

## **Chapter 5 Agricultural Diversification and Local Product Promotion**

### **5.1 Situation, Prospects and Issues**

#### **5.1.1 Business-Oriented Activities among Farmers**

##### **(1) Increasing Group Activities Among Farmers**

There has been a new trend of business-oriented activities among local residents and farmers living in suburban parts of Siem Reap District.

These new business-oriented activities are

- 1) Agricultural diversification: diversification from traditional crops to higher value-added new products and,
- 2) Handicrafts and souvenir products: introduction of handicraft production as an additional source of income.

The diversification of agriculture was triggered by projects to support farmers in suburban areas, which was sponsored by international organizations. These projects also developed many production groups.

Handicraft production originally started as individual artisan or farmer's work but not as group activities or village activities. In recent years, there has been a new movement to form production groups among farmers with the assistance and guidance of various NGOs.

Group activities among village farmers (community businesses) were not either common or rare since many farmers still remember the collective or compulsory work under Khmer Rouge thereby tend to have negative feelings over working as a group. Only in recent years, the farmers have been changing to take positive attitude to group activities with the flourishing guidance activities of NGOs.

##### **(2) Limited Linkage with Tourism Sector**

However, the diversified local agricultural products are limited in items, volume, quality and delivery, so the local agricultural sector is not always directly connected with the tourism sector such as hotels and restaurants. The situation is same in the case of tourism products such as handicraft and souvenir. Many handicraft and souvenir are imported from neighboring countries or supplied from outer provinces.

##### **(3) Limited Data Source and No Inventory**

In the process of the present study, we learned that it is difficult to obtain comprehensive data or statistics on actual number and inventories of agribusinesses /handicraft producers existing in present suburban areas or villages either from public or any other sources.

In addition to this, about 30 NGOs are supposed to assisting village people in some social or economic aspects but their exact activities and related data/ statistics are not

compiled or collected by the administrative office.

According to the 2004 industrial survey of Department of Industry Mines and Energy Siem Reap, about 1250 manufacturing industries are registered and all of them are cottage/ small and medium scale. It consists of 1100 rice mills, 60 metal / electric/repair and 40 stone/brick. Community businesses (agribusiness and handicraft) are not included in this survey.

## **5.1.2 Situation of Agricultural Diversification and Local Product Promotion**

### **(1) Situation of Agricultural Diversification**

Under AGRISUD project sponsored by AFD of French government, the first major agricultural diversification programs started in 1997. After 1999, these programs were transferred to PADAP (Program for suburban agricultural development, sponsored jointly by the Cambodian government and AFD) and continued to the end of the year 2002. In addition, several similar guidance activities were carried out by other NGOs and international organizations.

Following them new agricultural production groups have been formed as initiatives of local agricultural diversification. The number of production groups is increased steadily but this kind of group activities is rather informal and the solidarity among group members is weak, so economic or business activities are basically carried out individually.

#### **Mushroom Production Group**

A mushroom production group was organized in 1998 for the first time. They developed and at present about 60 farmers join this project forming several production villages in suburban areas. Mushrooms are produced 3ton per day in wet season and 1ton per day in dry season.

Five farmers are already succeeded in having direct trade with first –class hotels in Siem Reap city. However, direct trade with hotels requires not only stable supply of comparatively big amount of quality product but also flexibility in supply amount according to the daily fluctuation of guest numbers. These 5 farmers have telephone equipment and they are able to communicate daily with purchasers in hotels to adjust mushroom distribution.

#### **Vegetable Production Group**

A lettuce production group was formed in 1999 and it has 36 farmers as group members. They are engaged in organic lettuce farming. The group members are closely united with good leaders and they succeeded in supplying first-class hotel.

A green bean production group was formed in 1999 and it has 98 farmers as group members. They are able to produce one ton per day and all the products are supplied to the local market. They are not so strongly united, and the group has not yet reached the stage to negotiate with hotels on direct supplying.

**Fruits Production Group**

Jackfruit production group was organized in 1999 with the member of 20 farmers. After they irrigated their farmland, they successfully developed the group to self-sustaining level and supplying their product to local market. The group is planning to diversify their products by growing papaya and mango.

**Livestock Rearing Group**

Chicken rearing group was formed in 1998 with the member of 21 farmers. They successfully developed their new business and they had a record of supplying more than 50 percent share of local market. However, after the year of 2003, the rumor and the fear of flu contamination chicken destroyed their market demand totally. Finally 15 farmers among 21 members went into bankruptcy.

Pig rearing program was carried out as the system of piglet bank. The piglet bank lends two piglets to a farmer for the start up of new livestock rearing business. Within a few years repayment including interest to the bank is carried in the form of three piglets by the borrower. The piglet bank started 1999 and it has already gained 220 farmers as their customer. Siem Reap pork is becoming popular with its quality meat.

**Crocodile Rearing**

Crocodile rearing is gaining popularity recently. The crocodile group has 40 members in Siem Reap. Including this group, more than 60 farmers are already engaged in crocodile rearing. Each farmer grows up 40 to 50 crocodiles in his farm and after one or two years of breeding period, crocodiles will be exported to China or Singapore.

**Fish Sauce and Chile Sauce**

Several farmers are engaged in food processing such as fish sauce and Chile sauce production, but they are still very small-scale with no agricultural or food standard only for limited local market.

**Flowers and Flower Trees**

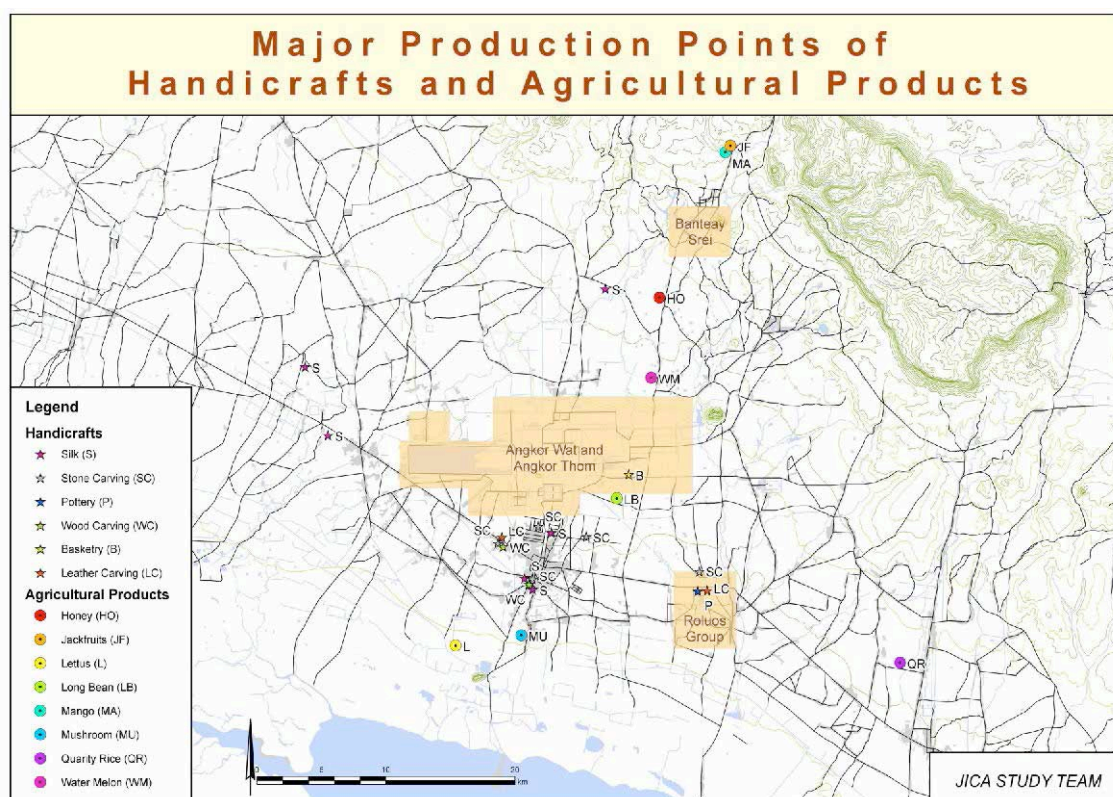
Four small-scale companies are engaged in growing flowers and flower trees at present. They are selling them mainly to the local residents and high quality hotels depend largely on imports from Thailand.

**Fruits, Vegetables and Crops Calendar**

<b>April-June</b>	Jack fruit, water melon, mango, pineapple, orange, longan, Lettuce, tomato, green pepper, long bean, carrot, cucumber, egg plant, potato, cabbage
<b>July-September</b>	Water melon, mango, pineapple, orange Lettuce, tomato, green pepper, long bean, carrot, cucumber, egg plant, potato, cabbage
<b>October-December</b>	Rice
<b>January-March</b>	Jack Fruit

## (2) Situation of Handicrafts and Souvenir Production

Major locations of local producers are identified as shown in Figure 5.1.



**Figure III.5.1 Major Locations of Local Producers in Siem Reap**

### 1) Development of Local Products and Local Brand in Siem Reap

Two major groups, namely IKTT and Artisan D'Angkor, are engaged in reviving Khmer traditions and are contributing a lot to the development and branding of local handicraft and art production. These groups are not only leading local handicraft industry with well known brand but also hiring and training more than 500 people separately and contributing to absorbing local labor and developing human resource. Brief outline of these groups are shown below.

#### **IKTT (Institute for Khmer Traditional Textile)**

IKTT was established in 1966 for the purpose of conservation and revitalization of traditional Khmer textile such as silk and cotton in Phnom Penh by Japanese textile artisan. The institute moved to Siem Reap in the year 2000. IKTT has successfully developed and been recognized internationally as the core organization revitalizing traditional Khmer silk production in Cambodia.

The current organization of IKTT is composed of following four divisions and one group.

- Research division: carrying research and collecting information and materials relating traditional textile.
- Restoration division: restoration and reproduction of high quality traditional textile by experienced master weaver.

- Training division: training textile workers, training courses are divided into 3, namely for beginners, for intermediate and for advanced.
- Working group: engaged in almost the whole silk production process such silk threads spinning and preparing, dyeing and weaving. In addition to silk, some workers are engaged in woodwork, bamboo work, basket weaving and etc.
- Sales division: selling products and set up exhibition.

IKTT started a new project in 2003 aiming the restoration of traditional forest in northern suburban area of Siem Reap. They are planning to restore mulberry cultivation, silkworm rearing, cotton plantation, indigo plantation and etc.

This project also aims at the creation of craft village where various handicrafts are produced and sold with the demonstration of the process of products including silk, basketry and painting. The craft village is scheduled to open in the summer of 2006.

### **Chanties-Ecoles de Formation Professionnelle (CEFP) and Artisan D'Angkor (AA)**

CEFP was established in 1992 founded by National Cambodian Institutes, the French Foreign Ministry and the European Union to provide rural young people with a chance to learn traditional artisan work such as stone carving, wood carving, lacquering, gilding and silk work. In the last 10 years, CEFP has trained over 4500 local or village people.

CEFP is composed of two training center: The Craftsmanship Training Center ( stone and wood carving, lacquering and gilding) and the Angkor Silk Farm ( mulberry tree growing, silkworm breeding and treatment of thread and weaving). For the graduate trainees, they have established several workshops in surrounding villages as their supporting factories.

Artisan D'Angkor is a limited company with minor public participation, which started as a SEFP economic entity and sales outlet. They have two shops in Siem Reap city and two airport shops in Phnom Penh and Siem Reap. Artisan D'Angkor is a successful enterprise that is internationally well known engaged in revitalizing traditional handicraft manufacturing with modern taste under modern management and marketing system.

## **2) Other Local Production Groups**

Except two major groups touched above, local handicraft and souvenir manufacturers are cottage industries, individual artisans and village farmers.

### **Stone and Woodcarving**

About 10 production groups or small-scale companies which are engaged in stone carving (partly engaged in wood carving) are identified in Siem Reap city. They are hiring 10 to 20 local artisans. They are conserving traditional skills and stone and wood materials are abundant in northern mountain area or border area. Products are supplied as tourist souvenir, hotel/restaurant interior decoration and export product.

### **Ceramic Products**

A group of 5 artisans from Kampong Chhnang started pottery tableware production in Roluos area in 2002. Cambodia-Singapore NGO supplied the factory and one

Japanese senior volunteer provided technical assistance for two years.

This group has favorably developed with increasing order from top-class hotels in the city. Siem Reap had the tradition of producing well-known Khmer ceramic ware and ancient 5 kiln sites are already discovered.

Quality local clay for pottery is abundant and the group is on the way of reviving traditional Khmer ceramics. Khmer ceramics have original taste and easy to compete or make difference with the products from Thailand, Vietnam and China.

### **Basketry**

Around 30 to 40 farmers in Pradak village are engaged in basketry using coconut leaf as its material. In other several villages, farmers are producing bamboo and rattan basketry. Major products are inexpensive and low-quality baskets, plates and bowls and they are selling on the nearby streets and in local markets. The basketry is side job and the second source of farmers' income.

### **Silk and Cotton Weaving**

Eight village workshops (about 20 workers each) are operating silk weaving guided and trained by Artisan D'Angkor. Also there are other several village silk weaving workshops supported by NGOs. A group of 6 weavers from Takeo is successfully engaged in quality cotton weaving and production in Roluos area using domestic materials supported by Cambodia-Singapore NGO since 2002.

### **Furniture and Construction Materials**

Several small-scale furniture manufacturers are located in the city which supplying rather low quality products. Comparatively large furniture companies in Phnom Penh area mainly supply high quality or large lot product required by hotels and restaurants. As for construction materials, stone and bricks are locally supplied but others are supplied from Phnom Penh area or imported.

## **5.1.3 Prospects and Issues of Agricultural Diversification and Local Products Promotion**

### **(1) Prospects and Issues of Agricultural Diversification**

#### **1) Constraints on Agricultural Diversification**

Farmers have a little experience of agricultural diversification, while supporting activities are limited. In the diversified agricultural production, the farmers have to be engaged in new activities and farming practices that they did not experience before. Farmers who have been growing traditional crops for a long time are unfamiliar with new agribusiness such as cash crops and livestock rearing. In diversifying process, farmers should have greater flexibility in shifting from mono-crop to multi farming system.

Furthermore, there should be appropriate support in acquiring market information, technical skill, management know-how and finance. For the promotion of further agricultural diversification, there are factors limiting the extent of development.

