

TAR:CAM 27400

ASIAN DEVELOPMENT BANK

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TECHNICAL ASSISTANCE

TO THE

KINGDOM OF CAMBODIA

FOR THE

URBAN WATER SUPPLY AND SANITATION PROJECT

January 1995

CURRENCY EQUIVALENTS
(As of 21 October 1994)

Currency Unit	-	Riel (R)
R1.00	=	\$0.0004
\$1.00	=	R2,500

ABBREVIATIONS

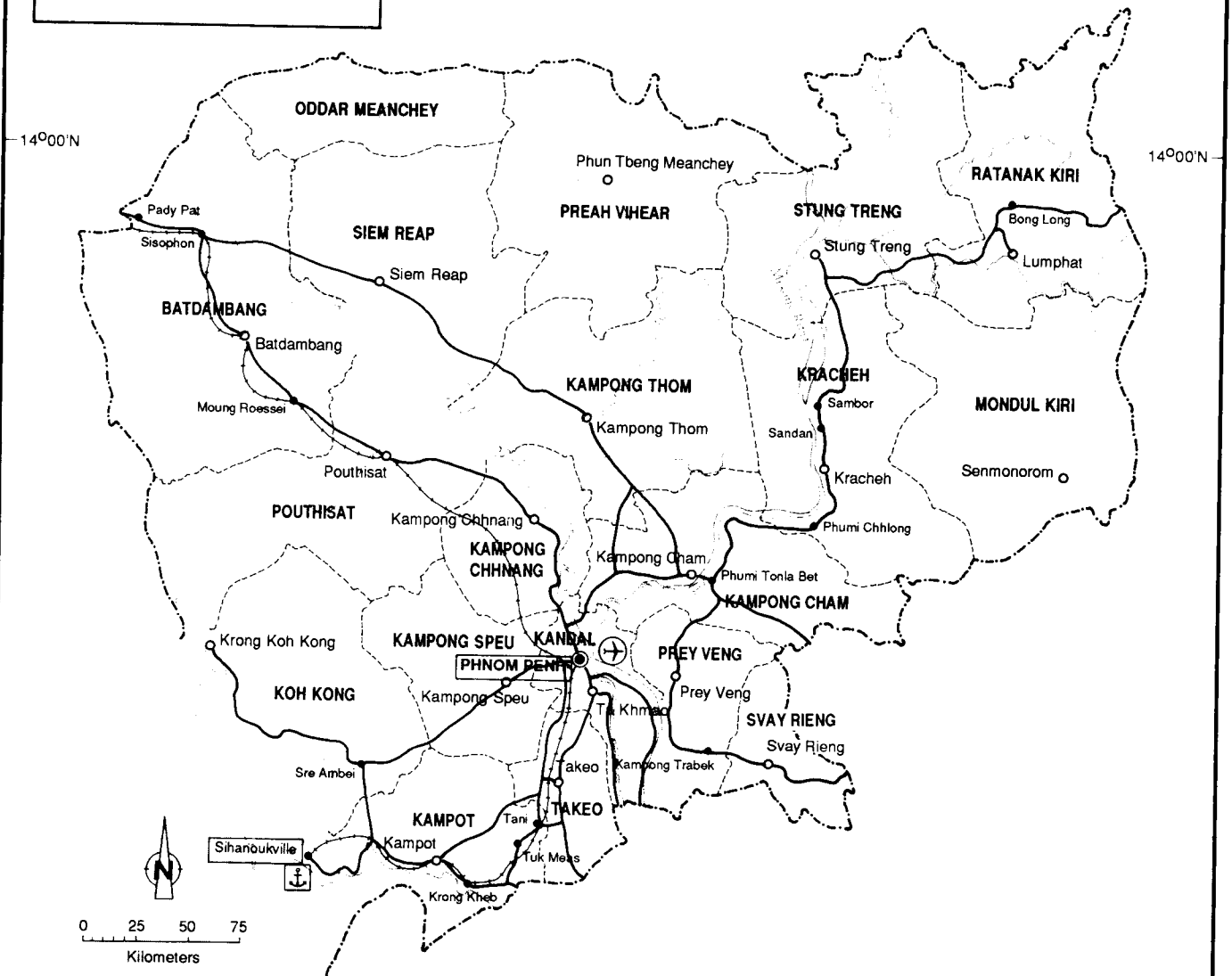
MIME	-	Ministry of Industry, Mines and Energy
MPWT	-	Ministry of Public Works and Transport
NGO	-	Non-Government Organization
ODA	-	Overseas Development Administration
TA	-	Technical Assistance
UNDP	-	United Nations Development Programme

