Chapter 10 Power

10.1 Situation, Prospects and Issues

10.1.1 Power Supply in Cambodia

Electrical power systems in Cambodia were fatally damaged in the civil war in the 1970's. Most of the existing facilities in operation have been constructed since the war ended. At present, power sector services and administration, such as generation, transmission and distribution facilities, are under control of MIME (Ministry of Industry, Mines and Energy) and EdC (Electricite du Cambodge), which is a limited liability company owned by the government.

Based on the Electricity Law issued in February 2001, EAC (Electricity Authority of Cambodia) was established under MIME in order to regulate electricity suppliers and companies on licensing and tariff settings as one of the governmental agencies. EdC, which was granted a consolidated license by EAC in 2002, is supplying electricity to Phnom Penh and nine provincial areas including Siem Reap as of February 2003. On the other hand, electricity supply for other provincial towns in Cambodia is administrated by DIME (Provincial Department of Industry, Mines and Energy) under control of MIME and /or Private Power companies which are contracted to the Cambodian government. Seven provincial areas are to be joined into the administration of EdC after completion of Provincial Power Supply Project by ADB, and the electrical facilities which they manage are to be transferred to EdC. In the near future, electrical facilities of twenty provincial towns and four municipalities will be under control of EdC.

No interconnected transmission system of high voltage with neighboring countries has been constructed so far. The electricity in Cambodia is being generated separately and individually at each area and is being supplied through its own distribution network. Therefore, region by region independent power tariff systems are adopted at present. As a result, the power tariff of Phnom Penh becomes different from that of other provinces being supplied by EdC.

According to Annual Report in 2004, installed capacity by EdC in total records 182.2MW and the maximum output shows 158.3MW roughly equivalent to 86.88 percent of the installed capacity of EdC. In 2004, energy generation is 761.1GWh including a purchased energy of 421.9GWh from IPP and an imported energy of 13.5GWh from Vietnam. Approximately 15 percent of the households in Cambodia can obtain the electricity and energy consumption per capita is 45 kWh per annum. It is the lowest consumption rate among Southeast Asian countries.

10.1.2 Power Supply in Siem Reap

(1) EDC Service Area

1) Power Supply Management

Power sector for Siem Reap district, especially city center of Siem Reap, is being managed by the Electricity Siem Reap Unit, a regional organization of EdC (Electricite

du Cambodge). Meanwhile, the power sector management for other area, mainly in the outskirts of Siem Reap city, the Siem Reap province, is under control of DIME with the supply of IPP companies obtaining a license from EAC. Figure III.10.1.shows the organization chart of EdC Siem Reap.

The table shows that EdC has a staff of 1,996, and 116 staffs of them are working for EdC Siem Reap as of December 31, 2004. There are two offices located along the national road No.6, old and new offices for EdC Siem Reap. The old office is used for mainly administration, distribution related affaires and the substation. In the meantime the new one, which was constructed together with the new diesel power station donated by the Japanese government, is being used for the generation related affaires.

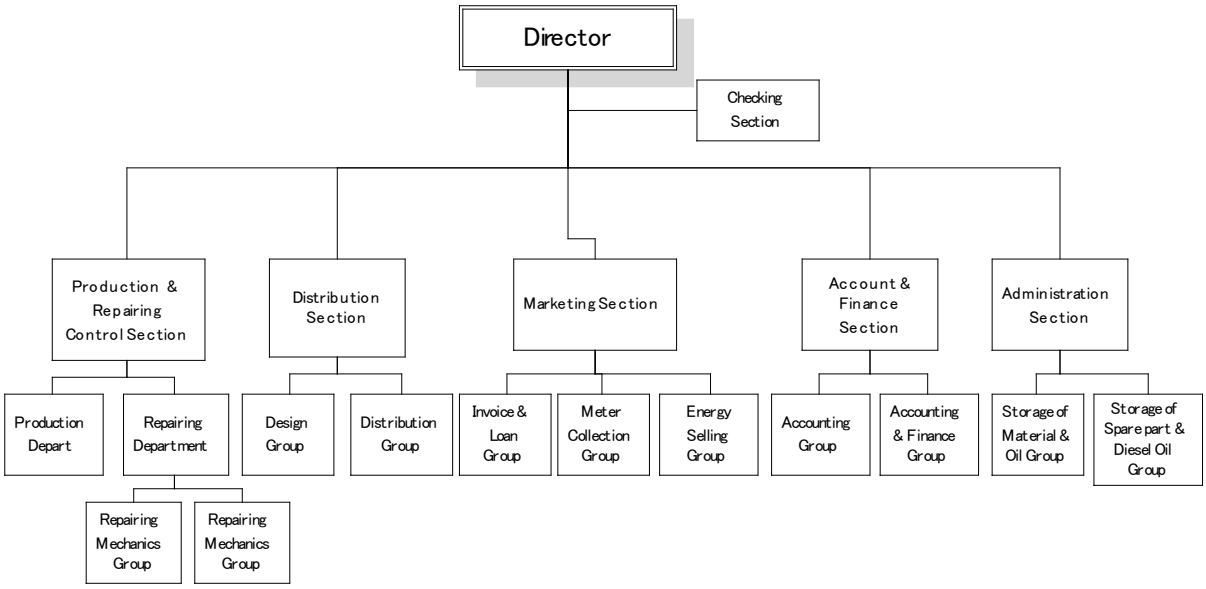


Figure III.10.1 Organization Chart of EdC Siem Reap
Source:EdC Siem Reap, 2004

Table III.10.1 Workforce of EdC Siem Reap

As of December 31, 2004

Degree	Siem Reap			EdC
	Male	Female	Total	Total
Doctor	-	-	-	2
Post-graduated	-	-	-	22
Engineers	8	-	8	295
Vocational Technicians	10	-	10	254
Skilled workers	21	4	25	293
High school, Unskilled	68	5	73	1130
Total	107	9	116	1,996

Source: Annual Report in 2004

2) Power Generation and Distribution Networks of EdC

a) Distribution networks

From 1997 through 1999, EdC improved ruined network with the help of a financial assistance of ADB, and even today, most of the systems have remained substantially unchanged. Table III.10.2.shows an outline of the distribution facilities in Siem Reap.

In the meantime, distribution loss of the network has improved drastically from the year 2000 thanks to the distribution project of ADB. The electrification ratio in both Siem Reap city and rural area of Siem Reap province is 40% and 5% approximately.

Table III.10.2 Distribution System in Siem Reap

Electrical System:		
22kV Distribution Line		3-phase, 3-wire
400-230V Distribution Line		3-phase, 4-wire
22kV Overhead Distribution Lines	5.48	km
22kV Underground Distribution Lines	31.559	km
400-230V Overhead Distribution Lines	75.46	km
400-230V Underground Distribution Lines	11.804	km
Distribution Substations	42(PMT:4)	Sites
Distribution Transformer Capacity	16,110	kVA

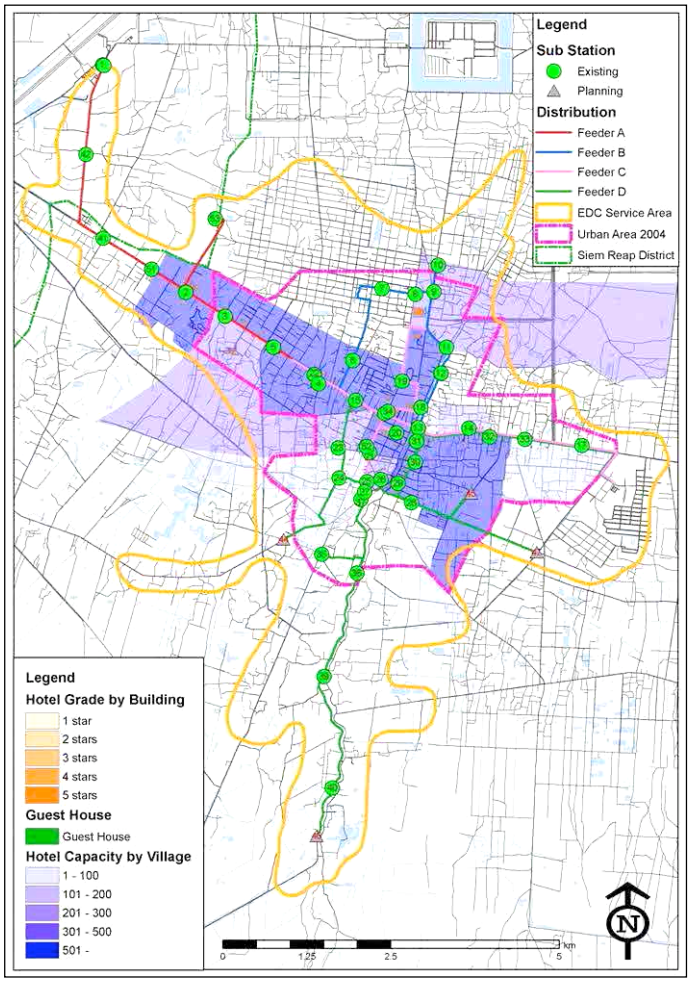
Source:EdC Siem Reap, 2004

Figure III.10.2 shows the coverage area of 22kV EdC networks and the location of the substations. The figure indicates that 22kV distribution lines are mainly laid along the roads adjacent to the hotels located except for south area. Although orange line indicates that there is electricity supply from EdC to the consumers, the 22kV networks have not been developed near to the consumers.

Meanwhile, low voltage network, which is supplied at 400/230V and is stepped down from 22kV at the substations shown in the figure, is impossible to be grasped and shown precisely in the figure. So far, EdC has not made any database on the low voltage networks. Actually, trunk line of low voltage cable is strung up from substation to the terminal pole with watt-hour meter, which is less than 1km. And the customers living within less than 200m in radius from the terminal pole are fundamentally permitted to be supplied with power from EdC.

For 22kV overhead distribution lines, AAC 150 has been adopted, and for 22kV underground lines, CV cables with 3-core x 240sqmm and 3-core x 150 sqmm (cross-linked polyethylene insulated, vinyl sheathed cables with aluminum conductors) are being laid underground in the district.

In Siem Reap, long and slack low voltage wires can be seen anywhere, and it highly ruins the beauty of landscape as well as the quality of electricity. The service wire is prepared by consumers, and it means that they have to buy it on their own; it implies that consumers away from the EdC facility have to bear more money than the customers near to the EdC facilities.



Source: Surveyed with GPS by JICA Team

Figure III.10.2. Service Area of EdC Siem Reap

b) Power generation

At present, the power supply in Siem Reap is fully dependent on the sole diesel power station with a capacity of 10.5MW(3,500kW*3sets), which was constructed in a site along the National Road No.6 donated as a grant aid assistance of the Japanese government in April 2004.

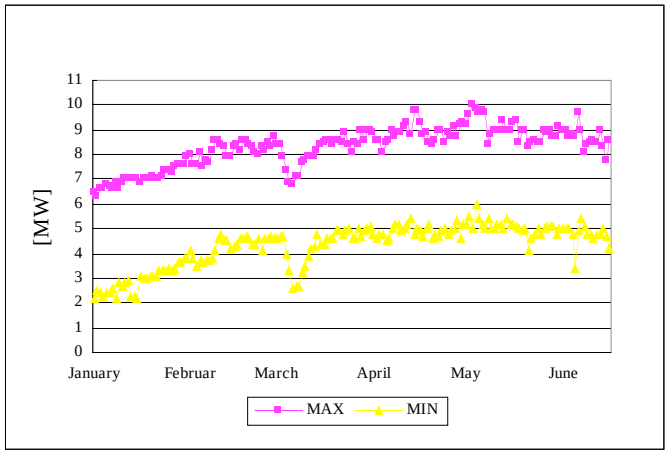


Figure III.10.3 Peak Demand from January to June

According to a report from EdC in May 2005, a peak demand of the district covered by EdC has reached almost 10MW out of 10.5MW of the existing diesel power station. Figure III.10.3 shows that trend of peak demand from January to June in 2005.

EdC Siem Reap supplies with the electricity only to the city center of Siem Reap district. Households, restaurants and guesthouses are main customers of EdC Siem Reap. Most of the large customers, such as hotels in Siem Reap, are generating their electricity by their own private power generators due to the limitation of supply from EdC.

In addition to the situation, large customers who use their own generators seem to have switched to EdC supply as a direct result of oil price growth. So, power supplying capability in Siem Reap is at stake, and either additional installment of supplying power or expansion of power supplying capacity is necessary.

For a small independent and decentralized district such as Siem Reap, what is called "hot reserve", is ordinarily required, which is a reserved margin for operation in case of accident to quickly control and secure the power for the stability of the networks. Therefore, once accident happened such as a trouble occurred in a diesel generator, power supply from EdC could not catch up with the demand at present.

Figure III.10.4 shows a sample of daily load curve. It is found out that the demands are high in the morning and the evening both in the dry season and the rainy season because their demands are mainly used by the hotel and the households. As there is no major industry in Siem Reap, so demand of daytime is not so large.

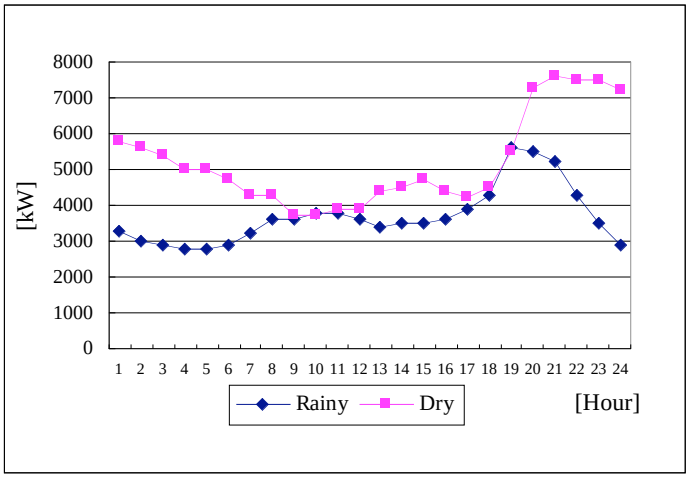


Figure III.10.4 Daily Load Curve

Table III.10.3 shows power demands from 1999 to 2003 in Siem Reap. It is found out that demand up to 2003 is supplied by Russian generators and the demand was held within a capacity of the Russian generators. But since the new generators were installed by the Japanese government, the demand of Siem Reap has risen. And distribution loss had been reduced since restoration of the distribution networks was completed.

Table III.10.3 Power Demand from 1999 to 2003

Fiscal Year	Unit	1999	2000	2001	2002	2003
Generated Energy	kWh	9,069,900	12,270,370	16,194,524	19,436,700	23,509,966
Peak Demand	kW	1,930	2,600	3,200	4,500	5,100
Sent-out Energy	kWh	9,093,398	12,159,701	16,045,952	19,240,736	22,838,649
Consumed Energy	kWh	6,274,894	10,255,543	13,527,543	15,370,633	19,213,381
Distribution Loss	%	31.0	15.0	15.7	20.1	15.9

Source:EdC Siem Reap

Table III.10.4.shows the number of the customers supplied by EdC Siem Reap and the power consumption by customer from 1999 to 2003, and Table III.10.5 shows power

consumption by sector in May 2005. These tables show that generated power is used for the hotels and the number of the hotel supplied by EdC has become 1.7 times from 2003, though the diesel power station was constructed for only BHN purposes.

Table III.10.4 Customers Supplied by EdC Siem Reap

Customers	No. of Customers					Consumed Energy(MWh)				
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003
Hotel	45	83	90	223	272	1,273	2,120	2,214	2,792	4,183
Restaurant	52	62	69	235	261	526	670	900	2,552	2,815
Households	7,093	7,657	8,026	8,106	8,953	3,605	5,981	8,378	8,950	10,862
Administration	105	100	93	96	94	871	1,484	1,966	1,004	1,269
Total	7,295	7,902	8,278	8,660	9,580	6,275	10,255	13,458	15,298	19,129

Source: EdC Siem Reap

Table III.10.12 shows the power consumptions in May 2005.

Table III.10.5 Power Consumption by Consumer in May 2005

Description	May 2005	
	Customers (No.)	Consumption (kWh)
Households	10,156	1,854,882
Commercial	348	558,653
Hotel/Guesthouse	465	1,047,171
Hotel (Medium)	2	46,924
Customers below contract	0	647
Hotel(large)	1	126,360
Water Supply	1	42,120
Government	76	109,250
Public Light	39	30144
Total	11,088	3,816,577

Medium sized hotel: More than 20,000kWh; Large sized hotel: More than 110,000kWh

Source: EdC Siem Reap

Figure III.10.5 shows distribution map of power consumption measured in each substation of the district. The figure indicates that the center of the city has much consumption because the hotels have gathered at the city center. And Figure III.10.6 shows power consumption by sector. It is found out that there are some circles in the figure which indicate consumption is only hotels, and the hotel consumptions tends to be concentrated in the southwestern area in Siem Reap, and consumption of households is sprawling toward suburbs.

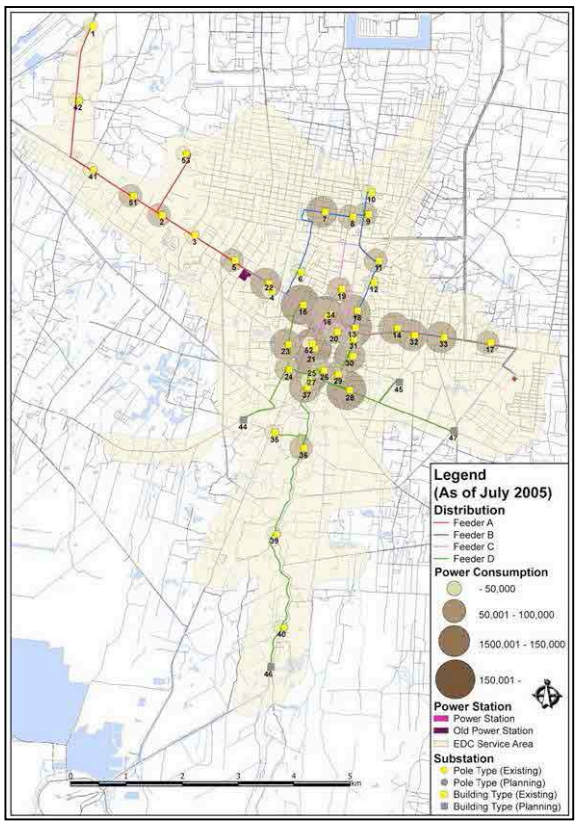


Figure III.10.5 Distribution Map of Power Consumption

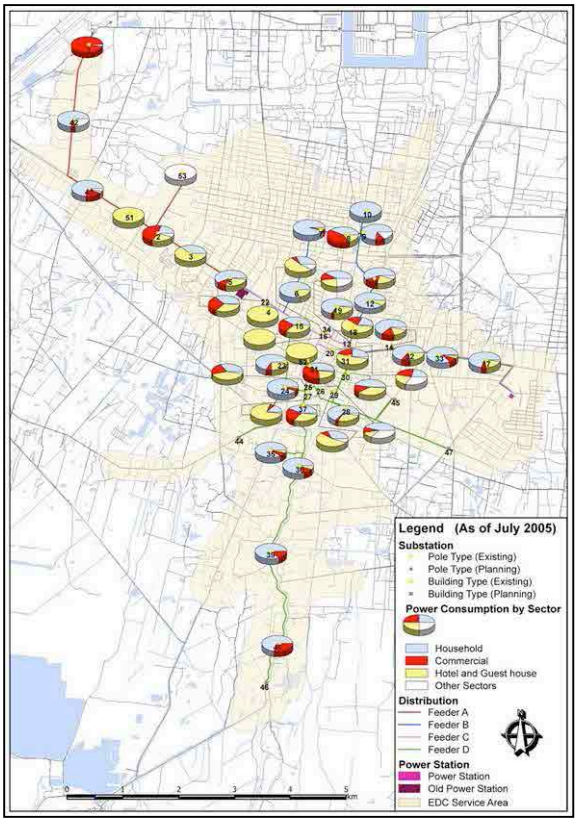


Figure III.10.6 Distribution Map of Power Consumption by Sector

3) Electricity Tariff and Other Charges

Although tariff rate is divided into several ranges in Phnom Penh, in Siem Reap, the tariff rate with sole range is adopted so far. The electricity tariff charged by EdC Siem Reap had been 880 Riel/kWh (0.23USD) until November 2004. After the diesel power plant was constructed in a Japanese grant aid program, the tariff has been altered to 780Riel/kWh (0.20USD) from November 2004. But still there seems to have been a chance of reduction for the tariff rate.

In the meanwhile, the connection charge to the EdC facilities is incredibly expensive. Not only the connection fee is charged, but also deposit is charged, when the customer apply for connection. In addition to the fees, the customers have to bear the material cost of low voltage cable. These situations make the connection to the EdC grids difficult for the native people.

(2) Outside the Area of EdC Service

Given that there are about 140,000 residents in Siem Reap and the number of the households supplied by EdC is about 10,000 and average members of the family are 5.6 people, almost half of the resident in Siem Reap can not obtain electric power from EdC. In other words, the half is living outside of EdC service area.

Although there is no power supply from EdC, Most of the residents manage to obtain some electricity from some kinds of sources on hand.

Power supplies or energy outside area of EdC service are chiefly divided into 3 ways below.

- IPP companies(village supply)
- Private diesel generator
- Batteries

As other style of energy use, kerosene lamps are being used in the residents who can not obtain any kind of power energy mentioned above.

1) IPP Companies

Almost all of their businesses of IPP have been transferred to EdC Siem Reap so far. To be exact, there are remaining ones, but those seem to be managed by village such as Chreav, Kouk Chak and Siem Reap commune. Those power suppliers have not been reported to be granted licenses by EAC. All of the areas where supply is managed by village are either away from the city center or in development restricted area.

Figure III.10.7 Batteries Charging

In addition to these cases, there is an exceptional case in some districts that only contracts on IPP with EdC are left, which means that IPP purchases power from EdC and supply customers at a higher rate.

Tariff rate ranges from 1500 to 2000 Riel/kWh. In addition to the high tariff rate, operating time in some area is limited only in the evening.

Figure III.10.8 TV with Battery

2) Private Diesel Generator

Some of the residents who own diesel generators use electricity for themselves or spare it for the neighbors. With the recent high oil price, the residents seem to be refraining from using them. They are looking forward to extension of EdC networks.

Figure III.10.9 Kerosene Lamp

3) Batteries

Of those who can not use electricity from the generators, most of them use batteries and recharge them at a battery charging shop.

Figure III.10.7 shows a batteries charging shop. At the battery shop, several kinds of batteries with several capacities are being charged and sold. Most of the batteries are charged for 12V. Residents ordinarily select size of batteries

in accordance with not only capacity of the electric appliances at home and the budget for the batteries, but also using hours—eg.1500Riel for 100Ah, 2000Riel for 120Ah. Most of them charge the batteries for black and white TV and lighting.

In the meantime, most of the residents who can not afford even batteries use kerosene lamps for lighting at home. Figure III.10.9 shows a picture of a kerosene lamp.

10.1.3 National Strategy

Not only development of whole Cambodia, but also development of Siem Reap power sector is planned under "Power Sector Development Policy" formulated in October 1994. The Policy will be taken into account and utilized in the M/P. The Following are the national policy formulated under the Cambodian government.

- **Energy Sector Development Policy**

  - To provide an adequate supply of energy throughout Cambodia at reasonable and affordable price,

  - To ensure a reliable and secured electricity supply at reasonable prices, which facilitates the investments in Cambodia and developments of the national economy,

  - To encourage exploration and environmentally and socially acceptable development of energy resources needed for supply to all sectors of Cambodia economy,

  - To encourage the efficient use of energy and minimize the detrimental environmental effects resulted from energy supply and consumption.

Based on "Power Transmission Master Plan & Rural Electrification Strategy", which was conducted with the help of the World Bank in June 1998, MIME established "Cambodia Power Sector Strategy 1999-2016" as a basic of Cambodian power sector in January 1999. This Strategy will be treated as a model in making this master plan.

10.1.4 Relevant Studies and Project So Far Undertaken

(1) Project so far Undertaken

Following programs and projects on Siem Reap power sector were carried out by the end of 2005.

1) Master Plan Study by JICA

In 1993, the Japanese government dispatched a study team for rehabilitation of the power systems in Phnom Penh and Siem Reap. In the Master Plan for Siem Reap, installation of diesel generators and rehabilitation of distribution line were proposed at that time. Expected future demand for hotels, guesthouses and restaurants, as well as households as a BHN, has been reviewed since 1993 based on the actual growth, development and its plan for Siem Reap city.

2) Diesel Generator Sets from the Former Soviet Union

From 1985 through 1987, the former Soviet Union donated four diesel generators (800kW 2sets, 280kW 2sets) as a grant aid assistance. Since then, the generator sets had been in operation as a main power source in Siem Reap until the new power plant donated by the Japanese government has started the operation.

3) Distribution Project by ADB

In 1995, a loan agreement with ADB was made for the purpose of rehabilitating and restoring Phnom Penh, Sihanoukville and Siem Reap power systems. For Siem Reap city, re-organization and rehabilitation of distribution lines were focused, and the following undertakings were carried out from 1997 through 1999 under the control of EdC

1) 22kV Underground Distribution Line: over 25km
2) 22kV Overhead Distribution Line: over 29 circuit-km
3) 22kV/400-230 Poll Mounted Transformer: over 35 sites
4) Low Voltage Underground Cable: over 11km
5) Low Voltage Overhead Distribution Line: over 65km
6) Watt-hour Meter: over 6,000 boxes
7) Replacement with Cubicle Type Switch Gear for the Upgrading of the Voltage

4) Diesel Generator Sets from France

In 1996, the French government donated secondhand generator sets with a capacity of 800kW, and installed them in the premises of former EdC power plant. At the same time, 22kV voltage cable in Siem Reap city was restored.

5) Power Transmission Master Plan

From 1996 to 1998, WB (World Bank) implemented the Power Transmission Master Plan Study covering whole Cambodia.

At present, the power supplying operation of northwest areas in Cambodia, such as Siem Reap, Battambang and Banteay Meanchey, is being implemented separately and individually. In the WB study, the completion of connection to the northwest systems with the Phnom Penh systems, which will connect the grids of Siem Reap, Battambang and Banteay Meanchey, will be expected on and after 2010.

6) Project for Siem Reap Generating Facilities

Up to April 2004, power demand in Siem Reap had been much dependent on the 4 generator sets donated by former Soviet Union and 4 lease generators. In consideration of growing demand for the Siem Reap power supply, especially for the increasing use of electricity by tourists, the Japanese government has agreed to carry out the following undertakings in 2001.

