CHAPTER 5: PROGRAMMING, FINANCING AND MANAGEMENT FOR THE IMPLEMENTATION

5.1 Institutionalization of the Master Plan

Preah Sihanouk at the center of Coastal area is one of the three cornerstones of Cambodia forming the Development Triangle of Cambodia, together with Phnom Penh as the capital, Siem Reap as the tourism center. Preah Sihanouk is sometimes referred to as the head of Dragon, in the context that the dragon, representing Cambodia, must raise its head first when it flies. When Cambodia is moving towards economic development, Preah Sihanouk must act as an engine of development. Also in this context, the previous JICA Study was devoted for the regional development of the area between Preah Sihanouk and Phnom Penh as the Growth Corridor of Cambodia.

Thus the implementation of the master plan for Preah Sihanouk will be of crucial importance to the development of Cambodia. This chapter illustrates the programming, financing and management of the implementation.

5.1.1 Institutionalization Process for Provincial/City Master Plans and Land Use Plans

It is legally stipulated that the provincial/city master plan and its land use plan shall be drafted by the respective local governments, and that the draft plans shall be evaluated at the National Committee for Land Management, Urban Planning and Construction, which is the inter-ministerial committee. The law has been enacted in 1994, but it is fact that none of master plans and/or land use plans has been authorized based on such a mechanism since the law was enacted, although a number of draft plans have been presented to the ministry by provincial government. This means that no legally powerful land use plans yet exist in the country, although many draft plans can been seen, and that no plan is yet effective so far to enforce to lead any land use and regulate land developments toward a deliberated and appropriate direction. This situation is unfortunate in a sense that very important governance has lacked in the entire national administrative system.

It seems that some reasons lie behind this situation such as: i) a lack of planning capacity of the relevant local government staffs in terms of both the personnel quality and quantity; ii) a shortage in planning staffs at the national government to expedite the formulation of master plans and land use plans at all provincial level; iii) an insufficient progress of the decentralization policy in terms of funding the master and land use planning; and iv) a lack of total coordination among relevant stakeholders for development administration both at the national and local levels.

The Ministry of Land Management, Urban Planning and Construction (MLMUPC) has prepared a planning manual of how to formulate a master plan and land use plan at the provincial level, employing a participatory planning approach. As this manual is assessed relevant and appreciable from the professional standpoint, this manual needs to be further defused and studied by provincial governments. However, it should be commonly noted that the urban and land use planning itself is of a highly sophisticated professional work, so local government officials alone cannot all manage it.

Professional consultants for planning work are also needed to be fostered through on-the-job training in collaboration with the donor community.

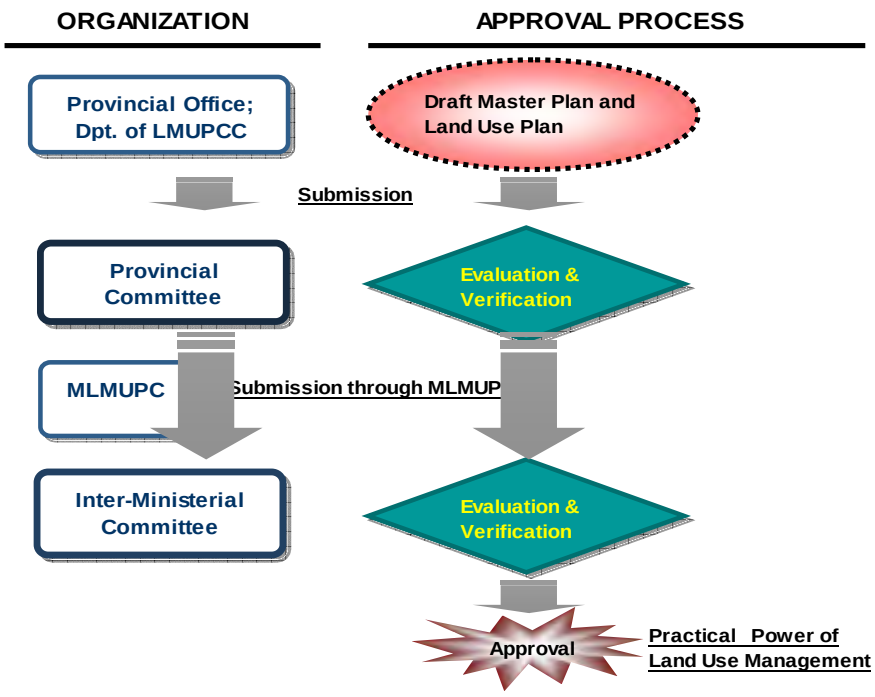
The process of institutionalization needs to be refined so as to be more practical, based on the existing legal framework. Figure 5.1.1 shows a stream of the institutionalization process of provincial/city master plan and land use plan, once those are drafted by Department of Land Management, Urban Planning, Construction and Cadastre (DLMUPCC). This stream is based on the current legal framework. In order to functionalize this stream, the important role of "provincial committee" should be noted under the on-going decentralization process. The provincial committee shall play a role of representing the provincial people's wills as well as provincial development policies and strategies, and only the committee is endowed with a political power to convince the national government. In this regard, it is desired that the provincial committee shall be organized at the initial stage of the planning work so as to monitor the planning process and provide necessary coordination among stakeholders.

Once draft plans are approved by the provincial committee, those plans shall be submitted to MLMUPC for its technical clarification, and it is regulated that MLMUPC will submit the clarified plans to an Inter-ministerial Committee, which is a national consultative committee, for its final approval. However, it is found that a crucial problem lies on setting up such a national committee which is functional, practical and capable enough to officially evaluate the draft plans. Also, there are no clear-cut criteria for the committee to make a rational decision of "pros or cons" on the draft plans, instead of a "political favor."

Currently, there exists a "Council of Land Policies (CLP)" along with MLMUPC for authorization of land registration and resolve land management issues. It is recommendable to reinforce this council in such a way that the council can address long-term economic, social and spatial development policies over the country and will be capable of providing a guidance on provincial development framework under the national policy. Therefore, for the regional development issues of Coastal area, the facility of this council shall be transferred to the Coastal Area Program Coordination Body (CAPCB), proposed in Section 6.2 of Book I, in the future. It is recommended that CAPCB shall have a permanent secretariat office to monitor the progress of provincial/city master planning as well as provide policy-consultations from the national viewpoint for provinces which are drafting their master plans and land use plans. The members of CAPCB is described in detail, in 6.2.2 of Book I..

It is expected that by strengthening such an inter-ministerial committee, the evaluation process for official approval at the national level will smoothly and efficiently progress with minimizing policy-gaps between national and provincial governments. Moreover, once the committee issues an approval to the draft provincial plans, the draft will be the officially committed plans, given the endorsement of Prime Minister's office. After all this process is cleared, the plans are no longer merely a drawing, but a powerful administrative tool to control and/or manage the land use development and environmental protection in practice.

Without such improvement of the total system for institutionalization of provincial/city master plans and land use plans as mentioned above, the governance for the growth management and land use management would be damaged, thereby resulting in disorderly development over the nation.



Source: JICA Study Team

Figure 5.1.1 Institutionalization Process for Provincial/City Master Plans and Land Use Plans

5.2 Financing Capacity of Provincial Government

The financial capacity of the provincial government is currently too limited to implement the infrastructure projects as locally required, therefore the infrastructure development and public service provisions at the provincial level are greatly dependant on the central government. Under the on-going decentralization process, the budgetary capacity of provincial governments should be further strengthened, and this issue must be crucial to structure a national development mechanism over the country.

5.2.1 Provincial Revenue of the Preah Sihanouk Province

Looking into the provincial budgetary revenue of Preah Sihanouk in 2009, as shown in Table 5.2.1, the total revenue was recorded at about 7.27 billion Riels (or USD 1.82 million) in the actual term, instead of 4.24 billion Riels (or USD1.06 million) in the nominal term based on the Financial Law. The actual revenue exceeds the budgetary framework based on the Financial Law. This often occurs, depending on the performance of actual local tax collections.

As seen in Table 5.2.1, the tax-based revenues share 88.1% of the total revenue at the actual term. Major sources of tax revenues are: (1) Stump duty for inheritance tax (54.4% of the total) ; (2) Tax on transportation and vehicles (15.6%) ; (3) Tax on undeveloped land (9.3%); and (4) Tax on accommodation (4.1%).

Whilst, non-tax revenues share 11.9% of the total revenue, including major sources of: (1) Endowments from the State Government (8.7%); (2) Income from land for rent (1.7%); and (3) Rental income from buildings (1.2%). Others are all very marginal income sources.

Thus, the provincial government revenue of Preah Sihanouk depends largely on the stump duty of inheritance tax, and not necessarily on the taxes on land and properties, although the local government revenue is commonly dependant on such taxes on immovable properties in many countries.

The per capita Preah Sihanouk provincial government revenue in 2009 is calculated at approximately USD8.00, which is equivalent to about 1.0% of the per capita Gross National Income in the same year. For a reference, the case of Japan, the per capita local government revenues accounted for about 11~12% of that of the national level[1]. It can be said that the financial capacity of the local government seem comparatively very weak in the Cambodian administrative system.

Table 5.2.1 Preah Sihanouk Budget Revenue (2009)

Chapter	Account	Sub-Account	Discription	2009			2009			
				Financial Law Beginning Year	US$	Share (%)	Actual Implementation	US$	Share (%)	US$ Per Capita
			1	2	2		3	3		4
Total Budget Revenue (I+II)				**4,240,000,000**	**1,060,000**	**100.0%**	**7,265,762,191**	**1,816,441**	100.0%	8.00
Type1: Tax revenue				**2,530,000,000**	**632,500**	**59.7%**	**6,401,960,397**	**1,600,490**	**88.1%**	7.05
70			**Tax revenue**	**2,530,000,000**	**632,500**	**59.7%**	**6,401,960,397**	**1,600,490**	**88.1%**	7.05
	701		**Tax on Heritage**	**1,650,000,000**	**412,500**	**38.9%**	**4,626,021,708**	**1,156,505**	**63.7%**	5.09
		7011	Stamp Duty: Inheritance tax	1,300,000,000	325,000	30.7%	3,952,431,685	988,108	54.4%	4.35
		7012	Stamp Duty: Death Tax							
		7013	Tax on undeveloped land	350,000,000	87,500	8.3%	673,590,023	168,398	9.3%	0.74
	702		**Tax on specific property**	**25,000,000**	**6,250**	**0.6%**	**39,610,240**	**9,903**	**0.5%**	0.04
		7021	Public lighting tax	25,000,000	6,250	0.6%	39,610,240	9,903	0.5%	0.04
	703		**Taxes on specific goods and services**	**55,000,000**	**13,750**	**1.3%**	**328,661,420**	**82,165**	**4.5%**	0.36
		7031	On accommodation	35,000,000	8,750	0.8%	299,105,505	74,776	4.1%	0.33
		7032	On Slaugthering	20,000,000	5,000	0.5%	29,555,915	7,389	0.4%	0.03
	704		**Taxes on Propery Utilization or on implementing action**	**800,000,000**	**200,000**	**18.9%**	**1,407,667,029**	**351,917**	**19.4%**	1.55
		7041	On patent	200,000,000	50,000	4.7%	270,709,600	67,677	3.7%	0.30
		7042	On Transportation ans other all kind of vehicles	600,000,000	150,000	14.2%	1,136,957,429	284,239	15.6%	1.25
		7043	On Electricity Supply of private enterprise in Province-City							
Type2: Non-tax revenue				1,710,000,000	427,500	40.3%	863,801,794	215,950	11.9%	0.95
72			**Income of state property**	**121,000,000**	**30,250**	**2.9%**	**122,200,000**	**30,550**	**1.7%**	0.13
	721		**Rental income from land**	121,000,000	30,250	2.9%	122,200,000	30,550	1.7%	0.13
		7211	Mining concessions	5,000,000	1,250	0.1%	6,200,000	1,550	0.1%	0.01
		7212	Store Rental in the market							
		7213	Income from Car Parking	81,000,000	20,250	1.9%	81,000,000	20,250	1.1%	0.09
		7214	Income from machine boat parking	35,000,000	8,750	0.8%	35,000,000	8,750	0.5%	0.04
73			**Income from Sale of goods and services**	**329,000,000**	82,250	7.8%	**107,441,794**	26,860	1.5%	0.12
	731		**Public enterprises- administration and property service**							
	732		Income from admint. Management	38,000,000	9,500	0.9%	21,499,694	5,375	0.3%	0.02
		7321	Cadastre fee	22,000,000	5,500	0.5%	15,171,494	3,793	0.2%	0.02
		7322	Construction fee		0		6,328,200	1,582	0.1%	0.01
		7323	Income for administration work							
		7324	Income from admint permits							
		7328	other admint revenue	16,000,000	4,000	0.4%		0	0.0%	0.00
	733		**Rental income from buldings**	291,000,000	72,750	6.9%	85,942,100	21,486	1.2%	0.09
		7331	Rental income from slaugthering place		0	0.0%	4,192,100	1,048	0.1%	0.00
		7332	Rental income from sales of goods and service in the market							
		7333	Rental income from dock or ferry dock							
		7334	Rental income from fishing place							
		7335	Rental income from everyday collecting fee in the market	291,000,000	72,750	6.9%	81,750,000	20,438	1.1%	0.09
74			**Fines and penalties**							
	741		Income from fines and penalties							
75			**Subsidies-grants**	**1,260,000,000**	315,000	29.7%	**634,160,000**	158,540	8.7%	0.70
	751		Endowment for the process that is supported by state budget	1,260,000,000	315,000	29.7%	634,160,000	158,540	8.7%	0.70
	752		Income from the distribution by state on customes' penalties							
77			**Other revenue and exceptional revenue**							
	775		from sale of fixed asset							

Source: Preah Sihanouk, Kingdom of Cambodia
Notes: Assumed Exchange Rate: 4,000 Riels/USD

[1] The per capita GDP in Japan was recorded at about USD40,000 in 2009; and the per capita local government budgetary revenues accounted at about USD4,7000 in the same year. So, the local government revenues shared 11.8% of the national GDP.

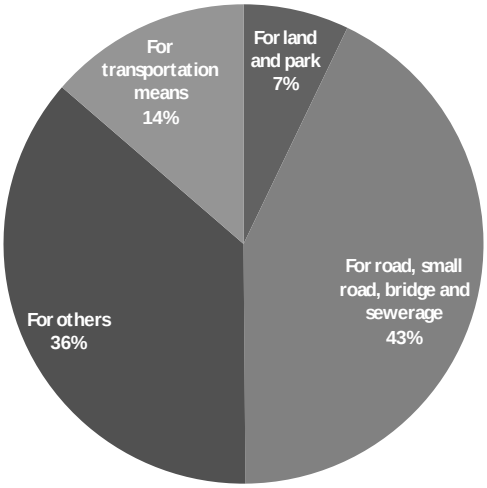
5.2.2 Expenditure Structure of the Preah Sihanouk Province

Looking into the provincial budgetary expenditures of Preah Sihanouk in 2009, as shown in Table 5.2.2, the total expenditure was recorded at about 6.65 billion Riels (or USD 1.66 million) in the actual term, instead of 4.24 billion Riels (or USD1.06 million) in the nominal term based on the Financial Law. The total expenditure amounted about 92% of the actual revenue.

Out of the total expenditure, about 47.3% was appropriated for recurrent expenditures, including: 1) Purchasing of office supplies and services; 2) Salary of staff and other personnel; 3) Maintenance of markets and public facilities; and 4) Public interventions such as subsidies for social activities.

Whilst, the investment expenditure or cashing for fixed assets shared 52.7% of the total expenditure. In terms of the per capita expenditure for public investment, only USD3.86 can be allocated for public investment.

Looking into the budgetary capacity for maintenance and repairs for existing facilities and service (Item #615), 348 .5 million Riels (or USD 87,128) was allocated for this purpose in total, out of which 41% was expensed for maintenance of roads, small roads, bridges and sewerage system, and 13% transportation means, and 35% for other facilities (see Figure 5.2.1).

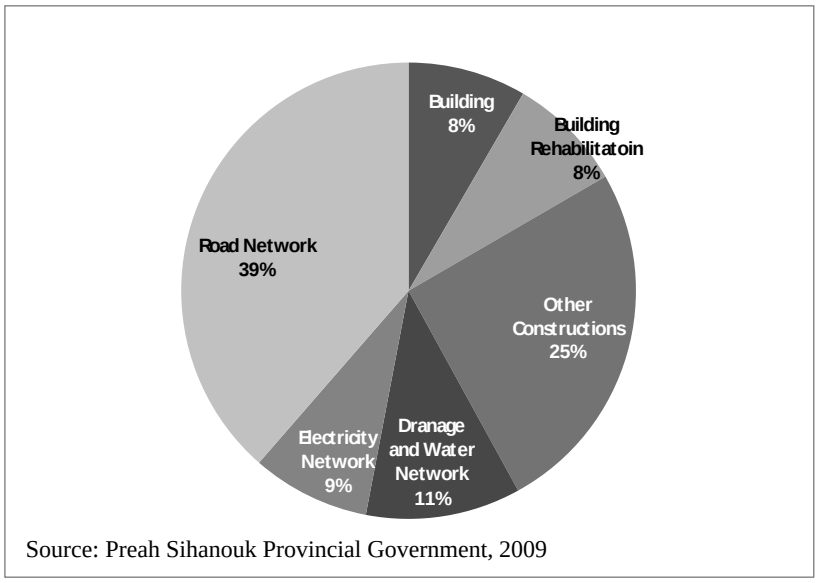


Source: Preah Sihanouk Provincial Government, 2009

Figure 5.2.1 Purposes of Expenditures for Maintenance & Repairs at Preah Sihanouk Provincial Government, 2009

It is unfortunate that the financial capacity for fixed assets (infrastructures) formulation of the provincial government is very weak. Looking into the budget components, as seen in Item #21 of Table 5.2.2, out of the total budget of 3.5 billion Riels, the largest budget was appropriated for "Road Network", followed by "Drainage and Water Network", and "Electricity Network", as shown in Figure 5.2.2. This allocation structure seems reasonable and rational in consideration of the reality of the local needs, but as the per capita expenditure for such public investments is only USD3.86 p.a. as mentioned earlier, the total budget for these purposes seems far from a sufficient level to provided even basic needs.

In particular, for the road network development, Preah Sihanouk Provincial Government appropriate 1.35 billion Riels, or USD 338.6 thousand for the 2009 budget. However, this budget will not be sufficient enough to construct even a 1.0 km long arterial road.



Source: Preah Sihanouk Provincial Government, 2009

Figure 5.2.2 Investment Expenditure Components for Fixed Assets at Preah Sihanouk Provincial Government, 2009

5.2.3 Strengthening of Financial Capacity for the Provincial Government

In general, since the provincial government owns a full duty to assure safe, livable and comfortable living for people in her jurisdiction, she has to possess as strong financial capacity as performing its responsibility. At least, the local government should be competent enough to provide basic human needs and basic infrastructures.

Under the currently on-going decentralization reform, strengthening of local governments' funding capacity will be a crucial political concern. This issue may includes: 1) devolution of some tax-sources from the state government to the local government; 2) liberalization for local governments to regulate new tax-revenue sources as well as generate non-tax revenues; 3) local governments' access to international donors' external resources; 4) innovative approach to issuance of development bonds for special cost-recovery projects; and so on.

As Preah Sihanouk is endowed with a plenty of development potentials, therefore it will receive actual economic investments. This will bring socioeconomic benefits to Preah Sihanouk, but at the same time, this shall impose a strict financial burden on Preah Sihanouk to provide necessary infrastructures and utilities services not so as to deteriorate the living and natural environment. The local government's financial capacity must be enhanced, otherwise socioeconomic benefits accruing from the development could not be gained by the local people.