NOTES












- (i) The fiscal year of the Government ends on 31 December.
- (ii) In this Report, "\$" refers to US dollars.

CAMBODIA

CAMBODIA URBAN WATER SUPPLY AND SANITATION PROJECT



LEGEND :

-  Airport
-  Port
-  Project City/Town
-  National Capital
-  Provincial Capital
-  City/Town
-  Major Road
-  Railway
-  River
-  Provincial Boundary
-  International Boundary

(Boundaries not necessarily authoritative)

I. INTRODUCTION

1. The Government of the Kingdom of Cambodia (the Government) has requested technical assistance (TA) to prepare a project to upgrade and rehabilitate water supply and sanitation facilities in Phnom Penh and Sihanoukville. A Fact-Finding Mission was fielded from 21 September to 4 October 1994. The Mission held discussions with a senior Minister of State with responsibility for regional and urban development, the Minister of Planning, the Governor of the City of Sihanoukville, and the Vice Governor of the Municipality of Phnom Penh. The Mission also held discussions with officials of the Ministries of Planning; Industry, Mines and Energy (MIME); Public Works and Transport (MPWT); and Economy and Finance. The Mission reached an understanding with the Government on the scope, cost estimates, and implementation arrangements for the TA and the terms of reference for the consultants. The Bank has programmed loans for two urban water supply and sanitation projects in its current three-year Country Operational Program, in support of the Bank's interim strategy of providing technical and financial support for the social sectors, particularly with regard to health and human resources development. The need for the TA was first identified during the 1994 country programming and is included in the program for 1994.¹

II. BACKGROUND AND RATIONALE

2. Most of Cambodia's urban water supply, drainage and sewerage facilities were severely damaged and suffered from poor maintenance during and after the civil war of the 1970s. Repair and rehabilitation, aimed at restoring services to their prewar condition, is proceeding. The urban population has increased rapidly since the early 1980s and water supply and sanitation services are overstressed. Several multilateral and bilateral agencies have provided assistance to the water supply and sanitation sector and nongovernment organizations (NGOs) have been active since 1979, but capital investment has been relatively modest.

3. Diseases related to poor water supply and sanitation are a leading cause of morbidity and mortality. They are responsible for about 50 per cent of the deaths of children under the age of five. The most recent data available² indicate that some 12,076 cases of diarrhea, 9,970 cases of dysentery, and 35 cases of cholera were reported in Phnom Penh in 1991. In Sihanoukville, 18,852 cases of diarrhea and 54 cases of dysentery were reported. The Ministry of Health considers malaria, spread by mosquitoes that breed in vegetation around ponds of drainage water and silted drains, to be the country's major health problem.

4. The TA is to study extension and improvement in the water supply and sanitation of the cities of Phnom Penh and Sihanoukville (see map). A Bank-financed needs assessment study of water supply and sanitation has identified these two cities as requiring priority improvements.³ Phnom Penh is the country's capital and principal commercial center. Sihanoukville, at one time known as Kompong Som, is the country's principal port. It is developing as an industrial center and has potential for tourism. More than 750,000 people live in Phnom Penh and about 45,000 live in Sihanoukville. The cities' populations are growing rapidly, stimulated by the return of people displaced by the war as well as by increased industrial and trading activities. Large population groups in both cities have low incomes.

¹ The TA was first listed in *ADB Business Opportunities* in October 1994.