1) Construction of a new power plant for Siem Reap of 10.5MW, which includes civil and building works
2) Construction of 22kV lines to connect the new power plant with the existing distribution network
3) Consultant's services including training for the operation and maintenance staff for the new power station

The power station has been constructed in the eastern suburbs of Siem Reap along National Road No.6 and has commenced the operation in April 2004. In the meantime, the operation of the old power station has been stopped at the same time as the completion of the new power station with the capacity of 10.5MW. After April 2004, the new power station becomes the sole power source operated by EdC in Siem Reap.

7) Master Plan Study on Rural Electrification by Renewable Energy

The Master Plan Study on Rural Electrification by Renewable Energy started in November 2004 in order to elaborating implementing methods of rural electrification by renewable energy and advancing technology to promote the rural electrification. The study is based upon the policies that the Rural Electrification Sector of Cambodia is aiming at achieving 100% the rural electrification by the year 2020; and 70% by grid connection by the year 2030, and to implement the rural electrification of off-grid areas with the renewable energy.

In the Master Plan Study, the outskirts of Siem Reap are considered one of the promising areas on the possibilities of installation of the renewable energy. The study for the area is scheduled to be implemented within nineteen months from November 2004 through to May 2006.

(2) Future Plan Surrounding Siem Reap

Following projects associated with Siem Reap power sector are to be implemented.

1) Thailand – Cambodia 115kV Transmission System Project

As of July 2005, there are several promising projects associated with the supply to Siem Reap district. Of those projects, the most promising one for the district is the 115kV transmission line project to be connected to Siem Ream through Banteay Meanchay, and to be linked to Battambang.

In April 2000, in consideration of the increasing demand for electricity in Cambodia, the two countries, Thailand and Cambodia, have entered into contract that EGAT (Electricity Generating Authority of Thailand) is to sell the generated electricity of Thai systems to EdC.

PPA(Power Purchase Agreement), which was agreed upon between EGAT and EdC in June 2002, has been updated in July 2005. And the contract on construction from the border on Thailand to the area in Cambodia made between EdC and some investment company in Cambodia. When the construction for interconnection with Thailand is completed, an electric power of 20MW will become obtainable through the transmission line by the middle of 2007. Meanwhile, the electricity charges will be expected to be reduced. As of December 2005, the project of the transmission line has already started for the completion.

2) 220kV Transmission Line from Phnom Penh to Battambang (Southern Route)

220kV Transmission line from Phnom Penh through southern area of Ton le Sap Lake is to be connected to the grids of Battambang, so the transmission line will have been linked to the grids of Siem Reap, and the grids between Phnom Penh and Siem Reap will be linked around 2017.

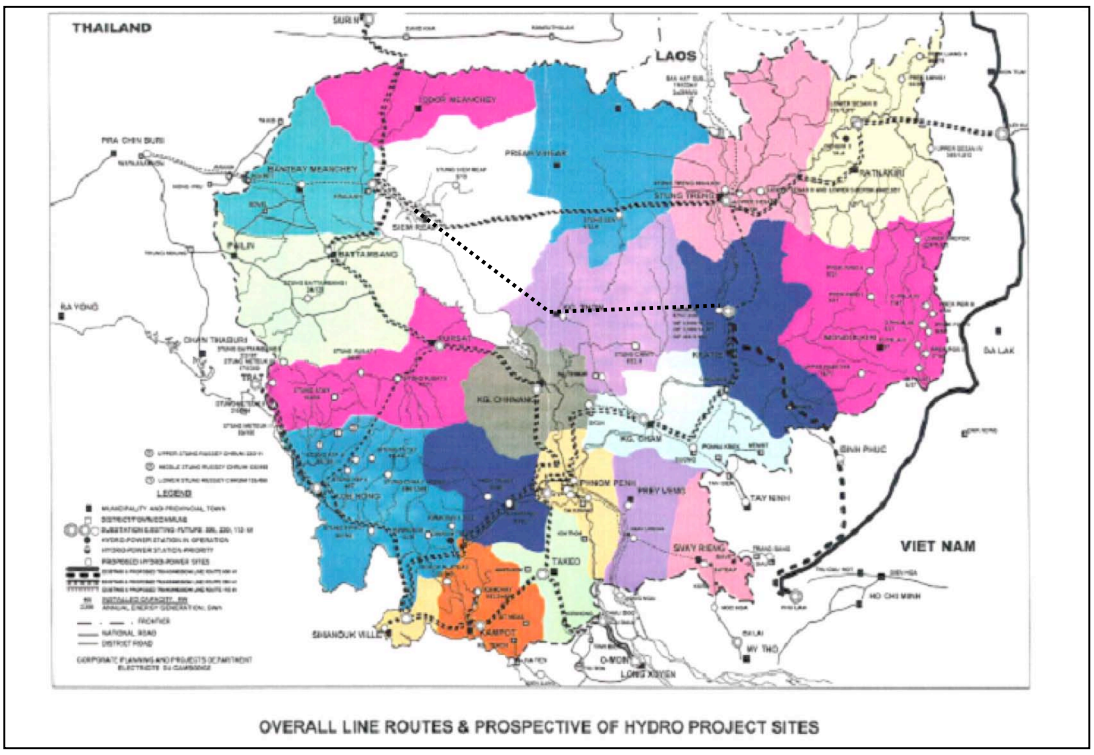
3) 220kV Transmission Line between Stung Treng and Siem Reap(Greater Mekong Sub-region Route)

220kV transmission line through northern area of Tonle Sap Lake via Stung Treng and Ratnakiri, which is regarded as a significant route for the realization of GMS networks, is expected to be completed up to 2020.

4) 220kV Transmission Line from Northern Thai Border (Greater Mekong Sub-region Plan Route)

As one of the GMS schemes, Interconnection Line from northern border on Thailand is assumed to be built by the year 2020.

Figure III.10.10 shows planned transmission line project in Cambodia



Sources: EdC

Figure III.10.10 Planned Transmission Line Project in Cambodia

Table III.10.6. Project to be Planned in Cambodia

Year	Generation	Transmission
2004	Siem Reap - 10 MW HFO	
2005	Khmer Electric Power – 32 MW HFO	
2006	Phnom Penh C5 – 10 MW HFO	
2007	Phnom Penh – 80 MW Import, Vietnam	220 kV Viet Nam – Phnom Penh
	Siem Reap – 20 MW Import, Thailand	115 kV Thailand – Banteay Meanchay
		115 KV GS1 – NPP and S/S at NPP
2008	Kirirom III – 13 MW Hydro	220 kV Takeo – Kampot and S/S at Kampot
2009	Phnom Penh – 120 MW extra from Vietnam	220 kV WPP – Kampong Cham
	Kamchay – 180 MW Hydro	
2010		230 kV WPP–Kampong Chhnang–Pursat-Battambang and S/Ss at Kampong Chhnang, Pursat
2011	Lower Russei Chrum – 125 MW Hydro	230 kV Sihanoukville – WPP
2012	Stung Atay – 110 MW Hydro	115 kV Phnom Penh –Neak Loeung- Svay Rieng and S/Ss at Neak Loeung, Svay Rieng
	Battambang II – 36 MW Hydro	
	Coastal – 300 MW Steam	
2013	Battambang I and II -60MW Hydro	230 kV Sihanoukville-Kampot
2014		
2015	Middle Russei Chrum -125 MW Hydro	
2016	Upper Russei Chrum – 35 MW Hydro	230 kV Stung Atay Hydro - Pursat
2017	Lower Se San II – 207 MW Hydro	
2018	Lower Sre Prok II – 222 MW Hydro	230 kV Sambor Hydro-Kampong Cham
	Stung Chay Areng – 260 MW Hydro	230 kV Kampong Cham- Kompong Thom- Siem Reap
2020	Sambor Hydro – 467-3300 MW Hydro	500 kV Sambor - Stung Treng – Lower Se San – Lower Srepok – ASEAN Grid Cambodia-Viet Nam – Thailand - Laos
	Stung Treng – 980 MW Hydro	

Sources: Analytical and Advisory Services of World Bank

10.1.5 Issues over Power Sector

EdC Siem Reap has managed Siem Reap power sector since MIME transferred its administrative responsibility to them. At present, there are several problems which mainly come from chronic shortage of the budget, and of planning of long-term strategy. Consequently, it affects the management of the sector and ends up in planning passive measures and causing difficulties in supplying sufficient and reliable power to the customers. Especially, large customers such as hotels have installed diesel generators on their own and use them in parallel with the power from EdC as needed. Because of these reasons, the customers who require a large amount of power have accumulated complaints toward policy of the sector.

At the same time, the consumers such as households who do not need a large amount of power also complain of the policy of the sector because the networks of distribution lines have not been extended enough to supply all of the residents, or there could be a case that the residents can not fully consume the power because of insufficient capacity and frequent power-cuts.

Through site surveys of JICA study team and an interview to the relevant organization, issues over Siem Reap power sector including consumers are summarized as follows:

Table III.10.7 Issues over Siem Reap Power Sector

Service area	EdC/IPP	Issues
EdC service area		
Supplier	EdC	Facility 1. Because of shortage of own fund, a new installment is difficult. (Generation) 2. EdC has to find own regional sources because there is no transmission line from outside area of EdC service regardless of large demand. 3. EdC is dependent on the sole power source. Something happened to the generator, black out in all Siem Reap district will not be prevented. 4. EdC has only one source there is no room to maintain diesel generators. 5. Capacity of existing power plant will reach the limit of the supply capacity. 6. The new power station is not working properly for BHN purposes. (Networks) 7. Some consumers are supplied power by single line. Once the line is damaged or cut, outage will occur in the consumer. 8. Loss of electricity supply is still large, so it is reflected to the tariff. Tariff 9. To determine tariff rate, not only EAC and MIME, but also Ministry of Economic and Finance are relevant 10. The tariff is determined based on income and expenditure of EdC, but the initiative of the decision is under EAC. Organization and skill of the staff 11. Due to rapid growth of demand, EdC has difficulty in estimating future demand. 12. Skill of maintenance is still not sufficient, it requires foreign support. 13. EdC Siem Reap is just an implementing body, the staff do not know even upcoming plan. 14. Management area of EdC is only Siem Reap district and some neighboring area, it actually difficult for EdC to plan large-scale facilities because of the demarcation of DIME.
Consumer	From EdC	Tariff and connection fee 15. Even though the diesel plant was donated by the Japanese Government, the tariff is still high for consumers. 16. The tariff rate is not suitable for small consumers who hardly consume electricity compared to large consumers. 17. EdC networks have not extended near to the consumers, so the consumers have to bear a lot of cost to connect the line. Quality 18. Quality of EdC electricity is not dependable, frequently, outage occurs. 19. Because of long distance supply at low voltage, even though they are supplied electricity, voltage drop is enormous. 20. Most of the power is being supplied to large consumers in terms of large income from the consumers 21. Consumption of the power has not been controlled by the consumers, it ends up in enlarging scale of EdC facilities.
	Private	22. Most of the consumers use battery paying much money, but it does not cover full power for which the consumers request. 23. Some can not even have battery, so they use kerosene lamp. 24. Some are supplied from neighbors because EdC charges much fee in connection. 25. Some households have private diesel generators, but fuel is too expensive for them to use full time.
	Non-electrified	26. Connection fee and tariff rate are expensive, the poor can not connect to the grids of EdC. 27. Feeling of unfairness exists
Outside of EdC service area		
Supplier	IPP	28. IPP companies can supply the power only away from the city center of Siem

		Reap. 29. There are some IPP companies which are working on IPP business, but most of them have not gotten any authorization from EAC.
Consumer	From IPP	30. Consumers in some area where EdC can not supply, because of restriction by APSARA and being remote, can not help being supplied from IPP regardless of high tariff rate. 31. Some consumers are paying more charges than the EdC customers. 32. Necessary amount of energy to their appliances can not be obtained from IPP.
Non-electrified		33. EdC networks have not fully extended, so that the residents cannot use the power.

The issues over Siem Reap power sector have been revealed above, and the issues are complicated and associated with not only EdC and other suppliers, but also consumers. More or less, the above issues seem to have been recognized by EdC and the other supplier.

To put it briefly, the table also reveals that there are some authorities associated with EdC and other power supplying companies, and the relationship makes it more complicated than they do by themselves that they invest their funds to a new facility and then reduce tariff rate. The following are roughly proposed as a core of solution.

Table III.10.8 Overall Solutions to Issues

EdC service area	Solution	Issue No.	Related keywords
1.	Additional power source	2. 3. 4. 5. 18. 22. 23. 24. 25. 26.	・ Limit of supply capacity ・ Sole power source ・ No chance of maintenance ・ No grid to outside ・ Outage ・ Expensive fuel
2.	Extension and improvement of networks	6. 7. 8. 17. 18. 19. 20. 22.	・ BHN purpose ・ Protection for accident ・ Energy loss ・ Low voltage cable ・ Outage ・ Voltage drop ・ Network capacity
3.	Review of tariff and connection fee	1. 10. 15. 16. 22. 23. 24. 25. 26. 27.	・ Fund shortage ・ High tariff ・ Tariff for small consumers ・ Expensive connection fee ・ Expensive fuel ・ Unfairness
4.	Strengthening of organization	1. 11. 12. 13. 18.	・ Short of funds ・ Future demand forecast ・ Ability of staff
5.	Other	9. 10. 14. 21.	・ EAC, MIME and Ministry of Economic and Finance ・ Demarcation of DIME ・ Demand side management

EdC non-service area	Solution	Issue No.	Keywords
1.	Additional power source	32.	・ Insufficient supply
2.	Extension and improvement of networks	30.	・ Remote area ・ APSARA
3.	Review of tariff and connection fee	31.	・ More tariff rate than EdC
4.	Strengthening of organization		
5.	Other	28. 29.	・IPP ・Authorization from EAC

All of the issues shown should be rectified, but they should have priority and sequence to be solved. From the above analysis, following scenario with an order of priorities is proposed in Figure III.10.11.

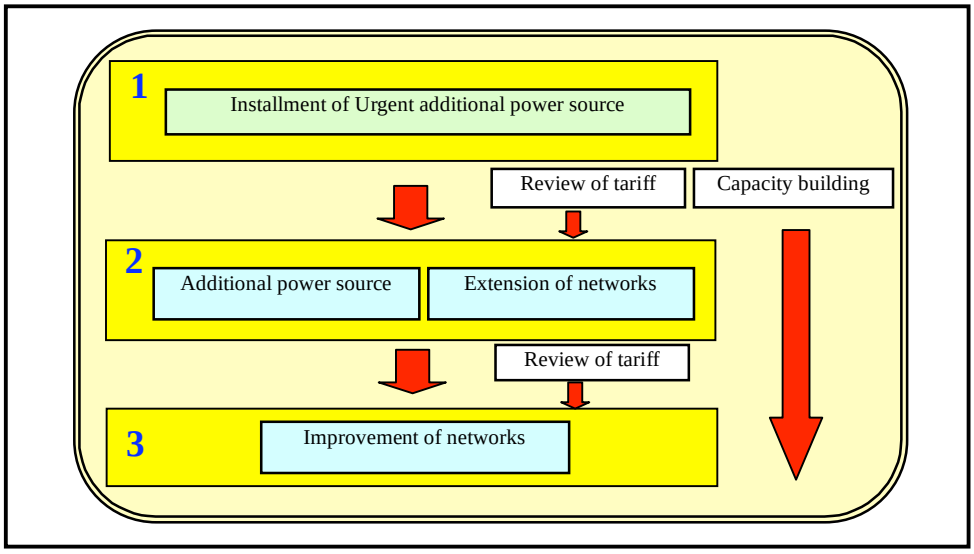


Figure III.10.11 Overall Scenario for Power Sector of Siem Reap

First off, judging from recent power demand, additional power source has to be installed urgently in advance of developing of networks. In the second, additional power based on the long –term view has to be secured for the future. And at the same time, it is suggested that network of EdC should be extended towards area where there will be demand based on forecast from future city planning. In the third, the distribution networks should be improved and strengthened based on the future city planning. Through the time for those developments of EdC, it is suggested that capacity building should be implemented, and the tariff should be reviewed considering suitable time, which will be discussed in the strategy plan.

In the strategy plan, with completion of the surrounding projects mentioned in the previous sector, suitable project and program to attain a sector objective and beneficial time and place to implement them will be mentioned following actual schedule.

10.1.6 Demand Projection

In the field survey, rough tendency on the hotels has been almost revealed. But it did not cover all of the hotels in the Siem Reap district. It is therefore practically difficult not only to mention the fact as the general matters over the district, but also to show the generalized data led by the collected answers in the survey.

Hotel Survey, which aims at grasping all of the hotel demands as well as supplementing the field survey on electric power and water supply, was conducted from June to July in 2005. The number of the hotels surveyed in this Survey is as follows:

Table III.10.9 Number of Hotels and the Respondents in Siem Reap

	Number
All hotels in Siem Reap(2005.7)	81
Respondents in Hotel Survey	76
Non-respondents and Non-cooperative	5

*Either hotel or guesthouses were finally judged by a staff of APSARA authority.
* Guesthouses that have responded in this survey was precluded, the data taken was analyzed for another purposes.

Collected data was analyzed and graphed out in APPENDIX J. Not all of the answered data are satisfactory, but in general, tendency on the use of power in the hotels has been understood with the data. Generally speaking, with almost the same question as the field survey, tendency analyzed in the hotel survey is likely to be the same as that of the field survey except answered values.

From this Hotel Survey, Basic units were estimated based on collected data which was collected by each of the hotel class—Class1 to Class5. Table III.10.10 shows the basic units for calculation and estimated total consumption of the each classified hotel. The table reveals that previous estimation on the potential demand of the whole hotels has been almost correct, and it is backed by the actual led data.

Table III.10.10 Unit Values Led by Hotel Survey

	Estimated consumption of each room(kW)	Number of room	kW
Class1	0.8	717	591
Class2	0.9	1,189	1,116
Class3	1.8	2,146	3,764
Class4	5.7	785	4,497
Class5	6.0	854	5,134
Total			15,102

*Adopted number in the hotels for calculation is December 2004

Potential demand in Sem Reap district was calculated based on the questionnaire surveyed by EdC and the field survey by the consultant. Table III.10.11 shows estimate of potential demand.

Table III.10.11 Estimate of Potential Demand

December 2004

	Estimated Peak Demand(MW)	Estimated Consumption (MWh/year)
Household	3.0MW	14,000MWh
Hotel	15.0MW	70,000MWh
Guesthouse	6.0MW	26,000MWh
Commercial	1.0MW	4,400MWh
Others	0.5MW	2,100MWh
Total(divided by 1.1)	23.0MW	116,530MWh

* Hospitals and restaurants using private generators are ignored due to its small demand.

*Power factor and diversity factor are 0.5, 1.1 respectively

*Power demand per guesthouse is estimated to require 20kW.

Future demands can be forecasted based on the value led by the result of the survey, which is shown in Table III.10.12. The values to be used for the demand forecasting are classified into 5 classes—from Class1 to Class5. The percentage of each number by classification is assumed so that Class4 and Class5 will increase for the year 2020.

In the meantime, the peak demand of guesthouses can be assumed to be 3kW/room, commercial use, such as restaurant, bank, workshop and hospital, is calculated based on the growth ratio of the population; peak demand estimated in household per family, which consist of average 5.6 people, is assumed to be 0.5kW/family, and the others including offices supply is assumed to be 500kW/office and the same growth ratio was adopted as that of the population.

Table III.10.12 Forecast of Potential Demand up to 2020

Year	Hotel		Guesthouse		Commerce	Household	Others	Total
	Required Room	MW	Required room	MW	MW	MW	MW	MW
2004	5691	15.1	1,166	3.5	1.0	12.5	0.5	32.6
2005	6910	19.2	1,351	4.1	1.0	12.9	0.6	37.7
2006	7804	24.2	1,655	5.0	1.0	13.4	0.6	44.2
2007	8698	27.7	1,873	5.6	1.1	13.7	0.7	48.8
2008	9593	31.3	2,056	6.2	1.1	14.1	0.7	53.4
2009	9800	32.2	2,324	7.0	1.1	14.5	0.8	55.5
2010	9900	32.6	2,625	7.9	1.2	14.8	0.9	57.4
2011	10300	33.7	2,788	8.4	1.2	15.2	0.9	59.5
2012	**10500**	**34.6**	**2,960**	**8.9**	**1.2**	**15.7**	**1.0**	**61.4**
2013	10750	35.6	2,938	8.8	1.3	16.1	1.1	62.9
2014	11000	36.6	3,018	9.1	1.3	16.5	1.2	64.6
2015	11250	37.6	3,050	9.2	1.3	16.9	1.2	66.3
2016	11500	38.5	3,081	9.2	1.4	17.4	1.3	67.9
2017	11750	39.5	2,987	9.0	1.4	17.9	1.4	69.2
2018	12000	40.5	3,015	9.0	1.4	18.3	1.5	70.8
2019	12250	41.4	3,042	9.1	1.5	18.8	1.6	72.4
2020	**12500**	**42.3**	**3,068**	**9.2**	**1.5**	**19.3**	**1.7**	**74.0**

*"Others" includes the demand of domestic tourist who stays at temples or relatives' houses, friend houses.

Table III.10.13 shows that potential demand in Siem Reap, and it is estimated that potential demands required for all Siem Reap district in 2012 and 2020 are 61.4MW and 74.0MW respectively. These values of the forecast have been revised based on the result of the hotel survey.

Table III.10.13 Potential Demand in 2012 and 2020

Year	Total Potential Demand
2012	61.4MW
2020	74.0MW

10.2 Sector Approaches

10.2.1 Sector Objective

As analyzed in Chapter 10.1.5, the issues over EdC and other power suppliers, and the overall solutions are presented. Those issues are complicated, and they are not true of only one solution, sometimes over several ones. But, the solutions were mainly divided into five items below.

(1)Additional power source
(2)Extension and improvement of networks
(3)Review of tariff and connection fee
(4)Strengthening of organization
(5)Other

In the previous chapter, there are no issues set out on reduction of environmental load. But, as being stated in Energy Sector Development Policy, attention to the reduction of environmental load is required to be mentioned in this M/P, and therefore it should be treated as one of the necessary attentions to be paid.

In the M/P, a sector objective will be set out as follows:

Extension of networks to the urban and sub-urban area by 2012, and realization of 100% electrification in all Siem Reap district by EdC by 2020.

10.2.2 Sector Approaches to Attain Sector Objective

From the solutions studied in the previous chapter, sector approaches set out to attain the sector objective in 2020 are summarized and suggested below.

1. Upgrading and expanding of power facility

This approach consists of two sub-measures below.

1-1. Additional Power Source

As an additional power source, there are two necessary installations. One is ought to be implemented urgently to solve current supplying difficulties, the other should be implemented aiming at long-term power sector approach based on future demand.
There are a lot of types of power source to be installed, but as an urgent necessary one,

package type diesel type generators end up in being the most suitable power source. As far as permanent power sources are concerned, there are several measures to obtain power such as an independent power source and power from outside of Siem Reap district. As a source of the power in Siem Reap, the most suitable one seems to be diesel power source given that easiness of installation, experience of maintenance, and amount of environmental load are focused on first. But, the first priority is a power source that will be obtained through transmission line outside of Siem Reap, and therefore future power sector planning is envisaged considering transmission line projects associated with Siem Reap power sector.

1-2. Extension and Improvement of Networks

Although the power station was constructed by a Japanese grant aid program under BHN purposes, indigenous people and other regional commerce have not been supplied the power by EdC. It is mainly due to the reason distribution networks are not satisfactorily developed near to the indigenous people. So in this M/P, the first priority for the time being is to extend the middle and the low voltage line near to them so that they can be supplied the power from EdC. After EdC extends networks for the most of the residents, then supply by EdC to the hotels is planned to be secured.

2. Reinforcement of EdC

2-1. Review of Tariff and Connection Fee

The connection fees and deposit are so high that consumers can not connect to EdC line even though the network is extended near to each consumer. They once even connect to the EdC line, they have difficulties continuing to pay the tariff to EdC. As a policy in the M/P, it is proposed that the connection fee should be reduced in order that the residents can be able to connect the line easily to EdC. In the meantime, the tariff ranges should be reviewed in order that the range can be complied with actual situation such as their income, the amount of consumption and consumed time.

2-2. Strengthening of EdC

IPP (Independent Power Producer) had played an important role in Siem Reap district until MIME finished transferring its managing responsibility to EdC Siem Reap. Nowadays, the role of EdC Siem Reap in the district has become important and essential. For the time being, it is difficult to think that EdC will be privatized, or another organization will undertake EdC's responsibility. So, as a sole power producer, EdC has to be reinforced for the future.

3. Control under law, ordinance and decree

3-1. Reduction of Environmental Load

As stated in Energy Sector Development Policy, paying maximum attention on the environment effect is necessary for the development of power sector. In this M/P, from the standpoint of reducing the environmental load, it is deemed to be necessary to encourage the consumers to reduce the use of their generators and shift them to the electricity from EdC with the help of the law, ordinances and/or decrees.

In the next chapter, approaches based on the above policies will be presented.

10.2.3 Sector Approaches

Figure III.10.12 shows summarized sector approaches up to 2020. Policy1 to 3 are all associated with each other, and therefore it is suggested that each proposed project and program should be implemented in a proposed year.

