linked to each other and lead to a balanced distribution of income and enhancement of value-added in the respective sectors.

The fourth objective means that in relation to the second objective, the promotion of small and medium scale but potential export-oriented industries is required to earn foreign exchange and maintain consistent purchasing power and re-investment capacity.

The fifth objective refers that SKR should fully utilize the resources and strategic location to establish highly competitive industries, in terms of technology, marketing and management.

2) Strategies

To attain the objectives set for the factory industry development plan, several development strategies are proposed as follows:

(i) Conceptual Strategy

The concept of industries to be developed in SKR should be small and medium scale with an original design characterizing Lao culture, high quality, custom made, and eventually high value-added products. Thus, Lao industries should build up a direct contact with customers, and enhance competitiveness and elasticity capable of responding to a changing world market niche and be geared to timely delivery of goods.

(ii) Resource-based Strategy:

A modest industrial development strategy should apply to make the utmost use of locally available resources. Eventually labor-intensive or mass production type of industrial development will not be applicable to SKR.

(iii) Export-oriented Strategy

Consolidation of the current industries and development of the export-oriented industries is an urgent task in SKR. For pursuing these strategies, it is necessary

to improve a consistent supply of raw materials, and to modernize management and promote new market development. On this basis, it is also necessary to initiate a global export promotion and foreign investment attraction campaign for SKR.

(iv) Regional Development Strategy

In order to avail a spill-over effect of industrial development for the sake of enhancement of quality life in the rural area, primary processing of the locally-available raw materials should be encouraged to the greatest extent in the respective rural area. This process will avoid an excessive concentration of population in the urban area and reduce potential hazards including environmental deterioration in the urban areas. In contrast, manufacturing and finishing facilities should be built up in the urban area, either in an **industrial park, export processing zone, or special economic zone,** taking full advantage of the strategic location of SKR. In view of promoting an influx of foreign investments, the construction of a **special economic zone** should be an optimum solution.

(v) Industrial Manpower Development Strategy

Many of the current workforce have not been trained in manufacturing since raw material producers and assemblers have been predominant. The cultivation of a trained industrial workforce capable of manufacturing quality goods is an urgent requirement, in parallel to development of the industrial hardware. In this context, the establishment of vocational training facilities is an urgent necessity, hopefully as one of the functions of **the special economic zone**. The promotion of entrepreneurship and a self-reliant business mind among Lao businessmen is a prerequisite for the industrialization process.

(vi) Public Sector Strategy

With regard to planning, execution and evaluation of the industrial development policies, the accumulation of knowledge and experience amongst the relevant government officers has been relatively limited. The typical case is a lack of reliable industrial statistics in terms of national and regional basis. Intensive training for staff members in charge of industry with regard to all the issues concerning industrial development is an urgent task.

V-3.3 Framework and Scenarios

1) Framework

The GPP share of the agriculture, industry and services sector in **Savannakhet** in 2020 is predicted to be 32.4%, 18.3% and 49.0% respectively. The contribution of the Savannakhet economy toward the national economy is projected to be more

than 17% in 2020. The annual average growth rate of the industry sector is estimated to be 4 % for the mining and quarrying sub-sector and 10 % for the manufacturing sub-sector up to 2020. The annual average growth rate of the industry is estimated to be 10.1 % in 2000~2005, 15.4 % in 2006~2010 and 6.5 % in 2011~2020 .

Table V3-1 Framework of GPP in Savannakhet

(Billion Kip at 1999 Price)

	Savannakhet			
	2000	2005	2010	2020
Agriculture	993	1,325	1,682	2,400
Industry	219	354	926	1,358
Mining & quarrying	6	9	11	14
Manufacturing	163	246	560	1,091
Services	545	885	1,821	3,632
Others	10	13	16	279
Total GPP in SKR	1,767	2,577	4,246	7,417

Source: JICA Team calculation

The GPP share of the agriculture, industry and services sector in **Khammouan** in 2020 is projected to be 33.2%, 25.2% and 41.2%, respectively. The contribution of Khammouan GPP toward the national economy is estimated to be more than 7% in 2020. The annual average growth rate of the industry is estimated to be 4% for mining, and 10.7% for the manufacturing sub-sector in Khammouan up to 2020. The annual average growth rate of the industry is estimated to be 10% in 2000~2005, 13.9 % in 2006~2010 and 15.6 % in 2011~2020.

Table V3-2 Framework of GPP in Khammouan

(Billion Kip at 1999 Price)

	Khammouan			
	2000	2005	2010	2020
Agriculture	493	635	788	1,104
Industry	132	213	408	841
Mining & quarrying	8	11	12	17
Manufacturing	89	146	307	680
Services	240	380	686	1,372
Others	41	63	98	157
Total GPP in SKR	871	1,235	1,891	3,330

Source: JICA Team calculation

The employment share of the agriculture, industry and services sector in **Savannakhet** in 2020 is projected to be 79.4%, 3.8% and 16.8%, respectively. The annual average growth rate of industrial employment up to 2020 is estimated to be 5% both for mining and quarrying, and manufacturing sub-sector. The annual average growth rate of employment by industry sector is estimated to be 3.3% in 2000~2005, 3.0% in 2006~2010 and 6.8 % in 2011~2020.

Table V3-3 Framework of Employment in Savannakhet

	Savannakhet (thousand)			
	2000	2005	2010	2020
Agriculture	349.0	393.6	427	20.8
Industry	7.9	9.3	11	2.3
Mining & quarrying	0.9	1.0	1	12.4
Manufacturing	4.7	5.5	6	90.8
Services	34.3	40.4	47	-
Others	-	-	-	541.6
Total emp. in SKR	391.2	443.2	485	541,522.0
Total emp. in Lao PDR	2,539.0	2,871.0	3,212.0	3,447.0

Source: JICA Team calculation

The employment share of the agriculture, industry and services sector in **Khammouan** in 2020 is estimated to be 81.8%, 4.7% and 13.5% respectively. The annual average growth rate of the industrial employment up to 2020 is estimated to be 3.8% both for mining and quarrying, and manufacturing sub-sector. The annual average growth rate of employment by industry sector is estimated to be 2.7% in 2000~2005, 1.7% in 2006~2010 and 5.6% in 2011~2020.

Table V3-4 Framework of Employment in Khammouan

	Khammouan (thousand)			
	2000	2005	2010	2020
Agriculture	141.7	160.6	176	183
Industry	4.9	5.6	6	11
Mining & quarrying	1.0	1.1	1	2
Manufacturing	2.3	2.6	3	5
Services	14.2	16.1	18	30
Others	-	-	-	-
Total emp. in SKR	160.9	182.4	200	224

Source: JICA Team calculation

2) Modest Industrial Growth Scenario in 2000~2005

AFTA is scheduled for advanced ASEAN countries in 2003 including Thailand while it is scheduled for Lao PDR in 2008. There is a time lag of 5 years for Lao PDR to consolidate a foundation for industrialization. Therefore, the period of 2000~2005 should be set for consolidation and competitiveness enhancement of the Lao as well as SKR industry through a consistent supply of raw materials, expansion of production capacity, intense export promotion and foreign investment attraction. It should be a preparatory period to realize a sound industrial growth in the forthcoming period of 2006~2010. The annual average industrial growth rate during 2000~2005 is projected to be 10.1% in Savannakhet and 10.0% in Khammouan. A modest industrial growth scenario is proposed for 2000~2005 to establish an optimum solution against the existing constraints and a sound growth of the industry sector in SKR.

