

TAR: PRC 38594

Technical Assistance to the
People's Republic of China for
Preparing the Guiyang Integrated
Water Resources Management
Project (Cofinanced by the
Cooperation Fund for the Water
Sector)

May 2005

CURRENCY EQUIVALENTS

(as of 31 March 2005)

Currency Unit	–	yuan (CNY)
CNY1.00	=	\$0.121
\$1.00	=	CNY8.277

ABBREVIATIONS

ADB	–	Asian Development Bank
GMG	–	Guiyang Municipal Government
IWRM	–	integrated water resources management
TA	–	technical assistance
WRB	–	Water Resources Bureau

TECHNICAL ASSISTANCE CLASSIFICATION

Targeting Classification	–	General intervention
Sector	–	Agricultural and natural resources
Subsector	–	Water resources management
Themes	–	Sustainable economic growth, Promoting economic efficiency
Subtheme	–	Rural development

NOTE

In this report, "\$" refers to US dollars.

I. INTRODUCTION

1. During the 2004 Country Programming Mission, the Government of the People's Republic of China (PRC) asked the Asian Development Bank (ADB) to help the Guiyang Municipal Government (GMG) prepare a project for possible ADB financing. The technical assistance (TA) is included in the PRC country strategy and program for 2005.¹ In December 2004 a fact-finding mission visited the PRC to hold discussions with GMG staff, and an understanding was reached with the PRC Government on the detailed objectives, scope, costs, implementation, and financing arrangements for the TA to prepare the Guiyang Integrated Water Resource Management Project. The Project will support GMG in utilizing scarce water resources by improving conservation, management, and development of water resources in Guiyang Municipality.²

II. ISSUES

2. Located in the central region of Guizhou Province,³ Guiyang Municipality is divided administratively into three counties (Kaiyang, Xifeng, and Xiuwen); one suburb city (Qingzheng); and Guiyang City, which comprises four rural districts and two urban districts, and accounts for 5% of the municipality's total area. Of the municipality's 3.5 million population, about 1.5 million (43%) live in the urban districts of Guiyang, the remaining 2 million (57%) are scattered across the surrounding rural area. About 25% of the rural population lives below the poverty line (CNY1,200 per capita per year).

3. Both urban and rural areas of the municipality are on the mountainous top ridge of the watershed boundary between the Changjiang River (Yangtze) Basin to the north and the Pearl River Basin to the south. Annual average precipitation is 1,117 millimeters. About 95% of the area drains into the Changjiang River Basin. Total renewable freshwater supply is estimated at 9.0 billion cubic meters (m³), or 1.2 m³ per capita; almost half evaporates due to the poor vegetation and rocky terrain of the catchment areas. The remaining water drains into rivers (4.3 billion m³ or 48% of total precipitation) as quick surface flows through numerous short creeks and streams that run deep in valleys, or through fast-flowing deep aquifers (groundwater rivers) through the limestone layer (karst areas).

4. Guiyang urban districts play an important role as an economic engine of growth for the province. More than 10 new industries are planning to move to Guiyang City by 2010; industry employees and their dependents are expected to increase the urban population by more than 150,000. Already, the rapidly increasing urban population has seriously stretched the existing water supply capacity, resulting in reduced water pressure and rotational water supply in dry years. Based on the projected growth of the urban population, Guiyang Municipality forecasts its water supply capacity must be increased by 530,000 m³/day by 2010, and by a further 880,000 m³/day by 2020.

¹ The allocated funding was increased during the review for the country strategy and program update (December 2004).

² The TA first appeared in the *ADB Business Opportunities* (Internet edition) on 13 October 2004.

³ Guizhou Province, with a total area of 176,167 square kilometers (1.8 % of the country), is mountainous, has no plains, and is rich in natural resources (certain minerals, hydro energy potential, biodiversity, and potential for tourism). The population in 2003 was 38.7 million (3% of the country). The 16 ethnic minority groups constitute about 35% of the provincial population with the *Miao* being the most populous (around 11% of the population). The rural population of Guizhou (85% of total) has the lowest annual urban income per capita among the provinces, and the second lowest rural income (CNY1,490 per capita per year), after Tibet.

5. In the surrounding rural area, shortage of water—both for drinking and irrigation—is a critical constraint to (i) improving rural incomes and living standards, and (ii) reducing persisting poverty. Due to the steep mountainous terrain, neither river water nor groundwater is available to many farmers, particularly those who cultivate crops in hilly, upper catchment areas. Only about 10% of the municipality area is arable; less than half is irrigated.⁴ Seasonal and annual variation in water availability is extreme; more than 70% of the rain falls from May to August. Largely because of drought conditions, food security is always at risk. Farmers cannot diversify their crops, even though the mild temperate weather permits farming year-round. The water constraints for household use and irrigation result in subsistence farmers being trapped in poverty; this situation could worsen as the demand from other water users increases.