- Low fertile soil and limited water source: vegetables, fruits and flowers require assured supply of water especially in dry season
- Production fluctuation (decrease in dry season)
- Demand fluctuation (decrease in wet season)
- Lack of agricultural skill and market information for diversification
- Lack of technical guidance activities and training program
- Lack of extensive integrated farming: research and development to find out new appropriate vegetables, fruits and flowers
- Not furnished with daily communication equipment such as telephone and internet with customer and wholesaler

## **2) Potential of Tourism Related Community Business for Agricultural Diversification**

It is increasingly important to diversify rural agricultural sector. For supporting this trend, the tourism related community businesses (agribusiness and handicraft) have higher potentials in Siem Reap. Most of these community businesses are very small scale and they are basically based on traditional or conventional technology. In other words, they are engaged in production works using manual skills and local natural resources.

The development of community businesses has a potential to the improvement of income and livelihood of farmers with appropriate technology (without investing large amount of capital or expensive, advanced technology).

Community businesses are economic activities but at the same time they are social group activities. In that sense, community businesses have clear difference in their character from existing incorporated small and medium businesses especially in terms of following aspects.

- Informal organization or group activities and leader-member relations
- Mostly farmers' side job and not full time job/ not always sales and profit growth oriented/ in many cases they have no factory (in house works)
- Mostly initiated and supported by NGO and public sector
- Basically small lot and hand made production (no production standard) using local natural resources as materials
- Weak business relations with tourism and urban sector
- Limited linkage with market and information and lagging behind in IT or telegraphic communication
- Limited fund raising source
- Little bargaining power with customer (hotels and restaurants) and wholesaler

### **Contributing to Rural Economy**

The followings are expected contribution to the local economy largely by the development of the small community businesses in suburban areas of Siem Reap.

- Establishment of tourism related and niche industries, such as agro products, agro-processing, handicrafts and souvenirs matching local market demands,

- Introduction of labor-intensive or capital-saving industries with appropriate technology suitable for rural areas,
- Creation of environmental friendly industries matching the city image of "Clean and Green Angkor",
- Effective utilization of locally scattered agro-related and tourism-related resources contributing to the conservation of natural resources,
- Improvement of income and livelihood of local residents and farmers. Narrowing the gaps between the urban large-scale modern business sector and the rural small-scale community business sector.

### **Contributing to Social Empowerment**

Community business development means not only the development of rural economy and business but also the development of the quality of life and culture in the following social aspects.

- Sustainable development in terms of social stability, empowerment and life style,
- Promote community development initiated by rural and local people,
- Natural resource based development with environmental conservation,
- Promotion of senior people and women's activities,
- Encouragement of young generation to stay in a village, and
- Promotion of cultural linkage between tourism of Siem Reap and rural people.

### **3) Potential Markets for Agricultural Products**

#### **Potential of Raising Share of Local Products in Local Market**

As for agricultural products' (excluding rice and meat) market and distribution channel in Siem Reap, there are three major wholesalers holding more than 80 percent of the market share. Under the umbrella of these wholesalers, about 30 secondary wholesalers (or middleman) are engaged in direct trade with retailers, hotels and restaurants. About 50 percent (increase to 60 percent in dry season and decrease to 40 percent in wet season) of wholesale market products are distributed to hotels and restaurants and the rest of the products are supplied for consumers.

In Siem Reap wholesale market, cabbage, cauliflower, Chinese cabbage, cucumber, green bean, mushroom, lettuce, pumpkin are locally produced, while major vegetables and major fruits are imported from Thailand or Vietnam. At present, it is estimated that only about 15 percent share of total vegetables and fruits treated in local wholesale market is locally produced and the rest 60 percent is imported and 25 percent is distributed from other provinces.

#### **Potential of Direct Trade with Tourism Market: Hotels and Restaurants**

Sales to hotels and restaurants have 50 percent share of vegetables and fruits in local wholesale market. Several vegetable production groups such as those of mushroom and lettuce have succeeded to supply directly to first-class hotels. Selling price of direct trade with direct users is higher than that of wholesale market.

However, direct trade with first-class hotels and restaurants is not so simple, because hotels and restraints usually require the supplier to abide by following conditions.



- Stable daily supply of quality, uniformly sized and good-looking products
- Flexible daily adjustment of supply volume according to the fluctuation of hotel operation
- Well-mannered and suitable appearance as a supplier to first-class hotels and restaurants

At present only a few production farmer groups are able to keep up with these requirements. To encourage direct trade with hotels and restaurants, farmers should improve their production and distribution systems.

### **Mid-range market**

In addition, an experience of "Angkor Product Fair 2005" revealed a potential demand in the mid-ranged local market. This market is to be targeted for local products and eventually penetrate into the tourism market.

## **(2) Prospects and Issues of Handicraft and Souvenir Promotion**

Handicraft and souvenir manufacturing will be an important source of income for local people, especially in rural village. As one of the world's major archaeological sites and tourist attractions, Siem Reap is a good place to sell handicrafts and souvenirs and it can be said that the city is a big sales outlet of the region or the country. Many shops in historic sites, hotels, town and market offer variety of goods.

Most of low to middle price mass production items were produced not in Siem Reap area but imported from Thailand, Vietnam and China. Those are silk cloth, cotton cloth, silver container, bronze casting, woodcarving, lacquer ware, ceramic ware and imitation temple rubbing. However, some of these imported items have been replaced with Cambodia-made items gradually in recent years. Potentials of handicraft and souvenir products are mentioned below.

### **1) Potential of Handicraft and Souvenir Made in Siem Reap**

#### **Upgrading Local Brand Quality Items in Tourism Market**

Comparatively small lot and hand-made quality items are produced in Siem Reap, Phnom Penh or other Cambodian cities. These products including silk cloth, cotton cloth, stone carving, wood carving, silver craft, pottery, jewelry and lacquer ware are usually sold not through traditional souvenir shop in market or vendors at the temples but through new art shops, galleries and boutiques. These hand made quality products are gaining popularity among tourists and have growth potential as local brand products.

#### **Concentration of handicraft products to Siem Reap: A potential of clustering**

As for major domestic items, we can identify production area. These are stone carving from Siem Reap and Phnom Penh, wood carving from Siem Reap, Battambang and Phnom Penh, silk and cotton cloth from Takao, Kandal, Preyveng and Siem Reap, earthen ware from Kampong Chhnang, marble carving from Pursat, silver ware from Kandal(near Lovek and Oudong), jewelry from Pailin and Battambang and bronze casting from Phnom Penh and Kandal.

At present most of Cambodian handicraft and souvenirs are produced in Phnom Penh and its surrounding Province Kandal. However, these outside producers have been moving their workshops to Siem Reap area gradually due to the convenience of location close to tourists' big sales market. We can expect further accumulation of producers in the future.

## **2) Potential Markets for Handicraft and Souvenir Products**

### **Mid-range market**

The mid-ranged market where their quality is not high as local brand quality items discussed above was revealed as a potential growing market. This market is to be a prime target for local producers some of which could step up to the tourism market.

### **Potential of Export Products Made in Siem Reap**

According to the Exporters' Directory of ASEAN-Japan Center, in which major manufacturers and exporters are registered, almost all major companies are located in Phnom Penh metropolitan areas. In this directory 38 companies are registered in gift, interior decoration products, 18 companies are registered in silver and jewelry and 18 companies in furniture. Among them only 4 silk, stone and wood carving companies are located in Siem Reap. As the Siem Reap products quality improves, the number of local exporters expected to increase more.

## **(3) Limited Supporting Activities and Potentials**

Supporting activities to rural economy are limited. Those existing activities are mostly initiated by NGO. The public sector is left behind. At the beginning of the Study, the government did not have even an inventory of local products.

In order to maximize local benefit of tourism development and to narrow the gap between the urban and rural economies, rural economy needs more attention and support. Supporting activities by the government have to be strengthened.

Rural producers have constraints especially in many ways and need supports for:

- Skills and technology development for improving quality of product,
- Marketing ability development to obtain market information and its utilization, and
- Negotiation ability development to have communication with buyers with better bargaining power.

Government support activities may include,

- Gathering information to develop an inventory to identify potential target groups,
- Giving target groups a chance to channel to the market, to get to know other producers and their quality of products and market situation. This channel has to be maintained on a regular basis and as publicly recognized activity.
- Giving technical information and managerial advice to the producers.

In the process of this Study, a counterpart team (C/P) of the Study Team developed an inventory of potential products and producers' groups as one of the major outputs. In addition to this, they organized "Angkor Product Fair 2005" as part of activities to give the local producers to have channels to market. The fair was successfully conducted

(see Chapter 15 for details). This successful experience gave C/P to have know-how to organize a fair, confidence in supporting activities, and gave them good reputation. This also demonstrated how a good model of private-public partnership can be.

## 5.2 Sector Approaches

### 5.2.1 Objective “Creating Angkor Brand Products”

Diversification of regional economy, especially in rural economy, is one of the crucial issues for narrowing gap between the urban tourism sector and the rural sector, which shall bring overall development of Siem Reap economy. To realize this, the following development direction should be studied.

- 1) Linkage of tourism and agriculture (agricultural diversification and upgrading)
- 2) Development of local products and local brand (handicraft and souvenir upgrading)

These two private sector development leads not only to the income increase of residents/farmers but also to the economic improvement in public sector by strengthening and creating local revenue base.

To realize this, the objective of the local product promotion is expanding local products supply in order to increase local economic benefit from tourism by creating Angkor Brand with more diversified and higher value added products.

### 5.2.2 Strategic Concept for Development

In consideration of economic contribution, social aspect and special character of community business, strategic concept for development of agricultural diversification and the development of handicraft and souvenir would be shown below.

#### (1) Agricultural Diversification to Vegetables and Fruits

Although there are several constraints, agricultural diversification has a potential to develop further. As mentioned earlier, about 85 percent of vegetables and fruits in local market are imported or supplied from other provinces. Diversified local products have surely the potential to replace them in the future.

**The diversification of agricultural products and improvement in quality and distribution system** is crucial for farmers to supply directly to hotels and restaurants. Thus, the linkage of tourism and agriculture should be improved.

Also, the demand for organic agricultural products is increasing steadily, much higher potential could be found in that area. In recent years, farmers are shifting from chemical fertilizer to natural compost with campaign and guidance activities by NGOs and the government.

As a conclusion, agricultural diversification from rice to organic vegetables, fruits and livestock rearing has high potential to replace local market products from imported or supplied from other provinces.

Potential items identified through the field survey are as follows;

- Livestock rearing (non-chemical, natural feed pig, chicken, duck),
- Mushroom (oyster mushroom, wood mushroom),
- Vegetables (organic lettuce, tomato, green pepper, long bean, carrot, cucumber egg plant potato, cabbage),
- Fruits (jack fruit, water melon, mango, pineapple, orange, longan),
- Flower and flower trees (orchid, hibiscus, bougainvillea),
- Crocodile rearing (leather tanning and processing in the future),
- Fish sauce and Chile sauce (higher quality and international standard).

In considering the present situation of not so common group activities or rather weak relationship among farmers, NGOs are expected to take an initiative to organize farmers and promote marketing activities.

## (2) Handicraft and Souvenir Development to Quality Angkor Brand

As for handicraft and souvenir, Cambodian products are gradually replacing imported goods. However, low quality and low priced mass production markets are already highly competitive. Therefore the strategies for product development should focus on hand made **high quality or artistic items**, the market of which is growing and less competitive. Siem Reap is abundant in unique material such as sand stone (for stone carving) and pottery clay. These items have rather big potential to develop.

Potential items identified through the field survey are as follows.

- Silk weaving and silk products (high quality, natural dyeing, hand woven),
- Cotton weaving and cotton products (high quality, natural dyeing, hand woven),
- Stone carving (artistic, traditional and modern interior decoration),
- Wood carving (artistic, traditional and modern interior decoration),
- Pottery (high quality, for hotel and restaurant use),
- Basketry (high quality, natural taste for tourist market),
- Bronze casting (artistic, high quality interior decoration),
- Lacquer ware (artistic, high quality interior decoration),
- Silver ware (artistic, high quality interior decoration).

The key factor to compete with the products from Thailand, Vietnam and China exists in **utilization or reviving Khmer traditional art and skills and establishing local brand**. It is also required to develop new products with new designs and concepts adaptable to changing tourist demands. In addition to this, manufacturing high quality and high value added products **with new technique and design** will be more sophisticated in the near future.

Two major production groups mentioned earlier (IKTT and AA) already established local brand in international market, so the quality improvement or branding of the other groups' or village peoples' products would be important strategic target.

### **5.2.3 Sector Approaches**

In order to achieve objectives mentioned above, following sector approaches are proposed.

#### **Sector Approach 1: Creating a Support System**

The first sector approach is to create a supporting system for agricultural diversification and local products promotion. With understanding the necessity and weakness of public supporting activities for agricultural and other local products promotion, it is essential to create a new supporting system.

The supporting system plays a role of an authorized channel to outside markets for the local producers. The system also functions as a channel for public relations, as a provider of information to producers, and as an adviser for the improvement of technical and managerial skill. This also plays a role of an adviser to the government on the policies, planning, legal framework, and public investment projects from the local producers' point of view.

#### **Sector Approach 2: Targeting the Tourism Market As Well As the Growing Mid-Range Market**

The tourism market for international tourists is obviously the main and most rewarding target of local products including agricultural sector. In addition, the local mid-range market is found to be another prime target as revealed in "Angkor Products Fair 2005". Growing tourism sector is a major factor to push up income level of the urban workers, which eventually broaden mid-range market further as shown in Figure III.5.3.

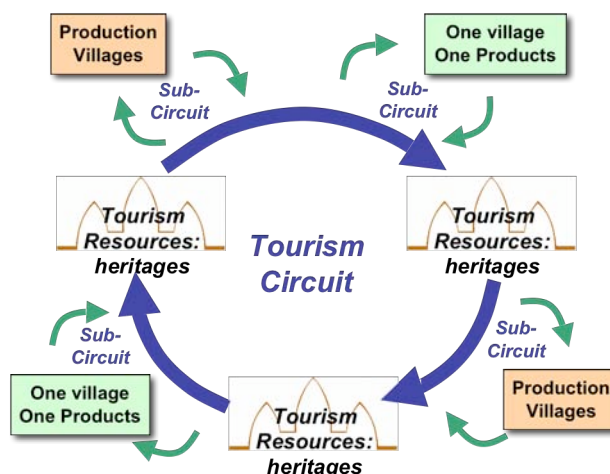
Agriculture diversified to livestock, vegetables and agro-processed food has a potential to the targeted markets. High quality and artistic product markets have potentials for handicrafts and souvenirs. To approach these markets, from the producer side, upgrading quality is essential to meet the preference of the tourists. In addition, marketing and promotion to the tourism markets, i.e., the purchaser side, is necessary. To approach purchaser side such as hotels and restaurants, it is proposed to encourage hotels and restaurants to purchase local products by grading.

These quality upgrading, marketing and promotion is supported by a new supporting system proposed as Sector Approach 1. Furthermore, there is a potential of forming a cluster of handicrafts in Siem Reap, as shown in the trend that handicraft producers are concentrated in Siem Reap as the market size grows.