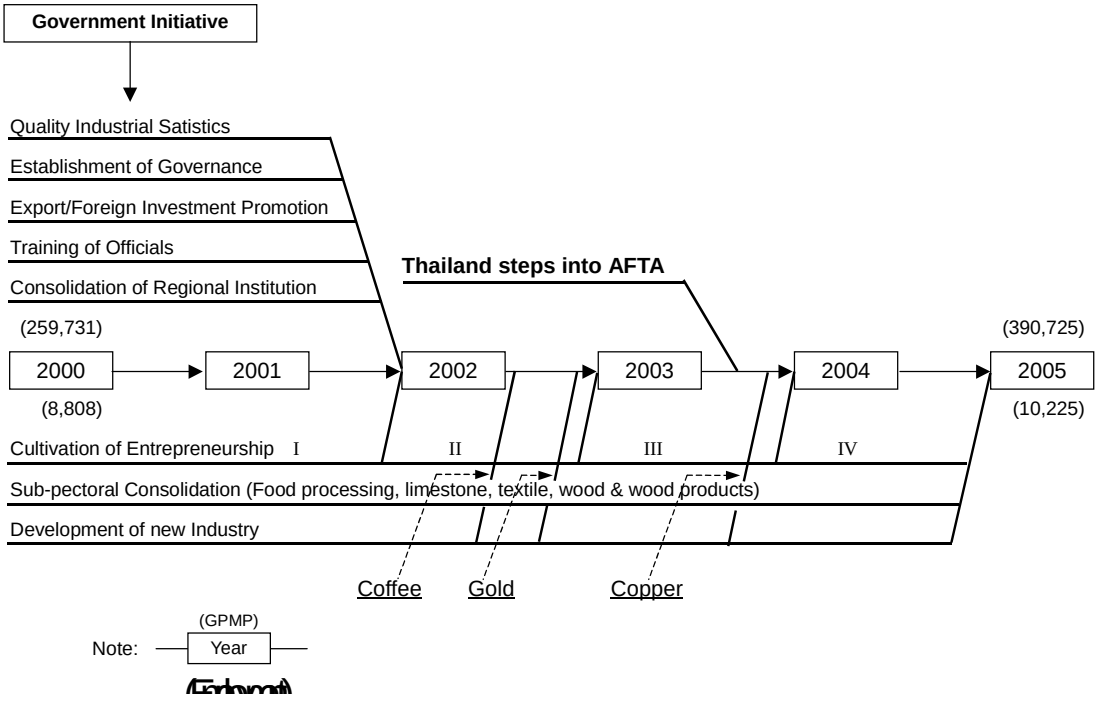


Figure V3-1 Industrial Development Scenario in SKR 2000~2005

(i) Establishment of Business Infrastructure

Provision of Quality Industrial Statistics

Industrial statistics, in conformity with the International Standard for Industrial Classification (ISIC), should be adopted by MOIH and regional authorities at the earliest, hopefully, toward the end of 2003. The Lao authorities should acknowledge that statistics are a face of the country.

Establishment of Governance Based on Legislation

The frequent issuance of government decrees as an implementation tool of laws is not advisable, since it leads to a loss of the concept of relevant legislation and eventually creates ambiguity among investors. If the issuance of decrees appears to be inevitable, a preliminary consultation and/or dissemination of the relevant information amongst all the relevant parties including public, private and foreign investors should be executed. A regulatory system of practical implementation of laws, namely, the governance should be established without delay.

Promotion Policy

Business promotion activities that the private sector has difficulty to execute should be taken care of by the public sector in this highlighted period of time. Export promotion including identification and re-examination of exportable items, and a new market development program including overseas PR activities should be employed by the public sector. Simultaneously, a massive foreign investment attraction program should be launched through overseas missions. These policies should be discussed and planned in 2001 and executed from 2002 onward. The private sector should fully cooperate with public sector activities through the input of a promotion strategy, joint organization and participation in a promotion mission.

Training for Government Officials

It is recommended to strengthen the administrative capability of the central as well as provincial government officers so that they can support the private sectors in fostering internationally competitive industries. With close coordination between the central and local authorities, an intensive and systematic training program should be designed and executed for industrial policy planning, execution and evaluation capacity as widely as possible amongst the relevant government officials. One of the highlighted subjects could be the development procedures, operation and management of the forthcoming Savannakhet SEZ. The project should be discussed in 2001 and put into practice in 2002. The gain from the training should be smoothly utilized toward the operation and investment promotion activities in the SEZ.

Consolidation of Regional Institutions

In response to increasing development activities in SKR, inter-alia, upgrade of Route 9, the New Mekong Bridge, the proposed SEZ and the subsequent promotional activities, an institutional consolidation including the establishment of an optimum organization is essential. In conformity with the allocation of the relevant budgets, the program should be undertaken by the end of 2002 at the latest.

Cultivation of Entrepreneurship

An intensive training program in promoting entrepreneurship for the private sector should be planned and implemented. The subjects for training would include business opportunity identification, planning, corporate management, factory management, quality and productivity improvement and corporate modernization. The program should be planned in 2001 and implemented accordingly.

(ii) Construction of Savannakhet SEZ

Unless SKR receives foreign investments, it seems difficult to foster industry. Taking full advantage of the completion of infrastructures and taking the strategic location of Savannakhet into consideration, **the construction of Savannakhet SEZ** is proposed as the best solution of attracting foreign investments and activating East-West business transactions. The SEZ will also promote the location of local industries at more favorable conditions than they are currently enjoying. Thus, the construction of SEZ will be considered as a potential “sparking off” project in the overall process of industrial development in SKR toward 2020.

The proposed SEZ should be established under a special and independent legislation to ensure (a) incentives superior than those of other ASEAN countries, (b) foreign currency exchange, (c) repatriation of profit, (d) supply of utilities and high quality services and (e) autonomous operation of SEZ by a relevant authority to be established. The outline of the recommended functions and facilities to be attached to SEZ is illustrated below.