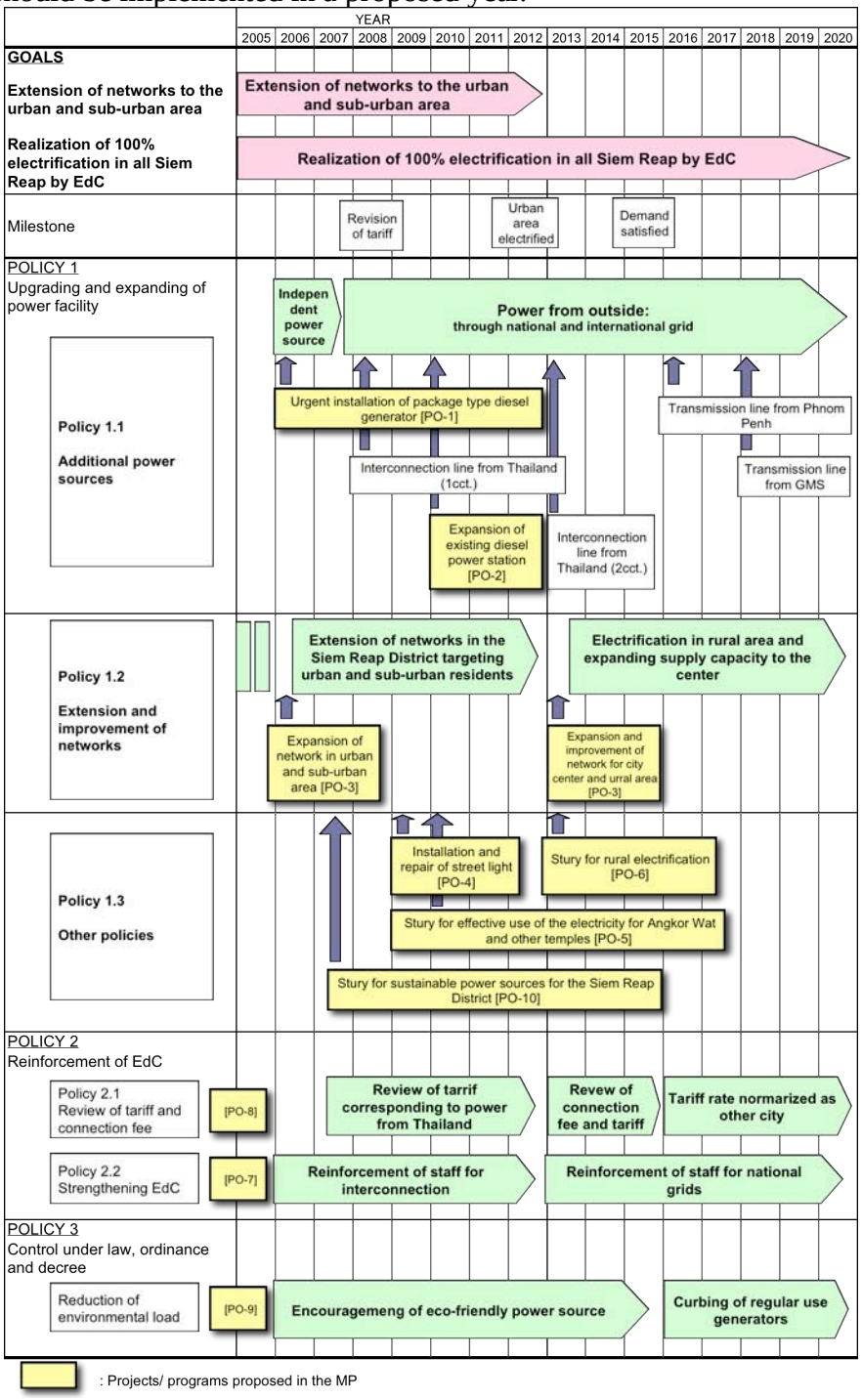


Figure III.10.12 Improvement Strategies up to 2020

(1) Policy 1 (Upgrading and Expanding of Power Facility)

1) Additional Power Source

Figure III.10.13 shows demand and supply forecast based on associated projects up to 2020, and it forecasts that the demand in the district could increase for the future in

response to the growth of the number of the tourists. It also reveals that supply capability will not be able to catch up with the demand of Siem Reap district until around 2016.

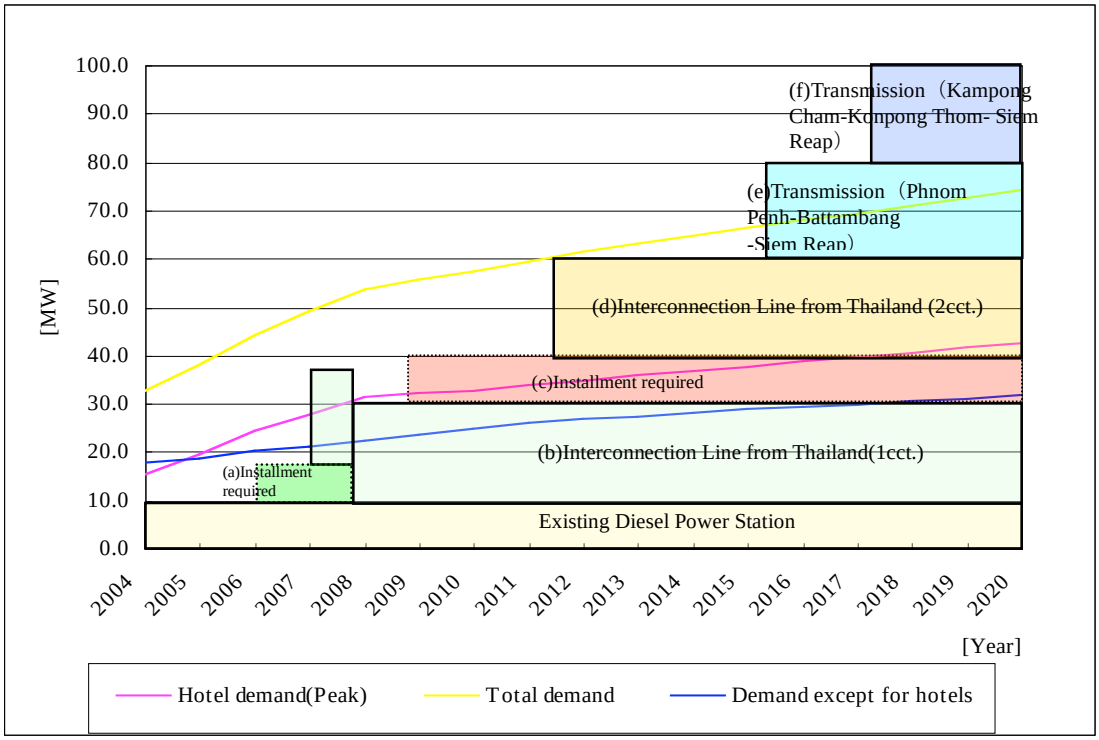


Figure III.10.13 Supply and Demand Forecast Based on Associated Project

For each stage required for additional installation of the power sources, it is proposed that following projects, including associated transmission line projects up to 2020, should be implemented on schedule.

(a) <u>Some Measure Required(Urgent Installment of Diesel Generators)</u>

As a countermeasure of imminent emergency for the capacity of the supplying power, an additional installment on the electrical generation is required as soon as possible. In consideration of a short-term countermeasure against increasing demand, it could be a suitable and reasonable solution that diesel generators with a power of estimated 7MW will be installed to catch up with the increasing demand tentatively. The location for the installation of the diesel sets should be in the premises of the old power station. Power supply by this diesel generators should be continued until 115 kV transmission line from Thailand is connected and starts supplying electricity to the district.

(b) <u>Transmission Line from Thailand(1cct.)</u>

In 2007, a transmission line of 115kV (1cct) from Thailand via Banteay Meanchey will start supplying electricity to the district. A power of about 20MW is expected through the transmission line. Progress and other relevant specifications are mentioned in the previous chapter.

(c) Some Measure Required (Expansion of Existing Diesel Power Station)

Although the additional power is obtained through transmission line in 2007, its power is not sufficient to satisfy all of the demand in the district. And from the standpoints of satisfying N-1 condition in reliability of power supply(power supply to all consumers shall be possible when one component of power system, either, line, generator, or transformer, etc. is out of service), and therefore the Siem Reap system needs some amount of own power source even after the system is connected to the interconnection line. In this point of view, and because of it can be suggested that existing power station needs to be expanded in the future.

(d) Transmission Line from Thailand(2cct.)

With the interconnection line of 115kV in a double circuit form Thailand around 2012, capacity of the power to be supplied will be further strengthened.

(e) Transmission Line from Phnom Penh

Around 2016, two 230kV transmission lines passing through northern area and southern area of Tonle Sap Lake from Phnom Penh is to be connected to the grids of Siem Reap. From this time on, all of the demand in the district, including hotels, will be covered with the help of outer power sources.

(f) Transmission Line in a Framework of GMS

There is a project of transmission line which connects among neighboring countries in a framework of GMS (Greater Mekong Sub-region). This line is planned to be linked to the grids of Siem Reap. From this time on, required power in Siem Reap can be dependent on the power source from the adjacent countries through the transmission line.

2) Expansion and Improvement of Network

Extension of Network in Urban and Sub-urban Area

Although distribution network in the district is being extended in the unelectrified area by EdC, the implementation is too slow to catch up with city development and the growth of the population because of shortage of their funds. Current distribution networks are not reflected by current demand distribution.

In 2004

Figure III.10.14 shows suggested distribution development plan in 2004. EdC is developing their networks in the area shown from A to D by their own budgets. But their budgets are limited, so they seem not to have further plan so far. The area where EdC is developing networks does not have a lot of population in 2004. But, about A and B, these are being constructed along important roads to rural community, and therefore developing networks should be continued after EdC finishes current construction by their budgets.

In the M/P, judging from demands of the residents and the hotels, it is highly suggested that 22kV distribution line shown as dotted lines should be developed along with substation and low voltage cable.

In 2012

Figure III.10.15 shows suggested distribution development plan by 2012. Dotted line in the figure means development to construct by 2012. This development suggestion was based on the demand of the residents and hotels as of 2012.

In the middle of 2007, the interconnection line from Thailand is to be completed and to be supplied power to Siem Reap. Substation to step down 115kV voltage is planned to be located in Puok district. It is suggested that two feeders should be laid and connected to the substation in the city center directly from the Puok substation, and they have to be constructed by the time the substation operates.
Along with the feeders, substations to step down to 400/230V are suggested to be newly built at some intervals.

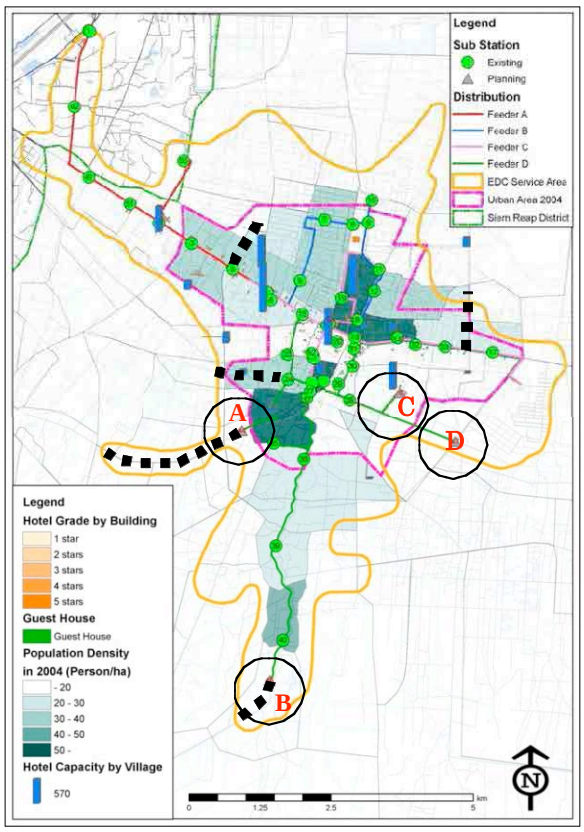


Figure III.10.14 Distribution Development Plan in the Siem Reap District in 2004

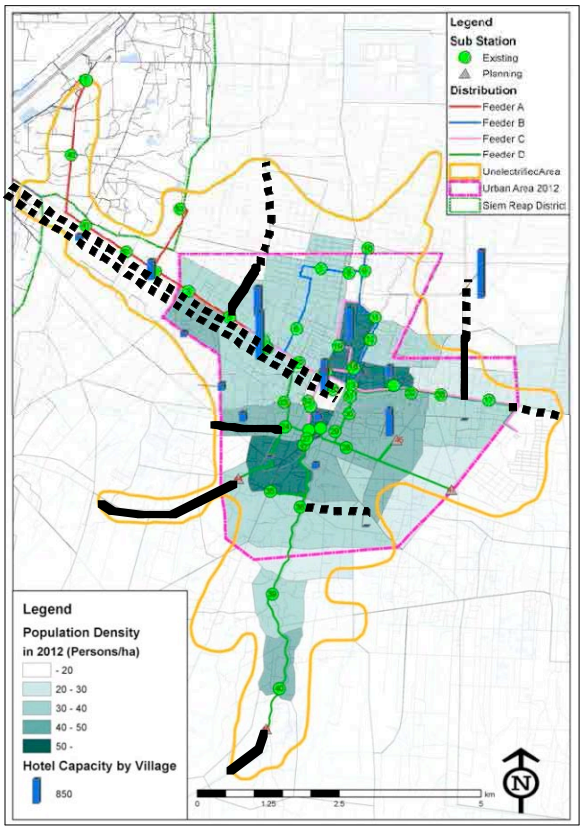


Figure III.10.15 Distribution Development Plan in the Siem Reap District in 2012

Extension and Improvement of Network for City Center and Rural Area In 2020

Figure III.10.16 shows distribution development plan by 2020. With meanings of protection and supply to the remote area from the city center, a ring line, which connects the Puok substation to the existing power station, is suggested to be constructed by the year 2020. Once this is implemented, even the area away from EdC servive area can be supplied from the ring line. And from this line, electric power can be supplied to the city center in order to cover supply for centralized demand in 2020.

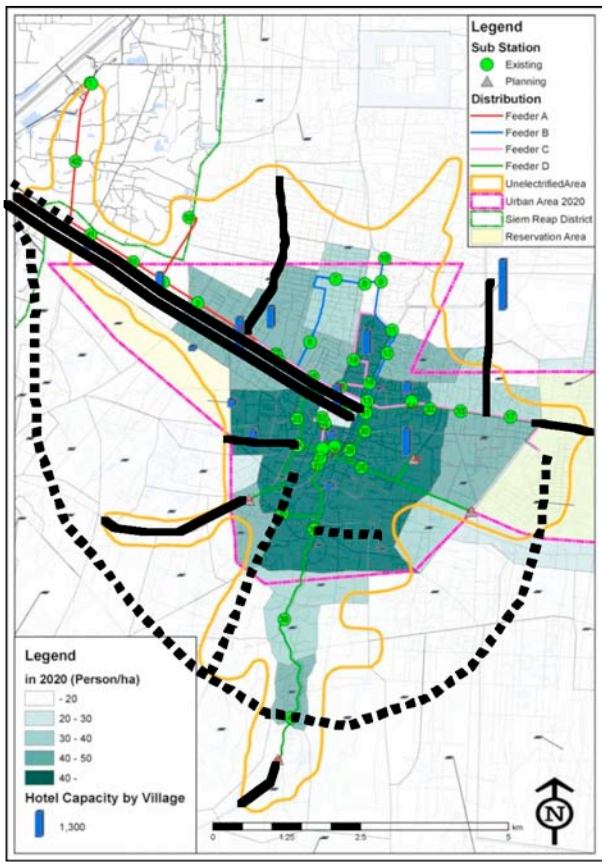


Figure III.10.16 Distribution Development Plan in the Siem Reap District in 2020

As a policy, three feeders from the Puok substation and existing power station should be connected each other. And at some intervals, substations should be constructed

In view of limitation of space for upgrading capacity, expansion of the existing substation seems to be difficult, so it is suggested that new substation to the new feeder should be constructed.

By such projects, ninety percent of Siem Reap district is planned to be electrified by 2020.

Other Projects and Programs

(g) Installment and Repair of Street Light

Although Siem Reap district is aiming at tourism based district, the night of Siem Reap is remarkably dark and not suitable for especially tourists from other countries. This often makes the tourist abandon strolling alone in the district in terms of security reasons. In the power sector approaches, in order to improve urban environments, more installments of public lights along roads could be suggested.

(h) Effective Use of the Electricity for Angkor Wat and Other Temples

In order to sustain growth of the tourism based district, it is goes without saying that the district should become attractive for the tourists. Given that Siem Reap is located near Angkor Wat and other temples, and there is any possibility to use electricity such as use for illumination to the temples, it is deemed to be inevitable that way to use and supply the electricity will be studied.

(i) Decentralized Power

Even though distribution networks are being extended as much the area as possible by EdC Siem Reap, there will be unelectrified area existing in the district even in the future. It is suggested to electrify the area by some decentralized and efficient powers to the area. This might be studied as part of rural electrification of World Bank. It could be one of the ways to bring the electrified area secondhand generators used in the hotels.

(j) Sustainable Power Sources for the Siem Reap District

In this M/P, there are several proposals over development of power sources and distribution networks. But they are planned based on an expectation. Provided that

one project failed, future power sector plan is difficult to be attained. As a protection, it is necessary to find another sustainable power sources suitable for Siem Reap.

(2) Policy 2 (Reinforcement of EdC)

1) Review of Power Tariff Rate

As mentioned in the previous chapter, currently, power tariff rate set by EAC is in operation in the district, but its tariff rate is divided to the use of consumed amount of the power regardless of the kinds of consumers. Given that beneficiary of the power should be shared more to the native residents, current tariff rate will be reviewed so that native residents and their commerce can be benefited more equally in consideration of balance between tourism purpose use and BHN of the native people. So, at first, it is proposed that the tariff should be reviewed after interconnection line from Thailand is linked to the Siem Reap grid and operates supply. As a second stage, in 2012, when the most of the residents in the urban and sub-urban area are supplied power by improving low voltage distribution line near to their houses, connection fee can be reviewed and minimized as much as possible. And then, in 2016, when national grids are organized, the tariff of Siem Reap could be the same as that of other cities and be reasonable charge.

2) Organization Reinforcement

EdC Siem Reap has been playing an important role for the supply of power in the district since MIME transferred its administration to them. So far they have managed to control power sector irrespective of inefficient workforce, and after the Japanese government donated the power plant, they have been transferred least control and maintenance technique by Japanese engineers. But for the future, EdC will be more expected in the district on the power sector, current workforce is not enough to manage future reinforced power systems in the district. Capacity building for the organization of EdC Siem Reap is necessary.

In 2007, interconnection line is going to be linked to Siem Reap, but present EdC Siem Reap will not be able to deal with transaction of power, namely, power outside of Siem Reap. So, by 2007, EdC has to be reinforced in terms of an ability to deal with the operation of the power from outside of Siem Reap. And by 2016, EdC Siem Reap will have to strengthen their organization in order to operate more complicated facility linked to the national grids.

(3) Policy 3 (Control under Law, Ordinance and Decree)

Reduction of Environmental Load

In order to minimize environmental load and aim at eco-friendly city, it deemed to difficult to avoid reviewing and revising law, ordinance and decree, related to the powers.

Table III.10.14 shows suggested programs to reduce environmental load as well as power consumption.

Table III.10.14 Suggested Programs to Reduce Environmental Load

Target year	From 2005 to 2016	From 2017
EdC/EAC action	Securing of Capacity	Securing of Reliability
Policy	Encouragement of eco-friendly power source	Curbing of regular use of generators
Measures in ordinance, decree or electricity charges	For example, incentives to install a renewable energy such as solar panels, wind powers and NAS batteries into the consumers could be encouraged, or stipulated by a law or decree, which could be given a discount of electricity charges	A kind of environmental taxes or oil taxes could be levied on the consumers who use much oil. With the collected tax and/or other sources, it could be also suggested that any foundation to make efficiently use of the collected taxes on the environmental use could be organized in the future.

10.3 Projects/Programs

In order to meet the demand of the district and attain ideal power sector, it is proposed that the following projects and programs should be implemented by 2020. Details of projects are listed in the Appendix of this Chapter.

Table III.10.15 Project Long List

No	Project Title	Project Site	Project Outline	Project Component	Assumed Fund	Estimated Cost*1000	Implementation Agency	Implementation Period 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20
PO-1	Urgent installation of diesel generator	Siem Reap district(EdC premises)	Against rapidly increasing demand, an additional installment on the electrical generation is required as soon as possible. In consideration of a short-term countermeasure it could be a suitable and reasonable solution that diesel generators are installed.	New installment of of diesel generators	EdC	2,090US$(lease contract is possible)	EdC	
PO-2	Project for expansion of existion disel power station	Siem Reap district(EdC premises)	To satisfy a condition required for power supply and increasing demand, Siem Reap system needs some amount of own power source. In this point of view, it can be suggested that existing power station needs to be expanded in the future.	Additional installment diesel generators	Bilateral(Grant)	20,800US$	EdC	
PO-3	Project for extention and expansion of distribution networks	Urban and suburban area	there are a considerable number of residents who can not obtain and use electricity. Extension of networks of distribution line to unelectrified area are required, and to meet large demand to expansion pf the capacity of the network also required	Extension and expansion of distribution networks	Bilateral(Grant)	7,800US$	EdC	
PO-4	Project for installation and repair of street light	City center	The night of Siem Reap is remarkably dark and not suitable for the tourists. This often makes the tourist abandon strolling alone in the district in terms of public security. In order to improve urban environments, more installments of public lights are also required.	Installation and repair of street light	Municipality	780US$	Municilality and/or other relevant organization	
PO-5	Planning of effective use of the electricity for Angkor Wat and other temples	Angkor Wat and other temples	In order to sustain growth of the tourism based district, there can be any possibility to use electricity such as use for illumination to the temples, it is deemed to be inevitable that way to use and supply the electricity will be studied.	Study for effective use and supply to the temples	APSARA or Bilateral	330US$	APSARA and/or other relevant organization	
PO-6	Planning for electrification for unelectrified area	unelectrified area in the Siem Reap district	Even though distribution networks are being extended as much the area as possible by EdC Siem Reap, there will be unelectrified area existing in the district even in the future. To study how to electrify the area by some decentralized way is required.	Study for electrification for rural and suburban area	Bilateral	275US$	EdC	
PO-7	Assistance to capacity building for EdC	Siem Reap district	For the future, EdC will be more expected in the district on the power sector, current workforce is not enough to manage future reinforced power systems in the district. Capacity building for the organization of EdC is necessary.	Dispatching of engineers and experts	EdC or Bilateral	550US$	EdC	
PO-8	Assistance to reviewing of power tariff rate	Siem Reap district	Currently, power tariff rate set by EAC is in operation in the district, but its tariff rate is divided to the use of consumed amount of the power regardless of the kinds of consumers. Given that beneficiary of the power should be shared more to the native people.	Study on proper power tariff rate or dispatching expert	EAC or Bilateral	990US$	EdC/EAC	
PO-9	Project for revision and/or set up law, ordinance and decree on the electrical power supply to reduce environmental load	Siem Reap district	In order to minimize environmental load and aim at eco-friendly city, it deemed to be important to review and revise law, ordinance and decree, related to the powers. Programs to reduce environmental load as well as power consumption are required.	Project tyoe technical cooperation such as dispatching experts	Bilateral	1,800US$	Municipality/EAC/EdC	
PO-10	Project to find a sustainable power souces for the Siem Reap district	Siem Reap district	Capacity of existing power station is almost reaching the limit, so not only urgent additional power sources, but also for the future a sustainable power source have to be found through careful study	Project tyoe technical cooperation	Bilateral	660US$	EdC/MIME	

10.4 Proposed Institutional Arrangement

As proposed institutional arrangements, which are including the programs mentioned in the previous chapter, following institutional arrangements will be proposed.

- Capacity building of EdC Siem Reap
  - Reinforcement workforce by employing more engineers
  - Reviewing and strengthening of the organization to manage large scale systems in the future
  - Necessity to manage all Siem Reap Province on behalf of DIME for rural area, especially in terms of networks
- Institution or department granting subsidy for customers with eco-friendly power sources.
- Tax collecting institution to environmental affecting matters such as use of heavy and diesel oil
- Third party to audit the management of EdC
- Ombudsman institution
- Institutional arrangement of the municipality for urban amenity such as public light
- Institutional arrangement in APSARA in consideration of the use of power in the temple area.

10.5 Priority Project/Programs Name (ID No.PO-1)

10.5.1 Project/Program Background

As recognized in the power cut occurred even in the city center, recent power supply situation has become one of the most notable issues in the Siem Reap district. It is being caused by the shortage of power capacity dependent on a sole power of 10MW in total. Thanks to the rise of oil prices, dependence of the hotels on the EdC power has more increased than before. In order to solve the problem, there may be several countermeasures, but to consider lead time to plan and install a generator, and instantaneousness of the operation, installing package type diesel generators is the most suitable countermeasure up to the time interconnection line from Thai border will be connected and start operation in 2007.

10.5.2 Project/Program Outline

(1) Project/Program Purpose

This project which plans to install about 7MW package type diesel generator aims at securing urgent power supplying capability, and there is an advantage in easiness of installation. However this countermeasure should be temporarily one, not perpetual one. The generators are planned to be placed up to the commencement of supply from Thailand.

(2) Target Area/Location

Location to place 7MW package type diesel generators will be premises of the old power station. The area is shown in Figure III.10.17 as solid circle.

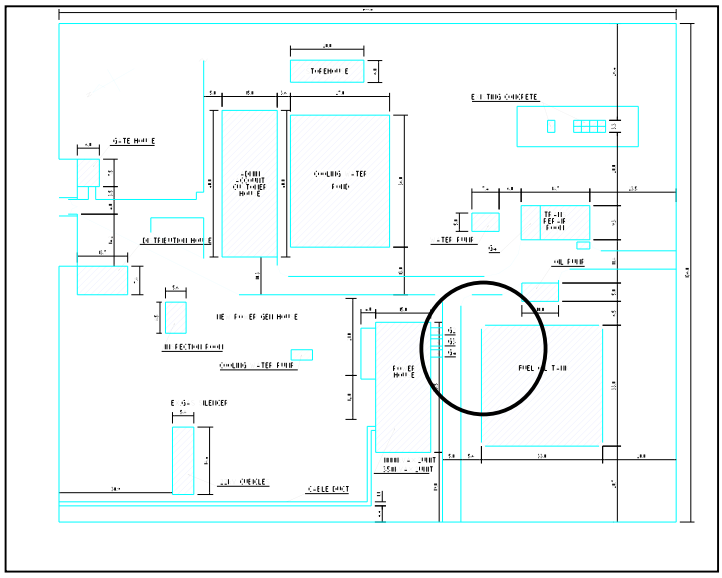


Figure III.10.17 Location to Place Diesel

(3) Prospective Beneficiaries

Consumers of power from EdC, especially for native people

(4) Project/Program Components/ Activities

Provision of 7MW diesel generators
Transformer 400V/22kV
Synchronous panel
Other auxiliary
And installation of the above equipment and facility

(5) Project/Program Output

Demand of the residents, and hotels of which increase of the demand is not taken into account, will be covered by the diesel generators.

(6) Project/Program Input

Installation of 7MW diesel generators

(7) Environmental and Social Impact

Environmental and social impact is almost nothing.

10.5.3 Institutional Arrangement and Implementation Schedule

(1) Implementation Organization

Implementation organization is EdC.

(2) Operation and Maintenance Organization

Operation and Maintenance organization is EdC.

(3) Implementation Schedule

Installation of the generators should be implemented as soon as possible.

1) Funding arrangements: in the beginning of 2006
2) Installation of the generators: in the middle of 2006
3) Commencement of operation: in the middle of 2006
4) Operation until about the end of 2008

10.5.4 Financial Arrangement

(1) Preliminary Cost Estimation

1) Project cost

Considering cost estimate conditions mentioned below, the cost is estimated as follows:

a) Direct cost	:1,900,000US$
b) Price escalation	: 190,000US$
Total	2,090,000US$

*Engineering service is not necessary.
*Land acquisition is not necessary.
*Lease contract could be possible. The lease fee is dependent on amount generation, the rough estimation of the charges will be about 600,000US$ in two years.