Table 5.2.2 Budget Expenditure, the Preah Sihanouk Province (2009)

Chapter	Account	Sub-Account	Discription	Financial Law Beginning Year (Riels)	Actual Implementation (Riels)	US$	Share (%)	US$ Per Capita Exp.
Total budget expenditure (I+II)				**4,240,000,000**	**6,652,496,615**	**1,663,124**	**100.00%**	**7.33**
I. Current Expense (A+B)				**2,863,000,000**	**3,144,608,215**	**786,152**	**47.27%**	**3.46**
A. Group1: Real Expense (Type1+Type3)				**2,663,000,000**	**3,144,608,215**	**786,152**	**47.27%**	**3.46**
Type1: Service Mean				**2,568,000,000**	**3,129,608,215**	**782,402**	**47.04%**	**3.45**
60			Purchasing of Office Supplies	#REF!	1,117,992,021	279,498	16.81%	1.23
61			External Service	403,000,000	541,362,600	135,341	8.14%	0.60
	612		Transportation Rental	22,500,000	22,450,000	5,613	0.34%	0.02
	613		Fees and other expenses (non-furniture)	180,000,000	170,400,000	42,600	2.56%	0.19
	615		Maintenance and Repairs	200,500,000	348,512,600	87,128	5.24%	0.38
		6151	Maintenance of Land and Park	24,000,000	24,000,000	6,000	0.36%	0.03
		6152	Maintenance of market, slaughtering and public buldings			-	0.00%	-
		6153	Maintenance of Road, small road, bridge and sewerage system	65,500,000	143,814,200	35,954	2.16%	0.16
		6154	Others maintenance	63,000,000	122,750,400	30,688	1.85%	0.14
		6155	Maintenance and Repairs of equipment, office supply and information supply	12,000,000	12,000,000	3,000	0.18%	0.01
		6156	Maintenance and Repairs of transportation means	36,000,000	45,948,000	11,487	0.69%	0.05
62			Other external services	463,000,000	461,196,354	115,299	6.93%	0.51
	621		External Staff			-	0.00%	-
	622		Public Communication-Advertising	129,300,000	129,045,000	32,261	1.94%	0.14
	623		Expense on news and other documents	14,400,000	14,400,000	3,600	0.22%	0.02
	624		Expense in the country	72,200,000	72,143,000	18,036	1.08%	0.08
		6241	Transportation	3,400,000	3,388,000	847	0.05%	0.00
		6242	Mission	10,600,000	10,600,000	2,650	0.16%	0.01
		6243	Accommodation	58,200,000	58,155,000	14,539	0.87%	0.06
	626		Telecommunication, Telephone and Mailing Expense	16,800,000	15,308,354	3,827	0.23%	0.02
	628		Others	230,300,000	230,300,000	57,575	3.46%	0.25
64			Employee Dependence	680,000,000	1,009,057,240	252,264	15.17%	1.11
	641		Bonus and Severange Payment of Public Power	30800000	28,032,720	7,008	0.42%	0.03
		6411	Severance of province and city governor (1 person)	4,000,000	4,752,000	1,188	0.07%	0.01
		6412	Severance of province and city deputy governor	26,800,000	23,280,720	5,820	0.35%	0.03
	642		Bonus and Severange Payment for permenant staff	555,200,000	612,225,520	153,056	9.20%	0.67
	643		Reward and Other benefits		57,420,000	14,355	0.86%	0.06
	644		Bonus and benefits for contracted officials	55,200,000	275,520,000	68,880	4.14%	0.30
	645		Social Allowance	38,800,000	35,859,000	8,965	0.54%	0.04
Type 3: Public Intervention				**95,000,000**	**15,000,000**	**3,750**	**0.23%**	**0.02**
65			Subsidies and Social Contribution	95,000,000	15,000,000	3,750	0.23%	0.02
	652		Social contribution and allowance	80,000,000		-	0.00%	-
		6522	Natural disaster victim aids	50,000,000		-	0.00%	-
		6528	Other social expenses	30,000,000		-	0.00%	-
	653		Subsidies to Social and Cultural Organization	15,000,000	15,000,000	3,750	0.23%	0.02
B. Group1: Warrant Expense and Unplanned Expense				**200,000,000**		-	**0.00%**	-
Type 6: Unplanned Expense				**200,000,000**		-	**0.00%**	-
9			Unplanned Expenses	200,000,000		-	0.00%	-
II. Total Expense in Cash				**1,377,000,000**	**3,507,888,400**	**876,972**	**52.73%**	**3.86**
21			**Fixed Asset**	**1,377,000,000**	**3,507,888,400**	**876,972**	**52.73%**	**3.86**
	212		Land Rehabilitation			-	0.00%	-
	213		Construction	587,000,000	1,473,810,400	368,453	22.15%	1.62
		2131	Building		293,930,000	73,483	4.42%	0.32
		2132	Building Rehabilitatoin	290,000,000	289,648,000	72,412	4.35%	0.32
		2138	Other Constructions	297,000,000	890,232,400	222,558	13.38%	0.98
	214		Network	790,000,000	2,034,078,000	508,520	30.58%	2.24
		2141	Dranage and Water Network	229,800,000	385,670,000	96,418	5.80%	0.42
		2142	Electricity Network	295,900,000	294,180,000	73,545	4.42%	0.32
		2144	Road Network	264,300,000	1,354,228,000	338,557	20.36%	1.49

Source: Preah Sihanouk, Kingdom of Cambodia

Notes: Assumed Exchange Rate: 4,000 Riels/USD

5.2.4 Financing Scheme for the Implementation of Master Plan

The implementation of the master plan of the Preah Sihanouk will need financing at different levels. The options for financing could broadly be divided into three categories; private financing and public financing, Public and Private Partnership (PPP) financing. The following are the remarks for the respective financing options.

Public Financing: Financing for the projects related to the basic human needs of the residents shall mostly come from the public source, such as local government and central government funding. Ordinarily the local government is closer to location, and is more familiar with the specific needs for development and improvement, and therefore is the preferable source for financing the BHN related projects. In Cambodia, however, the local government is not generally given enough funding to spend on the urgently necessary infrastructure and social services projects, and thus the funding may be sought from the central government sources or from international donors. As discussed in the previous section, the financing capacity for the Provincial Government has to be strengthened, and while it may take some time to do so, the central government funding, especially with donor assistance, should be carefully channeled to the urgent BHN projects in the Province. The capacity of the Provincial Government may also be improved so as to handle the projects financed by international donors.

Private Financing: Private financing may very well be applicable to revenue generating projects, such as industrial estate development, SEZ development and urban development. The main source of private financing may come from the overseas development funds in the form of Foreign Direct Investment (FDI) and Cambodian domestic development funds. Private development funding is regulated by the Law on Investment and the Amended Law on Investment. Private financing will continue to be an important element in the development financing for Cambodia. The projects with private financing must follow the environmental protection and urban planning regulations officially approved and institutionalized in Cambodia to stay in main stream of development in Cambodia the long term, and the strong sense of governance has to be upheld in the implementation process both in the private and public sides.

PPP Financing: Public and Private Partnership (PPP) financing is broadly utilized in Cambodia where the funds for development projects are generally scarce. PPP financing schemes are utilized mainly in projects where there would be room for user fee collection (such as a toll road, electricity and water supply). Although the PPP schemes are supposed to be regulated by the Law on Concession, the draft law is generally weak in realizing the competitiveness in the selection of a concessionaire in a PPP scheme, as well as enforcing a proper regulatory framework for the performance of the selected concessionaire. The latter matter is partly related to the fact that PPP contracts are seldom publicized, and thereby the public sector could do little to regulate the concessionaire responsibility. The Law on Concession need to stipulate these two points in more explicit form; i.e. the required competitiveness in the selection of the concessionaire in PPP schemes, and the required disclosure of the PPP concession contract to the public.

In the case of water supply for Preah Sihanouk, the water source is developed under a PPP scheme. As the water source for Preah Sihanouk will be of primary importance in the future development of Preah Sihanouk as the international gateway of Cambodia, the PPP scheme in water source may as well limit the public sector control of the future development of Preah Sihanouk, which need to be rectified urgently either by resolving the PPP contract, and/or parallel public sector scheme for water source development with possible ODA financing. This will be generally good for the water source development in future and stabilizing the water balance for Preah Sihanouk in the long run.

5.3 Priority Projects

5.3.1 Overview of the Selected Priority Projects

As mentioned in the implementation framework for the Integrated Development Strategy for Coastal area (6.3 of Book I), totally eleven (11) priority projects were selected from the 42 identified projects. These priority projects are all necessary to improve the current urban environment and to provide expanded livable environment with sound economic development in the future. It should be again noted that these projects shall be undertaken by different ministries or line agencies, so that an integrated programming approach is recommended to employ for the effective management of all the projects. This integrated programming approach is expected to provide with some benefits as follows, compared to a conventional individual approach:

- Synergetic economic benefits would be generated through project linkages, given a proper schedule of project implementation;
- More effective and efficient project management would be possible, given a well-functioning project management and budgeting mechanism; and
- Strategic program budgeting with full donors' cooperation and supports may be possibly pursued, if the programs are rational, feasible and justifiable, referring to donors' faiths and policies.

As discussed in the 6.3 of Book I, this program is titled as "Urban Environment Improvement and Harmonized Economic Development Program" and the selected priority projects are to be implemented under the following four (4) program sectors, respectively: i.e. i) Urban Planning Program, ii) Environmental Management Program, iii) Industrial Promotion and Logistics Development Program, and iv) Infrastructure Development Program.

Except a few projects, these priority projects are mainly targeted to be implemented in Preah Sihanouk and/ or Kampot. Therefore, these priority projects are quite important to materialize the development strategies proposed in the M/P of Preah Sihanouk and Strategy for Kampot for the sustainable socio-economic development.

To summarize, the priority projects are enumerated as follows;

Sector 1: Urban Planning Program

UD-01: National Spatial Grand Design: Land Use Planning Project

UD-02: Urban Development Master Plan for the Coastal Area

Sector 2: Environmental Management Program

EV-01: Strengthening EIA Implementation Capacity Project

EV-02: Establishment of Public-Private Partnerships and Development of Infrastructure for Solid Waste Management for Sustainable Environmental Protection and Development in Cambodian Costal Areas

Sector 3: Industrial Promotion and Logistics Development Program

L-01: Master Plan Study on Comprehensive Logistics Development between Preah Sihanouk and Phnom Penh

Sector 4: Urban Infrastructure Development Program

WS-01: Preah Sihanouk Water Supply System Development Project

WS-02: Preah Sihanouk Sewage System Development Project

WS-03: Kampot Water Supply System Development Project

WS-04: Kampot Sewage System Development Project

T-01: Preah Sihanouk Road Network Construction and Improvement Project

T-02: Kampot Road Network Construction and Old Bridge Rehabilitation Project

The tentatively proposed implementation schedule for the abovementioned priority projects are shown in Figure 5.3.1.

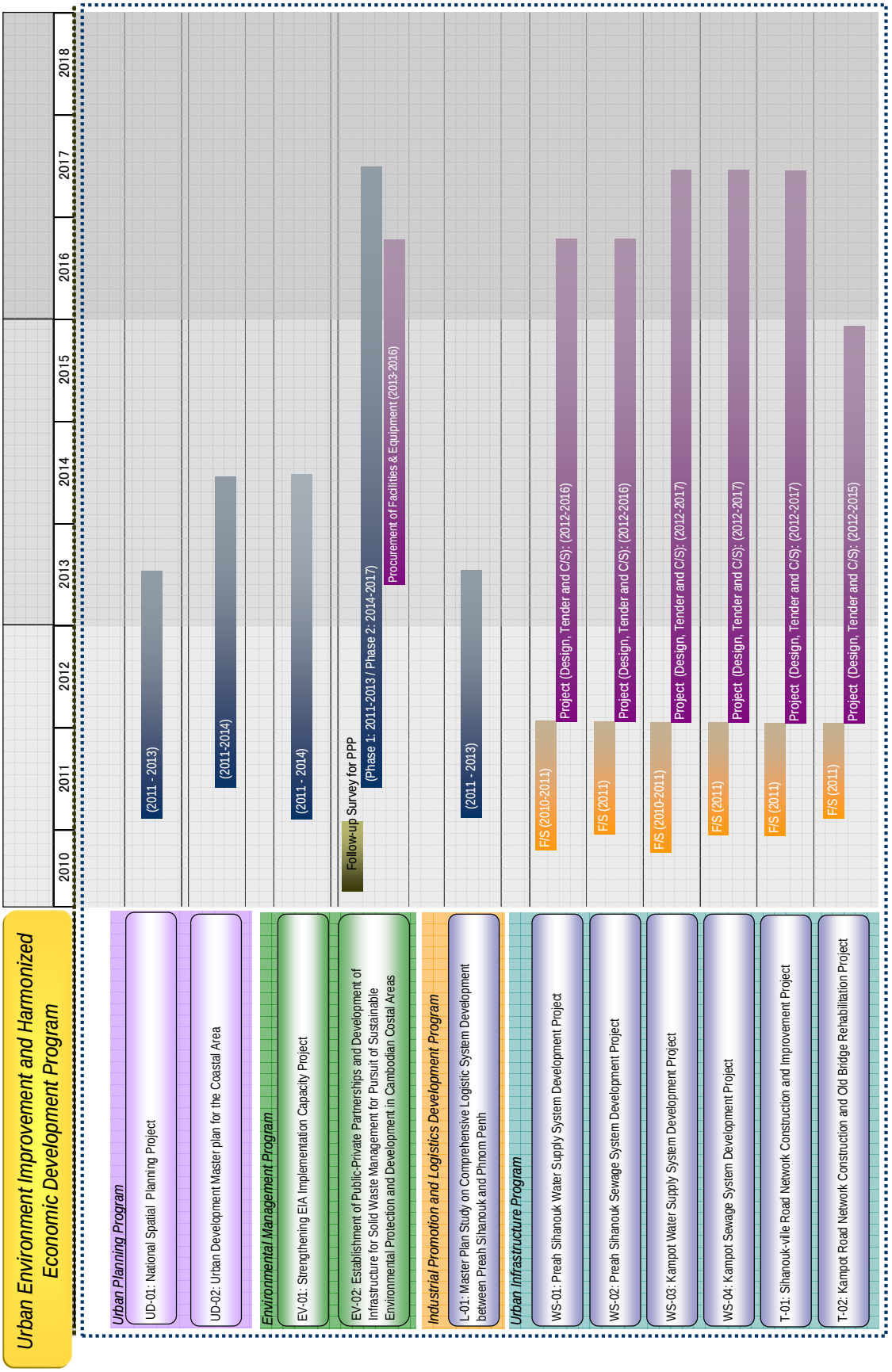


Figure 5.3.1 Proposed Implementation Schedule of each Priority Projects under the Program Approach

5.3.2 Priority Projects for Urban Planning Program

(1) UD01: National Spatial Planning Project

National Land Use Planning Project is proposed as a superordinate plan, as the guideline for subordinate provincial and district plans. Capacity development project will be implemented for the personnel of MLMUPC.

1) Background

There is no National Master Plan of Land Use / Spatial Design which should be the guideline for subordinate plans for whole country. Therefore inconsistent spatial and land use management is an issue for future national development.

2) Goals and Objectives

- To set the concrete base of national development planning in future of Cambodia and to manage the national development.
- To formulate the National Master Plan of Land Use / Spatial Design to be the superordinate plan as the guideline for subordinate plans.
- Capacity Development of MLMUPC.

3) Proposed Work Components

- Formulation of National Land Use Plan / Spatial Design / Network Master Plan.

The whole country should be classified into major land use categories for adequate land management and planning & development with ensuring the balance of urban and rural development and distribution of growth. National land use plan should consist of three major categories which are i)land use classification, ii)conceptual plan and iii)network plan.

i) The land use classification is the actual land use or demarcation of land such as Urban, Rural, Agricultural, Forestry, and Industrials.

ii) Conceptual plan is the use of land considering the future condition and visions, such as Environmental Preservation, Industrial Promotion, Agricultural Promotion, Residential Restricted, Tourism, Park & Ecotourism and so on.

iii) Network master plan is general conceptual plan of transportation and networks of domestic with due regard to adjacent countries. The three major cities, Phnom Penh, Preah Sihanouk and Siem Reap with each unique characters and charms are promised to be the pivot for future spatial and network planning from the view points not only of tourism but also of economic development and logistics.

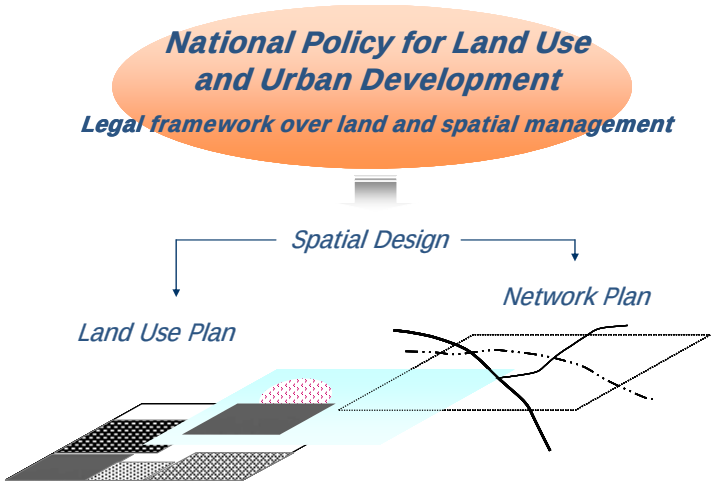
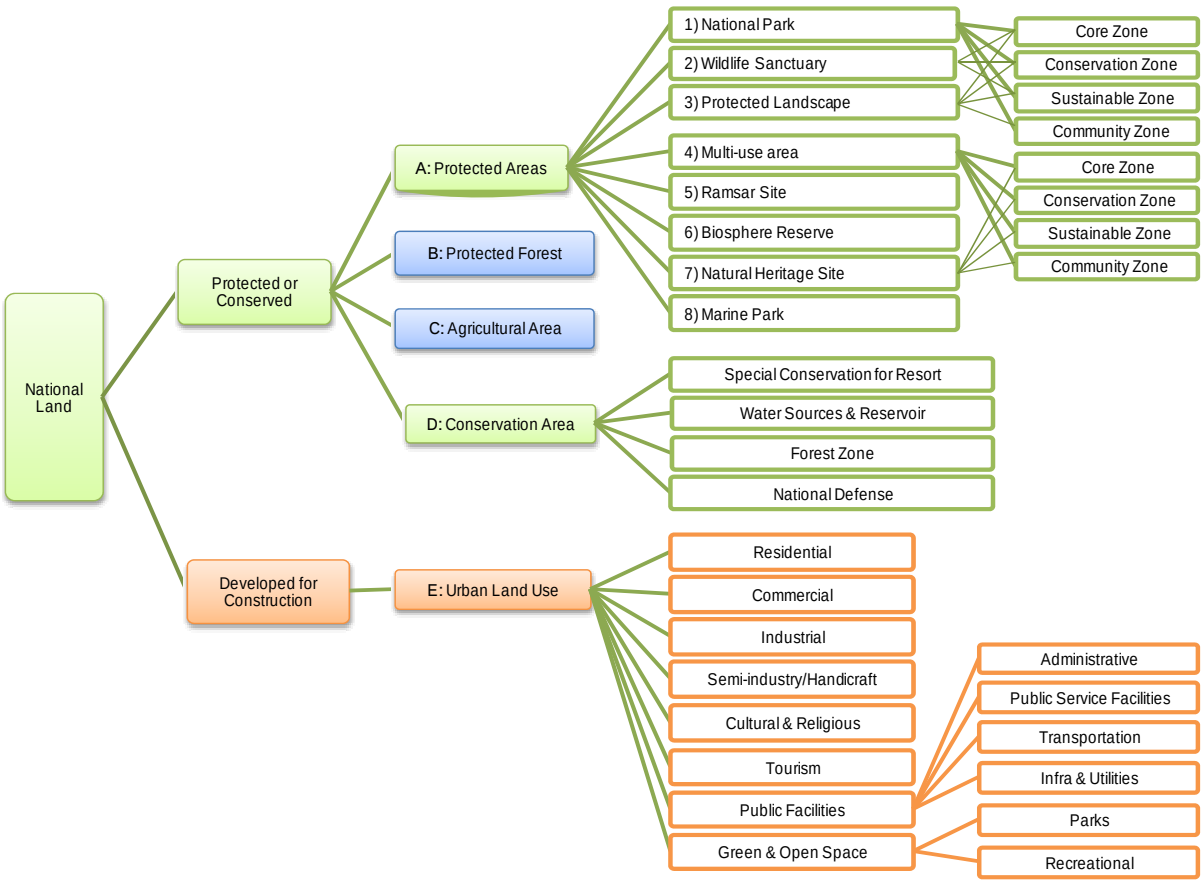


Figure 5.3.2 Conceptual Idea of Work Component

Actual land use classification for this national plan will follow the proposed one in this master plan as given below.



