3. Future Assistance to the Mekong Region in the Infrastructure Sector

3.1 Direction of Development and Tasks of Infrastructure

3.1.1 Direction of Development in the Mekong Region

(1) Realization of sustainable economic growth through strengthening economic collaboration

- The driving force of economic growth in the Mekong region is rapidly increasing trade within the region by China, Thailand, and Vietnam, and external trade, which are attaining high growth rates. In particular, north-south trade is expanding, such as trade between Yunnan Province in China and Thailand or Vietnam.
- On the other hand, development of infrastructure that supports trade within the region has been slow because of persistent civil conflicts and other factors. In general, the cross-border infrastructure has great potential as a network and its development is strongly required as an international public asset. However, sufficient development of cross-border infrastructure is impossible if development is undertaken by individual countries.
- As for infrastructure development on the north-south axis that runs through Thailand, Yunnan Province of China, and Vietnam, positive development efforts by the countries can be expected, independent of assistance from Japan, because the countries are engines for economic growth in the region. On the other hand, as for the east-west axis linking Myanmar, Thailand, Laos, and Vietnam, the potential for trade and exchanges is high in view of the population and the potential for economic development. But, development of infrastructure that supports economic activities on this east-west axis will not advance if it is left only in the hands of the related countries, partly because of a lack of consensus on interests. However, if the economic and social collaboration is attained on the east-west axis through infrastructure development, it will contribute to improving stability in the Mekong region.
- Basic problems related to life, such as poverty and high infant mortality rate, need to be solved. Therefore, to increase trade and expand growth in the region, it is necessary to improve the investment environment by developing infrastructure using public funds.
- However, in terms of highly effective project design to be derived from quantitative traffic data, infrastructure developments on both the north-south axis and the east-west axis are not necessarily satisfactory. To enable efficient and effective infrastructure development, it is necessary to improve data, to execute adequate analyses, and to formulate an appropriate implementation plan. Preparing such an implementation plan based on reliable data will also contribute to encouraging private investment.
- Because development of such a cross-border network might have negative effects, such as a cross-border expansion of a drug smuggling/crime and an increased load on the environment, measures will be taken to alleviate those effects.
- Thailand, which has attained a higher level of growth than other countries, holds an important position in trade, investment, and physical distribution in the Mekong region. Trends in this country are central to the sustainable development of the region.

(2) Alleviation of poverty and strengthening of regional integrity

- Achieving the millennium development goals is an important task. The most urgent task is to rectify gaps within the region so that basic living standards can be guaranteed at minimum. This will eventually contribute to avoiding conflicts and assuring the stability of the region.
- Myanmar, northeastern Thailand, southern Laos, northern Cambodia, and central Vietnam are the poorest areas in the Mekong region. Raising economic standards in these areas is important to secure the stability of the region and regional integrity.
- To have infrastructure development contribute to pro-poor growth, the following measures will be taken as a package combined with infrastructure development: measures that will have a direct impact on poor people (public health, education, access roads in local areas, etc.); measures that will give benefits to poor people through the growth via economic linkages (promotion of migration of labor force within sector and region, expansion of demand, etc.); and measures that will promote equitability development while complementing market principle-based measures (subsidies, public investment, financial policies, etc.).

(3) Disaster prevention and environmental conservation with the Mekong River as the axis

- Inundation damage due to flooding occurs every year in the Mekong river basin. The frequent occurrence of inundation not only causes loss of life and property, which are the bases of the economic and social development, but also prevents the development of the region as it poses a major risk to a new investment.
- Improving the safety of the region against flooding by taking flood mitigation measures is an important task for the economic development of the region.
- Along with economic growth in recent years, environmental deterioration is advancing in the Mekong region. Therefore, when planning or implementing a development plan, measures will be taken to minimize environmental impact.
- In the Mekong region, the “Mekong River Commission” (MRC) has been established on the basis of the “Cooperative Agreement Concerning the Sustainable Development of the Mekong River Basin,” which was concluded among Thailand, Laos, Vietnam, and Cambodia in 1995.
- This agreement states that natural resources and the natural environment along the Mekong River basin are important natural assets for economic growth, social welfare, and improving living standards of all basin countries, and that it is important to seek development while protecting those properties.
- When developing the Mekong region, it is important to realize the vision of the above agreement to avoid conflicts related to water utilization. For that purpose, it is effective to support regional level programs that are being promoted under the leadership of the Mekong River Commission.

- To solve various problems related to water resources in the countries of the Mekong region, using water management technologies that have been accumulated in Japan appears to be effective. It is considered meaningful to support the efforts of the Mekong River Commission and other related organs, in such fields as establishing water utilization rules and navigation rules, building a consensus that includes public involvement, and water resources management that includes collecting scientific data and analysis technology.

3.1.2 Tasks of Infrastructure Development

Based on the direction of Mekong region development in the future mentioned in Item 3.1.1, it is known that the following challenges must be addressed concerning the development of infrastructure in the region. Here, the term infrastructure means only those items related to transportation (roads, railways, water transport and airport), water supply and sewerage, electricity and energy, and flood control and water resources.