#### **Sector Approach 3: Strengthening the Linkage between Tourism and Rural Economy**

About a half of population reside in rural area, and agriculture accounts for 78% of the employment in Siem Reap Province. In order to maximize local benefit from tourism development, linking the tourism and rural economy is indispensable.

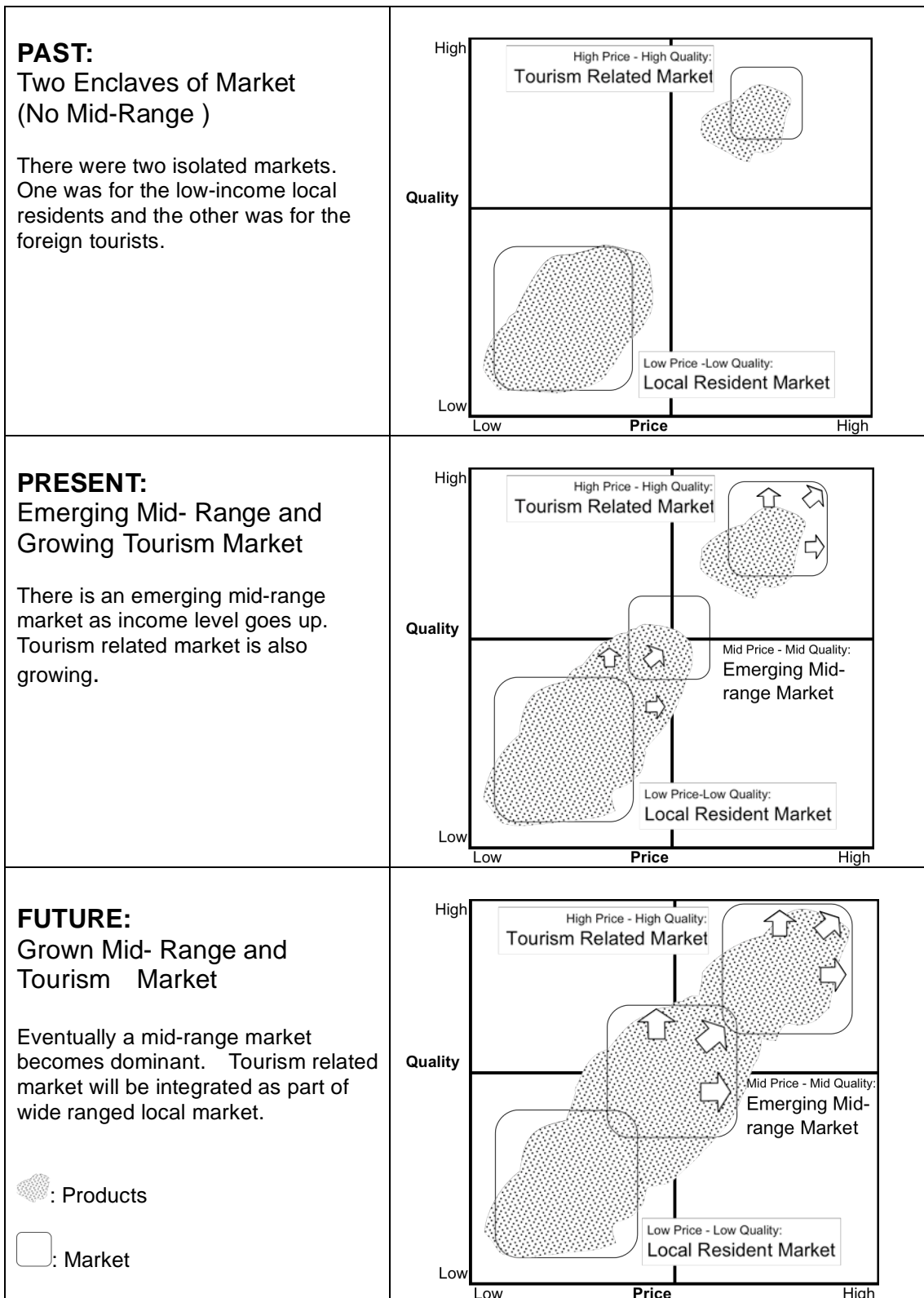
In order to link tourism and the rural economy, fostering rural community business is proposed as core villages on the tourism circuits. One Village One Products (OVOP) is effective for the improvement of quality and marketing of agricultural products to form a core village. In addition, production villages for handicraft and souvenir as well as OVOP villages are to be incorporated in tourism routing as a sub-circuit of heritage tourism (See Figure III.5.2). As the access to the remote heritage improved, a tourism circuit expanded, then the potential area of production villages is also expanded.



**Figure III.5.2 Production Villages and One Village One Product as Centers of Rural Products Promotion**

#### **Sector Approach 4: Improving Infrastructure for Local Products Promotion**

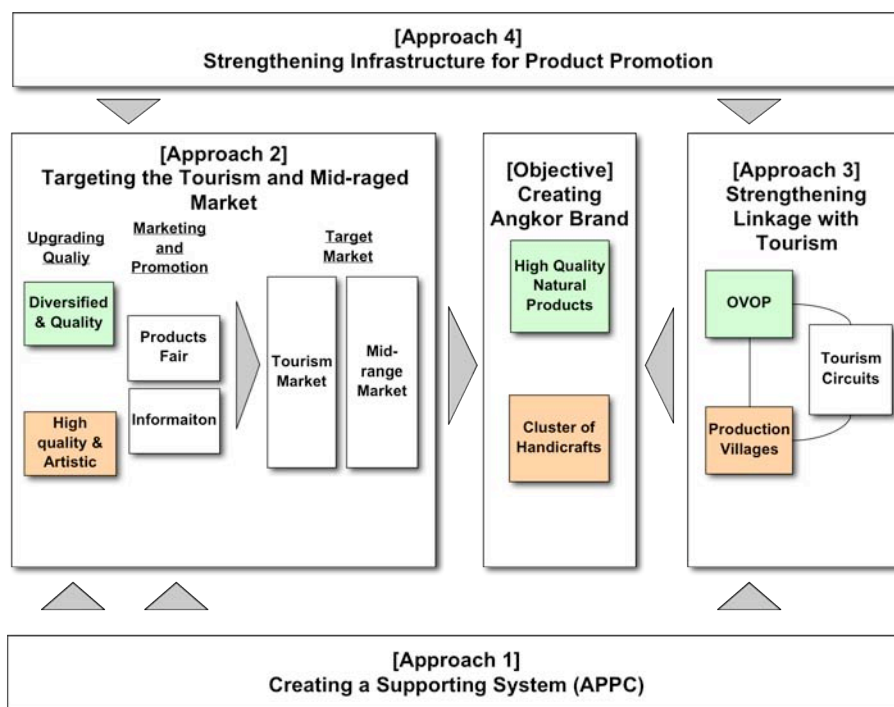
Lack of appropriate physical infrastructure for agricultural and other local production is one of the major constraints. These are market infrastructure, information system and network, local product promotion center, and distribution networks. These infrastructures could be designed by the promotion system proposed in the Master Plan.



Source: JICA Study Team

**Figure III.5.3 Evolving Market Segments (Conceptual Model)**

The objectives and approaches proposed above are illustrated in the figure below.



Source: JICA Study Team

**Figure III.5.4 Objective and Approaches**

### 5.3 Projects/Programs

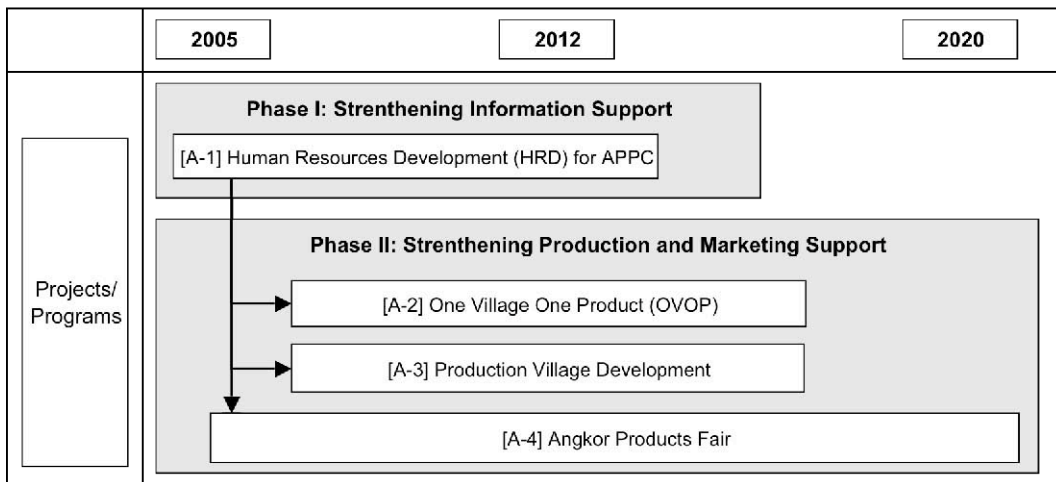
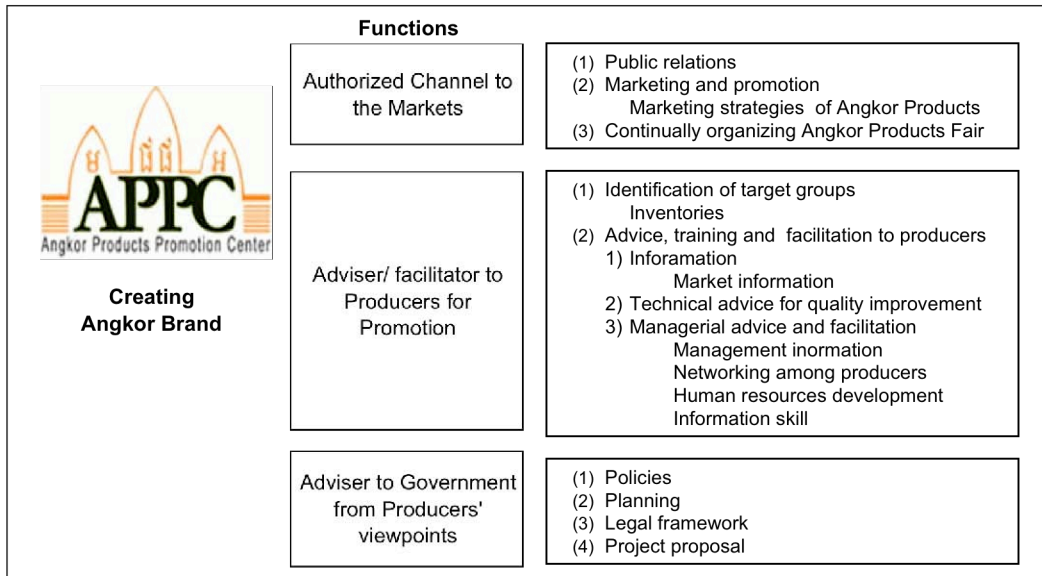
Following the approaches to promote agricultural diversification and local products, a supporting system shall play a core role. Angkor Products Promotion Center (APPC) is to be established as the supporting system.

APPC's functions are:

- Authorized channel to the market for public relations, information and marketing,
- Adviser and facilitator for producers in terms of information, technical matters, managerial matters, and human resource development,
- Adviser to the government on policies, planning, legal framework, and public investments from the viewpoint of the local producers.

These arrangements are illustrated in the figure below. Human resource development to create APPC (A-1) comes first, followed by organizing "Angkor Products Fair", "One Village One Product (A-2) and "Producers' Village (A-3)".





**Figure III.5.5 Angkor Products Promotion Center and Projects/ Programs**

## **A-1 Human Resource Development and Establishing Local Products Promotion Center (APPC) (Project A-1)**

### **(1) Background and Purpose**

#### **1) Human Resource Development for Guiding Activities**

To promote tourism related businesses, it is indispensable to develop skilled personnel and labor in the economic sector using production process with higher standard which is either pollution free or environmental friendly in order to add the real value in industrial productions.

In addition to production skill, there must be better linkage with related business skills such as designing, packaging, marketing, management, quality control and distribution. For this purpose, institutional and human capabilities, planning capabilities, in particular, of provincial authorities are not sufficient for promoting and guiding local businesses. To deal with the problems, the purpose of the project is to lead human resource development of guiding activities for tourism-related local businesses.

#### **2) Local Products Promotion Center (APPC)**

At present, the several departments in Siem Reap, including commerce, industry, culture and fine arts, agriculture and tourism are partly engaged in business development related to local tourism. However, the provincial government is lacking in comprehensive coordination or a core organization for promotional activities.

So, it is recommended to establish a provincial promotion center such as “Angkor Products Promotion Center (APPC)” as the core organization of the province for the development of local businesses related to tourism such as handicrafts, souvenirs and agricultural products.

The center will promote local and community businesses by assisting information networking, design and technical upgrading, public relations and sales promotion.

### **(2) Target Group**

The target group of this project is Siem Reap provincial government and potential guiding officers of provincial government.

### **(3) Expected Output of Human Resources Training**

Expected output as the result of training for promoting local tourism related businesses are shown below:

- (a) Making an effective database on the existing community business (agricultural diversification and handicraft production),
- (b) Identifying the target producers /groups for long-term based product and market development,
- (c) Studying successful examples of community business models with eco friendly productions,
- (d) Finding out healthy and organic new agricultural product and “niche, unique and only one” handicraft,
- (e) Studying agricultural processing / packaging and potential export market.

**(4) Expected Output and Promotional Activities of Angkor Products Promotion Center (APPC)**

**1) Mission of APPC**

The Angkor Products Promotion Center (APPC) will promote tourism related local and community businesses by assisting information networking, design and technical upgrading, public relations and sales promoting.

APPC will encourage the development of the Siem Reap local products that are acceptable internationally. The final target in the near future will be the development of local products and the establishment of Angkor brand. Blessed with natural beauties, long history, rich culture and tourism resources, Siem Reap/Angkor Town is the most suitable place for the center for the creation of high- value crafts, arts and eco-products.

**Validity and Expected Role of APPC**

Validity and expected role of APPC is as follows:

1. Inter-departmental Cooperation,
2. Public-Private Cooperation,
3. Tourism-Industry-Agriculture-Arts Linkage,
4. One-stop Service (Information, Exhibition, Guidance, Coordination, Business),
5. Small business, Community business (village work) and Social work encouragement,
6. Local Government and Local Business Initiative,
7. Window on International Cooperation,
8. Information-oriented business scheme.

**Strategic concept of APPC is as follows;**

1. Localization
  - Local initiative, and
  - Local production and local consumption.
2. Globalization
  - From the World to the Angkor, and
  - From the Angkor to the World.
3. Angkor Identity
  - Tradition-Culture oriented products,
  - Angkor brand, and
  - One Village One Product.