² 1991 Health Sector in Cambodia; Health Situation. Ministry of Health, July 1992.

³ TA No. 2031-CAM: Water and Sanitation Needs Assessment Study, for \$100,000, approved on 27 December 1993.

5. Only about 40 per cent of the population of Phnom Penh and about 50 per cent of Sihanoukville have access to piped, potable water supplies. Three urban districts, with a total population of about 300,000 people, have recently been incorporated into Phnom Penh municipality and, as with some other city localities, have no piped water supply service.

6. About 50 per cent of the cities' populations have sewerage or latrine services. Sewerage systems include piped sewers and extensive lengths of open drains and canals. Some people who are not connected to sewers or drains use household septic tanks and pit latrines that they themselves have constructed. On the urban fringes, many people use open areas. Hanging latrines, built above the level of the surrounding ground, are used in poorly drained areas and sewage frequently overflows into the adjacent streets. Many sewers and drains are blocked by silt and debris. Overflowing sewage and drainage water are a severe environmental problem and pose a health risk.

7. Ongoing repair and rehabilitation of water supplies in Phnom Penh and Sihanoukville, financed through multilateral and bilateral agencies, are aimed at restoring the capacities of the services to their prewar levels. This objective is unlikely to be fully achieved and, in any case, is inadequate to meet the needs of the present-day population. People in poorer areas of the cities who have no access to piped water supplies obtain water from wells, rivers, and streams that are often unsafe, or from vendors who also use these sources.

8. A United Nations Development Programme (UNDP)/World Bank project to rehabilitate urban water supplies through the provision of new water supply pumps, treatment plant repairs, spare parts, training, and consulting services commenced in 1993. Most of the work is centered on Phnom Penh and Sihanoukville. French assistance to improve the financial capacity of Phnom Penh water supply authority and to rehabilitate water treatment plants, part of the water distribution network and some sewers and drains is being provided under annual protocols. It is expected that future French financing will focus on Phnom Penh where rehabilitation at minimum cost is possible.

9. The Government of Japan, through the Japan International Cooperation Agency, is assisting in rehabilitating and improving a water treatment plant in Phnom Penh. The Japanese Government has also funded a water supply master plan for Phnom Penh. The plan requires updating to address recent major changes in the city's population level. New Zealand has financed studies of groundwater potential and the development of a new source of water for Sihanoukville and is to finance a review of the city's wastewater management infrastructure.

10. The UNDP/World Bank project (see para. 8) will provide new equipment in other urban centers: Kampot, Kompong Chom, Prey Veng, Svay Rieng, and Te Khman. The United Nations Children's Fund is assisting in the provision of wells, hand pumps, and latrines in both urban and rural areas. The World Health Organization is to assist the Ministry of Health to establish water quality monitoring and surveillance systems. The European Community has, since 1991, assisted in emergency rehabilitation of water supplies in Battambang and Pursat in association with NGOs, as part of its assistance for refugee resettlement. The United Kingdom Overseas Development Administration (ODA) assistance has focused on Battambang, but future ODA funding is likely to be limited to small-scale rehabilitation and institutional strengthening.

11. About 20 NGOs have been active in the water supply and sanitation sector since the early 1980s. With the exception of Oxfam, SAWA (a Netherlands group registered as a NGO in Cambodia) and Youth With a Mission, NGOs have been involved in rural areas. They continue

to provide assistance focused primarily on emergency and restoration needs. Some NGOs have extended their supporting roles to include implementation functions.

12. Management of the sector has, in recent years, been weak but is being progressively improved. In Phnom Penh, water supply service is provided through a water supply authority dependent on the municipality for administrative and financial decisions. Sanitation services are provided by the municipality. Separate water supply authorities in Sihanoukville and in other provincial urban centers are responsible to, and dependent on, MIME. In provincial urban centers, MPWT is responsible for urban sewerage, drainage, and solid waste management.

