

**BOARD
OF
DIRECTORS**

ASIAN DEVELOPMENT BANK

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**TECHNICAL ASSISTANCE TO THE LAO PEOPLE'S DEMOCRATIC REPUBLIC
FOR PREPARING THE NAM NGUM RIVER BASIN DEVELOPMENT PROJECT
(FINANCED FROM THE JAPAN SPECIAL FUND)**

The attached Report is circulated for the information of the Board. The President approved the technical assistance on 14 November 2000.

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ASIAN DEVELOPMENT BANK

TAR: LAO 33356

**TECHNICAL ASSISTANCE
(Financed from the Japan Special Fund)**

TO THE

LAO PEOPLE'S DEMOCRATIC REPUBLIC

FOR PREPARING THE

NAM NGUM RIVER BASIN DEVELOPMENT PROJECT

November 2000

CURRENCY EQUIVALENTS

(as of 1 November 2000)

Currency Unit	–	Kip (KN)
KN1.00	=	\$0.000123
\$1.00	=	KN8,163

The exchange rate of the kip is determined by the Bank of the Lao People's Democratic Republic under a system of managed float. For the purpose of calculations in this paper, a rate of \$1.00 to KN7,800 is used. This was the rate generally prevailing during the Fact-Finding Mission.

ABBREVIATIONS

ADB	-	Asian Development Bank
FAO	-	Food and Agriculture Organization (of the United Nations)
Lao PDR	-	Lao People's Democratic Republic
NGO	-	nongovernment organization
RBC	-	river basin committee
TA	-	technical assistance
UNDP	-	United Nations Development Programme
WRCC	-	water resources coordination committee
WSSAP	-	water sector strategy and action plan

NOTES

- (i) The fiscal year (FY) of the Government ends on 30 September.
- (ii) In this report, "\$" refers to US dollars.

I. INTRODUCTION

1. The Government of the Lao People's Democratic Republic (Lao PDR) asked the Asian Development Bank (ADB) for technical assistance (TA) to prepare the Nam Ngum River Basin Development Project. A reconnaissance mission¹ visited the Lao PDR in June/July 2000. Mission members held discussions with stakeholders, including officials of the relevant Government agencies, representatives of other aid agencies and nongovernment organizations (NGOs), and potential beneficiaries. The mission included field visits and consultations with provincial authorities. A stakeholders' workshop was held to broaden the consultation process. The Government and ADB have reached an understanding on the overall objectives, scope, terms of reference, cost estimates, and implementation arrangements of the TA. The TA will adopt an integrated river basin management and development approach. It is included in ADB's 2000 TA program for the Lao PDR.²

II. BACKGROUND AND RATIONALE

2. Eighty-five percent of the Lao PDR's five million people live in rural areas. A great majority of the rural population, about 90 percent, live on subsistence farming and many depend on food gathering from forests and rivers. Fish accounts for about 40 percent of the animal protein in the national diet. Managing water resources³ effectively and efficiently is necessary to achieve the country's development objectives of poverty reduction and economic growth. Agriculture contributes about 40 percent and hydropower another 30 percent of the country's total foreign exchange earnings. The Government has planned a major expansion in irrigation and hydropower projects to reduce poverty and spur economic growth. These projects will have an impact on (i) communities living in the river basins, and (ii) the environment in general and water resources in particular. Despite its dependence on water resources, the country lacks a holistic river basin development approach that would optimize the returns on hydropower and irrigation investments without compromising the long-term quality of the environment and the well-being of the local communities.

