

## 2-3 Agriculture

### 2-3-1 Current state of agriculture in the Lao PDR

#### <Significance of agriculture in the Lao PDR>

Accounting for 52% of the country's production (GDP) and 93.1% of the labor force (91.2% of which is engaged in self-sufficient farming), the share of the Lao's agricultural sector is significant. This is not only an industrial structure typical of underdeveloped countries; The Lao's agriculture has a greater weight than that of any other Asian low-income nation. Agricultural development is therefore vital not only for resolving the food supply issue and raising general income levels, but also from broader perspectives such as macroeconomic stabilization and development of a market economy.

According to the World Bank's "World Development Report 1997," the Lao's population grew by around 3% a year between 1990 and 1995, the highest rate among Asian low-income nations. As the income elasticity of demand for edible cereals is thought to be positive, there would seem to be a steep increase in potential demand in line with economic growth.

A comparison of the three-year moving average for rice production between 1990 and 1995 reveals that this crop, by far the most important edible cereal (around 90% of production volume), grew by an annual 1.1%, well under the rate of population increase. As a result, Lao's rice imports have started to swell again since 1993. Although the country has been a rice importer, its imports had been on the downturn since the 1980s.

#### <Lao's rice crop>

Most of Lao's rice is wet-season lowland aquatic rice which depends on rainwater and receives little chemical fertilizer or pesticide. However, the area of land planted with this crop shrank by an annual average of 1.01% between 1980 and 1996. The area planted in dry-season aquatic rice increased by 5.43% over the same period, but while irrigation is vital for a dry season crop, the amount of irrigated land remains at a low 4.9%, the lowest level in Asia. Rice production stagnated during 1995 and 1996 because of drought and flood damage in the south; however, with no such damage in 1997, the Lao PDR may have achieved self-sufficiency.

Given the comparatively large amount of hilly land in the Lao PDR, the proportion of dry-land rice grown using slash and burn agriculture is high compared to other countries (31% of rice harvest area in FY1996), but the area of land planted in this decreased by an annual 2.6% between 1980 and 1996 (Table I-13).

Apart from dry-land rice, slash and burn agriculture is also used for cash crops such as corn, cassava, vegetables, tobacco and opium. During the 1980s, these crops were absorbing as much as 73% of the area used for slash and burn agriculture, particularly in the north<sup>(51)</sup>. A cause-and-effect relationship has also been noted between this form of agriculture and the rapid decline in forest area in recent years (Table I-14). A major factor in forest destruction was shorter fallow periods, which were caused by the shift of slash and burn agriculture from an environmentally friendly to an environmentally destructive cultivation method, as well as population pressures brought about by politically and socially induced in-migration. The Lao

<sup>(51)</sup> UNDP, 1993, "Shifting Cultivation Systems and Rural Development in the Lao PDR", Report of the Nabong Technical Meeting, Nabong Technical College, Vientiane, Lao PDR, p.72.

PDR Ministry of Agriculture and Forestry sees forest destruction as not just exerting a negative impact on the environment but also causing major damage to agricultural production through soil erosion and degradation, abnormally low river levels and frequent droughts and floods<sup>(52)</sup>.

#### <Cash crops, animal husbandry and marine products>

In terms of cash crops cultivated in dry fields, corn is being grown as a feed cereal, while demand is also increasing for tobacco, cotton, coffee and sugar cane as raw materials for industrial use. Recent years have also seen greater production of vegetables in response to the demand spurt in Vientiane and other urban areas (Table I-13).

Many Lao farming households combine animal husbandry with their crop cultivation. Water buffalo are used to plough fields, while cattle are used for both carting and meat. Pigs are raised for market, and poultry are kept mainly for household consumption. Large livestock such as water buffalo and cattle are important as fall-backs when harvests fail, and also as a source of compost. Livestock numbers have been rising recently, with this increase particularly marked in the case of large livestock (cattle) (Table I-13). Most of the cattle are exported live to Thailand, in many cases informally because of barriers such as trade tariffs, the quota system and the broker license system. Around 160,000 to 260,000 head of cattle are thought to be exported informally every year<sup>(53)</sup>, pointing to extremely high potential export demand<sup>(54)</sup>.

Fish are an important and favored source of protein for the Lao people, and demand is expected to rise in parallel with economic development. However, freshwater catches from the Mekong and other rivers have been declining in recent years, while wildlife numbers are falling due to forest destruction. Fishpond culture is developing rapidly to compensate for these trends, but production is not yet meeting the increase in demand.

These agricultural trends are not unrelated to the various agricultural development projects conducted by the government and aid institutions. Below we overview the government's agricultural development efforts.

### 2-3-2 Agricultural development strategies and projects

Since 1986 when the government announced the New Economic Mechanism as its basic policy, changes in the agricultural sector have included the abolition of subsidies for production elements, the redistribution of production resources to individual farming households, market liberalization and the removal of trade barriers. In 1991, the government released its 1991-1995 Medium Term Socio-Economic Plan, which emphasized the following for the agricultural sector: (i) a stable food supply; (ii) a reduction in slash and burn agriculture; (iii) encouragement of cash crops, animal husbandry, afforestation and fishery; (iv) development of agricultural infrastructure, and particularly irrigation; (v) establishment of an agricultural research institute; and (vi) human resources development.

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<sup>(52)</sup> Asia Population Development Association (APDA) (1997), *Ajia shokoku no kaihatsu dankai-betsu nogyo-noson kaihatsu kisoch-osa hokokusho* "Raosu jinmin kyowakoku," p.76.

<sup>(53)</sup> Association for International Cooperation of Agriculture & Forestry (AICAF) (1991), *Raosu no nogyo: Genjo to kaihatsu no kadai*.

<sup>(54)</sup> Lao, PDR, (1998), "Agricultural to Rural Development Strategy of the Lao PDR is ASEAN", APDA, A Report of the Basic Survey on Agricultural and Rural Development by Progressive Stage -Lao PDR-.

Representative examples of agricultural development projects implemented in line with this policy are as follows: Japanese assistance in boosting food production, which pertains to (i) above; EU, IDA, Sida and Japanese slash and burn projects (ii); the APB and Sida's rural credit schemes, UNDP support for vaccine production, and Denmark's reservoir fisheries management project on the Mekong River (iii); irrigation projects by Japan, the ADB, UNDP and Quakers (iv); the Lao-IRRI project on rice experimentation and research, and the LUADP crop project by the World Bank, Australia and France (v); and the UNDP's Farmer's Irrigated Agriculture Training (FIAT) (vi).

In 1995, 14.39% of foreign aid went to the agricultural sector, 5.15% of which was bilateral (with Japan as the largest donor) and 8.47% multilateral (close to 80% of which was from the ADB).

By 1996, these projects had produced the results outlined in the previous section, and based on these, the government announced the 1996-2000 Socio-Economic Development Plan (produced by the State Planning Committee) in October 1996, looking ahead to the year 2000. The specific goals and strategies for the agricultural sector are outlined below.

- (a) A two million ton increase in rice production by the year 2000. This will require more intensive cultivation and a greater area planted in wet rice. Specifically, 100,000 more hectares will be planted in wet rice, and of this, irrigation will be used to expand the area planted in a dry season crop by 25,000 hectares. Harvests will be increased by 26% in the case of a rain-water wet-season crop and by 10% from irrigated fields. To achieve this, varietal improvement will have to be encouraged and proper use made of machinery, fertilizer and pesticide.
- (b) Encouragement of commercial animal husbandry and fishery
- (c) Encouragement of the production of sugar cane, corn, tobacco, cotton, vegetables, coffee, beans and specialized forest products (cardamom, benzoin, etc.)
- (d) To stabilize slash and burn agriculture, the government will work to settle farmers engaged in shifting cultivation by encouraging animal husbandry and the production of processed agricultural raw materials and agricultural products for export and by introducing regulations on the management of protected forests and logging.
- (e) Irrigation development. The area of irrigated wet-season fields will be expanded from the current 156,000 hectares to 200,000 hectares, while the area of irrigated dry-season fields will be expanded from 29,000 hectares to 50,000 hectares.
- (f) A survey will be implemented for farmland and irrigation plans for the Vientiane region.

The functions of the Naphok Center (rice) and the Hatdokkeo Center (other crop) in Vientiane, the crop experimentation center in Luang Prabang, and Khanggho Station (experimental research on tropical fruit) in Xiang Khouang, as well as other research institutes and experimentation centers, will be improved.

The plan therefore marks the establishment of the direction of agricultural development and certain targets. However, there are a number of issues involved in implementing the plan, as we examine below.

### 2-3-3 Major issues in agricultural development

#### (1) Increase in rice production and irrigation development

There is currently a wide gap between the target for increase in rice production and the actual level, and it seems highly unlikely that the target will be achieved. As noted above, two consecutive years of drought and flood in the south caused rice production to slump, but the recovery in 1997 was significant enough to raise the possibility of self-sufficiency. However, it must be said that given the limited amount of irrigated land, there is very little chance for the Lao PDR to achieve the kind of stable increase in supply needed to meet domestic demand under current conditions.

Lao farmers view wet-season rainwater rice paddy cultivation as a rational form of agriculture which organically combines livestock with forest land and is in harmony with the environment, and see no particular problem with continuing in the same way. Their attitude to breaking in new farmland, investing in irrigation and introducing new technology consequently tends to be negative given the difficulty and risk these experiments entail, which is one major reason that the introduction of intensive rice cultivation and the expansion of farmed land are not progressing as the government planned.

Aside from the problem of farmer motivation, the following issues also stand in the way of increased rice production.

##### <Issues involved in breaking in untouched land>

The first issue is whether or not breaking in untouched land on the six major plains in order to expand lowland wet fields will dry up feed resources for water buffalo and cattle during the dry season. Much untouched land is forested, and forest undergrowth in the plain areas is an important feed source for these livestock.

The government also plans a 26% increase in the productivity of land planted in a wet-season crop dependent on rainwater, but given current technological standards, the introduction of the necessary new technology, and particularly varietal improvement, could well increase production fluctuations instead, and is unlikely to lead to greater productivity<sup>(55)</sup>.

##### <Irrigation issues>

So what are the possibilities of using irrigation to stabilize a wet-season crop and expand the amount of land planted in a dry-season crop? Development of irrigation as a wet-season supplement or for the dry season is proceeding in some regions, including the construction of weirs and ponds and the establishment of pumps on the Mekong River and its tributaries. Examples include the small-scale gravity irrigation project in the northern mountain area, Vientiane's KM6 project (whereby irrigation water is pumped up from the Mekong River), Savannakhet's KM35 project (irrigation through weir and dam construction), and the projects in Savannakhet and Champassak for pumping irrigation water from the Mekong River.

If these irrigation projects result in completed irrigation facilities which are managed and maintained by farmers as public property and used effectively, they could have a considerable investment effect. As we explore below, however, many issues need to be overcome before these facilities are completed and ready for use.

<sup>(55)</sup> APDA (1998), *Ajia shokoku no kuihatsu dankai-betsu nogyo-noson kaihatsu kisochoha hokokusho* "Raosu jinmin kyowakoku".

- (a) With the exception of NGO-backed small-scale irrigation development, the government finances the construction of dams, weirs, ponds and main waterways, as well as the purchase of large pumps, but the government is currently experiencing a major budget shortfall.<sup>(56)</sup>
- (b) Because the government is too short on funds to cover irrigation costs, irrigation channels are built as a rule on the user-pays principle, with farmers using financing from the Agricultural Promotion Bank to purchase construction materials<sup>(57)</sup>. However, because the APB is also short of funds, the amount of financing provided is well under farmers' expectations. This prevents feeder channels from being built as planned, a situation in which facilities could end up being used either inefficiently or not at all<sup>(58)</sup>.
- (c) Even where irrigation channels are built, water-utilization organizations will be needed to manage and maintain irrigation facilities. Experience in other parts of Asia leaves some doubt as to whether the creation of land registers, designation of the recipient farmers and the collection of water utilization charges by water-utilization associations will proceed as planned, allowing the effective use of facilities.
- (d) Assuming that irrigation development did proceed smoothly, the introduction of new technology such as fertilizing management and mechanization in line with the introduction of a dry-season crop would raise the following issues<sup>(59)</sup>.
- \* Replacement of seed rice (where farming households use their own seeds, harvests drop for two to three years)
  - \* Lack of seed sterilization
  - \* In the case of the Lao PDR, insect and disease damage is not so severe as to make pesticide spraying worthwhile, although there is a certain amount of damage from rice blight and bakanae disease. This would be more effectively dealt with by providing rice plants with nutrition through the regular cleaning of field furrows rather than by spraying pesticide, but this practice does not seem to take root.
  - \* Where a dry-season crop is introduced, it would be sufficiently economic to use ploughs and threshers to avoid competition between wet- and dry-season crops for the use of production resources. As it would be a considerable overinvestment for individual households to purchase this machinery, a rental market would need to be developed, but at this point, rental services are inadequate.
  - \* There is an absolute shortage of provincial government personnel involved in dissemination.
  - \* Even where farmers are taught about new technology, they do not utilize this as directed because traditional farming methods already supply them with a certain level of harvest.

<sup>56)</sup> APDA (1998), *ibid.*

<sup>57)</sup> Hirotsugu Yoneda (1997), *Raosu no kangai*, Lao PDR Ministry of Agriculture and Forestry, Irrigation Department.

<sup>58)</sup> APDA (1998), *ibid.*

<sup>59)</sup> APDA (1998), *ibid.* Taken from case study in Savannakhet Province KM35 Project region.

## **(2) Projects to stabilize slash and burn agriculture (only in the context of agricultural development and related areas)**

### **<Conversion from slash and burn agriculture>**

The Lao government plans to stabilize slash and burn agriculture by encouraging conversion from traditional slash and burn to commercial animal husbandry and the commercial production of rice and other crops. We look at animal husbandry and the production of cash crops from a general perspective in the next section.

Projects instituting a shift from a dry to wet rice crop through the introduction of small-scale gravity-supplied irrigation are significant for both slash and burn agriculture and the type conducted primarily in mountain foothills. According to Yoneda (1997), an NGO style is more suited to developing such small-scale irrigation for mountain-area slash and burn agriculture, where the International Fund for Agricultural Development (IFAD) style is more appropriate for the larger-scale slash and burn agriculture conducted in mountain foothills (for details on both these styles, see the above Yoneda report). In both cases, the greatest impediment is efficient operation by water-utilization organizations, as was noted earlier. The IFAD style could also flounder because of the shortfall in the APB's rural credit.

### **<Zoning and determination of land-use rights>**

In addition to the conversion to other forms of agriculture, projects are being implemented in some parts of the Lao PDR to zone and determine land-use rights for slash and burn land, established fields, paddies and village communal land in order to promote the settlement of slash and burn farmers and protect forests. However, appropriate zoning which meets the objectives of forest and water resource conservation, knowledge, technology and extensive information gathering concerning surveying and hydrology are vital, while land-use rights cannot be determined without carrying out surveys and creating land registers. As is clear also from experiences in Thailand, wide-ranging work in this area needs the cooperation of experts with adequate knowledge and capabilities, as well as a large number of capable local staff<sup>(60)</sup>. It must be said that the Lao PDR currently has a very limited number of personnel with these capabilities.

Smooth implementation of the use of village communal land such as grass areas, protected forests and production forests also hinges on the formulation of strict utilization regulations and the agreement of villagers.

## **(3) Encouraging cash crops and animal husbandry**

### **<Cash crops>**

Because cash crops such as cotton, tea, corn, sugar cane, peanuts, fruit and vegetables are still being cultivated according to traditional methods and using old strains, quality is low and farmers can either only find local markets or else are losing market share to imports. While

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<sup>(60)</sup> Sathirathai, 1995, Rerkasem, 1995.

- Suthawan Saithirothai, (1995), "Roles of Property Rights on the Adoption of Conservation Practices in Northern Thailand", *TEI Quarterly Environment Journal*, Vol.13, No.2, Bangkok.
- Kanok Rerkasem, (1995), "An Assessment of Sustainable Highland Agricultural Systems in Thailand", *TDR Quarterly Journal*, Vol.10, No.1, Bangkok.

coffee exports are increasing, the lack of drying, threshing and sorting processes has kept quality low, with coffee trading at low prices even on the international market.

Expanded cash crop production will depend on securing markets through import substitution and export, which in turn will require the introduction of new strains and new technologies, the improvement of post-harvest technology and better marketing. However, most Lao farmers are used to traditional farming methods which are in line with natural rhythms and entail few or no inputs, and with both farmers and traders able to earn a certain amount of revenue through traditional methods, it will not be easy to provide the motivation to use new technology or to go beyond traditional trading areas to look at foreign markets.