13. MIME's capability is to be strengthened by the appointment of an international expert as Director of its Department of Provincial Water Supplies, through a German bilateral assistance, in early 1995. In Sihanoukville, the water supply authority's staff of 32 people have received technical and financial management training through a UNDP/World Bank TA. The Phnom Penh water supply authority has received institutional support from multilateral and bilateral agencies, including a comprehensive training program financed by UNDP. The authority's staff of 512 include 14 engineers and 8 financial and administrative specialists.

14. Under its National Program to Rehabilitate and Develop Cambodia,¹ the Government proposes to extend health, educational and social services so as to ensure, within the decade, a higher standard of living and a pattern of development that is sustainable socially, physically, politically, fiscally, and environmentally. The Government recognizes the urgent need to provide planned and sustainable water supply and sanitation development to reduce poverty, develop human resources, generate economic growth and improve health and the environment.

15. The inadequacies of the water supply and sanitation facilities in Phnom Penh and Sihanoukville, and in particular the inadequacy of the service for the urban poor, justify the need for development assistance. The TA therefore focuses on the preparation of a project that will improve the water supply and provide priority drainage services to the most needy localities of the two cities.

16. To determine whether an investment in water supply and drainage services would be cost effective, the technical, financial, socioeconomic, institutional, and environmental aspects need to be analyzed. In addition, the designs, benefits, and sustainability of operation and maintenance of the project, together with rehabilitation being financed by other agencies, need to be clearly defined. The TA will address these issues.

III. THE TECHNICAL ASSISTANCE

A. Objectives

17. The TA will assist the Government in (i) carrying out a study for the development of an integrated water supply, drainage and sewerage improvements in Phnom Penh and Sihanoukville; (ii) reviewing the requirements for institutional improvement in the sector; (iii) recommending improvements in the coordination of assistance for water supply and

¹ Formulated by the Government of the Kingdom of Cambodia, February 1994.

sanitation projects; and (iv) preparing a project (the Project) to improve water supply and sanitation services for the urban poor of Phnom Penh and Sihanoukville, to the preliminary design stage suitable for Bank financing. The study will have a time horizon up to the year 2015. Subject to the findings of the study, the Project will meet the intermediate-term water demand of Sihanoukville and of presently unserved areas of Phnom Penh. The Project will include priority improvements to drainage services in those districts.

B. Scope

18. The TA will be in two parts. In Part 1, a comprehensive analysis of water supply and drainage services in Phnom Penh and in Sihanoukville will be carried out. The scope will cover (i) collection, review, and analysis of all available data and information on existing and proposed water supply, sewerage and drainage services, including data from studies carried out with assistance from multilateral, bilateral, and other agencies; (ii) socioeconomic analyses, demand projections, and needs assessments; (iii) analysis of the potential for cost recovery for water supply and sanitation; (iv) determination of realistic objectives for coverage and service levels, based on the physical, social, and economic conditions; (v) evaluation of alternatives for new schemes and rehabilitation and upgrading of existing facilities, and determination of least-cost technically feasible solutions; and (vi) review of the institutional arrangements, including the role of the private sector, for urban water supply, sewerage and drainage, and determination of appropriate measures for institutional strengthening. Part 2 of the TA will be coordinated with Part 1 to prepare a project suitable for Bank financing and will incorporate (i) preparation of feasibility studies as necessary to supplement existing technical studies; (ii) environmental examinations and assessment of environmental benefits, risks, and mitigation costs; (iii) preparation of social, economic, and financial analyses; and (iv) assessment of the financial, economic and social viability of the project. During the implementation of the TA, local staff will be provided with on-the-job training in planning of water supply and sanitation improvements.

19. Participatory workshops for potential beneficiaries, NGOs, Government, local government, private sector agencies, multilateral and bilateral financing agencies, and other stakeholders will be convened during the course of the TA. One such workshop will be convened during Part 1 of the study to assist in determining the willingness and ability of the beneficiaries to participate in water supply and sanitation projects, appropriate coverage and service levels, evaluation of alternatives for new schemes, institutional requirements, and the overall coordination of water supply and sanitation projects. Another workshop will be convened during Part 2 to assist in determining the scope of the project, confirming the degree of beneficiary participation, and identifying social and environmental concerns. Other workshops will be convened as necessary to facilitate the implementation of the TA and the design of the project.