6. In large villages, village committees administer rural water supply,⁵ while urban residents rely on local water supply companies for their piped water supply. The majority of the rural population in smaller villages is not usually connected to a common public water supply system, and must depend on local springs and streams. Some villagers have small storage tanks close to their houses for domestic, livestock, and agricultural use. Currently, around 466,000 rural residents, or 23% of the municipality's rural population, are not able to satisfy their water needs, including 137,000 who do not have access to safe drinking water. By far the largest proportion of rural water is needed for agricultural purposes (domestic requirements account for only around 10%). Yet irrigation facilities are old and the efficiency of irrigation infrastructure is low, leading to waste of precious water, as well as soil erosion. Only around 25–30% of the total cropland is effectively irrigated.

7. Given the abundant supply of renewable freshwater and the numerous creeks and streams that run deep in valleys, Guiyang Municipality has strong potential for developing water resources by constructing reservoirs. Preliminary investigations identified potential dam sites within the municipality for the storage of over 4 billion m³; this compares with the existing reservoir storage of 2.44 billion m³, excluding hydropower reservoirs.⁶ The creation of new reservoirs would support sustained economic and social development in urban areas, but also reduce poverty and improve incomes in large rural areas. Preliminary estimates indicate that improving irrigation water supply would (i) increase crop yields (by 30% for rice, 20–30% for maize, and 10–15% for wheat and oilseed), and (ii) contribute to crop diversification. Such production increases in drought-prone areas would help to significantly reduce periodic food deficits (and starvation), and subsequently reduce poverty of the rural poor.

8. In parallel with augmenting water supply, measures to improve water management need to be encouraged. Farming techniques to conserve water and soil need to be widely disseminated and practiced by farmers. Municipal industries in general are encouraged to reuse processed water. Consumers need to understand urban water saving measures, especially the importance of economic water resources management during water scarcity. Water saving by communities and industry may be encouraged by direct targeted group campaigns, and exhibitions and fairs where water-saving appliances are demonstrated and made available for purchase. Pilot programs to conserve water and control soil erosion in farming on slope fields—including improved on-farm water management—must be promoted and replicated. Because many rural water infrastructure facilities are dilapidated and need rehabilitation, a proper and

⁴ Per capita irrigated area is estimated at 0.03 ha which is only half of the country's average.

⁵ The municipality has 71 townships and villages.

⁶ The *Guiyang Water Source Development and Use Investigation and Analysis Report* (1999), and the *Provincial Comprehensive Water Resources Master Plan*.

sustainable operation and maintenance mechanism needs to be developed and implemented.

9. Economic water pricing is an effective measure to encourage conservative water consumption, but has not been directly used as an incentive to reduce water consumption. In Guiyang urban area, the water fee is based on an increasing block tariff, in line with the 2003 national guidelines. The tariff includes the water supply direct costs, fees, taxes, and a reasonable water tariff profit. In rural areas, irrigation water is priced according to the area irrigated. The fee is collected by the local water management stations. A resource extraction fee of CNY0.02 per m³ is charged for extraction from water sources. These pricing schemes are nominal and based on cost recovery, rather than serving as a management tool for effective conservation and savings of water or efficient resource allocation in conditions of water scarcity. GMG is now considering increasing the water resource extraction fee, but needs assistance to incorporate economic pricing principles for efficient utilization, conservation, and allocation of water resources.

10. The Water Resources Bureau (WRB) of Guiyang Municipality is in charge of all aspects of water resources management within the municipality (i.e., development and monitoring of water resources; collection, storage, and conveyance of water; protection of water sources; and soil erosion prevention measures in the catchments). Integrated water resources management (IWRM) is new to WRB. To effectively manage increasing conflicts from multiple users' demands for water, WRB needs to rapidly develop an appropriate institutional and legal framework, as well as strengthen its capacity. The project proposal is in line with the overall planning objectives of Guiyang Municipality and Guizhou Province. Background documents for the project proposal are largely based on the Guiyang Water Source Development and Use Investigation and Analysis Report (1999), and the Provincial Comprehensive Water Resources Master Plan. Integrated management and planning requires a coherent direction of quantity development as well as resource management, including institutional, legal, and total watershed approaches. Acknowledging the importance of integrated water management, GMG wishes to establish IWRM in line with advanced international thinking and ADB's water policy.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