**2) Organization of APPC**

APPC will be organized and established by Siem Reap Provincial Government.

APPC will be the comprehensive coordinating or core organization in Siem Reap provincial government for promotional activities for tourism related products. APPC will collaborate with various provincial departments such as commerce, industry, culture and fine arts, agriculture and tourism.

APPC will promote cooperation scheme among central government (Ministry of Commerce, Ministry of Tourism and etc.), local government and private companies.

A. Steering Committee of APPC

Steering Committee will consist of Organizer (management staff) and Cooperate organizations.

B. Organizer and Management Staff

Chaired by the Governor

CEO=Vice Governor

Director= Angkor Products Fair 2005 task force team reader

(Cooperating staff under provincial government)

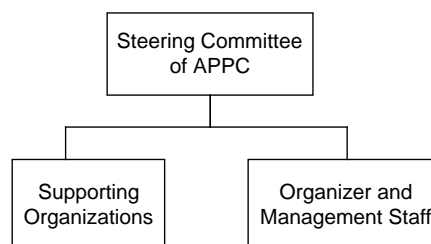
Department of Commerce

Department of Tourism

Department of Agriculture Forestry and Fisheries

Department of Culture and Fine Arts

Department of Industry Mines and Energy



**Figure III.5.6 Organization Chart of APPC**

C. Supporting Organizations

Ministry of Commerce

Ministry of Tourism

APSARA

Siem Reap Chamber of Commerce

Cambodia Hotel Association

Cambodia Association of travel Agents

NGOs

**3) Major Supporting Activities of APPC**

The development phase of the APPC will be divided into following 2 phases.

**Phase1**

(One year preparation period, information service center)

**(a) Information support**

1. One Stop Information Service
  - Angkor products database
  - Newsletter and Website
  - New product information
  - Research on potential products and market
  - Guidance and consulting
2. Promotion of International Cooperation
  - Promotion of international technical and management cooperation
  - Promotion of investment, trade and information exchange
  - Assisting in and out-bound economic missions
  - Compiling “Investment guide”

**Phase2**

(full-scale operation period, upgrading product quality and marketing promotional activities)

**(b) Production Support**

1. Technical and Management Support Activities
  - Production skill and design technology support
  - Packaging technology support
  - Business management and IT support

2. Business Group Organizing
  - Production and distribution group organizing with the cooperation of NGOs
  - One Village One Product Movement (Project A-2)

**(c) Marketing Support**

1. Linkage to Tourism
  - Production Village Development (Project A-3)
2. Exhibition Coordination
  - Organizing Angkor Products Fair (Project A-4)
3. Business Matching Coordination
  - Direct sales support to hotels and restaurants
  - Cultivation of market
4. Authorization and Quality Control on Local Products
  - Authorization (branding) of Angkor products
  - Angkor products mark
  - Testing and standardization of products
5. Encouraging purchasers (hotels and restaurants) to purchase local made products by grading.
  - Creating “Local Economy Contribution Grade” which is a grading system of hotels and restaurants for local made products purchasing
  - Monitoring the local products purchasing
  - Awarding by grading
  - Public relation of awarded hotels and restaurants

**(5) Project Period, Development Phase and Target Activities**

**Phase1**

1. Personnel training for guiding officers and establishing Angkor Products Promotion Center (APPC)
2. Main activities are:
  - 1) Training of potential provincial guiding officers in Japan. Dispatching them to local industrial promotion center (Jiba-san Center) dealing with handicraft and agricultural products, and
  - 2) Information support
3. Required personnel for training and information support: 3 potential guiding officers (director, handicraft manager and agricultural products manager), each officer 3 months training in Japan

**Phase2**

1. Full-scale business supporting and guiding activities by APPC
2. Main activities are:
  - 1) Information support (continued from phase1)
  - 2) Production support and
  - 3) Marketing support (newly start)
3. Required personnel: 4 guiding officers including IT specialist

**Table III.5.1 Implementation Schedule of APPC**

Phase YEAR	Phase I	Phase II					
	2006	2007	2008	2009	2010	2011	2012
	HRD and Establishing APPC	Full-scale business supporting					
<b>1 Human Resources Development and Establishing APPC [Project A-1]</b>							
Personnel training for guiding officers							
Required personnel							
Director							
Handicraft manager							
Agricultural products manager							
IT specialists							
Establishing APPC							
<b>2 Major supporting activities</b>							
<b>(a) Information Support</b>							
(a-1) One stop information services							
- Angkor Products database							
- Newsletter and website							
- New product information							
- Research on potential products and market							
- Guidance and consulting							
(a-2) Promotion of international cooperation							
- Promotion of international technical and management cooperation							
- Promotion of investment, trade and information exchange							
- Assisting in and out-bound economic missions							
- Compiling "Investment Guide"							
<b>(b) Production Support</b>							
(b-1) Technical and management support activities							
- Production skill and design technology support							
- Packaging technology support							
- Business management and IT support							
(b-2) Business group organizing							
- Production and distribution group organizing with the cooperation							
- One Village One Product Movement (OVOP) [Project A-2]							
<b>(c) Marketing Support</b>							
(c-1) Linkage to tourism							
- Production Village Development [Project A-3]							
(c-2) Exhibition coordination							
- Organizing Angkor Products Fair [Project A-4]							
(c-3) Business matching coordination							
- Direct sales support to hotels and restaurants							
- Cultivation of market							
(c-4) Authorization and Quality Control on Local Products							
- Authorization (branding) of Angkor Products							
- Angkor Products Mark							
- Testing and standardization of products							

Source: JICA Study Team

**(6) Executive Organization**

Siem Reap provincial government

**(7) Project Cost**

Training in Japan for 3 potential guiding officers (3 month training at local business promotion center at prefectural level)

**A-2 One Village One Product Movement (Project A-2)****(1) Background and Purpose**

The One village One Product Movement (OVOP) is a regional revitalization movement initiated in Oita, Japan. The OVOP movement is a movement to harness the internal energy for regional product development. It aims at endogenous development that does not depend on supports from the government or big companies.

The OVOP Movement has three principles;

- a) Local but Global,
- b) Self-reliance, Self –Support and Innovation,
- c) Human resources Development.

The goal set by the Governor is human resource development through OVOP. People have to show their own local products to be proud of, which means people show their pride. OVOP fosters village products and peoples pride in rural areas. People are to be independent and to have identity.

In considering the present situation of not so common group activities or rather weak relationship among farmers, in Siem Reap, to introduce OVOP effectively, NGOs are expected to take initiative role.

**(2) Target Group**

Rural people in Siem Reap province.

**(3) Expected Output of OVOP Movement**

**1) Guiding the Improvement of Community Group Activities**

- (a) Strengthen the unity of group activities and unified long-term development vision,
- (b) Grow up leaders who understand technology, management and marketing activities,
- (c) Production skill, management and marketing (including design and package) upgrading,
- (d) Introduction of business use of information and communication equipment (telephone and inter net).

**2) Supporting Effectives Development of Community Businesses**

- (a) Introduction of production process with higher standard which is either pollution free or environmental friendly,
- (b) Encourage market and information oriented business planning,
- (c) Support in human resource development not only from technological aspect but also from management, marketing and information,
- (d) Coordination between tourism and community business.

**(4) Project Period and Activities**

In 5 years period,

- Carry out projects to disseminate information and educate people about the OVOP movement,
- Carry out research and development on OVOP products and give advice in processing technology,
- Supporting marketing activities and organizing product association (group) among villages, and
- Developing human resources in villages to face the tasks in the future, where the successful experience are shared among the participants.

**(5) Executive Organization**

Siem Reap Provincial Government (APPC)

**(6) Project Cost**

Carry out seminar, training course and guiding activities

**A-3 Production Village Development (Project A-3)**

**(1) Background and Purpose**

To improve and develop tourism linkage production village where combined with local product shop, handicraft producing place and product processing demonstration. This project aims to encourage Angkor tourism diversification (develop new tourist spot for longer stay in Siem Reap) and to create opportunity for tourist to be more familiar with local handicrafts and souvenirs.

Also, this project will promote the collective peoples in local area and improve the unity of community by economic activities deeply related with local tradition and culture. Following "Production Village Tour" linkage with historic sights will be recommendable as the original plan.

**(2) Target Group**

**1) Silk and Handicraft Village**

Silk Handicraft Village (IKTT) ---near Banteay Srey area (total travel time: 4 hours)

IKTT started new project in 2003 aiming at the restoration of traditional forest in suburban area of Siem Reap. This project also aiming to create a craft village which produces, demonstrates production and sells various handicrafts including silk, basketry and painting. The craft village is scheduled to open in the summer of 2006.

Angkor Krau Village---near Angkor Thom area (total travel time: 2 hours)

Joint Support Team for Angkor Preservation and Community Development (JST), NGO, jointly supported by Japanese and Cambodian volunteers, is developing handicrafts (pottery, cotton weaving and stone carving) and eco-tourism village. This area is close to the above IKKT handicraft village.

**2) Ceramic Pottery, Cotton Weaving and Shadow Puppetry Workshops**

Ceramic, Cotton and Shadow puppetry Workshops---Roluos Group area (Preah Ko, Bakong and Lolei) (total travel time: 3 hours)

A group of artisans from Kampong Chhnang started pottery tableware production in Roluos area in 2002. Cambodia-Singapore NGO supplied the factory and one Japanese senior volunteer provided technical assistance for two years.

Quality local material clay for pottery is abundant and the group is on the way of reviving traditional Khmer ceramics. This tour includes cotton workshop and shadow puppetry workshop located in neighboring area.



### **3) Stone and Wood Carving and Silver Container Workshop**

Stone and wood carving and Silver container Workshop---North part of Siem Reap town area, way to Angkor Wat (total tour time: 2hours)

About 6 production groups or small-scale companies engaged in stone carving (partly engaged in wood carving) are identified in northern Siem Reap city. They are conserving traditional skills and stone and wood materials are abundant in northern mountain area or border area. A silver container workshop is also located in this area.

#### **(3) Project Period and Activities**

In 2 years period,

- Identifying and compiling production village guide map for tourists and promote, and
- Public relations activities through hotel association and travel agents association.

#### **(4) Executive Organization**

Siem Reap provincial government (APPC)

#### **(5) Project Cost**

Identifying production village and guide map making and public relations

### **A-4 Organizing Angkor Products Fair (Project A-4)**

#### **(1) Background and Purpose**

At present, there is no public exhibition suitable for local products in Siem Reap. As an important marketing promotional activity, arranging the public exhibition for local products is indispensable. This connects local producers and buyers/ tourists/residents.

The Pilot Project, Angkor Product fair 2005 was the first attempt of this kind in Siem Reap. The fair exhibited a wide range of quality local products, including arts, crafts and farm products. A lot of exhibitors, tourists, buyers and residents were participated and almost all of them evaluated the fair affirmatively and showed their expectation for the next fair.

The big scale fair has a big impact and attracts attention of buyers, tourist and residents rather than permanent showroom or display place. There are already so many shops or private showrooms of local products in Siem Reap town area.

#### **(2) Target Group**

- Handicraft and agricultural products producers in Siem Reap province,
- Buyers, business people and local residents.

#### **(3) Project Period and Activities**

3 years, twice a year (April and December),

- Arrange the large-scale (around 50 booths) exhibition for public relation and sales promotion of local products,
- Lead the producers and residents to join the exhibition and show the potential

products and market,

- Arrange opportunity of buyer, tourists and residents meet producers,
- Encourage sense of competitiveness and cooperation among local producers,
- Encourage Angkor Products identity and local identity,
- Encourage product quality and design improvement to create Angkor brand.

**(4) Executive Organization**

Siem Reap Provincial Government (APPC)

**(5) Project Cost**

Arranging and hosting the Angkor Products Fair



**JICA - Study on Integrated Master Plan for Sustainable Development of Siem Reap/Angkor Town  
Project Brief**

**Sector: Agricultural Diversification and Local Product Promotion**

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost	Project Priority																
A-1	Human Resource Development and Establishing Local Products Promotion Center	Local producers of handicraft and agricultural products	Bilateral	80 (thousand US\$)	Priority																
	Project Site Siem Reap Province	Department	Contact Person	Telephone	E-mail																
	Implementation Agency Provincial Government	<p>Project and Program Outline/Components:</p> <ol style="list-style-type: none"> <li>1) Training of guiding officers</li> <li>2) Establishing Angkor Products Promotion Center (APPC)</li> <li>3) Promoting local products by information, production and marketing support</li> <li>4) Encouraging purchasers to procure local products by grading</li> </ol>																			
	<p>Background:</p> <ul style="list-style-type: none"> <li>• Institutional and human capabilities, planning capabilities, in particular, of provincial authorities are not sufficient for promoting and guiding local businesses</li> <li>• The provincial government is lacking in comprehensive coordinating or core organization for local products promotional activities</li> </ul>																				
	<p>Project Purpose:</p> <ol style="list-style-type: none"> <li>1) To lead human resource development of guiding activities for tourism related local businesses</li> <li>2) To establish local products promotion center such as "Angkor Products Promotion Center (APPC)". APPC will promote local and community businesses by assisting information networking, design and technical upgrading, public relations and sales promotion</li> </ol>																				
		<p>Project Output:</p> <ol style="list-style-type: none"> <li>1) Human resource development</li> <li>2) Information support for local products promotion</li> <li>3) production and marketing support for local products promotion</li> </ol>																			
		<p>Project Cost: (000 USD)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">1) Direct costs</td> <td style="text-align: right;">16</td> </tr> <tr> <td>2) Capacity building</td> <td style="text-align: right;">54</td> </tr> <tr> <td>3) Physical conti.</td> <td style="text-align: right;">2</td> </tr> <tr> <td>4) Price Escalation</td> <td style="text-align: right;">7</td> </tr> <tr> <td>5) Engineering service</td> <td style="text-align: right;">2</td> </tr> <tr> <td style="border-top: 1px solid black;">sub-total</td> <td style="text-align: right; border-top: 1px solid black;">80</td> </tr> <tr> <td style="border-top: 1px solid black;">6) Land acquisition</td> <td style="text-align: right; border-top: 1px solid black;">-</td> </tr> <tr> <td style="border-top: 1px solid black;">TOTAL</td> <td style="text-align: right; border-top: 1px solid black;">80</td> </tr> </table>				1) Direct costs	16	2) Capacity building	54	3) Physical conti.	2	4) Price Escalation	7	5) Engineering service	2	sub-total	80	6) Land acquisition	-	TOTAL	80
1) Direct costs	16																				
2) Capacity building	54																				
3) Physical conti.	2																				
4) Price Escalation	7																				
5) Engineering service	2																				
sub-total	80																				
6) Land acquisition	-																				
TOTAL	80																				
		<p>Implementation Schedule</p> <ol style="list-style-type: none"> <li>1) 3 months training in Japan</li> <li>2) 1 year for phase 1 (starting phase)</li> <li>3) Full-scale activities after phase 1</li> </ol>																			
	<p>. APPC</p> <ol style="list-style-type: none"> <li>1) Improve local product quality and replace imported goods</li> <li>2) Connecting local products to tourism related business</li> <li>3) Income improvement and economic diversification of residents/ farmers</li> </ol>																				
	Angkor Products Fair 2005 (Pilot Project)																				