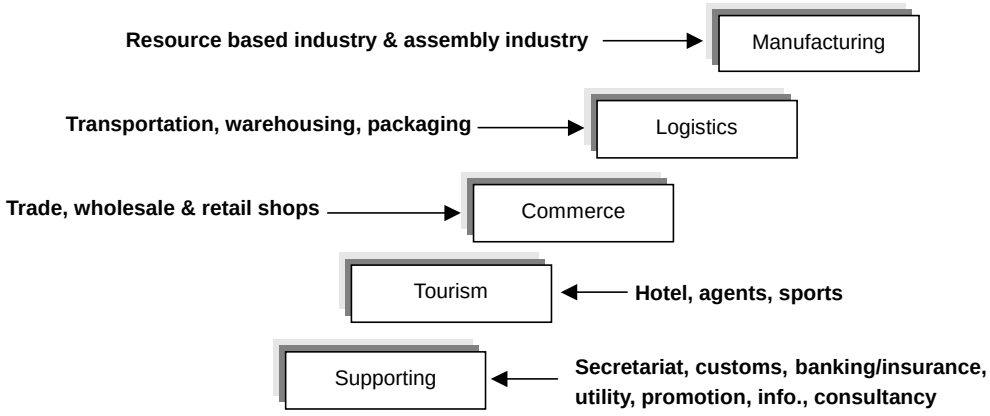


Figure V3-2 Major Functions of SEZ

(iii) Sub-sectoral Consolidation and Development

Gypsum

Gypsum**,** despite the identified large-scale deposit with high purity over 90 % in the Dong Heng area, the production has been stagnant at around 100,000 ~130,000 tons per annum. Most of it is being exported to Vietnam where domestic gypsum production is marginal. The first action to be taken by Dong Heng Gypsum is a detailed market survey, particularly in Vietnam. The survey should further cover other Southeast Asian countries including Japan, Korea and Taiwan where they have been consistently importing a large quantity of gypsum. At the mine site in Dong Heng an utmost effort should be taken to install modern exploitation machinery, thus cutting back the production cost and sustain consistent production. On the other hand, utilization of gypsum for industrial processing should be promoted for domestic markets and exports.

Gypsum for Sanitary Ceramics in Savannakhet

" For producing any kinds of quality products, quality of raw materials is surely important. However, for molded products, materials for molds may also be a critical factor to meet a high quality standard of such products," the managing director of a Khon Kaen-based sanitary ware company explained in an interview with our study team. Producing 160,000 pieces of toilet ceramics a year, the company has a substantial market share in Thailand. Since the mid 1990's, the company has expanded its sales boundary to the Indochina market including Lao PDR, Burma and Cambodia. The managing director believes that the Indochina market has a high potential.

He expressed his intention that if the East-West corridor is upgraded, he may think about entering the Vietnamese market by establishing a new manufacturing site in Savannakhet. In fact, Bangkok-based competitors are selling their sanitary ceramics products through Lao PDR to Vietnam. Because sanitary ceramics ware uses gypsum as a material for its molds. The existence of high purity gypsum in Savannakhet may attract such companies. By locating new manufacturing sites in Savannakhet, they may be able to utilize the gypsum at a minimum transportation cost. An abundant reserve of high purity gypsum together with the strategic location of Savannakhet for the Indochina market could attract companies using gypsum in their production processes.

Limestone

Regardless of whether to build up a cement plant, the exploitation of limestone should be expanded through installation of a modern quarrying plant. The production should reach at least 1 million-ton per annum. This leads to the reduced production costs and promotes exports to Thai markets.

Copper Mining

A middle scale **copper mine** is proposed in Vilabuly district in Savannakhet Province. According to exploration information available, gold associated copper deposit containing one million tons of metal copper and 3.5 million ounces (100 tons) of gold has been identified. Upon confirmation of its' viability, the mine company will launch gold production in 2002 and copper in 2003. The impact of opening of the mine is substantial in terms of a social and economic growth in SKR, rural development and employment generation since the mine complex usually includes various auxiliary facilities such as housing, school, hospital, shops and repair shop.

Food Products and Beverages

The food processing industry should play a leading role in the short as well as long run. The establishment of a consistent supply of raw materials at the rural level is a key to consolidating this sub-sector. Identification of marketable items based on potential cash crops should be pursued. For instance, raw materials for the existing edible oil factory in Savannakhet should be secured through the expansion of soybean, peanuts, and other cultivation. These initiatives will assist the foodstuff industry and help development of SKR economy in two ways, as import-substitution and export-promotion industry.

Coffee

The coffee processing industry can be developed in SKR as one of the potential export-oriented industries, though the major bean production area is in Boloveng plateau in Champasak Province. Improvement of Route 9 makes SKR an export base for processed coffee for Southeastern markets through Da Nang. The market expansion has been attributed to the invention of new byproducts in addition to consuming coffee just as coffee, such as canned coffee, milk coffee, coffee jelly and confectioneries. A private initiative by Coffee Exporters Association in Champasak should be encouraged to market “Cafe Lao” through an invitation of foreign coffee importers, the organization of PR mission overseas, or an advertisement through the Internet. A coffee-processing plant by Lao investors can be located in Savannakhet SEZ aiming at exports as well as marketing to hotels and all the service facilities to be located in the zone. The latter case extends a quick pay back opportunity for the industry.

Textiles

The textile industry in SKR is represented mainly by **garments.** Additional investments may be sought in view of the fact that the Thailand textile industry will loose its competitiveness after MFA expires in 2005. In contrast to the positive observations for Lao textile industry as above, a dialogue between textile industrialists and the Ministry of Industry and Handicraft should be held to discuss a conceivable negative impact of MFA.

Wood & Products of wood

It should be acknowledged that an unstable supply of logs has forced sawmills and furniture manufacturers to be hesitant in deciding new investments. The majority of exports of wood and wood products, therefore, are low value-added, and the most of value-added factors are being enjoyed by other countries, which have imported and processed the Lao materials. The organization of a **Log Auction Facility** in Thakhek is recommended for the consolidation of the wood related industry and even for the initiative of forests. A new market initiative should

be initiated to search into buyers' interests on quality furniture, furniture components and interior and exterior based on wood. A public versus private sector dialogue to discuss marketing strategy should be organized in 2001 and execute a survey in 2002 and 2003.

An idea of establishing the Woodworking Industrial Park (WIP) in and around Thakhek should be discussed. WIP will include the location of wood and wood products industries, joint designing, marketing, testing, and research and development of new items. Those activities should be supported by incentives including the guarantee for the supply of logs and fiscal incentives.

Pulp & Paper Mill

A eucalyptus plantation concession covering 50,000 ha located to the northwest of Thakhek has been granted to a joint Lao and New Zealand firm. The joint firm intends to produce either wood chips, or pulp in 6 to 7 years when the first crop of 400,000~450,000 tons of eucalyptus is expected. The feasibility study was recently completed as far as plantation segment is concerned.

Cement

As a result of exploration made by a Thai firm, a large-scale limestone deposit was confirmed in Muang Mahaxai District in Khammouan Province. All raw materials are available, except for coal, which could be transported from Vang Vieng, north of Vientiane. Currently, 90% of cement demand in Lao PDR has been supplied by imported cement mainly from Thailand. It is estimated that the demands will climb up to approximately 1.6 million tons in 2005, of which 1.3 million tons should depend upon import. The foreign currency to be paid to this import is estimated to be nearly US$100 million, which accounts for about 18% of total import in 1998. Whether or not a cement plant is constructed in Khammouan, an intense effort should be taken to make fully use of limestone, which is a potential and abundantly available indigenous natural resource. If the project viability is confirmed, the construction of the third cement plant will take place in Muang Mahaxai.