3. The Government's development strategy emphasizes poverty reduction and improved management of water resources. A river basin planning and management approach is necessary to better understand the links between water and land use, the environment and sustainable development. The Government has already taken several steps to introduce this approach assisted by ADB through several TAs. It has prepared the Water Law and documented issues relevant to river basin planning and management through consultations with the concerned stakeholders and developed a strategy by preparing a national water sector profile and a water sector strategy and action plan (WSSAP). The WSSAP, already approved by the Government, addresses cross-sectoral issues by emphasizing appropriate policy, community education, and data management. As a first step to building capacity to implement these policies and plans, the Government established a water resources coordination committee (WRCC) in February 1998.⁴

4. The Government is currently implementing the most important elements of the WSSAP and the Water Law by addressing the nationwide issues of policy development.⁵ The implementation of these policies and the WSSAP plan have increased the capacity of the WRCC. The Government

¹ Since the Government agreed to the overall objectives, scope, terms of reference, cost estimates, and implementation arrangements during this mission, the Fact-Finding mission was waived.

² The TA first appeared in *ADB Business Opportunities* (Internet Version) on 15 August 2000.

³ Water and related natural resources, such as forests and fisheries, are collectively referred to as water resources in this paper.

⁴ TA 3006-LAO: *Institutional Strengthening for the Water Resources Coordination Committee*, for \$260,000, approved on 16 April 1997.

⁵ TA 3205-LAO: *Implementation of the Water Sector Action Plan*, for \$300,000, approved on 9 June 1999.

has also studied the relevant issues relating to the upper Nam Ngum watershed area in detail and prepared draft policies and investment proposals to expand development opportunities and minimize adverse environmental impacts.⁶ The TA will significantly benefit from this work. The Government also aims to strengthen the institutional capacity of the relevant agencies to deal with social and environmental risks, particularly in the energy and transport sectors.⁷

5. The Nam Ngum River Basin covers a large area, about 10,400 kilometers², in northcentral Lao PDR, including the capital Vientiane. The annual average rainfall ranges from 1,400 to 3,000 millimeters. The estimated population of 165,000 (excluding Vientiane), has a moderate ethnic diversity⁸ and is highly mobile, with 60 percent of the people moving at least once a year. The incidence of poverty is high and about 40 percent of the population reports annual rice shortages of four months or more. Over 65 percent of the population lives below the poverty line of \$11.20 per capita per month.⁹ Despite the war in the 1960s and the early 1970s and the development of the Nam Ngum-I hydropower project in 1971, the impact on forests, water quality, and erosion has been minimal. However, the construction of the Nam Ngum-I dam had an impact on fisheries due by restricting the downstream migration of fish. Overall, the river basin is stable.

6. The Nam Ngum is the most important river basin in the country for several reasons. It is the first among the large river basins in the country where the water resources are already being used significantly through diversions, reservoir management, hydropower generation, and irrigation. Several prospective hydropower projects have been identified in this river basin.¹⁰ Several aid agencies are assisting projects in the Nam Ngum river basin, covering a variety of activities.¹¹ Moreover, being close to the capital city, the new approach of integrated river basin management and development can be effectively developed in close coordination with the stakeholders.

7. The WRCC has decided that each of the main tributaries of the Mekong River that act as catchment areas in the Lao PDR, including the Nam Ngum catchment, will be classified as a river basin where planning is to be undertaken in an integrated way to ensure that the effects of development on downstream areas are fully considered. For the Lao PDR, this is a new approach. In the past, planning has generally been on the basis of administrative rather than natural boundaries, ignoring the fact that natural features often cut across administrative units. For example, strategy and planning has been completed for the Nam Ngum watershed area upstream of Nam Ngum-I Dam. Moreover, previous planning has been done in isolation either by the Ministry of Industries and Handicrafts (for hydropower generation) or by the Ministry of Agriculture and Forestry (for watershed management).

8. ADB's investments in the water sector have accounted for 53 percent of TAs and 30 percent of loans to the Lao PDR. These investments have been allocated mainly to three subsectors, i.e., hydropower (71 percent), water supply (17 percent), and irrigation (12 percent). Other than ADB, the Government receives assistance in the water sector from the World Bank, Food and Agriculture Organization (FAO), United Nations Development Programme (UNDP), the Mekong River Commission, and other agencies. The TA will complement (i) an FAO program to develop legislation and decrees to support the implementation of the Water Law, and (ii) UNDP

⁶ TA 2734-LAO: *Nam Ngum Watershed Management*, for \$800,000, approved on 23 December 1996.