C. Cost Estimates and Financing Plan

20. The TA is estimated to cost \$610,000. Of that amount, the Bank would finance \$600,000 and the Government \$10,000 to cover the costs of remuneration and logistical and other support for counterpart staff. The TA will be financed by the Bank on a grant basis. Detailed cost estimates are provided in Appendix 1. The Government has been informed that approval of the TA does not necessarily commit the Bank to finance any ensuing project.¹

¹ The investment potential of the Project as envisaged is about \$20 million.

D. Implementation Arrangements

21. The Ministry of Planning will establish a Steering Committee to review the products of the TA and to ensure adequate input and support from, and close liaison with, Government and local agencies. The Steering Committee will include representatives of the Council for the Development of Cambodia, the Ministry of Planning, MIME, MPWT, municipality of Phnom Penh, City of Sihanoukville, and the Phnom Penh and Sihanoukville water supply authorities. The TA will be executed by MIME, which will nominate a senior staff member as Project Coordinator.

22. The TA will be carried out over eight months by an international consulting firm in association with a local consulting firm. It will require about 30 person-months of consulting services (18 person-months international and 12 person-months domestic) with expertise in water supply and sanitation engineering, institutional development, financial and economic analysis, and sociology. The international consultants will take the lead role and will subcontract local consultants who will assist in carrying out social and engineering surveys and other support activities. The consultants will be recruited in accordance with the Bank *Guidelines on the Use of Consultants*. An outline of the terms of reference of the consulting services is given in Appendix 2. Equipment to be provided under the TA, including computers, printers, and a photocopier, will be purchased by the consultants through direct purchase procedures to ensure standardization with similar equipment in use locally.

23. The consultants will submit an inception report within one month, an interim report within three months, and a draft final report within six months of the commencement of services. The interim report will set out findings on beneficiary participation, appropriate coverage and service levels, evaluation of alternatives for new schemes, and institutional requirements, and will summarize the proceedings of participatory workshops. The consultants will submit a final report that will incorporate the comments of the Government and the Bank on the draft final report, within one month of receiving the comments. The Steering Committee will review the reports jointly with the consultants and the Bank. Tripartite meetings among the Government, the Bank, and the consultants will be held in Phnom Penh following the submission of the inception and draft final reports.

24. The Government will provide counterpart staff from MIME, MPWT, and from the Phnom Penh and Sihanoukville water supply authorities to assist the consultants. MIME will provide the consultants with office furniture and access to existing reports and studies. The Government will provide transport and logistic support as required by its counterpart staff.

IV. THE PRESIDENT'S DECISION

25. The President, acting under the authority delegated to him by the Board, has approved the provision of technical assistance, on a grant basis, to the Government of the Kingdom of Cambodia in an amount not exceeding the equivalent of \$600,000 for the purpose of preparing an Urban Water Supply and Sanitation Project, and hereby reports his action to the Board.

COST ESTIMATES AND FINANCING PLAN
(in \$)

Item	Foreign Exchange	Local Currency	Total
A. Bank Financing			
1. Consultants' Remuneration and Per Diem	396,000	20,000	416,000
2. International Travel ^a	33,000	—	33,000
3. Reports	3,000	—	3,000
4. Equipment	10,000	—	10,000
5. Office Rental	—	10,000	10,000
6. Vehicle Hire	—	8,000	8,000
7. Engineering Surveys	—	8,000	8,000
8. Socioeconomic Surveys	—	20,000	20,000
9. Workshops and Training	—	9,000	9,000
10. Secretarial Support	—	5,000	5,000
11. Contingencies	<u>66,000</u>	<u>12,000</u>	<u>78,000</u>
Subtotal (A)	508,000	92,000	600,000
B. Government Financing			
1. Counterpart Staff	—	5,000	5,000
2. Logistic Support	<u>—</u>	<u>5,000</u>	<u>5,000</u>
Subtotal (B)	—	10,000	10,000
Total (A + B)	508,000	102,000	610,000

^a Includes the cost for two Government representatives to attend contract negotiations.