3) Sound Industrial Growth Scenario in 2006~2010

The period of 2006~2010 is proposed to be the period of enhancing the **competitiveness initiative** among SKR industries. To this end, it is required to strengthen value-added factors of resource-based industries and manufacture final goods based on the consolidation achieved in 2000~2005. In addition, development of new resource-based industries should be envisaged in 2006~2010. The focal point of these developments should be in SEZ, while primary processing facilities are planned to be established in the rural area.

Major industries that could be developed in SKR are pulp and paper, cement and automotive industries. Those industries planned and launched in 2000~2005 will increase or stabilize their production capacity. Needless to say, ever-lasting foreign investment attraction and export promotion drive should continue. It should be noted that Vietnam should step into AFTA from 2006. An intensive export promotion drive will be focussed on Vietnam.

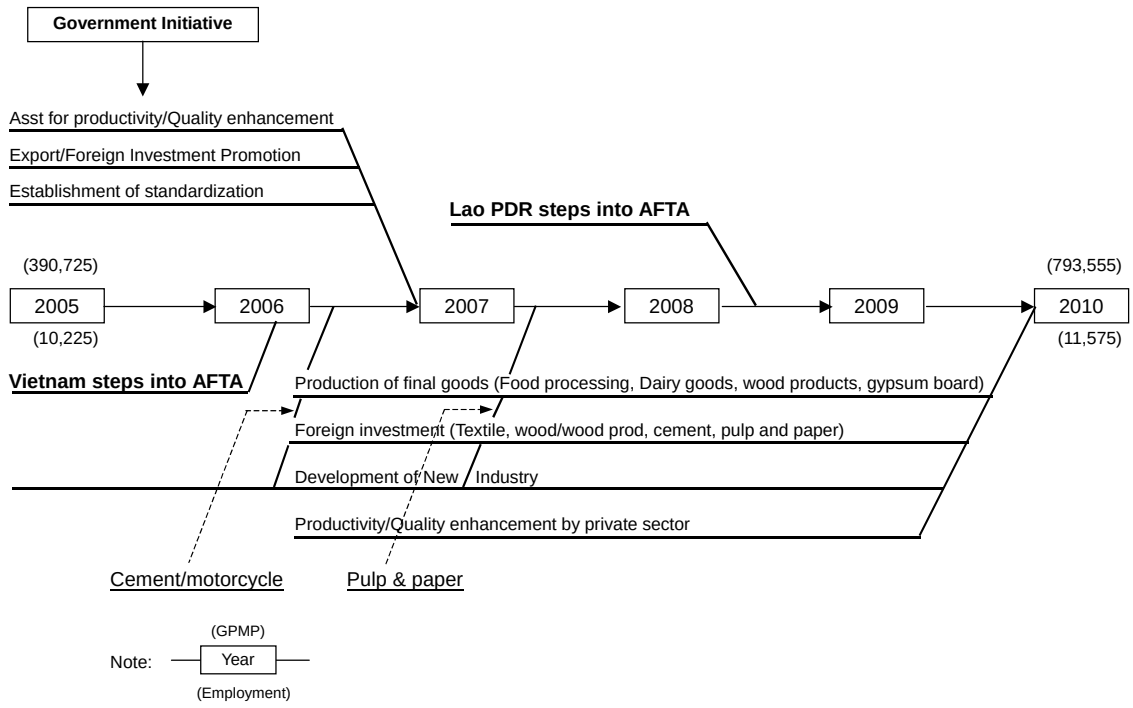


Figure V3-3 Industrial Development Scenario in SKR
2006 ~ 2010

(i) Support by Public Sector

Major support by the public sector in the period of 2006~2010 will include the application of quality and productivity enhancement for Lao industrial goods to be competitive in international markets. A factory diagnosis and management modernization program is envisaged. A business training facility established in the Savannakhet SEZ should widely transplant and disseminate the importance of productivity and quality enhancement for the designated trainees from relevant industries. A quality accreditation system of the **Lao Industrial Standard (LIS)** can be discussed for realization under the coordination of central and local authorities to promote quality enhancement among the Lao business circles.

Promotion Activity

An international marketing strategy should be worked out in the light of AFTA to be applied to Vietnam in 2006 and Lao PDR in 2008. Public and private sectors in SKR should concentrate on competitive goods that can be exported to Vietnam, Thailand and other Asian countries and draw up export strategy. In addition, a global public relation campaign for marketing Lao products should be undertaken. Public support measures with regard to foreign investments promotion in relation to the completion and launch of Savannakhet SEZ should be further strengthened. Promotion of investments in specific target industries and in specific countries is recommended.

(ii) Sub-sectoral Development by Private Sector

Food Products and Beverages

The food processing industries continues to raise quality and produce various end products such as canned or bottled mango and pineapple juice, refreshments, fruits such as melon and pineapple, pickles, and nuts and corn. As the food processing industry grows, a can making and/or a bottle making plant should complement the food processing industry.

Textiles

Making the best use of the incentives available at Savannakhet SEZ, the campaign to attract foreign investment should be continued. SKR should avoid a serious closure of garment firms. Instead of simply attracting foreign capital, a self-effort in promoting a Lao brand should be envisaged. There is a cotton-based garment manufacturer in Savannakhet that has developed “Jurgen Lehr” Brand by itself and exported the products to the Japanese market. It is important to foster the garment manufacturers based on Laotian investment. The selection of new items is also important. For example, various linens, which are marketable to hotels and service facilities in Savannakhet SEZ, should be taken into consideration by garment manufacturers.

Wood & Wood products

The wood and wood products industry should expand the production of more furniture components and furniture rather than sawn timber. For the sake of its transformation, a continued, regulated logging and the strict control of log exports imposed by the Lao authority and its transparent execution are prerequisites. This sub-sector should focus on producing high quality furniture taking advantages of quality raw materials available in SKR and Lao PDR. There is a consistent market niche in many high-income counties appreciating high quality furniture. The marketing drive should include overseas missions, participation in trade fairs, and more importantly through the **Internet**, thus the sub-sector can respond quickly to changing market needs. Also important is the marketing of furniture and furniture components to hotels and other service facilities to be established in the Savannakhet SEZ.

Pulp & Paper Mill

A plant could be built up at Nam Thon, 100 km northwest of Thakhek, adjacent to the eucalyptus plantation. The plant will produce 400,000 tons of wood chips, or 200,000 tons of pulp. The products will be exported mainly to the Southeast Asian countries. In addition to merely exporting wood chips or pulp, development of down stream industries such as craft paper, and/or cardboard mill will be planned to produce office supply and packaging materials in Savannakhet SEZ. The demand for those materials in SEZ could be consistent due to the transportation, distribution and other service facilities to be located in SEZ.