Source: JICA Study Team

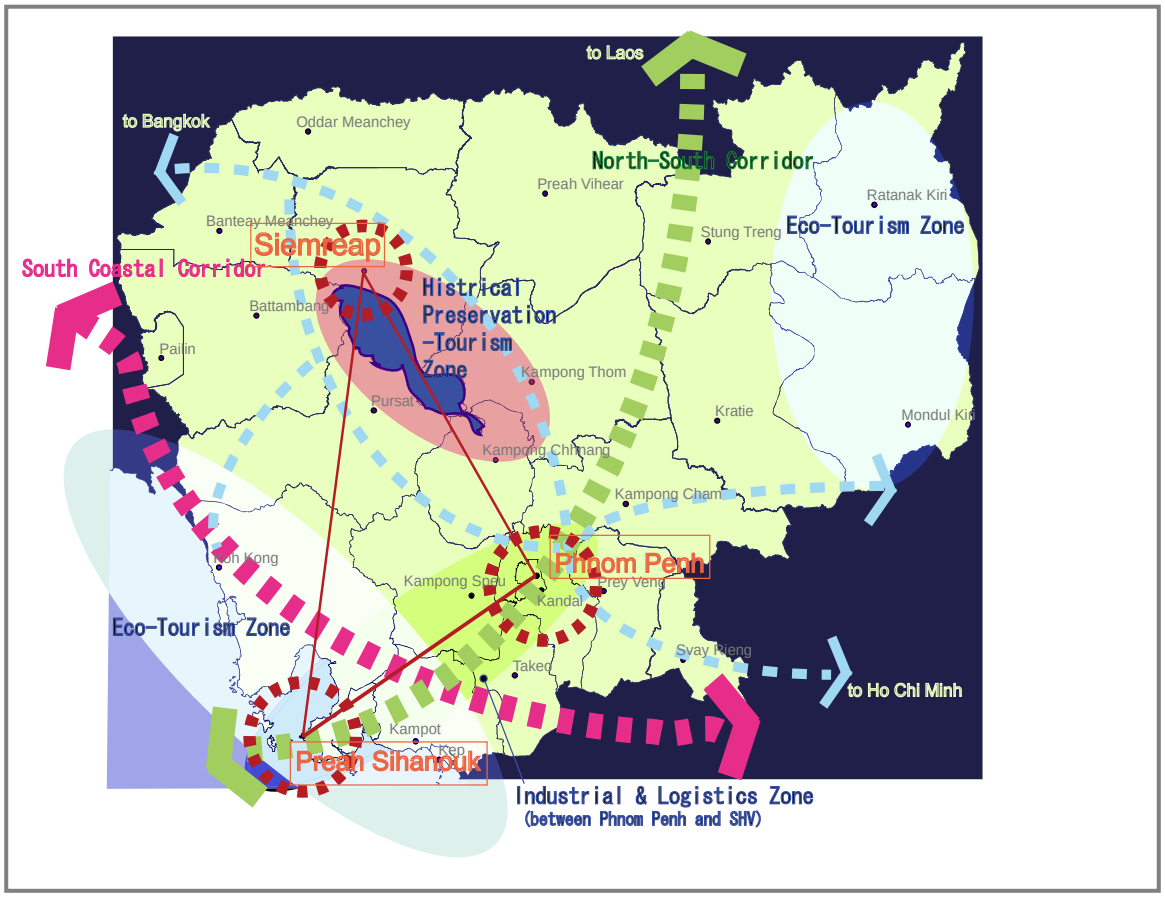
Figure 5.3.3 Land Use Categories for Land Use Planning (Proposed)

- Formulation of superordinate legal framework, laws and regulations over land and spatial management as national law;
- Capacity development plan of MLMUPC at the central level to enforce planning and management ability (Refer to Chapter 7 in Book I), ex. setting guideline, formulating manual and schooling and other technical trainings; and

4) Schedule

	2011			2012				2013		
Schooling	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Basic Survey										
Vision										
Spatial Concept Plan										
Land Use Plan										
Network Plan										

Figure 5.3.4 Proposed Schedule



Source: JICA Study Team

Figure 5.3.5 Schematic Plan of Cambodia

(2) UD02: Urban Development Master Plan for Coastal Area

1) Background

- No Master Plan of urban planning causes inconsistent spatial and land use management as a highly concerning issue for future development.
- Not enough capacity of planning and management for provincial officials.

2) Goals and Objectives

DLMUPCC of Provinces of the Coastal Area becomes to be able;

- to formulate Master Plan of City Planning for the 4 provinces,
- to improve construction permission procedure with development guideline.
- to develop management skills for urban planning and land management.

3) Proposed Work Component

- Schooling for technical officials (2week/3months) prior to each planning stage.
- Formulation of detail land use planning and transportation system.
- Formulation of development project plan for the city center.
- Implement pilot project to apply learned knowledge.

Figure 5.3.6 Proposed Land Use Plan of Preah Sihanouk

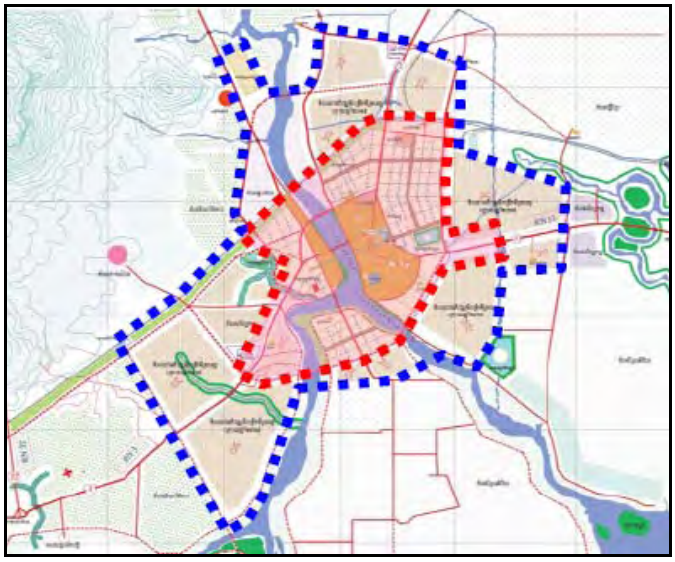


Figure 5.3.7 Proposed Land Use Plan of Kampot

(3) Proposed Implementation Schedule of Capacity Development Plan

Proposed Implementation Schedule of Capacity Development Plan with Priority Projects is as follows.

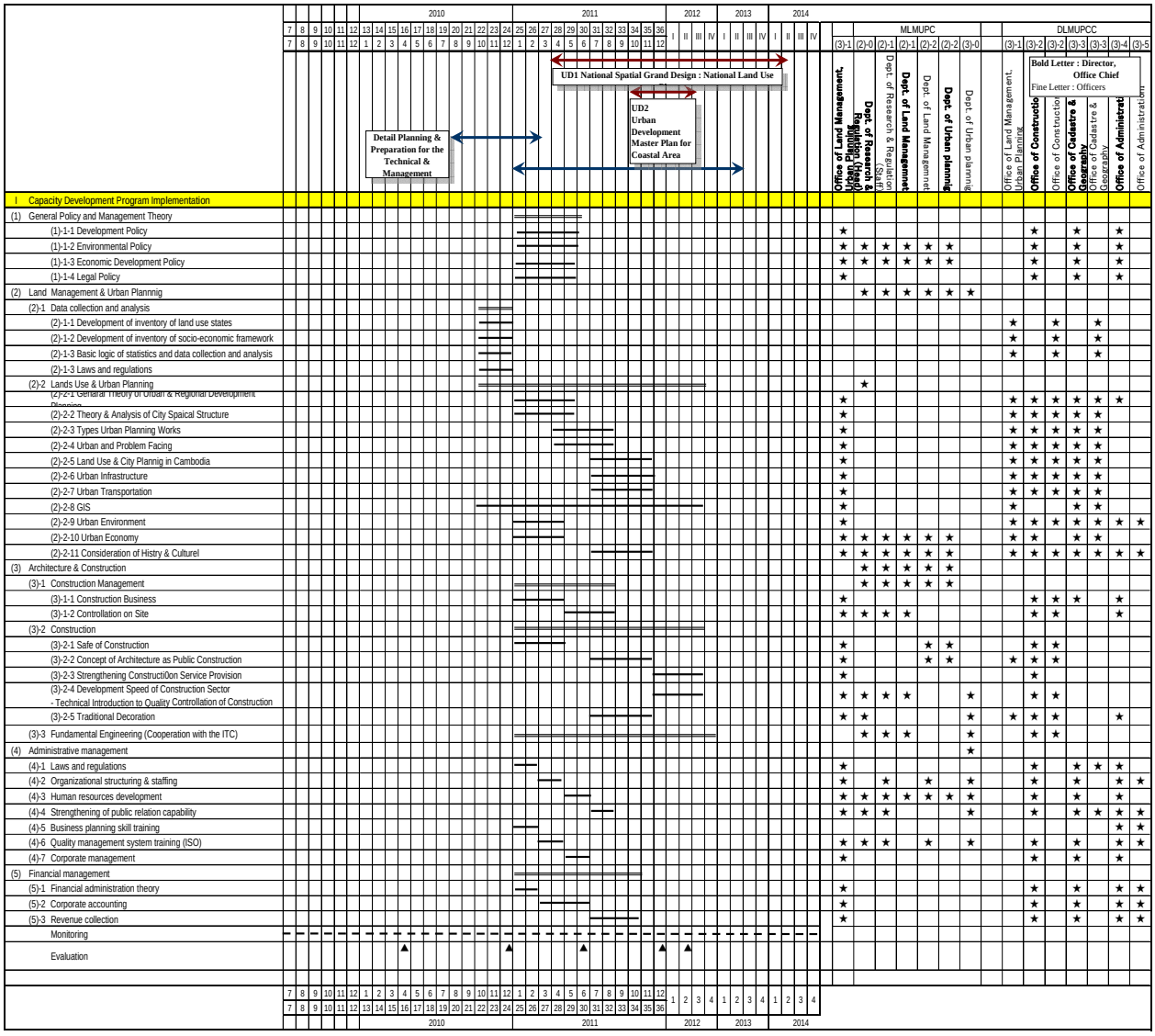


Figure 5.3.8 Proposed Implementation Schedule of Capacity Development Plan with Priority Projects

5.3.3 Priority Projects for Environmental Management Program

(1) EV01: Strengthening EIA Implementation Capacity Project

1) Background

The priority of proposed projects listed in section 4.3.1 is evaluated with some criteria such as effect, urgency, coherency to the national and local plan, response by executing organization, project maturity, required capacity of executing organization, and investment cost. Each measure is given in the rank of A, B or C, scored and weighted taking account of importance. The result of the evaluation matrix is shown in Table 5.3.1. The priority project was selected from the Total score.

Table 5.3.1 Evaluation of Proposed Projects for Prioritization

Project	Effect	Urgency	Coherency to the National and Local Plan	Coherency to the Country Assistance Plan	Response by Executing Organization	Required Level of Environmental Awareness	Project Maturity	Required Capacity of Executing Organization	Investment Cost	Total Score
Strengthening EIA Implementation Capacity Project	A	A	B	B	A	B	A	B	A	25
Capacity Development Project on the Management of Protected Areas	A	A	B	B	B	B	B	B	A	21
The Study on Coral Reef Conservation in the Coastal area	A	B	B	B	B	B	B	B	B	18
The Study on Aquatic Environmental Management in Sihanouk Province	A	B	B	B	B	B	B	B	B	18
Coastal Area Ecosystem Conservation Project using Ecological Corridor	A	B	B	B	B	B	B	B	B	18
The Study on Preaek Tuek Sab Watershed Management	B	A	B	B	B	B	B	A	B	18
(Full Marks)	A	A	A	A	A	A	A	A	A	30
Weight	3	2	1	2	2	1	2	1	1	-

Note: Score A=2, B=1, C=0

"Strengthening EIA Implementation Capacity Project" has the highest total score and selected as the priority project. The second highest score was Capacity Development Project on the Management of Protected Areas. Capacity development of MOE is crucial and urgent to avoid the significant negative impacts to the environment.

Royal Government of Cambodia (RGC) recognizes the importance of environmental conservation to maintain the ecosystem services such as food, water, industrial products, carbon sequestration and climate regulation, purification of water and air and recreational experiences. The National strategic Development Plan (2006-2010) mentioned that the goal of environmental protection was not only to conserve the unique nature but also to enhance integrated environmental conservation for the sustainable economic growth. Therefore environmental conservation strategy, that is superior plan, should be established over the implementation of EIA, pollution control, management of protected areas, and reducing greenhouse gases emissions.

Proper enforcement of EIA is essential to prevent the inappropriate land development. After the low on investment was amended in 2003, one stop service was introduced, and EIA process has changed. Therefore establishment of detail EIA guideline is the pressing need. Capacity development of the EIA department to enforce the guideline is also necessary at the central and provincial level. On the job and off the job trainings should be provided.

In order for investors to comply the legislation for environmental conservation and mitigation measures listed in their approved EIA report, environmental monitoring and its information

disclosure is essential. Capacity development of the EIA department is necessary with technical training at the field and research laboratory, practical of data handling and interpretation, and practice of information disclosure. A monitoring manual should be prepared for the sustainability to continue those activities.

As described above, capacity development of the EIA department is indispensable to impose adequate EIA and environmental monitoring, and a project to implement the capacity development should be implemented swiftly. The outline of the project is drafted below.

2) Goals and Objectives

- To manage the environmental conditions through EIA and environmental monitoring.
- To establish institutional and technical framework for implementing EIA and environmental monitoring.

3) Proposed Work Component

- Documents on the laws and regulations about EIA and environmental monitoring are prepared.
- Necessary sampling and data interpretation skills for environmental monitoring are developed.
- Awareness of importance of EIA and environmental monitoring among other ministries are enhanced.
- Clarification of responsibility and mandates for EIA and environmental monitoring in each section at central and provincial levels
- Holding seminars and workshops to introduce laws and regulations as well as mandates of each section
- On the job training to enforce laws and regulations
- Computation and/or collection of baseline environmental data
- Provision of necessary monitoring equipment for research laboratory
- Preparation of environmental monitoring manual
- Technical training for sampling, analysis and data interpretation
- Formulation of committee among ministries and discussion on the importance of EIA and environmental monitoring to enhance awareness
- Holding seminars to disclose the information of EIA and environmental monitoring result

4) Implementation Schedule

September 2011 to September 2014 (three years)

(2) EV02: Establishment of Public-Private Partnerships and Development of Infrastructure for Solid Waste Management for Sustainable Environmental Protection and Development in Cambodian Costal Areas

The Solid Waste Management is proposed as a priority projects for the Environmental Management Program. The proposed projects are as follows;

1) Backgrounds

Coastal areas is expected to be rapidly developed with the grown in population, tourism and industries. On the other hands, waste collection service is provided in limited areas and in insufficient level of service, and collected waste is mostly dumped without soil cover and nor leachette system and gas control system. Sometimes waste is burned at dumping sites illegally. There is a situation where the private initiative is valued, but does not function due to lack of monitoring and administration by the public sector. This is an outstanding situation of SWM in Cambodia. Initially, the question of what type of Public-Private Partnerships (PPP) is suitable for the coastal areas should be given a clear answer in order to solve the issues of SWM. At present environmental impact by solid waste may not be so serious, but it will be serious soon due to the increase in the amount and diversity of types of wastes in accordance with the economic and social development.

Now all of provinces in coastal areas need new landfill sites. Kampot and Sihanouk have to urgently prepare new landfill sites that are managed with leachette system and gas control system. Kampot and Sihanouk are proceeding with acquisition of land at area of approximately 20ha and 65ha, respectively, in order to establish new landfill sites. Especially Kampot addresses also involvement of districts and communities in order to establishment of community-based SWM in parallel with preparation for the new landfill site. Beneficial people are as follow:

2) Goal and Objectives

Overall goal is to prevent environmental impacts with improving image of tourism and contributing to sound, smooth and sustainable development of Cambodian Costal Areas Objectives are as follow:

- Model of sustainable Public-Private Partnerships SWM is established with sufficient technical and financial capacity;
- 3R (Reduce, Reuse, Recycle) at source is introduced, and waste reduction activities are established;
- Model system of stable and efficient collection and transportation of solid waste is established; and
- Composting plant and sanitary landfill site are established (in prioritized areas only).

3) Work Component

i) Location

Location of old or existing dumping site and proposed sites for new landfill site in Kampot and Sihanouk are shown the following maps.

In Kampot
In Tuek Chhou District 3 km from National Road 3

In Preah Sihanouk
In Prey Nob District 3km from National Road 4

Source: JICA Study Team and MLMUPC

Figure 5.3.9 Location of Proposed Site for New Landfill Site in Kampot and Sihanouk

ii) Executing Agency

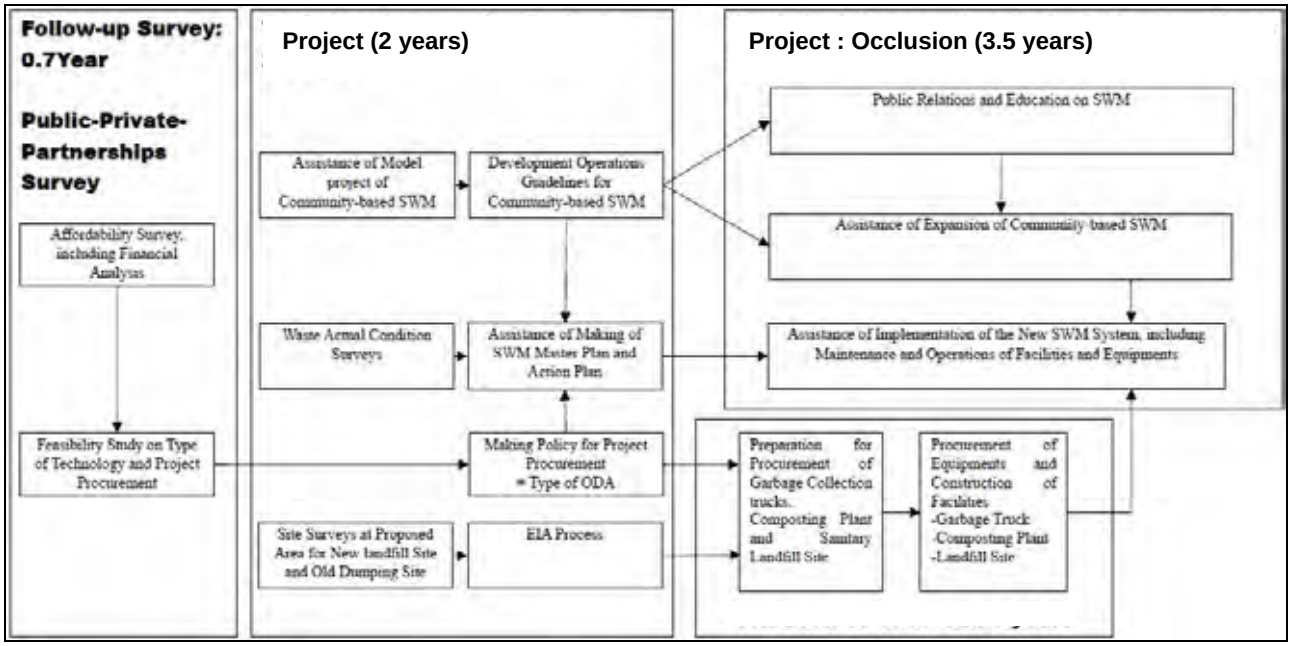
Executing agencies by project are as follows:

- Follow-up Survey: Ministry of Environment (MOE);
- Implementation Project (1st phase): Department of Environment (DOE) of four provinces in the coastal area;
- Implementation Project (2nd phase): Department of Environment (DOE) of four provinces in the coastal area; and
- Procurement: Department of Environment (DOE) of Kampot and Sihanouk Province.