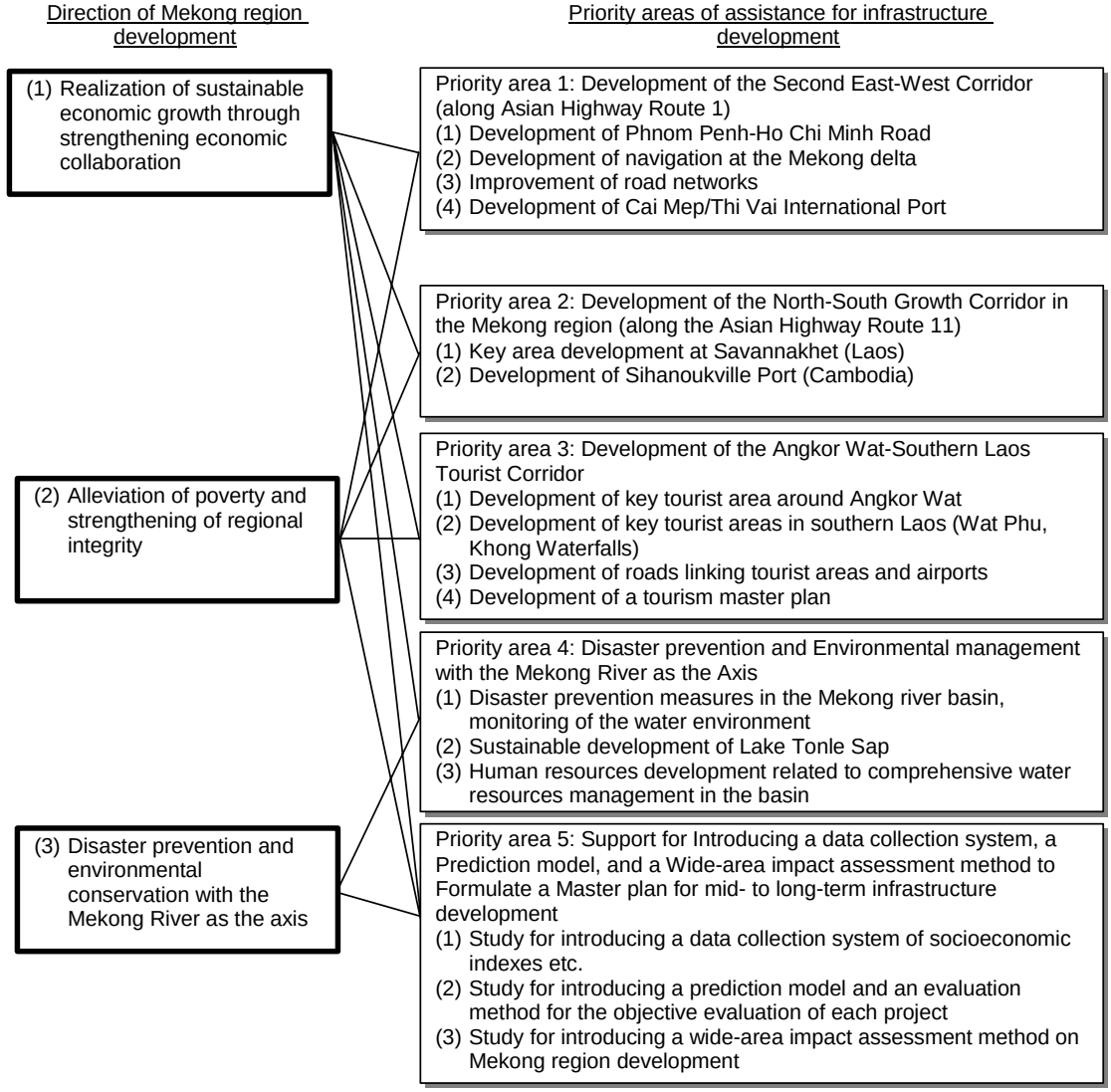
- Development of three economic corridors, namely, North-South Economic Corridor, East-West Economic Corridor, and Second East-West (Southern) Economic Corridor, has been underway in accordance with the GMS program of the Asian Development Bank (ADB). The most advanced development is seen in the road infrastructure of the East-West Corridor, such as construction of the Second Mekong International Bridge, which has been actively supported by Japan. But, infrastructure development is still needed before making the East-West Corridor the real East-West Economic Corridor. This includes development of harbors at both ends of the East-West Corridor, development of key economic areas at national borders and at cross points with other corridors, and development of tourist facilities.
- With regard to the North-South Corridor and the Second East-West (Southern) Corridor, it is necessary to continue development of harbors, development of key economic areas at the national borders and at the cross points with other corridors, and development of tourist facilities in the same way is being done in the East-West Corridor, while continuing development of artery road networks.
- In addition to these developments in corridors and key areas along the axis, it is necessary to develop infrastructure along branches of these corridors and to strengthen relations with local areas in order to widely diffuse the economic effects of the corridors and contribute to poverty reduction in local areas. It is also necessary to try to introduce a system similar to Japan's "Road Station" program (installation of service areas containing various useful facilities at the roadsides of ordinary roads to make them more serviceable to people).
- Together with the development of physical infrastructure, it is necessary carry out institutional development and build capacity.
- These three corridors are currently being developed mainly as a road network. Improving it into a comprehensive transportation network including a railway and a navigation channel, is a mid-to long-term task to be addressed in the future. In addition, formulating such a comprehensive transportation plan, collecting quantitative traffic data, and establishing a model development are required.

- It is also required to develop infrastructure to strengthen alliances with India, other ASEAN countries, China, and others, in addition to strengthening infrastructure networks within the GMS region.
- Concerning key areas in economic corridors where high economic development is expected, it is necessary to develop energy-related infrastructure (power generating facilities, power transmission facilities, pipelines, etc.), because energy demand is forecasted to increase in these areas.
- Infrastructure development in the Mekong region must be compatible with environmental conservation and social justice. For that purpose, the secondary effects of infrastructure development on environment and society must be carefully investigated, and necessary measures taken.
- Concerning water resources management in the Mekong region, distinctive interests exit in countries in the upper and lower reaches of the river; moreover, every project has environmental and social effects on the river basin. Therefore, it is necessary to strengthen systematic coordination from as early as the planning stage based on objective data on the region.

