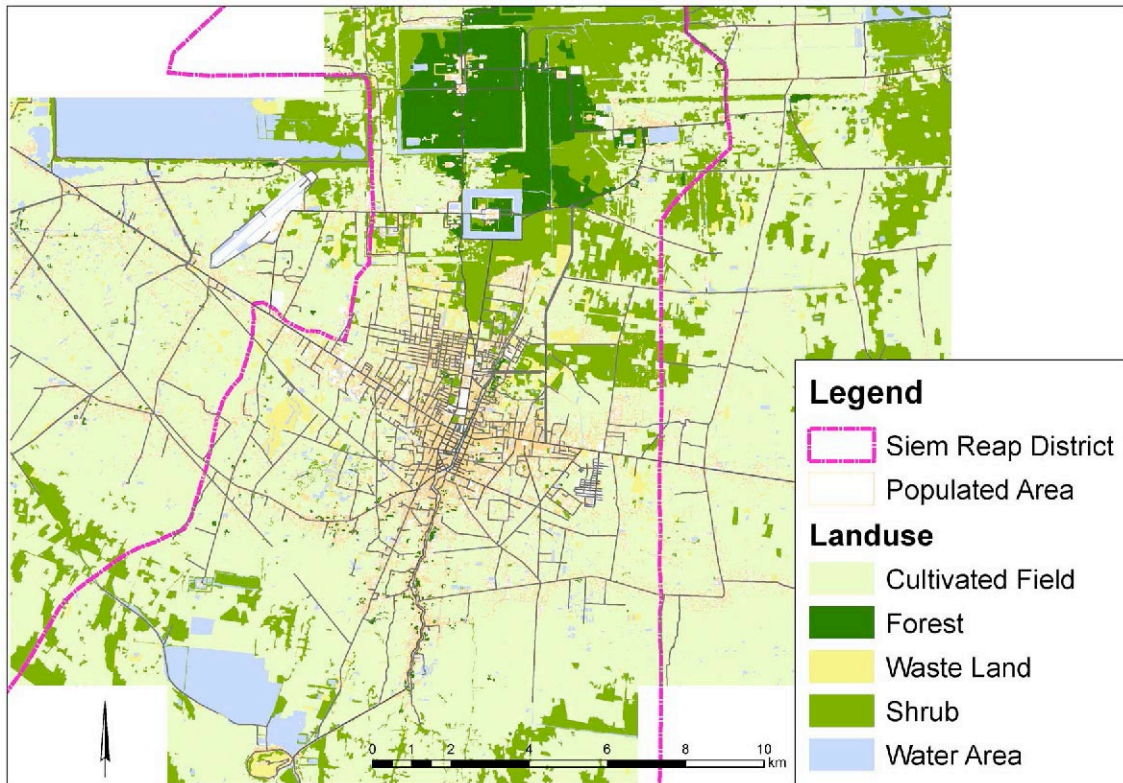


**3) Rural/Heritage Area**

Land use in Rural Area is mainly the cultivated field. In addition to this, forest area is expanded around the Heritage Area, and shrub area is expanded around the forest area. In Heritage Area, especially in Zone 1 and 2, new development is limited, however, agricultural use of the land that is not harmful to the Heritage is allowed.



Source: JICA Study Team

**Figure III.1.5 Existing Land Use in Rural Area**

**4) Tonle Sap Lake Area**

Land use in Tonle Sap Lake Area is covered with cultivated fields and natural shrubs. The areas which are closer to the Lake are periodically flooded (refer to Figure III.1.6) because the area underwater of Tonle Sap Lake in the dry season is five times less than in the rainy season. However, this area is rich in natural environment and biodiversity. The main activity of the people living in this area is fishing and also cultivating rice and vegetables in flood plain.



**Photo: Unlawful Human Settlement along the Siem Reap River**

**(3) Human Settlement**

**1) Urbanized Area**

Collective housings, such as apartments and flats, are not common

style of residence. Families share independent houses and townhouses. People also operate commercial activities such as restaurant and shops on the roadside lots. The upper floors on townhouses are used for their living. Sometimes, the usage of buildings is converted. Typically, independent houses are turned to guesthouses with minor reformation.

Unlawful human settlements are observed in some areas along the Siem Reap River.

## 2) Urbanizing Area

Very limited number of houses is provided for new comers. New houses are constructed for the high-income group. In most cases, moving-in people are not endorsed to live there because they do not have land title. New comers intend to sit in the location at least five years to obtain land tenure as a result of accomplished fact. This means that the new comers without land title do not invest their upper structure. Accordingly, only temporally- structured housings have been built in the newly urbanized area due to weak land management administration. Thus, the preparedness for the rapid urbanization has not been established.