Biomass Ethanol

If the price of petroleum is as high as US$ 35 around 2006 (at 2000 prices), the production of biomass ethanol would receive special attention. Since the foreign currency to be paid for importing petroleum in Lao PDR in 2005 is estimated to be over US$ 100 million a year compared to the current figure of US$ 60 million, the impact on international trade balance is significant. A detailed study and decision on whether Lao PDR should establish biomass based ethanol plant should be conducted, in addition to the possibility of developing hygene energy in the country.

Gypsum Products

Gypsum mining should attach a downstream, for instance, gypsum board and other building materials and plaster. Those items can be widely exported to Asian countries as wall and ceiling materials. In accordance with the expansion of cement production in Lao PDR, local consumption of gypsum is also expected to increase. A gypsum board and plaster making plant can be established near the Dong Heng Mine.

Cement

If the price of petroleum stands at more than US$30 at the beginning of 2005, the feasibility of coal-burning cement plant becomes affirmative. A timely decision of building the third cement plant in the Muang Mahaxai area should be made. The foreign currency saving effect would be significant.

Copper Mining and Copper Products

A copper mine in Vilabuly would have operated at full-scale in this period. In order to increase value-added in SKR, it is envisaged to develop metal working industry as a down stream of the copper mining project. Attention can be drawn to production of electric wire, copper tubes for household appliances such as refrigerator, and doorknobs, locks and keys. The last three products can be linked with door production in wood and wood products sector for further enhancement of value-added.

Automobile

The assembly of motorcycles has been actively operated in Vientiane, supported by a strong domestic market. The interest shown by a motorcycle assembler for relocation of either an assembly plant or warehouse to Savannakhet SEZ should be investigated. The automotive industry usually carries, in its character, a possibility to grow various peripheral industries at a later stage.

4) Sustainable Growth Scenario in 2011~2020

The major industrial developments in SKR based on indigenous natural resources could be completed by 2010. It is estimated that the population growth rate would be lowered in the latter half of 2010s in SKR specifically in the rural area. Therefore, in order to maintain balanced development among primary, secondary and tertiary sectors, extraordinary inputs of rural-based workforces toward industrial development is not fully recommended. In the period of 2011~2020, those industries consolidated and established by 2006~2010 will be operated at full capacity while the traditional industries tend to decrease their share in comparison to other sub-sectors, while resuming sustainable operations. A foreseeable threat in 2011~2020 is the gradual and inevitable decline of competitiveness in labor intensive industry, which should be shifted toward lower-wage countries. One of the important scenarios in this period would be a modification of labor intensive industries, or the identification of appropriate sub-sectors of higher value-added.

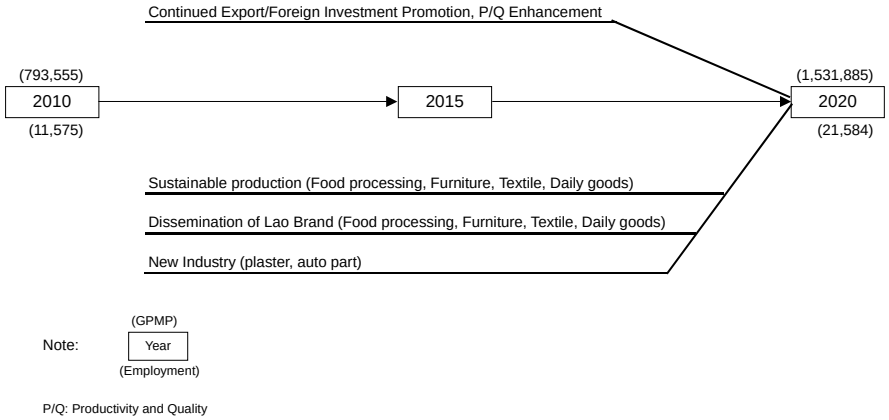


Figure V3-4 Industrial Development Scenario in SKR

2011~2020

Traditional Sub-sectors

Per capita GDP in SKR is estimated to be around US$ 600 at this period of time. In line with an increasing purchasing power in the local market for food processing, beverages, furniture, and dairy goods, the consumer industries will expand their production while decreasing their share against GPP. In addition, those sub-sectors should disseminate the respective Lao Brands in targeted markets, and further improve the quality and productivity in order to sustain their competitiveness.

Gypsum products

Gypsum board and plaster production will be further expanded as domestic construction activities will be activated in SKR. In addition, the demand for quality plaster in the medical sector is expected to increase as GDP per capita grows. Aiming at both local and foreign markets, the medical plaster plant can be located in SKR.

Copper mining and Copper Products

The copper mine in Vilabuly would have depreciated the original costs of investment around 2010, the mine will expand its production capacity and further contribute toward the GPP growth in SKR. Based on a careful study, down stream industries could be located in the Savannakhet SEZ.

Pulp and paper

The pulp plant at Nam Thon could reach full-scale operation in 2010. During 2011~2020, as is the case of the copper project, contribution toward export and GPP growth should be more substantial. In addition, the production of the paper mill will be expanded in line with a surging domestic demand for paper.

Automotive industry

In line with the growth of population to 1.3 million and GPP per capita to US$ 600 in SKR in 2010, the local market for motorcycles between 2011~2015 would be increase to the level of one motorcycle per family (suppose 6 persons/family). It enables the assembly capacity to expand to about 150,000~200,000 per annum. This production capacity usually enables venders to develop spare parts, and they are invited to locate in the Savannakhet SEZ.

5) Manufacturing Development Targets

Manufacturing development targets to be set for the major industrial sub-sectors in SKR is referred to in the next table. In Savannakhet, after completion of SEZ in 2004, new sub-sectors such as high quality furniture, and cardboard, doorknobs, keys and locks, motorcycle assembly and/or warehouse plants will be located. These investments will elevate the manufacturing output from Kip 560 billion in 2000 to Kip 4,230 billion in 2020. Taking the value-added factors of the respective sub-sector into consideration, the contribution to GPP in Savannakhet is estimated to be approximately Kip 1,100 billion in 2020 at 1999 prices.

Table V3-5 Forecast of Manufacturing Output in Savannakhet

(Billion Kip at 1999 price)

ISIC	2000	2005	2010	2020	Remarks
14 Mining and quarrying	84	130	165	222	Gypsum
15 Food, beverages, tobacco	124	180	440	717	
17 Textiles	164	241	388	764	Garment
20 Wood and wood products	N.A.	40	146	285	High quality furniture
21 Paper and paper products	N.A.	N.A.	76	158	Kraft paper, card board
24 Chemcals, chemical products	32	49	79	205	Rubber and plastic auto parts
26 Non-metallic mineral products	N.A.	N.A.	192	373	Gypsum board, plaster
27 Basic metals	N.A.	483	561	651	Copper, gold, doorknobs,keys
29 Machinery and equipment	48	330	330	330	Motorcycle asse'y, warehouse
Others	111	168	270	527	
Total	563	1,621	2,647	4,232	

Source: JICA Team estimates.