3.2 Details of Future Assistance in the Infrastructure Sector

Until now, Japan has extended economic cooperation for infrastructure development in the Mekong region in accordance with the "Greater Mekong Subregion (GMS) Program," which was proposed by the Asian Development Bank (ADB) in 1992. But now, it is also required to formulate further policies in accordance with "Japan-ASEAN plan of action." Therefore, while respecting the basic framework of the GMS Program, the priority areas of assistance from Japan for infrastructure development in the Mekong region have been determined as shown below, based on the direction and the tasks of future assistance mentioned in Section 3.1 above.*[6]

Five priority areas and 16 items consisting a total of 43 projects are extracted and proposed for implementation.



*[6] In the "GMS 10-year Strategy," which was agreed at the GMS summit in 2002, five strategic development thrusts are listed: Strengthen infrastructure linkages through a multisectoral approach; Facilitate cross-border trade and investment; enhance private sector participation in development and improve its competitiveness; Develop human resources and skill competences; and, Protect the environment and promote sustainable use of the subregion's shared natural resources. In the "Regional Cooperation Strategy and Program 2004-2008 (2004) proposed by the ADB, three GMS visions are listed—Connectivity, Competitiveness, and Community.

After establishing priority areas, priority projects are selected for each priority area.

Priority projects are selected by grouping them into short-term projects and mid-to long-term projects, mainly from among the projects proposed by the GMS Program and the projects requested to Japan by GMS countries.

The projects that are selected as the short-term projects are those that can support the growth of industries by having an immediate effect to local economy through foreign currency, in addition to projects for direct investment. As part of this selection process, the recent trend of trade and investment, such as the international division of work between production of parts and products, was taken into account.

Tables 1 through 5 on Page 23 and onward show priority projects in each priority area. The types of assistance shown in the column “project stage” in the tables, namely, technical cooperation, aid-based assistance, and loan-based assistance, are those presumed at present. Hence, they should be investigated in detail at their implementation stage as to which type of assistance is actually appropriate for the projects.

1. Development of the Second East-West Corridor (along Asian Highway Route 1)

Asian Highway Route 1 connecting Bangkok, Phnom Penh, and Ho Chi Minh, which will become the core of growth in the Mekong region, will be completed, development of the "Growth Belt (Second East-West Corridor)" will be promoted, and development of navigation at the Mekong Delta will be promoted, so that multi-modality between Phnom Penh and Ho Chi Minh will be attained.

Furthermore, to support road networks in the Mekong region, assistance for developing the Myanmar section of the Asian Highway Route 1 will be studied.

(1) Development of Phnom Penh-Ho Chi Minh Road

Among the sections of Asian Highway Route 1 passing through Vietnam, Cambodia, and Thailand that do not satisfy the minimum standard of a highway, the section between Phnom Penh and Neak Luong (about 55 km), which is not being undertaken by other donors, will be improved.

[Priority project]

(Note) The following priority projects correspond to those shown in the table. This applies to all of the priority projects shown hereafter.

- **1-1 Improvement of Cambodia National Road Route 1 (Phnom Penh-Neak Luong Section)**
- **1-2 Construction of the Second Mekong Bridge on Cambodia National Road Route 1**
- **1-3 Improvement of Phnom Penh Loop Road in Cambodia**
- **1-4 Development of "Road Station" on Asian Highway Route 1 (Vietnam)**
- **1-5 Development of "Road Station" on Asian Highway Route 1 (Cambodia)**

(2) Development of navigation at the Mekong delta

The river mouth of the Mekong delta has problems in terms of navigation, because sedimentation is advanced and virtually no dredging is done.

To reduce physical distribution costs in the southern part of Cambodia and others, navigation in at the Mekong delta will be developed. The development plan includes dredging of the river course to allow 5,000 - 10,000-ton class vessels to sail directly up to Phnom Penh, establishment of a signal system, specified as an international river, establishment of navigation rules, training of inland navigation crewmen, and introduction of a GPS navigation system.

[Priority project]

- **1-6 Mekong delta navigation development project (Vietnam)**
- **1-7 Mekong delta navigation development project (Cambodia)**

(3) Improvement of road networks

In response to the rough completion of the East-West Corridor and the Second East-West Corridor a few years from now, further improvements to road networks will be attempted. Prior to starting development work, an implementation plan enabling efficient and effective development will be prepared from quantitative traffic data on the basis of the Asian Highway route plan, and then priority sections will be extracted.

In addition to such a road improvement efforts, it is necessary to study introducing a guide system using GPS, tourist-oriented development in neighboring areas using "Road Stations," and adoption of "one village one product" activities in Thailand. Furthermore, there is a need to improve safety facilities on roads, and to train personnel on tourism and marketing local products.

[Priority project]

- **1-8 Development of auxiliary roads along Asia Highway Route 1 in Myanmar**

(4) Development of Cai Mep/Thi Vai International Port

To respond to increasing cargo needs in southern Vietnam, which is undergoing rapid economic growth and to eliminate restrictions on the sizes of ships at river ports around Ho Chi Minh City, a deep-water international port will be constructed at the Cai Mep and Thi Vai areas on the outskirts of Ho Chi Minh City (this will become the largest port in the Mekong river basin).

[Priority project]

- **1-9 Development of Cai Mep/Thi Vai International Port**

[Project objective]

The first objective is to develop a network among mega-city areas to establish a sustainable growth base, and to respond adequately to infrastructure needs arising from economic growth.

The second objective is to reduce poverty through balanced development in the region. Namely, besides corridors serving as the core axes, a wide-area network connected to the corridors will be developed, thereby extending the growth potential to local areas.