In addition, it is necessary to involve Department of Land Management, Urban Planning, Construction and Cadastre in the land matter. International Cooperation Office and Project Coordinator of Integrated Costal Management (ICM) in Sihanouk also should be involved because they have experience to introduce the Community-based SWM in a Village as a model project.

iii) Contents of Components

Proposed work components by project are as Figure 5.3.10 as below:



Source: JICA Study Team

Figure 5.3.10 Structure of SWM Projects

iv) Implementation Schedule

Implementation schedules by project are as follows:

- Follow-up Survey (0.7 years): August 2010 to March 2011
- Technical Cooperation Project (2 years): July 2011 to June 2013
- Technical Cooperation Project (3.5 years): January 2014 to June 2017
- Yen Loan or Grant Aid for Facilities and Equipments (3 years): July 2013 to June 2016

Structure of proposed SWM project is shown in the following Figure5.3.10.

5.3.4 Priority Projects for Industrial Promotion and Logistics Development Program

(1) L-01: Master Plan Study on Comprehensive Logistics Development between Preah Sihanouk and Phnom Penh

1) Background

Sihanoukville Port, which is the largest port in Cambodia, has a depth of 10m and can accommodate around 1,000 TEU container ship. In intra-Asian shipping route, Sihanoukville Port functions as Feeder Port. Most of the containeer cargos brought from Sihanoukville to West Coast of USA are currently transshipped at Singapore Port.

On the other hand, Sihanoukville Port, which is the only international port of Cambodia, plays a role of gateway on international trade in Cambodia. In order to promote economic growth in Cambodia, it is indispensable to develop Sihanoukvill Port and provide a logistics network between Sihanoukville Port and Phnom Penh which is an industrial and mega consumption area. NR3 and NR4 connect between Sihanoukville Port and Phnom Penh. Most of

commodities which are produced in Phnom Penh area and freights which is unloaded at Sihanoukville Port are transported by trucks through NR4. As to railway system, the Rehabilitation Railway Project has been implemented by ADB loan and is expected to contribute to an effective freight transport. Concerning of Sihanoukville Port, enlargement of Sihanoukville Port is planned by JICA assistance. It is expected that Sihanoukville Port functions as more efficient gateway.

Though Node which is like a Sihanoukville Port and Link which is like a NR4 have been developed and provided individually, a comprehensive logistics strategy has not been prepared yet. Therefore, a logistics network and an infrastructure for the network have not been developed as an integrated system.

2) Objective

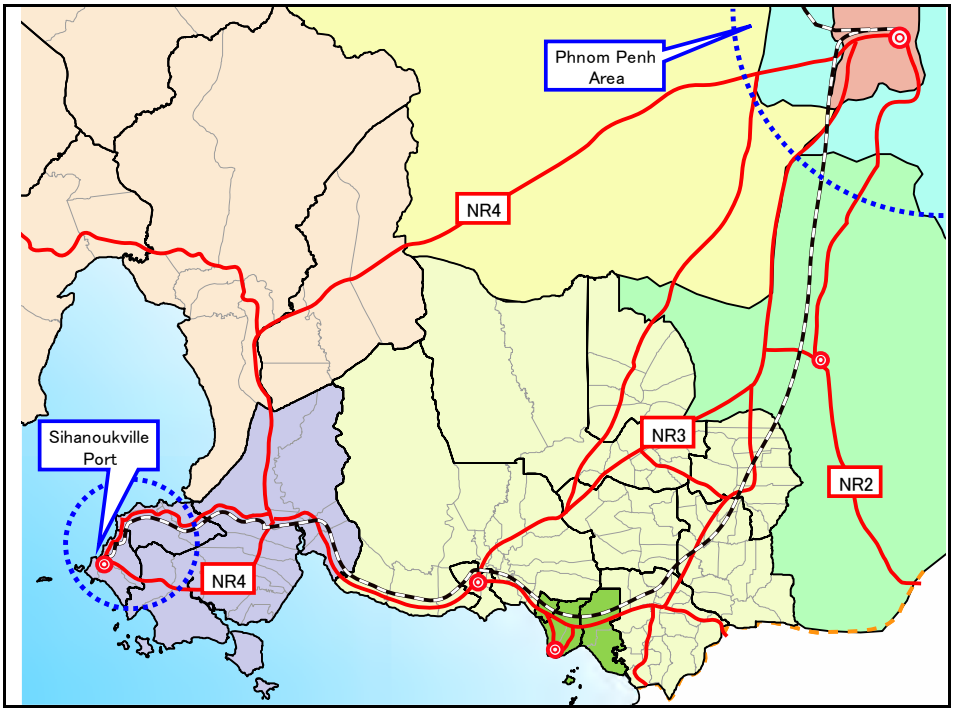
In consideration of a feature of Sihanoukville Port which is Feeder Port in intra-Asia shipping route, a strategic logistics development plan should be provided in order to accelerate to increase a freight volume and to establish an efficient logistics network.

3) Project Components

Components of the priority project are as follows:

- Analysis of present condition and issues;
- Proposal of an efficient international logistics and customs clearance system;
- Study of logistics marketing;
- Development plan of logistics terminal;
- Proposal of logistics information system;
- Development plan of rail transport and related facilities;
- Development plan of Sihanoukville Port;
- Proposal of land use and spatial plan related to logistics facilities;
- Proposal of environment and social consideration; and
- Economic and Financial Analysis.

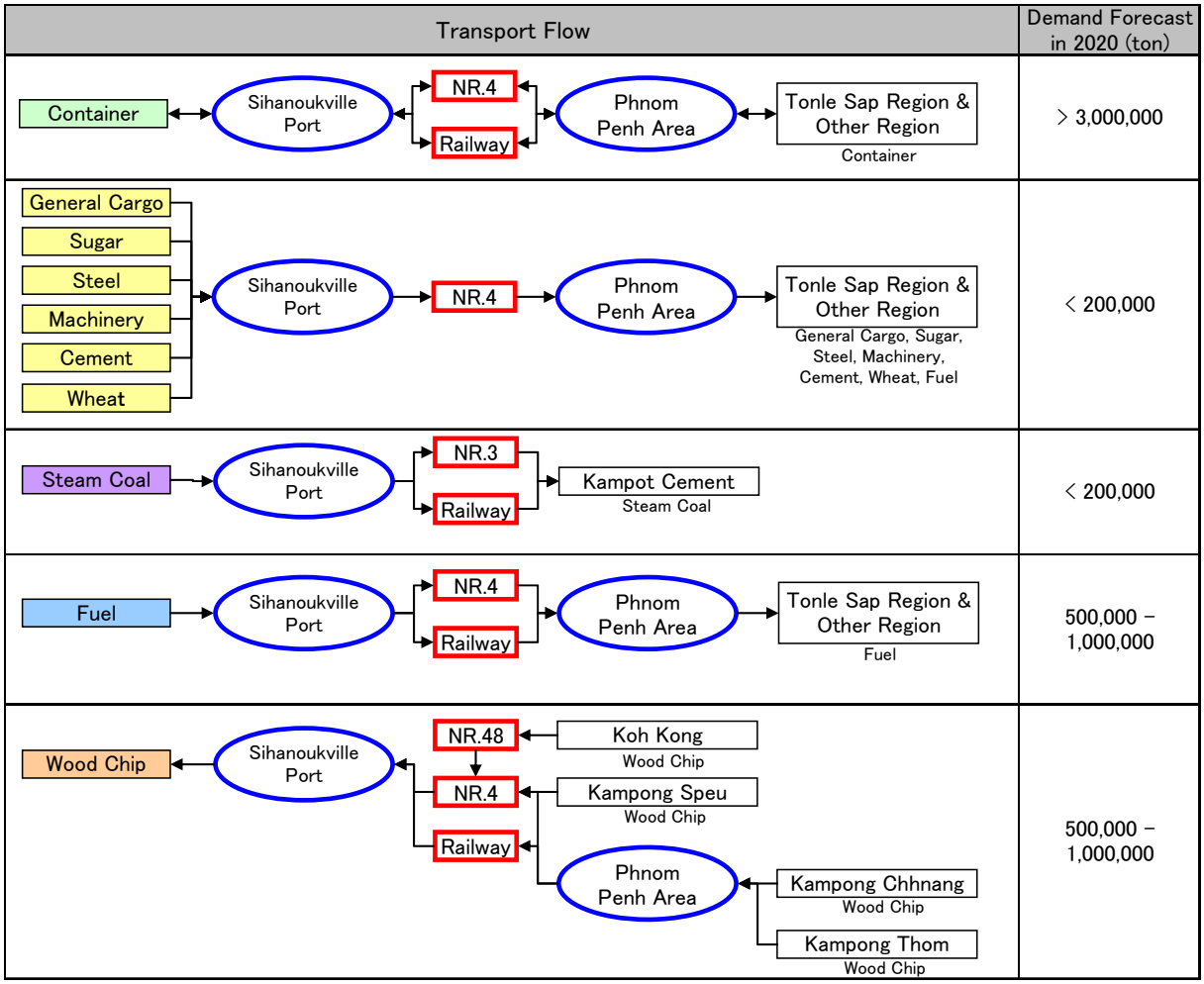
Location of the proposed project is shown below.



Source: JICA Study Team

Figure 5.3.11 Proposed Priority Project: L-01

Transport flow and demand of commodity, which will be transported from Sihanoukville Port to Phnom Penh and other area in 2020, is forecasted as follows. It is suitable to implement this study in consideration of the transport flow and the demand forecast



Source: JICA Study Team

Figure 5.3.12 Transport Flow and Demand Forecast in 2020

4) Project Implementation

Activities and timeframes for implementing the proposed priority projects are shown below.

The Study on Comprehensive Logistics Development between Sihanoukville and Phnom Penh

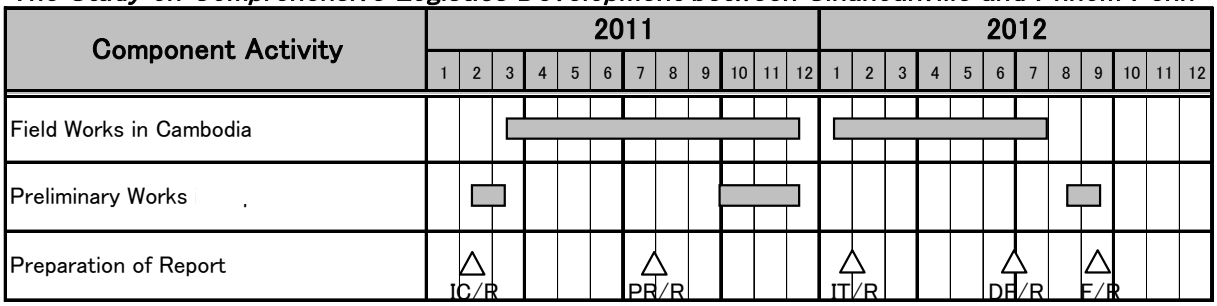


Figure 5.3.13 Implementation Schedule of L-01

5.3.5 Priority Projects for Infrastructure Development Program

(1) WS-01: Preah Sihanouk Water Supply System Development Project

1) Objectives and scope

This section presents a priority project for improving the storage, transfer and distribution of treated water in Preah Sihanouk. The project will focus on implementing the components of the water supply system that are required to meet the water demands identified for the year 2020. The project will improve urban services and living standards. It will also enable growth of tourism and industry in the area.

The project will include the following major components:

Table 5.3.2 Project Components: WS-01

	District No.1	District No.2	District No.3
Storage	S-1 =1,700 m3 S-4a =5,000 m3	S-2a = 9000 m3	S-3 = 1500 m3
Transmission pump station and head works	Pumps to S-1 VSD Variable speed drive Duty: 3 x 50-60 lps	By gravity	Pumps for S-3 Fixed speed Duty: 1 x 25 lps
Transmission pipeline	S-4 to S-1 600 mm dia. L=7000 m	S-4 to S-2 600 mm dia. L=3500 m	S-4 to S-3 Connect to existing 350mm dia. L=450 m
New feeder mains	From S-1 L = 9,775m	From S-2 L = 18,367m	Connect S-3 to existing 350 mm dia. main
Distribution system modifications to tie in new feeder mains	Including 5 pressure regulating valves	Including 2 pressure regulating valves	New distribution piping supplied from feeder main
Reconnect existing house connections	1622 connections	2602 connections	390 connections
Extend distribution system and new house connections	2992 connections	5206 connections	978 connections

Source: JICA Study Team

The structures at reservoir S2 and balancing tank S4 should be designed for the future expansion of a duplicate unit of equal size. All yard piping and valve arrangements at the reservoirs to be provided now for future connection.

Similarly, the transmission pumping station should be designed to accommodate pumps for transmission to S1 and S3 and should have provision for adding pumps in the future to meet the 2030 requirements. All intake and discharge piping at the pump station to be provided now for future connection.

The project should be implemented sequentially on a district by district basis to minimize disruption to residents starting with District no.1. It may however be advantageous to group the construction of storage and transmission components into a separate tender package to simplify the selection of a qualified contractor and get some cost savings.

2) Costs

Preliminary project costs are presented in Table 5.3.4.

Table 5.3.3 Project Costs: WS-01

Capital Costs (USD)	District 1	District 2	District 3	Total
S-W1. Storage reservoirs	3,350,000	3,150,000	1,125,000	7,625,000
S-W2 Pump stations	257,542	0	82,471	340,013
S-W3 Transmission pipelines	3,461,114	2,620,557	117,163	6,198,834
S-W4 Feeder mains	2,152,973	4,474,635	117,163	6,744,771
S-W5 Distribution network modifications	1,076,486	2,237,317	58,581	3,372,385
S-W6 Reconnect 40% of existing services	599,936	962,384	144,158	1,706,478
S-W7 Service connections in new service areas	677,379	1,178,554	219,288	2,075,221
sub-total	11,575,430	14,623,447	1,863,824	28,062,702
Additional costs				
Engineering (8%)	926,034	1,169,876	149,106	2,245,016
Contractor overhead (5%)	578,772	731,172	93,191	1,403,135
Admin and Inspection (9%)	1,041,789	1,316,110	167,744	2,525,643
Contingency (10%)	1,157,543	1,462,345	186,382	2,806,270
Total project cost	15,279,568	19,302,951	2,460,248	37,042,766
Land requirement (m2)	9,000	13,000	2,500	24,500
Land acquisition by MIME	450,000	650,000	125,000	1,225,000

Note: S = Preah Sihanouk, W = water supply
Source: JICA Study Team

Costs are derived from other water supply projects recently implemented in South-East Asia.

W1: Ground level reservoir structures are rectangular reinforced concrete, cantilever walls with raft foundations. Elevated storage structures are circular reinforced concrete tank supported on a circular base. It is assumed that pile foundations are not required. Reservoirs include inlet and outlet piping and flow metering.

W2: Pumping stations include building, lead/lag and back-up pumps, , intake and discharge piping, flow metering, emergency generator and telemetry.

W3 & W4: Pipelines and feedermains include all valves, thrust restraint and excavation in normal soil to 2 m depth. Rock excavation is not included. The cost of pressure reducing valves and district flow metering is also included. Feedermains include a 20% allowance for connecting with the existing distribution system.

W5: The cost for distribution network modifications is an allowance for replacement and reinforcement of distribution piping in the existing service area and extension of distribution piping into new service areas. This is assumed to be 50% of the cost of new feeder mains.

W6 & W7: Unit costs for house connections are derived from recent work in Kampot by the AIMF. The installation of new distribution piping in existing service areas will require reconnection of existing services. The cost assumes that 40% of the house connections in the existing service area will be affected.

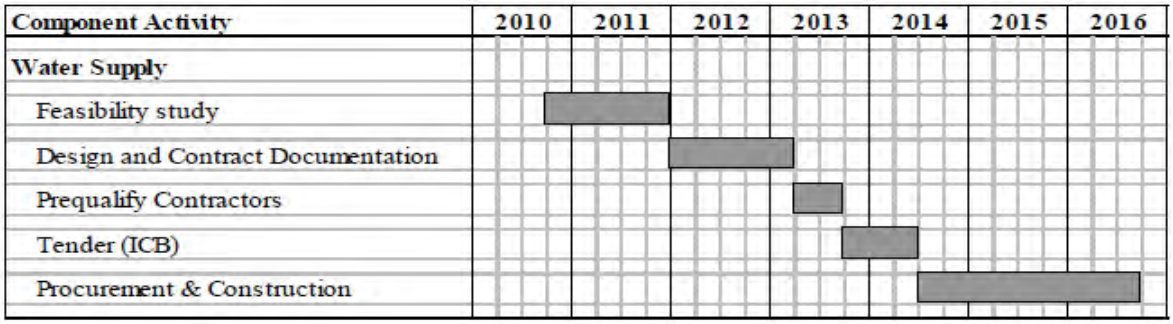
Unit cost of land is taken as $50 per m2 based on current market conditions for land in the urban area.

3) Project Implementation

Activities and timeframes for implementing the proposed priority project are identified in Figure 5.3.14. The project will be implemented by the Preah Sihanouk Water Supply Authority under the responsibility of DIME (Department of Industry, Mines, and Energy)

The proposed water supply project will begin with a feasibility study. The feasibility study should include a hydrological study of the Kbal Chay water resource to establish yield and reliability.

The complete project cycle will take 6 years to completion of construction.



Source: JICA Study Team

Figure 5.3.14 Implementation schedule: WS-01

(2) WS-02: Kampot Water Supply System Development Project

1) Objectives and scope

This section presents a priority project for improving the storage, transfer and distribution of treated water in Kampot. The project will focus on implementing the components of the water supply system that are required to meet the water demands identified for the year 2020. The project will improve urban services and living standards. It will also enable growth of tourism in the area.

The project will include the following major components:

Table 5.3.4 Project Components: WS-02

	District No.1	District No.2
Raw water intake and pump station	5,000 m3/day	existing
Treatment plant	5,000 m3/day Land = 50,000 m2	existing
Storage	S-1a =3,000 m3 T-1 =1,600 m3 Land = 6000 m2	S-2 = 2,000 m3 Land = existing
Pump Station	Pumps to S-1 included with treatment plant Pumps to T1 Variable speed drive Duty: 3 x 25-35 lps	existing
Transmission pipeline	to S-1 400 mm dia. L=8,100 m	none
New feeder mains	From S-1 L = 26,685 m	From S-2 L = 9510 m
Distribution system modifications to tie in new feeder mains	Including district metering	Including district metering
Reconnect existing house connections	2854 connections	822 connections
Extend distribution system and new house connections	1420 connections	1098 connections

Source: JICA Study Team

The structure at reservoir S1 should be designed for the future expansion of a duplicate unit of equal size. All yard piping and valve arrangements at the reservoirs to be provided now for future connection.

The project should be implemented sequentially on a district by district basis to minimize disruption to residents starting with District no.1.

2) Costs

Preliminary project costs are presented in Table 5.3.6.

Table 5.3.5 Project Costs: WS-02

Capital Costs (USD)	District 1	District 2	Total
K-W1: Raw water intake + low lift pumps	306,692	-	306,692
K-W2: Treatment Plant	17,160,000	-	17,160,000
K-W3: Storage reservoirs	2,700,000	-	2,700,000
K-W4: Pump stations	155,570	-	155,570
K-W5: Transmission pipelines	2,196,804	-	2,196,804
K-W6: Feeder mains	3,113,904	1,500,645	4,614,549
K-W7: Distribution network modifications	1,556,952	750,323	2,307,274
K-W8: Reconnect 40% of existing services	1,055,752	304,074	1,359,826
K-W9: Service connections in new service areas	321,483	248,584	570,067
sub-total	28,567,156	2,803,626	31,370,782
Additional costs			
Engineering (8%)	2,285,372	224,290	2,509,663
Contractor overhead (5%)	1,428,358	140,181	1,568,539
Admin and Inspection (9%)	2,571,044	252,326	2,823,370
Contingency (10%)	2,856,716	280,363	3,137,078
Total project cost	37,708,646	3,700,786	41,409,432
Land requirement (m2)	56,000	0	56,000
Land acquisition by MIME	2,050,000	0	2,050,000

Source: JICA Study Team

Costs are derived from other water supply projects recently implemented in South-East Asia.

W1: The costs are based on abstracting water from the river with low lift pumps. The cost may vary significantly depending on where the treatment plant is situated (elevation and distance). Raw water may also be abstracted from the reservoir by gravity but the feasibility of this arrangement cannot be determined at this stage because there are too many unknowns. The cost of a gravity pipeline from the dam may be significantly higher than the costs shown here.