In Khammouan, provided that a Woodworking Industrial Park is established with a log auction market, integration of current sawmills, location of new furniture component and furniture sub-sectors are foreseeable. In addition, pulp industries will locate to the northwest of Thakhek. These industries are driving forces to elevate the manufacturing output in Khammouan from Kip 410 billion in 2000 to Kip 2,700 billion in 2020. Putting the value-added factor of the respective sub-sectors into consideration, the contribution to GPP in Khammouan is estimated to be approximately Kip 680 billion in 2020 at 1999 prices.

Table V3-6 Forecast of Manufacturing Output in Khammouan

(Billion Kip at 1999 price)

ISIC	2000	2005	2010	2020	Remarks
14 Mining and quarrying	1	2	3	3	
15 Food, beverages, tobacco	340	420	570	960	
20 Wood and wood products	26	89	149	294	Funiture component, furniture
21 Paper and paper products	N.A.		417	821	Pulp/Paper
26 Non-metallic mineral produc			210	410	Cement
29 Machinery and equipment	1	1	2	2	
Others	40	65	110	215	
Total	408	577	1,461	2,705	

Source: JICA Team estimates

V-3.4 Factory Industry Development Plan

In conformity with the concept of the macroeconomic projection as well as by applying the development strategies proposed, the following industrial development plan should be pursued.

1) Competitiveness Initiative

The factory industrial development projects in SKR are combined into the promotion of Competitiveness Initiative both at the public and at the private sector levels.

As far as the present environment in Lao industry is concerned, it is not so optimistic. For example, the large international trade imbalance, chronic shortage of foreign currency, and volatile foreign exchange rate, have stagnated industrial development. On the other hand, the Lao population is forecasted to increase at an annual growth rate of 2.2% from 2000 to 2020. The current economic structure heavily dependent upon agriculture and will not be able to elevate the standard of living of the growing population. Definitely, an increased presence of the industry is necessary.

In this context, there is a question whether Lao industry can compete with those in Thailand, Vietnam, or other Asian countries. The Lao industries have stagnated at a small output level due to a sporadic and inconsistent supply of raw materials. Most raw materials for industry are imported, and the majority of value-added elements occur in foreign countries. There are few choices for Lao PDR to overcome these issues and compete in the international market. The solution must be to develop industries with high efficiency and high quality concepts taking full advantage of indigenous natural resources, that should be founded on the enhancement of the Competitiveness Initiative.

(i) Necessity of Competitiveness Initiative

The reasons why the cultivation of competitiveness initiative is indispensable for SKR, as well as for Lao PDR, are as follows.

Termination of MFA and adoption of AFTA

The termination of the Multi Fiber Agreement (MFA) in 2005 exposes the Lao garment industry to global competition in the international market. The adoption of AFTA from 2008 forces many of Lao export-oriented industries to cut back export prices in order to promote further exports.

Secure of Bargaining Power

It is necessary for a land-locked country like Lao PDR to secure a bargaining power for industry and its economy. To be more advantageous than surrounding countries, it is important to have highly developed industrial technology and know-how to process natural resources, and competitive export items.

Development of Value-added Industry

The mere export of the precious natural resources or the export of less processed products should be eliminated from the long-term development perspective at every level and hierarchy. The solution for this issue is the consolidation and sound development of a **value-added industry** based on the cultivation of the spirit of **competitiveness initiative** at the public and the private sectors in SKR.

(ii) Towards Cultivation of Competitiveness Initiative

Despite the current difficulties surrounding the Lao economy, it is possible to elevate the **competitiveness** if optimum legislative, administrative and institutional support measures are provided by the public sector and entrepreneurship is promoted among the SKR business sector.

Creation of A Lao Image or Lao Brands

SKR produces a variety of products for domestic consumption and for experts to the international markets. These products, however, have no brand name because most products for exports are not marketed by local enterprises. Consequently, the markets have no image at all that the produces have been produced in SKR. This makes the products low valued. When the market economy is advanced and when AFTA becomes effective for Lao PDR in 2008, the SKR products face global competition. To make the SKR products competitive in the global market, they should have brand names giving the market same images peculiar to SKR or Lao PDR. This is particularly true when SKR produces niche produces for niche markets.

A possible approach to initiate the creation of SKR brands or Lao brands is to promote the production of “ecology-friendly” products or “eco-products” in SKR. When SKR products niche products for niche markets, such niche products should bring with them an image that they are “eco-products” produced in SKR or Lao PDR. The image of SKR and Lao PDR for “eco-products” should be gradually expanded to niche international markets.

Public Sector Initiatives

The legislative, administrative and institutional supports for a limited period are necessary to put SKR industry on a sound development track. Otherwise, the enhancement of competitiveness seems unclear under the current business environment where the private sector has encountered constraints that they cannot solve themselves. Such public supports will include, but not be limited to the following:

- Accelerated legislation providing foreign investors with equivalent or more attractive incentives than those provided by other ASEAN countries; i.e., **tax holidays, duty-free import for raw materials and capital goods, free repatriation of profits and free foreign currency exchange**.
- Transparent implementation of the laws and regulation related to industrial development.
- Simplification and removal of bureaucracy with regard to approval for application submitted by the private sector.
- Administrative support measures to secure sufficient raw material for manufacturers, especially for potential cash crops, logs, and minerals (e.g., gypsum, limestone).
- Establishment of concessional development financing facility.
- Establishment of industrial accreditation system, inter-alia, **Lao Industry Standard (LIS)**.
- Intensive training for civil servants with regard to the real concept of the market economy.
- Support for foreign investment and export promotion activities, which are difficult to undertake by the private sector.
- A national level campaign for competitiveness initiative, designation of competitive factories and its commendation system.
- Institutional consolidation and integration including administrative functions of industry, trade and energy in order to efficiently utilize currently available resources.

Private Sector Initiatives

Under the private sector initiative by Lao PDR, Cambodia, Myanmar and Thailand, the Greater Mekong Sub-region Business Forum (**GMS-BF)** was established in October 2000. The Lao National Chamber of Commerce and Industry (LNCCI) was appointed as Chairman of GMS-BF for 2000~2003. The GMS-BF plays a coordinating function between private and public sectors with regard to the matters concerning economic development in GMS. The major terms of reference for GMS-BF so far agreed upon by four countries are; (i) promotion of foreign investment in the region; (ii) promotion of information technology; (iii) marketing; and (iv) training and promotion of mutual visits. In addition to the four functions mentioned above, the function dealing with industrial development should be added. An extended arm of GMS-BF should be established independently or as one of the functions in SKR Chamber of Commerce and Industry. In case of the former, the independent function including hardware facility can be located in one of the support functions in Savannakhet SEZ. An extended arm of GMS-BF in SKR is proposed to build up business infrastructure required for promotion of competitiveness initiative amongst SKR businessmen. This includes;

- Establishment of Competitiveness Task Force (CTF);
- Coordination with projects to be undertaken by the public sector;
- A campaign to promote competitiveness initiative including dissemination of the importance of quality control and productivity enhancement;
- A training program with regard to entrepreneurship development, productivity and quality enhancement, factory management, and corporate management;
- The organization of foreign investment and export promotion missions; and
- The organization of and participation in trade fairs.