Table 1 Priority projects related to Development of the Second East-West Corridor (along Asian Highway Route 1)

In progress: ●, short-term project: ⊙, mid-to long-term project: ○

Area	Project name	Country	Outline of project	Remarks	Rough project cost	Project stage				
						M/P	F/S	Technical cooperation	Aid-based assistance	Loan-based assistance
1. Development of the Second East-West Corridor (along Asian Highway Route 1)										
	1-1. Improvement of Cambodia National Road Route 1 (Phnom Penh-Neak Luong section)	Cambodia	Improvement of the road section between Phnom Penh and Neak Luong (about 55 km) of Cambodia National Road Route 1	B/D survey is in progress by JICA			● Completed		⊙	
	1-2. Construction of the Second Mekong Bridge on Cambodia National Road Route 1	Cambodia	Construction of a new bridge at the crossing of Cambodia National Road Route 1 over the Mekong River in Neak Luong	F/S is in progress by JICA			●		⊙	⊙
	1-3. Improvement of Phnom Penh Loop Road in Cambodia	Cambodia	Improvement of loop road section of Cambodia National Road Route 1 which bypasses the Phnom Penh city area			●	⊙		○	
	1-4. Development of “Road Stations” on Asian Highway Route 1	Vietnam	Development of “Road Stations” on Asian Highway Route 1			⊙	⊙		⊙	
	1-5. Development of “Road Stations” on Asian Highway Route 1	Cambodia	Development of “Road Stations” on Asian Highway Route 1			⊙	⊙		⊙	
	1-6. Mekong delta navigation development project	Vietnam	Preparation of a navigation master plan for the Mekong delta		100 million dollars (GMS Tien River channel improvement project)	⊙	○			○
	1-7. Mekong delta navigation development project	Cambodia	Preparation of a navigation master plan for the Mekong delta			⊙	○			○
	1-8. Development of auxiliary roads along Asian Highway Route 1 in Myanmar	Myanmar	Development of an access road from Asian Highway Route 1 to the Moulmein Port in Myanmar	Thailand will provide assistance to the remaining section in Myanmar.			○		○	
	1-9. Development of Cai Mep/Thi Vai International Port	Vietnam	A deep-water international port allowing the large ships will be constructed at the Cai Mep and Thi Vai areas on the outskirts of Ho Chi Minh (this will become the largest port in the Mekong river basin).	D/D is in progress by JICA				●		⊙

2. Development of the North-South Growth Corridor in the Mekong region (along Asian Highway Route 11)

While continuing to support development of Sihanoukville Port (Cambodia), for which Japan has extended active support, support will also be extended to key-area development in Savannakhet (Laos) at the intersection of the East-West Corridor (Asian Highway Route 16) and Asia Highway Route 11.

(1) Key area development at Savannakhet (Laos)

Key-area development will be undertaken at Savannakhet, which is the city on the Laos side where the Second Mekong International Bridge (a bridge at the Thailand-Laos border) on the East-West Corridor is currently under construction, and where a power transmission project for southern Laos is being planned. Concerning construction of the Second Mekong International Bridge, it is also necessary to study establishing road-use rules (such as open 24–hours a day) and introduction of a mutual communications system.

Consideration is also needed to expand the effects of this key-area development by improving local roads connected to Asian Highway Route 16, which passes through Savannakhet, and by installing community centers along the roads. Also, aiming at deriving synergistic effects, improvement of Savannakhet Airport will be attempted in cooperation with Thailand. Technical cooperation will also be extended to human resources development for air traffic control in Laos.

[Priority project]

- **2-1 Construction of the Second Mekong International Bridge (Thailand)**
- **2-2 Construction of the Second Mekong International Bridge (Laos)**
- **2-3 Improvement of city roads and roadside areas in Savannakhet**
- **2-4 Improvement of local roads connected to Asian Highway Route 16**
- **2-5 Installation of community centers along Asian Highway Route 16**
- **2-6 Improvement of Savannakhet Airport**
- **2-7 Human resources development for air traffic control in Laos**

(2) Development of Sihanoukville Port (Cambodia)

Sihanoukville Port is the only sea port in Cambodia that is contributing to steady economic growth. To alleviate the potential shortage of capacity of this port, expansion of the container berth and installation of cargo-handling equipment will be carried out as the second-stage project, following the first-stage container berth improvement project which has been completed. In addition, an existing railway will be rehabilitated as part of the development project for the growth corridor linking Sihanoukville Port and Phnom Penh.

[Priority project]

- **2-8 Sihanoukville Port Urgent Rehabilitation Project**
- **2-9 Improvement of an existing railway linking Sihanoukville and Phnom Penh**

[Project objective]

The first objective is to provide, on a short-term basis, bases that can invite private investment by putting collective investment into newly emerging key areas (Savannakhet, Sihanoukville) as the project to produce immediate effects.

The second objective is to mitigate poverty through the balanced development of the area.

As this north-south corridor does not have any conditions that can invite investment spontaneously, infrastructure will be developed to create demand, such as sales of local products, offering of services, vitalization of the area through tourism, which will be attained by expanding the transportation network.