W2: Costs assume conventional treatment with flocculation, sedimentation, rapid sand filtration and disinfection.

W3: Ground level reservoir structures are rectangular reinforced concrete, cantilever walls with raft foundations. Elevated storage structures are circular reinforced concrete tank supported on a circular base. It is assumed that pile foundations are not required. Reservoirs include inlet and outlet piping and flow metering.

W4: Pumping stations include building, lead/lag and back-up pumps, intake and discharge piping, flow metering, emergency generator and telemetry.

W5 & W6: Pipelines and feeder mains include all valves, thrust restraint and excavation in normal soil to 2 m depth. Rock excavation is not included. The cost of pressure reducing

valves and district flow metering is also included. Feeder mains include a 20% allowance for connecting with the existing distribution system.

The cost of the treated water transmission pipeline will vary depending on where the new treatment plant is located. The estimate is based on a length of 7,500 m assuming the worst case scenario where the treatment plant will be located near the raw water abstraction point.

W7: The cost for distribution network modifications is an allowance for replacement and reinforcement of distribution piping in the existing service area and extension of distribution piping into new service areas. This is assumed to be 50% of the cost of new feeder mains.

W8 & W9: Unit costs for house connections are derived from recent work in Kampot by the AIMF. The installation of new distribution piping in existing service areas will require reconnection of existing services. The cost assumes that 40% of the house connections in the existing service area will be affected.

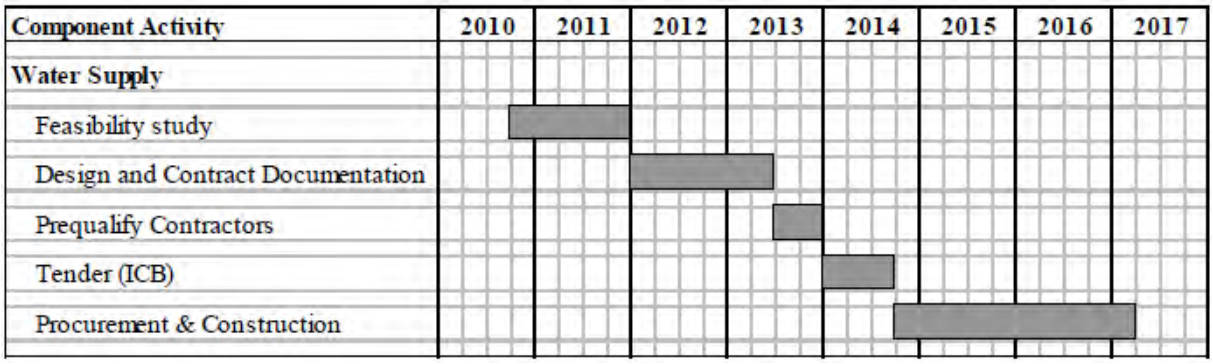
Unit cost of land is taken as $50 per m2 for the proposed storage site and $35 per m2 for the treatment plant site which is located outside city limits. These costs are based on current market conditions for land in the urban area.

3) Project Implementation

Activities and timeframes for implementing the proposed priority project are identified in Figure 5.3.15. The project will be implemented by the Kampot Water Supply Authority under responsibility of DIME.

The proposed water supply project will begin with a feasibility study. The feasibility study should include a hydrological study of the Tek Chhou water resource to establish yield and reliability.

The complete project cycle will take 6.5 years to completion of construction. This treatment plant will take 2 years to construct.



Source: JICA Study Team

Figure 5.3.15 Implementation schedule: WS-02

(3) WS-03: Preah Sihanouk Sewage Development Project

1) Objectives and scope

This section presents a priority project for implementing the major recommendations identified in the previous sections of this report. The priority project will focus on

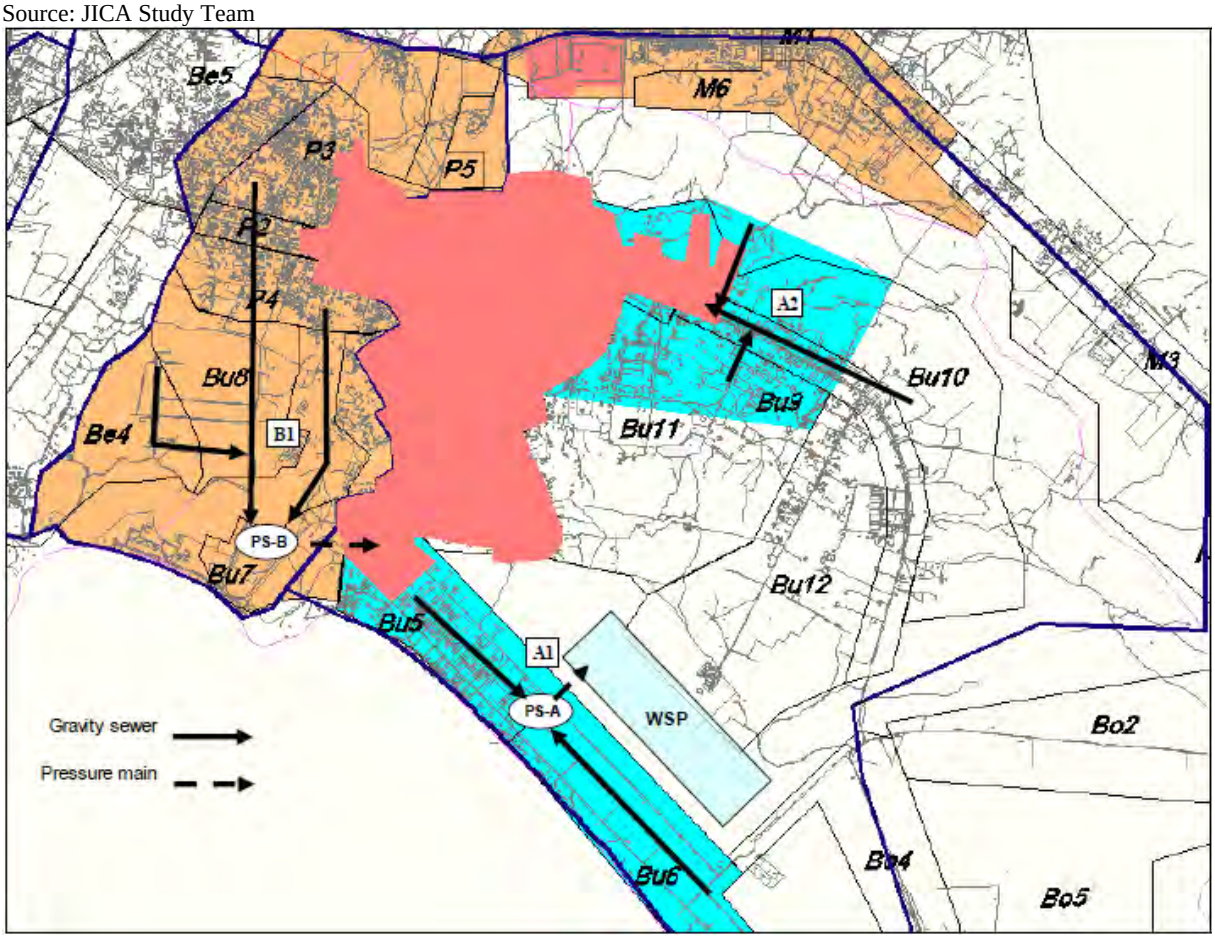
components of the wastewater collection system that are required to complete the previously implemented sewerage scheme in catchment A to preserve water quality along Ochheuteal beach.

The project will include the components identified in Table 5.3.7 and shown in Figure 5.3.16:

Table 5.3.6 Project Components: WS-03

	Catchment A	Catchment A	Catchment B
Project ID.	A1	A2	B1
Treatment			Expand existing waste stabilization ponds in catchment A
Trunk and branch sewers	100 mm to 300 mm dia. PVC branch sewers, pre-cast concrete manholes	100 mm to 300 mm dia. PVC branch sewers, pre-cast concrete manholes	100 mm to 300 mm dia. PVC pipe, 300 to 600 mm dia. Concrete trunk sewers pre-cast concrete manholes
Service Connections	1960	896	4.097
Pump station	PS-A Capacity 24 liter/sec	Gravity collector connected to existing	PS-B Capacity 60 liter/sec
Pressure main	From PS-A to treatment plant Dia 200mm L = 500m	none	PS-B to existing gravity trunk sewer in catchment A Dia. 300 mm L= 1200m

Source: JICA Study Team



Source: JICA Study Team

Figure 5.3.16 Priority Project Site: WS-03

Design populations and wastewater flow rates as follows:

Table 5.3.7 Wastewater Project Design Population and Flow

Project	Catchment area	2020		2030	
	ha	Population	m^3/day	Population	m^3/day
A1	142	4524	615	7840	1250
A2	134	2912	433	3584	571
B1	241	11946	1549	16,388	2217

Note: Excluding infiltration and wet weather inflow
Source: JICA Study Team

A1 (Catchment A1)

Wastewater generated in the catchment area along the beach will be collected by gravity to a pumping station which will convey it under pressure to the existing treatment plant. The required peak hourly pumping flow rate is assumed to be approximately 2 times the average peak hourly flow.

A 200 mm diameter transmission main is proposed. The pipe diameter is selected to provide a minimum velocity of 0.6 m/s at average flow in 2020 and 2 m/s maximum in 2030.

The pump station is relatively small and can be of the manhole type with submersible pumps. A source of emergency is recommended to avoid overflows during power interruptions. A small building will be required to house a control panel and a diesel generator.

Preliminary pump requirements are identified in Table 5.3.9. The size of the pumps and the number of pumps will be very dependant on the actual diurnal pattern and the amount of storage that can be provided in the wet well at the pump station.

Table 5.3.8 Pump Requirements for Catchment A

Parameter	Units		2020	2030
No of pumps		duty	3	3
		standby	1	1
Pump capacity	(lps)	each	8	15
Operating Head	(m)	peak	9	14
Motor power	(kw)	peak flow	1	3
Power consumption	(kwH)	per day	22	63
Energy cost [1]	USD	Per day	6	16

Note: (1) unit cost of electricity $0.25 / kwH,
Source: JICA Study Team

A2 (Catchment A2)

Wastewater will be collected by gravity and discharged into existing trunk sewer. The design of the existing trunk sewer has allocated capacity for future flows from this part of the catchment. Details such as sizes and alignment of proposed trunk sewers will be determined at the feasibility study stage.

B1 (Catchment B1)

Wastewater in Catchment B will be collected and conveyed by gravity to a pumping station located at the lowest point of land near the drain opposite the Sokha hotel (ground elevation approximately 2.5 m). The main collector will be located along the existing drain. Wastewater will be pumped up and conveyed under pressure to the existing gravity collector

sewer in catchment A (ground elevation 22 m). The required peak hourly pumping flow rate is assumed to be approximately 2 times the average peak hourly flow.

A 300 mm diameter transmission main is proposed. The pipe diameter is selected to provide a minimum velocity of 0.6 m/s at average flow in 2020 and 2 m/s maximum in 2030.

The pump station requires a larger wet well capable of accommodating 4 submersible pumps. A source of emergency is recommended to avoid overflows during power interruptions. A small building will be required to house pump controls and a diesel generator.

Preliminary pump requirements are identified in Table 5.3.10. The size of the pumps and the number of pumps will be very dependant on the actual diurnal pattern and the amount of storage that can be provided in the wet well at the pump station.

Table 5.3.9 Pump Requirements for Catchment B

Parameter	Units		2020	2030
No of pumps		duty	3	3
		standby	1	1
Pump capacity	(lps)	each	20	25
Operating Head	(m)	peak	29	32
Motor power	(kw)	peak flow	8	11
Power consumption	(kwH)	per day	206	246
Energy cost [1]	USD	Per day	52	62

Note: (1) unit cost of electricity $0.25 / kwH,
Source: JICA Study Team

2) Costs

Preliminary project costs are presented in Table 5.3.11.

Table 5.3.10 Project Costs: WS-03

Project	A1	A2	B1	Total
Capital Costs				
S1: Expand treatment ponds	-	-	6,000,000	6,000,000
S2: Trunk and branch sewers	4,312,000	1,971,200	9,013,400	15,296,600
S3: Connections	784,000	358,400	1,638,800	2,781,200
S4: Pump stations	234,198	-	351,037	585,235
S5: Pressure mains	67,500	-	240,882	308,382
sub-total	5,397,698	2,329,600	17,244,119	24,971,417
Additional costs				
Engineering: studies and detailed design (8%)	431,816	186,368	1,379,530	1,997,713
Contractor overhead (5%)	269,885	116,480	862,206	1,248,571
Engineering: contract admin and inspection (9%)	485,793	209,664	1,551,971	2,247,428
Contingency (10%)	539,770	232,960	1,724,412	2,497,142
Total project cost	**7,124,962**	**3,075,072**	**22,762,237**	**32,962,271**
Land acquisition by MPWT	50,000	0	50,000	100,000

Source: JICA Study Team

Costs are based on a current sewerage project being implemented in Sri Lanka with a similar size population, urban density and topography.

S1: Treatment is based on duplicating the same configuration and sizes as the existing waste stabilization ponds. The anaerobic ponds are lines with concrete to facilitate maintenance. The facultative and maturation ponds are unlined. Costs include site drainage, civil works,

and flow instrumentation. It is assumed that the existing outfall sewer to the treatment plant has sufficient capacity to accept flows from catchment B.

S2: Trunk and branch sewers unit cost per person approximately $550. Costs include excavation to 3 m depth, reinforced concrete pipe for trunk sewers, PVC pipe for lateral sewers, pre-cast concrete manholes with ductile iron covers. Rock excavation is not included.

S3: Connections unit cost per person is approximately $400 per person. Costs include excavation, PVC pipe and modification of property drains.

S4: Pump stations costs are based on submersible pumps. The wet well is a large diameter pre-cast concrete manhole. Pump station costs include a control panel, piping and valves, emergency power generator in a small building, and telemetry.

S5: The pressure main is ductile iron and the cost includes excavation, fittings, appurtenances and thrust restraint.

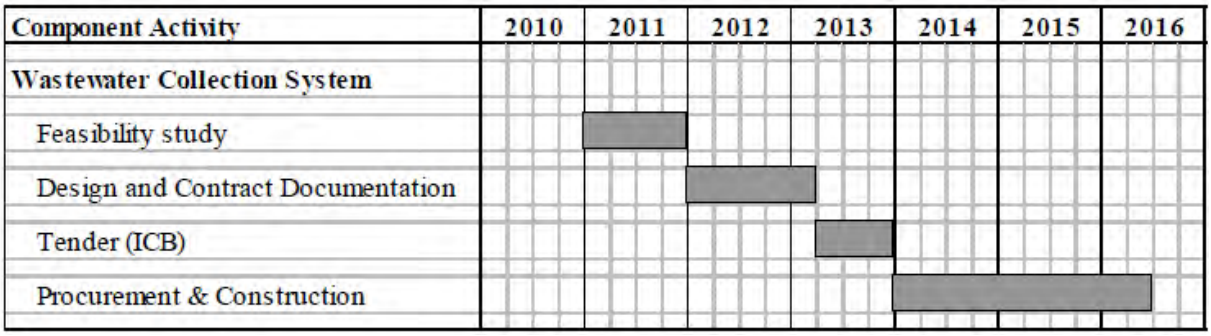
Unit cost of land is for pumping station sites and taken as $50 per m2 based on current market conditions for land in the urban area.

3) Project Implementation

Activities and timeframes for implementing the proposed priority project are identified in Figure 5.3.16. The implementing agency will be Preah Sihanouk Public Works and Transportation Department (DPWT).

The proposed wastewater project will begin with a feasibility study. The feasibility study should include a topographic survey of the areas to be serviced and a survey of the existing sewer system to determine as-built conditions and capacity of existing trunk sewers.

The complete project cycle will take 5.5 years to completion of construction.



Source: JICA Study Team

Figure 5.3.17 Implementation Schedule: WS-03

(4) WS-04: Kampot Sewage Development Project

1) Objectives and scope

Sewerage should be provided on the East side of the city first because it has the largest population and is already served by the water supply system. This area also includes the commercial core of the city and has the greatest potential for future growth. Sewerage in this

area will improve tourism potential and protect biodiversity in the estuary. This section presents a priority project for implementing sewerage on the east side of the river.

The project will include the components identified in Table 5.3.12:

Table 5.3.11 Project Components: WS-04

	East Catchment
Scope	Collection and treatment
Trunk and branch sewers	Separate sewer system 100 mm to 600 mm dia. PVC pipe, pre-cast concrete manholes
Service Connections	4560
Main Pump Station (PS-E)	Capacity 105 liter/sec
Pressure main	From MPS to treatment WSP Dia. 350 mm L=750m
Treatment Plant	Waste Stabilization Ponds: 4,000 m3/ day (2) Anaerobic (2) Facultative (2) Maturation
Capacity building	Technical assistance for operation and maintenance, bylaw enforcement and mandatory connection

Source: JICA Study Team

The treatment capacity required for 2020 is about 2/3 of the ultimate requirement therefore the construction of 2 process trains is recommended. Maturations ponds perform better when two are operated in series therefore the full capacity required for 2030 flows should be constructed initially.

Design populations and wastewater flow rates are identified in Table 5.3.13:

Table5.3.12 Wastewater Project design population and flow

	Units	2020	2030
Population served		20,720	31,015
Number of connections		4,560	6,825
Dry weather flow	m^3/day	3,260	5,230
Wet weather flow	m^3/day	3,545	5,685

Note: Service connections = 5 persons per connection + 10% for commercial and non-residential services
Source: JICA Study Team

2) Costs

Preliminary project costs are presented in Table 5.3.14.

Table 5.3.13 Project Costs: WS-04

	Catchment area (East)
Capital Costs	
Trunk and branch sewers	13,646,600
Connections	2,853,380
Pump stations	1,228,538
Pressure mains	219,680
Treatment WSP Stage 1	5,000,000
sub-total	22,948,199
Additional costs	
Engineering: studies and detailed design (8%)	1,835,856
Contractor overhead (5%)	1,147,410
Engineering: contract admin and inspection (9%)	2,065,338
Contingency (10%)	2,294,820
Total project cost	**30,291,622**
Land requirement (ha)	10.6
Land acquisition by DPWT	3,710,000

Source: JICA Study Team

Costs are based on a current sewerage project being implemented in Sri Lanka with a similar size population, urban density and topography.

S1: Costs are 2 out of 3 process streams plus a 25% allowance for making provision for future expansion. The anaerobic ponds are lined with concrete to facilitate maintenance. The facultative and maturation ponds are unlined. Costs include site drainage, civil works, and flow instrumentation.

S2: Trunk and branch sewers unit cost per person approximately $550. Costs include excavation to 3 m depth, reinforced concrete pipe for trunk sewers, PVC pipe for lateral sewers, pre-cast concrete manholes with ductile iron covers. Rock excavation is not included.

S3: Connections unit cost per person is approximately $400 per person. Costs include excavation, PVC pipe and modification of property drains.

S4: Pump stations costs are based on submersible pumps. The wet well I scast in place reinforced concrete construction. Pump station costs include a control panel, piping and valves, emergency power generator in a small building, and telemetry.

S5: The pressure main is ductile iron and the cost includes excavation, fittings, appurtenances and thrust restraint.