Many cash crops have to compete with Thai and Vietnamese products, but the Lao PDR currently has very few crops which can stand up to this competition in terms of either quality or cost. As a result, some type of border protection policy will be needed for the meantime to protect domestic agriculture.

Plateau areas such as the Boloven Plateau and Xieng Khouang are seen as particularly promising in terms of expanded production of cash crops and animal husbandry, but village market access routes are still undeveloped except around coffee regions.

#### <Animal husbandry>

The promotion of animal husbandry is also being prioritized as a means of increasing the cash revenue of farming households.

The Lao PDR has a higher number of zebu and water buffalo per household than that of neighboring countries, and these livestock are important as one of Lao's few exports. However, the continued existence of the broker license and export quota system lowers farmers' profits and could be impeding incentive to invest in cattle rearing<sup>(61)</sup>. In addition, because livestock are reared in the traditional organic combination with rice crops and forest land, increasing herd numbers any further will mean considering how to secure feed resources while bearing in mind a balance with paddy area and forest land. Mortality rates are high for livestock in general, with no immunization regime in place, while for cattle in particular, measures have been inadequate in response to infectious diseases such as hemorrhaging septicemia.

Old strains of pigs and poultry have been left virtually undomesticated, and the efficiency of rearing them is poor, but these cost little to keep and are important both as sources of side cash and in terms of household consumption. To expand small- and medium-sized domestic livestock numbers, an increase to a certain extent in herd and flock sizes will have to be considered, but this raises a range of issues, including how to procure the necessary feed, whether the use of purchased feed is profitable in the case of old strains, and whether the dissemination mechanisms are in place for varietal improvement and the breeding technology for this.

The Lao government has no particular strategy for fishery development. Issues which have been noted in this area include the lack of fishery statistics, the lack of fishery research and development mechanisms and the lack of systems for pisciculture and distribution.

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<sup>(61)</sup> AICAF (1991), *ibid.*, p.58.

**Table I-13 Production Trends for Major Agricultural Products (1996)**

Item	Harvest area (1000 ha)	1980-96 increase (%)	Average production volume (1000 tonnes)	1980-96 increase (%)
Rice (unhulled)	553.7	-1.73	1413.5	1.86
Of which, wet-season wet rice	363.1	-1.01	1076.0	2.68
Dry-season wet rice	18.0	5.43	71.5	12.36
Upland rice	172.6	-3.34	266.0	-1.47
Corn	37.4	1.75	78.1	6.53
Cassava	14.6	2.97	92.5	0.88
Mung beans	1.7	-3.38	1.2	-2.12
Soy beans	3.6	-1.80	3.2	-0.10
Peanuts	9.4	-0.81	11.9	2.54
Tobacco	7.2	3.76	26.0	2.84
Cotton	9.1	1.68	6.8	2.03
Sugar cane	3.4	8.64	87.1	8.36
Coffee	14.8	8.23	16.8	5.2
Vegetables	14.6	6.63	88.9	4.71
	Number of animals (thousand)			Average annual rate of increase 1980-1996 (%)
Water buffalo		1211.70		2.22
Cattle		1186.00		6.29
Pigs		1772.00		2.96
Sheep and goats		159.00		7.69
Poultry		11656.00		5.95

Source: Ministry of Agriculture and Forestry, *Agricultural Statistics of the Lao PDR 1996*, Cabinet Office of MAF, Vientiane, June 1997

**Table I-14 Deforestation in the Lao PDR**

Year	Forest area (ha)	Forest coverage (%)
1968	16,102,400	68
1982	11,603,200	49
1989	11,129,600	47
1993	10,845,440	45.8

Source: Ministry of Agriculture and Forestry

Note: Forest coverage = Current forest area/current forest area + lost forest area



## **Appendix: Overview of the Agricultural Promotion Bank and Issues Faced**

Motoyoshi Suzuki

### **1. Overview of the APB**

The APB is a government financing institution established under the Bank of the Lao PDR in June 1993 primarily to provide financing for the agriculture, forestry and handicrafts sectors.

The APB's basic policies are determined by a council comprising representatives from the Bank of the Lao PDR, the Ministry of Agriculture and Forestry, the Ministry of Commerce and the Ministry of Finance, as well as the APB president.

APB funds depend on equity capital derived through stock issue, deposits by general depositors, deposits from other banks, loans from international institutions (ADB, IFAD) and loans from the central bank.

APB financing is implemented through its headquarters in Vientiane and regional branches. The recipients of this financing are farmers (Lao citizens whose main revenue is income from agriculture), and defaults are dealt with through systems such as group loans, with members of the group having joint responsibility for repayment, as well as a mortgage requirement on individual loans.

The APB provides short-term (up to a year), medium-term (one to three years) and long-term (three years or more) financing. Loan interest rates are progressively lower for short-, medium- and long-term financing, matching the borrowing rate on the original funds. For example, in the case of low-interest financing by the central bank, the loan interest on funds borrowed at an interest rate of 5% would be 10% short-term, 8% medium-term and 7% long-term. In the case of loans where the original funds are drawn from a general deposit, a short-term loan using as original funds an eight-month time deposit earning 16% deposit interest would mean paying 20% interest. Where a borrower defaults due to unavoidable circumstances, the repayment date can be extended.

### **2. APB issues and possible solutions**

As was noted in the main text, agricultural financing has an enormously important role to play in agricultural development, including the development of irrigation, the promotion of animal husbandry, the promotion of fishpond cultivation and the encouragement of afforestation and cash crop production.

While APB financing should be the core of agricultural system financing, many problems stand in the way of this. Here we will touch upon the most important issues, namely the lack of funds and before- and after-care for loans.

#### **2-1 Lack of funds**

Neither the APB's loan capital or operating capital are exactly abundant, partly due to the government's lack of revenue sources, and they fail to match potential capital demand from farming households.

Potential responses to this problem include two-step loans using direct loans from Japan's OECF and the ADB to the APB, or depositing trust funds from donor countries and the ADB in the Bank of the Lao PDR without designating a specific repayment date, using this capital as APB financing capital.

For the present, however, because APB staff are not familiar with development financing loan business, three- or four-step loans will have to be made through the Bank of the Lao PDR which will mean farmers paying loan interest a step more expensive than it would otherwise have been.

## **2-2 Before- and after-care for loans**

Successful agricultural financing depends on banks investigating borrowers before loans are made and also conducting loan follow-ups in order to deal with the default issue. With the APB's current limitations in terms of both the number of staff and their capabilities, these measures cannot be carried out effectively. As a result, APB financing tends to go to wealthier clients, with poor farmers' access to the system in fact rather limited.

One means of overcoming these issues and providing a wider range of people with abundant funds would be to implement a revolving fund as an APB initiative and with the cooperation of the Lao Women's Union and provincial government personnel involved in dissemination activities, leaving loan before- and after-care to NGOs. This method would be a tidy solution to the above issues in that it would make use of the government's strengths--its capital procurement capacity and the weight of its administrative institutions--as well as NGOs' strong suit, which is providing careful and detailed care.

## 2-4 Forestry

### 2-4-1 Current state

#### (1) Logging

Roundwood and processed wood products comprise more than 30% of Lao's foreign exchange earnings (Table I-15). According to recent newspaper reports, this is as high as 60%<sup>(62)</sup>, which explains the importance of the forestry industry for the entire economy.

Commercial logging in the Lao PDR is in principle prohibited, but logging is allowed in areas where forest plans have been established and in areas scheduled to be flooded for dams. During the dry season in 1994 and 1995, a total of 819,653 cubic meters of timber was harvested nationwide, of which 670,412 cubic meters, or 80%, was in areas to be flooded for dam construction (Table I-19). Of this, two thirds, or 526,627 cubic meters, of timber was logged in Nam Theun Dam Project areas. Work began simultaneously on Nam Theun 1 and 2, with the second dam meant to direct water from the Nam Theun, which used to flow to the northwest, into Se Bang Fai<sup>(63)</sup> on the opposite side to the southeast, using this drop to generate electricity. The area to be flooded for Nam Theun 2 is the Nakai Plateau, which is shaped like a huge flat plate, and which is all pristine *Pinus merkusii* forest. Given the good quality of this pine, Japanese businesses have been going to the Lao PDR on buying trips, with exports back to Japan made through Viet Nam.

The next largest logging area apart from the site scheduled to be used for Nam Theun Dam construction is within the Nam Ngum Dam catchment area, comprising 87,637 cubic meters, or 11% of total logging. This dam was built over the period from the late 1960s to the early 1970s, with Dams 2 to 5 now scheduled for construction within the catchment area. Timber such as Chingchan (*Dalbergia Oliveri*) is being logged from the area scheduled for flooding. A Malaysian company is also engaged in underwater logging in the Nam Ngum Dam reservoir. Because the dam was built during the civil war, only the dam construction site was established as neutral territory under agreement among the left, right and neutral factions, and with no time to think about logging the area to be flooded, high-value timber was submerged<sup>(64)</sup>. Divers are now being used to cut this timber with electric chainsaws and bring it to the surface.

The area to be flooded for the Houay Ho Dam in the south has also yielded 56,148 cubic meters, with good quality *Pinus merkusii* being exported to Thailand.

One timber type of which there is only 11,014 cubic meters, or 1% of the total, but which is being reasonably systematically felled, is cypress<sup>(65)</sup>, which also fetches the highest price per log. Taiwanese cypress dealers have developed this as a substitute because of the Taiwanese cypress logging ban. The first imports to Japan began in 1991<sup>(66)</sup>. Major importers are Taiwan

<sup>(62)</sup> *Vientiane Times*, December 13-16, 1997, p.11.

<sup>(63)</sup> In Lao language, "nam" indicates a comparatively large river, where "se" is a comparatively small river. Diverting water from the Se Bang Fai to the Nam Theun could cause chronic flooding at the point where the Se Bang Fai meets the Mekong River, and the failure to formulate measures to prevent this is one factor in the suspension of Nam Theun 2 construction.

<sup>(64)</sup> Akio Yoshimatsu and Hajime Koizumi (1996), *Mekon-gau a ryuiki no kaihatsu: Kokusai kyoryoku no ariina*, Sankaido

<sup>(65)</sup> This is thought to be a sub-species of *Fokienia hodginsii*, but is not identified botanically. In the 1959 NOMS VERNACULAIRES DE PLANTES EN USAGE AU LAOS (Jules Vidal), the only paper on Lao flora, listed as *Fokienia kawai* - The local name for this is *Mai Long Leng* or *Hinoki*.

<sup>(66)</sup> Hiroyuki Tsuburaya, *Iu ayuru laosu hinoki ni tsuite*, *Nettai ringyo* No. 37, Page 3.

and Japan, with processed cypress also being exported from Taiwan to Japan. Japan is apparently the end-user for 90 to 95% of this cypress. The wood is used for shrines and temples.

## (2) Organizations involved in logging

In terms of commercial logging, until the late 1980s, State Enterprises were in charge of logging and afforestation for each region, but these were successively dissolved around 1992, and while some were purchased with overseas Chinese capital, they are in a state of hibernation. Taking over logging from the state enterprises are three regional development enterprises under the jurisdiction of the Ministry of Labour and Social Welfare. The government issued its Additional Order, Management System for Logging Throughout the Country as Decree of Prime Minister 16, 7 October 1994, and the corresponding Decree of Ministry of Agriculture and Forestry 0169 (12 October 1994) titled "The Implementation of the Additional Order No. 16/PM", in principle restricting commercial logging concessions to these three enterprises<sup>(67)</sup>. The exceptions to this were the PRC affiliates Yunnan Lao Forest and Tian Jin Lumber, as well as the Taiwanese affiliates Chang Lin Lumber and Big Lao Development Co., Ltd., who were allowed to retain their concessions, but these too seem likely to be gradually shifted over to the three regional development enterprises before the end of the century.

These three bodies are the Agriculture and Development Service (ADS) enterprise, which is in charge of Vientiane Province and northern Laos, including the Xay Somboon special region; Bolisat Phathana Khet Phoudoi (BPKP, or "mountain region development company" in English), in charge of central Laos; and the Development of Agriculture and Forestry Industry (DAFI) enterprise, which has jurisdiction over the south. The major role is played by BPKP, which is involved in *Pinus merkusii* logging on the Nakai Plateau and most of the logging of Lao cypress.

The provincial logging services under the jurisdiction of the Ministry of Agriculture and Forestry's Department of Forestry authorize areas which may be logged, survey the length and thickness of the felled timber and stamp the approved logs<sup>(68)</sup>. They also check for illegal logging or extraction at military or provincial logging services checkpoints built along the highways. The Department of Forestry drafts policy for the protection and management of forests, forestry and wildlife, conducts surveys and deals with offenders. Four divisions have been set up under one director and two deputy directors, while the department is also in charge of the Forest Police, who carry small arms and have judicial powers (Figure I-1). In terms of exports, the Foreign Investment Management Committee within the Prime Minister's Office checks to see that appropriate commercial trading is taking place.

The three regional development enterprises are under the control of these government institutions and operate in line with notifications and standards stipulated by the government<sup>(69)</sup>.

## (3) Prices and production costs

In 1997, BPKP was asking the following prices on Lak Sao yard prices for *Pinus merkussi*. Prices are composed of taxes such as (i) forest rehabilitation tax, (ii) resources tax, and (iii)

<sup>(67)</sup> DAFI, which is in charge of southern Lao PDR, only has authority over timber imports and exports, not over logging.

<sup>(68)</sup> The central government's Forestry Department has direct jurisdiction over *Pinus merkusii* logging on the Nakai Plateau. In the case of the Lao cypress too, a liaison meeting of the relevant central government ministries (generally known as the Cypress Committee) handles the administrative details.

export tax <sup>(70)</sup>, as well as BPKP profit and production costs, etc. A-grade timber has no warps, knots or other defects. B-grade timber is of slightly poorer quality. The size is the average of the base and the crown's diameter.

A1 grade (diameter of at least 80cm) \$430/m <sup>3</sup>	B1 grade (diameter of at least 80cm) \$200/m <sup>3</sup>
A2 grade (diameter of 70-79cm) \$360/m <sup>3</sup>	B2 grade (diameter of 70-79cm) \$180/m <sup>3</sup>
A3 grade (diameter of 60-69cm) \$290/m <sup>3</sup>	B3 grade (diameter of 60-69cm) \$160/m <sup>3</sup>
A4 grade (diameter of 50-59cm) \$220/m <sup>3</sup>	B4 grade (diameter of 50-59cm) \$140/m <sup>3</sup>
A5 grade (diameter of 40-49cm) \$150/m <sup>3</sup>	B5 grade (diameter of 40-49cm) \$120/m <sup>3</sup>
	B6 grade (diameter of 30-39cm) \$115/m <sup>3</sup>

Royalty charges including export tax for cypress were as follows in 1997. Cypress is categorized by quality, regardless of the thickness of the timber.

A grade \$1,200/m <sup>3</sup>
B grade \$1,000/m <sup>3</sup>
C grade \$960/m <sup>3</sup>
Non-graded \$550/m <sup>3</sup> (boughs and roots)

The above prices were the 1997 government-approved expected sale prices, but with the Thai economic crisis and the cooling down of Japan's timber market, deals have not been as smoothly struck as they might have been. The Minister of Agriculture and Forestry has responded by ordering a price review, and related institutions such as the Ministry of Agriculture and Forestry, the Ministry of Commerce, the Ministry of Finance and the Ministry of Foreign Affairs are deliberating toward setting 1998 prices at a lower level.

While production and transport costs are not disclosed, in the case of BPKP logging, production costs are on average \$250/m<sup>3</sup>, with transport costs between Lak Sao and Vinh \$20-30/m<sup>3</sup> when using the transport company under military jurisdiction, and \$70/m<sup>3</sup> between Sam Neua and Vinh, with \$12-13/m<sup>3</sup> paid in export tax when loading from the port <sup>(71)</sup>.

Another cost which should be mentioned is the contribution which the Lao PDR requires enterprises to make to the logging region when a contract is drawn up. Examples of such con-

<sup>(69)</sup> Established on 19 August 1984, the BPKP underwent a major organizational reform in July 1992. It now handles forestry, tourism and hotel management, etc., forming Lao's largest corporate group. However, as a result of the following kind of operation slip-ups, the government has suspended its operation of forestry-related business.

(1) It was reported that the BPKP engaged in excessive logging of *Pinus merkusii* over 1994-95 in the area scheduled to be flooded for Nam Theun 2, at one point holding 140,000-150,000 cubic meters in stock (*Nikkan mokuzai shimbun*, 6 December 1995). Normally, this timber would sell at around US\$160 per cubic meter at the cheapest, but insect damage and mould as a result of long periods in the forest and in the timber yard devastated its commercial value to the point where it was sold off to a Vietnamese sawmill for around US\$70 per cubic meter. This excessive logging was due to problems with BPKP export procedures, the lack of a system for liaison between logging sites and the timber yard and sloppy forest surveys.