# JICA - Study on Integrated Master Plan for Sustainable Development of Siem Reap/Angkor Town Project Brief

## Sector: Agricultural Diversification and Local Product Promotion

<b>ID No.</b>	Project Title		Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	Project Priority
A-2	One Village One Product Movement(OVOP)		Village people in rural area	Bilateral	60 (thousand US\$)	
	Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
	Siem Reap Province	APPC				
<b>Background:</b>						
<ul style="list-style-type: none"> <li>• At present, group activities are not so common and relationship is rather weak among village people</li> <li>• The OVOP movement is a movement to harness the internal energy for regional product development</li> <li>• The OVOP movement fosters village products and people pride in rural areas</li> </ul>						
<b>Project Purpose:</b>						
<ol style="list-style-type: none"> <li>1) To promote endogenous development that does not depend on supports from the government or big companies</li> <li>2) To develop rural products and diversifying agricultural products</li> </ol>						
<b>Project Output:</b>						
<ol style="list-style-type: none"> <li>1) Organize production group among farmers</li> <li>2) Production and marketing promotion of rural products</li> <li>3) Grow up leaders and human resource development</li> </ol>						
<b>Environmental and Social Impact:</b>						
<ol style="list-style-type: none"> <li>1) Improve rural product development and diversification</li> <li>2) Human resource development</li> <li>3) Improve rural income</li> </ol>						
			<b>Project Cost: (000 USD)</b> 1) Direct costs 50 2) Capacity building 3) Physical conti. 4) Price Escallation 5 5) Engineering service 5 sub-total 60 6) Land acquisition TOTAL 60			

**JICA - Study on Integrated Master Plan for Sustainable Development of Siem Reap/Angkor Town  
Project Brief**

**Sector: Agricultural Diversification and Local Product Promotion**

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	Project Priority
A-3	Production Village Development	Local producers of handicraft and souvenir	Bilateral	36 (thousand US\$)	
	Project Site Siem Reap Province	Department	Contact Person	Telephone	E-mail
	Implementation Agency APPC	<p>Project and Program Outline/Components:            1) Identifying and compiling production village guide map for tourists and promote public relations activities through hotel association and travel agents association</p>			
	<p>Background:            • This project aims to encourage Angkor tourism diversification(develop new tourist spot for longer stay in Siem Reap) and to create opportunity for tourist to be more fammiller with local handicraft and souvenir</p>				
	<p>Project Purpose:            1) To promote the collective people in local area and improve the unity of community by economic activities deeply related with local tradition and culture            2) To linkage production village with historic sights</p>	<p>Project Output:            1) Local product sales promotion            2) Identifying local tradition and culture            3) Tourism diversification</p>			
	<p>Environmental and Social Impact:            1) Improve local product quality and replace imported goods            2) Connecting local products to tourism            3) Improve local producers income</p>	<p>Implementation Schedule:            1) 2 years</p>			
		<p>Project Cost: (000 USD)</p>		<p>1) Direct costs 30            2) Capacity building            3) Physical conti. 3            4) Price Escallation 3            5) Engineering service                sub-total 36            6) Land acquisition                TOTAL 36</p>	

**JICA - Study on Integrated Master Plan for Sustainable Development of Siem Reap/Angkor Town  
Project Brief**

**Sector: Agricultural Diversification and Local Product Promotion**

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD (thousand US\$))	Project Priority																
A-4	Arranging the Angkor Products Fair	Local producers of handicraft and agricultural products, Buyers, business people and residents	Bilateral	108																	
Project Site		Department		Telephone	E-mail																
Siem Reap Province		Contact Person																			
Implementation Agency		APPC																			
<p>Background:</p> <ul style="list-style-type: none"> <li>• At present, there is no public exhibition suitable for local products in Siem Reap</li> <li>• As an important marketing promotional activity arranging the public exhibition for local products is indispensable</li> <li>• The pilot project, Angkor Products Fair 2005 was successful</li> <li>• A lot of exhibitors and visitors were participated the fair and evaluated the fair affirmatively and showed their expectation for the next fair</li> </ul>																					
<p>Project and Program Outline/Components:</p> <ol style="list-style-type: none"> <li>1) Arrange the exhibition of local handicraft and agricultural products for public relation and sales promotion</li> <li>2) Lead the producers and buyers, tourists and residents to join the exhibition</li> </ol>																					
<p>Project Purpose:</p> <ol style="list-style-type: none"> <li>1) To promote local and community businesses by assisting information networking, design and technical upgrading, public relations and sales promoting</li> <li>2) To develop local products and creating local brand</li> </ol>																					
<p>Project Output:</p> <ol style="list-style-type: none"> <li>1) Accumulating information of local products/producers and buyers</li> <li>2) Marketing and sales promotion</li> <li>3) Recognizing quality improvement needs</li> </ol>																					
<p>Environmental and Social Impact:</p> <ol style="list-style-type: none"> <li>1) Improve local product quality and replace imported goods</li> <li>2) Connecting local products to tourism related business</li> <li>3) Connecting local products to local residents</li> </ol>		<p>Project Cost: ('000 USD)</p> <table border="0"> <tr> <td>1) Direct costs</td> <td align="right">90</td> </tr> <tr> <td>2) Capacity building</td> <td></td> </tr> <tr> <td>3) Physical conti.</td> <td></td> </tr> <tr> <td>4) Price Escallation</td> <td align="right">9</td> </tr> <tr> <td>5) Engineering service</td> <td align="right">9</td> </tr> <tr> <td>sub-total</td> <td align="right">108</td> </tr> <tr> <td>6) Land acquisition</td> <td></td> </tr> <tr> <td><b>TOTAL</b></td> <td align="right"><b>108</b></td> </tr> </table>				1) Direct costs	90	2) Capacity building		3) Physical conti.		4) Price Escallation	9	5) Engineering service	9	sub-total	108	6) Land acquisition		<b>TOTAL</b>	<b>108</b>
1) Direct costs	90																				
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3) Physical conti.																					
4) Price Escallation	9																				
5) Engineering service	9																				
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6) Land acquisition																					
<b>TOTAL</b>	<b>108</b>																				
<p>1) Angkor Products Fair 2005 (Pilot Project)</p>																					

## Chapter 6 Transportation

### 6.1 Situation, Prospects and Issues

#### 6.1.1 Situation of Road Sector

##### (1) General Situation of Road Network

##### 1) National Road Network

The road network development in Cambodia started in the early 1900s and completed 50-60 years ago. However, due to years of destruction, exposure to natural calamities and lack of maintenance, the road network suffered and fell into a serious state of deterioration.

Efforts to rehabilitate and upgrade the road network started in the 1990s with various international donors contributing to the development and by the year 2004, almost 39,310kms of national, provincial and rural roads have been developed. Figure III.6.1 and Table III.6.1 show the present road network in Cambodia.

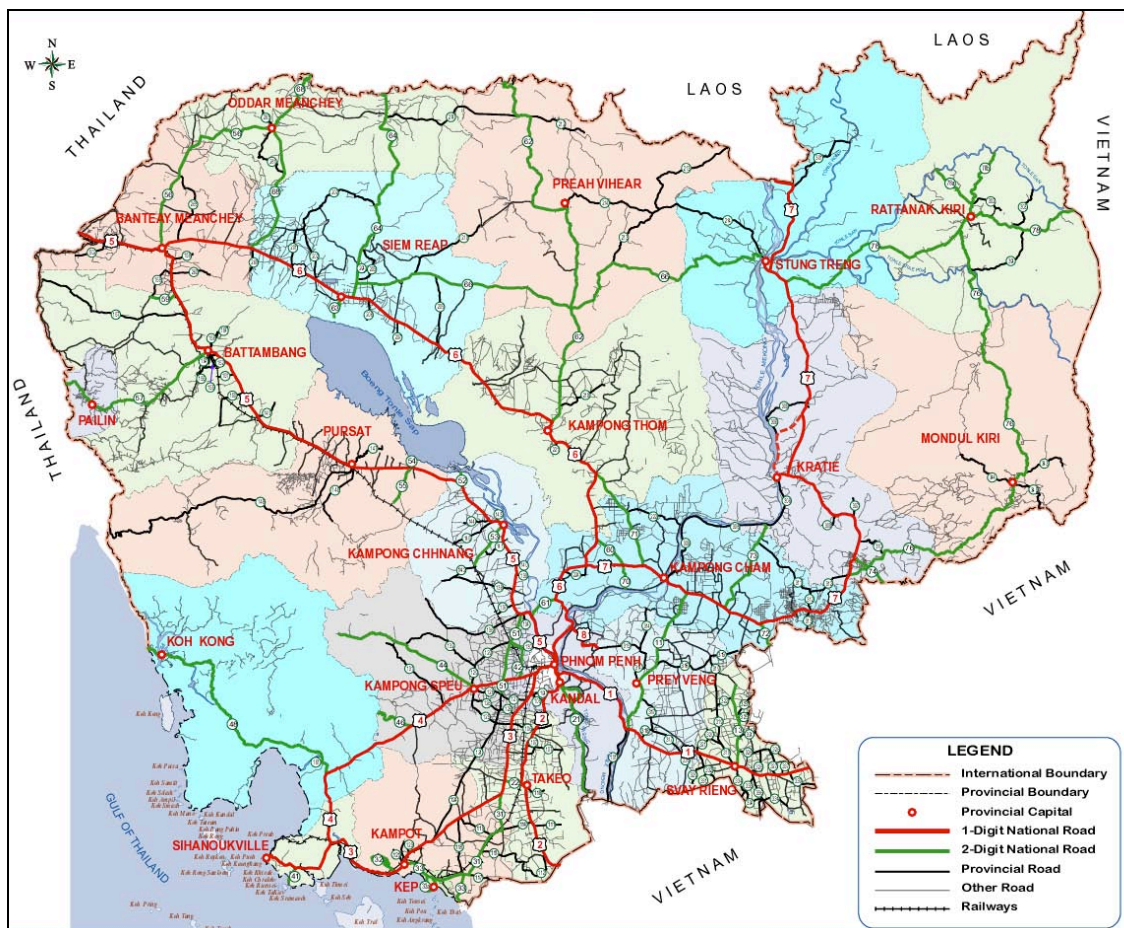


Figure III.6.1 Cambodia Road Network



Of these 39,310kms Cambodian road network, 2,052kms are classified as one-digit national roads composed of eight (8) arterial roads which spread to several direction from Phnom Penh and most of them have been rehabilitated or under rehabilitation.

Two-digit national roads, totally 2,643kms in length, diverge from one-digit national roads.

All the twenty two (22) provincial capitals are connected with Phnom Penh by these one-digit and two-digit national roads. However, the conditions of two-digit national roads are generally less than moderate and about 80% of them are still unpaved.

Provincial roads, totally 6,615kms in length, complement above national road network, though most of them are in less than poor condition. Only 1.5% of provincial roads are paved condition.

Previous three classes of roads are all managed by Ministry of Public Works and Transport (MPWT), while Rural or Tertiary roads are managed by Ministry of Rural Development (MRD).

**Table III.6.1 Road Length by Classification**

Road Classification	Road Length (km)
One-Digit National Road	2,052
Two-Digit National Road	2,643
Provincial Road	6,615
Rural or Tertiary Road	approx. 28,000
<b>Total Length</b>	<b>39,310</b>

As of July 2005

Source: Ministry Public Works and Transport (MPWT)

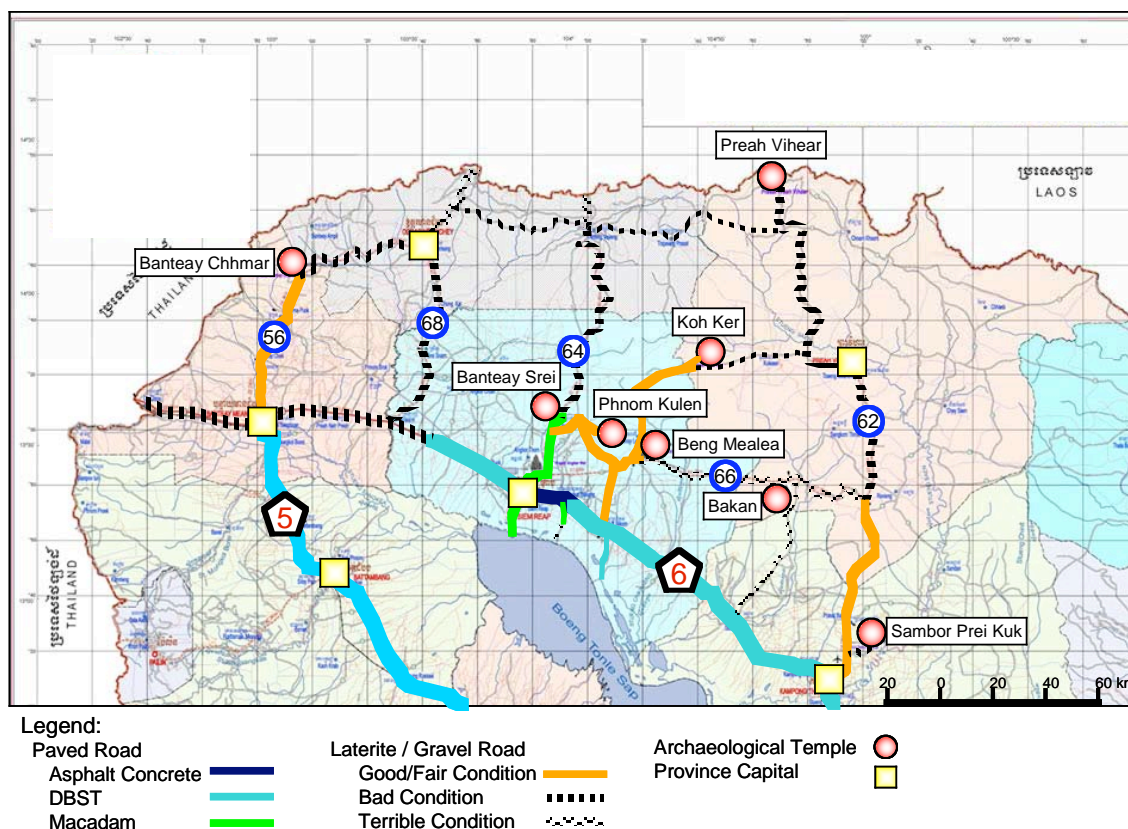
## 2) Regional Road Network in North-West Region

Siem Reap province is surrounded by five provinces, namely Khampong Thom, Preah Vihear, Oddar Meanchey, Banteay Meanchey and Battambang. The road network in this region is mainly composed of National Road 6 (hereinafter NR6), NR5 and 6 two-digit national roads i.e. NR56, NR62, NR63, NR64 and NR68. Provincial roads complement this network as the connection route between provincial capitals and major district centers.