## 3) Rural/Heritage Area

In Rural Area, human settlement is observed along roads that are connected to the Urban Area. Typical farming house in rural area is wooden and having high floor since the water level of Tonle Sap Lake changes seasonally.

In Heritage Area, the areas in Zone 1 and 2, in particular, people are not allowed to undertake any development or modification of the land or buildings in which they are living. They said that the residents there are forced to constrain their lives in the name of conservation of traditional life style and landscapes.

Actually, when the Heritage was registered to the World Heritage List, the Government had a policy not to allow any people to live in Zone 1 and 2, however, few years later, that policy has changed to preserve all population who has been lived in there ancestrally. Currently, the residents may renovate or repair dilapidated houses, or construct a new house to replace an old one, with authorization form APSARA Authority. However, the sale or purchase of land by traders for their business activities or for establishing tourism facilities is strictly prohibited<sup>3</sup>.



Photo: Typical House in Rural/Heritage Area



Photo: Floating Village in Tonle Sap Lake Area

<sup>3</sup> Decision No.70/SSR dated September 16, 2004, on determination of standards for utilization of land in zones 1 and 2 of Siem Reap/Angkor sites

#### 4) Tonle Sap Lake Area

The human settlement in Tonle Sap Lake Area is characterized by a floating village. This village is seasonally moving according to the water level of the Tonle Sap Lake. Since their main earning is from the activities related to the Lake, they take up their residence closer to the working place. Therefore, their house is small and has simple structure with wood, or other natural materials. Moreover, many public facilities such as school, health center, temple/church and so on are floating on the boats.

#### (4) Assessment of Land Conditions

The following aspects for development conditions have been assessed.

##### 1) Protection Zoning

Protection zoning is the most important factor to determine patterns of urban development. It should include the APSARA Zones and its surrounding areas. Among the five APSARA Zones defined above, Zone 1 and 2 shall be subject to the strictest protection for the monumental sites and its surroundings. Therefore, the activities that could have harmful effects on these sites shall be controlled and managed. In consequence, the number of the residents within Zone 1 and 2 are assumed not to increase beyond the current level. Moreover, the residents are encouraged to move out of the Zones voluntarily. Thus, the areas within these two zones are excluded from future urban areas. In addition, the APSARA Authority has been developing tourism and cultural zones (so called "Hotel Zone") besides Zone 2. This area is also excluded from future urban areas.

##### 2) Flatness

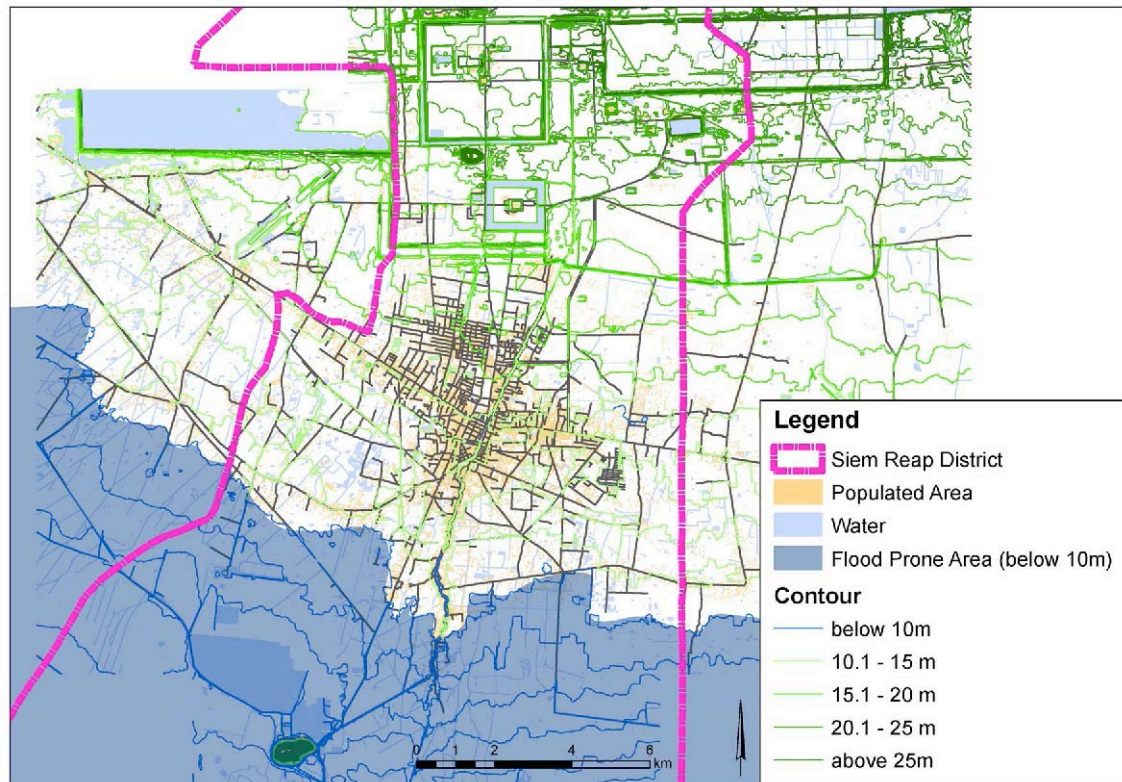
The area around Siem Reap lies on a very gentle slope from north to south. The average gradient of the slope is 0.15%. Thus, the area is flat enough and suitable for land development. However, some area may have a drainage problem due to flatness. Too flat area requires a careful consideration on land reclamation not to prevent natural drainage.