(2) At one point, BPKP was behind in paying close to US\$5 million in forestry royalty payments collected over 1994-95.

(3) In 1995, BPKP was contracted to undertake road upgrading work in Vientiane, but abandoned the project midway.

The government launched an examination of BPKP in 1997 as part of its efforts to determine accountability, resulting in a major staff reshuffle in November.

<sup>(70)</sup> Rehabilitation tax on pine is on average 50 kip per cubic meter, with an average resources tax of US\$125 per cubic meter. An export tax averaging US\$50 per cubic meter is levied on all tree types (according to a BPKP staff member). However, given the indicated mountain mill price, fees paid to the government, and logging volumes, etc., the portion which is purely tax is probably even lower.

<sup>(71)</sup> As reported by a locally-based Japanese employee at a forestry trading company.

tributions are the distribution of textbooks to schools in isolated mountain areas, or the provision of medical supplies to villages. When logging roads are built, they have to be routed so as to link the various villages along the way. Nominally, none of these cases require money handovers, but are instead provided in kind by the contract party. Japanese companies such as general trading companies build in from the outset non-contract costs related to timber trade. These tangible contributions are favorably perceived by the logging region.

#### **(4) Afforestation**

In 1996, 11,849 hectares of land was afforested (Table I-20), most of this in teak (*Tectona grandis*) and eucalyptus (*Eucalypts* spp.). Teak is naturally distributed from close to the Thailand and Myanmar borders to Xayaboury Province and the western part of Luang Prabang Province, and this natural teak is protected. Teak in high-quality afforestation areas is designated as a seed resource, with 30 plus trees currently designated for seed and seedling collection. Main afforestation areas apart from the above-mentioned areas of natural distribution are all in Luang Prabang and the north of Vientiane Province. Afforestation experiments are also being conducted in other regions, but teak grows best in well-drained soil with high levels of calcium and phosphorus. Growth therefore tends to be poor outside the areas of natural distribution because the soil conditions are not right. Teak is extremely popular with farmers because of the high prices even small-diameter trees (20 to 30 years old) that are cut into chips fetch as interior and furniture material.

Eucalyptus afforestation is taking place along the Mekong River in central and southern Lao PDR. This is for Phoenix Pulp Co., Ltd. in Khon Kaen in northeastern Thailand, and is more in the line of a cash crop. Phoenix Pulp Co., Ltd. calls for eucalyptus afforestation through the papers (Figure I-2), and has also established its own afforestation subsidiary for eucalyptus afforestation. However, the Lao PDR government has reservations about eucalyptus afforestation, and imposes the following administrative conditions:

- (i) Eucalyptus afforestation shall be conducted on so-called "potential forest land," including bare land, grassland and wasteland.
- (ii) Where farmers have rights over land to be forested, revenue distribution contracts have to be drawn up, with farmers' investment in services for eucalyptus management.
- (iii) Plantation of eucalyptus alone cannot be more than 50 hectares. This limit does not apply where acacia and other trees are also planted.

Most eucalyptus seeds and saplings are currently imported from Thailand.

#### **(5) Forestry**

There are currently two plywood factories, one chipboard factory and one paper-recycling factory in the Lao PDR (Table I-21). The plywood factory in the outskirts of Vientiane is funded by Taiwanese capital, while the plywood factory in Mahaxay (to the northeast of Thakhek city) is operated jointly by BPKP and Hong Kong capital. The paper recycling factory is next to the Vientiane plywood factory, with 80% of used paper imported from the United States, Australia and Taiwan, and the remaining 20% from printing factories in Vientiane. The factory manufac-

tures newsprint and toilet paper. The machinery is second-hand from Taiwan and produces 300 tonnes a day.

#### **(6) Development of forest and forestry laws**

The 1990s have seen the Lao PDR laws on forests and forestry developed in quick succession (Table I-22). The Decree of Prime Minister on 'Management and Use of Forests and Forest Land' (PM 169, 3 November 1993) in particular provided substantive forest legislation, and this together with the Decree of Prime Minister on 'Land and Forest Allocation for Tree Planting and Protection' (PM 186, 12 October 1994) was developed into the 'Forestry Law' (3 November 1996) (see 2-2-10 Environment, 1. Current Status, (1) Forestry Management, 1) Forestry Law). Responding to this, the following six working groups under the Department of Forestry are currently developing practical regulations to ensure the effectiveness of the Forestry Law.

- (i) Detailed regulations on logging systems, forest planning systems and forest operation
- (ii) Detailed regulations on afforestation
- (iii) Guidelines for the use of forest land
- (iv) Detailed regulations on management of protected areas
- (v) Detailed regulations on forest administration and development of laws
- (vi) Detailed regulations on forest development funds

The Department of Forestry has assigned foreign donors to each of these working groups (with some yet to be decided), and hopes that Japan will participate in (v).

#### **2-4-2 Issues**

Some issues arising from the current state of the Lao PDR forests and forestry as described above are outlined below.

- (i) Forestry is an important industry for the national economy. Given the landlocked nature of the country and the small population, there is a limit to how much industrialization can be achieved. Also, since the Lao PDR has no particular natural resources, the economy will therefore have to depend on forest resources for the meantime. However, because systems through from logging to export have yet to be developed, advantage is not being taken of the country's abundant forest resources.
- (ii) The first steps have only just been taken in the creation of forest planning systems and the development of forest and forestry laws.
- (iii) The Ministry of Agriculture and Forestry and the Prime Minister's Office are both checking up on logging in their respective capacities, but timber-related business is operated by state enterprises under the Ministry of Defence.
- (iv) There has been a rapidly-growing trend toward afforestation recently, but this has yet to match logging volumes.
- (v) Farmers are keen to work on teak afforestation in the Luang Prabang and Xayaboury Provinces, and some farmers are raising and selling saplings. However, there

is concern as to the negative effect on the species these so-called junk species <sup>(72)</sup> could have. In both provinces, land has been distributed to farmers as an experiment, but poor farmers are signing long-term teak afforestation contracts with teak afforestation experts (in many cases, local sawmills) and taking on long-term management obligations from the planting stage in exchange for saplings and lump-sum payments, effectively resulting in land enclosure using teak.

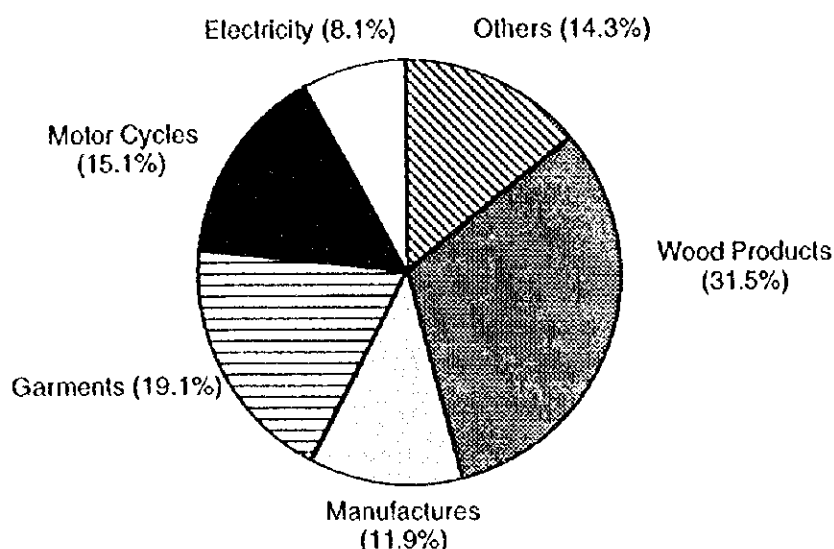
The Lao PDR is also a Mekong River catchment area with important tributaries making the water catchment function of the country's forests significant in terms of the Indochina peninsula as a whole. Support for the Lao PDR forestry will link not only to the country's economic development but also to the stability of the Indochina Peninsula's water supply system.

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<sup>172)</sup> During the Meiji period, seedlings for commercial trees in the Yoshino region were traded at high prices. As a result, not only high-quality seeds but seeds that could be picked up by the side of the road (so-called piggy-back species) were shipped, with the poor quality of the saplings creating low-producing forests in various regions.



**Table I-15 Lao PDR Export Items in 1994**



Source: *Development Lao P.D.R. 1995*, Vientiane, (1995) UNDP

**Table I-16 Log Export Value (unit: 1000 dollars)**

Item (unit)	1985	1989	1990	1991	1992	1993	1994	1995	1996
Logs (1000 m <sup>3</sup> )	4,122	5,749	3,465	3,003	9,596	7,582	11,876	28,954	32,510
Sawn logs (1000 m <sup>3</sup> )	871	12,657	17,028	32,796	27,285	31,239	30,029	23,706	37,606
Plywood (1000 sheets)	143	137	247	175	61	73	1,567	1,612	3,345

Source: *Agricultural Statistics Year Book 1993, 1994, 1995, 1996*

**Table I-17 Forest Product Production Volumes**

Item (unit)	1991	1992	1993	1994	1995	1996
Logs (1000 m <sup>3</sup> )	300.7	213.0	516.0	595.0	819.7	819.7
Sawn logs (1000 m <sup>3</sup> )	110.0	80.0	246.4	271.0	288.9	232.4
Plywood (1000 sheets)	346.6	304.3	1,507.7	1,870.4	2,069.4	1,295.0

Source: *C.P.C. Basic Statistics 1992, 1993, 1994, 1995, 1996*

**Table I-18 Forest Product Export Volumes**

Item (unit)	1991	1992	1993	1994	1995	1996
Logs (1000 m <sup>3</sup> )	12.0	47.0	20.1	47.8	44.3	313.0
Sawn logs (1000 m <sup>3</sup> )	53.0	50.0	261.2	187.7	126.1	-
Plywood (1000 sheets)	65.0	58.0	972.0	1,373.1	1,434.2	-

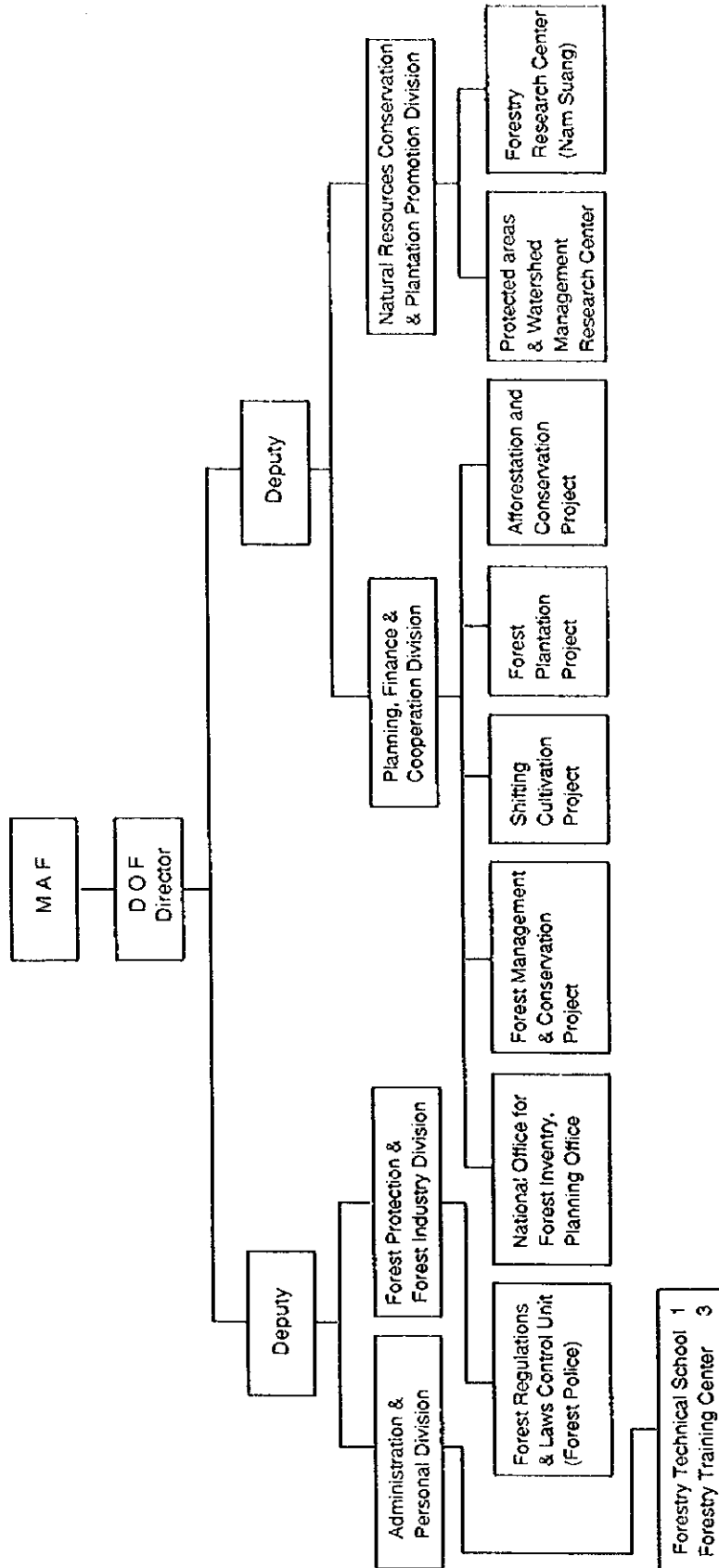
Source: *C.P.C. Basic Statistics 1992, 1993, 1994, 1995, 1996*

**Table I-19 Logging Volumes and Annual Logging Permits (1994-95 dry season)**

Logging area/company	Annual plan (m <sup>3</sup> )	Logging performance	
		Logging volume (m <sup>3</sup> )	Ratio of total log volume (%)
<b>A.D. and Service (northern Lao PDR)</b>	61,000	48,604	80%
Vientiane Mun.	4,500	1,805	40%
Phong Saly	1,000	1,029	103%
Louang Namtha	2,500	2,270	91%
Oudomxay	4,000	3,089	77%
Bokeo	6,500	4,646	71%
Hongsa	5,000	5,060	101%
Xayaboury	21,500	19,577	91%
Luang Prabang	1,000	686	69%
Vientiane Province	15,000	10,442	70%
<b>BPKP (central Lao PDR)</b>	53,000	53,065	100%
Houaphan	1,000	0	0%
Xieng Khouang	1,000	1,066	107%
Borikhamxay	31,000	31,590	102%
Khammouane	20,000	20,409	102%
<b>DAFI (southern Lao PDR)</b>	45,000	36,558	81%
Savannakhet	15,000	8,097	54%
Saravane	10,000	9,896	99%
Champassak	10,000	10,000	100%
Se Kong	7,000	6,005	86%
Attapeu	3,000	2,560	85%
<b>Dam construction projects</b>	432,000	670,412	155%
Nam Ngum	70,000	87,637	125%
Nam Theun	300,000	526,627	176%
Houay Ho	62,000	56,148	91%
<b>Cypress development projects</b>	19,000	11,014	58%
Yunnan Lao Forest	4,000	800	20%
Chang Lin Lumber	6,000	3,102	52%
Big Lao Dev. Co. Ltd.	5,000	2,800	56%
Tian Jin Lumber	4,000	4,312	108%
<b>Total</b>	<b>610,000</b>	<b>819,653</b>	<b>134%</b>

Source: *20 Years Agricultural Statistics 1976-1995*, Forestry Department. Ministry of Agriculture and Forestry, the Lao PDR

Figure I-1 Organization of Lao PDR Forestry Department



**Table I-20 Afforestation Area**

Period	Area (ha)
-1975	1,138.5
1976-1980	1,026.0
1981-1985	1,268.3
1986-1990	3,066.4
1991-1993	3,234.5
1994	3,798.0
1995	8,828.0
1996	11,849.0
Total	34,208.4

Source: Statistics (1996), Ministry of Agriculture and Forestry, the Lao PDR

**Figure I-2 Newspaper Advertisement by Phoenix Pulp Co., Ltd. Calling for Eucalyptus Afforestation**


VIENTIANE TIMES  
SEPTEMBER 20-29, 1994

**PHOENIX PULP & PAPER CO. LTD**  
**KHONKAEN, THAILAND**

We are now to buy 200,000 tons of industrial trees a year from Laos, especially Eucalyptus trees. If you wish to plant the trees in a radius of 100 Km around Vientiane, we are ready to grant long-term credits for the tree planting and to buy your trees at a fair price.