2) Operation and Maintenance Cost

Based on the condition mentioned below, operation and maintenance costs are calculated as follows:

a) Operation and maintenance costs(3% of the equipment):57,000US$

*Lease contract includes cost of operation and maintenance to be conducted by a lease company.
*If diesel generator is new one, the generators have to be used up in order to collect depreciation cost.

Project Cost

Preliminary project cost estimation is estimated based on the following conditions and assumptions.

1. Import duties are included in the direct cost.
2. For construction type project, physical contingency and price escalation are assumed to be 10 % each of the direct cost.
3. For program and procurement type project, only price escalation of 10% is considered.
4. Engineering service is assumed to be 10% of the direct cost.
5. Value added tax is not included in the direct cost.
6. Land acquisition includes compensation costs is estimated USD 30 for urban area, USD 10 for peri-urban area (outside ring road) and USD 5 for rural area/paddy field.

Operation and Maintenance Cost

Preliminary operation and maintenance cost estimation is estimated based on the following conditions and assumptions.

1. Operation and maintenance cost is estimated based on the existing similar project actual cost.
2. Annual straight-line depreciation cost is set by 6.7 % for equipment and 3.3% for civil works.

(2) Expected Funding Sources

- Despite that there is no lead time in which a donor prepares for the projects, it is necessary for the project to be implemented urgently as an emergency countermeasure. So it is strongly suggested that EdC should implement this project by their own budget urgently, and it is also suggested that EdC should adjust and balance the cost borne in the project when interconnection line is linked, and they can obtain cheaper energy from Thailand for the time being.

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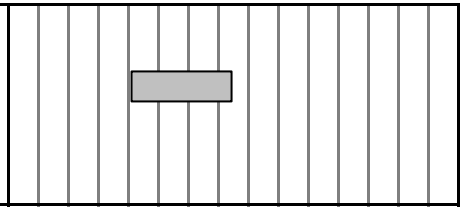
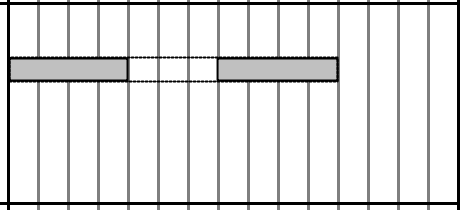
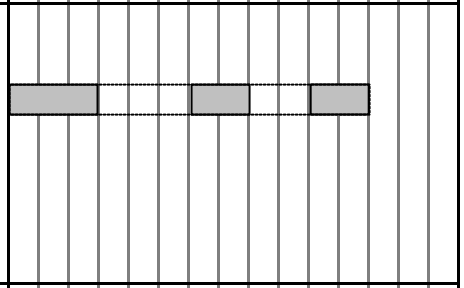
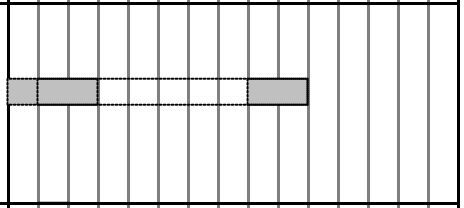
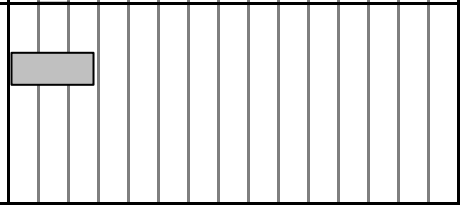
Project Long List

Sector: Power Sector

No	Project Title	Project Site	Project Outline	Present Related Action	Project Component	Assumed Fund	Estimated Cost (1000 USD)	Implementation Agency	Implementation Period 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20
P-1	Urgent installation of diesel generator	Siem Reap district (EdC premises)	Against rapidly increasing demand, an additional installment on the electrical generation is required as soon as possible. In consideration of a short-term countermeasure it could be a suitable and reasonable solution that diesel generators are installed.	No action confirmed	New installment of of diesel generators	EdC	2,090 (lease contract can be possible)	EdC	
P-2	Project for expansion of existion disel power station	Siem Reap district (EdC premises)	To satisfy a condition required for power supply and increasing demand, Siem Reap system needs some amount of own power source. In this point of view, it can be suggested that existing power station needs to be expanded in the future.	No action confirmed	Additional installment diesel generators	Internation al (Grant)	20,800	EdC	
P-3	Project for extention and expansion of distribution networks	Urban and suburban area	There are a considerable number of residents who can not obtain and use electricity. Extension of networks of distribution line to unelectrified area are required, and to meet large demand to expansion pf the capacity of the network also required.	EdC is extending their networks on thir own budgets	Extension and expansion of distribution networks	Internation al (Grant)	7,800	EdC	
P-4	Project for installation and repair of street light	City center	The night of Siem Reap is remarkably dark and not suitable for the tourists. This often makes the tourist abandon strolling alone in the district in terms of public security. In order to improve urban environments, more installments of public lights are also required.	No action confirmed	Installation and repair of street light	Municipali ty	780	Municilality and/or other relevant organization	
P-5	Planning of effective use of the electricity for Angkor Wat and other temples	Angkor Wat and other temples	In order to sustain growth of the tourism based district, there can be any possibility to use electricity such as use for illumination to the temples, it is deemed to be inevitable that way to use and supply the electricity will be studied.	No action confirmed	Study for effective use and supply to the temples	APSARA or Bilateral	330	APSARA and/or other relevant organization	

P-6	Planning for electrification for unelectrified area	unelectrified area in the Siem Reap district	Even though distribution networks are being extended as much the area as possible by EdC Siem Reap, there will be unelectrified area existing in the district even in the future. To study how to electrify the area by some decentralized way is required.	World Bank rural electrification study	Study for electrification for rural and suburban area	International	275	EdC	
P-7	Assistance to capacity building for EdC	Siem Reap district	For the future, EdC will be more expected in the district on the power sector, current workforce is not enough to manage future reinforced power systems in the district. Capacity building for the organization of EdC is necessary.	No action confirmed	Dispatching of engineers and experts	EdC or International	550	EdC	
P-8	Assistance to reviewing of power tariff rate	Siem Reap district	Currently, power tariff rate set by EAC is in operation in the district, but its tariff rate is divided to the use of consumed amount of the power regardless of the kinds of consumers. Given that beneficiary of the power should be shared more to the native residents, current tariff rate have to be reviewed so that native residents and their commerce can be benefited more equally.	No action confirmed	Study on proper power tariff rate or dispatching expert	EAC or International	990	EdC/EAC	
P-9	Project for revision and/or set up law, ordinance and decree on the electrical power supply to reduce environmental load	Siem Reap district	In order to minimize environmental load and aim at eco-friendly city, it deemed to be important to review and revise law, ordinance and decree, related to the powers. Programs to reduce environmental load as well as power consumption are required.	No action confirmed	Project tyoe technical cooperation such as dispatching experts	International	1,800	Municipality/EAC/EdC	
P-10	Project to find a sustainable power souces for the Siem Reap district	Siem Reap district	Capacity of existing power station is almost reaching the limit, so not only urgent additional power sources, but also for the future a sustainable power source have to be found through careful study	No action confirmed	Project tyoe technical cooperation	Bilateral	660	EdC/MIME	

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Project Brief

Sector: Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost	**Project Priority**
P-1	Project for urgent installation of diesel generators	Local residents and tourists in Siem Reap	EdC	2,090 (thousand US$)	**Priority**

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Siem Reap district	EdC	Planning department			

Background:
Against rapidly increasing demand, an additional installment on the electrical generation is required as soon as possible. In consideration of a short-term countermeasure it could be a suitable and reasonable solution that diesel generators are installed tentatively.

Project and Program Outline/Components:
1) Provision of package type generators with a total capacity of about 7MW
2) Provision of 400v/22kV transformers
3) Provision other auxiliary
4) Installment of the generators in the premises of EdC

Project Purpose:
With a capacity of about 7MW of package type diesel generators, tentatively, imminent crisis of shortage of power will be solved.

Project Output:
For the time being, supply capacity for livings of native people will be satisfied for the people living in the distribution covering area.

Environmental and Social Impact:
Environmental and Social Impact are negligible

Not yet confirmed

Implementation Schedule:

1)Funding arrangement	Jan-10	Dec-12
2)Implementation	Apr-10	Jul-10

Project Cost: ('000 USD)

1) Direct costs	1,900
2) Capacity building	
3) Physical conti.	
4) Price Escalation	190
5) Engineering service	
sub-total	2,090
6) Land acquisition	
TOTAL	2,090

*Lease contract is possible

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

Project Brief

Sector: Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (U	Project Priority
P-2	Project for expansion of existion disel power station	Local people and tourists in Siem Reap	International (Grant)	20,800 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Siem Reap district	EdC	Planning department			

Background:

In the future, outer power supply such as the power from thailand will be expected. But, in the Siem Reap, sustainable and stable power source is not planned for the future. Once accident or other incident happened in the outer sources. Users of power except hotel will face large outage. Therefore, Siem Reap has to have own power sources supplying least power for BHN purposes.

Project Purpose:

To satisfy a condition required for power supply and increasing demand, Siem Reap system needs some amount of own power source. In this point of view, it is suggested that existing power station needs to be expanded in the future.

Project and Program Outline/Components:

1) Provision of 10MW diesel generators
2) Installation of the diesel generators
3) Expansion of capacity of switchgears
4) Expansion of the building for diesel generators
5) Technical transfer
6) Other construction

Project Output:

Siem Reap district can secure least power sources for the lives of native people as a BHN purposes. And it secures another reliable power source in Siem Reap.

Environmental and Social Impact:

Environmental and Social Impact are negligible

Existing power station was constructed by a grant aid of Japanese government

Implementation Schedule:

1)Feasibility study and detail	Jan-11	Jun-12
2)Funding arrangements	Jan-10	Jun-12
3)Tender	Jul-12	Dec-12
4)Construction	Jan-13	Dec-13

Project Cost: ('000 USD)

1) Direct costs		16,000
2) Capacity building		
3) Physical conti.		1,600
4) Price Escallation		1,600
5) Engineering service		1,600
	sub-total	20,800
6) Land acquisition		
	TOTAL	20,800

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

Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (U	**Project Priority**
P-3	Project for extention and expansion of distribution networks	Local people and tourists in Siem Reap	International (Grant)	7,800 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Urban and suburban area in Siem Reap	EdC	Planning department			

Background:

At present, there are a considerable number of residents who can not obtain and use electricity. This does harm to the emotions of the indigenous residents in terms of unfairness over the districts. Therefore, it is suggested that extension of networks of distribution line to unelectrified area should be first conducted prior to other developments. As an actual plan, it is suggested that distribution line over to a next urban district, which implies a next district to become urban district, and sub-urban also be extended. It is proposed that the extension of networks towards suburb should be conducted step by step for the future in consideration of the demand in the suburb.

Project Purpose:

Through this project, more of the residents living outside service area will be able to obtain electricity from EdC. And to the large consumers also can obtain requesting power by strengthening distribution networks in the city center.

Project and Program Outline/Components:

1) Extention of 20kV destribution line toward outside in the district
2) Installment of new substation 22kV/400-230V
3) Extention of 400V low voltage line
4) Installment of wat-hour meter
5) Expansion of capacity of existing substation in the city center
6) Technical transfer on maintenance

Project Output:

Through this project, Almost all of the residents living in the surburb as well as consumers in the city center can obtain enough electricity for their lives.

Environmental and Social Impact:

Environmental and Social Impact are negligible

Implementation Schedule:

1) Land acquisition	Jan-10	Dec-12
2) Feasibility study and detail	Jan-11	Dec-11
3) Funding arrangement	Jan-10	Dec-11
4) Tender and award	Jan-12	Jul-12
5) Construction	Aug-12	Dec-19

Project Cost: ('000 USD)

1) Direct costs	6,000
2) Capacity building	
3) Physical conti.	600
4) Price Escallation	600
5) Engineering service	600
sub-total	7,800
6) Land acquisition	
TOTAL	7,800

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	**Project Priority**
P-4	Project for installation and repair of street light	Local people and tourists in Siem Reap	Municilality or grant	780 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Along road of the city center	Municilality and /or other relevant organizatior				

Background:
The night of Siem Reap is remarkably dark and not suitable for the tourists. This often makes the tourist abandon strolling alone in the district in terms of security reason. In order to improve urban environments, more installments of public lights along roads could be suggested

Project and Program Outline/Components:
(1) Extension of low voltage line for street lighting
(2) Expansion of existing substation
(3) Installation of poles and lamps
(4) Construction of the above facilities

Project Purpose:
1) to make the center of Siem Reap light up
2) to have tourist go out even at night in order to facilitate tourism
3) to have Siem Reap a safer city for resident and tourists
4) to have Siem Reap look beautiful city

Project Output:
1)Facilitation of night-time tour
2)Securing of bright road and district
3)Securing of safer road and district
4)Facilitation of activity of indigenous people

Environmental and Social Impact:
Environmental and Social Impact are negligible

Related Projects:

Implementation Schedule:

1) Land acquisition	Jan-10	Dec-11
2) Feasibility study and detail	Jan-11	Dec-11
3) Funding arrangements	Jan-10	Dec-11
4) Tender and award	Jan-12	Jul-12
5) Construction	Aug-12	Aug-13

Project Cost: ('000 USD)

1) Direct costs	600
2) Capacity building	
3) Physical conti.	60
4) Price Escallation	60
5) Engineering service	60
sub-total	780
6) Land acquisition	
TOTAL	780

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	**Project Priority**
P-5	Project of effective use of the electricity for Angkor Wat and other temples	Local people and tourists in Siem Reap	APSARA Bilateral	330 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Angkor Wat and Other temples	APSARA and/or other relevant organization				

Background:

In order to sustain growth of the tourism based district, there can be any possibility to use electricity such as use for illumination to the temples, it is deemed to be inevitable that way to use and supply the electricity will be studied.

Project Purpose:

In terms of environmental and social impact, necessity of the use of the power and possibility of construction of the electrcal facility are studied

Project and Program Outline/Components:

1) to evaluate possibility of use of the power inside the temple area
2) to evaluate necessity ilumination for Angkor Wat and other temples
3) to evaluate necessity of laying power cable
4) to evaluate necessity of building new substation
5) Feasibility study of the above

Project Output:

to analyze whether to extend the power facilities inside of Angkor wat and to use for illumination of the temples and others. And given that it is feasible, layout map is made based on a feasibility study.

Environmental and Social Impact:

This project is for studing environmental and social impact. If the environmental and social impact are large, it is actually impossible to implement the project.

Related Projects:

Implementation Schedule:

1) Feasibility study	Jun-13	Mar-14
2) Funding arrangements	Jan-11	Dec-12

Project Cost: ('000 USD)

1) Direct costs		300
2) Capacity building		
3) Physical conti.		
4) Price Escallation		30
5) Engineering service		
	sub-total	330
6) Land acquisition		
	TOTAL	330

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD	**Project Priority**
P-6	Planning for electrification for unelectrified area	Local people	EdC or Bilateral	275 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Unelectrified area in Siem Reap district	EdC				

Background:

Even though distribution networks are being extended as much area as possible by EdC Siem Reap, there will be unelectrified area existing in the district even in the future except for illigal residents.

Project Purpose:

Although about 90% of residents will be electrified by EdC, remaining 10% will not be electrified by EdC. So, studying how to electrify the area by some decentralized way is required.

Project and Program Outline/Components:

1) To study of possibility of renewable energy
2) To study of installation of second-hand diesel generator
3) To make cost estimate
4) To study of implementation management
5) To study impact on environment
6) To evaluate economical aspect

Project Output:

By studing the above items, way and feasibility to electrify unelectrified area can be found through this study.

Environmental and Social Impact:

Environmental and Social Impact regarded as small provided that project to electrify the area is implemented.

Related Projects:World Bank rural electrification study

Implementation Schedule:

1) Feasibility study	Aug-16	Jul-17
2) Funding arrangements	Jan-14	Dec-15

Project Cost: ('000 US D)

1) Direct costs		250
2) Capacity building		
3) Physical conti.		
4) Price Escallation		25
5) Engineering service		
	sub-total	275
6) Land acquisition		
	TOTAL	275

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (US$)	Project Priority
P-7	Assistance to capacity building for EdC	EdC staff	EdC or Bilateral	550 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Siem Reap district	EdC				

Background:

For the future, EdC will be more expected in the district on the manegement of power sector, current workforce is not enough to manage future reinforced power systems in the district. Capacity building for the organization of EdC is necessary.

Project Purpose:

Through trainings, EdC will be able to manage power sector to be linked to interconnection line from Thailand as well as national grids for the future

Project and Program Outline/Compon

1) Training of maintenance of 115kV transmission line
2) Training of maintenance of 115/22kV substation
3) Training of operation of 115/22kV substation
4) Other necessary training for national grids

Project Output:

By training the above items, EdC Siem Reap will be able to manage large scale facilities linked to the national grids. And they provide the same service as other cities.

Environmental and Social Impact:

Nothing

Related Projects:

Implementation Schedule:

1) Feasibility study	Jan-11	Jul-11
2) Funding arrangement	Jan-10	Dec-11
3) Trainings	Jan-11	Dec-20

Project Cost: ('000 USD)

1) Direct costs		500
2) Capacity building		
3) Physical conti.		
4) Price Escallation		50
5) Engineering servi		
	sub-total	550
6) Land acquisition		
	TOTAL	550

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	**Project Priority**
P-8	Assistance to reviewing of power tariff rate	All EdC consumers	EAC or Bilateral	990 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Siem Reap district	EdC				

Background:

Currently, power tariff rate set by EAC is being operated in the district, but its tariff rate is divided to the use of consumed amount of the power regardless of the kinds of consumers. Given that beneficiary of the power should be shared more to the native residents, current tariff rate have to be reviewed so that native residents and their commerce can be benefited more equally.

Project and Program Outline/Components:

1) To review current tariff from expenditure and revenue of EdC
2) To suggest a tariff rate for commercial use and household use
3) To study and suggest late-night charge
4) To review connection fee and deposit
5) To study for united tariff rate in Cambodia

Project Purpose:

1) to study and suggest reasonable tariff and the range on which the native residents can buy electricity
2) to study and suggest reasonable connection fee on which any income level resident can connect EdC grids
3) to study and suggest resonable tariff rate when national grids are connected

Project Output:

Through this assisrance, at first, the tariff will be changed complying with the consumer's income and other situation, so, native resident will become afford to pay the charges. And the connection fee and deposit will be reviewed and reduced, the consumers will be able to connect EdC grids. Finally, the tariff will be equal to other major cities.

Environmental and Social Impact:

Nothing

Related Projects: No project confirmed

Implementation Schedule:

1) Feasibility study	Jan-12	Dec-21
2) Funding arrangement	Jan-10	Dec-11

Project Cost: ('000 US D)

1) Direct costs		900
2) Capacity building		
3) Physical conti.		
4) Price Escallation		90
5) Engineering service		
	sub-total	990
6) Land acquisition		
	TOTAL	990

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	**Project Priority**
P-9	Project for revision and/or set up law, ordinance and decree on the electrical power supply to reduce environmental load	Siem Reap district	Bilateral	1,800 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Siem Reap district	Municipality/EAC/EdC				

Background:

In order to minimize environmental load and aim at eco-friendly city, it deemed to be necessary to review and revise law, ordinance and decree, related to the powers.
Programs to reduce environmental load as well as power consumption are required.

Project Purpose:

By establishing or reviewing a law or decree, use of private diesel generators mainly at hotels will be reduced and environmental loads to raised by the generators will be abated.

Project and Program Outline/Components:

1) To establish a regulation for incentives to shift diesel generators to eco-friendly power
2) To establish a law or regulation to regulate use of much oil or a lot of use of diesel generators
3) To advise for implementation and monitoring body
4) To introduce a kind of oil tax

Project Output:

Through this project, regular use of diesel generators at hotels will be reduced, and the hotels will shift the use to the power from EdC.

Environmental and Social Impact:

This project is conducted aiming at reducing environmental loads.

Related Projects: No project confirmed

Implementation Schedule:

1) Feasibility study	Jan-11	Dec-11
2) Funding arrangement	Jan-10	Dec-11
3) Capacity building(implementation)	Jan-12	Dec-19

Project Cost: ('000 US D)

1) Direct costs		1,500
2) Capacity building		
3) Physical conti.		
4) Price Escallation		150
5) Engineering service		150
	sub-total	1,800
6) Land acquisition		
	TOTAL	1,800

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Project Brief

Sector:_Power

ID No.	Project Title	Beneficiaries and/or Target Group	Assumed Fund	Estimated Cost (USD)	**Project Priority**
P-10	Project to find a sustainable power souces for the Siem Reap district	All of the consumers in Siem Reap	EdC/Bilateral	660 (thousand US$)	

Project Site	Implementation Agency	Department	Contact Person	Telephone	E-mail
Siem Reap district	MIME/EdC				

Background:

In this M/P, there are several proposals over development of power sources and distribution networks. But they are planned based on an expectation. Provided that one project failed, future power sector plan is difficult to be attained. As a protection, it is necessary to find another sustainable power sources suitable for Siem Reap.

Project Purpose:

This project will be conducted aiming at finding sustainable power sources suitable for Siem Reap district and also aiming at power source at the time when EdC widens their service area.

Project and Program Outline/Components:

1) To find a sustainable power source near Siem Reap such as hydro-electric energy
2) To make a cost estimate
3) To judge economical evaluation
4) To plan implementation
5) To study other feasibility

Project Output:

Through this study, EdC can find another reliable power sources and options for the future power sector will be widened.

Environmental and Social Impact:

None

Related Projects:No project confirmed

Implementation Schedule:

1) Feasibility study	Oct-11	Sep-12
2) Funding arrangement	Jan-10	Sep-11

Project Cost: ('000 US D)

1) Direct costs		600
2) Capacity building		
3) Physical conti.		
4) Price Escallation		60
5) Engineering service		
	sub-total	660
6) Land acquisition		
	TOTAL	660

INSTITUTIONAL AND FINANCIAL ARRANGEMENTS

Chapter 11 Development Administration

11.1 Situation, Prospects and Issues

11.1.1 Current Situation of Local Administration System

In Cambodia, the local administration systems at sub-national level are divided into three levels such as province/municipality, district/khan and commune/sangkat. Cambodia has 20 provinces, 4 municipalities, 171 districts, 14 khans, 1,510 communes and 11 sangkats.

Generally the following tasks have been undertaken by the local administration authorities at sub- national level, which plays a role as the representative of Ministry of Interior.

Table III.11.1 General Tasks of Local Administration Authorities

Provincial Level *1)	District Level *1)	Commune Level *2)
- Preparation and management of civil registration, - Management of licenses and permits to commercial and service companies, construction, and bus and taxi, - Registration of vehicles, - Management of voter registration list, - Police administration, - Registration of land, - Environmental administration, - Watching commercial price, - Controlling arms, - Conservation of cultural heritage, and - Child welfare.	- Preparation and management of civil registration, - Management of livestock registration list, - Management of vehicle registration list, and - Report to Provincial government.	- Security guard and social order, - Provision of social services - Civil welfare, - Acceleration of social and economic development and improvement of living standard, - Conservation of environment and natural resources, - Arbitration, and - Logistic work to meet public needs.

*1) Source: Sub-decree issued by Ministry of Interior on February 1994
*2) Source: Article.43, Law on Commune Administrative Management

The local administration of the Siem Reap District as the study area is managed by the provincial government of Siem Reap, the district government of Siem Reap and the Commune Council. The Siem Reap Province comprises 12 districts or 99 communes. Also the Siem Reap District consists of 10 communes.

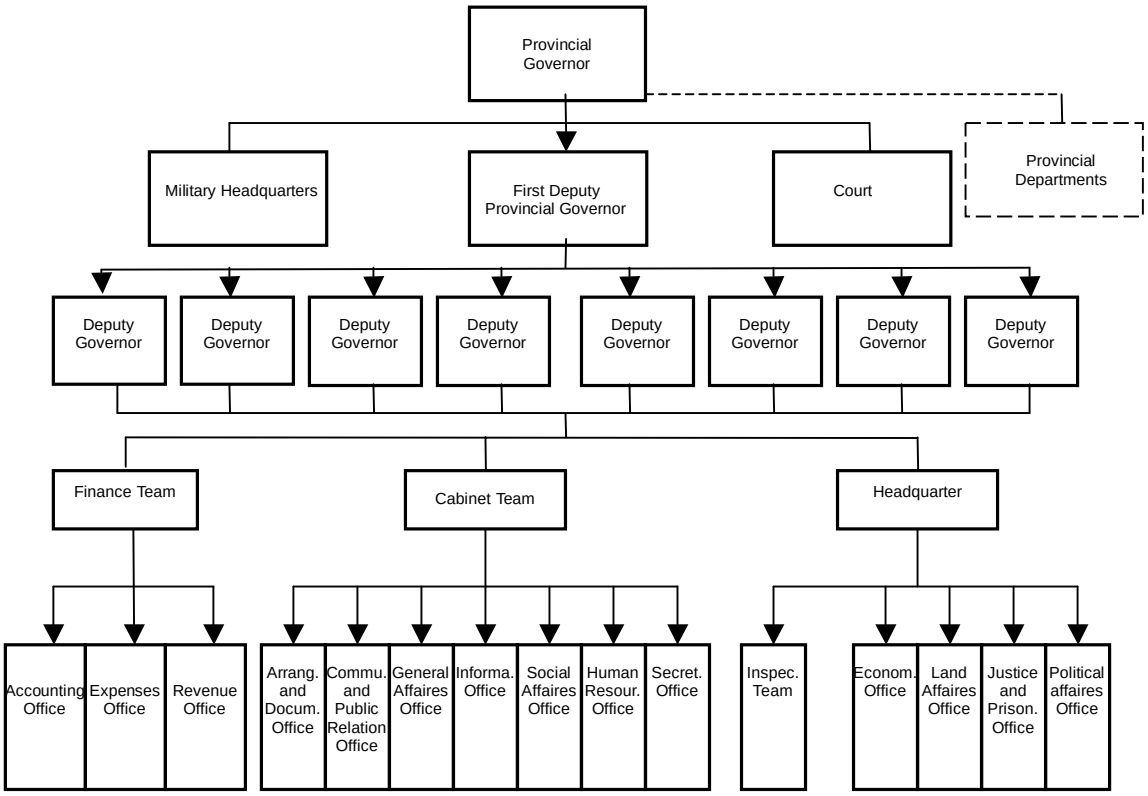
Besides the actual public and social services have been operated by the provincial departments that are vertical lines from central ministries. Sectoral departments have been executing those services based on the policies and plans of line ministries. The management system is fragmented by the vertical lines. Less coordination of horizontal

authorities at provincial level brings about many difficulties of local administration. Since the local administration is centralized, it is necessary to convert to a unified administration in line with the accelerating policy on decentralization and de-concentration.