(iii) Scenario for Competitiveness Initiative

The potential industries in SKR are mainly resource-based. They include wood-products, furniture components and furniture, pulp and paper, gypsum board and gypsum plaster, and copper products. A scenario for implementation of competitiveness initiative is proposed as shown below.

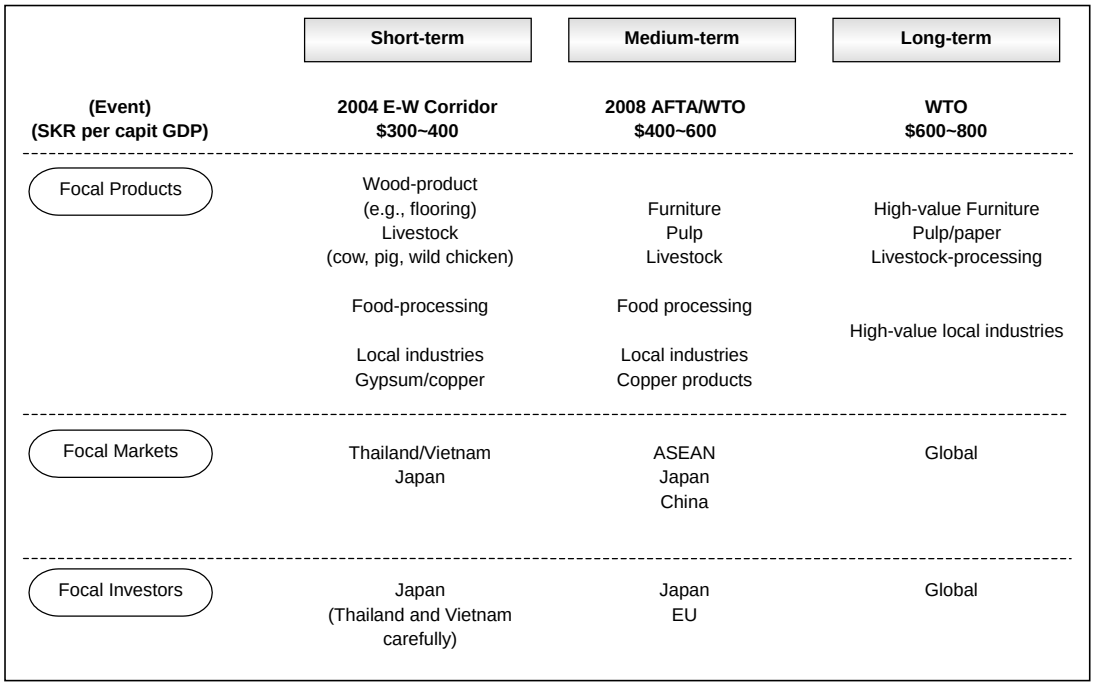


Figure V3-5 Scenario of Competitiveness Initiative

2) Business Infrastructure Development Plan

Industrial Development Dialogue

Industrial Development Dialogue or Forum which is sponsored by the Ministry of Industry and Handicraft in Vientiane, and Savannakhet and Khammouan provincial government in SKR should be organized. The forum would be an advisory body under jurisdiction of the Minister of Industry and Handicraft and SKR Governors, and participated by high-ranking officials from public and private sectors at the equal status. The forum will hold discussions, exchange views, and recommend optimum industrial development policies for consideration by the Minister. The importance of the forum exists in providing a place for public sector to address the needs of the private sector concerning administrative issues and inject them in the future policies. The subjects to be discussed will include:

(i) Exchange of views concerning the industrial development plans, which should be discussed and drafted in conjunction with the Socio-economic Development Plan;
(ii) Public sector governance on industrial development policy; and
(iii) Marketing, competitive enhancement, international trade promotion, and foreign investment promotion strategies.

The proposed forum should be put into practice as early as possible, at least by the end of 2001.

Provincial Industrial Development Plan

Regional Industrial Development Plans should have been discussed and finalized prior to draft of the Socio-economic Development Plan. The relevant authorities in SKR should initiate discussions on the plan and finalize it toward the end of 2001.

Industrial Statistics Improvement Project

The Industrial Statistics law should be enacted to consistently collect reliable data nation-wide and establish **quality industrial statistics**. Based on the law, the industrial statistics using a unified format, employing the criteria of International Standard for Industrial Classification (ISIC) should be implemented. Technical assistance can be provided by an inter-governmental organization including UNDP and/or UNIDO. The project should start from 2002.

Regional Institution Consolidation Program

The **sub-sector based function** should be established both in the Department of Industry and Handicraft and SKR provincial governments to intensively consolidate and develop resource-based industries. In addition, functions to enhance **competitiveness**, and promote international trade and foreign investment should be established.

In preparation for planning and operation of Savannakhet SEZ, officials with the background in jurisprudence, finance, economics, and engineering including environment specialist should be recruited.

A special budget should be allotted by the central and provincial governments for institutional consolidation due to the fact that SKR has been designated to priority development region.

3) Sub-sectoral Development Plan

Activities concerning the promotion of the competitiveness initiative are programmed through the industrial development forum. The sub-sector wise development plans will be formulated by referring to the following:

(i) Mining and Quarrying

Gypsum

The market research project should be undertaken in 2001 or 2002. Based on the outcome of the survey, the modernization of Dong Heng Mine should be launched in 2003.

Market Survey;

- Targeted Markets; Japan, Korea, Taiwan, and Vietnam with first priority.
- Finance: Joint finance by the public and local private sector.

Modernization of Dong Heng Mine;

- Production capacity: at least 200,000~250,000 tons /year in 2005. Production after 2005 should be decided by the relevant study.
- Installation of exploitation machinery and trucks.
- Finance: Local private sector and/or Regional Development Fund.

Copper

A copper deposit with associated gold has been identified in Vilabuly and the mine could start production of gold from 2002 and copper from 2003.

Outline of Vilabuly Copper/Gold Mining

- Deposit: Approximately 100 ton of gold and one million tons of copper cathodes.
- Production: Approximately 4 ton/year of gold and 40,000 ton/year of copper from 2002 and 2003 respectively and will be kept at the same level.
- Expected Investment Costs: Approximately US$ 150~170 million including the infrastructure by a foreign private investor.
- Expected Manufacturing Output: Approximately US$ 50 million.
- Market: Mainly Japan.

As a general character of a mining project, mine development is accompanied by a community development as well, such as repair shop, schools, hospital, shopping markets and utility plants. Therefore, the project will stimulate nearby village to produce more agricultural crops for marketing at the mine complex.