11. The Project is to ensure establishment of a long-term comprehensive water sector development plan that can be implemented within GMG's capabilities and the policy framework for the sector. The TA will help GMG develop an investment proposal to contribute to development of the water sector within the context of a long-term, comprehensive plan to establish an IWRM system. The main TA output will be an investment proposal suitable for ADB financing, comprising (i) an outline long-term water sector investment plan for GMG, for development during project implementation; (ii) an assessment of institutional capacity to implement the investment plan; (iii) a training plan to strengthen institutional capacity; (iv) criteria for the selection and appraisal of subprojects to undergo feasibility studies during project implementation; and (v) a set of practical and operational guidelines for a range of participatory soil and water conservation measures and water-saving practices, including an assessment of the potential for using economic pricing as an allocation tool. The TA will critically assess local systems for determining the technical, environmental, financial, economic, and social feasibility of the investment plan; and suggest improvements to contribute to GMG's overall development goals in relation to its long-term development plans for the water sector. A design and monitoring framework for the TA is attached (Appendix 1).

B. Methodology and Key Activities

12. The Project will be prepared in accordance with ADB guidelines for sector lending. The criteria include (i) the borrowing entity has a sector development plan to meet the priority development needs of the sector; (ii) the borrowing entity has the institutional capacity to implement the sector development plan; and (iii) if so required, the policies applicable to the sector can be improved. According to ADB operational procedures for sector lending assistance, the borrowing entity must submit: (i) an acceptable sector development plan; (ii) a statement on sector policies that affect development of the sector; and (iii) an assessment of the technical and managerial capabilities of the sector institutions to develop, process, and implement subprojects.

13. The TA will assist GMG to complete the requirements for sector loan assistance and will be conducted in two phases separated by a break of approximately 1 month to enable the Government and ADB to thoroughly consider the recommendations, in particular the proposed strategy for future development of the water sector. Phase 1 entails the development of the strategy and a comprehensive assessment of the policy and institutional framework within which medium- and long-term investment planning can be conducted. The strategy will be prepared under GMG direction and supervision. GMG will be responsible for obtaining approval of the plan, and for ensuring broad participation by representatives of all of the main stakeholders.

14. Phase 2 will focus on the requirements for implementing the investment program and establishing an IWRM system. It will include appraisal of subprojects to serve as models for processing of subprojects during project implementation and beyond, and design of the capacity-building component. The Project will be designed and set within the context of the long-term development plan for the water sector in Guiyang Municipality—an outline of the plan is an expected output of phase 2.

15. The TA will address the following: (i) comprehensive analysis of water resources, policy and institutional frameworks, and coordination and management systems to establish a sound basis for comprehensive water resources sector planning; (ii) project design and preparation appropriate for ADB interventions in line with ADB guidelines for assessing environmental impact, poverty reduction, social impact, involuntary resettlement, and impact on indigenous peoples; and (iii) critical assessment and design of economic pricing of water, public awareness, and participatory water conservation plans.

16. The TA will help GMG institute a planning process with a people-centered as well as pro-poor focus. Throughout TA implementation, various village, township, county, and municipal consultations and workshops will be conducted to ensure stakeholder participation. A partnership approach will utilize the respective strengths and resources of the public sector (municipal and county agencies), the private sector (nongovernment organizations, entrepreneurs, and private sector associations), and farmers (in groups, associations, or cooperatives). A systems learning approach will be used to (i) ensure a thorough understanding of the economic and social systems in Guiyang Municipality; and (ii) provide flexibility, and engender commitment and a sense of stakeholder ownership in the Project. Lessons learned from relevant previous and ongoing projects will be incorporated into the project design. An initial poverty and social analysis is shown in Appendix 2.

C. Cost and Financing

17. The total cost of the TA is estimated to be \$1,210,000 equivalent, comprising \$611,000 of foreign exchange cost and \$599,000 equivalent of local currency cost. ADB will provide \$960,000 equivalent to cover the entire foreign exchange cost and \$349,000 equivalent of local costs. The TA will be financed on a grant basis by ADB's TA funding program (\$800,000) and the Cooperation Fund for the Water Sector (\$160,000). The Government will provide \$250,000 equivalent to cover in-kind counterpart costs and services, including provision of necessary data, counterpart staff, office facilities, and administrative support (equivalent to about 20% of the total TA cost). The Government has been informed that approval of the TA does not commit ADB to finance any ensuing project. The cost estimates and financing plan is shown in Appendix 3.