TERMS OF REFERENCE

1. The consulting services for the technical assistance (TA) will be undertaken in two parts. In Part 1, requirements for the optimal development of water supply, sewerage and drainage facilities in Phnom Penh and Sihanoukville to the year 2015 will be assessed. In Part 2, a carefully prioritized and well-focused investment project (the Project) suitable for Bank financing will be identified. The consultants will provide on-the-job training and will conduct training seminars for local staff during the implementation of the TA.

2. The consultants will use, to the extent relevant, the studies carried out for water supply and sewerage rehabilitation in Phnom Penh and Sihanoukville, under assistance from multilateral and bilateral agencies, and other relevant studies. The consultants will supplement these studies where necessary. The consulting services required will include, but will not necessarily be limited to the tasks enumerated here.

A. Part 1 - Study for the Development of Integrated Water Supply, Drainage and Sewerage Improvements in Phnom Penh and Sihanoukville

1. Socioeconomic Aspects

- (i) Review and analyze all available data and information on socioeconomic conditions, health patterns, and income and expenditure patterns.
- (ii) Carry out socioeconomic surveys in Phnom Penh and Sihanoukville using the *Bank Handbook for the Incorporation of Social Dimensions in Projects*. The survey will include assessments of income levels, housing standards and health standards as well as consumer willingness to pay for improved water supply and sanitation services. The survey will include a gender analysis using the draft *Bank Water Supply And Sanitation - Gender Analysis Checklist for the Incorporation of Women in Development* and will cover existing and potential consumers.
- (iii) Assess the scale and impact of the community of water-vending activities, including quantities purchased and prices paid by households, commercial and industrial establishments, quality of water sold, and people and equipment engaged in water vending.
- (iv) Assess the socioeconomic benefits that will accrue from the provision of piped water supply systems, in terms of health benefits, social well-being, improvements in living standards, poverty reduction, social developments, and benefits to women. Assess the actual resource cost savings realized by households that will benefit from having piped water supplies.

(Reference in text: page 5, para. 22)

- (v) Formulate appropriate community health and hygiene education programs and identify requirements for sanitation improvements. Establish procedures for benefit monitoring and evaluation in terms of the Bank *Handbook for Benefit Monitoring and Evaluation*.
- (vi) Assess the willingness and extent to which communities and non-government organizations would be prepared to participate in the development and operation of water supply, drainage and sewerage services, and in the promotion of community hygiene. Convene participatory workshops to facilitate the determination of appropriate community inputs and service levels of project facilities.

2. Evaluation of Alternatives

- (i) Review and analyze all available data and information, including topography, climatology, hydrology and hydrogeology, water quality, water consumption by user group, and levels of water supply, sewerage and drainage services in Phnom Penh and Sihanoukville.
- (ii) Identify existing and potential water supply sources and assess their quality and yield capacity. Identify existing water distribution networks. Identify existing and potential receiving waters for sewerage and drainage. Assess the optimum levels of water and sewage treatment required.
- (iii) Carry out site inspections to verify or supplement information on topographic features, water supply sources, water distribution and drainage networks, drainage receiving waters, land use, land values, and subsoil conditions to assist in the selection of construction techniques, pipeline and drainage routes, and water and wastewater treatment methods.
- (iv) Assess the water supply, sewerage and drainage needs and the demand for services. Determine realistic levels of service and, with reference to willingness to pay for the services, make projections of future demands.
- (v) Identify, evaluate and prioritize least-cost alternatives for the provision of water supply and priority drainage services to unserved or poorly served localities. Recommend the most efficient water distribution, sewerage and drainage systems, taking into account technical, economic, and administrative factors.
- (vi) Prepare cost estimates of the recommended developments.