Table 2 Priority projects related to Development of the North-South Growth Corridor in the Mekong region (along Asian Highway Route 11)

In progress: ●, short-term project: ⊙, mid-to long-term project: ○

Area	Project name	Country	Outline of project	Remarks	Rough project cost	Project stage				
						M/P	F/S	Technical cooperation	Aid-based assistance	Loan-based assistance
2. Development of the North-South Growth Corridor in the Mekong region (along Asian Highway Route 11)										
	2-1. Construction of the Second Mekong International Bridge	Thailand	Construction of a new bridge at the crossing of the East-West Corridor (Asian Highway Route 16) over the Mekong River	Yen loan						●
	2-2. Construction of the Second Mekong International Bridge	Laos	Construction of a new bridge at the crossing of the East-West Corridor (Asian Highway Route 16) over the Mekong River	Yen loan						●
	2-3. Improvement of city roads and roadside areas in Savannakhet	Laos	Improvement of road conditions and traffic flow in the city (expansion of roads, installation of traffic signals, green belts, roadside trees, and drainage ditches)		Approx. 2 - 3 billion yen (including the development of 115 kV power transmission lines and key areas at the border with Vietnam)	⊙	⊙		⊙	
	2-4. Improvement of local roads connected to Asian Highway Route 16	Laos	Improvement of the 10-km section of local (prefectural) roads connected to National Road Route 9			⊙	⊙		⊙	
	2-5. Installation of community centers along Asian Highway Route 16	Laos	Installation of key facilities for local people along the above local (prefectural) roads and National Road Route 9			⊙	⊙		⊙	
	2-6. Improvement of Savannakhet Airport	Laos	International airport of Laos located at Savannakhet		17 million dollars		⊙		○	
	2-7. Human resources development for air traffic control in Laos	Laos	Improvement of functions of existing flight personnel training center, development of human resources for air traffic control at international and domestic airports, and offering necessary equipment					⊙		
	2-8. Sihanoukville Port Urgent Rehabilitation Project	Cambodia	To alleviate the potential shortage of capacity of this port, expansion of the container berth and installation of cargo-handling equipment will be carried out as the second-stage project, following the first-stage container berth improvement project which has been completed.					⊙		●
	2-9. Improvement of existing railway linking Sihanoukville and Phnom Penh	Cambodia	Rehabilitation of railway section between Sihanoukville and Phnom Penh	Improvement between Phnom Penh and Sisophon will be carried out by ADB		○				○

3. Development of the Angkor Wat-Southern Laos Tourist Corridor

Key area development will be attempted to enhance the attractiveness of internationally known tourist resources, represented by cultural heritage sites such as Angkor Wat in Cambodia and Wat Phu in southern Laos, and natural heritage sites such as Khong Waterfalls at the Laos-Cambodia border. Then, through assistance to develop a transport network linking these key areas, a tour route will be secured to establish the "Tourist Corridor."

(1) Development of key tourist area around Angkor Wat

To further enhance the attractiveness of Angkor Wat, which is a renowned international tourist resource, conservation of neighboring forests, improvement of water environment, and removal of land mines will be attempted.

Support is also needed for tourist-related activities, such as deepening understanding of the cultural value of Angkor Wat among foreigners and Cambodians, and improving the hospitality of local people towards tourists.

In addition, to expand the effects of development widely, a comprehensive survey for planning of sustainable vitalization of the Siem Reap/Angkor Wat area will be carried out.

[Priority project]

- **3-1 Siem Reap/Angkor Wat water environment improvement project**
- **3-2 Siem Reap eco-tourism project**
- **3-3 Comprehensive survey for planning sustainable vitalization of the Siem Reap/Angkor Wat area**

(2) Development of key tourist areas in southern Laos (Wat Phu, Khong Waterfalls)

To improve access to and the attractiveness of Wat Phu and Khong Waterfalls, which are tourist resources in southern Laos, efforts will be made to improve the Town of Wat Phu and support promotion of sightseeing around Khong Waterfalls.

[Priority project]

- **3-4 Wat Phu Town base improvement**
- **3-5 Support for the promotion of sightseeing around Khong Waterfalls**

(3) Development of roads linking tourist areas and airports

To connect tourist resources scattered throughout this area and to encourage round-trip tours, a round-trip tour route will be developed, with airports in Pakse and Siem Reap using as start/end points. To facilitate development of a tour route, improvement of roads and airports will be advanced.

[Priority project]

- **3-6 Improvement of roads on the right bank (Wat Phu side) of the Mekong River**
- **3-7 Improvement of roads between Siem Reap and Stung Treng (approximately 250 km)**
- **3-8 Improvement of Pakse Airport**

(4) Development of a tourism master plan

Besides the tourist spots mentioned above, many tourist resources within the Mekong region are designated as world heritage sites. Therefore, to select priority investment targets related to tourist resources, a tourism master plan taking the entire Mekong region into view will be formulated.

[Priority project]

- **3-9 Development of a Mekong region tourism master plan**

[Project objective]

The overall objectives of tourism development are twofold: [1] use of resources in areas having a tourist potential; [2] promotion of areas without any particular growth base except tourist spots (and mitigation of poverty).

The first objective is to generate further tourist demand and invite more tourists by making collective investments to enhance the attractiveness of tourist resources, because world-class tourist resources such as Angkor Wat exist in the Mekong region. Besides Angkor Wat, many other world heritage sites are available in the Mekong region, such as Hue in Vietnam, Van Chiang Archeological site in Thailand, and Luang Prabang in Laos. Therefore, development of a wide-area tourist route can be expected in the future.

The second objective is to generate tourist demand and to activate poor areas without any particular growth base except tourist spots, such as the southern Laos area (Khong Waterfalls, Wat Phu), by making collective investments to enhance the attractiveness of tourist resources and to improve access and tourist-receiving facilities in the areas.

In addition, increased exchanges derived from the development of a round tour route will be used for promoting the industry (sales of local products, offering of services, and sightseeing) in areas other than tourist spots, thereby activating areas without any particular growth base and mitigating poverty in those areas.