D. Implementation Arrangements

18. WRB, the Executing Agency for the TA, will establish a TA management unit.⁷ The vice mayor, who is in charge of WRB, will chair the leading group. The TA management unit will facilitate interdepartmental arrangements and coordination of ADB, TA consultants, the concerned offices of GMG, and provincial and central governments as necessary. A full-time qualified and experienced senior staff will be appointed as the TA manager to foster TA implementation. Two full-time counterpart staff with relevant qualifications and experience will be assigned to facilitate the work of the consultants. To facilitate TA implementation, GMG will provide support to the consultants, including a suitably furnished office with utilities and Internet access, local transport for field visits, materials, maps, data, documents, and coordination required for the TA activities.

19. The TA will be carried out over 8 months, commencing in August 2005 and completed by May 2006. A total of 58 person-months of consulting services will be required: 20 international and 38 domestic. Terms of reference for the consulting services are given in Appendix 4. An international consulting firm will be engaged according to ADB *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for selecting and engaging domestic consultants. ADB will engage a firm of consultants, the selection of which will follow ADB quality and cost-based selection method, following full technical proposal procedures. Equipment for the TA will be procured by the consultants in accordance with ADB *Guidelines for Procurement*.

IV. THE PRESIDENT'S DECISION

20. The President, acting under the authority delegated by the Board, has approved (i) ADB administering a portion of technical assistance not exceeding the equivalent of \$160,000 to be financed on a grant basis by the Cooperation Fund for the Water Sector, and (ii) ADB providing the balance not exceeding the equivalent of \$800,000 on a grant basis, to the Government of the People's Republic of China for preparing the Guiyang Integrated Water Resources Management Project, and hereby reports this action to the Board.

⁷ The physical office will be established on the premises of the local design institute where domestic feasibility studies will be undertaken.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Impact Implementation of a long-term comprehensive water sector development plan for Guiyang Municipality</p>	<p>Submission to the Asian Development Bank (ADB) and the Government of a statement on policies that affect the development of the water sector by 2006</p> <p>Submission to ADB and the Government of an assessment of the technical and managerial capabilities of the water sector institutions, to be developed, processed, and implemented by the subprojects by 2006</p> <p>Submission of a water sector development plan to ADB and Government authorities by 2011</p>	<p>ADB document registration</p> <p>The People's Republic of China (PRC) Government document registration</p>	<p>Assumptions: Government committed to a holistic and participatory approach to water resource conservation and management</p> <p>Effective interagency coordination</p> <p>Adequate and timely provision of counterpart funds during project implementation</p> <p>Sufficient contributions from beneficiaries</p>
<p>Outcome Sector project design agreed by the Government and ADB</p>	<p>Memorandum of understanding signed by the Government and ADB during appraisal mission in July 2006</p>	<p>Memorandum of understanding</p>	<p>Assumptions:</p> <ul style="list-style-type: none"> • Adequate counterpart support • Adequate and timely provision of data • Adequate sharing of knowledge and information • Adequate performance of consultants
<p>Outputs</p> <ol style="list-style-type: none"> 1. Outline water sector development plan 2. Assessment of capabilities and training needs 3. Criteria for selection and appraisal of subprojects 4. Guidelines for conservation and water-saving practices 	<p>Outputs prepared in conjunction with the project preparatory technical assistance (TA) consultants and submitted together with the draft final report by May 2006</p>	<p>ADB document registration</p> <p>Government document registration</p>	<p>Assumptions:</p> <ul style="list-style-type: none"> • Effective stakeholder participation and ownership developed <p>Risks:</p> <ul style="list-style-type: none"> • Restricted availability and access to information and government personnel • Restricted access to geographic sites

Activities with Milestones	Inputs:
<p>Conduct reviews of water sector investment plans, Government policy, institutional framework, and capacity; prepare inception report and detailed work plan (within 4 weeks of TA commencement).</p>	<p>International consultants, 20 person-months</p>
<p>Conduct training needs assessment and prepare training plan; prepare interim report comprising the proposed strategy for implementing integrated water resource management within the context of a long-term water sector investment plan. Interim report to include outline water sector investment plan with identification of subprojects to be appraised in phase 2 and guidelines for subproject feasibility studies and selection (within 12 weeks of TA commencement).</p>	<p>Domestic consultants, 38 person-months</p> <p>ADB: \$960,000</p> <p>PRC Government: \$250,000</p>
<p>Assess proposed designs and costs of core subprojects and conduct preliminary analysis to set the standard and form templates for appraisal and selection of subprojects; prepare draft final report (together with draft environment impact assessment and resettlement plans), and prepare draft final plan for the development of the water sector (within 16 weeks of phase 2 commencement).</p>	
<p>Prepare and submit the final report reflecting the comments and incorporating required amendments and long-term investment plan for the development of the water sector in Guiyang Municipality (within 3 weeks of formally receiving such comments and required amendments).</p>	