Figure III.6.2 shows the present condition of the main road network in northwest region.

All through the one-digit national roads (NR5 and NR6) in this region other than Siem Reap – Poipet section have been rehabilitated up to Phnom Penh with the fund of international donors. By the effort of this rehabilitation, travel time from Siem Reap to Phnom Penh, approximately 310km in distance, has been shortened to about five (5) hours. As regards the non-rehabilitated section, the rehabilitation project funded by Asian Development Bank (ADB) has just started its construction work with the duration of 36 months on November 2005.

Two-digit national roads in this region other than NR63 and part of NR64 are laterite, gravel or even earth road. The conditions of these unpaved roads are mostly poor or terrible if the periodic maintenance work have not been implemented within few years. In the rain season, some routes become impassable because of lack/deterioration of bridges. Under such a circumstance, some rehabilitation projects to these two-digit national roads are now under implementation with the fund of international donors such as World Bank (WB), ADB and Government of Thailand.



As of July 2005

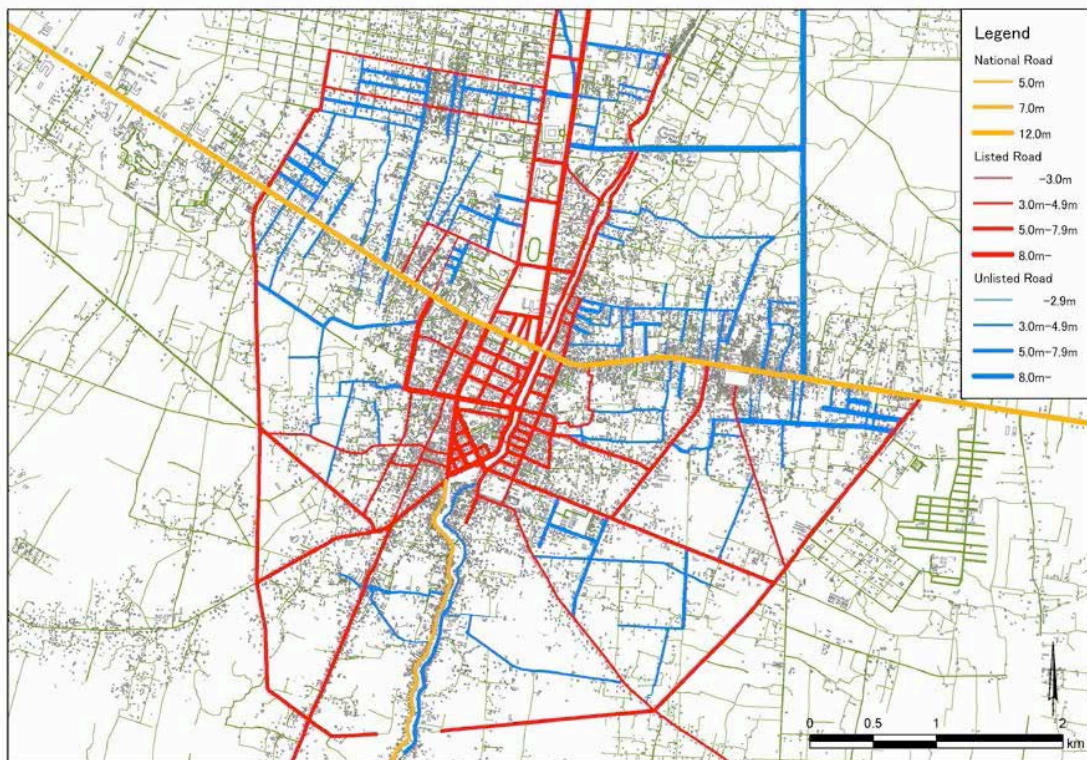
Source: JICA Study Team

**Figure III.6.2 Present Condition of Regional Road Network**

### 3) Road Network in the Study Area

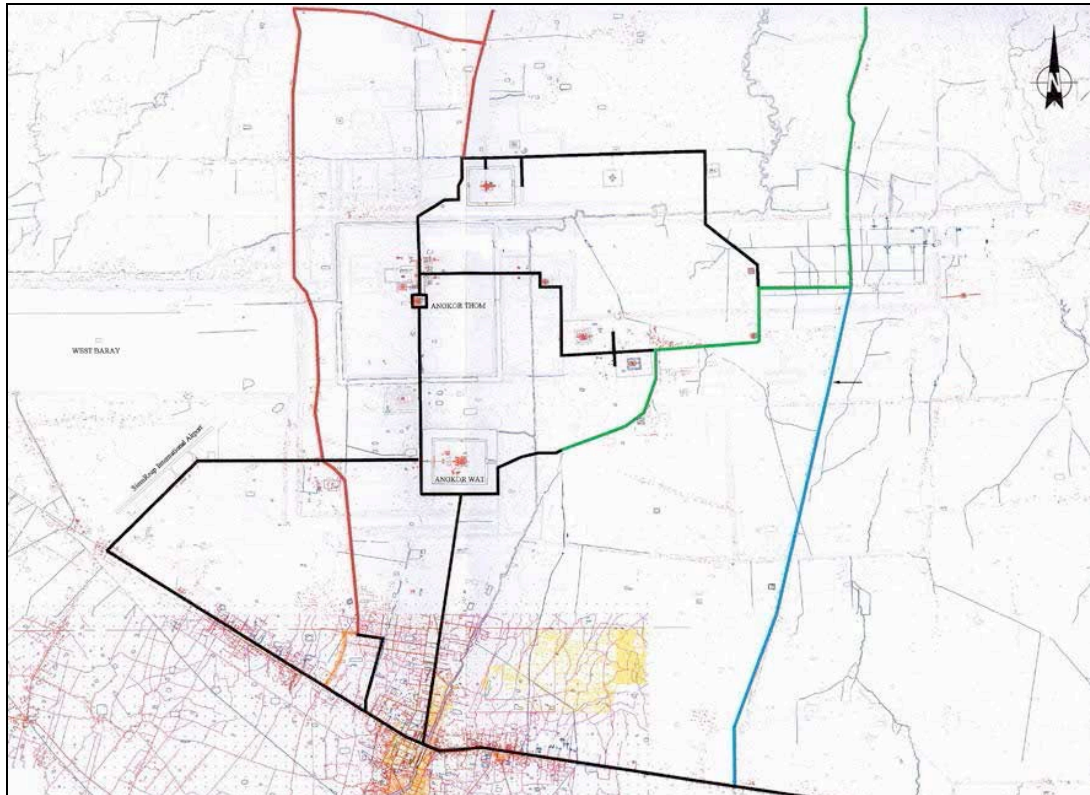
NR6, NR63 (linking Siem Reap and Tonle Sap) and NR64 (linking Siem Reap, Angkor Archaeological Park and Banteay Srei, former NR67) make the framework of the road network of the study area. City roads and small paths diverge from these arterial roads into the residential area and rural area. Figure III.6.3, 6.4 and Table III.6.2 show the existing road network in the Siem Reap City and Angkor Archaeological Park (hereinafter AAP), and road length in Siem Reap province by road class respectively. In recent years, the number of hotels and restaurants are increasing year by year especially along NR6. Large number of tour buses and bike taxis run all over the Siem Reap city and AAP.

Roads in the study area have been heavily damaged while last some decades because of the internal war and lack of maintenance. MPWT and Provincial Government have executed the road rehabilitation, maintenance and new construction projects since the democratization with strictly limited budget. However, these efforts cannot catch up the rapid motorization and sharp increase of tourists and population in the study area. As the result, traffic congestion occurs at some bottlenecks on the NR6 in peak hours, and back streets in residential area are left unpaved, damaged and narrow. In addition, many people in rural area are left in the hard condition in accessing to an urban area, and tourists use heavily damaged road to visit some suburban heritages even in dry season. Detailed problem and issues of road network in the study area will be shown in following section.



Source: JICA Study Team

**Figure III.6.3** Current Road Network in Siem Reap City



Source: APSARA Authority

**Figure III.6.4** Road Network in Angkor Archaeological Park

**Table III.6.2 Road Length by Class in Siem Reap Province**

	Road Classification	Total Length (m)
1	National Road–A (1digit)	132, 500
2	National Road–B (2digit)	213,550
3	Provincial Road-A (3digit)	351,768
4	Provincial Road-B (4digit)	186,500
5	Rural Road	N/A
6	City Road	144,000 (Estimated in 2003)
7	Road in Archaeological Park	110,000 (Estimated in 2003)

Source: Department of Public Works and Transport of Siem Reap Province

## (2) Review of National Road Development Strategy

The Royal Government of Cambodia had set the national development vision on a poverty reduction when it was established in 1993, and have prepared two development guidelines, namely,

- Socio-Economic Development Plan 1&2 (1996-2000, and 2001-2005), (SEDP 1 &2), and
- National Poverty Reduction Strategy 2003-2005 (NPRS).

In 2004, the Government handed down a new socio-economic development vision i.e. “Rectangular Strategy” with emphasis on economic growth, employment opportunity, equity and efficient government. In this development vision, the policy focus has shifted from “poverty reduction” to “acceleration of poverty reduction and good governance”, indicating that urgent rehabilitation stage of the nation has completed, and that the Cambodia is now at a stage to make a new foundation of growth by aligning all the development participants.

In 2002, MPWT has prepared “Transport Sector Strategy Study (TSS)” to achieve the goals of SEDP 2. The eight road sector approaches shown in Table III.6.3 were set in TSS.

In addition, JICA has started the master plan study on “The Road Network Development in the Kingdom of Cambodia” in March, 2005. The main objectives of this master plan study are:

- To formulate a road development master plan covering the whole country of Cambodia with a target year 2020 including the study on institutional development of road maintenance,
- To carry out a pre-feasibility study for high priority projects selected in the short-term plan(2010), and
- To undertake a transfer of knowledge and technology.

The final report of this master plan study will be published in August, 2006.

**Table III.6.3 Road Sector Approaches in TSS (2002)**

Approach	Contents
1 Completion of the Primary Road Network	Phase 1: Completion of the ongoing rehabilitation on the National Roads by the end of 2003. Phase 2: Completion of the committed program by the end of 2005. Phase 3: Provide all-weather access between all the provincial capitals and the National Road Network, and to all major border-crossing points. Rehabilitate other primary roads of significant importance to the national economy and tourism.
2 Road Maintenance	<ul style="list-style-type: none"> <li>- Expanding the rationale of the pilot to organize and strengthen the road maintenance capabilities in all the provinces.</li> <li>- Establishing a financing mechanism for funding road maintenance.</li> <li>- Establishing a network of weigh stations to regulate the use of overloaded vehicles on roads</li> <li>- Developing appropriate planning and prioritization procedures for periodic maintenance interventions.</li> <li>- Develop and implement axle load monitoring and control procedures.</li> </ul>
3 Road Safety	<ul style="list-style-type: none"> <li>- Raise public and road user awareness of road safety issues.</li> <li>- Monitor accident statistics and identify accident black spots.</li> <li>- Review and audit road designs and completed road projects for conformance to design guidelines.</li> <li>- Establish a National Road Safety Committee by 2005.</li> </ul>
4 Social Impacts	<ul style="list-style-type: none"> <li>- The Government will place greater emphasis on routine maintenance and the use of labor based methods for road maintenance.</li> <li>- Local engineers and consultants should be actively engaged in the design and supervision of civil works.</li> </ul>
5 Socio-environmental Impact Assessment & Mitigation	<p>Establish an appropriate department of the MPWT that is responsible to</p> <ul style="list-style-type: none"> <li>- Social Impact Assessments and the formulation of Social Action Plans and Resettlement Plans and,</li> <li>- Environmental Impact Assessments and the formulation of Environmental Impact Management and Mitigation Plans.</li> </ul>
6 Transport Sector Planning	<ul style="list-style-type: none"> <li>- Establish a strong planning capability within MPWT with the necessary expertise and resources.</li> </ul>
7 Rural Roads	<ul style="list-style-type: none"> <li>- Establish a liaison committee made up of representatives of MPWT and MRD geared to sharing planning, technical, financial and maintenance experiences and with the mandate to develop inter-ministry co-operation at every level.</li> </ul>
8 Road Maintenance Mechanism	<ul style="list-style-type: none"> <li>- Broadening and deepening the revenue base for the fund for road maintenance and repair.</li> <li>- Strengthening and building the institutional structure for planning and delivery of maintenance service.</li> </ul>

### (3) Road Management Legislation and Organization

#### 1) Legislation

For the purpose of road administration, there are generally three (3) essential items to be stipulated by law or regulation:

- Responsibilities, obligations, rights and interests of the state on road

- Definition of roads to be constructed rehabilitated and maintained by the road authorities
- Application and enforcement of Traffic rules

In Cambodia, there has not been any appropriate legal framework that enacts above items. The “Road Law”, which is enacted for the purpose of defining the responsibilities, obligations, rights and interests of the State, the community, individuals and users of public roads, is under preparation by relating ministries led by MPWT.

The existing framework, rules and regulations for road administration are mainly stipulated by following laws and sub-decrees.

#### Road Management Responsibilities

- Anukret No.14/ANK/BK of March 3, 1998 on the Organization and Functioning of MPWT
- Anukret No.78/ANK/BK of December 1, 1997 on the Organization and Functioning of Ministry of Rural Development (MRD)
- Prakas of July, 2002 on the Organization and functioning of Department of Rural Road (DRR)

#### The Fund for Road Maintenance and Repair (FRMR)

- Inter-Ministries Prakas of June 28, 2000 on Formation FRMR
- Sub-Decree of May 6, 2002 on Transferring of the Management of Budgetary Credit
- Circular of October 2, 2003 on Procedure and Law of Using FRMR

#### Road Traffic

- Law on Road Traffic, 1991 (under revision)
- Sub-degree of November, 2003 on the issue of the Vehicle Plate Number

## 2) Management Organization

Roads in the Siem Reap are under the responsibility of Department of Public Works and Transport (DPWT), Provincial Department of Rural Development (PDRD), Provincial Government and APSARA Authority. Relationship and responsible road of these organizations are shown in Figure III.6.5.

National roads, provincial roads and rural roads which have more than 50 of average daily traffic are under the control of DPWT as the line department of MPWT. In addition, DPWT has responsibility for the management of city roads from the aspects of one department of provincial government.