Table 3　Priority projects related to Development of the Angkor Wat-Southern Laos Tourist Corridor

In progress: ●, short-term project: ⊙, mid-to long-term project: ○

Area	Project name	Country	Outline of project	Remarks	Rough project cost (billion dollars)	Project stage				
						M/P	F/S	Technical cooperation	Aid-based assistance	Loan-based assistance
3. Development of the Angkor Wat-Southern Laos Tourist Corridor										
	3-1. Siem Reap/Angkor Wat water environment improvement project	Cambodia	Improvement of the drainage and sewerage environment in Siem Reap			⊙	⊙		○	
	3-2. Siem Reap eco-tourism project	Cambodia	Development of the natural sightseeing area including Angkor Wat temple site, Lake Tonle Sap, Phnom Kulen National Park		2.3 million dollars (GMS)		⊙	○		
	3-3. Comprehensive survey for planning sustainable vitalization of the Siem Reap/Angkor Wat area	Cambodia	Comprehensive development of Siem Reap			●	⊙		○	○
	3-4. Wat Phu Town base improvement	Laos	Town improvement (grass-root schools, hospitable activities, improvement of drainage channels) to make Wat Phu temple site a tourist area		Approx. 1 - 2 billion yen		⊙		⊙	
	3-5. Support for the promotion of sightseeing around Khong Waterfalls	Laos	Support for the promotion of sightseeing around Khong Waterfalls (natural resource) and nearby ruins				⊙		⊙	
	3-6. Improvement of roads on the right bank (Wat Phu side) of the Mekong River	Laos	Improvement of National Road Route 14 on the right bank of the Mekong River which runs for the south from the Pakse Bridge				⊙		○	○
	3-7. Improvement of roads between Siem Reap and Stung Treng	Cambodia	Improvement of roads (approx. 250 km) between Siem Reap (key city for sightseeing of Angkor Wat) and Stung Treng (key city of the north-south corridor)		Approx. 15 billion yen (GMS)	⊙	○			
	3-8. Improvement of Pakse Airport	Laos	Improvement of Pakse Airport which will be the start/end point of a round tour route from Angkor Wat, Khong Waterfalls, to Wat Phu				○			
	3-9. Development of a Mekong region tourism master plan	Wide area	Preparation of a tourism master plan taking the entire Greater Mekong Subregion (GMS) into view			⊙				

4. Disaster prevention and Environmental management with the Mekong River as the Axis

To improve responses to disasters that frequently occur in the Mekong river basin and to strengthen environmental management of the basin by taking the Mekong River (a natural resource communalized by regional countries) as the axis, establishment of a data collection system, a data improvement system, and a upper and lower river flow regulation system will be attempted.

Support will also be extended for the sustainable development of Lake Tonle Sap, which has a distinctive environment among the natural systems in the Mekong river basin.

(1) Disaster prevention measures in the Mekong river basin, monitoring of the water environment

In view of the fact that inundation damage due to flooding is hampering development of the Mekong region, improving the information base and preparing inundation area maps will be attempted to strengthen the disaster prevention measures along the Mekong River. Then, using such information and maps, flood prevention measures and river bank erosion prevention measures will be formulated. Also, various data consolidated through these efforts will be used for monitoring of the water environment.

[Priority project]

- **4-1 Improvement of information base on the Mekong River**
- **4-2 Preparation of Mekong River inundation maps using the "Global Map"** *[7]
- **4-3 Formulation of flood mitigation measures based on river inundation information**
- **4-4 Development of erosion prevention measures for the Mekong River bank at the Laos-Thailand border (Laos)**
- **4-5 Development of erosion prevention measures for the Mekong River bank at the Laos-Thailand border (Thailand)**
- **4-6 Support to develop tools for hydraulic, environmental, and social impact assessments**

(2) Sustainable development of Lake Tonle Sap

Sustainable development of Lake Tonle Sap will be advanced from a holistic standpoint that includes disaster prevention, environmental improvement, and protection of fishery resources.

[Priority project]

- **4-7 Improvement of Tonle Sap Port and Phnom Penh Port**
- **4-8 Establishment of Tonle Sap basin management organization**

*[7] This project is proposed by the Ministry of Construction (currently, the Ministry of Land, Infrastructure and Transport). It is intended to develop a digital map (Global Map) of the entire Earth indicating the present situation of the global environment, in cooperation with map-making institutions around the world.
[Reference] http://www1.gsi.go.jp/geowww/globalmap-gsi/globalmap-gsi.html

- **4-9 Study on water level regulation at Lake Tonle Sap**
- **4-10 Study on water quality improvement at Lake Tonle Sap**

(3) Human resources development related to comprehensive water resources management in the basin

In addition to the development of (1) and (2), support will also be extended to developing human resources for comprehensive water resource management in the basin.

In particular, to minimize damage due to flooding, it is necessary to improve risk management using the information base improved in Project (1). For that purpose, human resources will be developed by expanding existing training programs, as well as by making use of Network of Asian River Basin Organizations (NARBO) and International Flood Network (IFNet).

[Priority project]

- **4-11 Human resources development related to comprehensive water resources management in the basin**

[Project objective]

Because frequent inundation damage is preventing development in the Mekong region, urgent measures must be taken to improve the situation.

However, in the case of the Mekong region, it is difficult to obtain a consensus, such as that reached in Japan, on keeping a balance between upper and lower flows or between right and left banks, and for taking consistent flood control measures in the entire water system. Therefore, as a practical approach, measures to mitigate human and physical flood damage as much as possible will be taken preferentially. Measures for mitigating inundation damage will be taken by improving hydrological data, developing an information base on river, and human resources development, as well as through lot-level efforts such as raising housing land and constructing small-scale embankments.

Various data on flood damage mitigation can also be used for environmental conservation.

In addition, accumulated monitoring results can be used not only for identifying disaster hazard levels but also for calculating the cost effectiveness of disaster prevention investment, which can be directed to the further encouraging disaster prevention investment.