INITIAL POVERTY AND SOCIAL ANALYSIS

A. Linkages to the Country Poverty Analysis

Is the sector identified as a national priority in country poverty analysis?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the sector identified as a national priority in country poverty partnership agreement?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>Contribution of the sector or subsector to reduce poverty in the People's Republic of China (PRC): The provision of water for irrigation benefits the poor by increasing incomes enabled by higher crop productivity from increased yields and cropping intensity. The supply of clean drinking water also benefits the poor, particularly women who otherwise spend long hours carrying water, and children who benefit from better hygiene.</p>			

B. Poverty Analysis

Targeting Classification: General intervention

<p>What type of poverty analysis is needed? Poverty analysis will be carried out to identify the incidence of poverty in the project areas, and particularly the households affected by relocation of residences and farm plots. The analysis will identify the causes of poverty in the project areas and demonstrate how the Project will help reduce poverty by incorporating specific intervention measures within the project scope. The analysis will be carried out following the <i>Handbook on Poverty and Social Analysis</i> and <i>Handbook for Integrating Poverty on Economic Analysis of Projects</i>.</p>

C. Participation Process

Is there a stakeholder analysis?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No. To be undertaken as task under project preparatory technical assistance (TA)
Is there a participation strategy?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No. To be formulated by TA consultant

D. Gender Development

<p>Strategy to maximize impacts on women: A gender analysis is to be conducted by the community development specialist who will gather information on issues such as the roles and responsibilities of women in the water sector, including soil and water conservation and agriculture production; their access to control over water resources for agriculture and domestic uses; income levels; participation in decision making and community-based organizations; and their ability and willingness to pay for water. The gender analysis will (i) identify project implications for women in terms of opportunities and adverse impacts of the Project according to gender, and (ii) recommend mitigation measures.</p>		
Has an output been prepared?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No. To be undertaken as task under PPTA

E. Social Safeguards and Other Social Risks

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
Resettlement	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	Resettlement plans for core subprojects and a resettlement framework for other subprojects under the sector loan will be prepared in accordance with PRC Government requirements and ADB policy on involuntary resettlement. The plans will be disclosed to the public and affected people. An independent monitor will be hired during project implementation.	<input checked="" type="checkbox"/> Full <input type="checkbox"/> Short <input type="checkbox"/> None
Affordability	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	Water tariffs are needed to implement improved environmental and water quality management. These will be structured to ensure that the poor can access these services.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Labor	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None	The relocation of people to new residences and farming plots will disrupt employment and earnings for those being relocated, however this will be temporary and not significant. Any plans required to mitigate such temporary effects will be incorporated into the resettlement plans.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Indigenous Peoples	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None <input checked="" type="checkbox"/> Uncertain	The number of ethnic minority people adversely affected in the project areas has not yet been determined. In terms of beneficiaries, a large percentage will be ethnic minorities. A social analyst will assess the project areas and expected impacts, and determine whether ethnic minority development plans or special measures are required to enhance project benefits and take remedial actions for adverse impacts, if necessary.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Uncertain
Other Risks and/or Vulnerabilities	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> Uncertain		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Uncertain

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank (ADB) and Cooperation Fund for the Water Sector Financing^a			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	462.0	0.0	462.0
ii. Domestic Consultants	0.0	175.0	175.0
b. International and Local Travel	56.0	6.0	62.0
c. Reports and Communications	0.0	20.0	20.0
2. Equipment and Software ^b	10.0	0.0	10.0
3. Miscellaneous Administration and Support Costs ^c	0.0	66.0	66.0
4. Participatory Workshops, Survey, and Data Collection ^d	0.0	40.0	40.0
5. Government Participation in Contract Negotiations ^e	5.0	0.0	5.0
6. Contingencies ^f	78.0	42.0	120.0
Subtotal (A)	611.0	349.0	960.0
B. Government Financing			
1. Office Accommodation and Data Acquisition	0.0	60.0	60.0
2. Remuneration and Per Diem of Counterpart Staff	0.0	60.0	60.0
3. Workshops and Participatory Discussions			
a. Venues	0.0	30.0	30.0
b. Domestic Travel Expenses of Government Participants	0.0	25.0	25.0
c. Dissemination	0.0	20.0	20.0
4. Contingencies ^f	0.0	50.0	50.0
Subtotal (B)	0.0	250.0	250.0
Total	611.0	599.0	1,210.0

^a \$160,000 financed by the Cooperation Fund for Water Sector and \$800,000 by ADB's technical assistance funding program.