⁷ TA 3133-LAO: *Strengthening Social and Environmental Management*, for \$950,000, approved on 10 December 1998.

⁸ The ethnic groups include Lao Loum (61 percent), Hmong (28 percent), and khamu (11 percent).

⁹ This is the income poverty line estimated by the World Bank. The Government has now adopted a consumption poverty line of 2,000 calories per capita per day.

¹⁰ TA 2734-LAO (footnote 6) identified Nam Ngum II, III, and V as potential future hydropower projects in the river basin.

¹¹ Japan International Cooperation Agency, Deutsche Gesellschaft für Technische Zusammenarbeit, and Danish International Development Assistance are supporting forestry and soil conservation activities. The World Bank has financed small-scale irrigation and agricultural development schemes in the area.

assistance to assess the environmental impact of hydropower and develop the capacity of the Lao National Mekong Committee.

9. The Government has made steady progress in water sector reforms since 1997 by (i) carrying out a sector study; (ii) adopting the Water Law, (iii) establishing, and building the capacity of, a water sector apex body; (iv) implementing sector strategies and an action plan; and (v) initiating the formulation of a water policy to support the implementation of the Water Law. These reforms were carried out under considerable resource constraints and involved extensive consultations with provincial authorities. The Government has decided that further sector reforms should be implemented under an integrated water resources management approach in the country's most important river basins, starting with the Nam Ngum basin. The TA will support the continuation of the water sector reform process and formulate an investment project in the Nam Ngum basin that will combine investments in physical and institutional infrastructure, in an integrated approach, in consultation with the stakeholders. The proposed approach is fully consistent with ADB's emerging water policy¹² and is supported by the concerned line agencies, provincial authorities, assistance organizations, and NGOs.

III. THE TECHNICAL ASSISTANCE

A. Objectives

10. The objective of the TA is to help the Government introduce an integrated water resources management and development approach in the Nam Ngum river basin by (i) preparing a river basin resources assessment and action agenda in consultation with stakeholders, formulating a medium-term basin management strategy, and establishing a river basin organization; and (ii) formulating a water resources investment project with components that focus on poverty reduction, environmental management, and institutional development.

B. Scope

11. The TA will be implemented in two parts over 11 months. In part A, the TA will prepare a river basin profile, an action agenda, and a medium-term management strategy. In addition, a river basin committee (RBC) will be constituted as a precursor to the formation of a river basin organization. For this TA, the RBC will act as a steering committee. A river basin management action plan will be formulated to implement the management strategy. The action agenda will lay out the principals for the optimal use of water resources in the Nam Ngum basin. Under the medium-term management strategy, the objectives of various subsectors and geographical areas will be defined and a synergy among them demonstrated to arrive at a combined strategy for integrated water resources management in the basin. The basin management strategy and coordination will enhance the impact of other ADB TAs¹³ and loans¹⁴ that are sector specific. Simultaneously, cofinancing and collaborative opportunities with other assistance organizations will be explored.

12. In part B, high priority investment subprojects will be identified. Since the investments in hydropower and water supply are being supported by ADB's ongoing projects, the potential new

¹² Working Paper, *Water for All: The Water Policy of ADB*, August 2000

¹³ TA 3285-LAO: *Strengthening the Capacity of Aid Coordination and Monitoring*, for \$680,000, approved on 28 October 1999; TA 3374-LAO: *Power Sector Strategy Study*, for \$800,000, approved on 23 December 1999; and TA 3403-LAO: *Towards Implementation of the Agriculture Study*, for \$100,000, approved on 11 February 2000.