11.1.2 Organization Structure and Responsibility of Local (Provincial and District) Government of Siem Reap

(1) Provincial Government of Siem Reap

The provincial government of Siem Reap, which is situated as a regional organization of Ministry of Interior, consists of five (5) groups, namely i) governor team including one (1) governor and nine (9) deputy governors, ii) cabinet team, iii) headquarter, iv) finance team, v) inspection team with a total staff of 106 as of July 2005. The organization structure of the provincial government of Siem Reap is shown in the following figure.



Source: Provincial Government of Siem Reap

Figure III.11.1 Organizational Structure of Provincial Government of Siem Reap

The governor was appointed based on the King's decree (No. 1104/013) which was stipulated on appointment as the position of governors on November 10, 2004. The governor executed the legal document as the Reference Statement on the temporary duty and responsibility of the governor and the deputy governors on December 03, 2004, as shown in the following table. As the duties and responsibilities are not integrated, those are so complicated and partly duplicated among the duties of the deputy governors.

In line with the increase of the numbers of the deputy governors, those are amended on March 10, 2005. The facilitation of the duties and responsibilities, however, is not comprehensive and is not unified.

Table III.11.2 Current Duty and Responsibility of the Governor and Deputy Governors of Provincial Government of Siem Reap

Position	Duty and Responsibility (Dec. 2004 - Mar. 2005)	Duty and Responsibility (Mar. 2005 -Date)
1. Governor	Responsible for the whole works in the Province, responsible for directly the politics, general administration, public order, social security and rural development.	Responsible for leading joint work in the Province, directly the politics, general administration, public order, social security, rural development and city development.
2. First Deputy Governor	Responsible for the whole works in the Province with the Governor, in order to investigate, discuss and achieve the tasks.	Jointly responsible with the Governor to examine and discuss to decide various tasks in the Province in accordance with principals of unanimity, consensus and jointly in charge of inspection and finance affairs.
3. Deputy Governor (A)	Responsible for urban planning and construction, industry, mine and energy, planning, APSARA, business and investment.	Responsible for land management, urban planning and construction, APSARA, trade, investment affair.
4. Deputy Governor (B)	Responsible for staff, social affair, education, health and HIV/AIDs, red cross, committee of active drug.	Responsible for personnel affair, education affair, women affairs, red cross, cults and religions.
5. Deputy Governor (C)	Responsible for publicity and transportation, airport, prison, training affairs, international organization and entertainment of international tourist.	Responsible for public work and transportation, airport, training affairs, protocol of international guest, international organization.
6. Deputy Governor (D)	Responsible for tourism and resort, culture and fine art, election, information, entertainment of international tourist, national ceremony, NGOs	Responsible for tourism and resort, culture and fine art, election affair, protocol of national guest and national ceremony, NGOs
7. Deputy Governor (E)	Responsible for environment, post and telecommunication, water resource and meteorology, tourism development, agriculture, local administration, complaining of quarrel and court.	Responsible for post and telecommunication, water resource and meteorology, agriculture, local administration.
8. Deputy Governor (F)	Responsible for electricity, water supply, forestry control, royal residence, women's affair, religious affair, relationship between seneschal and parliament.	Responsible for electricity, forestry administration, royal residence, health, national assembly and senate relations.
9. Deputy Governor (G)		Responsible for social affair, veteran, and youth rehabilitation, industry, mine and energy, judiciary affair, penitentiary.
10. Deputy Governor (H)		Responsible for planning, environment, information, water supply.

Source: Provincial Government of Siem Reap

: Revised duties and responsibility

Also the duties and responsibilities of each team and office are not stipulated and defined at the present. Also the organization structure of the headquarter; the cabinet team and financial team do not correspond to each task of the governors.

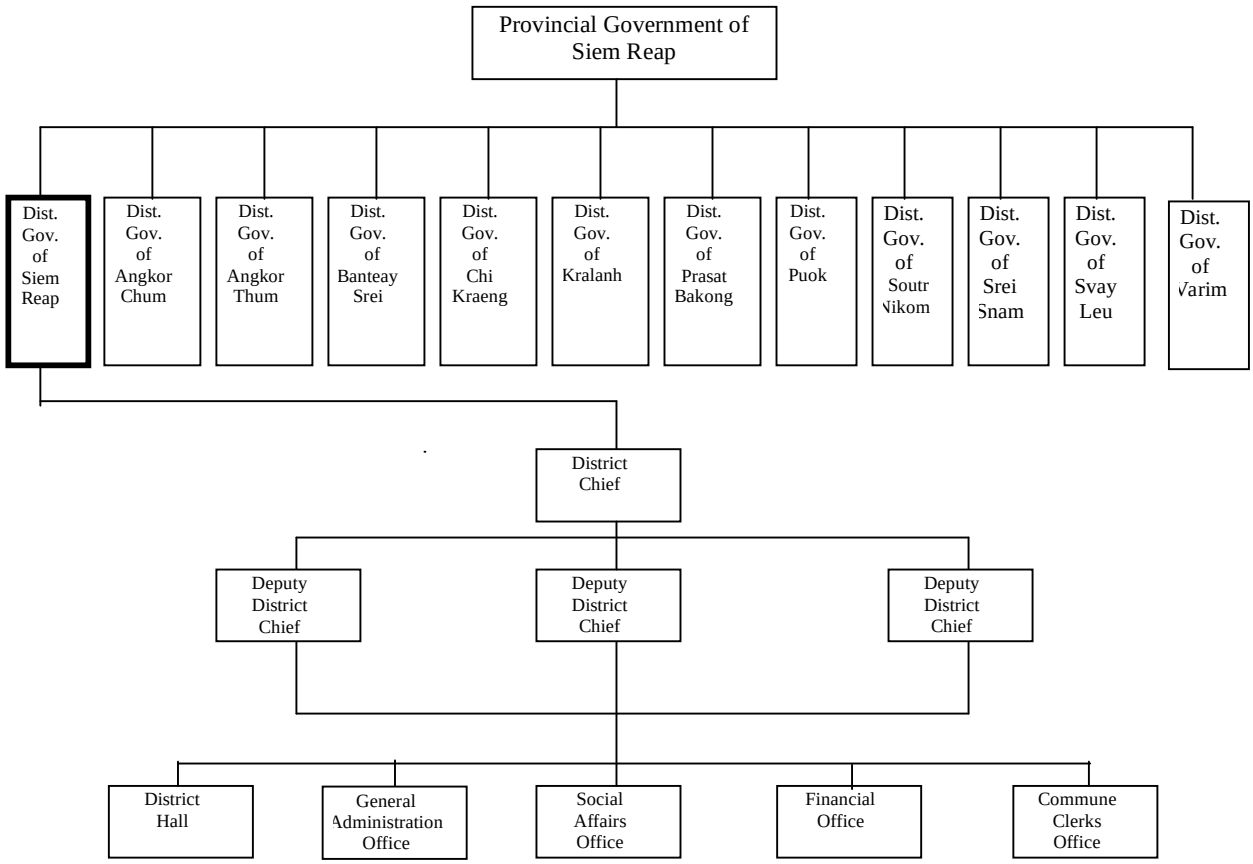
Besides there exist 22 provincial departments with a number of staff of about 5,500 including schoolteachers. The sector development programs have been formulated and managed under a centralized system. These departments are responsible to their line ministries and directly perform their duties. The provincial government cannot prepare the development plan, budget and manage personnel, since there is no regulatory framework creating "unified administration system".

Table III.11.3 Provincial Departments of Siem Reap

No.	Provincial Departments
1.	Department of Senate Relation
2.	Department of Economy and Finance
3.	Department of Information
4.	Department of Health
5.	Department of Industry, Mines and Energy
6.	Department of Planning
7.	Department of Commerce
8.	Department of Education, Youth and Sports
9.	Department of Agriculture, Forestry and Fishery
10.	Department of Culture and Fine Arts
11.	Department of Environment
12.	Department of Rural Development
13.	Department of Social Affairs and Veterans
14.	Department of Post and Telecommunication
15.	Department of Cults and Religion
16.	Department of Women's Affair
17.	Department of Public Works and Transport
18.	Provincial Court
19.	Department of Tourism
20.	Department of Land Management, Urban Planning, Construction and Land Title
21.	Department of Water Resources and Meteorology
22.	Department of Vocational Training Affair

(2) District Government of Siem Reap

Under the provincial government of Siem Reap, there exist twelve (12) district governments as illustrated below. Among 12 districts, the district government of Siem Reap consists of i) one (1) district chief, ii) three (3) deputy district chiefs, iii) district hall, iv) general administration office, v) social affair office, vi) financial office, and vii) commune clerks office with a total staff of 41 as of March 2005. The organization structure of the provincial government of Siem Reap is shown in the following figure.



Source: Provincial Government of Siem Reap

Figure III.11.2 Organizational Structure of District Government of Siem Reap

11.1.3 Human Resources Development

(1) Human Resources Development of Provincial Government of Siem Reap

The total number of the governmental officers reached to106 as of July 2005. About half of the officers, however, are not permanent staff due to the limitation of the employment budget. The educational background of the officers is shown in the following table. More than half of staff graduated of high school. Besides, nine staff graduated of university.

Table III.11.4 Numbers of Government Officials of Siem Reap Province

	University		High School		Secondary School		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
I. Governor Team	-		-		-		10	(100)
II. Cabinet Team	2	(33)	4	(67)	0	(0)	6	(100)
(1)Arrangement and Documents Office	0	(0)	4	(27)	11	(73)	15	(100)
(2) Communication and Public Relation Office	0	(0)	4	(80)	1	(20)	5	(100)
(3) General Affairs Office	0	(0)	3	(75)	1	(25)	4	(100)
(4) Information Office	0	(0)	2	(67)	1	(33)	3	(100)
(5) Social Affairs Office	0	(0)	4	(80)	1	(20)	5	(100)
(6) Human Resources Office	1	(17)	4	(66)	1	(17)	6	(100)
(7) Secretary Office	1	(17)	4	(66)	1	(17)	6	(100)
III. Headquarter	1	(17)	5	(83)	0	(0)	6	(100)
(1) Economic Office	1	(25)	3	(75)	0	(0)	4	(100)
(2) Land Affairs Office	2	(40)	3	(60)	0	(0)	5	(100)
(3) Justice and Prison Office	0	(0)	3	(75)	1	(25)	4	(100)
(4) Political Affaires Office	0	(0)	3	(100)	0	(0)	3	(100)
IV. Finance Team	0	(0)	4	(67)	2	(33)	6	(100)
(1) Accounting Office	0	(0)	5	(100)	0	(0)	5	(100)
(2) Expense Office	0	(0)	3	(100)	0	(0)	3	(100)
(3) Revenue Office	0	(0)	1	(50)	1	(50)	2	(100)
V. Inspection Team	1	(12)	5	(63)	2	(25)	8	(100)
TOTAL	9	(9)	64	(67)	23	(24)	96*	(100)
Grand TOTAL							106	

Note: *: This figure is exclusive of numbers of the governor team.
Source: Provincial Government of Siem Reap

The current conditions of human resources development in the provincial government of Siem Reap are summarized as the table.

Table III.11.5 Current Conditions of Human Resources Development for Provincial Government of Siem Reap

Subject	Current Conditions
1.Qualification of English	(1) Among 106 staff, 13 government officials including two governors are capable for English conversation. (2) Although the Provincial government tried to educate English for the government officials in the Australian Center for Education (ACE), the plan was suspended.
2. Utilization of Computers	(1) The following equipment and articles were donated by the Mayor of Suwon, the Republic of Korea in September 21, 2004. ● 202 units of computers (PCs & Monitors), ● 20 units of printers (HP-1015), ● 43,000 articles of clothing, and ● 700 articles of T-shirts (2) The allocation of computers are shown as follows: ● 28 units of computers for Provincial government of Siem Reap, ● About 40 units of computers for Communes, and ● The others for Department of Ministries. (3) Only three (3) government officials are familiar with the computers at the present. They have been carrying out the training of utilization of those for the other staff on the basis of on-the job.

3. Overseas Training	(1) Though only one (1) government officials, who belonged to the Secretary Office, had an experience of the training on the aspect of human resources development in Singapore, the officer had left the Provincial government.

Source: Provincial Government of Siem Reap

The training needs for the provincial government of Siem Reap which are interviewed by the JICA Study Team are summarized as the following table.

Table III.11.6 Training Needs of Provincial Government of Siem Reap

Provincial Government of Siem Reap	Training Needs
1. Headquarter Team	- Project Management - Project Evaluation - Data Management and Analysis - Method of Settlement for Land Conflict - English Conversation - Long Term and Continuous Training
2. Cabinet Team	- English Conversation - Computer Skills (Maintenance, Utilization) - Project Management - Data Analysis - Management of Documents
3. Financial Team	- Technical Skill for Budget Management by Computer - Skill for Cash Book - Accounting System with International Standard

Source: JICA Study Team

(2) Human Resources Development of District Government of Siem Reap

The capacity development programs under the Master Planning in the pilot district Siem Reap within the frame of Asia Urbs Project "Provincial Towns (AUPPT) in Cambodia" have been progressed by the 'Rhein-Sieg-Kreis District (Germany)' and 'Spoleto Municipality (Italy) by means of a participatory approach since 2001. The programs are carried out by the Konrad Adenauer Foundation (KAF) in cooperation with the Ministry of Interior.

Two pilot districts including Siem Reap and Battambang have been selected by the government in order to promote decentralization and to strengthen district authorities especially in the area of urban planning.

The aim of the pilot program is to prepare the District Master Plan. The following scope of work was scheduled to be covered by the original plan of the pilot program.

- Preparation of land use plan,
- Preparation of technical infrastructure plan,
- Preparation of social infrastructure plan, and
- Preparation of environmental plan.

The Land Use Plan has been focused by KAF by means of the participatory approach of the government officers of the district government of Siem Reap. In the programs, the method on preparation of base map, and analysis and categorizing the existing built-up areas has been transferred to the governmental officers. However, the technology transfer is behind time schedule.

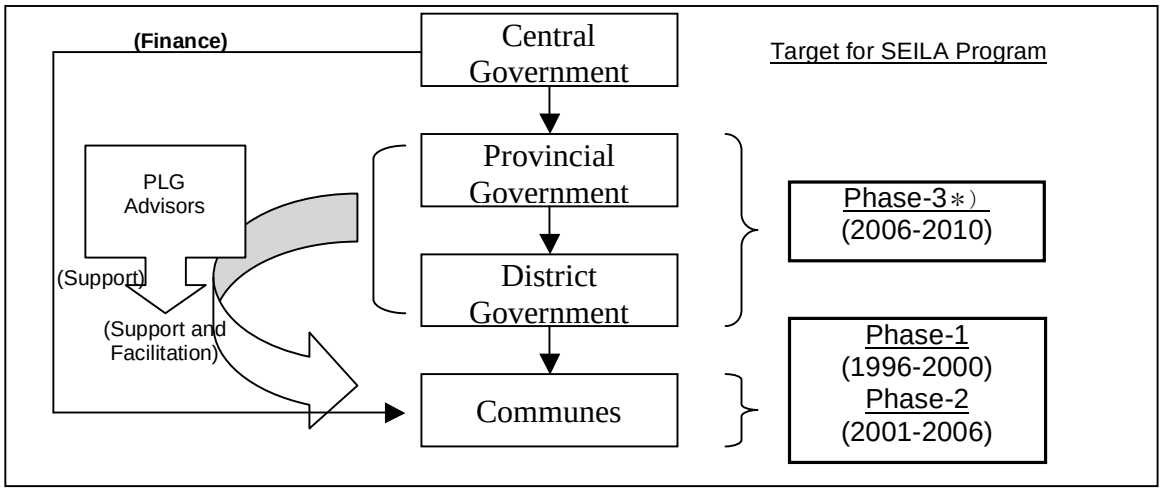
(3) Human Resources Development by Social Economic Improvement for Local Area (SEILA) Program

The Social Economic Improvement for Local Area (SEILA) program has been carried out by UNDP, the Netherlands, EU, Sweden, UNCDF, UK, Australia, the World Bank, UNHCR, WFP and IFAD since 1996, in order to promote decentralization and de-concentration reforms. The target areas of the programs consist of five (5) provinces such as Siem Reap, Banteay Meanchey, Pursat, Battambang and Rattanakiri. The program is divided into three (3) phases, i.e., Phase-1 (1996 - 2000), Phase-2 (2001-2006) and Phase-3 (2006-2010).

The Phase-1 and Phase-2 target the communes and the Phase-3 the provincial and district government, in order to accelerate the decentralization and de-concentration reforms involving the following contents.

- Establishment of laws and regulations on responsibility and duty for the governmental organizations;
- Planning and designing the interventions projects/ programs;
- Financial arrangement;
- Establishment of administrative system including capacity building;
- Implementation of the interventions projects/ programs; and
- Monitor and evaluation for the interventions projects/ programs.

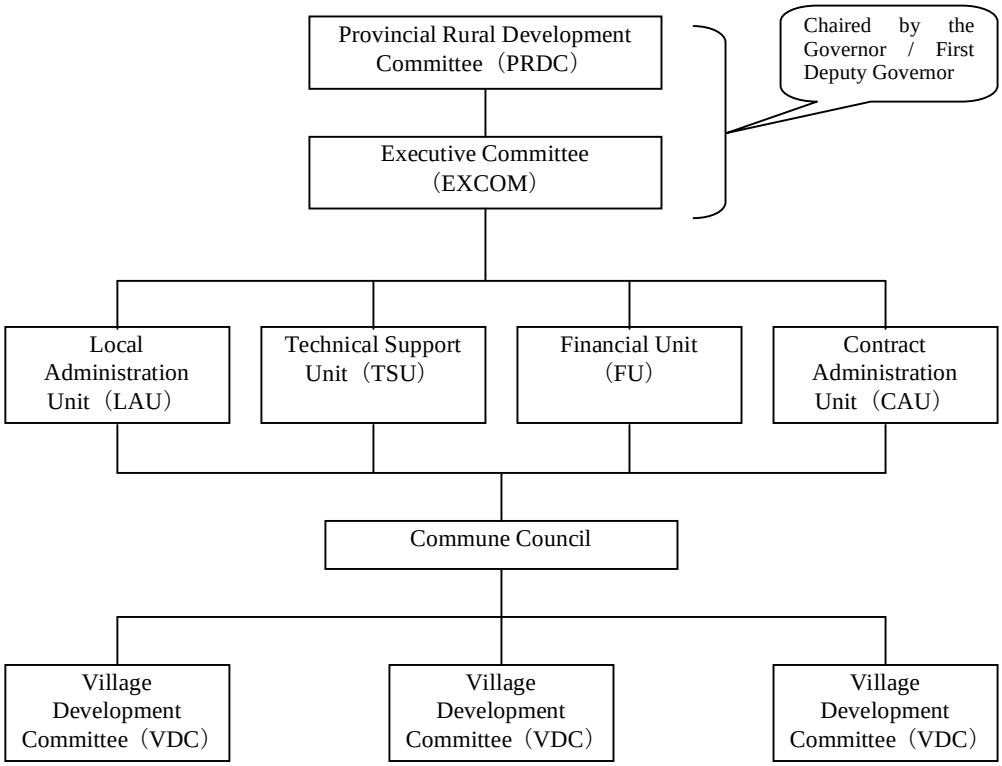
The average budget per annum for the commune is about US$ 10,000 and the budget arrangement was directly made by the central government. During the Phase-1 and Phase-2, the implementation of the programs were supported and facilitated by the government officials of the provincial and district government in association with the advisors of the Partnership for Local Governance (PLG). The staff of the communes has been implementing the various interventions projects/programs without any permission of the projects/programs. The administrative scheme for the SEILA programs is shown in the following figure.



*）: Phase-3 is not fixed to continue.
Source: PLG

Figure III.11.3 Administrative Set-up for SEILA Program

The Provincial Rural Development Committee (PRDC) has been established to manage the SEILA programs at the provincial level. The Partnership for Local Governance (PLG) has been carrying out the capacity buildings for members of the PRDC, who are coming from the governmental officers of the provincial government of Siem Reap. The ten (10) advisors of PLG were assigned for capacity building as shown in the following figure and table. Since the activities of capacity building will be essentially started from 2006, the current capacity on administration and management for the SEILA programs is not adequate. For instance, a part of facilities does not work and are not operated after completion of the construction works, due mainly to lack of management capacity of the governmental officers. Therefore, it is indispensable for the local governmental officers to improve the capacity on management and monitoring for public works.



Source: PLG

Figure III.11.4 Management Structure for SEILA Program

Table III.11.7 Capacity Building for Provincial Rural Development Committee (PRDC) under SEILA Program

Advisors of PLG	Target Unit for Capacity Building	Numbers of Trainees of Gov. Officers	Contents of Capacity Building
Two (2) Local Capacity Building Advisors	Local Administration Unit (LAU)	54 staff	- Training on Guidelines for Commune Planning (Commune Investment Plan and Commune Development Plan) - Training on Facilitation Skills - Training on Financial Management System
One (1) Infrastructure Advisor	Technical Support Unit (TSU)	13 staff	- Training on Guidelines and Manuals for Infrastructure Planning (Commune Investment Plan and Commune Development Plan) - Training on Preparation of Technical Specification - Training on Management and Monitoring for Infrastructure Projects
One (1) Financial Advisor	Financial Unit (FU)	14 staff	- Training on Payment Procedure - Training on Handling of Petit Cash - Training on Budget Accounting - Training on Financial Report Preparation - Training on Procurement Procedure - Training on Financial Administrative Form - Issues on Accounting
One (1) Infrastructure Advisor	Contract Administration Unit (CAU)	10 staff	- Training on Guidelines and Manuals for Procurement of Contractor - Training on Tendering Method - Training on Preparation of Contract Documents
One (1) Planning Advisor	(Not Specified)		
Two (2) Agriculture Advisors	(Not Specified)		
One (1) Sector Advisor	(Not Specified)		
One (1) National Resource Environmental Management Advisor	(Not Specified)		

Source: PLG

11.1.4 Decentralization and De-concentration Reforms by the Cambodian Government

(1) Trends on Decentralization and De-concentration for Nationwide

Decentralization and de-concentration have been accelerated by the royal government of Cambodia through the national meeting on Strategic Framework of Decentralization and De-concentration Reforms (SFDDR) held by the initiative of the prime minister at Sihanoukville on April 1-2, 2005 and preparation of SFDDR paper issued by the government in June 2005.

Through the discussion of the meeting and SFDDR paper, the vision and basic concept

for decentralization and de-concentration reform have come to light as summarized below.

1) Vision of the royal government of Cambodia in the Formulation of Management Systems of Province/Municipality, District/Khan and Commune/Sangkat Administrations

The vision is described in the SFDDR paper clearly as follows.

> The royal government will develop management systems of provincial/municipality, district/khan and commune/sangkat levels based on the principles of "democratic participation." This system will operate with transparency and accountability in order to promote local development and delivery of public services to meet the needs of citizens and contribute to poverty reduction within the respective territories.

2) Basic Concept for Decentralization and De-concentration Reform

The basic concept for decentralization and de-concentration reform is outlined as below.

(a) Strengthening the Rights of the Provincial Governor

- Ministers cannot release the decisions without opinion provision of the provincial governors. In other words, the provincial governors, starting from vice-heads of departments downward, are privileged to release decisions to directly appoint without going to meet the ministers.

(b) Finance and Budget Reform

- Budget of the province should be put into the budget package of the province so that it becomes a sole budget of the province.
- The provincial governor should act as the original owners of the budget of the provincial departments in which at the present the governor of the province are only right-transferred owners to this budget while the minister is an original owner.
- The diagram of finance and budget reform is planned by the Government as the following figure.
- This figure indicates that existing complicated financial system for public works shall be unified and integrated to the provincial government represented by the governor as a sole commander. At present the financing for implementation of public works in the province consists of two complicated systems. One for rather bigger projects is directly financed by central ministries and another for smaller projects is financed by the provincial government. Since central ministries have the power for implementation of bigger projects, it is difficult for the provincial government to control and manage urban development even if the site is located within the province. Also some problems such as delay to implementation have been observed become the development policy of central ministries is not always consistent with the provincial needs. In order to solve these problems, it is planned that the provincial governor should be the original owner of the budget of the provincial departments, which shall be utilized for implementation of public works.

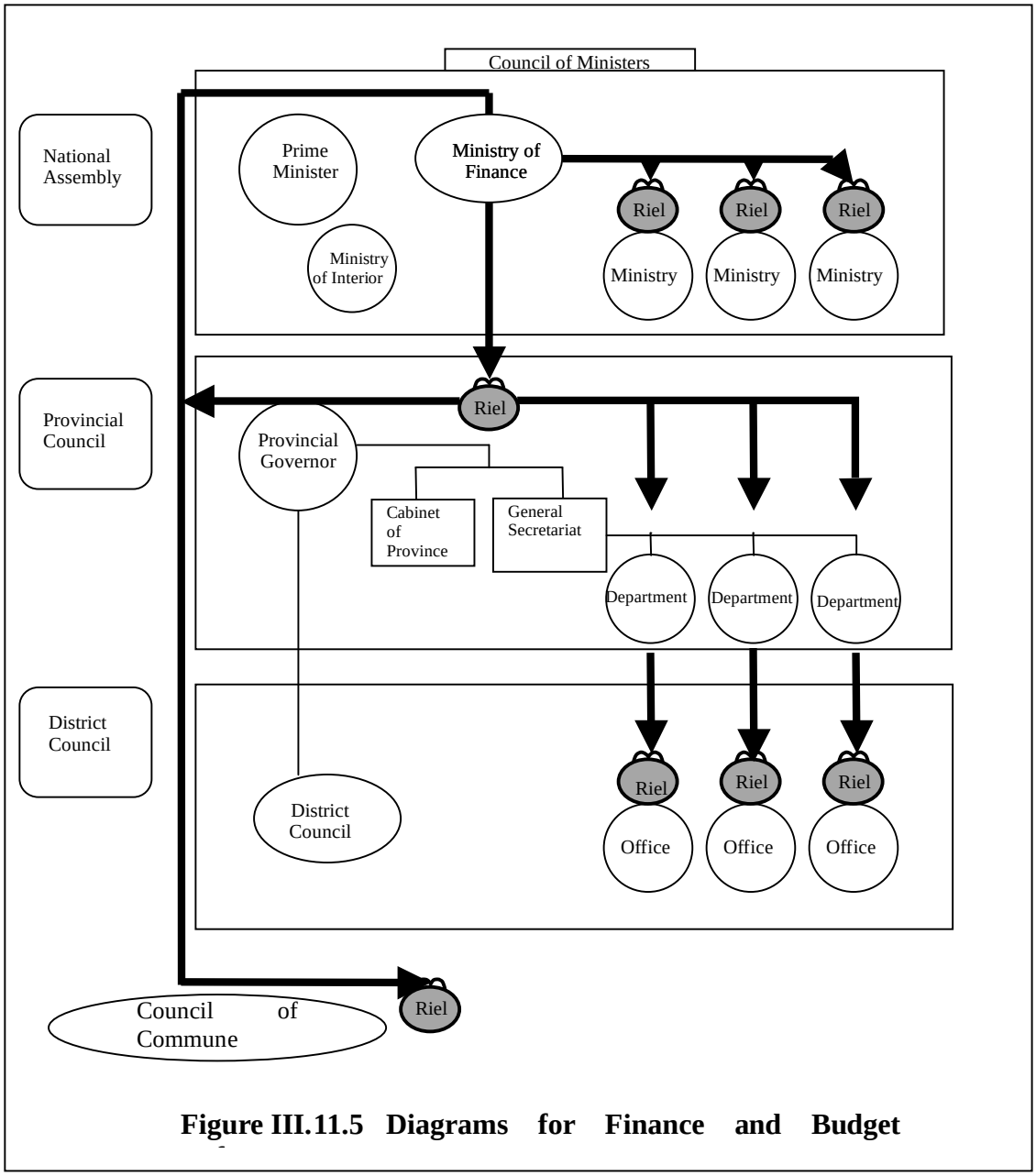


Figure III.11.5 Diagrams for Finance and Budget

Source: Strategic Framework of Decentralization and De-concentration Reforms, the Government of Cambodia

(c) Introduction of Council Democracy System

- The national assembly and commune council have been already established by means of voting system. However, the council democracy system has not been introduced yet. Provincial councils will be established in each province by indirect elections based on the provisions of an organic law, whose draft has been prepared by the Ministry of Interior in association with UNDP.
- Unified administration with the status of legal entity will be established at provincial level. The legal entities will be given to the entire province including its territory, citizens and council.