^b Includes desktop computers, photocopier, and fax machine (to become the property of Water Resources Bureau on completion of the technical assistance).

^c Includes office supplies and translation services.

^d Includes the costs of (i) surveys on (a) resettlement/ social impact survey, (b) economic pricing survey, and (c) participatory approach and public awareness training design; and (ii) renting equipment and hiring interpreters.

^e Costs of travel, accommodation and per diem for two PRC Government Officials: one from National Government Department and one from GMG

^f Contingencies at a generally higher level is required to cater to the unknown number of subprojects to be prepared under the sector approach as well as the potential need for preparation of plans to address social safeguards.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. Consulting services (58 person-months) are required to design and prepare the Integrated Water Resources Management Project. International consultants (20 person-months) will have expertise in institutional development, water resources management and engineering, design and structural engineering, environment, finance, economics, and social aspects. Domestic consultants (38 person-months) will have expertise in hydraulic, civil, structural, water utility and design, and mechanical and electrical engineering; environment; agronomy; agricultural economics; resettlement; community participation; and legal and institutional aspects.

A. Phase 1 Activities: Work Planning and Strategy for Water Sector Development

2. **Water Sector Review and Systems Analysis.** Activities include the following:

- (i) Review documentation and data pertaining to the Project and the water sector (to be provided by the Water Resources Bureau (WRB), and identify gaps and need for additional data.
- (ii) Identify, review, and draw from the experience of similar water resources management projects in the People's Republic of China (PRC).¹
- (iii) Undertake an overall analysis of present and future water resources distribution and availability in the municipality.
- (iv) Undertake a stakeholder analysis. Identify expected beneficiaries and communities to be affected by the Project, and undertake a social assessment in accordance with the Asian Development Bank (ADB) *Handbook on Poverty and Social Analysis*. Give particular attention to
 - (a) poverty analysis to ensure that the percentage of poor people benefiting is higher than the percentage of poor in the country;
 - (b) gender analysis in accordance with ADB gender checklists for agriculture and water supply and sanitation;
 - (c) incorporation of concerns of ethnic minorities in accordance with the ADB Indigenous People's Policy;
 - (d) participatory development and involvement of nongovernment organizations; and
 - (e) any adverse impacts anticipated, particularly on minorities and the poor.

3. **Institutional Aspects.** Activities include the following:

- (i) Review the existing prevalent municipal and local institutional arrangements for similar projects, in particular water affairs bureaus, pilot tested in other Guizhou counties; and propose an appropriate institutional setup and organizational arrangement for integrated water resources management (IWRM).
- (ii) Assess the roles of water user associations to maintain irrigation schemes in a sustainable manner, in connection with a participatory consultation approach.

¹ For a critical assessment of economic pricing and participatory conservation plans, the overall approach is to adapt the existing practices and knowledge suitable for the political-economic and institutional contexts of Guiyang, in the field of water governance.

- (iii) Review the capacity of village committees and assess strengthening measures required, as well as potential innovative participatory institutional arrangements involving these committees in water resources management.
- (iv) Examine WRB's implementation capacity and undertake training needs assessment for the other main project stakeholder institutions (e.g., the key government agencies/institutions for project implementation). Identify the capacity-building needs to secure efficient and effective project implementation, and to secure proper operation and management of the systems in urban areas and townships. Prepare a brief training plan.
- (v) Undertake a financial management assessment of the proposed project implementing agencies including corporate planning and budgetary control, financial and management accounting, cost accounting, internal control and audit system, and data processing. In light of the ADB governance policy (1995), recommend ways to improve financial management and corporate governance.

4. **Economic Aspects.** Activities include the following:

- (i) Analyze the economic rationale for government investment in the water sector, including a description of the situation with and without government intervention, to establish that the investment plan is a justifiable government activity.
- (ii) Analyze the goals of the investment plan, including a description of the process of goal setting and the extent of public participation, to establish that the plan will serve the public and deserves support.
- (iii) Analyze the investment plan in terms of achieving the goals, including a review of all options and policy changes, as well as development of selection criteria for investments, to minimize the cost of achieving the goals.
- (iv) Analyze associated policies, including policies that can affect goals or individual investments, to identify policy changes to increase the likelihood of success.
- (v) Analyze GMG's capacity to implement and monitor the plan, including a list of all required capacities, and compare with existing capacity to establish the best form of aid and the need for technical assistance (TA).
- (vi) Analyze sources of funds to finance the plan. If funding constraints exist, describe them and list the cost of available funds.
- (vii) Analyze GMG's commitment to the plan and describe indicators of commitment at all levels of government involved in the plan—to establish the best form of aid, and possibly the form of disbursement conditions.
- (viii) Analyze the commitment and coordination of foreign aid agencies including a description of the involvement of other foreign aid agencies as well as any coordination efforts, to minimize the real, total cost of foreign aid.
- (ix) Analyze risks to implementing the investment plan and achieving its goals, including a review of the lessons learned from previous efforts, and unique aspects of this plan, to identify risks that foreign aid can help mitigate.
- (x) Analyze conditions attached to aid, including a comparison of the conditions to implementation, and identification of key policy changes in the conditions, to reduce transaction costs, and possibly support related policy changes.