¹⁴ Loan 1525-LAO: *Secondary Towns Urban Development*, for \$27 million, approved on 26 June 1997; Loan 1533-LAO: *Xieng Khoung Road Improvement*, for \$27 million, approved on 9 September 1997; Loan 1558-LAO: *Power transmission and Distribution*, for \$30 million, approved on 30 September 1997; and Loan 1710-LAO: *Water Supply and Sanitation*, for \$20 million, approved on 16 November 1999.

investments are expected to be confined to irrigation, flood control, fisheries, watershed management, institutional development, and capacity building activities. For these investments, detailed feasibility studies, comprising financial, economic, poverty, social, and environmental analyses, will be prepared for possible ADB financing. Other opportunities identified under the medium-term management strategy may be taken up by other aid agencies based on the indicated priorities in the action agenda. Ongoing investment activities will be integrated into the action agenda and management strategy. In addition, the TA will assess the capacity of the concerned line agencies, formulate a capacity-building program, and recommend implementation arrangements for the ensuing project. Furthermore, the TA will formulate a river basin management implementation action plan to guide the implementation of integrated Nam Ngum river basin management and development activities. Close coordination among all relevant stakeholders will be sought by conducting a series of workshops and a number of community meetings at different stages of TA implementation. NGOs will be engaged to facilitate the participation of local communities and the implementation of certain investment activities.

C. Cost Estimates and Financing Plan

13. The total cost of the TA is estimated at \$1.015 million equivalent, of which \$616,000 will be foreign exchange and \$399,000 equivalent in local currency costs. ADB will finance \$850,000 equivalent, including all foreign exchange costs and \$234,000 equivalent of local currency costs. The TA will be financed by ADB on a grant basis from the Japan Special Fund, funded by the Government of Japan. The Government of the Lao PDR will finance the balance of \$165,000 equivalent in local currency costs to cover staff salaries, office accommodation, and local transportation cost. Details of cost estimates and financing plan are provided in Appendix 1. The Government has been advised that approval of the TA does not commit ADB to finance any ensuing project.

D. Implementation Arrangements

14. The WRCC will be the Executing Agency for the TA. The Prime Minister's Order 1335 of August 1997 designated the WRCC to be the coordinating agency for water resources and established its secretariat as an executive body. A project office will be established at the WRCC secretariat and a suitably qualified official will be appointed as the project director. The RBC will act as a project steering committee, headed by the Chairman of the WRCC. The RBC's members will be drawn from the concerned central and provincial line agencies. Technical staff will be seconded to the WRCC from the relevant line agencies, including the Ministry of Agriculture and Forestry and the Ministry of Industry and Handicrafts.

15. ADB's TA for Nam Ngum Watershed Management,¹⁵ accomplished a considerable amount of work on policy and environmental management for the upper Nam Ngum watershed. The current TA will benefit greatly from this work. The TA is expected to begin in February 2001. Both parts A and B will be implemented over a nine-month period. There will be a one-month break to review the draft final report. The final report will be prepared in the eleventh month incorporating the comments received from the Government and ADB. In part A, a river basin profile, an action agenda, a management strategy, and a management action plan will be prepared according to a phased implementation schedule. The formulation of the RBC, and finalization of its rules of business, will continue throughout TA implementation. In part B, detailed feasibility study reports for specific investments, to be financed under the ensuing loan project, will be prepared. The implementation of the TA will require the services of a multidisciplinary team of international and domestic consultants. A consulting firm will be engaged to provide these services and to work closely with the counterpart staff of WRCC: a total of 76 person-months of services from international (21 person-months) and domestic (55 person-months) consultants will be required.

¹⁵ TA 2734-LAO: *Nam Ngum Watershed Management*, for \$800,000, approved on 23 December 1996.

The international consultants will have expertise in water resources economics, water resources policy and institutions, environment and biodiversity conservation, social development, and natural resources law. The domestic consultants will have expertise in water resources planning, water resources institutions and training, rural infrastructure engineering, rural development economics, agronomy and extension, social anthropology and gender, forestry and biodiversity, fisheries, and law and development. The consultants will be recruited by ADB in accordance with its *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB on the engagement of domestic consultants. The outline terms of reference for the consulting services are shown in Appendix 2. All equipment will be procured in accordance with ADB's *Guidelines for Procurement*.