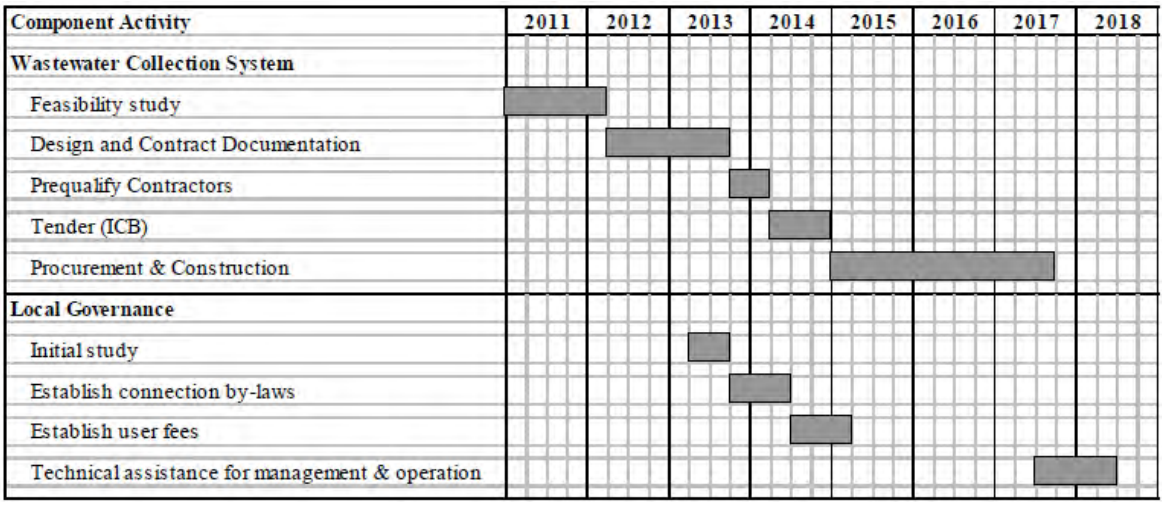
Unit cost of land for pumping station and treatment plant site s taken as $35 per m2 based on current market conditions for land outside the urban area.

3) Project Implementation

Activities and timeframes for implementing the proposed priority project are identified in Figure 5.3.18. The project will be implemented by the Kampot Department of Public Works and Transportation (DPWT).

The proposed wastewater project will begin with a feasibility study. The feasibility study should include a topographic survey of the areas to be serviced and a survey of the existing sewer system to determine as-built conditions and capacity of existing trunk sewers.

The complete project cycle will take 6.5 years.



Source: JICA Study Team

Figure 5.3.18 Implementation schedule: WS-04

Capacity building activities are required to implement sewer use by-laws that will among other things make connection to the system mandatory under the project. The study will make recommendations on connection fees, user charges, and billing systems. Technical assistance aimed at operations, maintenance and management of connections will be required for a period of 1 year starting at the commissioning stage.

Source: JICA Study Team

Figure 5.3.19 System Configuration Options: WS-04

(5) T-01: Preah Sihanouk Road Network Construction and Improvement Project

1) Background

Preah Sihanouk Road Network Construction and Improvement Project is proposed as priority project based on the following points.

Necessity of an access road to the center of Sihanouk City

As the gateway of Cambodia, the population of Preah Sihanouk is estimated to increase rapidly. The residential area is expected to expand to the east of the existing urban area of Preah Sihanouk City. However, the road network of east area of Preah Sihanouk has not been provided yet. If the road network situation was not improved, all inhabitants would have to detour along with NR4 via the center of Preah Sihanouk in order to go to the direction of Phnom Penh. Tourists also have to detour along with NR4 to visit beach resorts and the center of the city due to no direct access from the direction of Sihanoukville Airport.

Necessity of an industrial road between Sihanouk City and Veal Renh via Stueng Hav

Along the coastal line of Preah Sihanouk, there are industrial area and oil jetties located in the northern part. At present, since NR4 is used as the only one main access route to the center of Preah Sihanouk City, the traffic congestion mixed with motorcycles and heavy vehicles occurs. According to the road traffic condition, the number of traffic accidents has increased. Therefore, it is needed to consider northern part as industrial area and southern part as tourism area in order to provide an efficient road network for Preah Sihanouk.

2) Objective

In consideration of the population growth, the traffic congestion, the increase of the number of traffic accidents and the growth of industry of Preah Sihanouk, an efficient road network should be provided.

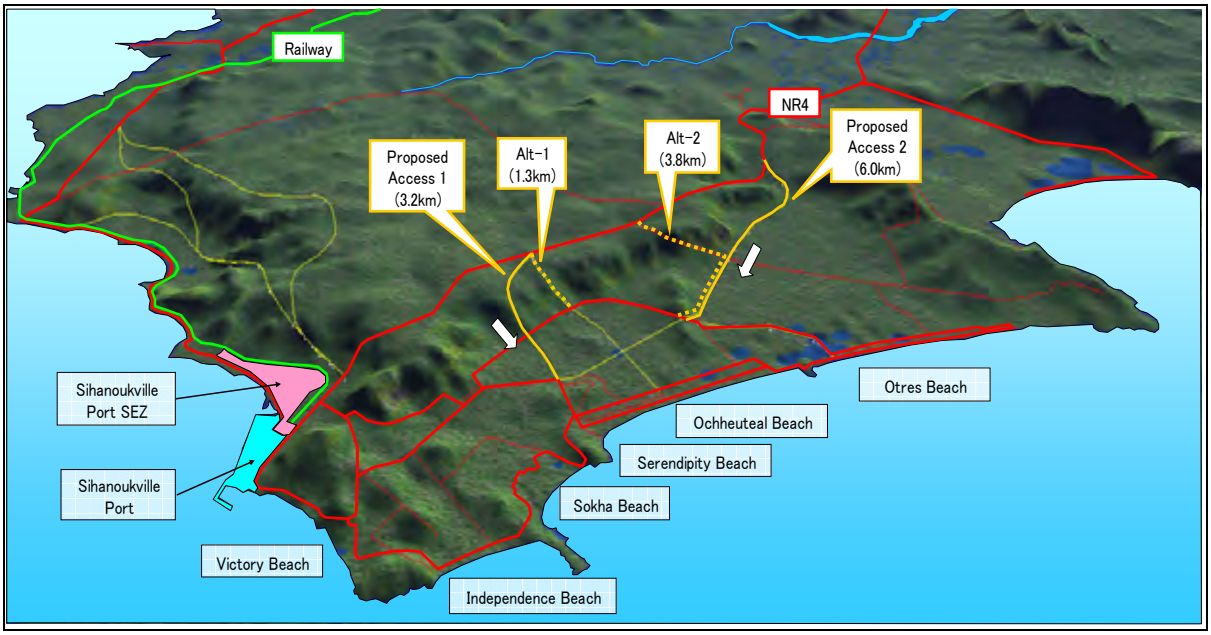
3) Project Components

Components of the priority project are as follows.

- Component1: Construction of an access road to the center of Preah Sihanouk from NR4,
- Component 2: Construction of an access road between Sihanoukville Port and Stueng Hav,
- Component 3: Rehabilitation of the exisiting road between Stueng Hav and Veal Renh, and
- Component 4: Rehabilitation of the existing bridges (21 bridges)

Location of the proposed project is shown below.

Component 1 : Construction of an access road to the center of Preah Sihanouk from NR4

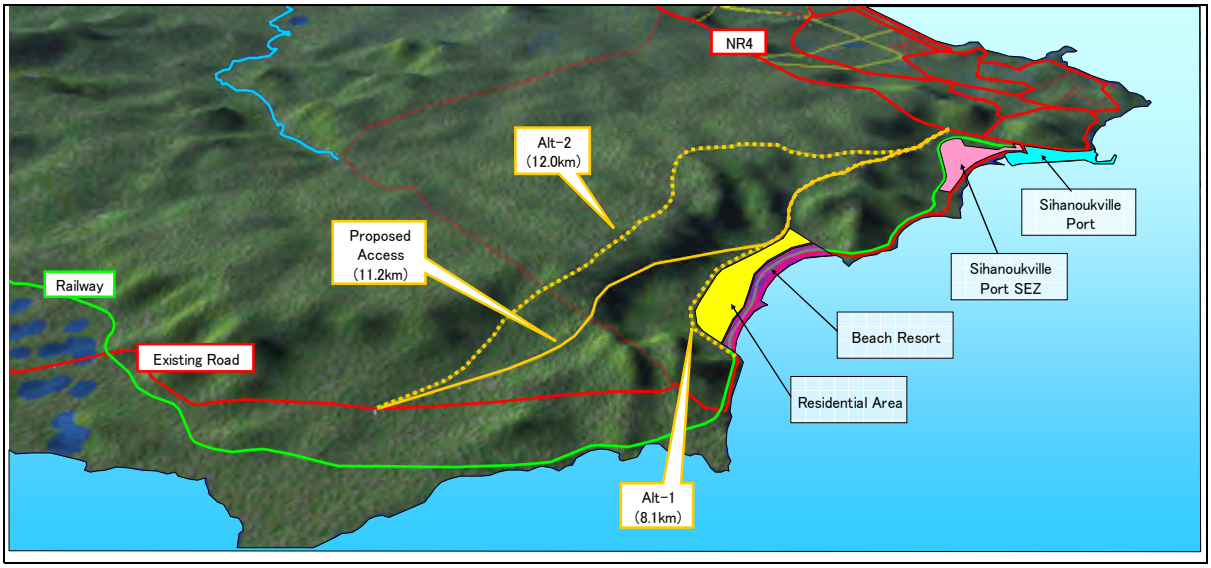


Source: JICA Study Team prepared based on SRTM (Shuttle Radar Topography Mission) data

Figure 5.3.20 Proposed Priority Project (Component 1)

Access 1 (3.2km) is proposed to connect the center of Sihanouk City with NR4 directly without detouring along with NR4. Access 2 (6.0km) is able to provide an efficient route to tourists who visit beaches and inhabitants who will settle in residential area which has been developed. Two alternative routes are proposed. According to a condition of land acquisition and a development plan of Preah Sihanouk City, access routes including alternatives should be considered in a feasibility study.

Component 2: Construction of an access road between Sihanoukville Port and Stueng Hav



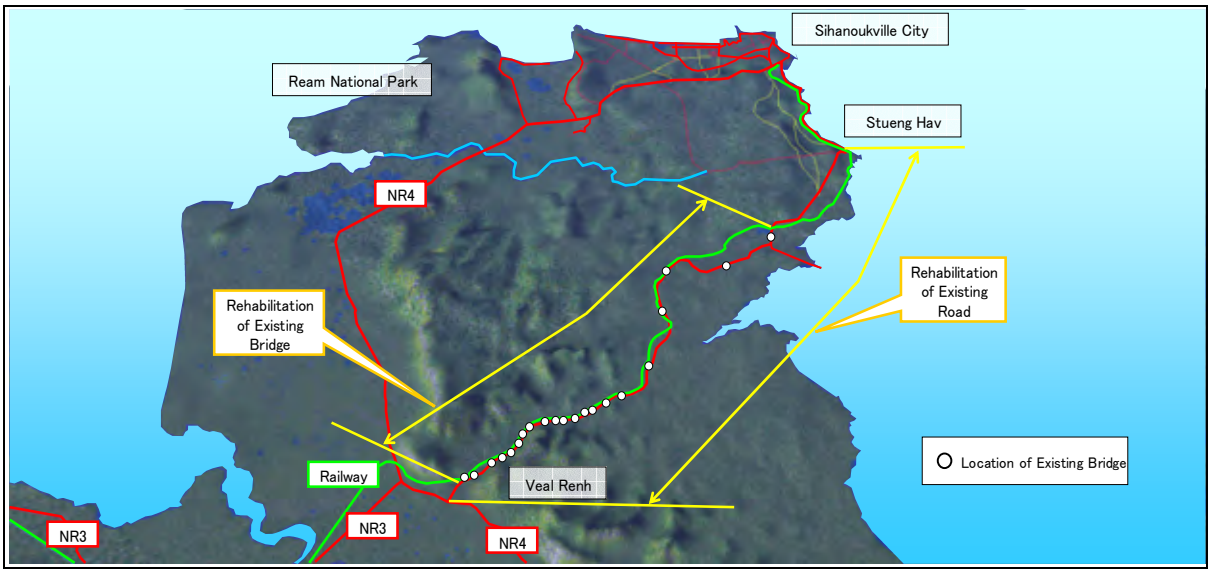
Source: JICA Study Team prepared based on SRTM (Shuttle Radar Topography Mission) data

Figure 5.3.21 Proposed Priority Project (Component 2)

One access road (11.2km) is proposed as an industrial road to connect Preah Sihanouk City with Stueng Hav and avoid traffic congestion mixed with motorcycles and heavy vehicles.

According to the land use plan suggested by JICA study team, there is a plan to develop a residential area and a beach resort along with the existing road in northern part of Sihanoukville Port SEZ. The proposed access road is located avoiding the development area. There are two alternative routes. They should be considered in feasibility study according to the result of a soil mechanical survey and a condition of land acquisition.

Component 3: Rehabilitation of the exisiting road between Stueng Hav and Veal Renh and Component 4: Rehabilitation of the existing bridges (21 bridges)



Source: JICA Study Team prepared based on SRTM (Shuttle Radar Topography Mission) data

Figure 5.3.22 Proposed Priority Project (Component 3&4)

4) Costs

A cost of the proposed project should be calculated based on a road design determined by the result of detail soil mechanical survey, traffic survey and analysis, traffic demand forecast. However, there is no detail data which is usable for preparation of a road design.

In this study, the cost is estimated practically based on a location and length of the proposed alignment, and the cost of the priority project, which is The Project for Improvement of National Road No.57, suggested in "The Study on the Road Network Development in the Kingdom of Cambodia". National Road No.57 was classified into R4/U4 which is design standard mentioned in the Road Design Standard of Cambodia. The cost of the improvement project of National Road No.57 was based on the design standard R4/U4. In consideration of the background of the proposed project, it is considered that R4/U4 is suitable for the proposed project. The design standard R4/U4 is as follows.

- Standard R4/U4: Provides medium geometric Standard and serve intermediate trip lengths with medium traveling speeds. It is also usually with partial access control. The Rural Highway, Major Provincial, Minor Arterial and Major Collector fall under this standard.

Cost of the priority project is shown below.

Table 5.3.14 Project Costs: T-01

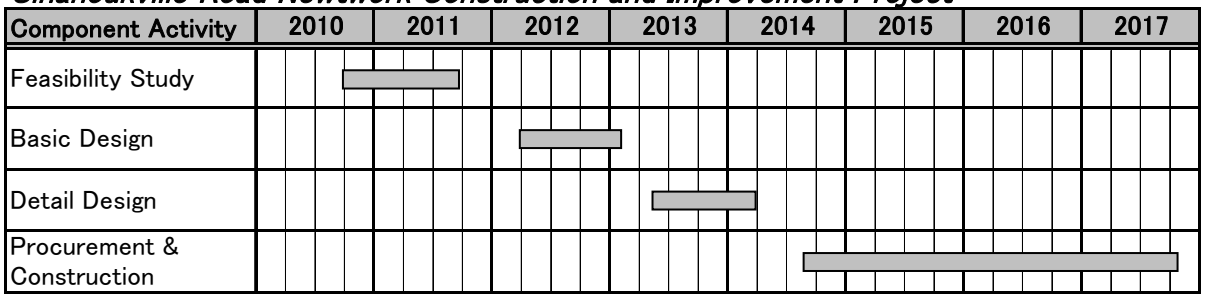
Component	Detail		Distance (km)	Cost (Million USD)
Component 1	Proposed Access 1	New Construction	3.2	2.8
	Proposed Access 2		6.0	3.8
	Alt-1		1.3	1.0
	Alt-2		3.8	3.0
Component 2	Alt-1	New Construction	8.1	6.1
	Proposed Access		11.2	11.1
	Alt-2		12.0	12.6
Component 3	Rehabilitation of Existing Road	Rehabilitation	33.9	13.4
Component 4	Rehabilitation of Existing Bridge	Rehabilitation	0.5	10.2

Source: JICA Study Team

5) Project Implementation

Activities and timeframes for implementing the proposed priority projects are shown below. The project will be executed by MPWT (Ministry of Public Works and Transport). The proposed projects will begin with a feasibility study. The feasibility study should include a soil mechanical survey and traffic demand forecast survey & analysis to determine a suitable road design. The complete project cycle will take about 7 years to completion of construction.

Sihanoukville Road Newtwork Construction and Improvement Project



Source: JICA Study Team

Figure 5.3.23 Implementation Schedule: T-01

(6) T-02: Kampot Road Network Construction and Old Bridge Rehabilitation Project

1) Background

Kampot city is located at the junction for three routes, NR3 (from Phnom Penh to Kampot), NR3 (from Preah Sihanouk to Kampot) and NR33 (from Kep to Kampot). Though three routes come into Kampot city, all vehicles have to pass through the center of the city. Especially, heavy vehicles to transport commodity from Kampot port come and go in the city.

Kampot City is divided by Kampong Bay River, most vehicles pass through Kampong Bay Bridge to over the river. Though there is one more bridge, it is too old and deteriorated and there is restriction for vehicle to over the bridge. In Kampot City, an efficient road network is not only provided to connect three routes, which are NR3 (from Phnom Penh to Kampot), NR3 (from Preah Sihanouk to Kampot) and NR33 (from Kep to Kampot), but an infrastructure to transport in the city is not provided sufficiently.

Moreover, it is estimated that more vehicles will pass through Kampot City because three routes, NR3 (from Phnom Penh to Kampot), NR3 (from Preah Sihanouk to Kampot) and NR33 (from Kep to Kampot), have been rehabilitated by Korean aid. To avoid for Kampot City to be bottle neck for traffic flow in the future, provision of ring road and rehabilitation of the existing old bridge are required.

2) Objective

In consideration of the following thing, an efficient road network should be provided and the existing old bridge should be rehabilitated.

- Situation that Kampot City is located at the junction for three routes, NR3 (from Phnom Penh to Kampot), NR3 (from Preah Sihanouk to Kampot) and NR33 (from Kep to Kampot),
- Situation that roads around Kampot City have been rehabilitated, and
- Population growth and development of Kampot City

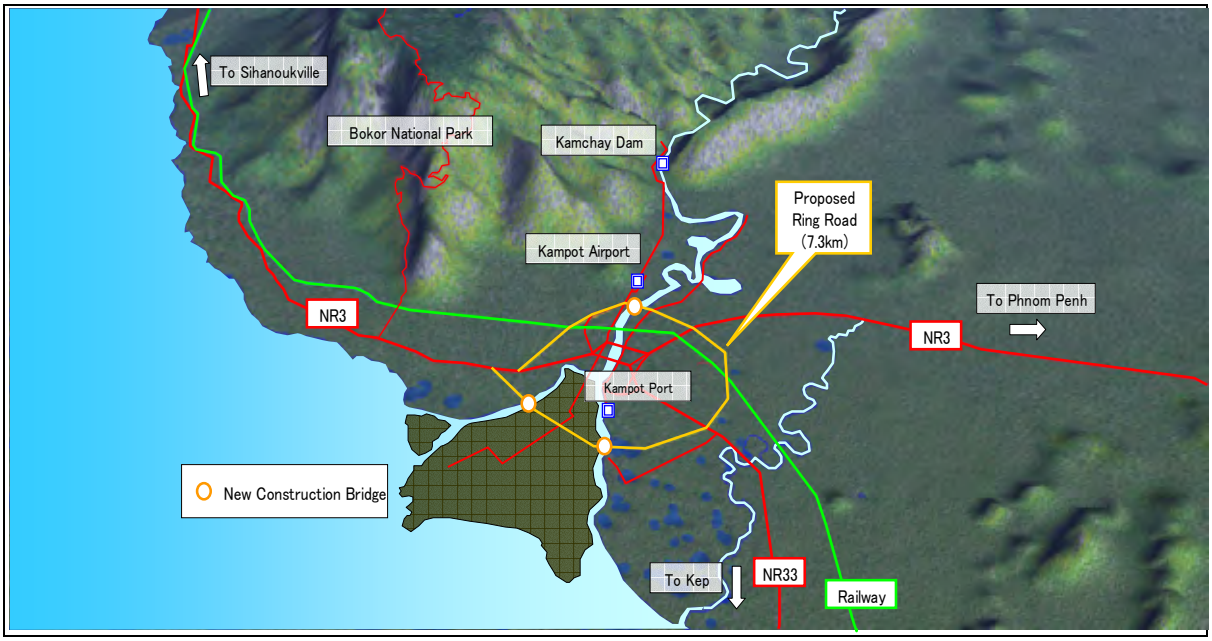
3) Project Components

Components of the priority project are as follows.

- Component1: Construction of a ring road to establish a road network around Kampot City (including a construction of 3 bridges), and
- Component2: Rehabilitation of the existing old bridge

Location of the proposed project is shown below.