##### 3) Flood Proneness

Tonle Sap Lake has seasonal fluctuation and observes its highest water level at the end of rainy season. The probability of high and low water levels in Tonle Sap (Plancenter, February 2004) are as follows:

Highest recorded high water level:	11.09m above MSL (mean sea level)
50-year recurrence	10.77m
20-year recurrence	10.65m
10-year recurrence	10.50m

The area below 10 meters above MSL is seasonally flooded, and thus not suitable for urban development. In addition, the area below 11 meters should be protected by embankment from 50-year recurrence flood.



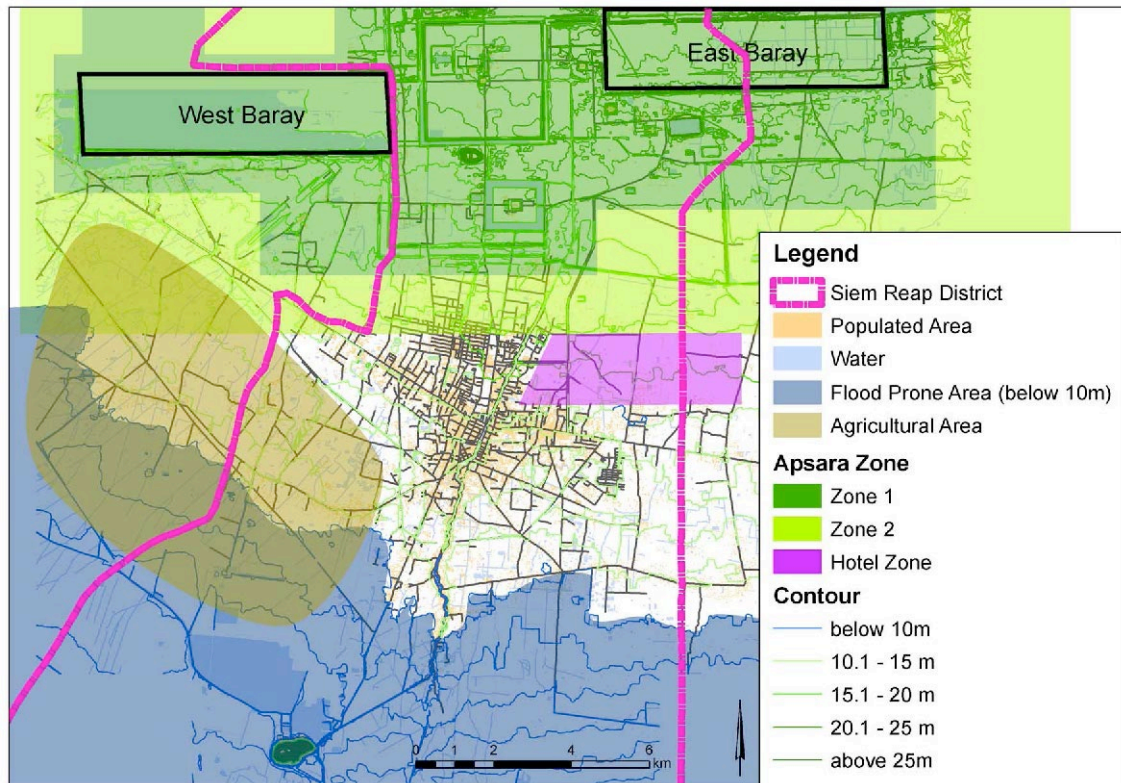
Source: JICA Study Team

**Figure III.1.6 Flood Prone Area**

#### 4) Agricultural Area

Because West Baray supplies water for agricultural usage, the western bank of Siem Reap River is suitable for the agricultural area. The other bank, east bank, does not have effective water supply system for agriculture. Then, the east bank area has been prioritized for further land development among various authorities.