Please contact our office at Thapabannay KM4, Thadous Road, (in front of Mekong Restaurant), Vientiane, Lao PDR

TEL: 312185



Source: Statistics (1996), Ministry of Agriculture and Forestry, the Lao PDR

**Table I-21 Number of Lao PDR timber factories**

Sawmills	115
Board factories	18
Plywood factories	2
Chipboard factories	1
Furniture factories	423

Source: Statistics (1996), Ministry of Agriculture and Forestry, the Lao PDR

**Table I-22 Lao PDR Government Ordinances and Laws on Forests and Forestry**

Date of signature	No. of law/ordinance	Outline of law/ordinance
28 May 1989	Agenda	Resolution of the First National Conference on Forestry (Foreign support for Lao PDR forests and forestry increases as of this conference)
5 October 1989	Government ordinance (117/CCM) Abolished 3 November 1993	The Management and Use of Forests and Forest Land (The first forestry ordinance to be formed in response to the First National Conference on Forestry)
3 November 1993	Ordinance (169/PM) Abolished 3 November 1996	The Management and Use of Forests and Forest Land (Develops the first forestry ordinance; also provides the base for the Forestry Law three years later)
5 May 1994	Decree of Prime Minister (4/PM)	Decree of Prime Minister on Forestry (Appeals to provinces to crack down on illegal logging and directs them to administer forests in line with central government guidelines)
7 October 1994	Decree of Prime Minister (16/PM)	Additional Order, Management System for Logging Throughout the Country (Notification of integration of commercial logging rights under three military-controlled regional development enterprises)
12 October 1994	Decree of Ministry of Agriculture and Forestry (169/AF)	The Implementation of the Additional Order No. 16/PM
12 October 1994	Decree of Prime Minister (186/PM)	Land and Forest Allocation for Tree Planting and Protection (Afforestation promotion measures allowing tree planting by foreign companies and giving rights to afforestation areas of 1000 or more trees to afforestation parties)
3 November 1996	Law	Forestry Law (The Lao's first forestry law)

## 2-5 Transport and communications

### 2-5-1 Current state of the transport sector

#### (1) Overview of the transport sector

Full-scale development of the Lao's transport sector began in 1986 with the initiation of market economy and open-door measures. At virtually the same time, the source of aid to the Lao PDR also shifted from the Eastern nations to Western aid focusing on the road sector. Over the next ten years up until the late 1990s, projects to upgrade Route 13, a national trunk road, and other projects which had been underway since the late 1980s have been moving steadily toward completion, setting in place the minimum infrastructure for the integration and development of the national economy.

Reflecting the country's topographical conditions (a mountainous, landlocked country bordering a major river), the Lao's current transport sub-sectors are roads, water transport and air. Various plans for a rail system have been formed, but cost factors have prevented these from realization. The volume of traffic has grown dramatically from the close of the 1980s through into the 1990s, with both freight and passenger transport on the increase; however, given the Lao's continued economic growth, these appear slightly sluggish.

#### (2) Development plans

Since 1981, from the first through to the third Five-Year Development Plan, one focal point has been the development of a transport and communications network. The current 1996-2000 Socio-economic Development Plans (the fourth in the series) also notes the following major objectives.

Roads:	Development of trunk roads and bridges to provide access to neighboring countries; development of a national road network linking major regional cities; road construction toward regional development.
Rail:	A study on a line linking Vientiane and Nong Khai (Thailand), followed by the design and construction of this, as well as a preliminary feasibility study on a north-south route.
Water transport:	A study on Mekong River navigation routes; development of river ports in major cities; measures to prevent erosion.
Air:	Development of facilities to allow B747 traffic at Vientiane International Airport; development of facilities to allow B737 traffic at Luang Prabang, Savannakhet and Pakse Airports; construction of airport in mountain areas and tourist areas.

In budgetary terms, with 51.2% of public investment used in this sector over 1991 to 1995, the top priority placed here by the government is evident; the current plan, however, reduces this share to boost spending on areas such as education, health and medical care, and rural development. At the same time, investment in this sector is still of undisputed importance, and while its overall share may continue to diminish, budget allocations are likely to continue to be on an appropriately large scale (Table I-23).

**Table I-23 Comparison of actual fiscal 1991-1995 PIP and projected fiscal 1996-2000 PIP**

	FY1991-1995 Laos government PIP		FY1996-2000 PIP		
			Real PIP		Plan corrected in line with World Bank proposal
	Amount (in billion Kip)	Share (%)	Amount (in billion Kip)	Share (%)	Amount (in billion Kip)
Agriculture	83.3	15.4	168.9	11.4	168.9
Industry	92.2	17.4	217.7	14.7	217.7
Transport & communi- cations	273.5	51.2	513.5	34.6	383.5
Education	35.4	6.6	145.4	9.8	145.4
Health	18.8	3.5	120.9	8.1	120.9
Information & culture	9.4	1.8	30.4	2.0	30.4
Social welfare	2.3	0.4	96.5	6.5	96.5
Housing construction	13.5	2.5	47.1	3.2	47.1
Regional development	6.4	1.2	143.8	9.7	55.9
Total	534.4	100.0	1,484.0	100.0	1,266.2
(as percentage of GDP)			(13.60)		(11.6)

Source: World Bank

### (3) Implementation mechanisms

The transport and communications sector as a whole is under the jurisdiction of the Ministry of Communications, Transport, Posts and Construction (MCTPC). At the central level, this comprises one secretariat, five departments and two committees, with a District Office of Communications, Transport, Posts and Construction (DTCP) in each province. The MCTPC also supervises the various types of vocational training schools and research institutes on transport design and surveying. The state enterprises under the MCTPC have been progressively broken up and privatized in recent years, with only 11 remaining.

### (4) Road sector

#### 1) Overview

Road transport is the Lao's most important form of transport. In 1996, there were 22,321 kilometers of roads, with road density standing at 0.09 kilometers per square kilometer. In terms of road types, the Lao PDR has national highways, provincial roads and district roads, a ranking system for which is currently being developed. As of 1995, only 15% of total roads were paved, although this figure had reached 69% in the case of national highways. Even in regard to national highways, however, there are still many roads with obstructions to smooth year-round vehicle traffic, with major transport problems in the rainy season.

Vehicle numbers skyrocketed between 1980 and 1990, increasing from 25,000 to 80,000. This trend has extended into the 1990s to reach 156,000 vehicles in 1996. By vehicle type, 120,000 of these were motorcycles, 26,000 ordinary passenger vehicles and 9,800 buses and trucks. Motorcycles therefore comprise an extremely high 77% of total vehicles. This swift

rise in vehicle numbers has been accompanied by an equally swift rise in the number of traffic accidents.

Since the 1991 National Transport Study, while only limited measurements have been made of traffic volume, overall this apparently remains at a low 10 to 300 vehicles a day (1991). At the current point in time, the road with the heaviest traffic is Route 13 running through the northeast of Vientiane, which carries around 2,000 vehicles a day. As roads improve and distribution picks up, trunk roads are expected to carry somewhere up around 500 to 1,000 vehicles a day. A mechanism therefore needs to be developed to measure traffic volume as the basis of road development plans.

## **2) Development plans: performance and outlook**

In the early 1990s, the MCTPC formulated the Long-Term Road and Bridge Development Plan (1990-2000) in regard to road sector development. From 1991 to 1995, this focused on the development of national highway Route 13, followed by Routes 8, 10 and 20 in that order. Roads and bridges along Route 13 were in fact rehabilitated over that period, while aerial bridges were also constructed, among which the Thai-Lao PDR Friendship Bridge attracted particular attention.

Spending on the road sector expanded significantly over 1991 to 1995, doubling in the case of national highway construction, and tripling for provincial highway construction and maintenance. Around half of the projects planned for Route 13 went ahead supported by various donors; road work as a whole, however, ran into budget shortfalls, and with the additional factor of poor project management capacity, many projects went over schedule. In cases such as Route 9, supported by the former Soviet Union, inadequate management and maintenance saw roads begin to deteriorate within project life-spans, enforcing upon the Lao PDR government an awareness of the need for maintenance work.

The 1996-2000 plan targets the completion of the principle axis of north-south traffic, as well as the full-scale development of main national highways (Routes 1, 4, 6 and 7, etc.) and provincial roads. Development of an implementation body for provincial and district road construction, as well as of maintenance, management and repair mechanisms, are also part of the plan. International projects have been launched under ADB leadership as part of the GMS scheme, and further Mekong bridge construction, as well as road projects targeting cross-border transportation between the Lao PDR and its neighbors, are expected to be included in this framework.

## **3) Implementation mechanisms and introduction of private sector dynamism**

### **Planning and construction:**

The Transport Department within the MCTPC has overall responsibility over the road sector, handling the planning, construction and maintenance of national and provincial roads. Each province also has a District Office of Communication, Transport, Posts and Constructions, while local authorities are involved in district and urban roads. The shortfall in management and engineering capacity, however, is hindering more vigorous engagement in road work.



In terms of state enterprises under the wing of the MCTPC, whereby transport and construction work were once basically a state enterprise task, privatization had left only 11 such bodies in 1997, while in 1998 another eight are to be put on a commercial basis. The Communications Design and Research Institute and the State Enterprise for Survey and Construction on Material Laboratory in particular have traditionally been in a monopoly position as local consultants on roads.

The Lao PDR also has 30 private sector construction companies which are gradually being contracted for road work, but these still lack the capacity to take on large projects single-handedly. Donors, NGOs and other cooperation entities are beginning to work on bringing these local companies into trunk road development work and local residents into village road construction, and this is an area deserving positive consideration in terms of increasing local involvement and encouraging technology transfer through such projects.

#### Management and maintenance:

Management and maintenance administration is under the jurisdiction of the MCTPC Transport Department's Road Management Division and three local offices in the northern, central and southern Lao PDR. A 1996-2000 road maintenance plan was created in 1997 with World Bank support, positioning the 6,324 kilometers of national roads and main provincial roads as a 'Core Network' on which to concentrate maintenance work. The plan classifies maintenance work into Routine, Periodic and Urgent Maintenance, stipulating not only urgent maintenance but also maintenance on a six-year cycle for paved roads and a four-year cycle for gravel roads.

The MCTPC has budgeted around US\$55.4 million for maintenance and management costs from 1996 through 2000 under the Public Investment Plan, an annual allocation of around US\$11 million. Allocation of an annual US\$6-9 million from 1991 through 1995 reflects growing government awareness of the importance of management and maintenance.

Gasoline taxes, automobile import tariffs and automobile registration taxes are being used to fund these maintenance costs, and thanks to government efforts to steadily raise these, annual revenue is now estimated at US\$15-19 million. The government has also set up a road fund managed independently from the general account budget to secure tax revenues and other funds for this area.

## (5) Aviation

### 1) Overview

Conditions such as geography (a long strip of land running along a north-south line), numerous mountain areas and a low population density, as well as the lack of roads and water transport, put the aviation sector in high demand. However, since the Lao PDR was founded in 1975, a sluggish economy and the lack of government funds obstructed almost any real development, and airport facilities continued to deteriorate. Airport renovation has picked up in the 1990s, with the Civil Aviation Masterplan, created with UNDP and ICAO support, forming the basis for on-going work in this area, starting in 1993 with Vientiane Airport development.

In 1995, the aviation sector still formed only a minor 0.9% (on a ton/km base) of total cargo transport. Passenger transport, on the other hand, comprised 19.8% (on a person/km base), and has been growing rapidly in the 1990s, becoming an area which cannot be overlooked.

The provision of air traffic control and flight information to planes passing over national territory is another important point in regard to the Lao's aviation sector. While around 100 domestic and foreign planes fly over national territory every day, the Lao's air control system is obsolete and unable to ensure adequate safety standards.

## **2) Trends in air transport volume**

Transport volumes for domestic air routes show sluggish growth in terms of cargo transport but a marked increase in passenger transport. According to 1992 data, planes use Vientiane Airport 7,100 times a year, and a total of 4,800 times in the case of other airports in the Lao PDR. This indicates that routes are basically established radiating out from Vientiane Airport, with very few routes joining local points. (Table 6-3-1).

## **3) Current state of airports**

The Lao PDR has 18 airports altogether, including Wattai Airport in the capital of Vientiane and the three major airports in Luang Prabang, Savannakhet and Pakse. The Vientiane and Luang Prabang airports are international airports, while around 10 airports handle regular flights (Xayaboury, Oudomxay, Luang Namtha, Honei Sai, Sam Neua and Xieng Khouang, as well as the four airports above).

## **4) Development plan trends**

As noted above, fully-fledged development of the aviation sector began with the Civil Aviation Masterplan put together in 1991 by the MCPTC Aviation Department with UNDP and ICAO cooperation. This plan identifies problems in the groundwork for private aviation, laying out measures targeting 14 airports in order to improve and strengthen Lao's aviation sector by the year 2000. Main objectives are as follows:

- \* Improvement of airport runways and navigation support systems to allow year-round operation in all weather conditions, including night flights.
- \* Improvement of communications with airports in remote areas
- \* Improvement of meteorological services in local airports
- \* Improvement of passenger terminals and other airport operating facilities
- \* Training for aviation-related staff, including airplane crews, ground crews and traffic controllers.

The ADB provided support for a feasibility study based on the above plan, the results of which were reported in October 1993. At a donor meeting in July the same year, it was decided to launch development work on the 14 target airports with donors behind each. This Airport Improvement Project was undertaken in the majority of the airport in the Lao PDR between 1993 and 1997, with work virtually completed by the end of 1997 despite a lag of around a year, contributing greatly to the improvement of the country's aviation sector.

Responding to the above, the current Five-Year Plan lists aviation sector development objectives as continued development of Vientiane Airport, implementation of research for a new international airport and continued upgrading of domestic airports, earmarking US\$32 million, which is 6.3% of the Public Investment Plan budget, for these purposes.

## **5) Implementation mechanisms**

### **a. Central government**

Airport administration is supervised by the MCTPC Aviation Department. The Major Project Implementation Unit handles large-scale projects, while in terms of management and maintenance, the Airport Section basically handles terminal facilities and the Control Section airport auxiliary facilities. Airport management and maintenance are still inadequate, but with donor support, staff are gradually being brought in and trained, mechanisms developed and manuals created. Airports remain in the black, and airport income virtually covers management and maintenance costs.

### **b. Lao Aviation**

The Lao PDR has only one airline, the state-run Lao Aviation, which has close to a free hand over the operation of both international and domestic sectors. International flight services were consigned to a private foreign company in 1990, but these have continued to run a deficit, and the Lao PDR has yet to see the smooth expansion of its flight network. Measures such as fare hikes, as well as the steady growth in passenger numbers, seem to be improving profit on domestic routes. In terms of the planes themselves, the Lao Aviation has one jet on lease, but otherwise most of its fleet are small propeller planes which are gradually deteriorating.

The Lao Aviation handles only simple aircraft maintenance, commissioning the rest out to a foreign company.

## **(6) Water transport**

### **1) Overview**

The Lao's water transport is concentrated on river traffic on the Mekong, which runs 1,820 kilometers from north to south in western Lao PDR. Because of the Khone Falls in the far south, water transport is blocked from sea access, which only allows overland access by the Lao PDR to Vietnamese and Thai ports. There is also a significant water level change of around 10 meters between the wet and dry seasons, obstructing the passage of large craft during the dry season. To the north of Luang Prabang, where there are many rapids, the river is navigated predominantly by small craft in the 10 to 30 ton class, with a comparatively large amount of distribution both domestically and internationally to China, Thailand and Myanmar. Smooth passage to the south of Luang Prabang allows virtually year-round movement of vessels in the 60 to 80 ton class, making this Lao's major water transport route.

Transport between the Lao PDR and Thailand cutting east-west across the Mekong is also active, but is likely to see a gradual decline in transport volume as work goes forward on bridges spanning the Mekong.

## **2) Trends in water transport traffic volumes**

While the bulk of the Lao's traffic is by overland transportation, during the dynamic economic activity of the early 1990s, water transport began a sudden catch-up on land transport, and cargo transport volumes were virtually equal in 1995. This was partly because the improvement of road conditions failed to keep pace with the growth in transport volume which accompanied economic development, with water transport stepping in to fill the gap, on top of which there was the special factor of flood damage in 1994-95 which hampered overland traffic. However, further road development and the construction of bridges over the Mekong are likely to reduce water traffic, and the underdevelopment of water transport infrastructure, as well as the deterioration of existing infrastructure, will lead to a gradual slowdown in this area.

Compared to cargo transport, road upgrading has led to a major shift in passenger transport from water to road transport, and as a result, far from seeing the same jump in transport volume as for cargo, passenger transport is on the downturn.

Even for those regular services linking ports along the river, the degree of irregularity is increasing, starting with the significant drop in passengers travelling between Vientiane and Savannakhet as a result of the upgrading of Route 13. With the exception of tourist boats, water passenger transport is likely to be lose out increasingly to overland traffic.

## **3) Port situation**

The Lao PDR has a total of 18 ports, but with the exception of Lakse Port in Vientiane, Keng Kabao Port in Savannakhet and the Luang Prabang Port, these lack loading facilities and most have only earthen slopes for docking. Support from Japan and Australia, however, has led to the construction of concrete ramps. The Lakse and Keng Kabao ports are managed by the MCTPC, but the others are left to the management of local authorities.