It is recommended that the vision and basic concepts for decentralization and de-concentration reform mentioned above shall be accelerated even for proper local administration of Siem Reap.

(2) Trends on Decentralization and De-concentration at District Level

In June 2003, the decision on the structure and the administration of Srok Battambang, Battambang Province and Srok Siem Reap, Siem Reap Province are stipulated in the official letter of No.47 by the Prime Minister. The important articles concerned with local administration and decentralization are listed as the following table.

Table III.11.8 Decision on Structure and Administration of Battambang and Siem Reap District

Article 1
This Decision shall define the structure and administration of Siem Reap district, Siem Reap province and Battambang district, Battambang province in the pilot framework of establishing a well-balanced socio-economic hub and contributing to the reduction of poverty.

Article 2
The present structure and administration of Siem Reap and Battambang districts shall be assessed and organized step by step to adapt to the practical condition and to conform the provisions of this Decision.

Article 3
Within the pilot framework, the two districts' roles and functions are as follows:
Role:
-To promote and secure good governance, by managing and using resources available in the Districts in a sustainable way to meet the basic demand in the Districts in order to serve the common interest of the locals and of the nation and also to be in conformity with the policies of the royal government.
-To act as an experimental centers of the provinces to meet the local demand and deliver public services to the locals.
Function:
-To deliver public administrative services badly needed in their daily life and business by the citizens, enterprises or companies, traders in an effective, efficient and transparent way so as to set an example of good governance.
-To formulate district development planning with people's participation in a way that the planning shall consistent with the development planning of the provinces and socio-economic plan of the State, by coordinating all the commune development planning and by determining resources needed in the carrying out of their plans.

Article 4
In implementing the pilot project, the two Districts shall be delegated with such power as to direct, and /or to coordinate, and/or to promote, and/or to supervise the formulation of master plan, land use planning, and all constructions as approved, to build, repair and maintain roads, to control traffic circulation, to register vehicles, to issue licenses and permits to commercial and service companies and to small and medium handicrafts, to handle educational, social, cultural and health care affairs, to conduct civil registration or certify all documents and all photocopied papers.

Article 11
There shall be a "One Window Service Office" created in each district office. The One Window Service Office shall be able to provide the locals and all enterprises with administrative services badly needed by the citizens in a timely and transparent way and in simple procedures. The Office shall be the focal point of all services and administrative procedures. The Office shall serve as a place where customers shall be able to obtain all kinds of application papers and complete information on the delivery of all public services and on the service charges and other fees. The Office shall also be a place where all official approvals shall be obtained by the applicants. The organization and the functioning of the One Window Service Office shall be defined by the Declaration of the Ministry of Interior following

consultation with the NCSC and the CAR and with cooperation from all the ministries and departments concerned.

Along the decentralization and de-concentration for district level, the reform of the district government had commenced since 2005. The contents of the reform divide into the following items and are summarized as Table III.11.9.

- Administrative reform,
- Establishment of District Council,
- Introduction of Ombudsman System, and
- Introduction of One Window Service Office.

This reform has been carried out in Siem Reap and Battambang districts.

Table III.11.9 Contents of Reform of District Government

Item	Contents of Reform of District Government
1. Administrative Reform	The reform consists of, i) administrative reform, ii) preparation of master plan, and iii) establishment of job placement agency. - There are week communications between the line (Ministry of Interior – Provincial Government – District Government) and the line (Ministries – Line Departments – Line Offices). In order to solve the problem, the relationship between the District Government and the Line Offices is encouraged by means of information sharing. The district government could keep the information of what happened in the district under a unified control. - The 1st Draft of a master plan for land use plan in the district has been completed in association with EU. - The Job Placement Agency (JPA) has been established for the purpose of matching between employers and employees.
2. Establishment of District Council	The Commune Council (CC) was established in 2001 based on the Law on Administration and Management of Communes. The District Council (DC) has been established as well. - The DC function is to advise to the district chief on the important issues such as the budget plan of the district. The district chief without an approval of DC cannot carry out the important aspect. - The DC comprises 35 members, which consists of 30 members (3 from each commune), the district chief, three deputy district chiefs and the chief of district department.
3. Introduction of Ombudsman System	The residents had no opportunity to claim to the Government. The Ombudsman System can solve the problems, which may occur to the residents. - The committee is established and the numbers of the committee are 16, which consist of 3 from NGOs, 3 from private sectors, 10 from communes). - One person as an ombudsman is selected between 2 candidates nominated by the committee. - The term of ombudsman is three years.
4. Introduction of One Window Service Office (OWSO)	The One Window Service Office has been established for unification of application window and approval as well as clarification of the cost. - The target aspects are i) application/registration of license plate for vehicles and motorcycles, ii) registration of restaurants, guesthouses, massage shops and tuk-tuk businesses, iii) application for events, and etc. - The cost for application has been clarified and the period for application has been deducted.

The major issue of the reform is lack of finance of the district government. Even if the One Window Service Office (OWSO) can collect the charges for application, all the

charges shall be transferred to the Tax Office. In spite of low level of salary (about 20 US$) of the district government officers, the work volume has been increasing for dealing with jobs concerned with one window service. Because the budget of the district government is controlled by the provincial government, it is difficult that adequate budget can be allocated to the district government.

It is necessary to improve the budget system so that a certain percentage of the charges in OWSO shall be left for the district government and the salary system of the district government officers.

11.1.5 Local Administration Concerned Application for Laws and Regulation

Cambodia has promulgated many laws and regulations concerned with development of administration such as local administration, urban and regional planning and development, tourism and environmental aspects.
As for these laws and regulation, there are some problems and issues (refer to the following table). As seen in the table, some laws are still in progress for enactment. In addition those have been amended by the various decrees and sub-decrees. It is not possible to strictly apply, manage and abide by laws and regulations at present. The various causes for the problems are considered as follows:
1) Underdevelopment of laws and regulations;
2) Inadequate formation of unified legal framework; and
3) Inadequate application of laws and regulations (including penalty clause).

In particular, the following problems related to local administration in Siem Reap shall be solved at the early convenient:

- No legal framework on local administration at province and district level (organic laws have not been enacted yet.);
- Overlapping the rights to preparation of land use plan among provincial departments of land under the provincial government, the district government of Siem Reap and APSARA authority; and
- Law on water resources management inclusive of water use right has not been enacted.

Table III.11.10 Problems and Issues on Laws and Regulations Concerned with Local Administration

Sector	No	Title	Brief	Enacted Date	Authority	Problems and Issues on Laws and Regulations and Its Operation
Local Administration	1.	Organic Law	This law will define the responsibility and duties of sub-national government at provincial/municipal, district/khan and commune/sangkat levels.	Not yet enacted (under preparation)	-	It will take more than 3 years to be enacted
Local Administration	2	Law on Commune/ Sangkat Administrative Management	This law defined the council of the Commune/Sangkat including election system, the roles, functions and powers of Commune/ Sangkat, and so on.	March 2001	Royal Government of Cambodia	The management systems and structures for local administration have not been strengthened due to limited budget and low capacity of Commune/ Sangkat
Urban and Regional Planning and Development	3	Land Law	This law defined various types of land rights such as propriety, temporary possession, authorization to cultivate, concession, ownership for a life time, right of use etc.	August 1992 (Revised in 2001)	Royal Government of Cambodia	-
Urban and Regional Planning and Development	4	Law on Land Management, Urban Planning and Constructions	The law established a National Committee for Land Management, Urban Planning and Construction as a national organization. Provincial and district government are also required to establish respective Sub-Committee for Land Management, Urban Planning and Construction.	August 1994	Royal Government of Cambodia	Sub-Committee has not been established in any provinces to prepare their land use master plans.
Urban and Regional Planning and Development	5	Law on the Establishment of MLMUPC	This law merged related ministries into one. The Ministry has the authority to prepare and implement land use plans in urban areas in all Cambodia.	May 1999	Royal Government of Cambodia	In fact, each provincial and municipal department of land management, urban planning and construction represents the function to prepare local master plans.
Urban and Regional Planning and Development	6	Government Decision No. 47	The Ministry of Interior delegated the administrative power from Provinces to Siem Reap District and Battambang District as to coordinate, to promote, and to supervise the formulation of master plan, land use planning, and all constructions as approved to build, repair and maintain roads to control traffic circulation and to register vehicles.	2003	Ministry of Interior	The Decision is not working properly and most of above administration still remains within the Siem Reap Provincial government.
Urban and Regional Planning and Development	7	Sub-Decree Number 15	This Sub-decree authorized the APSARA Authority to prepare and to implement the district urban master plan and provincial tourism master plan.	June 2004	Royal Government of Cambodia	The responsibility on urban planning is functionally duplicated among Provincial Department, District Government and APSARA.

Urban and Regional Planning and Development	8	Royal Decree on Protected Cultural Zones in the Siem Reap/Angkor Region	This decree states the zoning in the Siem Reap/Angkor Region for conservation of cultural heritage zone as follows: Zone 1: Monumental Sites, Zone 2: Protected Archaeological Reserve: buffer zone, Zone 3: Protected Cultural Landscape, Zone 4: Sites of Archaeological, Anthropological or Historic Interest, Zone 5: The socio-economic and cultural development zone of the Siem Reap/Angkor. APSARA has a responsibility of management of these Zones.	1994	Royal Government of Cambodia	There is inadequate concept that community try to live together with cultural heritage.
Urban and Regional Planning and Development	9	Construction Law	This law states permission on construction and taking down, general stipulation of land use.	December 1997	Royal Government of Cambodia	The Law is not properly complied regarding facilitation of parking area, setting back of buildings, and sewerage treatment.
Urban and Regional Planning and Development	10	Law on Road Traffic	This law is described for traffic rule on the road	1991	Royal Government of Cambodia	The revision of this law is under process. The objectives of this revision are to keep road safety for road users and traffic flow all over the country
Urban and Regional Planning and Development	11	New Road Law	The objective of this law are to provide a legal framework to plan for improvement and extend the existing road networks, to classify public road, to facilitate the development and management of such networks and to regulate the activities of road transport carriers.	Not yet enacted (under preparation)	-	The appropriate legal instruments regarding road have not been enacted.
Urban and Regional Planning and Development	12	Sub-decree on the issuance of license plate for vehicles	This sub-decree plans to implement the international numbering system followed by ASEAN standard.	November 2003	Royal Government of Cambodia	The sub-decree has not been properly worked yet. (The registration of license plate has just started within Siem Reap District.)
Urban and Regional Planning and Development	13	Law on Water Resources Management	This law drafted in 2002 tentatively stipulated the rights and obligations of water use, and institution in charge of its implementation and enforcement, and so on.	Not yet enacted.	Ministry of Water Resources and Metrology	This law has not been approved by the National Assembly due to very slow procedure.
Urban and Regional Planning and Development	14	Sub-decree on Issuance and Administration of Water License under Water Resources Management	The Sub-decree drafted in 2001 consists of water use licenses, extraction and filling licenses, drillers' (groundwater) licenses and wastewater discharge licenses.	Not yet enacted.	Ministry of Water Resources and Metrology	This law can be executed after the approval of Law on Water Resources Management.
Tourism	15	Tourism Law	This law was drafted by MOT under the assistance of ADB including general provision, tourism	Not yet enacted.	Royal Government of Cambodia	The Prime Minister signed the Sub-decree on June 11, 2004.

			development plan, licensing of tourism operators, monitoring in lined with the new Law of Investment and other agreements.			
Tourism	16	Sub Degree on Hotel Classificatio n	The Sub Degree on hotel classification system based on international standards and incompliance with Cambodian law consisting of legal procedures and minimum standard system from non-star to 5-star hotels.	Not yet enacted.	Ministry of Tourism	-
Environment	17	Law on Environment al Protection and Natural Resources Management	This law states 1) preparation of National and Regional environmental plan, 2) implementation of environmental impact assessment, 3)natural resource management, 4)environmental protection, 5)implementation of monitoring, recording and inspection, 6) public participation and access to information, 7)environmental endowment fund and penalties	1996	Royal Government of Cambodia	-
Environment	18	Sub-Decree on Water Pollution Control	This law defines the public water areas, sources and types of pollution, effluent discharge permit.	April 1999	Ministry of Environment (MOE)	There are two sets of standards, one for protected public water areas such as Lake Tonle Sap and Siem Reap River and another for discharge to sewers. There are no standards regarding the discharge of treated effluent to agriculture.
Environment	19	Sub-decree on Solid Waste Management (SWM)	This sub-decree stipulated guidelines on 1) hazardous waste management (HWM) and non-HWM and, 2)disposal of solid waste (SW), 3) importation and exportation of SW, and 4)penalty	1999	Ministry of Environment (MOE)	This sub-decree is generally without specific descriptions, and detailed regulations and guidelines have not been well prepared yet. No local authority has established a non-HWM plan for the short, medium and long-terms.
Environment	20	Sub-decree on Environment al Impact Assessment Process	This defines the scope of the EIA, responsible institutions, and requirements to be included in the EIA, review process and conditions for approval.	August 1999	Ministry of Environment (MOE)	-

Source: JICA Study Team

11.1.6 Local Financing

As discussed in Chapter 12 (refer to the next chapter), the major problems on government financing in Siem Reap are summarized as follows:

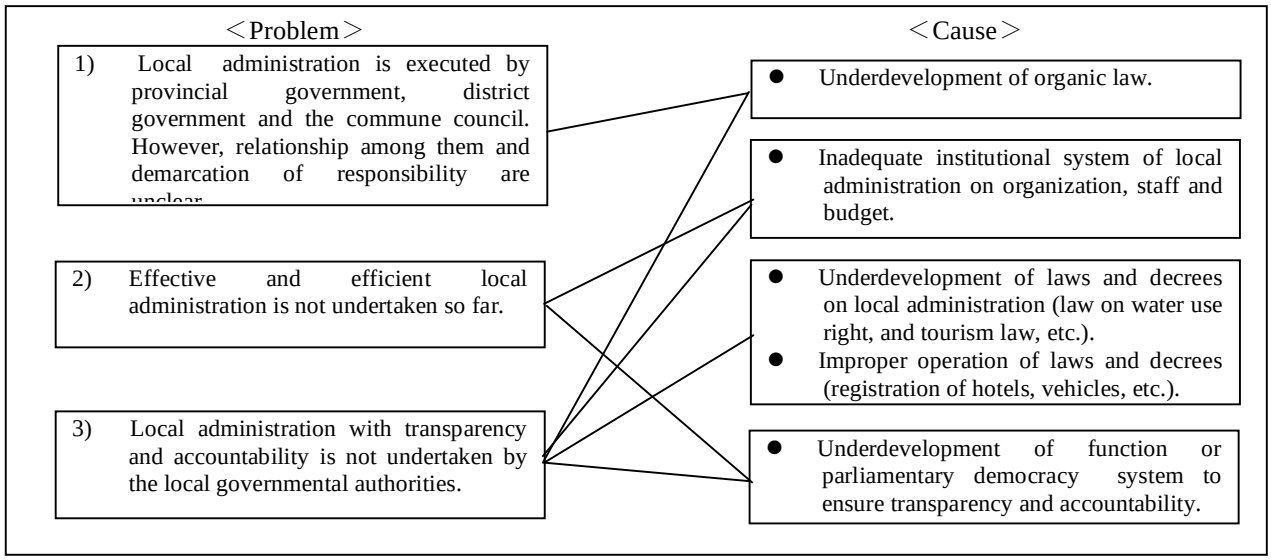
- Insufficient financial sources,
- Inadequate budget planning and implementation,
- Inadequate human resources, and

- Low level of transparency.

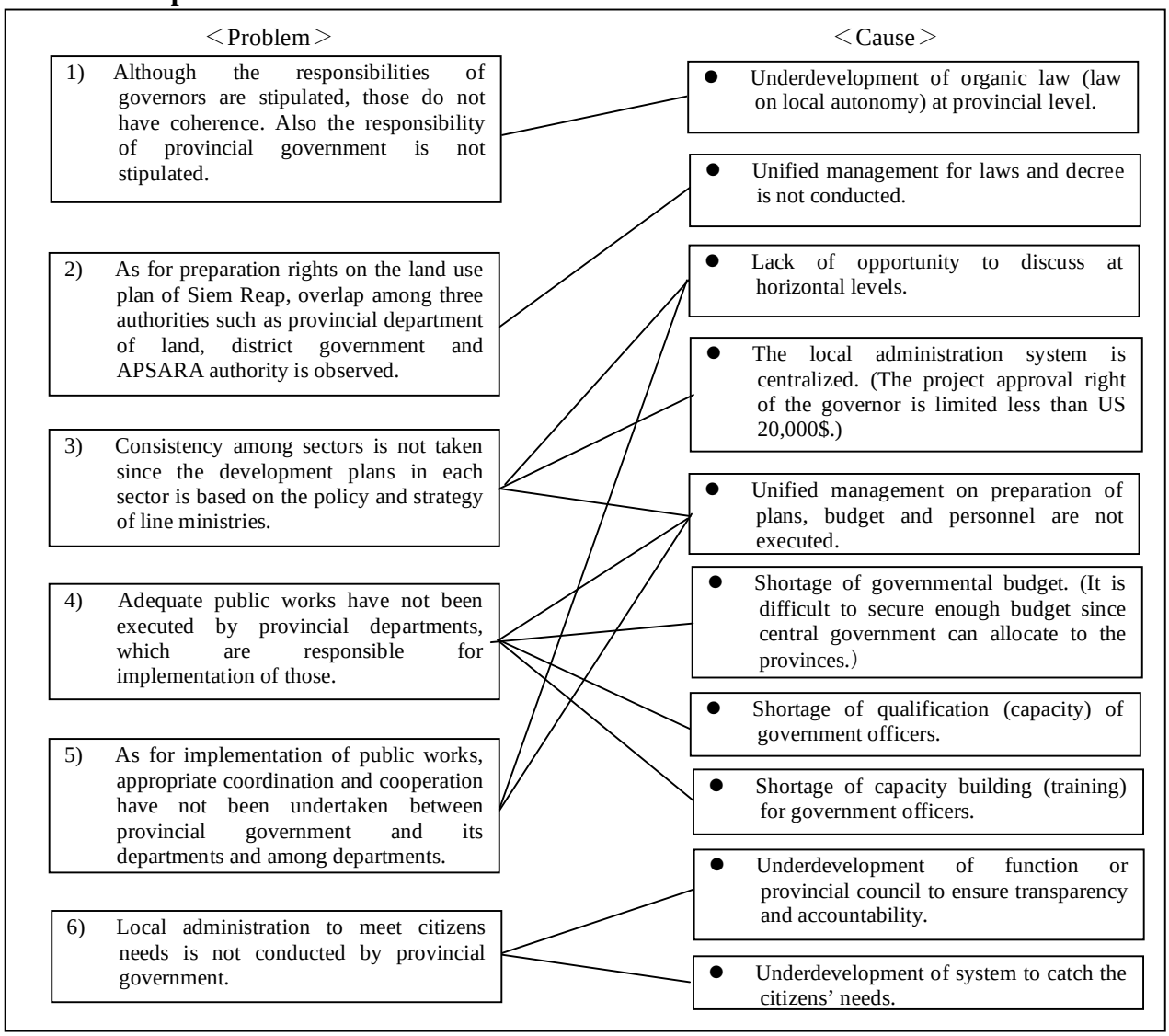
11.1.7 Issues on Local Administration

Based on previous sections (11.1.1-11.1.5), the problem structure on local administration is analyzed as follows:

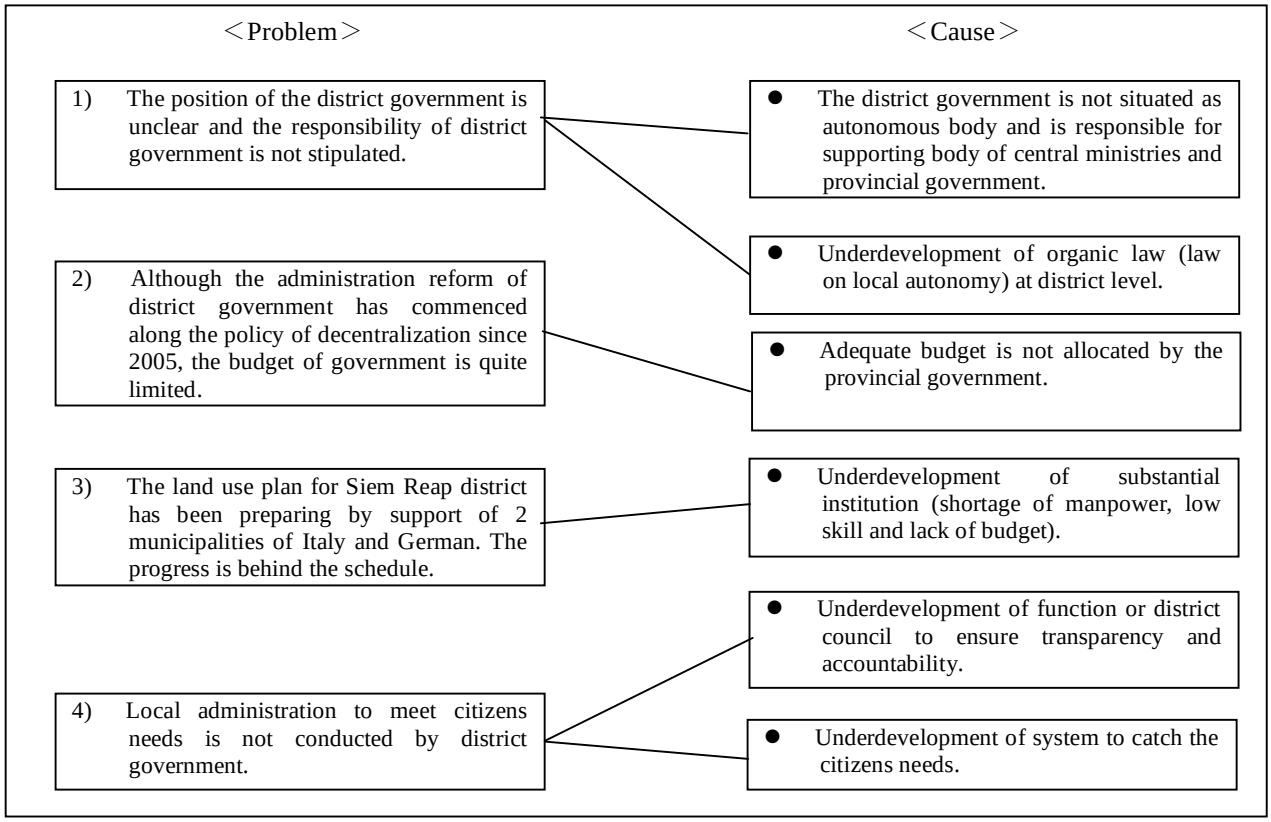
(1) Overall Problems and Causes on Local Administration in Siem Reap



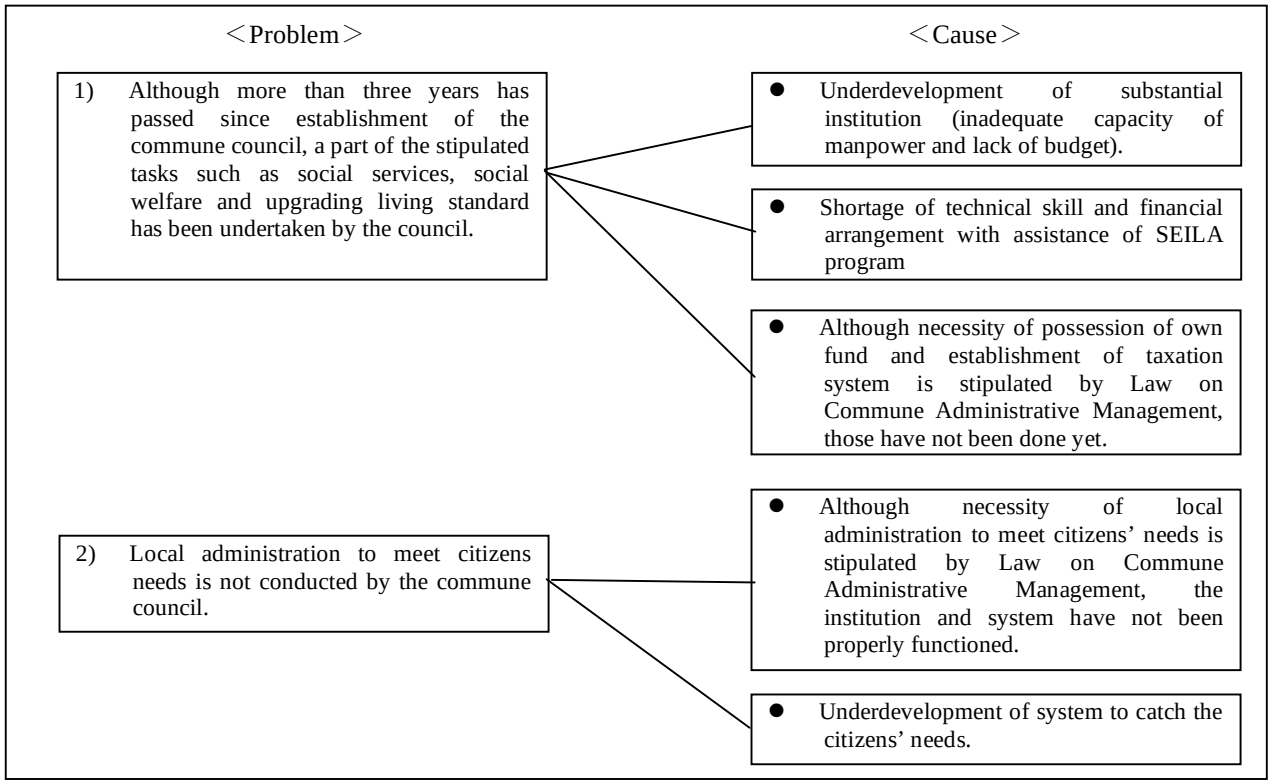
(2) Problems and Causes on Local Administration at Provincial Level of Siem Reap



(3) Problems and Causes on Local Administration at District Level of Siem Reap



(4) Problems and Causes on Local Administration at Commune Level of Siem Reap



11.2 Objective and Vision

Taking the issues and characteristics on local administration into consideration, the objective for local administration is set as follows:

Autonomous and Unified Local Administration for Siem Reap to Ensure Transparency and Accountability

The vision of local administration system is set along the aims of the Constitution of the Royal Government of Cambodia as follows:

(1) Establishment of autonomous and unified local administration system following the policy of decentralization and de-concentration, and
(2) Execution of local administration under parliamentary (council) democracy system in order to ensure transparency and accountability.