16. The Government will provide 15 counterpart staff to work with the consultants' team. The counterpart staff will have expertise in regional planning, water resources management, hydropower, irrigation, water supply, fisheries, environmental management, data management, geographic information systems, and administration. Selected high-ranking Government officials will be sent on short study tours to regional countries to learn more about the integrated river basin planning approach. The Government will provide suitably furnished office space, telephones, and required office supplies for use by the consultants and counterpart staff. The consultants will be located in Vientiane but will travel throughout the Nam Ngum river basin. They may need to establish a small office in one or more of the provincial centers. If so, provincial authorities will provide office space.

17. The active involvement of stakeholders will be sought throughout the implementation of the TA through formal workshops and a number of informal community meetings. One provincial and three national workshops will be arranged. The first national workshop will be conducted in the second month of the TA to promote participation at all levels and refine the approach to be adopted in implementing the TA. The second workshop, at the provincial level, will be organized in the fourth month to finalize the possible investment opportunities for which detailed feasibility reports will be prepared in part B. The third workshop, at the national level, will be arranged in the sixth month to present the river basin profile and the draft action agenda and elicit feedback. The draft final report will be discussed at the fourth and final workshop to be held at the national level about a month prior to the completion of part B. The first, third, and fourth workshops will coincide with tripartite meetings among the Government, consultants, and ADB. Consultants will present concise reports for discussion at each workshop. The reports will be revised and submitted for approval at the conclusion of each tripartite meeting.

18. The following reports will be submitted by the consultants at the end of the periods indicated: (i) inception report—first month, (ii) midterm report—fifth month, (iii) draft final report—ninth month, and (iv) final report—eleventh month. In addition, brief monthly progress reports will be required when other reports are not due.

IV. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance, on a grant basis, to the Government of the Lao People's Democratic Republic in an amount not exceeding the equivalent of \$850,000 for the purpose of preparing the Nam Ngum River Basin Development Project, and hereby reports such action to the Board.

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing^a			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	0	0	0
ii. Domestic Consultants	0	0	0
b. International and Local Travel			
i. International Travel	30	0	30
ii. Local Travel	5	0	5
2. Communications	8	0	8
3. Reports and Translation	2	6	8
4. Office Equipment and Support Costs			
i. Office Equipment	20	0	20
ii. Office Supplies	10	0	10
iii. Vehicle ^b	20	0	20
iv. Vehicle Operation and Maintenance	0	3	3
5. Activity			
i. Workshop	0	20	20
iii. River Basin Committee	0	20	20
iii. Regional Study Tour	20	0	20
6. Contingencies	76	20	96
Subtotal (A)	191	69	260
B. Government Financing			
1. Remuneration and Per Diem of Counterpart Staff	0	85	85
2. Office Accommodation	0	50	50
3. Local Transportation	0	20	20
4. Miscellaneous Administration Costs	0	10	10
Subtotal (B)	0	165	165
Total (A+B)	191	234	425

^a The technical assistance will be financed by the Asian Development Bank on a grant basis from the Japan Special Fund, funded by the Government of Japan.

^b One 4x4 double cab vehicle will be purchased.

Source: Staff estimates

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Introduction

1. The implementation of the technical assistance (TA) will require the services of a multidisciplinary team of international and domestic consultants. A consulting firm will be engaged to provide these services and work closely with the counterpart staff of the water resources coordination committee (WRCC): a total of 76 person-months of services from international (21 person-months) and domestic (55 person-months) consultants will be required. The international consultants will have expertise in (i) water resources management and team leadership, (ii) water resources policy and institutions, (iii) environment and biodiversity conservation, (iv) social development, and (iv) natural resources law. The domestic consultants will include a deputy team leader with expertise in water resources planning. Other domestic consultants will have expertise in (i) water resources institutions and training, (ii) rural infrastructure engineering, (iii) rural development economics and poverty analysis, (iv) agronomy and extension, (v) social anthropology and gender, (vi) forestry and biodiversity, (vii) fisheries, and (viii) law and development.