The special feature of Mekong ports is the major fluctuation in water levels between the dry and wet seasons, creating a considerable fluctuation in the size of the ships able to tie up.

In terms of the cargo volume handled by ports, Lakse (the largest port) handles 20,000-30,000 tons a year, while Keng Kabao and Luang Prabang are thought to handle between some thousands of tons up to the 10,000 ton mark. With a handling capacity of some 100,000 tons, Lakse and Keng Kabao still have room to increase their cargo volume.

## **4) Vessels**

Vessel numbers were falling in the late 1980s, but have started to rise again in the 1990s. In 1996, the Lao PDR had around 1,100 vessels, roughly 430 of which were cargo boats and roughly 690 passenger boats. The biggest vessels are between 130 and 140 tons, but 90% of all vessels are small-scale wooden boats of 50 tons or less.

The Lao PDR has various small and medium-sized private water transport companies, but the largest company is the State River Transport Company (SRTC) under the auspices of the MCTPC, which has a 17-ship fleet, including both passenger and cargo vessels, and handles transport between Vientiane and Savannakhet.

There are a number of shipyards handling the construction of small-scale wooden craft; however, only the national shipyard attached to Lakse Port has the facilities to handle steel ship construction. This shipyard is run by the SRTC under the MCTPC, but its facilities are becoming outdated.

#### **5) Development performance and outlook**

From the 1980s through to 1995, the Netherlands, Japan, Australia and Sweden, etc., provided assistance in the development of major ports. Water transport development was stressed in the second Five-Year Plan (1985-90), with shore protection work starting in Pak Sane.

The fourth Five-Year Plan (1996-2000) includes objectives such as implementation of a study on Mekong routes, port upgrading and construction in northern Lao PDR, and shore protection work. Water transport related projects which have been proposed as GMS regional cooperation projects are the Upper Lancang-Mekong River Navigation Improvement Project and the Southern Lao PDR-Cambodia Navigation Improvement Project. These are intended to develop water transport through route studies, the conclusion of navigation agreements, port upgrading, and dredging and shore protection work.

#### **6) Implementation mechanisms**

At central government level, the MCPTC Transport Department's Land and Water Transport Section handles water transport administration, with jurisdiction over water transport planning and budget management; the construction and maintenance of auxiliary shipping facilities, shore protection and ports; and water transport institution management statistics and registration license issuance, etc. Local offices have also been set up in river-bank provinces to handle port operation.

### **(6) Rail**

#### **1) Overview**

While the Lao PDR currently has no railroads, a number of studies have been undertaken on its rail possibilities since the 1930s onward. To date, technology and cost issues have prevented lines from actually being laid, but the plan to run a line between Nong Khai and Vientiane using Lao-Thai Friendship Bridge, completed in 1994, is looking increasingly real.

A number of rail plans are also envisaged within the GMS program. Plans have been created to link Yunnan Province in China with Thailand and Viet Nam through the Lao PDR; however, what needs to be developed and then implemented is a plan realistic also in cost terms, taking into consideration the scale of Lao's economy and population.

### **2-5-2 Issues in transport sector development**

#### **(1) Creation of an integrated transport masterplan toward a coordinated transport network**

The Lao PDR has not yet developed an integrated transport masterplan based on a balance between the various transport sectors and trends in overall distribution. Given the above

situation, however, there are numerous issues which need serious consideration in terms of the future of the transport sector, including a complementary relationship between road and water transport, the relationship between GMS regional cooperation projects and domestic transport projects, and the extent to which rail will be developed. To give some order to this situation and push forward with efficient development, the Lao PDR needs to begin immediate work on the development of an integrated transport masterplan, with efforts spearheaded by the MCTPC. Distribution and OD studies should also be launched to form the basis for this.

## **(2) Creation of masterplans for each transport sector**

The current Five-Year Plan for national development and the Public Investment Plan both look ahead as far as the year 2000, and the existing road and bridge and private sector aviation masterplans also expire in the same year. In parallel with the integrated transport masterplan described in the previous paragraph, medium- to long-term masterplans also need to be compiled for each part of the transport sector, such as roads.

## **(3) Development of transport statistics**

The Central Statistics Department and the MCTPC both have sections set up to deal with transport statistics work, but the system is weak and data is somewhat unreliable. Because this will create problems in transport policy drafting and transport-related management and maintenance, a better statistical system has to be developed concerning roads (including measurement of daily traffic volumes), water transport and aviation.

## **(4) Strengthening implementation mechanisms**

It will be vital to strengthen engineering and planning capacities within the MCTPC at central government level. Provincial-level organizations such as DCPTCs also remain undeveloped, and strengthening the functions of these is a high-priority task, particularly given their involvement in maintenance. In addition, while the commercialization and privatization of state enterprises under the wing of the MCPTC is underway, this trend needs to be further promoted to ensure effective operation of the transport sector as a whole, also fostering local companies with a basic competence in road construction and maintenance.

## **(5) Securing fund sources and strengthening management and maintenance**

While the high priority placed on this sector in terms of budget allocation is unlikely to change, its budget share is expected to gradually decrease as development advances in sectors such as agriculture, human resources development and health and medical care. Greater effort will therefore have to be put into the proper screening of candidate projects, the creation of development plans on the basis of careful consideration of priorities, and ensuring adequate budget allocation.

Over the last ten years, priority has been placed on the rehabilitation of existing facilities and the construction of new facilities; it is now time to begin work on building and strengthening a thorough management and maintenance system. Some roads are already beginning to deteriorate despite the short passage of time after completion. In addition to regular working maintenance and the development of systems matched to maintenance levels, an information system also needs to be developed to allow effective management and maintenance, determining, for example, the classification of national and provincial roads.

The government has become strongly aware of the importance of maintenance, and is using donor support to implement studies on road maintenance, etc. Based on the results of these studies, the next step will be to arrange prompt budget allocation and to secure personnel. It will be particularly important to establish a system whereby gasoline taxes, automobile registration taxes and other tax revenue from transport users flows smoothly back into management and maintenance work.

New construction projects must be implemented within the scope of management and maintenance capacities.

#### **(6) Intra-sectoral prioritization**

As the transport sector budget is not limitless, consideration will obviously have to be given to prioritization among its various sub-sectors. Given the nature of the Lao's transport system, the bulk of transport sector investment should go into roads. As progress is made on the development of the trunk road network, priority should be shifted to the upgrading of local roads, without making this too drastic a conversion. National highway work is also far from complete, and if progress is not made in this area, smooth distribution will be impossible no matter the extent of local road development.

One theme of development should also be strengthening sub-sector linkages, opening the way for complementary relationships between these. Here again, the creation of an integrated development plan will play an important role.

#### **(7) Contribution to Indochina regional transport networks**

Concepts for the construction of an international transport network are currently being developed, spearheaded by the GMS plan, and as the country lying at the heart of the region, the Lao PDR will play an important role in linking its various neighbors. The Lao's future will depend to a great extent on turning its disadvantage as a land-locked country into an advantage by using this network as the base for the momentum driving national economic development. The following points should be borne in mind in regard to the Lao's participation in regional cooperation projects.

- 1) The creation of a network allowing the smooth linkage of domestic and international distribution
- 2) The development of plans which benefit the domestic economy, such as organic linkage with regional development programs located along network lines
- 3) Because of the country's limited capacity to shoulder capital burdens, the way should be opened for the Lao PDR to obtain foreign capital on soft conditions for the implementation of international projects.
- 4) Multinational border issues such as the collection of toll charges and legislature development need to be addressed at an early stage to facilitate international project implementation.

## 2-5-3 Current state of the communications sector

### (1) Telephones and mail services

#### 1) Overview

In the early 1990s, the Lao PDR had only 0.16 phones per 100 persons, a low level even by developing country standards. Most telephone facilities were of a French style established in the 1950s, with 80% of switches manually operated. The number of phone lines increased from around 5,900 in 1985 to around 8,000 in 1990, but many of these were overhead cables, while relay circuits were the old short-wave (HF) transmission facilities.

The number of phones (number of subscribers) has grown rapidly as of 1994 with the majority of users shifting from the public to the private sector. The Lao's dissemination rate has improved to around 0.42 phones per 100 persons, but the level is still low.

Telephone switch capacity (by number of terminals) has shot up from around 8,500 terminals (lines) in 1992 to the present level of approximately 32,000. More telephone infrastructure has also been developed in local cities in recent years, but around three quarters of switch capacity is still concentrated in Vientiane.

In regard to mail services, construction of the Vientiane Central Post Office, launched in 1975, had not been completed 10 years later, while local cities frequently had no post offices or else the post office shared a building with other government institutions. Inadequate means of transport for delivering mail had been a fatal weakness, with the undeveloped state of road and river transport keeping service reliability low.

#### 2) Development plans

The Telecom I plan for construction of a telecommunications network was created for the 1986-90 period based on the government's economic open-door policy. With funds from the IDA and ITU/UNDP, existing facilities were renovated and training conducted with the five following objectives. However, the aging of existing facilities and the difficulty of obtaining parts for repair prevented the plan from achieving adequate results.

- \* Construction of a communications network linking Luang Prabang and Pakse, with Vientiane as the hub
- \* Improvement of existing facilities (switches, etc.)
- \* Strengthening of the Enterprise d'Etat des Postes et Telecommunications Lao (EPTL), creation of a five-year plan for telecommunications
- \* Rehabilitation of the mail system
- \* Increased switch capacity

Real work began in this sector in the 1990s, when the Long-Term Development Plan for Telecommunications (1991-2010) was formed. This established mechanisms for telecommunications sector development in five-year phases in line with the national Five-Year Development Plans.



The 1991-95 Telecom II plan learnt from the experience of the first plan, setting as its main objectives the total replacement of the existing manual, analogue switches with automatic, digital switches, as well as the completion of a microwave trunk line running from north to south of the country.

The current 1996-2000 Telecom III plan seeks to promote private sector participation in development, as well as setting the following objectives:

- \* Construction of a microwave trunk line between Pakse and Muang Khone
- \* Completion of Telecom II projects
- \* Development of telephone networks in local cities
- \* Construction of a satellite ground station (standard A) and fiber-optic transmission lines between this and the telephone center in Vientiane
- \* Cooperation in an Asian fiber-optic project linking Shanghai, Viet Nam, the Lao PDR, Thailand, Malaysia and Singapore
- \* Launching of a Lao telecommunications satellite
- \* Development of the postal system

### **3) Implementation mechanisms**

MCTPC's Posts and Communications Department has jurisdiction at central level, with the EPTL and vocational schools also under its control.

Local implementation mechanisms were weak, with mail and telephone services conducted as part of government administration at 17 points around the country up until 1985. In 1982, this system was reorganized into provincial mail and telephone concerns, which were then integrated into the national-level EPTL in 1986.

Because of the strategic importance of the telecommunications sector, government policy is to keep basic operation of the sector within the government, but in recent years there have been experiments toward more rational and efficient implementation mechanisms. In particular, the government plans to restrict MCTPC involvement to policy drafting and overall management functions, leaving operator functions completely in the hands of the EPTL and increasing the independence of this agency. The EPTL was also broken down in April 1995 into two state enterprises, one for communications and the other for mail services.

The promotion of private sector participation being one of the objectives of the current Five-Year Plan, the Lao Telecom Company was established in 1996 with joint financing from Shinawatra Co. (a Thai company) and the Lao PDR government. The new company leases communications network utilization rights from the Enterprise de Telecommunications Lao (ETL) to provide telephone services.

The way has also been opened for private sector participation in part of the cellular phone sector, with the government approving construction of a cellular phone system on a BOT basis by the Lao Shinawatra Co., which operates with Thai capital.

#### **4) International communications and Indochina regional development projects**

The Lao's international communications began in the early 1970s with a microwave established between Vientiane and Nong Khai, but until 1985 was limited to high-frequency communications with Moscow, Hong Kong and Hanoi and satellite communications with Moscow using the Intersputnik.

In 1985, Australia built a standard F-3 satellite ground station, but this was unable to cover international communications demand, increasing in terms of both relay and other costs and also capacity.

A full-scale ground station was built in 1995 through grant assistance from Japan, expanding the international line facilities of the Central Telephone Exchange Office and constructing a 16m diameter standard satellite ground station and fiber-optic and microwave transmission lines between this and the Central Telephone Exchange Office.

GMS infrastructure project considerations began in 1992 under ADB leadership, including the communications area. This resulted in implementation of a sectoral development program study, the report on which was completed at the end of 1995.

Based on the results of this study, tariff policies and systemic, technological and regulatory aspects are to be examined, working toward implementation of 13 regional development projects. These 13 projects have been grouped into North, East and West Loops and an Improved Interconnectivity Project, to be constructed using a fiber-optic communications network, taking advantage of the rapid development of fiber-optic networks in the 1990s.

Particular priority has been placed on the East Loop, which includes the Lao PDR, and a supplementary study in relation to this loop is to be carried out with aid from France.

The Lao international communications therefore seem likely to be developed with a balance between the Asian fiber-optic network and satellite communications. Particular attention should be paid to the linkage between the Shanghai-Singapore and GMS fiber-optic communications networks, as well as developments in regard to the Laostar satellite communications included in the current Five-Year Plan.

#### **2-5-4 Issues in communications sector development**

The government has been pushing forward rapidly with development of the communications sector in the 1990s. As a result, domestic communications has seen the completion of the north-south trunk line network, and digitalization is not far away.

Communications sector development has just begun in the Lao PDR, and telephone office plans still cover no more than the major cities. The Lao PDR will have to look at extending its communications network out to smaller cities and rural villages. In terms of international communications, while satellite communications have been developed, the next step will be to open international communications access not just to major cities but also to other parts of the country. Particularly in terms of linking the Lao PDR and its neighbors, the likely outlook is for gradual development of a fiber-optic communications network under the GMS plan.

- **Creation of a masterplan**

A masterplan covering the early 1990s was created with IDA support, but no new plan has been created since the Lao PDR entered the latter half of the decade. With new moves toward, for example, private sector participation, to define the direction of development and clarify the appropriate scale of public investment, the role of foreign aid and the relationship between the government and the private sector, the Lao PDR needs to create a masterplan which contains the following elements.

- \* **Communications demand forecasts**
- \* **Consideration of the direction and content of communications network development**
- \* **Prioritization of investment projects and consideration of implementation timing**
- \* **Review of the demarcation of roles between the government and private sectors**
- \* **Consideration of linkages with international communications networks**

- **Demarcation of government and private sector roles**

The government has been actively promoting private sector participation in recent years, but policies seem to swing between maintaining public sector control and promoting privatization. Pushing forward with across-the-board privatization would not be appropriate in terms of efficient development operation and the Lao's stage of socioeconomic development; private sector participation should be increased in stages, with the public sector playing the main role in the development of local communications and other areas with low productivity.

- **Linkages with international communications networks**

Construction of the GMS fiber-optic communications network is being undertaken on the principle that each country will shoulder development costs within their own territory, creating a major capital procurement headache for the Lao PDR. The Lao PDR needs to move forward at a realistic and appropriate pace, bearing capital procurement prospects in mind. A plan will also be essential to link international and domestic communications networks.