Figure III.1.7 summarizes the above conditions.



Source: JICA Study Team

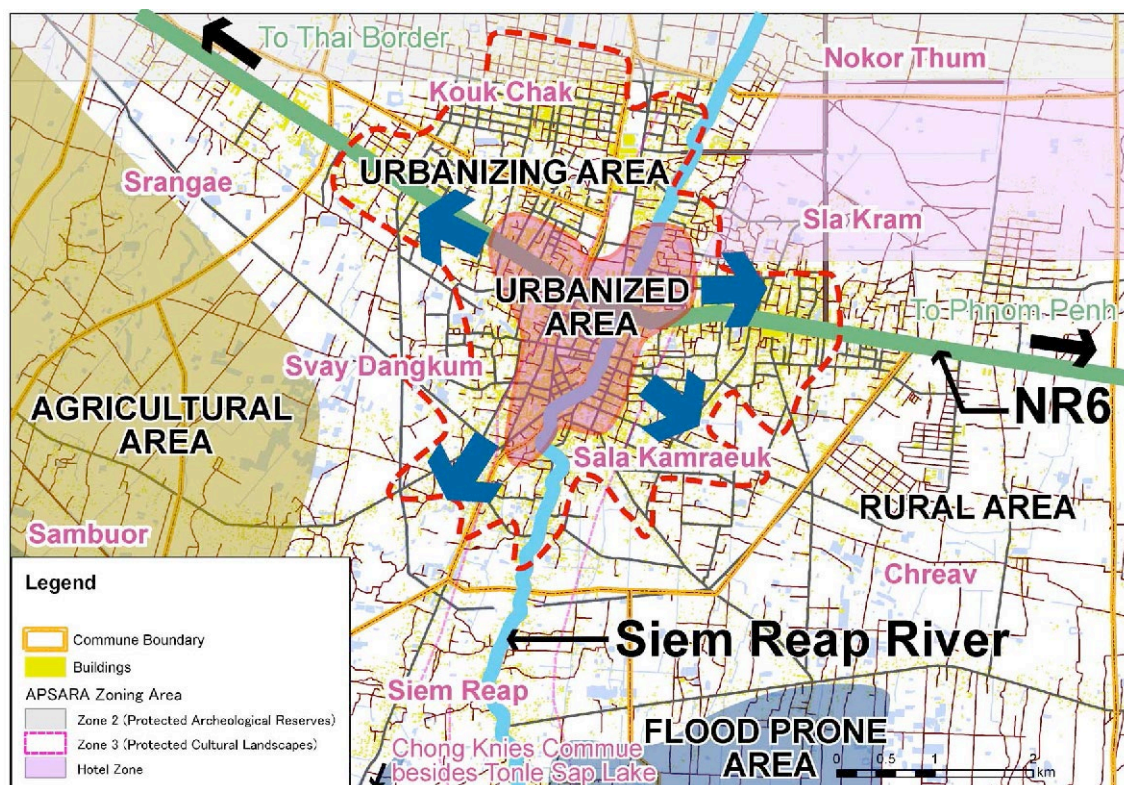
**Figure III.1.7 Summary of the Land Condition in Siem Reap District**

According to the above-mentioned assessment of the land condition, the suitable area for urban development is limited to the eastern corner of the city.

#### (5) Urban Development Trend

The city of Siem Reap is located along NR6 connecting Phnom Penh on the east and the border to Thailand on the west. The urban area is also stretched along the course of the Siem Reap river that originates in the Phnom Kulen mountain range on the north, and flushes to Tonle Sap. The current urban area is compact, extending within the radius of about 2 km.

As it has already been assessed in previous section, the urban area of Siem Reap District is bounded on the north by the APSARA protection zone 1 and 2, where urbanization is restricted, and bounded on the west by potent agricultural area with the supply of water from West Baray. South of the urban area is rural area connecting to the holly hill, Phnom Krom and the perennial flooding area around Tonle Sap Lake. Thus the natural direction of city expansion will be towards the east along the NR6.



Source: JICA Study Team

**Figure III.1.8 Boundary Conditions and Direction of Expansion**

### 1.1.3 Area-specific Issues for Urban Development

#### (1) Urbanized Area

The urbanized area of Siem Reap refers to the built-up areas where there are hotels, guesthouses, shops and commercial complex as well as housing units of the local residents. The core of the urbanized area extends between Sivatha Street and the Siem Reap river. With the population of 139,000 in 2004, the urbanized area of Siem Reap falls in a compact area within radius of about 2 km. As depicted in Sub-section 1.1.1, Siem Reap had been a small regional town until early part of 1990 with the population not exceeding 50,000.