Based on these visions mentioned above, the features for local administration system are designated in the following figure.

It is scheduled that the organic laws at the provincial and district level, which have been prepared by the royal government, will be enacted in 2007 or 2008 through the parliament approval. After enactment of the organic laws (2009), the provincial council will be established.

The local administration will be obliged to continue by management of centralized system until realization of decentralization and council system. Local authority of provincial government shall be reformed toward more comprehensive administration to ensure transparency and accountability under the conditions mentioned above. 'Development Committee for Siem Reap' together with 'Siem Reap Development Fund' which is described in hereinafter will contribute to proper local administration. During the periods from 2006 to 2009, the following actions as the transition measures are recommended:

- Establishment of local authority to enable better unified administration,
- Capacity building for governmental officers,
- Execution and management of public works in strong cooperation with provincial departments, and
- Action for transition measures for creation of own fund.

After realization of decentralization and council system (2010), the local authority of provincial government shall be reformed toward autonomous and unified administration to secure transparency and accountability. The planned council system together with election system shall be functioned under the organic law. The following actions are recommended after 2010:

- Execution of autonomous and unified administration,
- Capacity building for governmental officers,
- Proper execution and management of public works, and
- Creation of own fund.

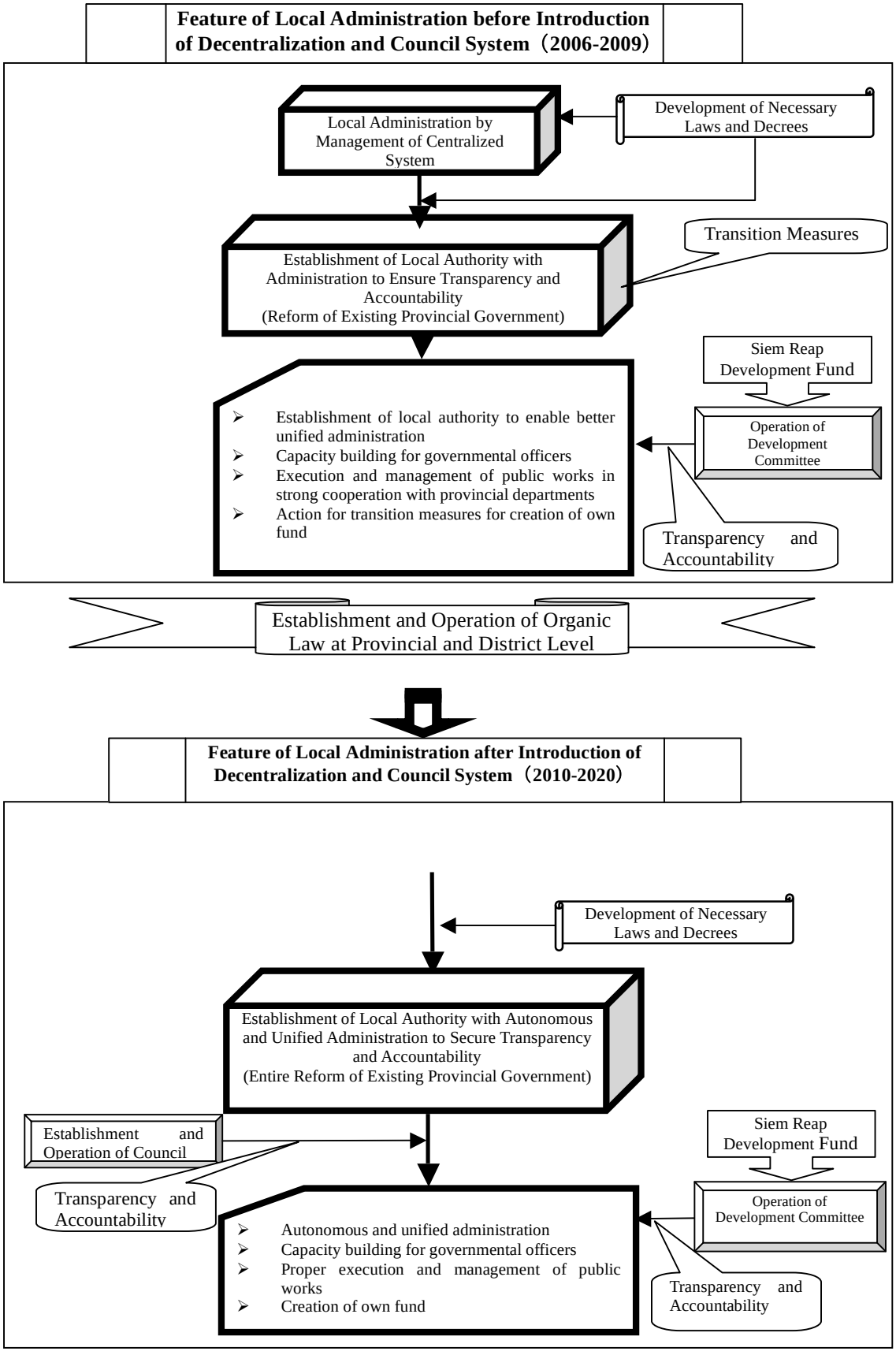


Figure III.11.6 Feature of Local Administration

11.3 Sector Approaches for Development Administration

Taking the objective, vision and features on local administration for Siem Reap into consideration, the following five sector approaches for local administration are set as follows:

Sector Approach-A: Execution of autonomous and unified administration following the decentralization and de-concentration reform,

Sector Approach-B: Strengthening provincial government of Siem Reap as an autonomous body for proper local administration,

Sector Approach-C: Ensuring adequate budget for unified administration,

Sector Approach-D: Establishment of parliamentary democracy system to play an important role of transparency and accountability, and

Sector Approach-E: Formation of legal framework for supporting unified administration.

(A) Execution of Autonomous and Unification of Administration following the Decentralization and De-concentration Reform

In the Strategic Framework of Decentralization and De-concentration Reforms (SFDDR) paper issued by the royal government of Cambodia, a concept of 'unified administration' is emphatically advocated as the principle of local administration system. Siem Reap can be treated a special city since Siem Reap has the great Angkor Park including Angkor Heritage, which contributes to not only the tourism sector development and earning foreign currency but also economic development of a whole country of Cambodia. It is necessary to introduce an autonomous body for the purpose of the efficient and effective administration for Siem Reap as a special city. A special power shall be delegated to local authority for unified administration of Siem Reap.

(B) Strengthening Provincial Government of Siem Reap as an Autonomous Body for Proper Local Administration

The responsibility of the local authorities at the provincial and the district levels is not clear because there exist no legal framework such as law on local autonomy. The draft of the organic law at the provincial and the district levels has been prepared by the Ministry of Interior in association with UNDP. It will take more than three years to enact the law. Local administration at the provincial and district level is quite inexperienced and inadequate at present. The provincial government takes part mainly in the logistic work and public work that have been carried out by provincial departments on the basis of centralized system. Also opportunity of information sharing among line departments at the provincial level is quite limited. A maximum of the development project to be approved by the provincial governor is officially USD 2.0 million. In order to improve the current conditions, it is indispensable to strengthen the provincial government of Siem Reap as an autonomous body in terms of mainly organization and capacity of the government officers for proper local administration.

(C) Ensuring Own Fund for Unified Administration

The governmental budget at the provincial and the district levels is in serious shortage. In line with the decentralization and de-concentration policy, the provincial governor is privileged to release decisions to directly appoint without going to meet the ministers. The provincial governors should act as the original owner of the budget of the departments of the province. In fact, however, it takes much time to accomplish the finance and budget reform, which is proposed by the royal government. Since the budget resources for local administration is not adequate at present, it needs for new financial arrangement system such as tax reform. Also it is necessary for unified administration of Siem Reap to ensure own fund as well as to encourage financial arrangement by means of introduction of new tax system and increase of local tax revenues.

(D) Establishment of Parliamentary Democracy System to Play an Important Role of Transparency and Accountability

According to the Strategic Framework of Decentralization and De-concentration Reforms (SFDDR) paper, the councils of the provincial and district administrations will be established based on the principle of free democracy to secure transparency and accountability by means of indirect elections at the nation-wide. The council system will be introduced after enactment of the organic law. As another way needs to apply at the early convenient before enactment of the law, it is recommended to effectively utilize the function of the proposed 'development committee for Siem Reap' for the purpose of ensuring transparency and accountability.

(E) Formation of Legal Framework for Supporting Unified Administration

Although the draft laws on water use right and tourism law have been already prepared, it takes long time for enactment due to its long process for making consistency among governmental ministries and other relevant stakeholders. Besides some decrees and sub-decrees, for instance, sub-decrees for registration of hotels and vehicles are properly functioned yet even if enacted. Because those laws and decrees are deeply linked with management of local administration, it is necessary to develop and enact the necessary legal framework for supporting unified administration.

11.4 Recommendations

11.4.1 Establishment of Development Committee for Project Approval

To deal with Sector Approach-A and Sector Approach-D, establishment of 'Development Committee for Siem Reap' is recommended. The aims of its Committee are to monitor the development of projects and facilities, to evaluate and approve the proposed development projects (including the concession projects), to coordinate the ministries and various donors concerned with development and environmental conservation of Siem Reap, and to ensure the transparency in procedures for project approval.

(1) Necessity of Development Committee

The necessity of Development Committee is described as follows:

- Shortage in provision of public services is already at a conspicuous stage especially in the environment-related facilities including sewerage and solid waste disposal. As mentioned in the previous section, public services and maintenance of facilities have not been provided properly due to some difficulties such as inadequate centralized system of local administration and lack of fund and so on. In order to establish unified administration, the provincial government shall be responsible for an initiative of implementation and management of public services. Also it is necessary to form an appropriate institutional framework and a managerial capacity both in the government and private sectors for the purpose of the steady supply of such public services and proper maintenance of facilities.
- Approval procedure for the projects did not ensure the transparency. Since the local administration system is centralized, some investors offer directly to the central government without any information to the provincial government. Suppose that the provincial government shall be reformed toward a unified local administration, it is not functioned under these circumstances.
- Lack of opportunity to discuss at horizontal levels is one of serious issues for proper local administration. It is necessary to create the opportunity with transparency.
- Under management of the governor of provincial government, there exist the committees on both of 'Efficiency of Administration of the Provincial Government' and 'Beautification of the Siem Reap City'. However, those committees are not for dealing with the integrated issues but with a part of them focusing on specific aspects. Particularly Siem Reap have faced the serious problems on disordered hotel construction, uncontrolled intake of groundwater, the low capacity for administration.

Taking the mentioned above into consideration, for the first step, 'A Development Committee for Siem Reap' shall be established to accelerate the implementation and maintenance of the programs/projects, including those proposed by the JICA Master Plan (M/P).

(2) Objectives

The objectives organization, functions are detailed below, the Development Committee for Siem Reap are to enable the provincial government to execute the proper local administration with transparency and accountability.

(3) Proposed Organization for Development Committee

The Development Committee for Siem Reap shall be managed under the initiative of the provincial governor of Siem Reap in collaboration with representative of central government as well as APSARA authority, in order to execute the unified local administration with transparency and accountability.

The members of the Committee are tentatively proposed as shown in the following table. International experts may be invited as an advisor. The representative of the resource persons and private sectors who will be appointed by the provincial governor may be invited as another advisor. A secretarial office shall be formed under the Development Committee.

Table III.11.11 Duty and Responsibility of the Governor and Deputy Governors of Provincial Government of Siem Reap

	Members	Position for Committee	Duty and Responsibility
I. Cambodian Government	1.Governor, Provincial government of Siem Reap	Chairman (Committee Member)	Final Decision Maker for Approval (Councilor)
	2.Vice Chairman, APSARA Authority	Committee Member	Councilor
	3. Director General, Ministry of Planning	Committee Member	Councilor
	4. Director General, Ministry of Tourism	Committee Member	Councilor
	5. Director General, Ministry of Environment	Committee Member	Councilor
	6. Director General, Ministry of Industry, Mine and Energy	Committee Member	Councilor
	7. Director General, Ministry of Rural Development	Committee Member	Councilor
	8. Director General, Ministry of Agriculture, Forestry and Fishery	Committee Member	Councilor
	9. Director General, Ministry of Water Resource and Meteorology	Committee Member	Councilor
	10. Director General, Ministry of Land Management	Committee Member	Councilor
	11. Director General, Ministry of Public Works and Transport	Committee Member	Councilor
II. International Donors	1. Representative, International Donors	Advisory Member	Advisor
III. Resource Persons and Private Sectors to be Appointed by the Provincial Governor	2. Representative, literate and private sectors	Advisory Member	Advisor

Source: JICA Study Team

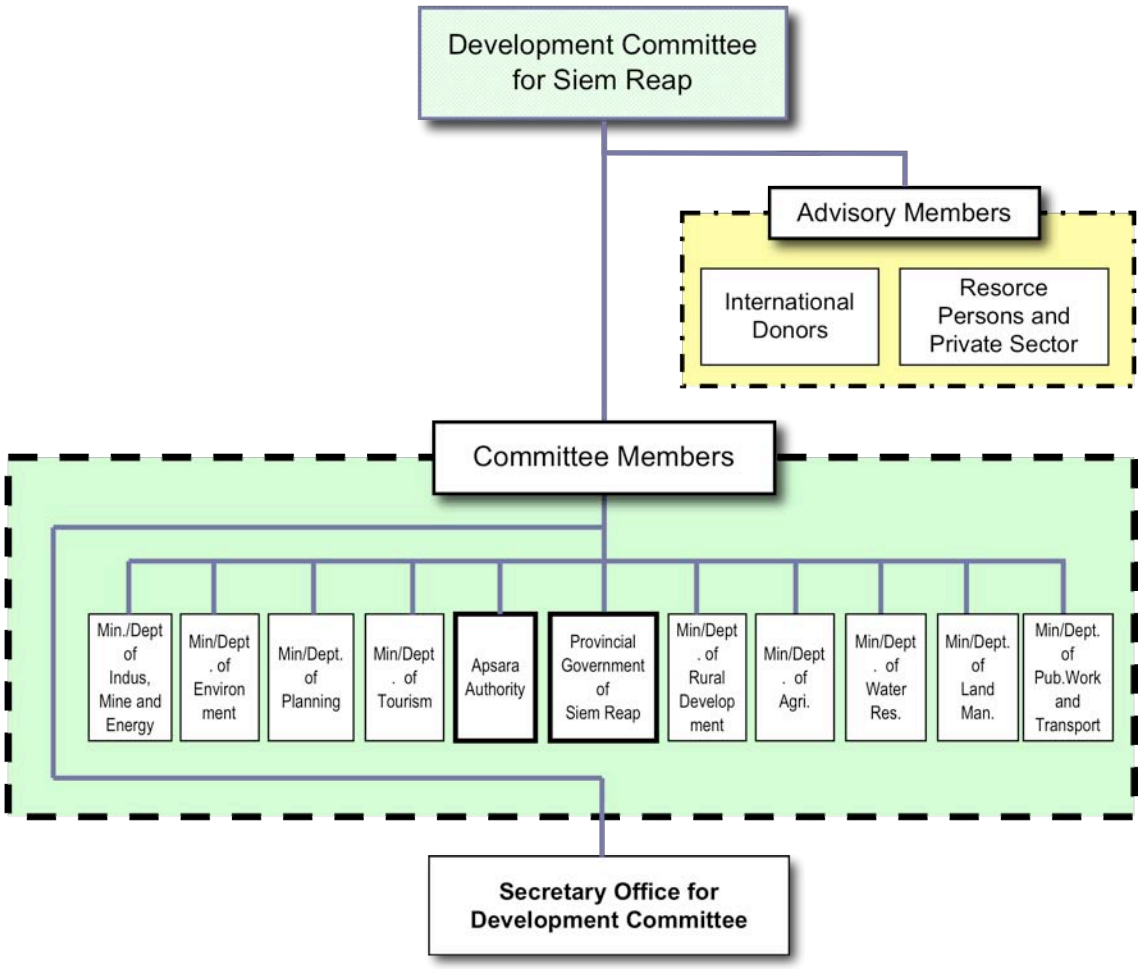


Figure III.11.7 Proposed Organizational Structure of Development Committee for Siem Reap

(4) Responsibilities and Duties

The responsibilities and duties of the Development Committee for Siem Reap are as follows:

(i) To screen and monitor development projects and facilities in order to create 'A Tourism and Cultural City with Water and Green Founded on the Khmer's Culture and the Wisdoms in Natural Resource Use',

(ii) To evaluate and approve the proposed development projects (including the concession projects),

(iii) To coordinate the ministries and various donors concerned with development and environmental conservation of Siem Reap, and

(iv) To maintain the transparency in procedures for project approval.

The projects to be evaluated and filed by the Development Committee for Siem Reap are tentatively set as follows:

- New development of hotels,
- New development of commercial area (complex),
- Development projects of infrastructure and utilities such as road, sewerage treatment, solid waste treatment for public spaces,

- Operation and maintenance (O&M) projects of infrastructure and utilities above as well as the concession projects, and
- Conservation and protection of environment such as cultural facilities, forest, green area, rivers, etc.

As a maximum of the development project to be approved by the provincial governor is officially USD 2.0 million at present, the decree shall be followed during the period from 2006 to 2009 (before decentralization and enactment of organic law at the provincial level). In order to substantially establish the unified administration, it is indispensable to abolish approval amount of the project for overall management of public service after 2010.

(5) Frequency of Regular Meeting

It is proposed that the regular meeting of the Development Committee for Siem Reap will be tentatively held quarterly (at every 3 months).

(6) Tasks of Secretary Office

For making the committee functioning well a standing secretary office is proposed to set up it is proposed that the tasks of the Secretary Office are tentatively divided into two parts as follows:

1) Logistic Works,

- Compilation and updating of proposed projects,
- Preparation of regular meeting for logistic administration such as scheduling of the regular meeting, invitation, arrangement of venue, financial arrangement, transportation arrangement for members,
- Recording of minutes of discussion etc., and
- Announcing the results including reply of evaluation results.

For the logistic work, 5-10 staff shall be allocated.

2) Technical Works

- Preliminary evaluation of the proposed projects, and
- Technical support such as documentation for evaluation, etc.

For the technical work, it is proposed that the working group consists of the representatives of the provincial government (deputy governors), directors of provincial departments and directors of APSARA authority with 25-30 authorized persons shall be established.

11.4.2 Organizational Reform of Provincial Government of Siem Reap

To deal with Sector Approach-A and Sector Approach-B, organizational reform of the provincial government of Siem Reap is recommended. The organizational structure of the provincial government shall be reformed to execute the unified administration and to strengthen the organization for the purpose of proper administration such as supply of public services effectively and efficiently.

(1) Study on Introduction for Autonomous Body for Siem Reap

Along the features for local administration system described in 11.3, the most

appropriate system shall be created. In this section, a study on introduction for autonomous body as the local administration system for Siem Reap is examined as follows.

Siem Reap can be treated a special city since Siem Reap has the great Angkor Park including Angkor Heritage, which contributes to not only the tourism sector development and earning foreign currency but also economic development of a whole country of Cambodia. For the purpose of the efficient and effective administration for Siem Reap as a special city, municipality or autonomous body should be introduced in the future.

It is very important for the management of local administration to compare possible alternatives for such municipality or autonomous body. The alternatives are set from the viewpoint of geographic boundary as follows:

- Alternative – 1: Existing provincial boundary;
- Alternative – 2: Existing boundary to enclose the three districts of Siem Reap, Puok and Prasat;
- Alternative – 3: Existing boundary of Siem Reap District; and
- Alternative – 4: Boundary to enclose an urban area in the center of Siem Reap District.

The boundaries under these alternatives are shown in the following map.

Table III.11.12 Comparison of Alternatives for Municipality or Autonomous Body

Alternative	Advantage	Disadvantage	Evaluation
Alternative – 1 (Existing provincial boundary)	- Enable to develop with a good balance between urban and rural areas. - High possibility of flexible administration in terms of development policy, planning, financial arrangement, and implementation within Provincial Government. - Efficient development and management can be easily realized because all the economic activities are undertaken within the province. - Urban-rural linkages such as waste water treatment and solid waste disposal can be easily accommodated.	- Public investment might be spread over the whole province (It is noted that this disadvantage can be settled by a clear development policy and/or by due financial allocation).	**A**
Alternative – 2 (Existing boundary for areas within 3districts)	- Enable to develop with a good balance between urban and rural areas within the three districts. - Efficient development and management can easily be realized because the urban/tourism economic activities are undertaken mostly within the three districts. - Urban-rural coordination for waste water treatment and solid	- Possibility of conflicts between urban and rural areas outside the three districts due to economic disparities. - Difficult to cooperate and coordinate with other local authorities.	**B**

	waste disposal can easily be accommodated.		
Alternative – 3 (Existing boundary for Siem Reap District)	- Governmental public work (investments) can be concentrated in the district. Rapid urban infrastructure development can be expected because the boundary is small. - No need to spend the governmental budget on rural areas.	- Negative impacts due to urbanization and concentration. - Difficult to develop with a good balance between urban and (outside) rural areas because the boundary is small. - High possibility of conflicts between urban and (outside) rural areas due to economic disparities. - Efficient development and management cannot be easily realized because all the economic activities are undertaken over the district. - May have conflicts with outside boundary areas when constructing solid waste disposal/ landfills. - Difficult to cooperate and coordinate with other local authorities.	**C**
Alternative – 4 (Boundary for area within urban center of Siem Reap District)	- Public works enable to invest intensively within the urban center. - Conspicuous increasing taxes revenue (per capita) because of taxpayers of big amount such as hotels owners and restaurants.	- Serious negative impacts due to urbanization and concentration. - Difficult to develop with a good balance between urban and (outside) rural areas because the boundary is quite limited. - High possibility of conflict between urban and rural areas due to income gap. - Efficient development and management can not easily be realized because all the economic activities are undertaken over the area. - Hard to find the land to develop some infrastructures such as waste water treatment plant and solid waste disposal/ landfills. - Difficult to cooperate and coordinate with other local authorities.	**C**

A : Most recommended administration system

B : Likely recommended administration system

C : Non-recommendable administration system

As a result of the comparison above, **Alternative – 1** (local administration within existing provincial boundary) is the most appropriate from the viewpoint of application of unified administration on implementation and management social services and infrastructure development.

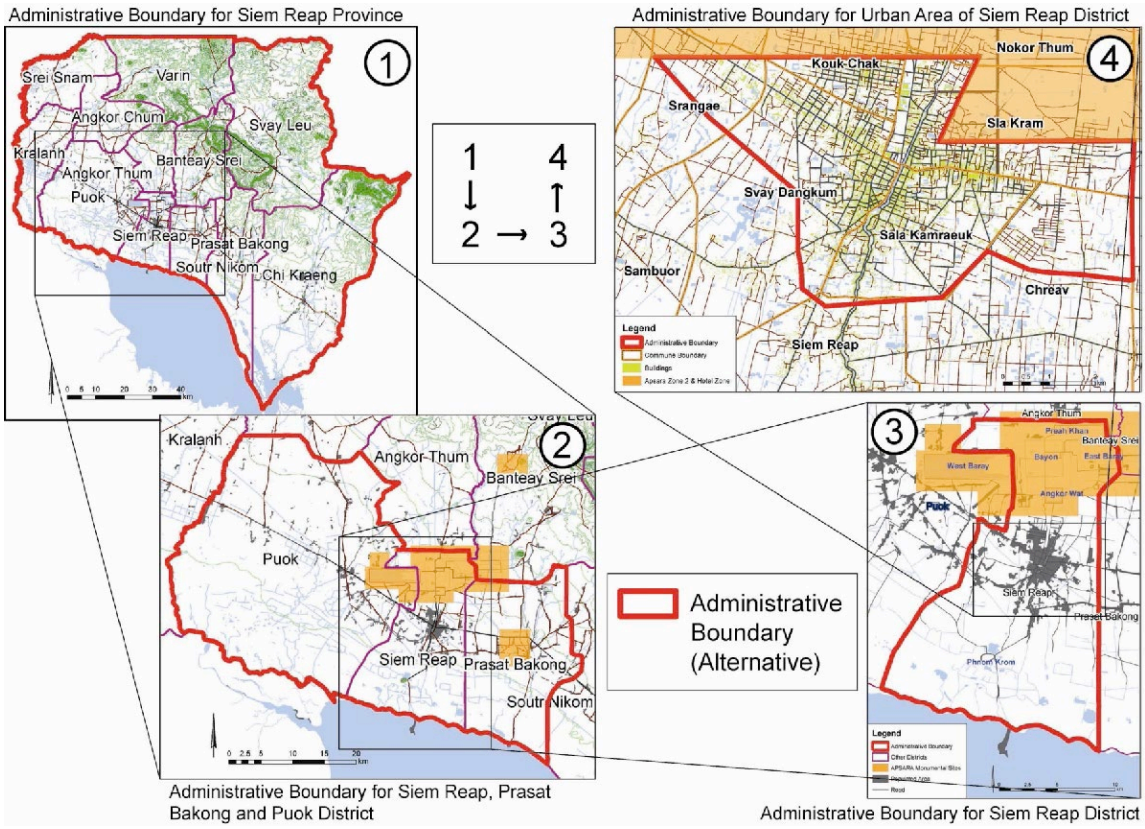


Figure III.11.8Map of Alternative Administration Boundary

A careful consideration needs to be given to the following aspects of the Alternative – 1:

1) Avoidance of Overlapping Function among the Governmental Authorities Concerned

As for preparation rights on the land use plan of Siem Reap, for instance, overlap among three authorities such as provincial department of land, district government of Siem Reap and APSARA authority is observed so far. Suppose unified administration for urban areas of Siem Reap is established, more serious overlaps might be seen among related local authorities. It is better for the unified administration to utilize effectively and efficiently the existing administration authority rather than to establish a new body for that, in order to avoid overlapping of function within governmental authorities concerned.