Figure I-3 Donor Support for Lao Road Sector (1980s Onward)

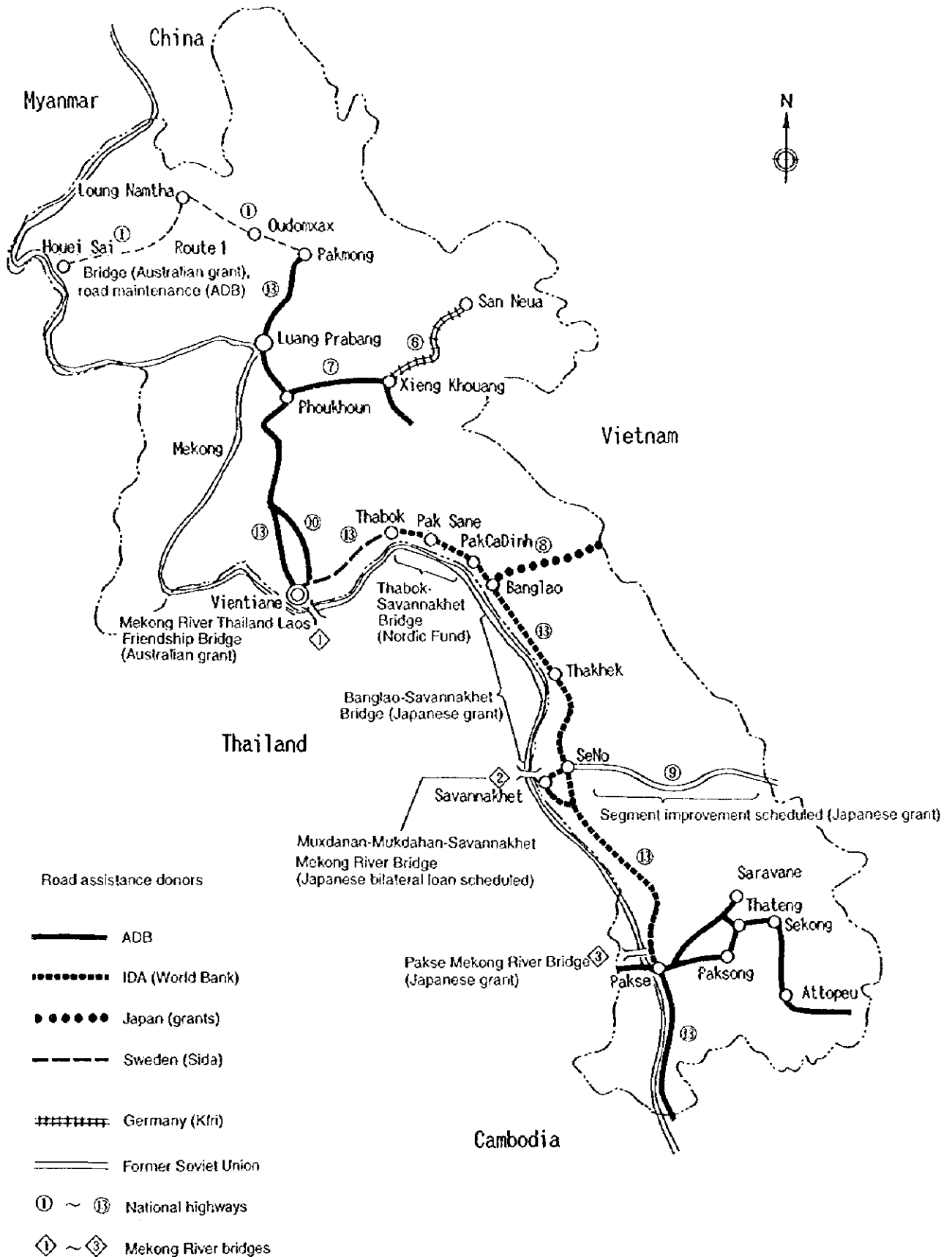
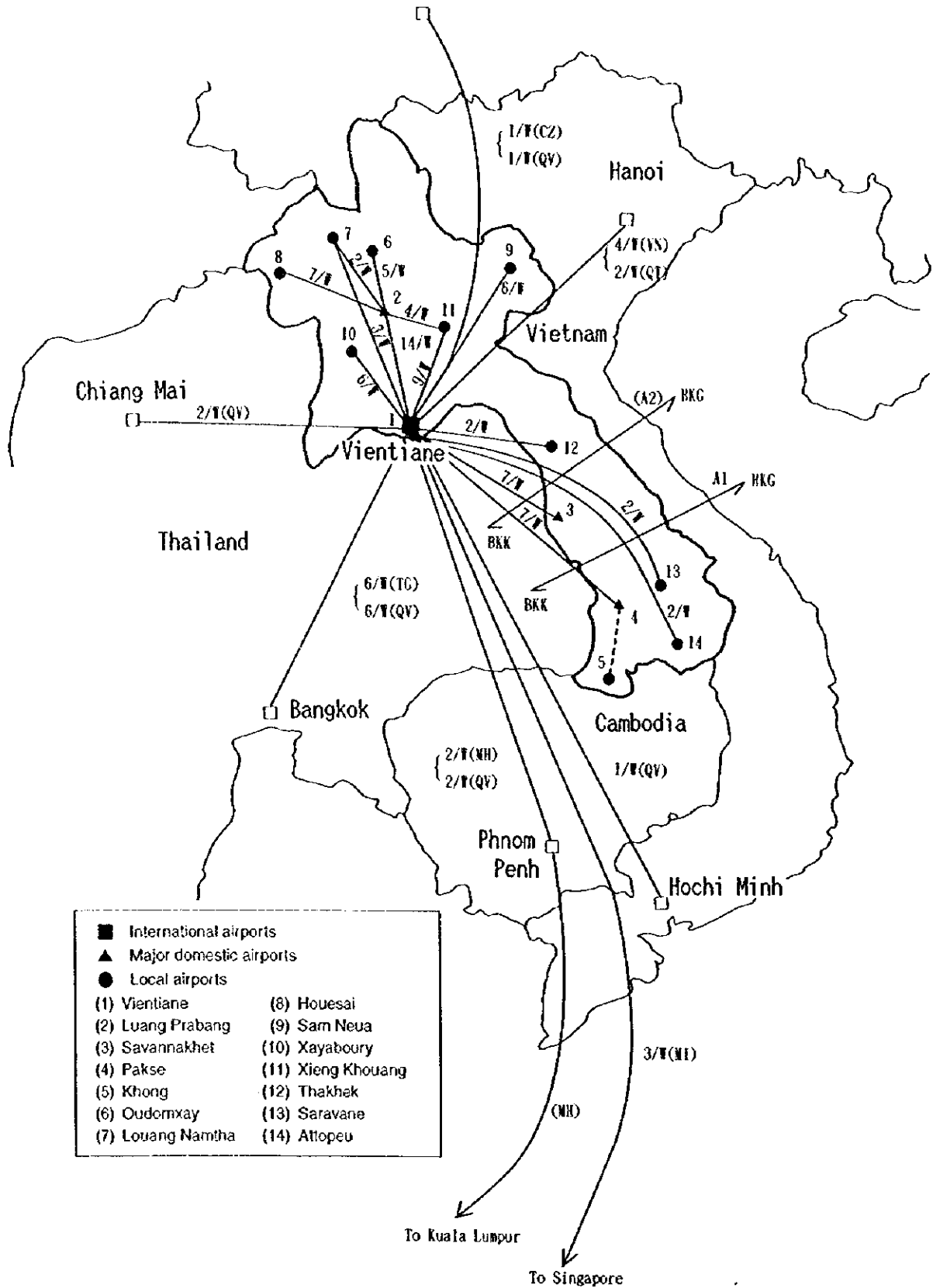
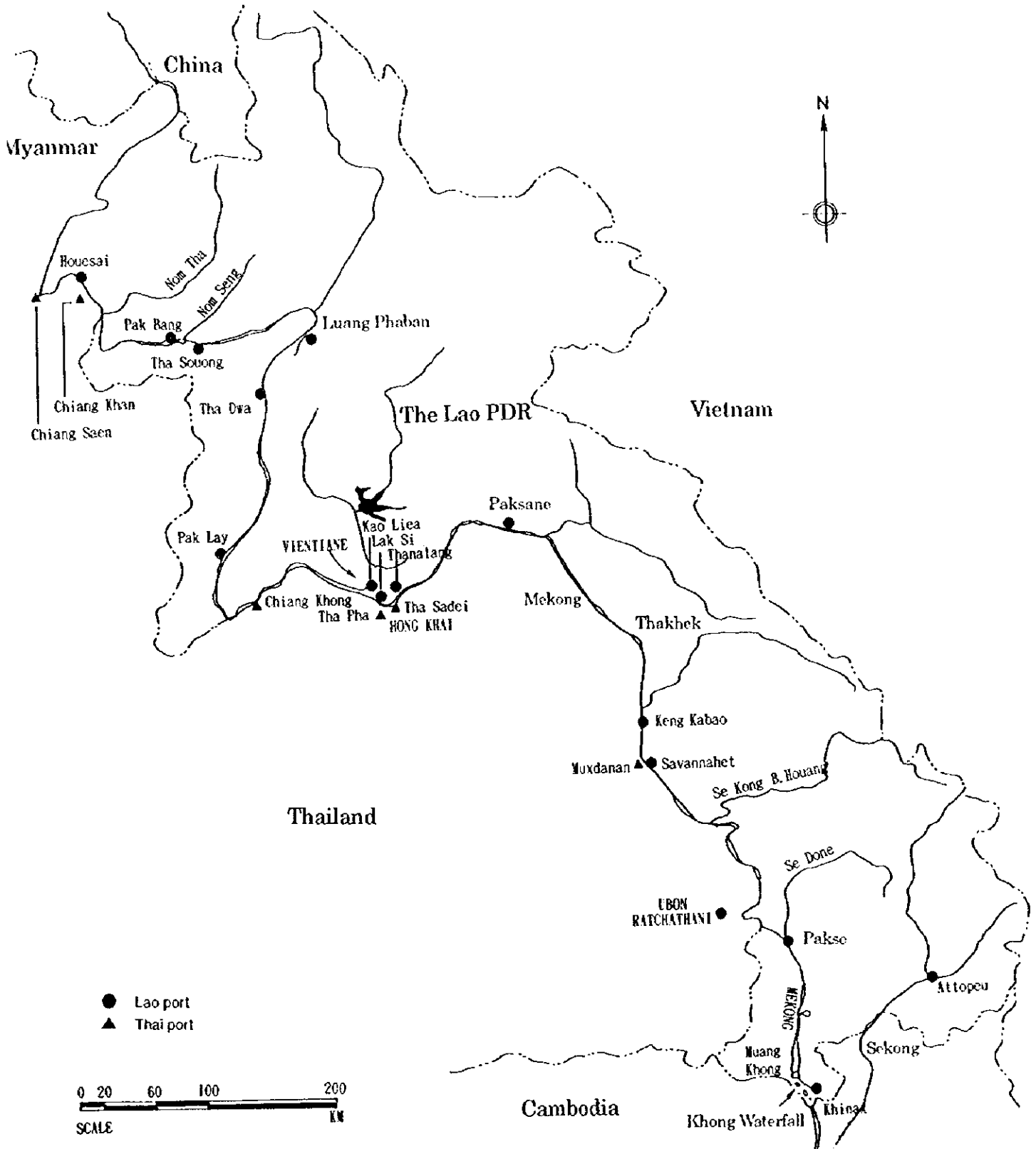


Figure I-4 Lao Airport Distribution and Flight Network (November 1996)



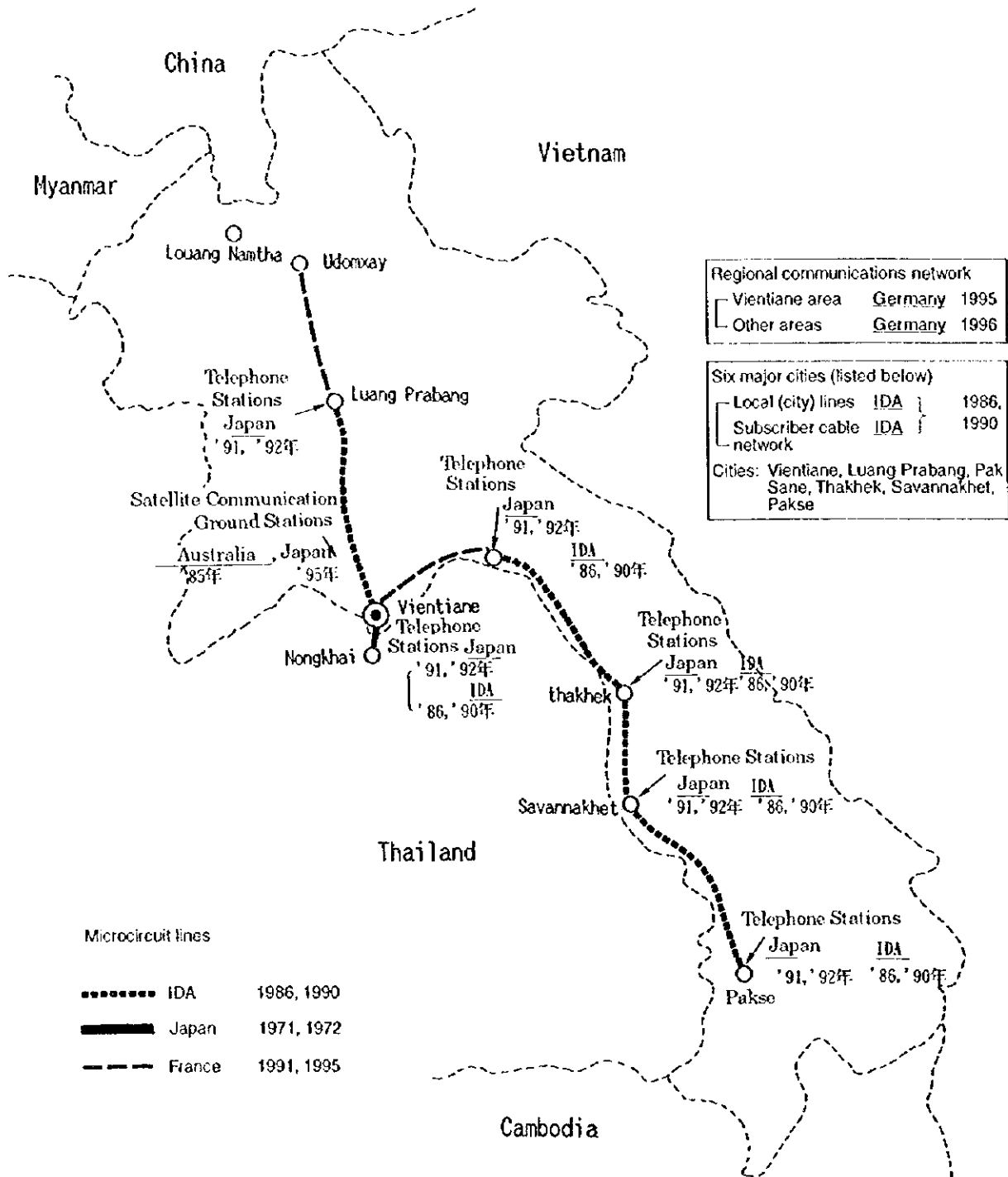
Sources: Indochina Region Transport Sector Cooperation Promotion Study (Cambodia, Laos), Foreign Transport Cooperation Committee 1997 (Lao Aviation Department and Lao Aviation)

Figure I-5 The Mekong River and Location of the Lao PDR Ports



Sources: Indochina Region Transport Sector Cooperation Promotion Study (Cambodia, Laos), Foreign Transport Cooperation Committee 1997

Figure 1-6 Trends in Donor Aid for the Lao PDR Communications Sector A



## **2-6 Electricity and energy**

### **2-6-1 Current state**

#### **(1) Energy policy**

The Lao's basic challenges in this area are the efficient development of available domestic energy resources and less dependence on imported energy, with energy policy focused on five areas: lessening dependence on imported petroleum by developing coal and lignite; actively developing hydropower as a means of earning foreign exchange through electricity exports (which were around 10% of gross export value in 1996); diversifying energy sources and Lao's export partners; strengthening government energy sector institutions; and promoting rural electrification to reduce the amount of firewood and other non-commercial energy consumed.

#### **(2) Energy resources**

The Lao PDR is blessed with a wealth of hydropower resources due to its topography and abundant rainfall. Mekong River tributaries alone have a hydroelectric potential of around 18 million KW, which it would be economically feasible to develop. With only around 216,000 KW generating capacity installed to date, there is still enormous room for development.

Coal deposits have been confirmed in provinces in northern, central and southern Lao PDR, and a small amount of anthracite is currently being extracted from shafts in the Boten area of Vientiane Province. There is a high likelihood of deposits in other areas as well, and we hope to see these developed in years to come. According to recent surveys, very high quality lignite (a sulfur content of around 0.7%) has been discovered in the Hongsa area of Xayaboury Province in the north, close to the Thai border, with the deposit estimated to be around 220 million tons. Negotiations are underway with Thailand on extraction and the construction of a thermal power station, and a joint venture is to be established.

#### **(3) Energy demand and supply**

United Nations energy statistics reveal swings in total energy production according to the year, the result of the bulk of production being supplied through hydroelectricity. Electricity is currently being exported to Thailand from the Nam Ngum power station, providing an important source of foreign exchange. However, export volume fluctuates according to the amount of hydroelectricity generated. All petroleum is imported, and with the demand for gasoline and fuel oil growing in response to the greater use of motorcycles and the advance of industrialization in recent years, the import volume of petroleum products has also been rising at an annual average of 5%. Because the Lao PDR has yet to develop a transmission grid, electricity is diverted from Thailand and Viet Nam, making the Lao PDR an electricity importer, albeit of very small quantities.

Domestic energy consumption has been increasing by an annual average of 4% from the 84,000 tons consumed in 1984 (petroleum conversion), reaching 121,000 tons in 1994. The composition of consumption in 1994 was 18.2% electricity, 0.8% coal and 81.0% petroleum products. Compared to 27.4% electricity and 72.6% petroleum products in 1984, electricity has lost ground and petroleum products have increased, with coal also emerging as an energy source.