5. **Water Resources Pricing.** Activities include the following:

- (i) Review and analyze the present water pricing mechanisms in urban and rural areas for domestic and industrial water supply and irrigation water; propose

appropriate refinements using a participatory process,² to achieve sustainable utilization of water sources and water use by consumers².

- (ii) Examine water unavailability and related factors affecting the low performance of the irrigation systems, and identify practical options to improve land and water resources management on a sustainable basis. Examine the social, environmental, and institutional requirements as well as cost-effectiveness of the identified options; discuss the findings with key stakeholders; and identify the recommended option as strategy for the Project.
- (iii) Design participatory tools (to be implemented during the Project) for improving equity, efficiency, and sustainability of water allocation and use, including participatory approach planning in the rural areas, awareness raising mechanisms on water conservation, and the use of economic pricing tools.
- (iv) Examine financial capacity and requirements of the overall water sector in GMG by conducting financial analysis of the relevant water supply and resources ministries including WRB and the water supply companies.

B. Phase 2 Activities: Water Sector Development Planning

6. Subproject Feasibility Studies and Appraisal. Activities include the following:

- (i) Collect municipal, county, township, and district data needed to undertake the economic, environmental, and social benefit analysis of selected subprojects.
- (ii) Collect and examine records (relevant to the selected subprojects) on Guiyang urban water distribution and use (domestic, industrial, and other), and municipal use of irrigation water.
- (iii) Review, assess, and verify the technical feasibility of the proposed solutions and facilities being prepared for the selected subprojects included in the national feasibility study: reservoirs and dams (i.e., including types, construction material, heights, regulation volumes), conveyance systems (i.e., tunnels and/or large diameter pipelines), water treatment plants (i.e., new one for Guiyang City and/or the smaller ones for the townships), water supply distribution systems (i.e., extension of the Guiyang City system with storage facilities, and/or township systems), and irrigation systems (i.e., conveyance canals, and/or distribution channels).
- (iv) Conduct supplementary studies, in conjunction with WRB, to update and improve sections of the national feasibility study that relate to the selected subprojects, and propose alternative options, if required.

7. Finance and Costing. Activities include the following:

- (i) Complete a financial evaluation of the proposed components, subprojects, and overall Project in accordance with Guidelines for the Financial Governance and Management of Investment Projects financed by ADB.

² This will include an assessment of the water extraction fee and the proposed new national fee system at present being prepared, if such one is released and available. Assessments should take into consideration ADB's review of policies and practices for tariff setting and establishment of user charges as set out in *ERD Technical Notes 9 and 10: (i) Setting User Charges for Public Services: Policies and Practices at the ADB* (December 2004); and (ii) *Beyond Cost Recovery: Setting User Charges for Financial, Economic, and Social Goals* (January 2004).

- (ii) Prepare detailed cost estimates for subprojects, and establish a practical cost-financing plan to be used for onlending and disbursement arrangements. Assess the financial sustainability of the proposed facilities and measures.
- (iii) Formulate financing plans, and verify that resources for operation and maintenance are available.
- (iv) Assess the financial performance and health of water supply companies, and absorptive capacity of borrowing, including the ADB loan as well as any commercial loans proposed. Recommend sustainable financial management, including a time-bound action plan for tariff increases.

8. **Economics and Benefit Assessment.** Activities include the following:

- (i) Analyze available and prevalent national/local methodologies for valuing economic, environmental, and social benefits of soil and water conservation. Establish a practical analytical framework for use in project preparation and design.
- (ii) Assess economic soundness of subprojects, and propose means of strengthening economic viabilities. Assess implications for participating entities and beneficiaries in accordance with *ADB Guidelines for the Economic Analysis of Projects*. Where viabilities are weak, recommend appropriate measures to strengthen the design.
- (iii) Design allocation of government grant subsidies where economic benefits outweigh financial returns.