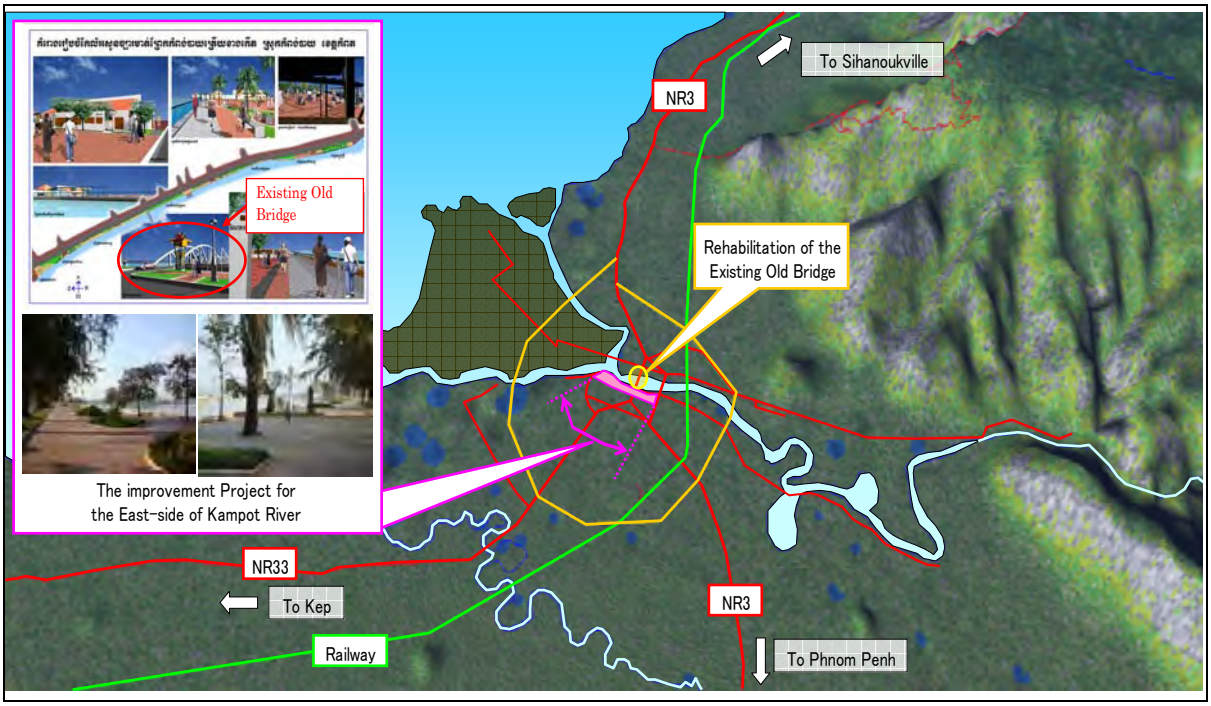
Component 1: Construction of a ring road to establish a road network around Kampot City



Source: JICA Study Team prepared based on SRTM (Shuttle Radar Topography Mission) data

Figure 5.3.24 Proposed Priority Project (Component 1)

Component 2: Rehabilitation of the existing old bridge



Source: JICA Study Team prepared based on SRTM (Shuttle Radar Topography Mission) data

Figure 5.3.25 Proposed Priority Project (Component 2)

DLMUPCC of Kampot Province has started to "Improvement Project for the East-side of Kampot River. The existing old bridge is located at the East-side of Kampot River. To rehabilitate the existing old bridge is able to contribute to the improvement project.

4) Cost Estimate

A cost of the proposed project should be calculated based on a road design determined by the result of detail soil mechanical survey, hydraulics analysis in the river, traffic survey and analysis, traffic demand forecast. However, there is no detail data which is usable for preparation of a road design.

In this study, the cost is estimated practically based on a location and length of the proposed alignment, the cost of the priority project, which is The Urgent Bridge Rehabilitation Program, suggested in "The Study on the Road Network Development in the Kingdom of Cambodia", and the cost of Basic design study report on the project for rehabilitation of bridges along the main trunk roads in Kingdom of Cambodia.

Cost of the priority project is shown below.

Table 5.3.15 Project Costs: T-02

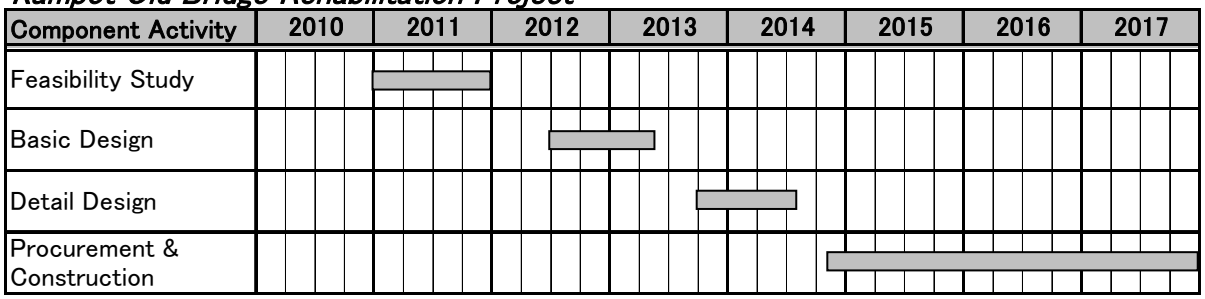
Component	Detail		Distance (km)	Cost (Million USD)
Component 1	Construction of Ring Road	New Construction	7.3	2.9
	Construction of Ring Road (3 Bridges	New Construction	0.7	22.1
Component 2	Rehabilitation of Existing Old Bridge	Rehabilitation	0.3	10.2

Source: JICA Study Team

5) Project Implementation

Activities and timeframes for implementing the proposed priority projects are shown below. The project will be executed by MPWT (Ministry of Public Works and Transport). The proposed projects will begin with a feasibility study. The feasibility study should include a hydraulics analysis and soil mechanical survey of Kampong Bey river to design stable and durable revetment and riverbed protection work. Traffic demand forecast survey & analysis also should be included in the study to determine a suitable road design. The complete project cycle will take about 7 years to completion of construction.

Kampot Old Bridge Rehabilitation Project



Source: JICA Study Team

Figure 5.3.26 Implementation Schedule: T-02

5.4 Social and Environmental Considerations for Priority Projects

As the impacts of basic plans were preliminary evaluated in section 4.5, the social and environmental impacts of projects along with the basic plans are mostly low. However, when a specific project is implemented, social and environmental considerations must be carried out. With respect to the Priority projects recommended in the previous sections, preliminary social and environmental considerations i.e. pre-screening and pre-scoping were carried out, so that appropriateness of and expected process for implementation of each project is confirmed from the view point of environment.

5.4.1 Pre-screening

The priority projects selected in Section 6 are below.

- Short-term Follow-up of Land Use Planning
- Capacity Development for City and Land Use Planning for the Coastal Area
- Strengthening EIA Implementation Capacity
- Preah Sihanouk Water Supply System Development
- Kampot Water Supply System Development
- Preah Sihanouk Sewage System Development
- Kampot Sewage System Development
- Sihanouk-ville Road Network Construction and Improvement Project
- Kampot Old Bridge Rehabilitation
- Establishment of Public-Private Partnerships and Development of Infrastructure for Solid Waste Management for Pursuit of Sustainable Environmental Protection and Development in Cambodian Costal Areas

First three projects do not involve any construction work, and the projects intends to improve the social and environmental conditions. EIA process would not be necessary for the projects with regard to the regulations in this country. Referring to the former the JBIC guideline, environmental category of the projects would be Category C.

The other seven projects involve some construction work. The social and environmental impacts are expected to be low, because the size of the projects are less than the list of the projects require an EIA (Annex of Sub-Decree No 72 ANRK BK, 1999) and preliminary SEA (section 4.5) implied that basic plans make miner negative impacts. IEIA would be required by MOE to the projects except for the Kampot old bridge rehabilitation. The rehabilitation project may have only to make environmental contract with MOE. However, environmental category of former JBIC guideline would be Category B for all seven projects, since there will be negative impact to some extent.

5.4.2 Pre-scoping

The pre-scoping was carried out for the seven priority projects that involve some construction work. A matrix is used in to preliminarily evaluate the magnitude of impacts listed in the former JICA guideline.

(1) Preah Sihanouk Water Supply System Development

The pre-scoping results on environmental and social impacts of the proposed Project are summarized in Table 5.4.1. Some negative and positive impacts are expected, though the magnitudes are slight or unknown. Basically, social environmental impacts are positive, while natural environmental and environmental pollution impacts are negative.

Table 5.4.1 Summary of Pre-scoping Result (Water Supply in Sihanouk)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase	C/−																													
Construction Phase		C/+														C/−		C/−				C/−	C/−			C/−				C/−
Operation Phase		C/+			C/+				C/+	C/+						C/−	C/−	C/−					C/−		C/−					

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
Blank: No impact is expected

Source: JICA Study Team

(2) Kampot Water Supply System Development

The pre-scoping results are in Table 5.4.2. The types of impacts and magnitudes are basically the same as the water supply in Sihanouk.

Table 5.4.2 Summary of Pre-scoping Result (Water Supply in Kampot)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase	C/−																													
Construction Phase		C/+														C/−		C/−				C/−	C/−			C/−				C/−
Operation Phase		C/+			C/+				C/+	C/+						C/−	C/−	C/−					C/−		C/−					

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
Blank: No impact is expected

Source: JICA Study Team

(3) Preah Sihanouk Sewage System Development

The pre-scoping results are in Table 5.4.3. Social environmental impacts are positive, while natural environmental and environmental pollution impacts are negative as well as water supply project.

Table 5.4.3 Summary of Pre-scoping Result (Wastewater Treatment in Sihanouk)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase	C/−																													
Construction Phase		C/+								C/−													C/−		C/−	C/−		C/−		C/−
Operation Phase					C/+				C/+	C/+					C/−		C/+	C/+					C/+		C/−			C/−		

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
Blank: No impact is expected

Source: JICA Study Team

(4) Kampot Sewage System Development

The pre-scoping results are in Table 5.4.4. The types of impacts and magnitudes are basically the same as the wastewater treatment in Sihanouk.

Table 5.4.4 Summary of Pre-scoping Result (Wastewater Treatment in Kampot)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase	C/−																													
Construction Phase		C/+								C/−													C/−		C/−	C/−		C/−		C/−
Operation Phase					C/+				C/+	C/+					C/−		C/+	C/+					C/+		C/−			C/−		

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
Blank: No impact is expected

Source: JICA Study Team

(5) Sihanouk-ville Road Network Construction and Improvement

The pre-scoping results are in Table 5.4.5. Impact on social environment is small, and local economy will have positive impact relatively during construction, though it is temporary. In the meantime, impacts on natural environment and environmental pollution are various, though the magnitude is slight or unknown at present.

Table 5.4.5 Summary of Pre-scoping Result (Road Construction in Sihanouk)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase	C/−																													
Construction Phase		B/+												C/−				C/−		C/−	C/−	C/−	C/−	C/−	C/−	C/−				C/−
Operation Phase		C/+												C/−				C/−		C/−	C/−	C/−	C/−			C/−				C/−

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
Blank: No impact is expected

Source: JICA Study Team

(6) Kampot Old Bridge Rehabilitation

The pre-scoping results are in Table 5.4.6. Since the scale of the bridge will not be substantially different from the existing bridge, impact caused by the project will be small. During the construction, river bottom sediments may be diffused, and aquatic ecosystem may have some impacts. The magnitude will be slight or unknown.

Table 5.4.6 Summary of Pre-scoping Result (Bridge Rehabilitation in Kampot)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase	C/−																													
Construction Phase																		C/−								C/−			C/−	
Operation Phase																														

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses
Blank: No impact is expected

Source: JICA Study Team

(7) Establishment of Public-Private Partnerships and Development of Infrastructure for Solid Waste Management for Pursuit of Sustainable Environmental Protection and Development in Cambodian Costal Areas

The pre-scoping results are in Table 5.4.7. Landfill site is planned to be constructed in the project, and it may cause some negative impacts to groundwater, surface water, soil, etc. A stream needs to get around the site, hydrological situation might be changed. The magnitude will be slight or unknown.

Table 5.4.7 Summary of Pre-scoping Result (Solid Waste Management in Coastal Area)

Impacts / Phase	1.Land Acquisition and Involuntary Resettlement	2.Local Economy such as Employment & Livelihood	3.Land Use &Utilization of Local Resources	4.Social Institutions such as Split of Communities	5.Existing Social Infrastructures & Services	6.The Poor, Indigenous & Ethnic Pople	7.Misdistribution of Benefit & Damage	8.Local Conflict of Interest	9.Water Usage or Water Rights	10.Sanitation	11.Cultural heritage	12.Hazards (Risk) Infectious diseases such as HIV/AIDS etc.	13.Topography & Geographical Features	14.Soil Erosion	15.Groundwater	16.Hydrological Situation	17.Coastal Zone	18.Fauna, Flora & Biodiversity	19.Meteorology	20.Landscape	21.Global Warming	22.Air Pollution	23.Surface Water Pollution	24.Soil Contamination	25.Waste	26.Noise and Vibration	27.Ground Subsidence	28.Offensive Odor	29.Bottom Sediment	30.Accidents
	Social Environment												Natural Environment									Environmental Pollution								
Planning Phase																														
Construction Phase		C/+											C/−			C/−		C/−		C/−			C/−	C/−	A/+	C/−	C/−			C/−
Operation Phase		C/+								C/+			C/−		C/−	C/−		C/−		C/−			C/−	C/−	A/+		C/−	C/−		C/−

A+/−: Significant positive/negative impact is expected.
B+/−: Some positive/negative impact is expected to some extent
C+/−: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)
Blank: No impact is expected

Source: JICA Study Team

5.5 Preliminary Evaluation of Priority Projects

As mentioned in the previous sections, totally eleven (11) priority projects were proposed under the Urban Environmental Improvement and Harmonized Economic Development Program. Table 5.5.1 summarizes these priority projects.

Table 5.5.1 Priority Projects: at-a-glance

No.	Sector	Title of Project	Location	Executing Agency	Script
i) Urban Planning Program					
UD-01	Urban Planning	National Spatial Panning Project	Phnom Penh (whole country)	MLMUPC	Reinforcement of legal framework, laws and regulations over land and spatial management. Capacity development plan of MLMUPC at the central level to enforce planning and management ability.
UD-02	Urban Planning	Urban Development Master plan for the Coastal Area	Four (4) coastal provinces	MLMUPC	Capacity development for drawing up detailed land use planning, circulation system, and development project plan for the city center of Coastal provinces. During short-term, a follow-up study to finalize master plan of Preah Sihanouk and Kampot proposed through CiCaDs and proceeding approval process is done.
ii) Environmental Management Program					
EV-01	Environment	Strengthening EIA implementation capacity project	Phnom Penh (whole country)	MOE	Capacity development of EIA department staff to enforce the laws and regulations of EIA and environmental monitoring.
EV-02	Solid Waste	Establishment of public-private partnership and development of infrastructure for solid waste management for sustainable environmental protection and development in Coastal area	Four (4) coastal provinces (Preah Sihanouk & Kampot)	MOE (Provincial Governmen t)	T/A for 3R implementation and preparation of SWM master plan, and procurement of SWM equipment and facilities through Grant aid or Loan.
iii) Industrial Promotion and Logistics Program					
L-01	Transportation	Master Plan Study on Comprehensive Logistics Development between Preah Sihanouk and Phnom Penh	Phnom Penh – Preah Sihanouk	MPWT	There is no logistics network between Preah Sihanouk and Phnom Penh as an integrated system. Therefore, in consideration of a feature of Sihanoukville Port which is Feeder Port in intra-Asia shipping route, a strategic logistics development plan should be provided in order to accelerate to increase a freight volume and to establish an efficient logistics network.
iv) Urban Infrastructure Development Program					
WS-01	Water Supply/ Sewage	Water supply system development project in Preah Sihanouk	Preah Sihanouk	MIME	Construction of storage facilities, a system of feeder mains and facilities for the transmission of treated water from Kbal Chay, and rehabilitation and improvement of distribution system.
WS-02	Water Supply/ Sewage	Water supply system development project in Kampot	Kampot	MIME	Construction of new treatment plant, treated water pipeline, storage facilities, and a system of feeder mains, and improvement of distribution system.
WS-03	Water Supply/ Sewage	Sewage system development project in Preah Sihanouk	Preah Sihanouk	MPWT	Expansion of treatment facility and making service connections mandatory over the ocheuteal beach.

WS-04	Water Supply/ Sewage	Sewage system development project in Kampot	Kampot	MPWT	Construction of treatment plant and sewage distribution system.
T-01	Transportation	Road network construction and improvement project in Preah Sihanouk	Preah Sihanouk	MPWT	Construction of access roads i) between NR4 and Preah Sihanouk city and ii) between Sihanoukville Port and Stueng Hav, improvement of Stueng Hav - Veal Renh road and rehabilitation of existing bridges (21 bridges).
T-02	Transportation	Road Network Construction and Old bridge rehabilitation project in Kampot	Kampot	MPWT	Construction of new Ring Road and bridges and rehabilitation of the existing old bridge located in the center of the Kampot city.

Source: JICA Study Team

5.5.1 Criteria of Assessment

The priority projects were subsequently assessed and evaluated by the following four (4) criteria:

- ***Readiness*** is to evaluate the maturity of the project and easiness of implementation. If any arrangement and agreement among the concerned entities, i.e. donors, private developer, land owner and so on, is required prior to the project implementation, the rate of Readiness shall be reduced.
- ***Justification*** is to evaluate the coherence to both the development plans by Cambodian government (both local and central governments) and the Country Assistance Plan prepared by Japanese government. If the sector of the project is one of the targeted development sectors in each plan, the project shall receive top rating.
- ***Urgency*** is to evaluate literally whether the project shall be commenced urgently.
- ***Effectiveness*** is to evaluate the socio-economic impact and environmental impact of project implementation. If the number of beneficiary is large and socio-economic impact is expected high, the project shall be rated highly, whereas the negative impact of environmental is expected high, the project shall be degraded accordingly.

Finally, each of the criterion was evaluated on a A, B, C basis. A scores five (5) points; B scores three (3) points; and C one (1) point. The prioritization is basically dependent on the current situations and will be changed when new circumstances evolve for each project.

5.5.2 Evaluation Result

The evaluation results for each priority project based upon the above mentioned criteria are summarized as following Table 5.5.2.