The urbanized area extends between Sivatha Street and the Siem Reap river. The road grids were constructed during the French protectorate, and are well devised within this area today. This area accommodates a number of hotels, commercial facilities and government buildings, and is relatively well planned. The area around the Old Market (hereinafter Old Quarter Area) is an active downtown area with a number of restaurants and pubs, retail shops including souvenir shops and service providers' offices. This area is becoming the core of the tourism activities after the visits to the ruins during the day.

#### **Preservation of French Colonial Architecture**

There are a number of architectural pieces with the French Colonial atmosphere in the blocks adjacent to the Old Market. There are a few old buildings from the French Protectorate era, and there are some others that were built anew following the French

Colonial style. The overall townscape of the Old Market area is relatively well preserved. The urban heritage is a precious resource of Siem Reap that may put additional attractiveness to the Angkor tourism.

It should also be noted that few specific researches have been available for the French Colonial architecture near the Old Market<sup>4</sup>. Consequently, it is difficult to know which piece of architecture has a historical value for preservation. There is a strong need for a research on the styles, structures and the historical values of old buildings near the Old Market to build a basis for future conservation and rehabilitation.



Photo: French Colonial Buildings in Old Market area

### **Making an Attractive City for the Visitors**

The urbanized area of Siem Reap needs to be not only a suitable place for living for the local residents, but also a amiable place for visitors. As the livelihood of Siem Reap is very much dependent of tourism, this is more so in the central urban area of the city around the Old Market, which is the core of the tourist area in Siem Reap. It will be thus important to make the areas around the Old Market more attractive and efficient as the town center.

### **The City with River and Greenery**

Although there is a problem of water quality at present, the city of Siem Reap has evolved with the Siem Reap river running in the middle of the city. The character of the city shall be enhanced significantly if the space along the river is improved and more riverine greenery provided. A park accessible from the Old Market will also be essential to make this friendlier to the visitors as well as to the residents.

It should be noted that in Siem Reap there are very few urban parks. Parks are not only good for refreshment of the local residents and visitors, but also provide greenery space that would compose a system for greenery and water spaces and enhance natural habitat of small animals and insects, which is the reason why the parks are considered to be essential elements of urban planning. More efforts need to be made to secure lands for parks in Siem Reap.

### **Improvement of High Density Residential Zones**

At present there are three villages within the urbanized area with the population density exceeding 100 persons/ha. The three villages are Banteai Chas and Sla Kram villages in Sla Kram Commune and Mondol Muoy village in Svay Dangkum commune. In

<sup>4</sup> For the historical architecture in Phnom Penh, a research with a French assistance was conducted and the results were published. This will be a good sample for the necessary research for Siem Reap historical architecture.

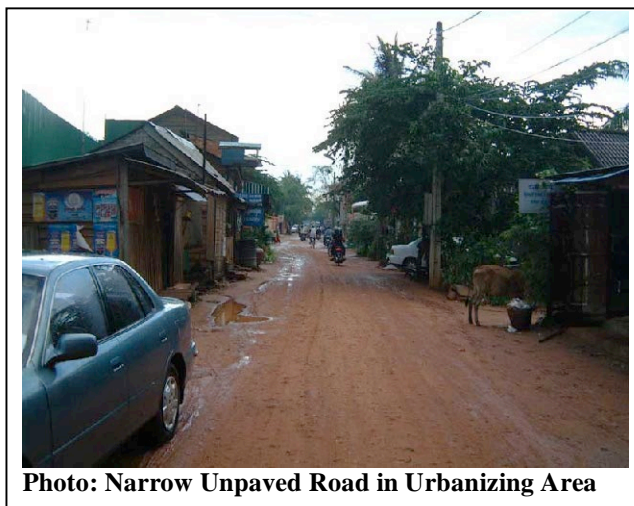
general, the population density of 100 persons/ha may not be excessively high if the residential units are composed in well-planned neighborhood. In the case of the three villages, they are located north of Route 6 along the Siem Reap river, where the neighborhood has a poor infrastructure network. Heavy concentration of urban population in small zones is presumable causing heavy water quality load. Particularly the market along the Siem Reap river has a persistent problem of lack of proper garbage collection, which results in damped of garbage to the river.

Community development in these zones to provide basic infrastructure such as roads, drains and septic tanks will be considered for implementation in near future. The population density in these zones will have to be reduced to allow for more space for open space and infrastructure.