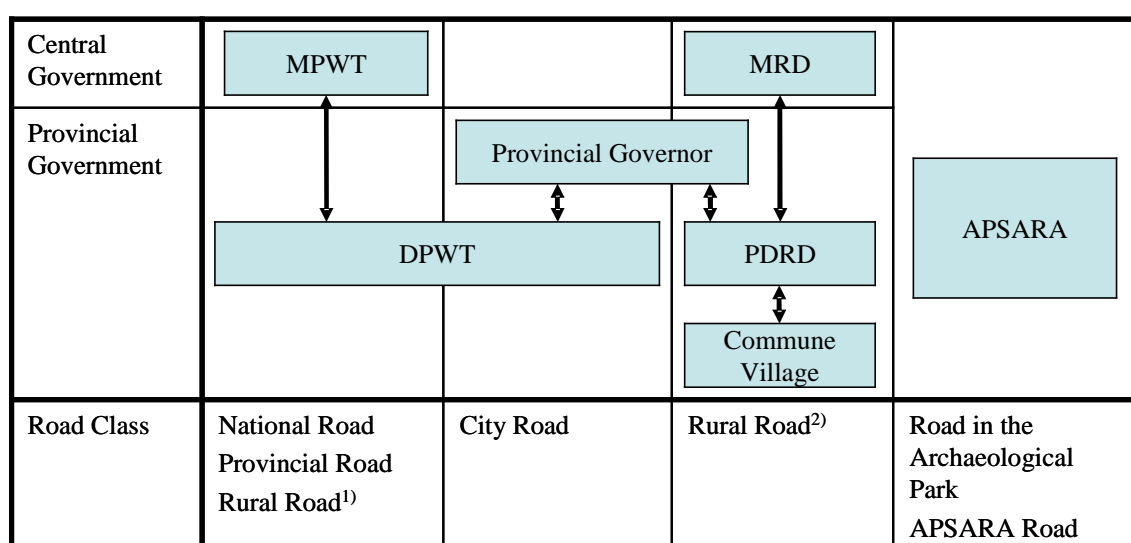
PDRD has responsibility for the management of rural roads which have less than 50 of average daily traffic. The rural roads are classified into four categories as follow;

- TERTIARY : Connects District to District
- SUB-TERTIARY1 : Connects District to Commune
- SUB-TERTIARY2 : Connects Commune to Commune

- SUB-TERTIARY3 : Connects Commune to Village, and Village to Village

PDRD has an ownership and management responsibility for the TERTIARY roads only. Other three categories of rural roads belong to Communes and Villages. MRD provides advice to rural road owners and managers on road maintenance and the mobilization and use of funds and resources.

APSARA Authority manages the road network in the AAP and two major roads in Siem Reap city called APSARA Road which run north-east Siem Reap city up to the AAP. APSARA has two departments that have responsibility in road management, namely Urban Development Department and Angkor Conservation Compound. The main task of Urban Development Department is to advice issues and its countermeasures of urban road network to the provincial government and DPWT. In the meantime, Angkor Conservation Compound is responsible in planning and execution of the road rehabilitation and maintenance work.



1) Rural roads that have more than 50 of average daily traffic

2) Rural roads, which have less than 50 of average daily traffic

**Figure III.6.5 Road Management Organizations and Responsible Road Class**

#### (4) Road Maintenance

Each organization shown in Figure III.6.5 executes road maintenance works to their responsible roads with a strictly limited budget and resources.

##### 1) MPWT / DPWT

MPWT/DPWT has basically adopted two kinds of procurement methods, one is contract out and another is force account. In addition to the prescribed methods Army corps also joins the maintenance works. The demarcation on procurement procedure of those agencies is not transparent. After obtaining the budgetary approval, MPWT calls this budget as Contract that allocated to DPWT.

DPWT plays a main role in road rehabilitation and maintenance work on national and provincial roads in the province. Table III.6.4 shows the road rehabilitation and maintenance record conducted by DPWT.

One digit national road in Siem Reap province (NR6 only) will be completely

rehabilitated by 2008. About half of three digit and four digit laterite roads had periodic maintenance within three years. However, the 38.4% of two digit national roads and the 14.5% of three digit provincial roads have not had any rehabilitation or periodic maintenance work within last ten years. (See Figure III.6.6)

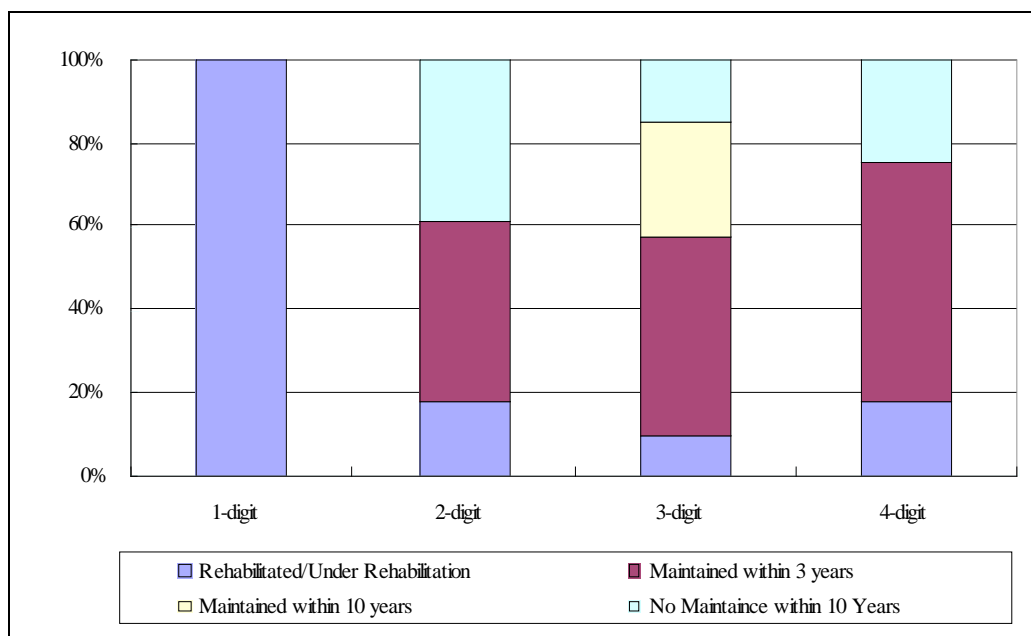
**Table III.6.4 Road Rehabilitation/Maintenance Record of DPWT**

Digit	Road Number		Length (Km)	Rehabilitation / Maintenance Work			External Fund
	New	(former No.)		Year	Work Type	Pavement	
1 digit	6		64.4	2005	PM	DBST	WB
			17.6	2002	RH	AC	JICA
			50.5	U/C	RH	AC	ADB
	Total		132.5				
2 digit	63		10.0	2002	RH	Macadam	
	64	(67)	10.4	U/P	RH	DBST	KOICA (Existing Alignment)
			18.0	2000	RH	Macadam	
			52.7	2005	PM	Laterite	
	66		82.0	N/M	-	Cart Track	
	68		40.5	2005	PM	Laterite	
Total		213.6					
3 digit	265A	-	14.0	2000	PM	Laterite	
	265B	-	10.0	2002	PM	Laterite	
	265C	(207)	15.8	2005	RH	DBST	WB
	265D	-	8.0	2003	PM	Laterite	
	265E	(206)	16.0	1962	PM	Macadam	
	265F	-	12.0	1999	PM	Laterite	
	266	-	42.0	1999	PM	Laterite	
	266A	-	30.0	2002	PM	Earth	
	266B	-	19.0	U/C	RH	DBST	WB
	266C	-	10.0	N/M	-	Earth	
	266D	-	17.0	1997	PM	Laterite	
	266E	-	78.0	2005	PM	Laterite	
	267	-	12.0	1996	PM	Laterite	
	267A	-	18.0	2002	PM	Laterite	
	268	(203)	25.0	2005	PM	Laterite	
	268A	-	25.0	N/M	-	Earth	
	Total		351.8				
4 digit	2632	(205)	7.0	U/P	RH	DBST	WB
	2640	(203)	14.0	2002	PM	Earth	
	2641	-	42.0	2005	PM	Laterite	
	2642	(204)	9.0	2002	PM	Laterite	
	2644	-	17.5	2003	PM	Laterite	BOT
	2646	-	27.0	U/C	RH	DBST	BOT
	2648	-	45.0	U/P	PM	Laterite	
	2661	(214)	25.0	2004	PM	Laterite	BOT
Total		186.5					

Abbreviation: N/M No Maintenance RH Rehabilitation  
 U/P Under Preparation PM Periodic Maintenance  
 U/C Under Construction

Source: Department of Public Works and Transport of Siem Reap Province





**Figure III.6.6 Accomplishment of Road Rehabilitation/Maintenance by Road Class**

DPWT executed routine maintenance work on National and Provincial road for 59km in length in 2003 and 17km in 2004 with a budget of 168 million riel in 2003 and 24 million riel in 2004 respectively.

DPWT also has a responsibility in road rehabilitation and maintenance work of City road. DPWT plans and implements the rehabilitation and maintenance work with the approval from Provincial Hall.

## 2) PDRD

The rural people are living in a poor access to markets, employment, education and health service. Most of rural roads are in the terrible condition without any rehabilitation and periodic maintenance work for a long time. MRD/PDRD is applying most of his road maintenance work by contract-out and remaining one by force account based on his policy. That is, the Labor-Based Appropriate Technology (LBAT) with the involvement of the local private sector.

PDRD is implementing the road rehabilitation and maintenance work under the project of Northwest Regional Development Project (NRDP) funded by ADB. Table III.6.5 shows the work record of 2004 and plan of 2005 of this project.

## 3) Siem Reap Provincial Government

Provincial Government has a responsibility in approving the City Road rehabilitation and maintenance plan prepared by DPWT, and requesting the budget of it to the Ministry of Economy and Finance.

#### 4) APSARA Authority

In the AAP, potholes and rutting are seen on the carriageway and road shoulder because of the heavy vehicle traffic such as tourist bus and trucks.

APSARA Authority is conducting road rehabilitation/maintenance work mainly in the AAPark with his own budget. In 2005, eight (8) km of rehabilitation of macadamization work have been conducted with the budget of about 500,000 USD.



**Table III.6.5 NRDP Road Rehabilitation/Maintenance Record/Plan**

Year	Work Type	No	Commune	Length (Km)	Amount ('000 USD)	
2004	Rehabilitation	1	Kok Dong	5.2	N/A	
		2	Kok Dong	5.1		
		3	Nokopheas	5.4		
		4	Reul-Trei Nhoiur	6.8		
		5	Trei Nhoeur-Nokopheas	6.9		
		6	Nokopheas-Ta Saom	6.8		
		7	Kok Dong-Svay Sar	8.0		
		8	Pouk-Lvear	8.3		
		9	Svay Leu-Tasiem	6.0		
				Total		58.4
	Routine Maintenance	1	Leang Dai-Peak Snaeng	13.5		
			Total	13.5		
2005	Rehabilitation	1	Prasath-Varin	8.0	120.0	
		2	Varin	8.0	132.0	
		3	Varin-Srae Nouy	8.0	132.0	
		4	Srae Nouy	8.0	132.0	
		5	Ta Siem-Kantuot	15.0	247.5	
		6	Kantuot-Srae Nouy	15.0	247.5	
				Total	62.0	1,011.0
	Routine Maintenance	1	Kouk Doung-Nokorpheas-Ta Saom	10.5	4.2	
		2	Kouk Doung	13.1	5.2	
		3	Svay Leu-Ta Siem	6.0	2.4	
		4	Trei Nhoar-Ta Saom	11.2	4.5	
		5	Puok-Trei Nhoar	17.2	6.9	
		6	Leang Dai-P. Snaeng	13.5	5.4	
			Total	71.5	28.6	

Source: Provincial Department of Rural Development in Siem Reap Province

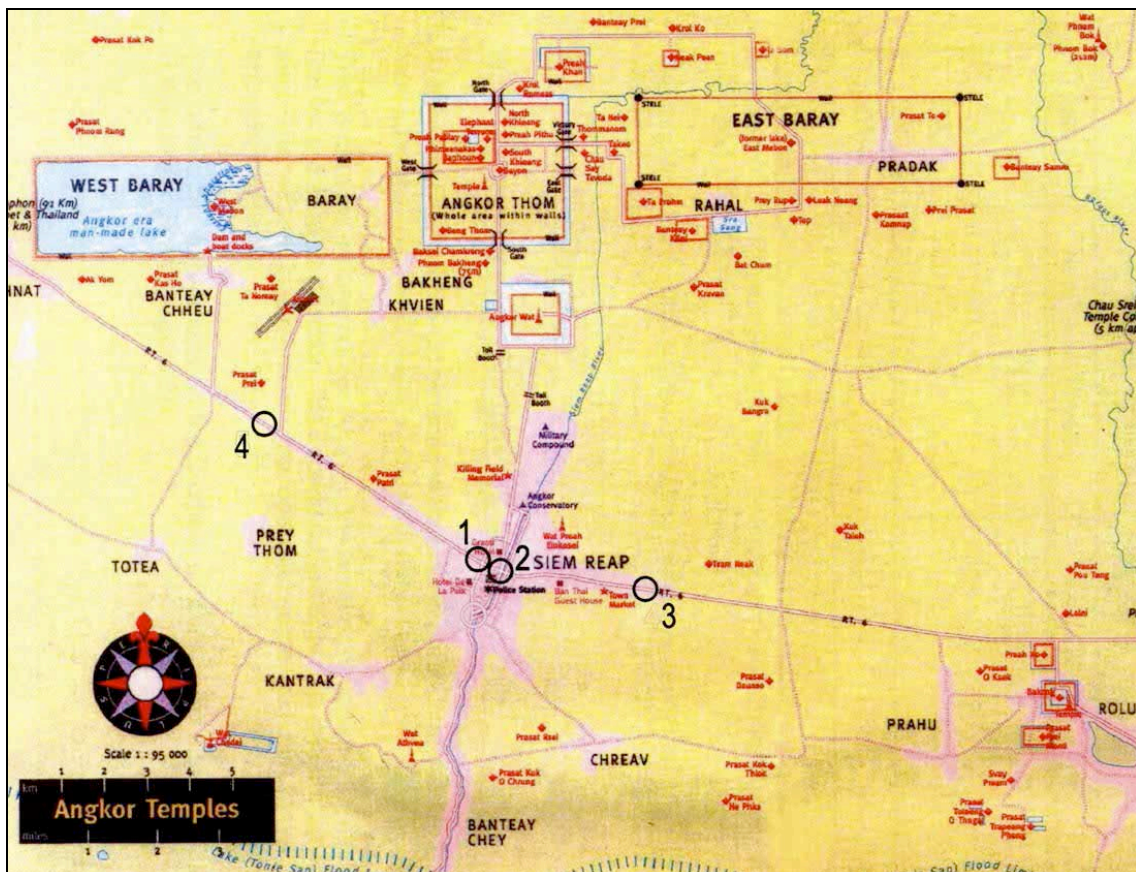
## (5) Traffic Volume and Condition in the Study Area

## 1) Traffic Count Survey

The traffic count survey was conducted along NR6 on December 12 and 13 in 2004 at two major intersections in Siem Reap urban area and two simple points at suburbs. The outline of the survey and survey points are shown in Table III.6.6 and Figure III.6.7 respectively.