1. **Table 4 Priority projects related to Disaster prevention and Environmental management with the Mekong River as the Axis**

In progress: ●, short-term project: ⊙, mid-to long-term project: ○

Area	Project name	Country	Outline of project	Remarks	Rough project cost	Request of support (Y/N)	Project stage				
							M/P	F/S	Technical cooperation	Aid-based assistance	Loan-based assistance
4. Disaster prevention and Environmental management with the Mekong River as the Axis											
	4-1. Improving information base on the Mekong River	Wide area	Collecting data on water resources, establishment of monitoring database, and improving access to data		2 million dollars (GMS)				⊙		
	4-2. Preparation of Mekong River inundation maps using the "Global Map"	Wide area	Preparation of Mekong River inundation maps and technical transfer of hazard map preparation technology						⊙		
	4-3. Formulation of flood mitigation measures based on river inundation information	Wide area	Raising of inundation-prone roads, installation of bridges, embankments, and weirs						⊙		
	4-4. Development of erosion prevention measures for the Mekong River bank at the Laos-Thailand border	Laos	Institutional development to widely diffuse river bank erosion control technology which is underway in Vientiane as a pilot project	Pilot project is under way by JICA				●	⊙		
	4-5. Development of erosion prevention measures for the Mekong River bank at the Laos-Thailand border	Thailand	Technical cooperation and institutional development for erosion-prevention measures on the Thai side banks of the Mekong River						⊙		
	4-6. Support to develop tools for hydraulic, environmental, and social impact assessments	Wide area	Support to develop tools for hydraulic, environmental, and social impact assessments in the Mekong river basin						⊙		
	4-7. Improvement of Tonle Sap Port and Phnom Penh Port	Cambodia	Improvement of Tonle Sap Lake Port and Phnom Penh River Port in consideration of fluctuations of water level and water edge line				⊙	○		○	
	4-8. Establishment of Tonle Sap basin management organization	Cambodia	Establishment of public corporation to supervise comprehensive management of the Tonle Sap basin	Know-how of Japan Water Agency is used.					⊙		
	4-9. Study on water level regulation at Lake Tonle Sap	Cambodia	Study to secure navigation throughout the year including flood control, flood forecasting and warning				⊙	⊙			○
	4-10. Study on water quality improvement at Lake Tonle Sap	Cambodia	Study for wastewater control at cities around Lake Tonle Sap and for water quality improvement with monitoring of lake water				⊙	○			
	4-11. Human resources development related to comprehensive water resources management in the basin	Wide area	Introduction of human resources development program, training within the basin, personnel exchange promotion program, for comprehensive water resources management in the basin						⊙		

5. Support for Introducing a data collection system, a Prediction model, and a Wide-area impact assessment method to Formulate a Master plan for mid- to long-term infrastructure development

To formulate a master plan enabling systematic and efficient mid- to long-term infrastructure development in the Mekong region, support will be extended for developing a data-collection system for items such as socioeconomic indexes, introduction of a systematic prediction model, and an evaluation method, which will be necessary for evaluating each project objectively.

Support will also be extended for the introducing a wide-area impact assessment method to assist infrastructure development that promote sustainable development in the Mekong region.

(1) Study for introducing a data collection system of socioeconomic indexes etc.

It is necessary to improve collection systems of statistical data, which are the basis of systematic and efficient mid- to long-term infrastructure development.

[Priority project]

- **5-1 Development of a collection system on traffic volume and transportation volume by OD in the Mekong region**
- **5-2 Support for collecting detailed data and improving data accuracy such as socioeconomic indexes of each country in the Mekong region**

(2) Study for introducing a prediction model and an evaluation method for the objective evaluation of each project

It is necessary to introduce a prediction model and an evaluation method to evaluate each project objectively based on the data obtained in (1).

[Priority project]

- **5-3 Study on Asian Highway physical distribution model**

(3) Study for introducing a wide-area impact assessment method on Mekong region development

When developing infrastructures in the Mekong region, it is necessary to study the introduction of negative effect mitigation measures associated with developing a wide-area network, and introducing an evaluation method on the effects on other countries, such as the a trans-boundary impact assessment.

[Priority project]

- **5-4 Study on negative effect mitigation measures associated with the development of a wide-area network**
- **5-5 Study for introducing trans-boundary impact assessment**

[Project objective]

Infrastructure development projects in the Mekong region until now have, in a sense, been merely a conglomeration of various projects planned by each country or area independently in accordance with their own demand forecasts or desires. Hence, they have not been carried out in a priority order based on various criteria such as the efficiency of physical distribution and passenger transportation, and quantitative effects of investment on the whole Mekong region.

Therefore, to make best use of limited resources (funds etc.), and to obtain the best possible effects, the project objectives are to determine the priorities of various projects, to prepare investment plans, and to formulate development strategies and infrastructure improvement strategies, based on the results of quantitative data analysis.

Table 5 Priority projects related to Support for Introducing a data-collection system, a Prediction model, and a Wide-area impact assessment method to Formulate of a Master plan for mid- to long-term infrastructure development