## (2) Urbanizing Area

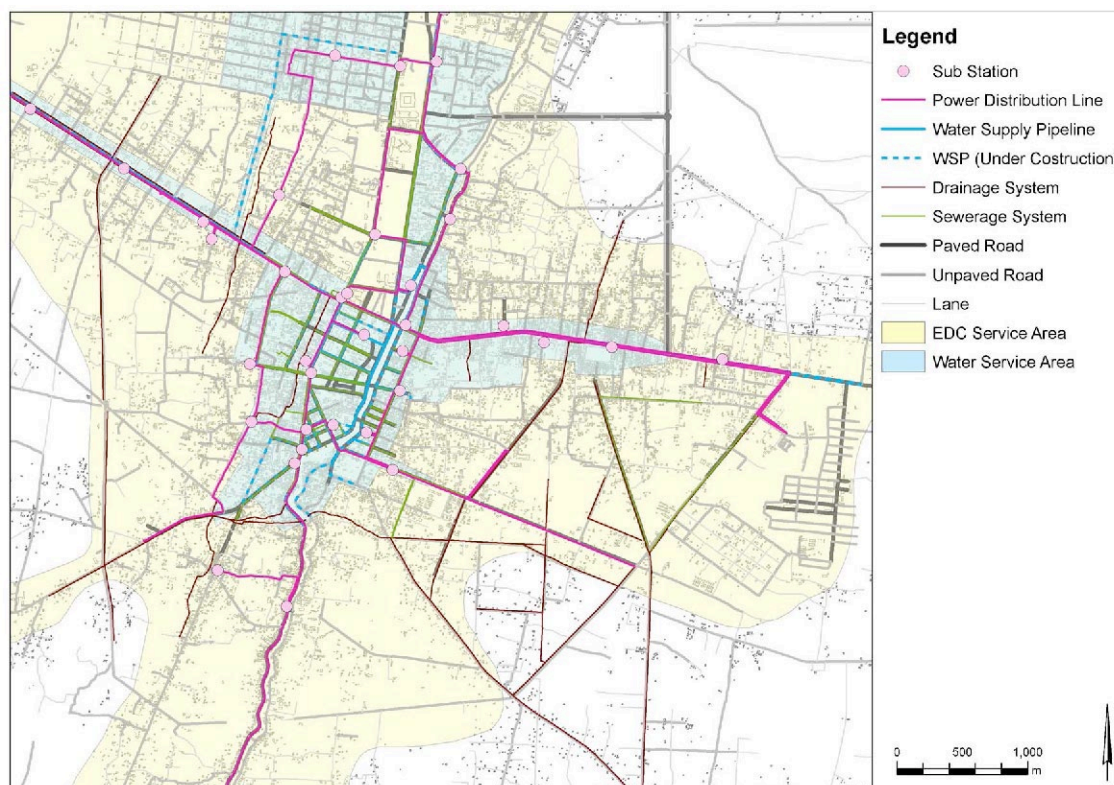
### **Insufficient Infrastructure Development**

Outside of the existing urbanized area mentioned above is the urbanizing area, where the new development is in progress rapidly. Roads are not readily provided prior to development, due to the lack of local funding, and the lack of clear spatial development vision. Conversion of lands from agricultural use to residential or hotel uses takes place sporadically, without much coordination with the provision of infrastructure. As a result, the urbanizing area shows every symptom of urban sprawl with narrow, unpaved and winding, and often disconnected, roads, and generally the shortage or lack of much of infrastructure on site is prevailing everywhere in the urbanizing areas.



**Photo: Narrow Unpaved Road in Urbanizing Area**





Source: JICA Study Team

**Figure III.1.9 Existing Infrastructure and Service Area of Electricity and Water**

### **Hotel Construction without Order**

The area along NR6 is developing as the areas for commercial and hotel use from halfway between the Airport and the city center on the west, and towards around the Upstream Market (*Phsa Lieu*) on the east. West side of the area along NR6 is a high-density area with a mixture of new hotels, roadside shops and residential units. Basically, the area along NR6 has a construction regulation on the location of the building to assure the width of future road construction of 50m wide. This regulation is good. However, some buildings are constructed without consideration in neighbor buildings or surrounding environment. Comprehensive construction law and implementing measure should be established with the urban planning regulation.

### **(3) Rural/Heritage Area**

#### **Agricultural Development with the Water from West Baray**

Rural Areas of Siem Reap, which are not significantly different from other rural areas in Cambodia, rely mostly on rainwater for agriculture, and thus have a low production capacity. Some farmers often engage in construction during the dry season. Production of vegetable and cash crops is limited despite the relatively high potential of agriculture in some of the agricultural lands west of the city. In order to improve the livelihood of the rural area particularly west of the city, a study on agricultural development utilizing the water from West Baray needs to be undertaken.