(ii) Agro-based industries

Establishment of Markets

In order to secure consistent and large quantity supply of raw material, especially agricultural products, **markets** should be established. The potential raw materials to be considered to supply agro-industry are;

(i) Bamboo shoots, beans, nuts, bracken (warabi), cabbage, Chinese cabbage, corn, coffee, fruits and radish from cash crops;
(ii) Cotton and silk.

This project gives secure markets for raw materials for downsteam industries, and provides farmers with consistent income and stabilize the price of goods by removing the unqualified brokers.

Pickle Making

A pickle making plant using bamboo shoots, bracken, cabbage, Chinese cabbage is developed either in the rural areas or in Savannakhet SEZ.

- Market: Domestic, hotels and service facilities in SEZ and Southeast Asian countries including Japan.

Snack Making

Various king of beans and nuts and corn processing plants to produce snacks is developed either in the rural areas or in SEZ.

- Market: Local, the service facilities in SEZ and Southeast Asian countries.

Fruits Juice and Canned Fruits Making

Various fruits juice making plant is established in the urban areas in SKR or in SEZ.

- Market: Domestic, service facilities in SEZ and Southeast Asian countries.

Coffee Processing

A coffee processing plant specialized to produce Arabica coffee is established in Savannakhet SEZ. An attractive brand name should be attached such as **Café' Lao, Boloveng Highland**.

Indicative Plan for Coffee Processing

- Production Capacity: 2,000 ~2,500 ton/year,
- Approximate Investment Cost: US $ 350,000~500,000,
- Expected Manufacturing Output: US$ 5~7 Million/year,
- Market: Europe and Southeast Asia including Japan, Korea, Taiwan, Singapore,
- Finance: Private investor.

(iii) Textiles

Garment Manufacturing

Several garment plants with Lao majority ownership are established in SEZ including current plants operating in and around the urban areas.

- Items to be produced: garments to be used for hotels such as towels, bed cover, blankets, chair cushion, and carpets. Clothes with Lao materials and Lao design.
- Market: Hotels and service facilities in SEZ, and those in Southeast Asian countries and Europe.
- Incentives: Fiscal incentive, concessional financing and support for design, product development and marketing for those garment manufacturers to be located in SEZ.
- Finance : Private investor.
- Marketing: Internet should be fully utilized to advertise Lao Brands to customers and catch market niche.

The consolidation activities should be promoted in 2000~2005 and other value-added factor including the foster of the brand image should be established 2006 onward.

(iv) Wood and Wood Products

Log Auction Market

A log auction market is established in Thakhek to ensure the consistent supply of logs toward down stream sub-sectors that eventually leads to the enhancement of competitiveness and value-added in the sub-sectors.

- Ownership: Thakhek Province.
- Membership: Logging companies, sawmills, furniture component, and furniture manufacturers.

- Finance: Public finance.
- Period: As early as possible, at least by the end of 2002.

The operation of the log auction market will be effective for the stabilization of the log price and guarantees the consistent income toward the public sector.

Woodworking Industrial Park

A woodworking industrial park can be considered in and around Thakhek in which the relocation of currently operating small-scale sawmills can be envisaged for integration and competitiveness enhancement.

- Ownership of the Park: A semi-governmental corporation.
- Incentives: Fiscal incentives, concessional financing and guarantee for a consistent supply of logs.
- Land: to be leased.
- Common Facility: Designing, marketing and testing, or common sawmilling.
- Finance: Public and private sector finance.

Furniture Making

Several furniture component and furniture making plants are established in Thakhek including relocation to the Woodworking Industrial Park. In addition, several export-oriented furniture manufacturing plants are established in Savannakhet SEZ.

Furniture Components;

- Items to be produces: high quality floor materials, doors, window frames, chairs and table components, and knockdown bookshelves.
- Location: Thakhek and /or Woodworking Industrial park.
- Market: Domestic, service facilities in SEZ and high quality/ custom made furniture for export to Europe, Oceania, Southeast Asian countries including Asean, Japan, Korea, and Taiwan.
- Marketing: Internet should be fully utilized to directly catch the niche of customers.

Furniture;

- Items to be produced: exteriors such as bench, garden table, flower base, garden terrace and fence. Furniture such as high quality chair, sofa, table, and side board using high quality trees. Those products should be custom to semi-custom made.
- Location: Savannakhet SEZ.
- Market: Service facilities in SEZ and Europe, Southeast Asian countries including high income Asean countries such as Singapore, Japan, Korea, and Taiwan.
  Marketing: Same as above case.

(v) Paper and Paper products

Pulp and Paper

Based on eucalyptus plantation, 100 km to the northwest of Thakhek, a pulp plant is established in Nam Thon in 2005. As a down steam sub-sectors, kraft paper and cardboard mill are established.

Pulp Mill;

- Production Capacity: 200,000 tons /year of pulp from 2008
- Expected Investment Costs: US$450~500 Million.
- Market: Southeast Asian countries, especially Korea and Japan and craft paper mill and cardboard mill.
- Finance: Foreign direct investment.

Paper Mill;

- Products: kraft paper for office supply, and cardboard for packaging materials.
- Market: Packaging and transportation industry to be located in SEZ.
- Finance: Foreign direct investment

(vi) Non-metallic Mineral Products

Gypsum Products

A plant producing plaster for medical use is established after 2010 to respond to the local demand in medical sector.

- Products: Plaster bandage for surgery.
- Location: Savannakhet SEZ and/or urban areas.
- Market: Local, and exports to neighboring countries.
- Finance: Local or joint venture with foreign investors.

Cement

If the price of petroleum continues to increase above US$30 in 2005, construction of the third cement plant in Lao PDR will be realistic.

Indicative Cement Production

- Location: Khammouan Province.
- Production Capacity: 450,000 tons/year,
- Expected Investment: US$ 60 million,
- Finance: Joint finance by local and foreign investor,
- Market: Domestic

(vi) Basic Metals

As a down stream of the copper mine in Vilabuly, metalworking plants to produce various copper metal products are established after 2011. There is a potential market for copper tube in Asean and West Asian countries where many household appliance plants are operating. Market for the quality doorknobs, locks and keys is global including Europe, Oceania, and USA.

- Products: Copper tube for refrigerator, doorknobs, locks and keys.
- Location: Copper tube in Savannakhet SEZ, Woodworking Industrial Park considering a linkage with wood products sectors therein.
- Market: Asean and West Asian countries for copper tube, and exports to Southeast and West Asian countries, Europe and USA for doorknobs, locks and keys.
- Finance: Joint venture with foreign investors.

(vii) Machinery and Equipment

Automotive

Motorcycle assembly plant and/or warehouse is located in SEZ. A down stream such as rubber and/or plastic based spare parts sub-sectors are expected after 2010. The viability of the down stream sub-sectors should be judged through a detail market survey in Southeast Asian countries for searching the possibility of exports.