2. In part A of the TA, a river basin profile, an action agenda, and a medium-term management strategy will be prepared for the integrated management and development of the water resources in the Nam Ngum river basin. The action agenda and management strategy will describe the process for water resources assessment, and the planning and ranking of priority investments. Guidelines for project approval, implementation, and monitoring will be developed. In part B, specific development options for irrigation, flood control, fisheries, watershed management, institutional development, and capacity building within the scope of the action agenda and management strategy will be identified and feasibility studies prepared for investments commencing in 2003. Development options will be managed through a number of action plans. An outline of these action plans will be formulated in part B of the TA but the plans will be fully developed during the implementation of the ensuing investment project.

B. Part A: Preparation of Action Agenda and Investment Strategy

1. River Basin Committee Formation

3. To assist in the planning and management of the Nam Ngum river basin, the consultants will work with central and provincial government staff to establish coordinating arrangements. A river basin committee (RBC) will provide a focus by involving local communities in planning and management, as well as overseeing the implementation of the action agenda and the management strategy. The RBC will act as the project steering committee. The Government is increasingly delegating greater decision-making power to the provinces. The Nam Ngum river basin extends over three provinces and one special zone whose interests need to be considered. The concerned line agencies will be represented in the RBC. Other attributes sought for the RBC could include: (i) transparent institutional arrangements that do not overlap with those of other agencies, (ii) appropriate community awareness and participation programs, and (iii) integrated policies for river basin management and development.

2. River Basin Profile and Action Agenda

4. A primary planning task is to take inventory of the water resources in the river basin. The relevant data are to be collected and compiled into a river basin profile, using the Asian Development Bank's (ADB) standard format. Specific tasks in preparing the profile will include (i) assessing water resources, (ii) identifying existing resource and management problems, and

(iii) collating national/regional goals and resources management policies in a river basin perspective. Based on this profile, an action agenda will be prepared to lay down principles of sustainable management and development of the river basin. This action agenda will outline the objectives and scope for key result areas and specify the development options, ranked through a multi-objective analysis, and link these to an investment strategy.

3. Medium-term Management Strategy

5. Under the medium-term management strategy, the objectives of various subsectors and geographical areas will be defined and a synergy among them demonstrated to arrive at a combined strategy for integrated water resources management in the basin. Simultaneously, cofinancing and collaborative opportunities with other aid organizations will be explored. Planning for water resource development and other investments in the river basin will be coordinated with other projects aiming to reduce poverty and promote sustainable economic development.

4. River Basin Management Action Plan

6. An action plan will be developed to address the issues related to river basin management raised in the action agenda. The action plan will cover areas such as water resources policy for the basin, benchmarks to measure the performance of different agencies, information management, and public awareness. Within the Nam Ngum river basin, the resources management issues likely to emerge are (i) upstream-downstream conflicts arising from provincial developments that abstract water; (ii) the need to manage water for flood mitigation, irrigation development, power generation, and fish production; (iii) the impact of industrial development on water quality and urban/rural health and agricultural production; (iv) the impact of agricultural runoff on water quality; (v) the impact of large dam operations on river channel stability; and (vi) the importance of information dissemination and community awareness. The issues considered for inclusion in the outline action plan are indicative only and will need to be reviewed and adapted to the specific circumstances of the river basin communities.

C. Part B: Preparation of Integrated Investment Project

1. Investment Components

7. Within the scope of the management strategy, specific investment subprojects are to be identified for irrigation, flood protection, forestry, soil conservation, fisheries, institutional development, and capacity building. These subprojects will be considered for ADB financing. Existing studies and data on selected subprojects, put together by the relevant line agencies, will be reviewed and updated. If the selected subprojects have not already been evaluated, feasibility studies will be prepared for them. Each of these feasibility studies will provide detailed estimates (prepared in ADB's COSTAB software) of foreign exchange and local currency costs. ADB estimates of inflation rates will be used in preparing the cost estimates.

2. Economic and Financial Analysis

8. Detailed economic and financial analysis for each of the feasibility studies for all components will be carried out following ADB's *Guidelines for Economic Analysis of Projects* (1997). Partial and farm budgets will be generated, employing FARMOD, to analyze the impact of the project on household incomes and poverty. Primary data will be collected following

standard methodologies of rural appraisal. Data from all relevant secondary sources will be collected to supplement these analyses.