**Table III.6.6 Outline of the Traffic Count Survey along NR6**

Date:	: December 12 (Sun) and 13 (Mon)
Survey Time	: From 5:00 to 21:00 (16 hours)
Survey Point	: 1. Intersection with Sivatha Blvd. 2. Intersection with Pokambor Avenue 3. East suburbs near Bus Terminal 4. West suburbs near Air Port
(See Figure III.6.7)	
Vehicle Classification	: 1. Motorcycle 2. Light Vehicle 3. Heavy Vehicle (Bus and Trucks)



**Figure III.6.7 Traffic Survey Point**

Table III.6.7 shows the average daily traffic volume both in Urban Area (survey point 1 and 2) and Suburban Area (survey point 3 and 4). The night time traffic volume (from 21:00 to 05:00) is assumed to 10% of the counted traffic volume.

Vehicle type composition doesn't show much difference between urban area and suburban area. The share of each vehicle type in traffic volume was 75% for motorcycle, 20% for light vehicle and 5% for heavy vehicle.

**Table III.6.7 Traffic Volume on NR6**

	(Vehicle/day)			
	Urban		Suburbs	
	Survey Point 1	Survey Point 2	Survey Point 3	Survey Point 4
Motorcycle	32,988	24,473	10,866	8,751
Light Vehicle	11,598	5,670	3,167	2,126
Heavy Vehicle	2,807	1,331	1,047	369
Total	47,394	31,474	15,080	11,246

	PCU Rate	(PCU/day)			
		Urban		Suburbs	
		Survey Point 1	Survey Point 2	Survey Point 3	Survey Point 4
Motorcycle	0.3	9,896	7,342	3,260	2,625
Light Vehicle	1.0	11,598	5,670	3,167	2,126
Heavy Vehicle	2.5	7,018	3,328	2,618	923
Total		28,512	16,340	9,045	5,674

Source: JICA Study Team

## 2) Vehicle Registration

In Cambodia, vehicle registration is stipulated in the sub-decree on the issue of the Vehicle Plate Number issued on November 2003. In this sub-decree, all vehicles are categorized into fourteen (14) types by vehicle type and ownership as shown in Table III.6.8.

Registration Tax is levied on the transfer of automobiles to the purchaser at four percent (4%) of presumptive values. In addition, annual tax is levied on automobiles at the confines of 3,000 and 750,000 Riels.

In Cambodia, vehicle registration has not been effectively enforced especially in the rural area. Table III.6.9 shows the annual new registered vehicle in Siem Reap Province. Even more than 47,000 vehicles were counted in the central urban area (see Table III.6.7), only 1,903 vehicles have been registered in Siem Reap Province since 1990. Large number of motorcycles and light vehicles without license number plate can be seen in the study area.

**Table III.6.8 Vehicle Category in Registration**

(I) Motorcycle	State Owned Motorcycle
	O.I. <sup>1)</sup> Owned Motorcycle
	CD <sup>2)</sup> &ONU <sup>3)</sup> Owned Motorcycle
	Private Owned Motorcycle
(II) Light Vehicle	O.I. Vehicle <sup>1)</sup>
	Car
	Mini Bus
	Pick-up
	State Owned Vehicle
(III) Heavy Vehicle	Bus
	Truck
	Trailer
	Special Vehicle <sup>4)</sup>
	State Owned Truck

1) International Organization

2) Consulates and Diplomats

3) United Nations

4) Used for special purpose such as construction, agriculture, industry and tourism works

**Table III.6.9 Annual New Registered Vehicle (1990-2004)**

Year	Siem Reap Province				Whole Country
	Motor cycle	Light Vehicle	Heavy Vehicle	Total	Total
1990	0	22	13	35	49,450
1991	0	21	7	28	33,827
1992	0	21	13	34	42,716
1993	0	0	2	2	19,123
1994	0	21	15	36	19,634
1995	0	102	46	148	26,732
1996	0	32	49	81	27,408
1997	0	55	54	109	20,881
1998	0	36	16	52	27,707
1999	0	88	25	113	30,151
2000	0	98	13	111	34,229
2001	0	69	25	94	51,120
2002	42	90	52	184	27,010
2003	103	126	35	264	37,440
2004	270	281	61	612	38,184
Total	415	1,062	426	1,903	485,612

Source: Ministry Public Works and Transport (MPWT)

**3) Traffic Accident**

The number of vehicles is increasing year by year, and the average travel speed is getting higher and higher as the road condition become better and better. As a result, traffic accidents have increased in these years.

Table III.6.10 shows the number of traffic accident. It is noted that the data of Siem Reap province show the accidents occurred on the national main roads only. The number of accidents has increased from 2,951 in 2000 to 4,255 in 2004 in the nationwide level. It is remarkable that the ratio between fatal casualties and number of accidents has jumped up from 13.6% in 2000 to 24.5% in 2004.

The 115 of 150 accidents occurred in Siem Reap province in 2004 that were related with motorbike. Motorbike is the most popular transportation mode in Cambodia. However, many people use motorbike with over capacity of passenger and most drivers and passengers don't have a helmet on.

**Table III.6.10 Number of Traffic Accident**

Year	Accident	Casualties	
		Fatal	Injury
1995 (National)	719	91	369
2000 (National)	2,951	401	4,389
2004 (National)	4,255	1,042	6,925
2004 (Siem Reap)	150	29	164

Source: Ministry Public Works and Transport (MPWT)

Against the increasing traffic accident, the Cambodian Government drew out Road Safety Action Plan in 2004 that contains following fifteen (15) action plans for the realization of safety road traffic;

**Table III.6.11 Road Safety Action Plan**

AP-1	: Establishing of a National Road Safety Council for Coordination and Management of Road Safety
AP-2	: Establishment of Road Accident Data Collection Systems
AP-3	: Establishment of Road Safety Funding
AP-4	: Publication of Road Safety Audit and Hazardous Locations
AP-5	: Improvement of Roads Environment and Road Design
AP-6	: Road Safety Education for Children
AP-7	: Enactment of Traffic Law and Regulations
AP-8	: Law Enforcement
AP-9	: Vehicle Technical Inspection
AP-10	: Drivers Training
AP-11	: Improvement of Emergency Assistance to Traffic Victims
AP-12	: Road Safety Public Campaigns
AP-13	: Partnerships with Private and NGOs
AP-14	: Road Accident Costing Evaluation
AP-15	: Establishment of Road Safety Research Institute

### 6.1.2 Traffic Demand Prospect

The future traffic demand on the NR6 is one of the most important factors in planning the future road network in the study area. Future traffic demand on the NR6 was forecasted by using the traffic count data collected in this study, and the future socio economic framework in the study area prepared in this study.

### 1) Socio-Economic Framework

The growth rate of inhabitants, tourist and Per Capita GDP are estimated in the former chapters as shown in Table III.6.9. The projection of tourists with policy intervention into the tourism in favor of sustainability in environment and economy was adopted in this traffic demand forecast.

**Table III.6.12 Socio-Economic Framework**

Year	Population				Per Capita GDP	
	Ininhabitant		Tourist		Siem Reap District	Other Districts
	Siem Reap District	Other Districts	International	Domestic		
2005-2006	2.5%	2.3%	20.0%	10.0%	6.3%	4.9%
2007-2010	2.5%	2.3%	15.0%	10.0%	6.3%	4.9%
2011-2012	2.7%	2.3%	8.0%	4.2%	6.3%	4.9%
2013-2014	2.7%	2.3%	4.0%	4.2%	6.3%	4.9%
2015-2020	2.7%	2.3%	2.0%	4.2%	6.3%	4.9%

Source: JICA Study Team

### 2) Traffic Growth Model

The following formula was applied in forecasting the future traffic volume associated with population size both inhabitants and tourist, and Gross Domestic Products (GDP).

It is noted that the GDP growth rate is excluded in the estimation of urban traffic growth rate.

$$T = [1 + \sum (a_i \times P_i)](1+G) - 1$$

Where

T = Traffic growth rate (% per year)

P = Population growth rate (Ininhabitant and Tourist)

G = Per Capita GDP growth rate

a = Population weight factor defined as below

a = (Objected Population)/(Total Population)

### 3) Future Traffic Demand on NR6

The traffic growth rate and the traffic volume on the NR6 up to 2020 both for urban area and suburban area are shown in Table III.6.13. The future growth of international tourist is excluded in forecasting suburban traffic on the NR6 because most of the international tourists move between the airport, Siem Reap city and Angkor town only.

In 2020, the traffic volume of NR6 at the intersection with Sivatha St. is forecasted to exceed 69,000 PCU/day, the 2.4 times as large number as present volume.

The design capacity of existing NR6, the two-way in two-lane traffic, is estimated to 2,500 PCU/hour. When 10% of one-day traffic is presupposed to concentrates at peak one hour, the present peak traffic volume at Survey Point 1 exceeds the design capacity.

In the same assumption, the future peak traffic volume at Survey Point 2 and Survey Point 3 are estimated to exceed design capacity in 2009 and 2016 respectively.

**Table III.6.13 Future Traffic Demand on the NR6**

Year	Growth Rate (% per year)		Traffic Volume (Vehicle/day)			
	Urban	Suburbs	Urban		Suburbs	
			Survey Point 1	Survey Point 2	Survey Point 3	Survey Point 4
2005	13.5%	9.8%	52,811	35,736	16,563	12,352
2012	4.1%	8.1%	91,887	61,023	30,800	22,968
2020	3.1%	8.2%	118,180	78,484	57,568	42,930

Year	Traffic Volume (PCU/day)			
	Urban		Suburbs	
	Survey Point 1	Survey Point 2	Survey Point 3	Survey Point 4
2005	32,373	18,552	9,933	6,232
2012	55,278	31,679	18,471	11,588
2020	71,096	40,774	34,524	21,659

Source: JICA Study Team

### 6.1.3 Problems on the Road Sector

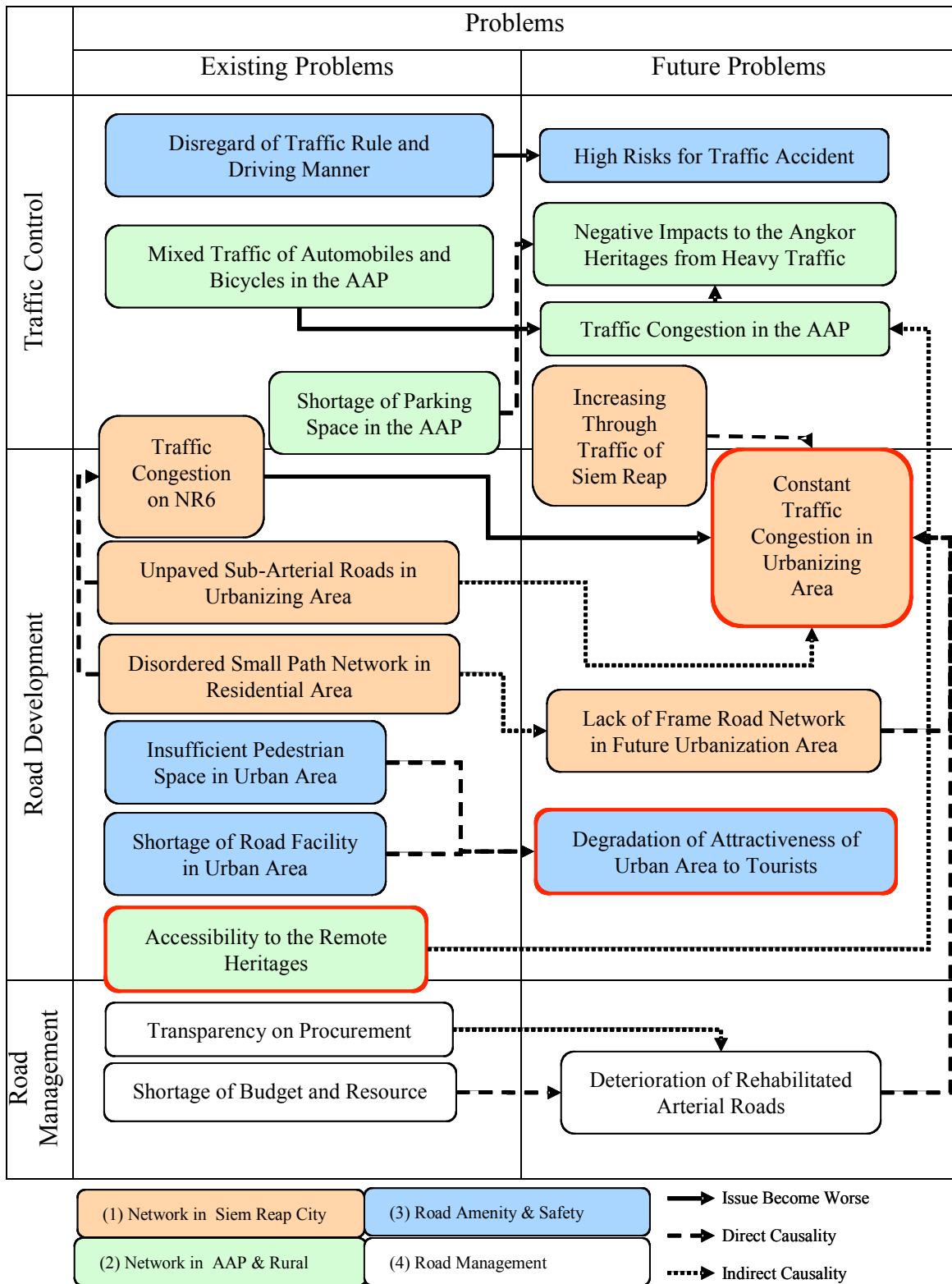
Rapid increase of tourists, population and motorization in these years has made gaps between traffic demands and road service level in the Study Area. The existing gaps are still not so serious but have potentials to become irrecoverable ones if any appropriate measures are not implemented in coming years.

In this section, the problems on the road sector will be described from the following four points of view;

- (1) Road Network in Siem Reap City
- (2) Road Network in Angkor Heritage Area and Rural Area,
- (3) Road Amenity and Safety, and
- (4) Road Management.

Each viewpoint shown above has 1) Existing Problems and 2) Future Problems if there are any countermeasures. Figure III.6.8 shows the summary of road sector problems.





**Figure III.6.8 Road Sector Problems**