2) Following Acceleration of Decentralization and De-concentration Reforms

Under the decentralization and de-concentration policy, Local administration shall be delegated to the provincial governor. Following the reforms, the simple way to establish the unified administration system is that the provincial governor shall be a sole commander under control of parliamentary (council) democracy system. The parliamentary democracy system shall play an important role of transparency and accountability.

3) Flexible Local Administration

Within urban areas, there will be some difficulties in land acquisition or relocation in line with urbanization. Although it is difficult for limited administration body for urban areas to deal with these issues properly, wider administration body like provincial authority may settle within their administrative boundary. Also wider administration body can flexibly apply the development policy. For instance, a provincial development policy can be made in such a way that, at initial stage, public investments can concentrate on the urban areas by means of a larger amount of budget rather than that being possible under limited administration body.

4) Importance of Linkage between Urban and Rural Areas

Siem Reap is a special place for tourism sector development in Cambodia. How to make use of the tourism sector development for residents in rural areas and regional areas is one of the big subjects for Siem Reap. From this viewpoint, the following issues can be settled by a unified administration of provincial authority.

- Control of License Registration
  Many residents in rural areas finds work on the hotel business as staff work, the transport business as vehicles, motorcycles and tuk-tuk drivers, tourist guides business and construction works. Those license registrations shall be managed by not limited administration body but wider administration body like provincial authority.
- Economic Linkage between Production and Market
  Taking economic linkage between production in rural areas and market in urban areas into consideration, wider administration body like provincial authority can operate and manage easily to support both producers (mainly in rural areas) and consumers (mainly in urban areas).

(2) Organizational Reform of Provincial Government of Siem Reap

The organizational reform of provincial government is proposed as shown in the following figure. The reform shall be done step by step as below.

- Before enactment of organic law at provincial level (Step-1)
  Organization reform on the provincial government of Siem Reap (2006-2009)
- After enactment of organic law at provincial level (Step-2)
  Organization reform on the provincial government of Siem Reap (2010-2020)

In parallel with the implementation of nation-wide organization reform accelerating under decentralization and de-concentration reforms, the following special authority or power shall be delegated to the provincial government of Siem Reap for the purpose of establishing a unified administration system.

Necessary Special Authority or Power to Provincial Government of Siem Reap
(Step-1)

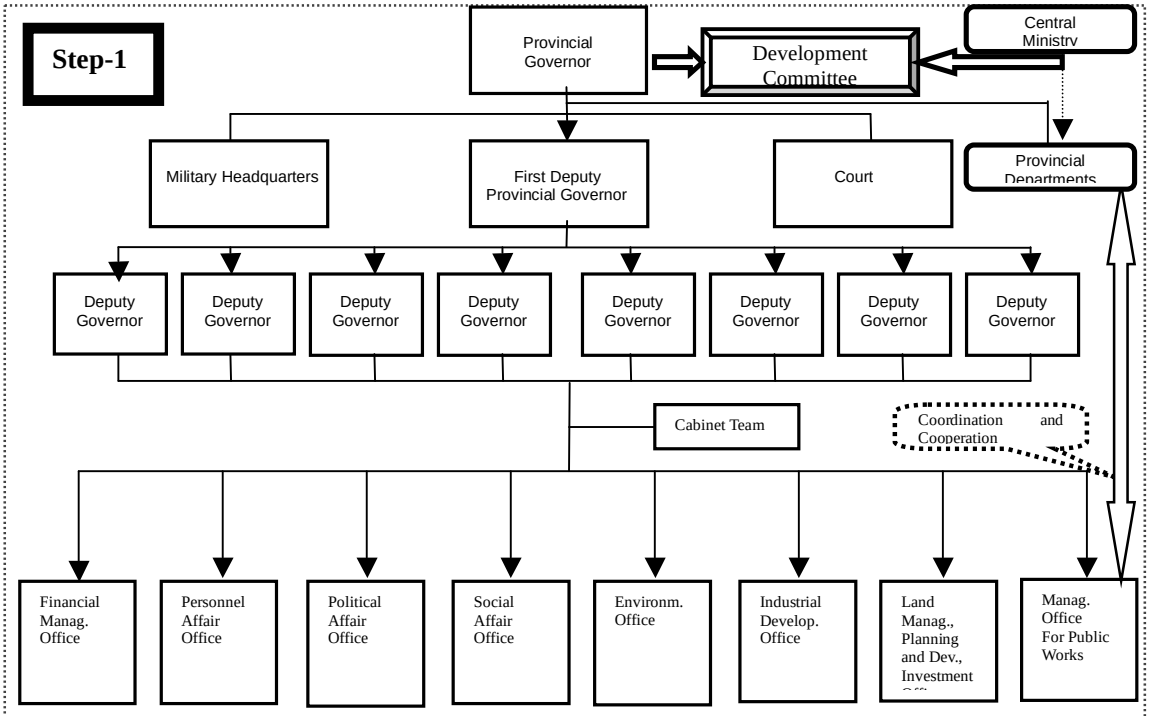
- Establishment of Development Committee: for unified administration and securing of transparency and accountability,
- Establishment of 'Siem Reap Development Fund': for secure own fund to invest and maintain in Siem Reap,

(Step-2)

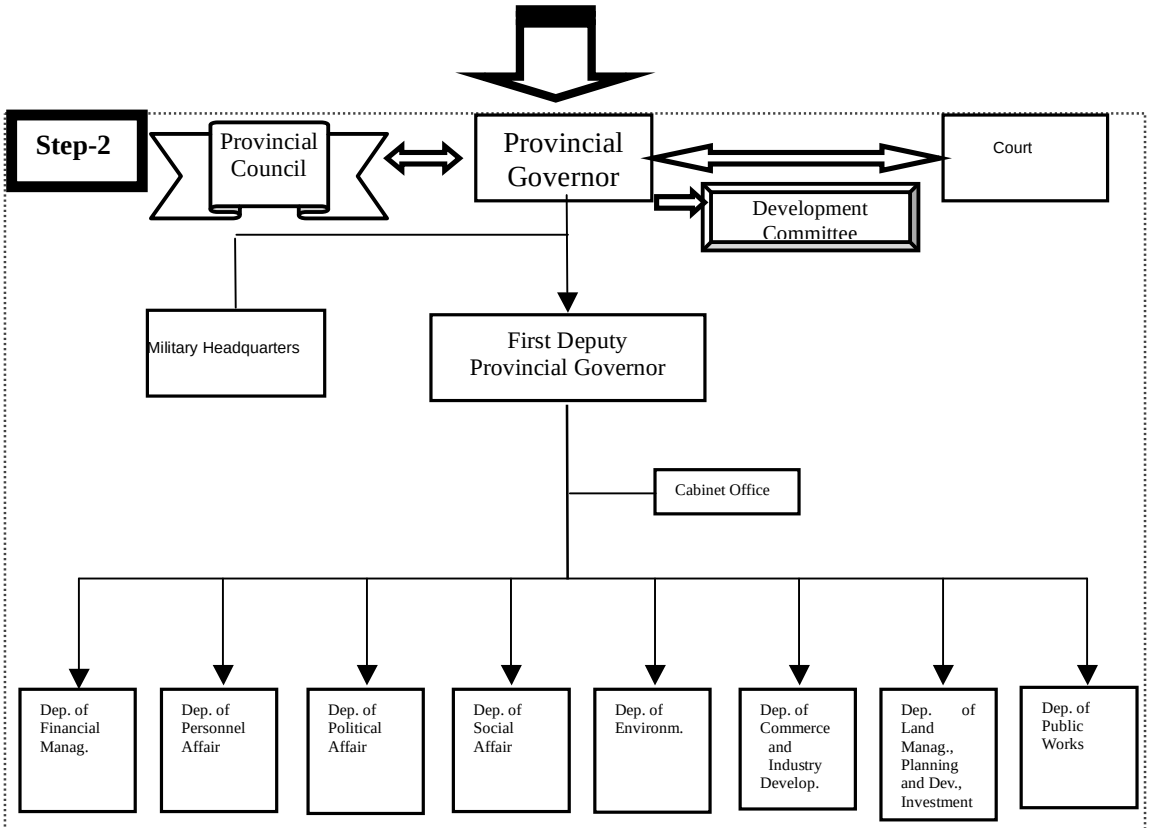
- Abolition of limitation of Approval Amount of Development Project (currently USD 2.0 million) : for overall management of public services by unified administration,
- Introduction of parliamentary (council) democracy system : securing of transparency and accountability
- The separation of the three branches such as the administrative, legislative and judicial branches of provincial government shall be created.

1) Step-1: Organization Reform of Provincial Government of Siem Reap (2006-2009)

Under the conditions of no organic law on the provincial government, the responsibilities of ten governors are stipulated in the sub-decree. Overlap of responsibility among the governors is observed at present as shown in the following table. Also the responsibilities of the governors are not integrated and not theoretical but too complicated at present.
The organization structure of the provincial government of Siem Reap shall be reformed to be integrated and improved based on the duties from a viewpoint of efficient works, and shall be formed as the implementation body of the public services. At the initial stage, the duplication for the responsibilities of the deputy governors shall be integrated and unified as the following table.



Proposed Organization Reform on Provincial Gov. of Siem Reap (2006-2009)



Proposed Organization Reform on Provincial Gov. of Siem Reap (2010-2020)

Table III.11.13 Recommendation on Responsibility for Organization Structure of the Provincial Government of Siem Reap

Overlap for Responsibility (at present)	Recommendation
● Urban planning ● Planning	● Urban and rural planning
● Training affair ● Personnel affair	● Personnel affair
● Electricity ● Energy	● Energy
● Public work ● Construction	● Public works
● Forestry administration ● Environment	● Environmental conservation
● Protocol of international guest ● Protocol of national guest and national ceremony	● Protocol of guest and ceremony

Consequently, the responsibilities of the governors are proposed as the following table. In order to execute proper public services, the integrated eight duties shall be allocated for the deputy governors.

- Land management, planning and development, investment,
- Management of public works,
- Industrial development,
- Environmental conservation,
- Social affair,
- Political affair,
- Personnel affair, and
- Financial management.

In line with eight duties of the deputy governors, each office shall be established for the purpose of substantial public services as a transit measure for establishment of further comprehensive departments. In implementing the organization reform, reorganization of the governmental officers shall be conducted without reduction of personnel.

The provincial government shall execute more proper local administration together with efficient operation of the Development Committee.

Table III.11.14 Recommendation on Responsibility of the Governor and Deputy Governors of Provincial Government of Siem Reap

Position	Responsibility (Mar. 2005 -Date)	Recommendation	
		Major Duty	Responsibility
1. Governor	Responsible for leading joint work in the Province, directly the politics, general administration, public order, social security, rural development and city development.	Overall Governance	Responsible for leading joint work in the Province, directly the politics, general administration, public order, social security, rural development and city development.
2. First Deputy Governor	Jointly responsible with the Governor to examine and discuss to decide various	Overall Governance (supporting to	Jointly responsible with the Governor to examine and discuss to decide various tasks in the Province

	tasks in the Province in accordance with principals of unanimity, consensus and jointly in charge of inspection and finance affairs.	Governor)	in accordance with principals of unanimity, consensus and jointly in charge of inspection and finance affairs.
3. Deputy Governor (A)	Responsible for land management, urban planning and construction, APSARA, trade, investment affair.	Land management, planning and development, investment	Responsible for land management, urban and rural planning and development, investment.
4. Deputy Governor (B)	Responsible for personnel affair, education affair, women affair, red cross, cults and religions.	Management of public works	Responsible for management of public works including transportation, airport, water resource and water supply, drainage and sewerage, mine and energy, post and telecommunication.
5. Deputy Governor (C)	Responsible for public work and transportation, airport, training affairs, protocol of international guest, international organization.	Industrial development	Responsible for tourism and resort, industry, agriculture, trade, culture and fine art.
6. Deputy Governor (D)	Responsible for tourism and resort, culture and fine art, election affair, protocol of national guest and national ceremony, NGOs.	Environmental conservation	Responsible for environmental conservation (forest, river, solid waste, groundwater), meteorology.
7. Deputy Governor (E)	Responsible for post and telecommunication, water resource and meteorology, agriculture, local administration.	Social affair	Responsible for education, health, red cross, women affair, social affair, veteran, and youth rehabilitation, penitentiary.
8. Deputy Governor (F)	Responsible for electricity, forestry administration, royal residence, health, national assembly and senate relations.	Political affair	Responsible for election affair, NGOs, judiciary affair, statistic affair, national assembly and senate relations.
9. Deputy Governor (G)	Responsible for social affair, veteran, and youth rehabilitation, industry, mine and energy, judiciary affair, penitentiary.	Personnel affair	Responsible for personnel affair including human resource development, local administration, protocol of guest and ceremony, international organization.
10. Deputy Governor (H)	Responsible for planning, environment, information, water supply.	Financial management	Responsible for financial management (budget, tax, etc.)

Source: Provincial Government of Siem Reap : Recommendation

2) Step-2: Organization Reform of Provincial Government of Siem Reap (2010-2020)

As described and studied in the previous section 11.4.2(1), the provincial governor shall be delegated the authority or the power for handling local administration for the whole province of Siem Reap and a sole commander under control of parliamentary (council) democracy system. During the stage, autonomous and unified local administration for Siem Reap to ensure transparency and accountability shall be formed by the initiative of the provincial governor. In order to achieve the objective, the following measures

should be undertaken by the royal government.

- All the provincial departments shall be under the control of the provincial governor under accelerating decentralization and de-concentration reforms.
- The limitation of approval amount (currently USD 2.0 million) of development project to be approved by the provincial governor shall be abolished for overall management of public services by unified administration.
- The parliamentary (council) democracy system shall be introduced to ensure transparency and accountability.

At the initial stage of Step-2, it is recommended that the eight offices shall be reformed to the departments to execute substantial public services as follows:

- Department of land management, planning and development, investment,
- Department of public works,
- Department of commerce and industrial development,
- Department of environment,
- Department of social affair,
- Department of political affair,
- Department of personnel affair, and
- Department of financial management.

Along the entire organization reform of the provincial government and departments, the reduction of the personnel can not avoid. From the viewpoint of ensuring employment for the governmental officers, the following measures are recommended.

- It is necessary to increase the governmental officers in the department of public works, since the substantial public works volume will be drastically changed.
- It is necessary to reallocate the staff for the secretary office of the proposed Development Committee.

11.4.3 Human Resource Development for Provincial Government Officers of Siem Reap

To deal with Sector Approach-A and Sector Approach-B, it is indispensable for the local governmental officers to improve the capacity on management and monitoring for public works.

The capacity of the provincial government of Siem Reap is not adequate for local administration in terms of management and operation for public services, because the provincial government takes part mainly in the logistic works. The public works have been carried out by the provincial departments under the limited conditions of personnel and budget. Besides the SEILA programs have been conducted mainly for rural development by the commune during the past ten years. The SEILA programs, however, might be integrated into the activities of Inter-Ministry Commission (ICC) operated by the initiative of Ministry of Interior after the year of 2006.

Also it is scheduled that JICA will conduct the technical cooperation on capacity building for local administration in Cambodia during the periods from 2006 to 2008 (or 2009) mainly for the purpose of disseminations and formation of preparation to take in decentralization and de-concentration reforms. In the technical cooperation by JICA,

training of trainers (TOT) method for the capacity building will be adopted and the training for the central government officers will be carried out at the initial stage. Then the trained central government officers will train the local government officers.

The recommendation of capacity building (training) programs for the local governmental officers in the short term is described as the following table on the basis of the needs of the government officers. It is desirable that the recommendation programs will be combined into the above mentioned technical cooperation program. In case that it is difficult to combine the program, it is necessary for other assistance for implementation of capacity building.

Table III.11.15 Recommendation on Capacity Building (Training) for Provincial Governmental Officers

Expected Public Services	Recommendation of Capacity Building (Training) Programs	Target of Capacity Building
1. Planing Urban MP and Planning Projects	● Planning of Projects based on MP	● Governors and Chiefs of Offices in Provincial Government (PG)
2. Implementation and Management of Public Works (projects)	● Project Management and Monitoring Method, and ● Project Evaluation	● Management Officers for Public Works in PG ● All Provincial Departments Officers
	● Method of Settlement for Land Conflict	● Land Management, Planning and Development, and Investment Officers in PG ● Provincial Department Officers of Land Management, Urban Planning, Construction and Land Title
3. Administration Works	● Preparation of Database for Provincial Government Officers and Department Officers, ● Statistical Database for Investment and Its Procedure, and ● Registration of Enterprises by Computer.	● Land Management, Planning and Development, and Investment Officers in PG ● Provincial Department Officers of Land Management, Urban Planning, Construction and Land Title
3. Financial Aspect	● Technical Skill for Budget Management by Computer.	● Financial Management Officers in PG ● Provincial Department Officers of Economy and Finance
4. Basic Administration Skills	● Data Management and Analysis, ● Statistical Analysis, ● Computer Skills (Maintenance, Utilization), ● English Conversation, and ● Management of Documents.	● All the PG Officers ● All Provincial Departments Officers
5. Dissemination of Decentralization and De-concentration Reforms*)	● Understanding the organic law, ● Preparation of Council System, ● Preparation of Election, ● Understanding Organization and Financial Reform,	● All the PG Officers ● All Provincial Departments Officers

*) It is expected to be conducted by the planned JICA technical cooperation on capacity building for local administration in Cambodia.

Source: JICA Study Team

In executing the local administration for public services including the development project, the following information management is essential and one of important subjects for local administration of Siem Reap. These information is very much concerned with the urban development such as road development, water supply facilities and electric power supply facilities, which Siem Reap faces some issues.

- Land management,
- Enterprises information, and
- Vehicles information.

Therefore, it is recommended to prepare the following database under implementing the capacity building for the governmental officers.

Table III.11.16 Necessary Database for Local Administration

Items	Necessary Inventories
1. Land	a) Ownership b) Term of ownership c) Land area (m2) d) Location in the GIS map e) Boundary f) Unit price of land (US$/m2) g) Evaluation result by the real estate appraisers h) Transfer experience
2. Enterprises	a) Ownership b) Term of ownership c) Category (hotel, guesthouse, restaurant, others) d) Land area (m2) e) Location in the GIS map f) Turnover amount (US$/year) g) Water use volume (m3/day) h) Electric power (kW or kWh) i) Financial statements j) Numbers of employees k) Capacity of facility (numbers of rooms for hotels, numbers of seats for restaurants) l) Evaluation result for financial statements by the certificated public account
3. Vehicles	a) Ownership b) Term of ownership c) Category of business (rental cars, bus companies, motorcycles, tuk-tuk) d) Registration No. e) License plate for vehicles f) Turnover amount (US$/year) g) Financial statements h) Numbers of employees i) Numbers of vehicles

11.4.4 Necessary Development and Efficient Operation of Laws and Regulations

To deal with Sector Approach-A and Sector Approach-E, it is necessary to develop the underdevelopment of the laws and decrees and integration of the overlapping decrees concerned with local administration.

Firstly the legal framework on local administration at province and district level shall be formed by the royal government. As the draft of organic laws has been prepared by the

Ministry of Interior, it is expected to enact the laws through parliament (national assembly) approval at the early convenient. Introduction of parliamentary (council) democracy system, election system and the responsibility of local administration body such as the provincial and district government together with the method how to ensure transparency and accountability shall be stipulated in the laws. Under the law, proper local administration shall be functioned along other laws and decrees concerned.

In particular the following measures shall be undertaken by the central government at the early convenient.

1) Integration of the Rights on Preparation of Land Use Plan

As mentioned before, overlap of the rights on preparation of land use plan among provincial department of land under provincial government, district government of Siem Reap and APSARA authority is observed at present.

It is recommended that the rights on preparation of land use plan shall be integrated to the sole organization of the provincial government.

2) Enactment for Underdevelopment of Important Laws Concerned with Local Administration

The law on water resources management inclusive of water use right and the tourism law have not been enacted even if the drafts had been submitted to the national assembly. The law on water resources management has not been approved by the National Assembly due to very slow procedure. As for the tourism law, it is said that it needs to make consistent with other related laws and regulations in spite of the Prime Minister signed the contents on June 11, 2004. Since the laws are essential, the procedure for enactment of the laws shall speed up.

3) Necessity of Development of Other Laws Concerned with Local Administration

Even if laws and decrees were enacted, the issues on inadequate description, improper operation and overlapping are observed at the present. Although each ministry is responsible for preparation of decree and sub-decree, no organization has been managing and coordinating overall decrees and sub-decrees. In order to develop and improve the conditions, the legal framework and each law and regulation shall be managed and unified by the sole organizational body.

11.4.5 Financial Budget Reform for Unified Administration

To deal with Sector Approach-A and Sector Approach-C, it is necessary to ensure adequate budget for unified administration of the provincial government.

As discussed in Chapter 12 (refer to the next chapter) in detail, the following three strategies are suggested as follows:

- Increase financial resources of the provincial government,
- Improve budget planning / implementation and human resources, and
- Enhance transparency associated with government financing.

Under the strategies, the peculiar ways are (i) introduction of new taxes/charges such as accommodation tax, groundwater pumping charge and property tax, and increasing

patent tax rates for the service sector, (ii)earmarking a certain percentage of total entry fee of Angkor Park to urban infrastructure development in Siem Reap, and (iii) creation of 'Development Fund for Siem Reap'.

The proposed Development Committee may smoothly coordinate and manage proper implementation and maintenance of infrastructure in Siem Reap by the initiative of the provincial governor, when the above mentioned financial budget reform be realized.

11.5 Schedule for Implementation

The schedule for implementation of recommendations on strengthening local administration is expected as shown in the following figure.

- LA-1 : Establishment and Operation of Development Committee for Project Approval (for Sector Approach-A&D): 2006-2020
- LA-2(a) : Organizational Reform of Provincial Government in Step-1 (for Sector Approach-A&B): 2006-2009
- LA-2(b) : Organizational Reform of Provincial Government in Step-2 (for Sector Approach-A&B): 2010-2020
- LA-3 : Human Resource Development for Provincial Government Officers(for Sector Approach-A&B): 2006-2020
- LA-4 : Necessary Development and Efficient Operation of Laws and Regulations (for Sector Approach-A&E): 2006-2020
- LA-5 : Financial Budget Reform for Unified Administration (for Sector Approach-A&C): 2006-2010

11.6 Priority Program

Among the recommendations on strengthening local administration, the following two programs are treated as the priority programs as shown in Table III.11.17 and 11.18, respectively.

- LA-1 : Establishment and Operation of Development Committee for Project Approval (for Sector Approach-A&D): 2006-2020
- LA-3 : Human Resource Development for Provincial Government Officers(for Sector Approach-A&B): 2006-2020

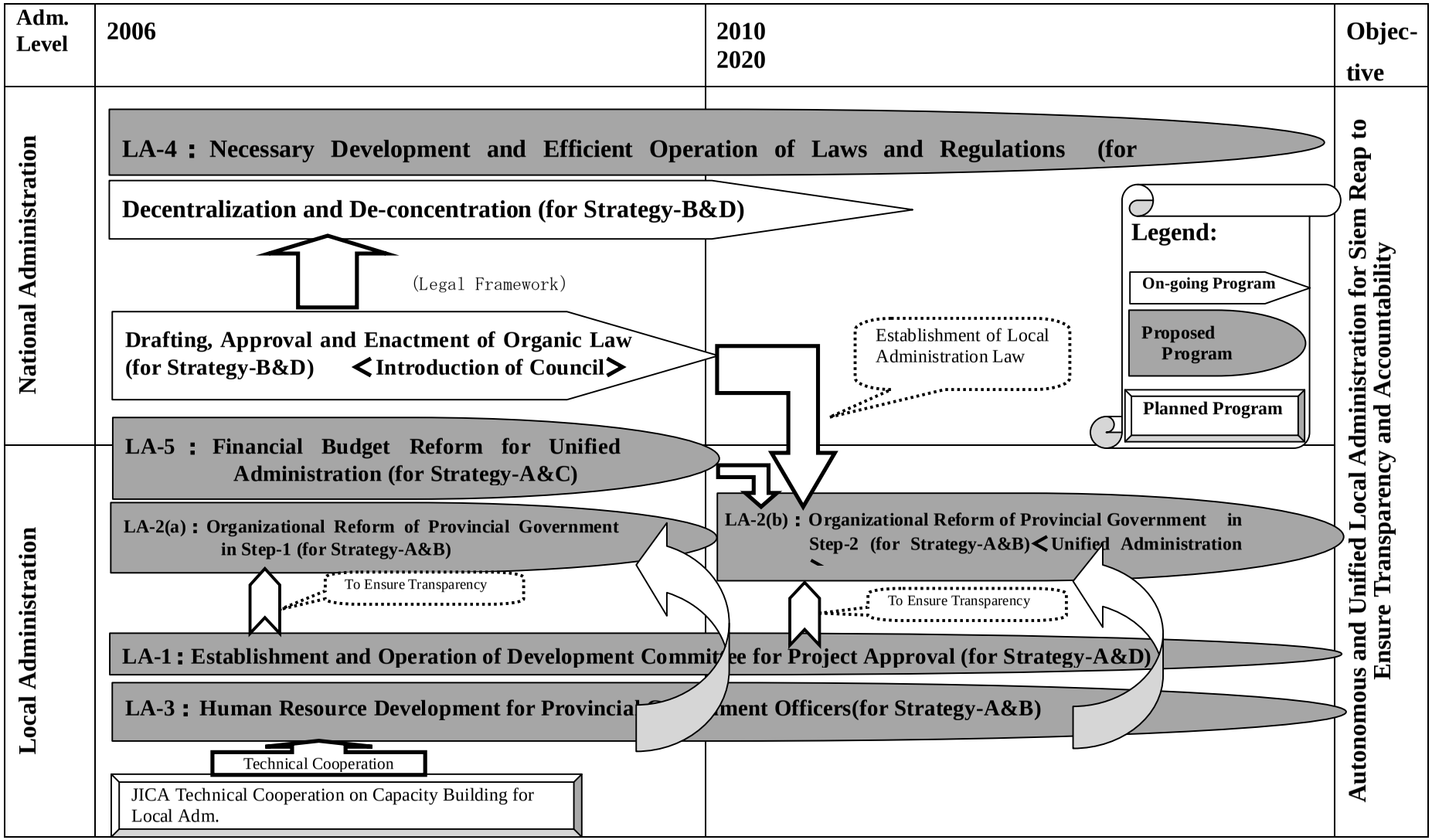


Figure III.11.9 Implementation Schedule for Recommendations on Strengthening Local Administration