#### **(4) Current status of electricity projects**

The Committee for Energy and Electric Power, the members of which are drawn from

the Electricity Department of the Ministry of Industry and Handicrafts (MIH), *Electricité du Laos* (EDL) and the Ministry of Finance, decide the basic direction in terms of electricity policy, development plans for electricity sources and revisions to electricity charges. Environment-related issues are under the jurisdiction of the Science, Technology and Environmental Organization (STENO), which conducts environmental impact assessments in regard to hydropower development. Plans to introduce independent power producers (IPPs) have also been advancing in recent years, with MIH and the Foreign Investment Management Committee (FIMC) jointly formulating IPP policies and strategies.

Looking at the supply and demand balance for electricity, 1.09 billion KWh of electricity (at the point of generation) was produced in FY1995, while domestically supplied electricity (including that used by power stations) was around 491.3 million KWh after subtracting the 598.7 million KWh of diverted electricity (excluding imports and exports). While only 76.8 million KWh of diverted electricity was imported, 675.5 million KWh was exported, or 61.2% of total electricity generated, and around double the scale of electricity sold domestically. Installed generation capacity was 216,200 KW at the end of FY1995. Five power stations have either been newly built or expanded over the last decade: the Xeset hydropower plant (45,000 KW; in operation since 1991); the Saravan hydropower plant (expanded to 3,000 KW; completed in 1994); the Pak Song hydropower plant (40 KW; in operation since 1985); Luang Prabang Diesel (expanded to 540 KW; completed in 1992); and Saraven Diesel (100 KW; in operation since 1985). The component ratio of electricity sources is therefore 93% hydropower and 7% diesel, with an increasing predominance of hydropower. There has been a marked delay in the development of a nationwide transmission grid, with both of the only two existing transmission lines running from the provincial capital of Luang Prabang Province (Luang Prabang) through the capital of Vientiane as far as Thailand (the 115kV Vientiane line) and from the Xeset hydropower plant in the south through Pakse City to Thailand (the 115 kV Xeset line). Even in regions using diverted electricity imported from Thailand and Viet Nam, high-tension distribution lines supply only an extremely limited area.

#### **(5) Development trends**

<Main directions in private sector hydropower development>

The Lao PDR has abundant hydropower resources, with hydropower capacity estimated in some quarters as running to 30 million KW. This capacity has attracted a great deal of interest in neighboring Thailand, where rapid economic growth has brought about a shortfall of electricity sources. However, little progress has been made with hydropower development because of the difficulty of international diversion of electricity across national borders and the problems experienced by the Lao PDR government in procuring development funds. The Lao PDR tried to use ODA from donors such as Japan, but made little progress because of the limited scale of the national economy. In 1992, however, the government took advantage of the new momentum in Southeast Asia in regard to the use of private sector capital, and opened the door to private sector development of hydropower resources as BOT projects, etc. Responding to the government's new policy, many private investors declared their interest in such development, and a number of BOT and joint venture plans are currently underway. At the same time,

private sector hydropower development raises many issues--for example, environmental problems, fund procurement, and negotiations with Thailand over the unit price for electricity sales--and the government is currently struggling to resolve these with some exceptions.

<Environmental issues revealed in the Nam Theun 2 plan>

Plans have been made to construct Nam Theun 2 (around 600,000 KW) in the upper reaches of the Nam Theun River, with the original feasibility study conducted using UNDP funds. In response to government calls for private sector development, development preparations are currently being spearheaded by Australian capital. However, because the Lao PDR government insists on holding a certain amount of the capital, the World Bank was to do the backing, but this has been suspended because the World Bank's own position requires further environmental impact assessments to be carried out before funds can be provided. This stance by the World Bank has also affected the attitude of other private banks supplying funds, and all this pressure has come to bear on the Lao PDR government, which is doing its best to resolve the issue. In addition, the Electricity Generating Authority of Thailand (EGAT), which has agreed to buy the electricity supplied, is in the stronger bargaining position in terms of unit price; further, where electricity generation does not begin within the agreed fiscal year, contract problems could emerge. The direction in which the World Bank leans is therefore the subject of considerable interest.

<Private sector development of dams on the Se Kong Nam Ngum and in the lower reaches of the Nam Theun>

As the Nam Hinboun hydropower development plan (around 200,000 KW) in the lower reaches of the Nam Theun requires no reservoir and consequently poses few environmental problems, construction is apparently proceeding smoothly on the basis of cooperation between the Lao PDR government, supported by the ADB, and private investment, mostly from Sweden, with the plant likely to start operating on schedule in 1998. Surveys for the medium-scale plan for the Se Kong River close to the Boraven Plateau are moving ahead on the basis of capital from South Korea, etc., with no hitches arising to date. Plans for construction of Nam Ngum 2 and 3 above the existing Nam Ngum dam are being advanced primarily on Thai capital, but with the government's portion of the capital to be prepared through the private investors involved by introducing financing sources to the government, further developments will bear close attention. These plans currently being developed are proceeding relatively smoothly because of the focus of environmental debate on the Nam Theun 2 plan. However, given the massive amount of capital required and the way in which private investors are advancing their plans independently, with no integrated means planned for power transmission to Thailand, a more proactive role will be required of the Lao PDR government in days to come.

<The Lao PDR benefits from private sector hydropower development>

The government opened the door to private sector development because it was unable to gain unanimous support from public sources of funds, spurring discussion for a while about the benefits which the Lao PDR would reap from such development. The government's eventual response was to insist on holding a certain amount of the project's capital, but because this required the intervention of public funds (in particular, from the World Bank for Nam Theun 2), serious environmental debate was stirred. Many experts argued that it was up to the government to set in place complete legal systems relating to private sector development, taking

the initiative in terms of the necessary compensation for inhabitants and demonstrating strong leadership in regional development and environmental protection. Japan has experience in this area: development in Hokuriku and Kisogawa was led by electric power companies, and this created problems in regard to the riverine environment. This in turn resulted in the passing of three laws on the electric power industry (Dengen Sanpou) and other components of a legal framework that mandates environment protection in areas providing electricity. We believe that the Lao PDR will also have to work on a legal system that places the environment at centerstage.

<The Greater Mekong Development initiative and the establishment of a transmission company>

With various private sector developers currently pushing ahead with plans on the basis of their own respective ideas for transmission to Thailand, the Mekong River Commission in particular is arguing that these need to be brought together under an integrated initiative as a transmission company which will work on the comprehensive construction of transmission lines. The other side of the argument is the Greater Mekong Development initiative headed by the ADB. This sets out to build one broad-ranging economic bloc centered on transport, traffic, trade and tourism, incorporating Myanmar and China's Yunnan Province, areas bordering the upper reaches of the Mekong which have been prevented from this unity by their political environments, as well as the Lao PDR, Thailand, Cambodia and Viet Nam in the lower reaches. The concept of a wide-ranging transmission grid in the electricity sector plays an important role in this. The plan also involves development of hydropower sources on the Chinese Lan Cang River which runs through the north of Viet Nam and Yunnan Province and has similar abundant hydropower resources. Geography places the Lao PDR at the center of this transmission grid concept, premised, however, upon the economic development of the region's major cities, including Ho Chi Minh in Viet Nam, Phnom Penh in Cambodia and Kunming in Yunnan Province.

<Importance of environmental policies in Japanese private investment>

There has been little Japanese interest in the Lao PDR private sector hydropower development, partly because of the way in which the recession has cooled private sector investment, and also because of discussion as to the economic feasibility of private hydropower development, which has a long redemption period. Supported by the Asian energy strategy put forward by the Japanese Ministry of Trade and Industry (which seeks a massive injection of development funds from the private sector as well), Japanese electricity investors are finally launching into serious considerations, but companies will need to see a serious response being made to environmental issues before they move into hydropower development. When public funds play a part in such development, the allocation priority should be environmental measures, and this is an area where Japan's experience could provide a major contribution.

<Establishing policies for Lao PDR rural electrification>

Government efforts toward the electrification of rural villages and isolated areas of the country should not be forgotten in the focus on the introduction of private capital toward large-scale hydropower exports. Along with the broad-ranging transmission grid concept, the need for rural electrification too has been a topic of increasing debate among the Lao's experts. A definite group is emerging which is concerned that large-scale development will degrade

national territory and wants to see this territory properly developed, which obviously ties in with the development of a domestic electricity supply grid. There is a strong likelihood that boosting the rate of domestic electrification through small- to medium-scale hydropower, particularly from the upper reaches of the Nam Ngum, could become the starting-point for this.

<Need to develop personnel and legal systems in the Lao PDR electricity sector>

As the Lao PDR is engaging in some of the world's largest-scale electricity development with very little in the way of human resources, it is hardly surprising that the development of human resources in the electricity sector, as well as the development of laws and other institutions, have become issues from an early stage. The UNDP and many other institutions and countries are beginning to move on these, and Japan has also suggested cooperation centering on these issues, but with a number of countries simultaneously putting forward their analyses of the issues at hand, the Lao PDR government is not responding as appropriately as it might. The government sees development funds as the pivotal issue, and will take some time to be convinced of the need for efforts to develop the above areas as the foundation for development.

## **2-6-2 Issues**

Amidst the major tide of private sector hydropower development, thought needs to be given to developing the systemic and personnel environment in the electric energy sector to handle this, as well as fund procurement methods and a correct response to domestic energy demand. Priority issues can therefore be narrowed down to the following five points:

### **(1) Development of the systemic and personnel environment**

Progress is being made in developing laws on private sector investment as a whole, but the pace has been slow in developing the electricity sector laws, human resources and institutions to accompany these. Not only is the government not responding properly to the proactive private sector and NGOs, but concrete measures to link private sector electricity development with the economic development of the Lao PDR have yet to materialize. Measures are therefore needed in regard to the following:

- \* Establishment of technological standards to ensure the safety of the environment and of the surrounding region;
- \* Establishment of laws on development in electricity source areas, and securing of the finances for this;
- \* A clear distinction between the electricity administration and electricity development sectors, and establishment of institutions which reflect this distinction; and
- \* Securing and fostering of personnel in electricity administration and the technological area.

### **(2) Creation of an integrated development plan for each river**

Plans are currently going ahead for isolated private sector development participation based on proposals for specific geographical points, with the result that a number of private enterprises are working on the same river system. This raises the issue of the creation of a single optimum development plan for the length of a river. The government needs to authorize such integrated development plans for each river, taking into consideration plans which are

already underway, and to organize the various private sector participants accordingly. Plans should incorporate local regional development plans (irrigation, etc.) and the watershed protection concept which has been adopted in some areas.

### **(3) Securing government development funds**

The government is seeking to secure benefits for the country through its participation in hydropower development, demanding a certain share in private sector-led development. This means, however, that the government has to secure participation capital, for most of which it wants to rely on public funds. The ADB and the World Bank have recently been developing various backing plans, but no country, including Japan, has yet given any clear indications in regard to bilateral public funds. This is partly because of concern over environmental issues, but the main factor is the delay in legal development in the Lao PDR, and the government needs to throw its full weight behind redressing this, engaging actively in dialogue on public funds.

### **(4) Blueprint for environmental measures and capital procurement**

While hydropower development should bring some benefit to the Lao PDR, it will also naturally have a certain negative impact on the environment. To deal with this issue, detailed environmental studies have to be carried out and measures formulated on the basis of these to ameliorate any environmental impact, as well as procuring the necessary capital to ensure that such measures are adequate. This will require the establishment of a legal system which places appropriate regulations on developers from the perspective of government electricity administration. Concepts such as active capital cooperation for the environment, currently a buzzword among donor countries, should be taken advantage of in dealing with the environmental impact issue. It is obvious that measures must also be included in regard to local residents, that involve directly and indirectly environmental issues.

### **(5) Consideration of impacts on people's lives**

While the export of electricity through large-scale hydropower development is aimed at boosting state budget and national income, electrification policies for rural villages and isolated areas tend to be overshadowed by this and forgotten. Rural electrification could be one effective means of combating environmental destruction caused by slash-and-burn agriculture, and nationwide measures should be advanced actively in this area, with the government also engaging in dialogue toward gaining cooperation where necessary from other countries and institutions.

## 2-7 Manufacturing

### 2-7-1 Current state

#### (1) Current state of manufacturing

##### 1) Current state of domestic manufacturing and the trade balance

###### <Problems in industrialization led by modern manufacturing>

While demand for non-durable daily consumer goods is becoming increasingly diverse in the Lao PDR, most of this is covered by imports, particularly of Thai products. If the transition to the AFTA regime goes ahead according to schedule, common tariffs could see the Lao's imports of consumer goods increase still further. The likely result of this situation will be a perpetual current account deficit and a consequent devaluation of the Kip. The Kip in fact is already falling steadily against the dollar. This will obviously be a disadvantage in terms of introducing foreign direct investment, but at the same time, the economy does not have the strength to handle a dollar peg.

Improvement of the Lao's foreign exchange position will hinge on the fostering of manufacturing. At present, the country's notable manufacturing industries are food processing, wood processing and garment. Many garment factories were established through direct investment immediately after the economy was opened up. However, because of problems with proof of origin--Thailand exporting its own products as the Lao PDR products, etc.--the European Union took away the Lao's Generalized System of Preferences (GSP) status in 1996, leading to the closure of 10 factories. The Lao PDR is currently negotiating with the EU, and its GSP status is expected to be restored. With Viet Nam and the People's Republic of China as competitors, if the WTO textile agreement, which has carried on the functions of the Multi-Fiber Arrangement<sup>(73)</sup>, moves toward free competition in the garment industry, it seems unlikely that the Lao PDR will be able to maintain international competitiveness in the industry over the long term. As in the above case, there is a risk that this kind of industry could simply collapse in the face of any major shock caused by changes in the external environment such as the GSP and the MFA.

The absence of a cloth-making industry in the Lao PDR has also meant that the garment industry has to import raw materials, handling only the downstream garment manufacturing process. This prevents the creation of any substantial value added in the garment industry. The same is true for a Japanese-affiliated motorcycle assembly plant. The establishment of this factory was announced with great fanfare, but all the factory handles, even of the downstream process, is the simple final assembly, with all parts imported from a Thai factory. This reduces the creation of value added to the bare minimum.

###### <Conditions for a sustainable manufacturing industry>

Without the deepening of industry through the domestic supply of raw materials and intermediate goods, even where industrialization goes ahead not on the basis of short-term capital but of direct investment, the only likely result will be a worsening current

<sup>(73)</sup> An international agreement concluded in 1974 to allow quantitative import restrictions as a safeguard measure against sudden increases in textile imports. This expired at the end of 1994 and was succeeded by the WTO Textile Agreement, which seeks the abolition of selective safeguards over the next ten years.

account deficit. The Lao PDR, however, has virtually none of the small and medium enterprises needed to supply parts and components. Industries such as garment and motorcycle assembly appear to be major foreign exchange earners in terms of the amount exported, but when their dependence on imported raw materials and parts is taken into consideration, they in fact have very little effect in terms of improving the trade balance.

<Endogenous constraints on the manufacturing industry>

At the same time, it will not be easy for the Lao PDR to industrialize through import substitution and industrial deepening. Even looking just at ASEAN and the economic disparity between the Lao PDR and more advanced countries such as Thailand and Malaysia, the possibility of the Lao PDR achieving international manufacturing competitiveness seems remote, with the exception of cement manufacture and some staple products such as timber and coffee. Moreover, when tariffs are lowered under the AFTA regime and the Lao PDR is exposed to international competition, the country has very few industries which are likely to survive or to become recipients of direct investment. To a major extent, this is because of the following external constraints on the Lao PDR industrialization.

- ① Because of the limited domestic markets, even if import substitution industrialization was advanced on the basis of protectionary trade policies, the Lao PDR would not be able to achieve economies of scale, and it is also unclear how far such policies would be allowed by the AFTA regime.
- ② Given that the Lao PDR cannot currently hope to produce most raw materials and intermediate goods domestically, import substitution specializing in assembly (downstream stage) could have only a limited effect in terms of improving the country's foreign exchange position.
- ③ Insufficient dissemination of basic education will make it difficult to create modern factory workers.
- ④ With a very limited labor force spread around the country, economic development through labor-intensive industrialization is very likely to stall at an early point.
- ⑤ The Lao PDR wages are certainly not cheap compared to China and Viet Nam, its potential competitors, despite the lack of basic education.
- ⑥ Transport costs are high because of the Lao's landlocked environment.

The Lao PDR must choose its manufacturing industries in full awareness of these conditions.