9. **Environmental Safeguards.** Activities include the following:

- (i) Assess the environmental soundness and feasibility of the Project and selected subprojects, and undertake public consultations (at least twice) along with provision of full disclosure as required. Conduct the appropriate environmental assessment required: initial environmental examination or a full environmental impact assessment in accordance with *ADB Environmental Assessment Guidelines*. Prepare the environmental impact assessment of the Project and selected subprojects, highlighting the main findings, in accordance with *ADB Environmental Guidelines for Selected Agricultural and Natural Resources Development Projects*, and *Environmental Assessment Guidelines*.
- (ii) Evaluate soil conservation in farming practices in conjunction with water sources protection, and recommend an approach for environmental sustainable farming practices, training, and design to integrate water and soil conservation.

10. **Poverty Assessment.** Activities include the following:

- (i) Analyze the overall social and poverty-related issues in the municipality, with a special emphasis on relations to water, and prepare a social and poverty analysis report.
- (ii) Assess poverty reduction aspects of rural irrigation and water supply, in connection with farming practices, cultivation techniques, water use schemes, accessibility to markets, potential for agroprocessing enterprises, and any other means to improve rural living standards, livelihoods, and income opportunities.

- (iii) Assess institutional and financial support required by the most vulnerable beneficiaries, notably the rural poor, to use and operate project facilities during project implementation, and recommend arrangements to meet such needs.

11. **Resettlement.** Activities include the following:

- (i) Review GMG's resettlement policy for households to be affected by subproject reservoir construction activities, and prepare a resettlement plan pertaining to these areas.
- (ii) Prepare a resettlement plan and resettlement framework for subprojects where the Project will entail significant land/house acquisition or disruption of livelihood in accordance with the ADB *Handbook on Resettlement* and policy on involuntary resettlement.

12. **Community Development.** Activities include the following:

- (i) Prepare a plan to increase awareness and develop capacity of the local counterpart agencies and future project executing agencies, on international best practices in promoting participatory water management as well as using economic pricing tools.
- (ii) Use a participatory approach to involve municipal and county stakeholders as well as project beneficiaries in the analysis and project design.
- (iii) Conduct workshops with municipal, county, district, and township stakeholders to discuss proposed irrigation schemes and other relevant project design in a participatory manner. Prepare a plan for participatory operation and maintenance of irrigation schemes during project Implementation.

13. **Project Formulation.** Activities include the following:

- (i) Assess the project rationale, objectives, and scope; prepare a problem analysis and project performance management system framework using a participatory approach.
- (ii) Prepare monitoring indicators and baseline data to facilitate project monitoring and evaluation.
- (iii) Prepare an implementation schedule and detailed implementation arrangements.
- (iv) Identify needs for additional studies/research after the TA, necessary for successful implementation of the Project.
- (v) Identify any TA needs during project implementation, and prepare terms of reference for such assistance.

C. Reporting Requirements

14. The consultant will produce four reports. All will be discussed in tripartite meetings of the consultant and representatives of WRB and ADB. All reports are to be written in English and will be translated into Chinese. Five copies of each report (in English) are to be submitted to ADB and five copies (in both Chinese and English) are to be submitted to WRB.

15. **Inception Report.** To be submitted within 4 weeks of TA commencement, the report will provide preliminary reviews of the national feasibility study report and other relevant water sector investment plans; PRC Government policy and GMG's institutional framework in relation to the water sector; and the capacity of WRB and relevant implementing agencies to implement the Project and ultimately address IWRM needs. The report will identify the gaps in data and

information, and present a detailed work plan, and resource utilization and implementation schedule for the TA.

16. **Interim Report.** To be submitted within 12 weeks of TA commencement, the report will build upon the preliminary reviews presented in the inception report and, within the context of establishing an IWRM system in the long term, contain detailed plans for institutional development including a training needs assessment and training plan. The report will contain a proposed strategy for implementing IWRM and an outline of an integrated long-term investment plan for the water sector in Guiyang Municipality. It will identify subprojects subject to feasibility studies and appraisal in phase 2, and provide guidelines for subproject selection, including economic, environment, and resettlement criteria.

17. **Draft Final Report.** To be submitted within 12 weeks after commencing phase 2, the report will be structured in accordance with the ADB format for the report and recommendations of the President, and cover each topic by chapter sufficiently for ADB to prepare the project document. The report will also include completed feasibility study reports, and environmental impact assessments and resettlement plans as necessary, for the selected subprojects. The reporting from these subprojects will be used to set the standard and form templates for the appraisal of the remaining subprojects. The ADB and selected Chinese government agencies will have 3 weeks to review the report and submit comments.

18. **Final Report.** To be submitted at the conclusion of the TA, the report will reflect the comments and incorporate amendments required by Government agencies, ADB, and other relevant stakeholders.