#### **Promotion of Village Tourism and Eco Tourism**

Many of the residents in the Heritage Area have a sentiment against the stringent regulations imposed on the development activities within the APSARA protection zones,

and the necessity to ask for permission when they seek to improve their housing compounds. In order to secure the livelihood of local residents within the conservation area, promotion of indigenous tourism such as the village tourism and eco tourism need to be promoted.

**(4) Tonle Sap Lake Area**  
**Promotion of Sustainable Tourism**

Chong Knies Commune, located near the estuary of the Siem Reap river to Tonle Sap Lake, is where all the Tonle Sap boats start, and there are different characteristics and issues from agricultural rural areas. There are 1,101 households in the village, most of who reside in floating communities. About 60 % of the population are said to be fishermen, while 20% are engaged in tourism, mostly operation of pleasure boats, 10% in retail and 10% in cargo handling. Fisheries output is on a decline partly due to water pollution from wastewater and to the increase in fishing population, making the livelihood tight for most of the dwellers. Environmental degradation is significant in Chong Knies Commune. About 60% of the population utilizes the water from the lake after simple filtering, coagulation and boiling, 30% of the residents buy groundwater from a middleman, 7% rely on rainwater, while only 3%, mostly the well to do purchase bottled water.

As the living condition of the estuary area, such as Chong Knies Commune is very poor due to the lack of infrastructure facilities, there is a need for community development to improve the basic living environment for sustainable means of livelihood. At the same time, promotion of sustainable Tonle Sap tourism shall have to be considered together with the environmental conservation of the Lake.

## **1.2 Sector Approaches**

### **1.2.1 Development Concept**

The Urban Area of Siem Reap accommodates not only the hotels, guesthouses and commercial facilities such as restaurants and shops, but also the housing units of urban dwellers that supports and sustains the tourism industry at large.

This indicates that the urban area of Siem Reap must be a good and livable place for the dwellers, but at the same time it must provide with the tourists with amenity and relaxation after a visit to the ruins. This nature of the urban area is essential to sustaining and flourishing the tourism industry in the future.

Siem Reap has the population of 139,000 in 2004 (Siem Reap District), and is a compact city where most of the existing urbanized area is contained in a radius of about 2 km. Being a compact city is a natural gift of Siem Reap in the viewpoint of short and easy distance for human and goods movement and thus is energy efficient. The urban area is along the Siem Reap river (although there is a water quality problem now that needs remedy), and has a long water edge line and riverine forests. Siem Reap has a history dating to the first decade of 20<sup>th</sup> century with prominent trace of French colonial architecture, wide streets with lining of trees. As Siem Reap City is thus potentially gifted with natural and historical enchantment, the basic direction of urban development is taken to enhance and substantiate the potential to make an attractive city

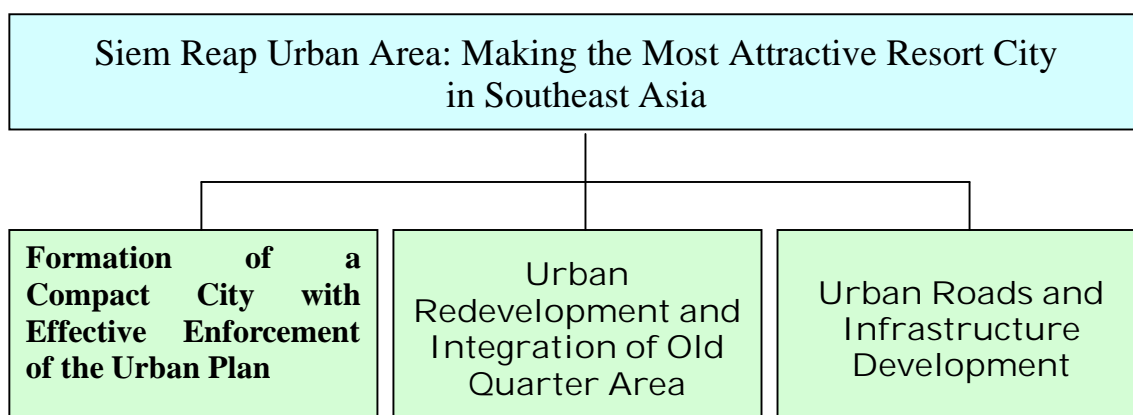
for the city dwellers and visitors alike.