**2) Conditions for a sustainable manufacturing industry (industrialization relying on domestic resources)**

Given the above constraints, the East and Southeast Asian development model of export-oriented industrialization and the attraction of labor-intensive downstream industries hardly seems a useful strategy in achieving take-off for the Lao PDR economy. The same constraints also make the country unlikely to succeed with broad-ranging industrialization providing substitutes for a variety of imported goods. They also stand in the way of the Lao PDR drawing in foreign capital as a recipient of direct investment. A more useful industrialization strategy would be one which fosters industries which (a) are based on exist-

ing local technology which alleviates the problems associated with the introduction of new technology; (b) permit domestic handling of the entire process, from upstream through to downstream; (c) do not induce sudden urbanization (i.e., do not impose a major social burden); and (d) are export-competitive. In other words, the Lao PDR needs industrial policies similar to the priority production system adopted by Japan in the past. Industries meeting these criteria include cement manufacture, wood processing, agroprocessing and the rural handweaving industry.

Because the raw materials for these industries can all be supplied domestically, they will allow industrialization based not on the usual import substitution but on the processing of primary products; in other words, these are export-substitution industries (with the exception of rural handweaving). For example, despite Lao's unlimited supply of limestone as raw material for cement, the sole existing cement factory has only old Chinese machinery and extremely low productivity. This is not enough to meet cement demand, with the result that the Lao PDR depends on cement imports. This situation should be remedied as soon as possible. The Lao PDR also exports a lot of timber, but the majority of this is still round logs. The Lao PDR needs to learn from the measures previously adopted by Indonesia, namely prohibiting round log exports and moving quickly to establish sawmills and furniture factories, etc., which can provide export substitutes. Cement manufacturing and wood processing based on domestic raw materials should have a greater impact on the national economy than the garment industry, which is only a downstream industry.

Rural handweaving also has the potential to become such an industry. Here we would suggest a policy which positions rural handweaving as one of the key areas of industrialization. One reason for considering rural handweaving is its recognized export competitiveness, with significant exports of handwoven cloth that are, however, not traced in statistics. Many developing countries have adopted policies for fostering cottage industries to redress income disparities between rural and urban areas. However, as typified by India, fostering cottage industries without market competitiveness leads to high costs and eventually impacts negatively on the macroeconomy. The Lao's handweaving industry, however, has achieved a good export performance despite the lack of special protective policies, which would suggest, albeit in retrospect, that the industry has market competitiveness.

Secondly, the handweaving industry has a strong linkage effect. In other words, it involves a series of processes, including sericulture, thread manufacture and raw cotton production, which should create a significant amount of value-added and employment. In addition, while sericulture, yarn manufacture and raw cotton production are still at the old technological levels, they do have a history in the Lao PDR, providing the foundations on which to build these industries through the introduction of new technology. The handweaving industry can therefore be described as one of the country's few industries with the potential for domestic production throughout the whole process, from upstream to downstream.

Thirdly, because this is a rural industry, it will not induce urbanization. Envisaging the various problems which could arise if industrialization was advanced by inviting in large-scale factories at a point when urban infrastructure was not sufficiently developed, if there is a possibility of promoting rural industries with export competitiveness, these would be very viable strategic targets.



## (2) Rural handweaving

### 1) Profile of the handweaving industry and related problems

#### <Characteristics of the handweaving industry>

Lao cloth can be classified into figured cloth and *mat mi*, which is also known as Indonesian *ikat*. These are used for the wrap-around skirts known as *sin* which are the dress of Lao women. The former is produced mainly around Vientiane and in northern Lao PDR (Luang Prabang, Phong Saly, Xieng Khouang and Houaphan Province), while the latter is produced in the south (Champassak Province is particularly famous for this).

Around the Vientiane area, figured cloth is usually woven from a silk-cotton mix, while cotton predominates in the north. The mixing of silk and cotton is because tough silk warp yarn (most of which is Chinese or Japanese) is expensive in the Lao PDR, with cotton yarn used in its place. Because silk is hard to come by in the north, cotton yarn is used for both warp and weft yarns. Good-quality cotton yarn is all produced in Thailand, however, while products are exported directly to northern Thailand, by-passing Vientiane. *Mat mi* is also made of silk, silk-cotton mixes or cotton. Many different types of silk yarn are used, with silk warp yarn inevitably imported. Low-quality yarn is produced domestically, although there are no production statistics. Looking at the yarns in the market, however, there seems to be heavy dependence on imports for both silk and cotton yarns. The fact cannot be overlooked that these imports of good-quality yarn since the economy was opened up have improved the quality of Lao handwoven cloth. Handwoven cloth therefore may have export competitiveness, but imports are relied on for the greater part of raw materials, diminishing the industry's effect in terms of improving the Lao's foreign exchange position.

#### <History of handweaving>

With the pre-revolution influx of garment industry products, the traditional wrap-around skirt began to vanish, particularly in urban areas. After the 1975 revolution, however, this influx of products was cut off, once again sparking the manufacture of handwoven cloth. The recent economic liberalization has produced the following three climates which differ from the pre-revolution days.

Firstly, before the revolution, the patterns of Lao cloth reflected the cultural, religious and ritual symbols of ethnic groups, regions and even villages. However, the revolution saw a migration from the Houaphan, Xieng Khouang and Phong Saly provinces (which, as it happened, had sided with the new administration), the so-called treasure-house of handwoven cloth, to the Vientiane Plain. This cultural interaction increased interest in the various woven patterns, turning patterns which were formerly linked to religious and other ceremonies into a fashion source as simple motifs. Weavers who formerly only had to create the patterns unique to their region were suddenly required to begin weaving a variety of patterns in response to fashion trends.

Secondly, many people who had backed the old administration fled to the United States and other countries, creating a new demand for skirt cloth.

Thirdly, Thailand became an important consumer. Northern Thailand and the Lao PDR were originally part of the same cultural sphere, and Thais had also engaged in loom weaving. However, over the period when the Lao PDR was virtually closed off from the

world economically, Thailand underwent rapid economic development which pushed up wages and led to the gradual dying-out of handloom weaving. Today, Lao cloth is popular in Thailand as high-quality woven material.

<Limitations of the handweaving industry>

History has provided the Lao's handweaving industry with the above momentum, but rural handweaving also has the following limitations.

- (i) Demand is limited to domestic customers, Thais who share the same culture, and the Laos who fled to the United States and elsewhere during the period of unrest around the revolution. Wider demand needs to be created.
- (ii) Because of the high dependence on imported raw materials (silk and cotton yarn), exports do little to improve the trade balance. The Lao's silkworms are the wild variety, and spinning technology still uses primitive sitting-style machinery. As a result, good-quality silk yarn cannot be produced domestically. The same holds for cotton yarn, with only poor-quality cotton yarn able to be manufactured from old domestic raw cotton strains. For example, in Luang Prabang in the north, exports of cloth (woven cotton) to Thailand have been increasing rapidly since economic liberalization. Boats go up the Mekong River to take exports to Hoi-sai on the Thai side without passing through Vientiane. However, the cloth for export uses good-quality cotton yarn imported from Thailand, with domestic yarn used for low-quality cloth for the domestic market.
- (iii) Western clothing has been coming back on to the Lao market with economic liberalization, with the custom of wearing a wrap-around skirt beginning to fade again. While demand for this cloth is likely to increase due to the income effect of economic development, over the long term, the wrap-around skirt is likely to meet the same fate as traditional Japanese clothing. This is why the Lao PDR needs to create wide foreign demand.

## 2) Marketing for handwoven cloth

To make rural handweaving part of the Lao's economic development strategy, marketing channels must be understood. Handweaving has traditionally been a sideline for village women, with producers essentially scattered among rural villages. An efficient link between these women and large-scale demand (urban and foreign markets) will be a key issue in the development of rural handweaving. In other words, any strategy in this regard must be based on the recognition that the market is still in its infancy. For example, in the case of figured cloth, the presence of master weavers, who, as will be explained later, also create the designs as pattern makers, will be a vital element. NGOs and other international aid bodies are currently supplying funds to the Lao PDR to teach weaving technology to people in poor and isolated areas. In most instances that the authors are aware of, however, this aid has failed. This is because the weavers can only produce cloth with market competitiveness through master weavers who create the designs, and in isolated areas where no close links can be formed with these, any aid strategy to foster weavers will unfortunately not succeed. In this sense, if the rural handweaving industry is to be included in industrial policy, an understanding of the composition of the handweaving marketing will be essential.

With *mat mi* the weaver personally decides on the pattern, and dye the yarns by themselves. Moreover, because *mat mi* is plain cloth, the weaving process requires no more than the simple repetitive operation of two treadles, with the necessary technology not, therefore, particularly advanced. According to the weavers we asked, the weaving technology for *mat mi* can be virtually mastered in the course of weaving the 21 pieces that make up one set. In the case of figured cloth, however, the pattern is woven in the form of satin and twill. For such patterns, three or more treadles are generally operated to determine which warp yarns to lift up or down to create a gap through which to pass the weft yarns. This takes skill. However, Lao weavers use a vertical heddle with the heddle thread woven like mesh, allowing twill and satin weaving even by relatively inexperienced weavers. Many weavers cannot weave vertical heddle or can only produce a limited number of vertical heddle patterns. Patternmakers who are skilled at creating vertical heddle are therefore essential in weaving cloth in fashionable patterns. The weaver can therefore maintain control of the pattern in the case of *mat mi*, but it is the master weavers (patternmakers), not the weaver, who has control of figured cloth. This contrast will also mean different marketing channels for the two types of cloth, as well as different policies.

The difference between the marketing channels for the two types of cloth relates not just to differences in marketing rural industrial products in cities. To produce cloth which has market competitiveness, consumer tastes have to be clearly understood and the cloth turned into a product. In the same context, information about demand-side tastes (fashion) has to flow back in the opposite direction from products. The trade relation seen in this marketing is the putting-out system including loom and thread exchange systems. In other words, in the relationship from the retailer to the master weavers to the weaver (the master weavers are cut out of the process in the case of *mat mi*), the raw materials are supplied by the former to the latter, with the woven cloth moving in the opposite direction. Although we will not go into such contractual relations here, a rational contract is formed on the basis of existing human relations in a form which absorbs operating capital shortfalls and stock and price fluctuation risks. Any strategic approach to the handweaving industry must therefore avoid carelessly disturbing these relationships.

### 3) Devaluation of the Kip and the Thai economic crisis

Where the exchange rate was 37.5 Kip to the baht and 920 Kip to the dollar in August 1996, by December 1997 this was 47 Kip to the baht and just over 2100 Kip to the dollar. The Kip has therefore fallen against the baht by around 25% and by around 120% against the dollar. This has had a severe impact on the Lao PDR handweaving industry, which depends on imports for most of its raw materials. Most good-quality cotton yarn and the silk weft yarn are produced in Thailand, meaning an inevitable price rise. Market prices are in fact denominated in baht, with the equivalent in Kip paid according to the current exchange rate. However, it is Chinese warp yarn which has caused the greater shock. Because the yuan is currently pegged to the dollar, market prices for Chinese warp yarn have risen dramatically.

With virtually no change in the market price of woven cloth in the market, it is producers who have had to absorb exchange fluctuations. In 1997, independent weavers producing *mat mi* in the Vientiane area were purchasing yarn, weaving their cloth and taking it to market themselves. However, because these weavers can no longer afford warp yarn, rela-

tively wealthy weavers are becoming master weavers and buying warp yarn instead, with the putting out system emerging.

The crash of the Thai economy, in addition to rising yarn prices, will aggravate the situation still further. With Thailand's own handweaving industry disappearing as economic development pushed up wages, Thailand provided a major handweaving market for the Lao PDR when it launched into economic liberalization. This market has suddenly vanished, dealing a crushing blow to those who were weaving middle-grade products for the Thai market. For example, a master weaver who was operating around 200 looms in 1997 has now cut these down to around 40. These are all Vientiane cases, and while we were not able to survey the situation in Luang Prabang, the impact is likely to have been considerable given that this area used to import good-quality cotton yarn from Thailand and export the majority of the cloth it wove back to Thailand.

At the same time, a master weaver who is developing cloth using natural dyes for the Western and Japanese markets is seeing production go from strength to strength. This master weaver is even exhibiting in large Japanese department stores, with 25% of current sales going to Japan.

The situation described above suggests that domestic yarn production and the diversification of export partners (and the product development this will require) are becoming increasingly important.

## **2-7-2 Issues**

As is obvious from the Five-Year Economic Plan, the government's development priorities lie in agriculture (food self-sufficiency) and electricity and energy development. However, the government has yet to create any clear strategy for fostering manufacturing industries. The Lao PDR is still in fact developing the infrastructure needed for industrialization.

This does not mean that development of the country's manufacturing is not important at this point in time. Given the Lao's imports of daily consumer goods from Thailand, and its imports of machinery and other capital goods vital to economic development, a trade deficit seems unavoidable. If the Lao PDR continues to adjust this current account imbalance using aid funds, the country risks losing its economic autonomy almost to the point of no return, as was the case in Nepal. Learning from Nepal's mistakes, the Lao PDR manufacturing should not be slighted. The Lao PDR needs a manufacturing industry development strategy which fosters manufacturing as the run-up to industrialization, if not over the short term, then over the medium to long term.

Based on these concepts, the Lao's strategy for fostering manufacturing should be grounded in (i) promotion of market development and (ii) entrenchment of the philosophy of domestic self-sufficiency in raw materials for manufacturing.

### **(1) Promotion of market development**

While there may be a need for public institutions to develop the human resources for economic development, at the same time, promoting market development in the Lao PDR context is more a matter of fostering the potential entrepreneurial spirit of the Lao people within the market economy development process. To put it in slightly abstract terms, the country's cur-

rent isolation from information on international commercial activities should be redressed, providing Lao entrepreneurs with access to internationally important information. This would be a means of encouraging the autonomous development of human resources within the market economy.

Human resource development by public institutions is creating demand-supply mismatches, while wages are inadequate, particularly in government institutions, leading to problems such as a brain-drain to other sectors (for example, human resources such as language experts and university lecturers are moving into the private sector, defeating the original purpose of their development). The market-based human resource development strategy which we are putting forward here focuses on providing economic opportunities based on market principles in order to foster entrepreneurs.

This strategy should also leave no room for rent-seeking activities. With the market economy still undeveloped and legal frameworks not yet fully in place, establishing large-scale factories would attract rent-seeking activities and distort economic activities, something borne out by the experience to date of many other developing countries. Given the likelihood in the Lao PDR of the government intervening in manufacturing activities in a variety of forms, rent-seeking activities cannot be ignored in achieving sound economic development.

## **(2) Entrenchment of domestic procurement of and domestic self-sufficiency in raw materials**

Despite increasing imports of daily consumer goods from Thailand, it would not be logical for the Lao PDR as it currently stands to make import substitution the main axis of its industrialization strategy, as this would be more likely to create a high-cost economy. Obviously comparative advantage needs to be considered when choosing which industries to foster; at the same time, sufficient thought must also be given to how far the industry in question will improve the current account balance. Internationally competitive industries should therefore be chosen from among those in which domestic self-sufficiency in raw materials is possible now or will be in the future.

On the basis of these criteria, promising Lao industries are, as noted earlier, cement manufacturing, wood processing, agroprocessing and rural weaving. In the case of cement, these criteria can be cleared through the introduction of technology, so it should not be too difficult to resolve current problems. Wood processing is similar to rural weaving in that it needs to receive demand information (designs, etc.) from a wider market, and the feature of assistance described later on for handweaving could be a useful reference to this.

Many reports point to the possibilities of agroprocessing. Here we would like to look at the issues in some detail. Coffee certainly has significant export possibilities, but agroprocessing, particularly in the case of vegetables, raises the following issues. For example, establishing mechanisms for the collection of vegetables from farming households (timing, vegetable size, etc.) will be vital for pickle production, etc. Japanese-affiliated pickle factories in Thailand have experienced enormous difficulties on this point. In Japanese-affiliated pickle factories in northern Viet Nam, on the other hand, this problem has been resolved using a cooperative society network, resulting in the successful mass production of pickles. The Lao PDR has no network corresponding to such cooperative societies. The strong possibilities for vegetable production were also noted in the Survey on Comprehensive Agricultural and Rural Village

Development Plans on the Boraven Plateau (produced by the Lao PDR Ministry of Agriculture and Forestry and JICA), but a number of issues have to be resolved in order to link this to agro-processing.

The same holds for sugar production. Sugar is an international commodity, but is currently in over-supply on the international market. Large-scale sugar factories using vacuum pans are in operation even in Thailand, and it would not be economic for the Lao PDR to establish sugar factories with the same level of technology. Sugar cane, like the agroprocessing industry, raises the issue of collecting raw materials. It could be possible to adopt India's sugar production technology, which does not use vacuum pans but has a crushing capacity of around 100 tons of sugar cane a day, where Thailand's capacity is in the thousands of tons. In other words, even in the case of agroprocessing, which at first glance seems to have possibilities, industry types have to be chosen on the basis of a careful cost comparison with Thailand and Viet Nam.