In progress: ●, short-term project: ⊙, mid-to long-term project: ○

Area	Project name	Country	Outline of project	Remarks	Rough project cost	Request of support (Y/N)	Project stage				
							M/P	F/S	Technical cooperation	Aid-based assistance	Loan-based assistance
5. Support for Introducing a data collection system, a Prediction model, and a Wide-area impact assessment method to Formulate a Master plan for mid- to long-term infrastructure development											
	5-1. Development of a collection system on traffic volume and transportation volume by OD in the Mekong region	Wide area	Development of a collection system on traffic volume and transportation volume by OD in the Mekong region						⊙		
	5-2. Support for collecting detailed data and improving data accuracy such as socioeconomic indexes of each country in the Mekong region	Wide area	Support for collecting detailed data and improving data accuracy such as socioeconomic indexes of each country in the Mekong region						⊙		
	5-3. Study on Asian Highway physical distribution model	Wide area	Development of a physical distribution model to determine priority development sections of the Asian Highway						⊙		
	5-4. Study on negative effect mitigation measures associated with the development of a wide-area network	Wide area	Study on non-structural measures for mitigating negative effects (drugs, crime, environmental loads, etc.) associated with the development of a wide-area network						⊙		
	5-5. Study for the introducing trans-boundary impact assessment	Wide area	Development of an assessment method and system for impacts on other areas, small river basins, and the whole basin area, caused by infrastructure development						⊙		

3.3 Ways to Advance Assistance

So far, projects that should be advanced preferentially for developing the Mekong region have been extracted. However, various problems can arise when attempting to initiate projects. To achieve highly effective assistance, it should be advanced in the following way.

3.3.1 Comprehensive assistance in the infrastructure sector

For the development of the infrastructure sector, it is necessary to provide not only spot-type assistance such as the construction of physical structures, but also comprehensive assistance including improving policy, institutions, and maintenance aimed at completely solving various problems in each sector. Also, for the efficient operation of infrastructure, cooperation with the private sector should be considered sufficiently.

To achieve the above objective, it is essential to advance assistance efforts by interlinking loan-based assistance, aid-based assistance, and technical cooperation organically. It is also required to cooperate with international organizations to make bilateral assistance more productive using funds delivered to the Asian Development Bank (ADB), the Mekong River Commission (MRC), etc.

It is also important that the Ministry of Land, Infrastructure and Transport of Japan, which has extensive experience, human resources, and expertise in the fields of planning, development, maintenance, and administration of infrastructure, should extend such support as well.

Example 1: complicated customs procedures

- As complicated customs procedures are becoming a bottleneck for physical distribution in the Mekong region, improving customs clearance systems, such as through single-stop clearance and mutual certification, will also be sought when developing a cross-border road network, in collaboration with a customs procedures improvement project now being negotiated at the Japan-ASEAN meeting of transportation ministers.

Example 2: high cost of harbor use

- To improve international competitiveness, it is necessary to solve such problems as the high cost of harbor use. An efficient operation scheme must be conceived, such as entrusting port facility operations to the private sector.

Example 3: railway management in need of improvement

- When improving a railway network, it is necessary to improve the management of its administrative body simultaneously. In terms of achieving management efficiency, using private sector vitality will also be considered.

3.3.2 Coordination with non-infrastructure sectors

Infrastructure development may cause a growth gap between areas that can enjoy the benefits of development and areas unable to access such benefits. Although the emergence of this type of gap is considered to be unavoidable in the process of economic growth, efforts to alleviate such a gap must be taken. Therefore, it is important to provide support in fields beyond the infrastructure sector, such as social welfare, to areas that cannot receive the benefits of infrastructure development, through close coordination with sectors outside the infrastructure sector.

3.3.3 Communalization of a development vision for the Mekong region

When developing infrastructure, there is a possibility that a gap will be caused between the priorities from the perspective of the entire Mekong region and from each country. Therefore, to advance infrastructure development efficiently and effectively from the perspective of the entire Mekong region, it is important for Japan to present a region-wide development vision to every country in the Mekong region, and to communalize it with them through policy negotiations.

It is also important to communicate Japan's development vision to the donor community and to advance a regional development vision in an integrated manner in cooperation with other donors on a long-term basis. For that purpose, exchanges of opinions among donors must be actively encouraged, for example, on the basis of present recommendations.

Thailand it is one of assistance-receiving counties in the Mekong region, but in recent years it has also been a donor country extending assistance to other countries in the basin through the Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy (ACMECS). Hence, Japan must communalize information and cooperate with Thailand as donor countries.

3.3.4 Cooperation with international organizations to provide support from policy formulation and planning stages

To advance infrastructure development based on a region-wide development vision as mentioned above, support should begin from policy formulation and planning stages. Therefore, communalization of information and cooperation with international organizations such as the Asia Development Bank (ADB) and the Mekong River Commission (MRC) must also be started from policy formulation and planning stages.

To enhance communalization of information and cooperation with international organizations, it is essential for Japan to actively make technical proposals and offer information, as well as improve the quality of information shared. To enable efficient provision of high-quality information, communalization of information should be promoted through the joint efforts of the Japanese Government and support organizations.

3.3.5 Coordination of interests among countries in the Mekong region

To facilitate infrastructure development in the fields of navigation, disaster prevention, water utilization, and environment at this international river, it is important to coordinate the interests of upstream and downstream areas and between right and left banks where conflicts of interests tend to

occur. The Mekong River Commission (MRC) has been established as the organ coordinating interests in the Mekong region. Together with assistance for infrastructure development, Japan should appeal to GMS countries having conflicting interests to cooperate with the MRC, to provide support of human resources to the MRC, and to promote consensus-building among countries in the Mekong region.

3.3.6 Study on a new assistance system

To effectively promote a wide-region development project spanning multiple countries in the Mekong region, with Japan taking a leadership role, it is necessary to take new measures, such as allocating some amount to a wide-area project having cross-border effects out of the total budget appropriated for bilateral assistance using a separate framework.

3.3.7 Continuity of development vision and periodic review

To carry out a wide-area development project such as the Mekong region development, both a long-term effort and a flexible approach are required, as socioeconomic changes occur very quickly in this region where the speed of growth is very fast.

Therefore, development vision, priority projects, and other development-related matters should be reviewed periodically, and then advanced again with necessary modifications, by paying attention to changes in private investment and physical distribution in the region.