3. Institutional Aspects

- (i) Review the administrative, managerial, organizational, and legal framework of the concerned sector agencies at national level and in the cities of Phnom Penh and Sihanoukville. Identify their corporate and operational policies and examine their

institutional development programs.

- (ii) Examine the adequacy of staff in the water supply and sanitation sector at national level and in the cities of Sihanoukville and Phnom Penh. Determine the needs for human resources development to ensure successful implementation of the Project and operation and maintenance of facilities.
- (iii) Review and recommend improvements to operational policies and management of the sector. Make proposals for any institutional improvements necessary for the operation and maintenance of water supply, sewerage and drainage systems, taking into account the overall requirements for manpower resources, and budgetary and financial constraints. Propose the form and scope of any assistance needed for institutional strengthening, particularly with regard to the implementation of the Project.
- (iv) Identify the potential for provision of water supply and sanitation services by the private sector, making recommendations for a regulatory and institutional framework that would enable the private sector to finance future expansion.

B. Part 2 - Project Preparation

1. Feasibility Study

- (i) Prepare and evaluate preliminary designs for a Project to improve water supplies and provide priority sanitation works to unserved or poorly served localities in Phnom Penh and Sihanoukville, for development to the year 2005, subject to the findings of Part 1.
- (ii) Identify and describe in detail the scope of each component, with outline specifications for materials and equipment.
- (iii) Prepare cost estimates accurate to plus or minus 10 per cent, identifying direct and indirect foreign exchange and local currency costs.
- (iv) Make recommendations for the procurement of materials and equipment and determine appropriate procurement packages.
- (v) Recommend Project implementation arrangements, including the identification of implementing agencies, determination of contract packages, staff and other inputs, and prepare a Project implementation schedule.

2. Environmental Analysis

- (i) Conduct initial environmental examinations of the proposed schemes and, appropriate, conduct environmental impact assessments. Assess the likely environmental benefits. Examinations and assessments should be based on the

Environmental Assessment Requirements and Environmental Review Procedures of the Asian Development Bank and on the Bank Environmental Guidelines for Selected Infrastructure Projects.

- (ii) Coordinate with the State Secretariat for the Environment and recommend procedures for environmental monitoring, including institutional requirements, identification of likely significant impacts, identification of mitigation measures, and preparation of checklists and programs of environmental monitoring.

3. Financial and Economic Aspects

- (i) Establish financial objectives and targets of the proposed schemes and prepare financing plans for the schemes.
- (ii) Review the cost recovery policies and tariff collection efficiencies in Phnom Penh and Sihanoukville. Review the present water and sanitation charges and propose any revisions in consultation with the Government, to obtain full cost recovery, including recovery of capital and operation and maintenance costs and debt service. Design a framework of appropriate water and sanitation charges, taking into account user charges based on metered consumption, cross-subsidization, affordability, willingness to pay and other relevant factors.
- (iii) Prepare financial projections for water supply and sanitation operations in each sector agency concerned for a ten-year period after the commissioning of Project facilities. Projections will include income statements, balance sheets, cash flow statements, capital investment schedule, and other related financial statements. From these projections, compute the financial internal rate of return and average incremental cost per cubic meter of water produced and sold. Conduct sensitivity analyses on the projected financial performance under the assumption of reasonable changes in revenue, capital investment, and operating and maintenance costs.
- (iv) Compute relevant financial indicators of each sector agency concerned, to assess the financial viability of each scheme. The financial indicators will include self-financing ratio, debt coverage ratio, operating ratio, and rate of return on revalued assets.
- (v) Develop performance criteria that can be utilized in assessing project viability, based on the financial projections prepared.
- (vi) Carry out in-depth social and economic analyses of the Project, including calculation of the economic internal rate of return of the schemes, taking into account all economic costs and benefits. The draft Bank *Guidelines on Economic Analysis of Water Supply* should be used in carrying out the economic analysis to the extent relevant and with available data.