3. Poverty Analysis

9. A poverty profile of the Nam Ngum river basin will be prepared. A detailed analysis will be carried out to determine poverty levels based on both income and consumption standards. The existing reports and data will be analyzed and surveys carried out to determine the extent of poverty and the available income generating opportunities. The poverty analysis will identify, through extensive community-level meetings, the type of interventions and investments required for local communities to gain access to income generating activities.

4. Social Analysis

10. For the subprojects for which feasibility study reports will be prepared, a social analysis will be carried out following ADB's *Guidelines for Incorporation of Social Dimensions in Bank Operations* (1993) and *Handbook for Incorporation of Social Dimensions in Projects* (1994). The social analysis will identify the communities or groups that would be adversely affected and/or directly benefit from the project activities. In cases of likely adverse impact, mitigating measure will be considered in close consultation with the concerned communities or groups. Data will be derived from secondary sources and supplemented with sample surveys and rapid rural assessments where necessary. If the affected people happen to be minority groups, a minority people's development plan will be prepared in accordance with ADB's *Policy on Indigenous People* (1999). For subprojects that may require significant land/house acquisition or disruption in livelihood, a resettlement plan will be prepared following ADB's *Policy on Involuntary Resettlement* and *Handbook on Resettlement: A Guide to Good Practice* (1998).

5. Environmental Analysis

11. Consultants will comprehensively review the reports prepared under TA 2734-LAO¹ so that there is no duplication of effort. Based on the selected sites for investment subprojects, consultants will determine whether the existing environmental assessments cover these areas within the river basin. For areas not covered, full environmental impact assessment will be carried out following ADB's *Environmental Guidelines for Selected Agricultural and Natural Resources Development Projects* (1991) and *Environmental Assessment Requirements of the Asian Development Bank* (1998).

12. For each subproject, an environmental assessment will be prepared to determine the positive as well as adverse impacts. Where necessary, consultants will prepare recommendations for appropriate mitigating measures. An outline environmental management and monitoring plan and cost-benefits analysis will be prepared for each subproject. More detailed plans will be prepared during the implementation of the subprojects.

6. Assessment of Institutional Capacity and Capacity Building Program

13. Most of the line agencies,² both at the central and provincial levels, have limited technical capacity in managing natural resources. The WRCC and the proposed RBC will also need to be further strengthened with professional training. Provincial agencies are expected to play a role in allocating water, issuing permits for waste discharge, monitoring the projects, and

¹ TA 2734-LAO: *Nam Ngum Watershed Management*, for \$800,000, approved on 23 December 1996.

² There are 12 agencies dealing with water directly and another 10 that have an indirect interest in it.

collecting data in their areas of responsibility. In addition, provincial agencies are to be involved in integrated water resources planning. Provincial agencies may also play a role in data collection; and assessment of water demand, availability, and quality. These responsibilities would require new capacity in the relevant agencies. The TA will assess the institutional capacity of the agencies against the expected responsibilities and prepare a capacity building plan. Elements of capacity building will include (i) strengthening information systems and investigation capabilities; (ii) developing procedures and technical criteria for assessing water uses, demand, and proposals for further water abstractions; (iii) developing recording and monitoring systems for water use licenses; (iv) developing procedures; and (v) evaluating the need to strengthen educational institutions.

14. In addition to developing and enhancing the capacity of counterpart staff through on-the-job training and regional study tours for senior officials, the TA will prepare a comprehensive capacity building program to be considered under the investment project. The TA will define the objectives, attendance, and destination of the regional study tours and professional training.

7. Implementation Arrangements for Investment Project

15. Based on the nature of investment subprojects, consultants will prepare elaborate implementation arrangements. Appropriate line agencies will be identified and their role and responsibilities defined in detail in the context of the river basin management and development approach. For each investment subproject, the consultants will prepare detailed procurement packages for all goods and services, and formulate a detailed project framework following ADB's standard format.