Table 5.5.2 Evaluation Results of Priority Project

No.	Title of Project	Criteria	Assessment	Remarks
UD-01	National Spatial Planning Project	Readiness	B+	Senior Minister of MLMUPC has strong interest in preparing national land use master plan.
		Justification	A	Coherent to the both Cambodian development plan and Country Assistance Plan, which aim to enhance management capacity at local level.
		Urgency	B+	As there is no national master plan of land use/ spatial design in Cambodia, inconsistent spatial and land use management is a strongly concerned.
		Effectiveness	A	The project is expected to contribute the improvement of living environment and achievement of the sustainable tourism development.
		Overall Score		**18**
UD-02	Urban Development Master Plan for the Coastal area	Readiness	A	E/A (DLMUPCC and MLMUPC) strongly request for the immediate implementation. Also, the project contains a follow-up T/A of this Master Plan Study (CiCaDs) by dispatching short-term expert.
		Justification	A	Coherent to the both Cambodian development plan and Country Assistance Plan, which aim to enhance management capacity at local level.
		Urgency	A	As the project is a follow-up of this Master Plan, and thereby urgent implementation is required. Currently numbers of large scaled development projects (tourism, residence, SEZ and so on) are on-going or planned. The master plan shall be urgently approved.
		Effectiveness	A	The project is expected to contribute the improvement of living environment and achievement of the sustainable tourism development.
		Overall Score		**20**
EV-01	Strengthening EIA implementation capacity project	Readiness	B+	MOE once submitted the request form of this project, and the working group for promoting new projects was established in MOE.
		Justification	A	Coherent to the both Cambodian development plan and Country Assistance Plan, which aim to enhance management capacity at local level.
		Urgency	A	Numerous development projects have been approved without proper EIA manner. Some of them are developed even in the national park, the precious nature and ecosystem is in danger.
		Effectiveness	A	The project is expected to contribute the improvement of living environment and achievement of the sustainable tourism development.
		Overall Score		**19**
EV-02	Establishment of public-private partnership and development of infrastructure for solid waste management for sustainable environmental protection and development in Coastal area	Readiness	B	Although provincial government has strong intention to implement 3R activities, discussion with the private concessionaire （CINTRI） is required.
		Justification	A	Development of socio-economic infrastructure and capacity development for good governance are key pillars of country assistance plan.
		Urgency	B	Although the immediate implementation of T/A is expected, procurement of related equipment and facilities are to be done a few years later,

				based upon the T/A results.
		Effectiveness	B+	If grant aid can be available, the project IRR shall be quite high.
		Overall Score		**15**
L-01	The Study on Comprehensive Logistics Development between Preah Sihanouk and Phnom Penh	Readiness	B	Not only MPWT, but also PAS and National Railway (ADB) shall be well coordinated to implement this study
		JustificationJustification	A	Coherent to the both Cambodian development plan and Country Assistance Plan, which aim to enhance management capacity at local level.
		Urgency	B+	The traffic situation of NR.4 as well as the entrance of Sihanoukville Port is quite congested, especially weekends. Numerous development projects have been approved without proper EIA manner.
		Effectiveness	A	The project is expected to contribute to the economic development of the whole country, especially to development of export-oriented industries and commodities.
		Overall Score		**17**
WS-01	Water supply system development project in Preah Sihanouk	Readiness	B-	Water source is currently managed by a private company. So, an arrangement with the private operator is required.
		Justification	A	In terms of Basic Human Needs (BHN), improvement of access to the clean water and sanitation is one of the key priority development issues in both Cambodian national development plan and Country Assistance Plan.
		Urgency	A	Due to the incremental urban population, implementation of the project is quite urgent.
		Effectiveness	A	The project covers large number of beneficiaries and basic infrastructure development is a key factor to achieve sustainable economic growth.
		Overall Score		**17**
WS-02	Sewage system development project in Preah Sihanouk	Readiness	B	Existing treatment plan can be utilized, but the expansion of treatment plant is required.
		Justification	A	In terms of Basic Human Needs (BHN), improvement of access to the clean water and sanitation is one of the key priority development issues in both Cambodian national development plan and Country Assistance Plan.
		Urgency	A	Due to the incremental urban population, hotels and restaurants, implementation of the project is quite urgent.
		Effectiveness	A	Sanitation is one of the most important factors for the touristic destination.
		Overall Score		**18**
WS-03	Water supply system development project in Kampot	Readiness	B-	Water source is currently managed by a private company. So, an arrangement with the private operator is required.
		Justification	A	In terms of Basic Human Needs (BHN), improvement of access to the clean water and sanitation is one of the key priority development issues in both Cambodian national development plan and Country Assistance Plan.
		Urgency	B	Population growth of Kampot city is comparatively lower than that of Preah Sihanouk city, but in the future water supply system must be developed.
		Effectiveness	B	Considering the financial impact, the investment cots are quite large for its profit (demand).

		Overall Score		**13**
WS-04	Sewage system development project in Kampot	Readiness	B-	Land acquisition for construction of water treatment plant is required.
		Justification	A	In terms of Basic Human Needs (BHN), improvement of access to the clean water and sanitation is one of the key priority development issues in both Cambodian national development plan and Country Assistance Plan.
		Urgency	B	Although drastic population growth will not be considered in Kampot city, sewage system shall be provided in the near future.
		Effectiveness	B+	As there is no sewage system in the city, if the city have one socio-environmental impact is quite high. However, in terms of financial impact, the profit is not expected so high.
		Overall Score		**14**
T-01	Road network construction and improvement project in Preah Sihanouk	Readiness	B	Although constructing new road, the proposed route does not create the resettlement.
		Justification	A	Development of socio-economic infrastructure is one of the key pillars of country assistance plan.
		Urgency	A	Due to the mixed traffic with heavy vehicles and light vehicles (motor cycles), the traffic accidents are frequently occurred in the area.
		Effectiveness	A	As the current road (No.4) is congested and traffic accidents are occurred frequently, both the economic and social impact shall be quite high.
		Overall Score		**18**
T-02	Road Net Work Construction and Old bridge rehabilitation project in Kampot	Readiness	B+	DLMUOCC Kampot is currently executing Improvement Project for East-side of Kampot River and the rehabilitation of the old bridge is essential for the project, too.
		Justification	A	Development of socio-economic infrastructure is one of the key pillars of country assistance plan.
		Urgency	A	As the quality of the existing bridge is seriously degraded and urgent rehabilitation is required.
		Effectiveness	B	As the bridge located in the center of the city and the only bridge connecting East side.
		Overall Score		**17**

Note: B+ is scored at four (4) points, whereas B- is scored at two (2).
Source: JICA Study Team

Finally, each the priority projects are classified based upon the priority degree as shown in the following Table 5.5.3.

Table 5.5.3 Prioritization of each Project

Priority	No.	Title of Project	Score
The highest priority	UD-02	Urban Development Master Plan for the Coastal area	20
	ENV-01	Strengthening EIA implementation capacity project	19
	UD-01	National Spatial Planning project	18
	WS-02	Sewage system development project in Preah Sihanouk	18
	T-02	Road network construction and improvement project in Preah Sihanouk	18
Second highest priority	WS-01	Water supply system development project in Preah Sihanouk	17
	T-01	The Study on Comprehensive Logistics Development between Preah Sihanouk and Phnom Penh	17
	T-03	Road Network Construction and Old bridge rehabilitation project in Kampot	17
High priority	SW-01	Establishment of public-private partnership and development of infrastructure for solid waste management for pursuit of sustainable environmental protection and development in Coastal area	15
	WS-04	Sewage system development project in Kampot	14
	WS-03	Water supply system development project in Kampot	13

Source: JICA Study Team

5.6.1 Results of 3rd SHMs

The third stakeholder meetings (SHMs) were held on 24th and 25th May 2010 in Preah Sihanouk and Kampot respectively.

The objective of third SHMs was to present and discuss M/P of Preah Sihanouk and strategic plan of Kampot urban areas that have been prepared by the Study Team. SHMs were also held to listen to the opinions about priority projects in the two provinces which have been identified by the Study Team and MLMPUC. So, the survey results of third SHMs have been summarized in this section after the Teams's tentative evaluation of the priority projects.

(1) Methodology of Stakeholder Meeting

For the stakeholder meetings, the following methodologies had been applied;

- Presentation of M/P of Sihanouk-ville City in Preah Sihanouk Province and Strategic Plan in terms of urban planning in Kampot Province, that have been prepared by the Study Team and MLMUPC.
- Question and answer as well as the discussion on the M/P and Strategy.
- Filling on the questionnaires on priority projects to listen to the opinions of stakeholders.
- Analysis of the questionnaires
- Identification of further comments and opinions on urban development in the two provinces and reflection of the opinions to the final M/P of Sihanouk-ville and Strategy of urban areas of Kampot Province.

(2) Number of Participants in Third SHMs

The main participants of each SHMs held in Preah Sihanouk and Kampot are shown as following Table 5.6.1.

Table 5.6.1 Number of Participants of Third SHMs

Organization	Number of Participants in Preah Sihanouk	Number of Participants in Kampot
MLMPUC and Other Central Government	1	1
Provincial Local Government	17	19
Districts	8	9
Commune Council	1	5
Scientific Organizations	4	2
Private	5	1
NGOs	3	0
Total	39	37

(3) Questionnaire Survey Results on the Priority Projects

Major findings from the questionnaire surveys held in both provinces regarding the selected priority projects are summarized as follows:

1) Responses from the Participants in Preah Sihanouk Meeting

In overall, stakeholders have agreed to all the priority projects which were identified by MLMPUC and the JICA Study Team. In SHM in Preah Sihanouk, most stakeholders agree to the projects which are related to regional economic development including L-01 (the study on comprehensive logistics development between Preah Sihanouk ad Phnom Penh) and T-01 (Preah-Sihanouk road network construction and improvement). Moreover, the study results show that stakeholders of Preah Sihanouk city are very much keen on environmental improvement projects including WS-02 (Preah Sihanouk sewage system development) and E-02 (Establishment of PPP and development of infrastructure for solid waster management).

2) Responses from the Participants in Kampot Meeting

On the other hand, in Kampot Province, the study results show that stakeholders strongly feel that there is a necessity of Spatial Planning and Master Plan of urban areas in the province. These projects are UD-01 (National Spatial Planning Project) and UD-02 (Master Plan of city planning for the coastal area) as well as T-02 (Road network construction and old bridge rehabilitation in Kampot). In Kampot, most of the stakeholders also have interests in environmental improvement by posting to projects EV-01 (Projects for strengthening EIA implementation capacity) and WS-02 (Kampot sewage system development).

(4) Additional Hearing Survey for the Important Factors to Implement the Priority Projects

Finally, which factors are important for the implementation of the priority projects have been inquired. The Items asked were as follows, and the respondents answered “Yes” or “No” against each item:

1. More political supports from the state government as the strategic growth center.
2. More decision-making power for the project implementation forms the state government to the provincial government.

3. More enhanced financial capacity of the provincial government even with a new local taxation on land and property ownership and/or local consumptions.
4. More local allocation tax to be officially allocated over local governments by the state government.
5. More international donors' resources (funds/technologies) to be explored by local governments.
6. More proactive involvement of stakeholder groups in the process of project designing.
7. More professional personnel to be staffed for the urban planning and land management department at the provincial government.
8. More economic incentives for the business sector's participation to promote provision of infrastructures and utility services (water supply, sewerage system, solid waste management, etc.)
9. More local people's concerns with the social development to be encouraged through community activities.
10. Others

The following figures show the results of hearing on the factors[2].

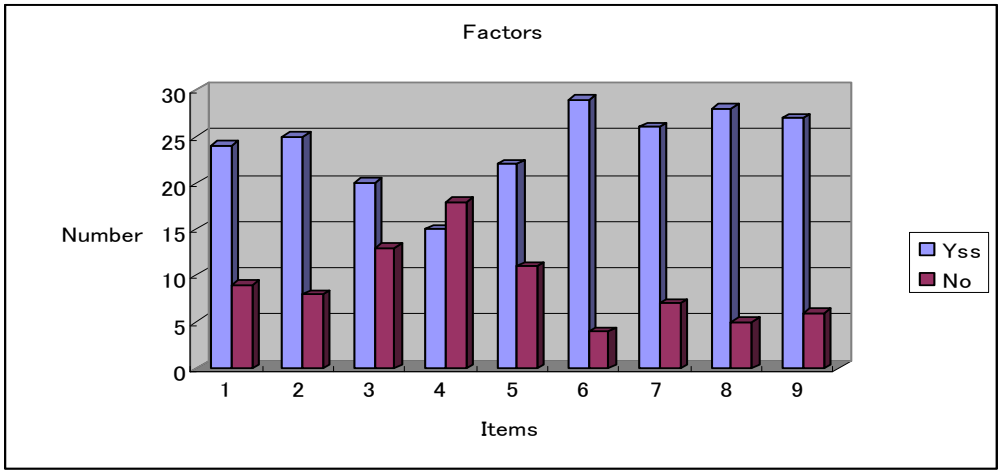


Figure 5.6.1 Hearing Results of Important Factors for Development Activities in Preah Sihanouk

[2] Multiple answers

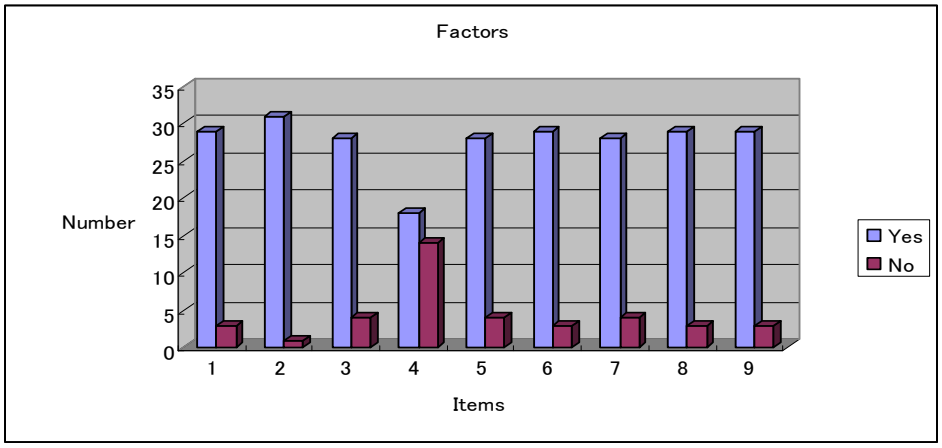


Figure 5.6.2 Hearing Results of Important Factors for Development Activities in Kampot

In Preah Sihanouk, most of stakeholders answered the factor No.6,8 and 9 are more important. This result indicates that, for the regional development, more participation of stakeholders is necessary (No.6 and 9). At the same time, stakeholders think that more incentives for socio-economic infrastructure is necessary (No.8).

On the other hand, in Kampot, stakeholders also expressed their opinion by choosing factors which indicate that more participation of stakeholders is necessary (No.6 and 9) as well as incentives to socio-economic infrastructure (No.8). However, in Kampot, unlike Preah Sihanouk case, most of stakeholders strongly feel that more political supports and decision making of government is necessary for the development of the province.

CHAPTER 6: RECOMMENDATIONS

6.1 Recommendations

The following are the recommendations for sustainable development of Preah Sihanouk.

1. Preah Sihanouk is often referred to as the head of the dragon. The dragon, meaning Cambodia, needs to lift the head, Preah Sihanouk, first when it starts to fly. Thus setting an appropriate goal for Preah Sihanouk is important for the Coastal area as well as to the nation.

2. The goal for Preah Sihanouk has been considered in an proactive procedure between the Study Team, MLMUPC and the Province in workshops and stakeholder meetings. The goal thus proposed consists of five pillars; 1) Function as the National Gateway of international trade, economies, human resource and technologies; 2) Be a National Growth Center with diversified economic activities and urban services; 3) Be the National Logistic Center linked with World Markets; 4) Be an Industrial Center with modern & non-traditional manufactures and agro-industries; and 5) Be an internationally reputable Marine Resort, harmonized with most livable environment.

3. For the industrial development, promotion of export industries, resource-based industries, such as processing of fishery and agricultural products, and tourism utilizing the area's gifted natural and resort resources is crucial for Preah Sihanouk Province.

4. At present, there are six approved SEZs in Preah Sihanouk Province, but the actual location of firms within SEZ is limited. In order to promote location of export-oriented industries, various policies need to be implemented including 1) Improving and strengthening the SEZ scheme such as enactment of SEZ law and related structural improvements in SEZ administration; and 2) Utilizing the National Agency for Occupations and Labor for mobilizing labor to rectify the issue of labor shortage.

5. With regard to urban planning of Preah Sihanouk, six (6) major issues are seen, including 1) Sparse and scattered urban structure; 2) Sprawling of Urban Area; 3) Mixed traffic and inconvenient road network; 4) Environmental Protection for sustainable development; 5) Uncontrolled Concessions; and 6) Informal settlements.

6. The present road network is mixed for industrial, and touristic/residential all on NR 4, causing danger for traffic accidents. The road network to/from Sihanouk should be divided into two routes; namely passenger and logistics to improve road safety. The passenger route uses NR4 to connect the beaches and the administrative area with the downtown, Sihanouk Airport and NR3 & NR4. Logistics route shall pass along the coastal line connects Sihanoukville Port, Sihanoukville Railway Station, Sihanoukville Port SEZ, three Bulk Oil Terminals, Stung Hav Industrial area and NR3 & 4. The latter route needs to be improved to cater to heavy trailers and trucks.

7. Control of urbanization needs to be considered in some delineated areas in Preah Sihanouk, including 1) Ream National Park; 2) Kbal Chhay protection forest (Water catchment area); 3) Water catchment area for water reservoir of Municipal Water Authority; 4) Conservation Area for Mangrove Forest Fostering; and 5) Open Space. The level of control of urbanization has to be considered and legal framework should be formulated by MLMUPC.

8. Urbanization promotion area, where urbanization is to be promoted, shall be designated in the central part of Preah Sihanouk and along the costal line to the north up to Stung Huv area. The area includes 1) Tourism Zone; 2) Commercial and Residential Zone; 3) Industrial Zone and 4) Future Fishing Zone.

9. Based on the above, a detailed land use zoning scheme and draft development guidelines are proposed for the central part of Preah Sihanouk. These proposed plans need to be further discussed with the stakeholders for final adoption, following the Law on Land Management, Urban Planning and Construction by MLMUPC and Province. Donor organizations, including JICA, are encouraged to assist this process to establish the first approved urban master plan in Cambodia.

10. Sustainable and reliable water supply to cater to rapidly expanding Preah Sihanouk will be given serious considerations. While the estimated water demand for Preah Sihanouk will be 12.2 MCM in 2030, the potential water source seem to be the Kbal Chay, which is estimated to have nearly double of the supply capacity, although the grounds for the estimation is not well documented. The Kbal Chay reservoir has been developed by a private concessionaire, and the quality of the dam is low with apparent technical problems that need to be addressed as soon as possible, and a reliable technical study needs to be carried out to determine the potential yield of the Kbal Chay as the future water source of Preah Sihanouk. For the treatment and transmission capacity, an addition of a new treatment plant and a transmission pipe to the existing public treatment plan will need to be made by 2014, and improvement of distribution systems will be necessary accordingly.

11. Proper wastewater disposal will be crucial to Preah Sihanouk, which is expected to grow as an international beach resort, but the connection to the present sewerage system is limited. For the existing service area covering the Downtown needs to be expanded to its surrounding areas including the Ochheutal beach area so as to protect the most favored beach in Preah Sihanouk.

12. Solid Waste Management (SWM) for Preah Sihanouk is entrusted to a private firm, but there is an issue of insufficient collection service. The issues in SWM includes 1) Establishment of a new sanitary landfill site to receive waste from urban area is urgent in consideration of increase in the amount of waste in future; 2) Enhance administration of private concessionaire in order to achieve proper level of service; and 3) Introducing community-based SWM to other areas in harmony with 3R concept.

13. The priority projects for the national level include two projects. The National spatial grand design: land use planning project (UD-02) aims at the reinforcement of legal framework, laws and regulations over land and spatial management and the capacity development plan of MLMUPC at the central level to enforce planning and management ability. Strengthening EIA implementation capacity project (EV-01) aims at the capacity development of EIA department staff to enforce the laws and regulations of EIA and environmental monitoring.

14. The priority projects for the provincial level include four (4) programs; 1) Urban Planning; 2) Environment Management, 3) Industrial Promotion and Logistics Development, and 4) Urban Infrastructure program.

- Urban Planning Program comprises Master plan of city planning for the Coastal area (UD-01), which aims at the capacity development for drawing up detailed land use planning system, and development project plan for the city center.

- Environmental Management Program comprises Establishment of public-private partnership and development of infrastructure for solid waste management for pursuit of sustainable environmental protection and development in Coastal area (SW-01) focusing on improved PPP-based Solid Waste management with 3R for the four Coastal Provinces. .

- Industrial Promotion and Logistics Development Program comprises Master Plan Study on Comprehensive Logistics Development Study between Preah Sihanouk and Phnom Penh (L-01) focusing on preparing a comprehensive logistics development plan over the growth corridor. The project is also expected to contribute the industrial promotion.

- Urban Infrastructures Program comprised urgent improvement of road network, water supply and sewerage for sustainable development of Preah Sihanouk and Kampot. The Preah Sihanouk package will include road improvement; water supply improvement; and sewerage improvement. The Kampot package includes old bridge rehabilitation; water supply improvement; and sewerage improvement. For the two Urban Infrastructure Programs, feasibility studies will be necessary to clarify the economic, technical and environmental viability of the proposed projects.

15. All the donor organizations, including JICA, are encouraged to assist Cambodia in implementing the priority projects proposed in this Study, while RGC must further prepared for the implementation of each priority project by clarifying the scope of work, plan of operation and preparing application for assistance.

16. The above recommendation on the approval of the M/P of Preah Sihanouk has been acknowledged by the RGC and the minutes of meetings, which stipulate that the M/P of Preah Sihanouk be approved by June/ July of 2011, was signed between the JICA Study Team and the Cambodian Steering Committee of this Project, on May 27th 2010.

.