The development concept for the urban area of Siem Reap is set as follows;

**Siem Reap Urban Area: Making the Most Attractive Resort City  
in Southeast Asia**

### 1.2.2 Approaches for Urban Development

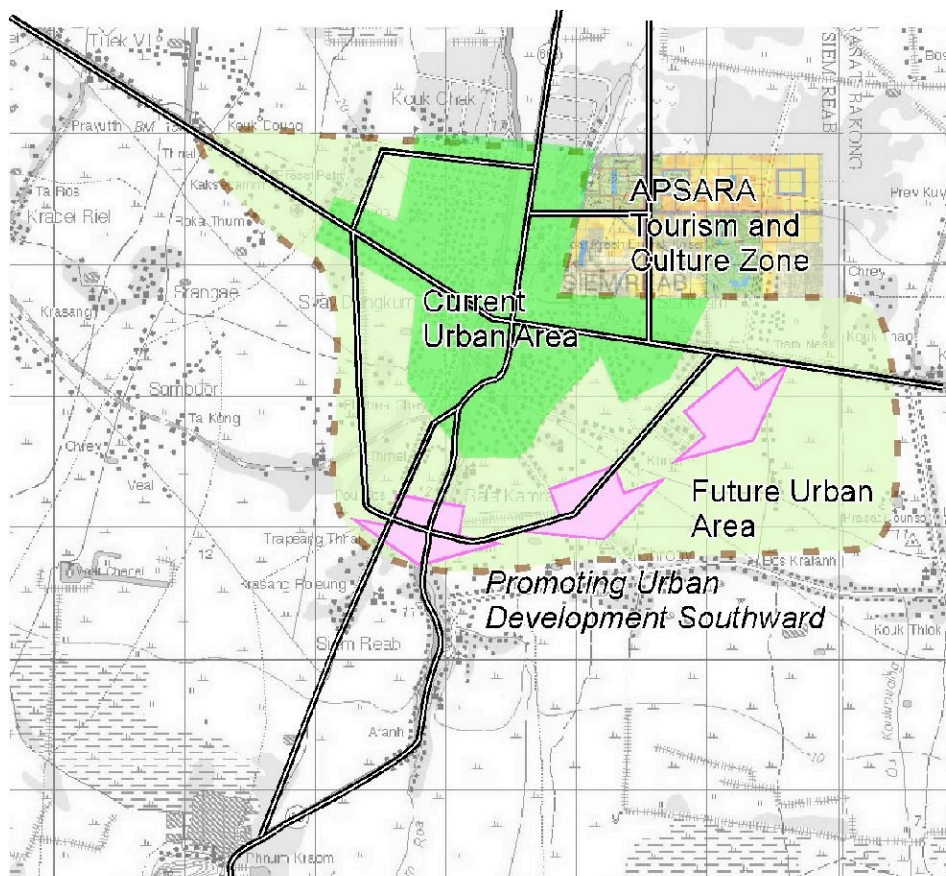
The approaches to realize the concept above are shown in the followings:



#### **Formation of a Compact City with Effective Enforcement of the Urban Plan**

Although Siem Reap has the population of about 139,000 in 2004, and is one of the largest regional cities in Cambodia, the urbanized area is almost concentrated in a compact radius of about 2 km utmost. This would mean that the city is a “Compact City”, which is good in energy efficiency and easy transport. This aspect of the city needs to be preserved in the future by inducing the urbanization in the central area to avoid excessive expansion of the urban areas.

In order to achieve a Compact City in Siem Reap, the control of new development shall be regulated based on the future land use plan. The land use plan depicted in this Study devices the concept of a Compact City so that the city would not spread too much to outwards which would lower the efficiency of infrastructure development and the intra-urban transport more time and energy consuming.



Source: JICA Study Team

**Figure III.1.10 Expansion of Urban Area following Compact City Concept**

### **Urban Redevelopment and Integration of Old Quarter Area**

The Old Quarter area, with a number of the buildings in French Colonial architectural design, is an ideal town center for the tourists and residents alike. The Old Market on the south and Central Market on the north both deal with mixture of souvenirs for tourists and daily commodities and foodstuff for local residents. As a consequence, the both markets are not either quite attractive to tourists or very convenient for local residents. These markets need to have a clear distinction in the line up of the commodities they deal in, typically like the Old Market dealing in more tourism oriented commodities and the Central Market dealing in more daily commodities.

There is a triangular block separating the Central Market area from the Old Market area occupied by the Provincial Hospital. There is no road going through this block, and this hinders the interactions between the two areas. As it is said that site of the Provincial Hospital shall be available in the future for commercial purpose, the planning for the site shall need to be considered thoroughly to provide a connection to the neighboring block to the north with the Central Market, as well as to enhance the areas commercial / tourism appeal by way of redevelopment and integration of the entire block.

At the same time, the Old Quarter area needs to be safe and amiable to the visitors and residents alike. For that purpose, provision of wide sidewalks with tree lining is