8. River Basin Management Implementation Plans

16. To effectively implement elements of the action agenda and components of the management strategy, elaborate policy guidelines and recommendations will be required. The consultants will prepare four outline action plans. Detailed action plans will be prepared during the implementation of the investment project.

a. Water Allocation Plan

17. A formal allocation, for both surface and groundwater, is a critical element in modern water resources management. A major element of planning for sustainable water resources use in the Nam Ngum river basin will be the allocation of water resources. Since master plans for irrigation, power generation, and urban/domestic water supplies have been developed separately, on a sectoral basis, there is no coordinated system for defining water rights. Water is allocated implicitly with the approval of schemes that take water. A formal water allocation plan is needed. The Water Law provides for a water allocation system and water rights, but the institutional capacity has not been developed. The mechanisms for defining, recording, monitoring, and enforcing water allocations have not yet been developed.

18. Water allocation is intended, in the draft water policy, to be a two-step process to take into account the existing responsibilities of the water sector agencies. The initial allocation will be to subsector agencies and will take into account the capability of some of the sectors to support use by another sector. (For example, regulation of the river flows by a reservoir could permit more water use for irrigation downstream without using it for hydropower. A formal agreement between the operators of the hydropower station and the irrigation system would be needed to prevent changes in operation placing this synergetic operation at risk.) Based on these themes and principles, an outline water allocation plan will be prepared under the TA.

b. Agency Roles and Responsibilities Plan

19. The policies of water resources management and development, addressed through the action agenda and the management strategy, are to be shared among all relevant line agencies. National policies and the management framework being developed under TA 3205-LAO³ will be used as a guide. At the international level, the water use rules being developed by the Mekong River Commission will be directly relevant. The Mekong Agreement also requires the Lao People's Democratic Republic (Lao PDR) to provide information on the use of water significantly affecting other countries. The extent of obligation arising through these clauses will become clearer after the work planned for the development of the water use rules by the Mekong River Commission is complete. It is likely that each Mekong River tributary basin in the Lao PDR will have an obligation to maintain the flow to the Mekong River at or above predetermined levels in both quality and quantity. The WRCC and the Lao National Mekong Committee will need to review these rules to ensure the interests of the country have been considered adequately. The outline plan will demarcate the areas of responsibilities for each of these agencies as well as the proposed river basin committee.

c. Information Management Plan

20. Water management decision-making requires reliable information. The Department of Hydrology and Meteorology has a national network of rainfall and hydrologic data collection but other water resources information is collected and archived by different agencies. Protocols and management systems are needed to create an integrated information system for water resources management. The effective management of water resources will require data collection, analysis, and storage; and ready access to the data. Under TA 2734-LAO (footnote 1), a geographic information system based data system for the upper river basin area was established. This could be incorporated in the new system or expanded to cover the whole river basin. TA 3205-LAO (footnote 3) is also developing a database for the Nam Ngum river basin. This could also be a basis for the new system.

21. Establishing effective national data management systems is a long-term program. An assessment and updating of data networks, and the introduction of quality control mechanisms and information transfer facilities would require several years to complete on a national basis. The tasks under this TA are limited to confirming data availability, developing and reaching agreement on the information framework, and preparing draft terms of reference for an action plan to address the needs for development and capacity building necessary in this critical area.

d. Public Awareness Plan

22. A combination of general community awareness and specific farmer involvement through community-managed irrigation and watershed activities will provide a means for changing attitudes, allowing the gradual introduction of new policies supportive of sustainable water resources use. The development of regulation and management measures, in association with the local communities, will require information on water resources, their uses, and management practices. The process of collating information must take into account the interests, skills, background, and capability of the local communities. It should aim to increase public awareness about these issues and, where appropriate, to modify behavior. The TA will prepare an outline of a public awareness plan to institutionalize the community awareness and participation process.

³ TA 3205-LAO: *Implementation of the Water Sector Action Plan*, for \$300,000, approved on 9 June 1999.