

**BOARD
OF
DIRECTORS**

ASIAN DEVELOPMENT BANK

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**TECHNICAL ASSISTANCE TO TAJIKISTAN
FOR THE STRATEGY FOR IMPROVED FLOOD MANAGEMENT
(FINANCED FROM THE JAPAN SPECIAL FUND)**

The attached Report is circulated for the information of the Board. The President approved the technical assistance on 5 September 2000.

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I. INTRODUCTION

1. The Government of the Republic of Tajikistan has requested the Asian Development Bank (ADB) to provide technical assistance (TA) to prepare a strategy for improved flood management. The TA, which is included in the country assistance plan for 2000, will assist the Government consolidate hydrometeorological information, create a computerized database and publish historical data; study the climatological and physical factors contributing to floods; identify systemic, institutional, and other constraints; and prepare recommendations regarding policy reforms, institutional strengthening, further studies, and investment projects. The objective, scope, terms of reference, implementation arrangements, and cost estimates for the TA were prepared in consultation with the Government during the TA Fact-Finding Mission from 29 May to 9 June 2000.¹ The TA framework is attached as Appendix 1.

II. BACKGROUND AND RATIONALE

2. Tajikistan, with about 93 percent of the area occupied by mountains, suffers frequently from floods. Three major floods hit the country during the last five years (1995-1999). The recent devastating floods of 1998 and 1999 took 32 lives and caused widespread damage estimated at \$55 million. While ADB and the World Bank extended emergency rehabilitation assistance² to reinstate infrastructure damaged by these floods, there is a need for a comprehensive review of the flood subsector to identify major constraints and long-term solutions.

3. The poor, who constitute about 83 percent of the Tajikistan population, are generally most affected by the floods. Most of the rural poor are dependent on river flows for their agriculture, livestock, and domestic water supply, and therefore live close to the riverbanks. The floods directly affect their settlements and livelihood. If not properly managed, recurring floods will continue to add to the miseries of the poor, and erode the benefits of development efforts of the Government and assistance of international agencies, in addition to reducing productivity, disrupting communications, and enhancing the desertification process.

4. Floods in Tajikistan are caused by snowmelt, heavy rainfall, and a combination of the two. The early flood peaks in snowmelt rivers are experienced in spring. However maximum flood peaks are generally the result of higher rates of snowmelt due to hot summer weather combined with runoff resulting from high-intensity rainfall. The situation is worsened by associated landslides and mudflows. The 1999 flood occurred in July as a result of snowmelt combined with very high-intensity rainfall—400 millimeters in nine hours in some parts of Leninabad—and the situation was worsened by mudflows. Flood damage was exacerbated by poor preparedness, ineffective flood-warning system, and delays in emergency assistance partly because of the damaged communication facilities.

5. Because of the predominantly mountainous terrain, roads are generally located along the rivers. A large number of bridges and roads are subject to damage by riverbank erosion. Proper design of river protection works and bridges requires reliable hydraulic parameters that depend on the accuracy, area coverage, and period of hydrometeorological records; and the thoroughness of their analyses. In mountain areas, where many sites cannot be gauged, design

¹ The TA first appeared in *ADB Business Opportunities* (Internet Edition) in March 2000.

² ADB Loan 1714(SF)-TAJ: *Emergency Flood Rehabilitation Project* for SDR3.601 million approved on 2 December 1999; and World Bank Credit 3123-TJ: *Emergency Flood Assistance Project* for SDR3.800 million approved on 27 August 1998, and supplemental credit of SDR1.500 million approved on 14 December 1999.

parameters can be approximated by regional hydrologic analyses techniques using the data of the nearest rain and stream-gauging stations. Nonetheless, this requires a reasonably extensive observation network and data measured over a sufficiently long period.

6. While the country has a good network of climatic and river-gauging stations, a majority of these stations are nonoperational because of neglect during the last decade. Such stations provided vital climatic, river flow, and sediment concentration information needed for forecasting the river flows and floods, and for the design of bridges, flood control and protection facilities, and other hydraulic structures. Because of the poor security situation in the past, difficult access, and lack of financial resources, these hydrometeorological stations have not been adequately maintained and repaired or replaced, and currently only about 25 percent are fully operational. Likewise, the compilation, analyses, and publication of this data are lagging by nine years. Considering the importance of such data for all aspects of flood management, there is an urgent need to assess the adequacy of the existing network, and identify the need for additional stations or rehabilitation of existing stations. In addition, there is an immediate need to (i) establish a computerized database; (ii) train staff in storing, updating, retrieving, and disseminating information; and (iii) clear the backlog of data to be published. Establishment of such a database at this early stage is crucial for making information regarding design parameters readily available. This information will be required for future flood-related and agriculture sector studies. The Government will be required to assure full budgetary and staffing support for regular operation and maintenance of the database established under the TA.

7. Fewer climatic and river-gauging stations in working condition, together with a poor and outdated communication network have virtually paralyzed the flood-forecasting capabilities of the Government. A reliable flood-forecasting and warning system can lead to significant reduction in loss of lives and flood damages. Other nonstructural measures, like flood zoning, preparedness, developing awareness among the vulnerable communities, use of reservoirs for reducing flood peaks, and improvements in the catchment areas, can also reduce flood hazards and the resulting damages. There is also a need to review the legal instruments related to flood management to check their adequacy, and determine if any changes in the existing legal framework, or additional instruments, are required. Suitable legal instruments are a prerequisite for implementing various measures like flood zoning, procurement of land for flood management facilities, and evacuation in cases of imminent emergency.

8. Considering the remoteness of the areas generally affected by floods, difficult terrain, and poor communication network, there is need to investigate the possibility of effective involvement of local communities in planning, implementing, and rehabilitating flood-related facilities; relaying exceptional precipitation and flood-flow information; disseminating flood warnings; evacuating, if required; and provides emergency assistance to affected communities.

9. Sarez Lake in the Pamir Mountain range presents a potential flood threat to Afghanistan, Tajikistan, Turkmenistan, and Uzbekistan; where about 5 million people living along the Amu-Darya, Bartang, and Panj, rivers are at risk. Sarez Lake was created by the blocking of the Murghab River valley by a landslide resulting from an earthquake in February 1911. The lake behind the 550-meter high natural embankment—the tallest dam in the world—is located at an altitude of 3,200 meters, is about 60 kilometers long, and stores about 17 cubic kilometers of water. Failure of the embankment could be caused by overtopping, earthquakes, or piping.³ In October 1999, the Government created Sarez Agency under the Ministry of Emergency

³ Piping is the phenomenon of washing away of the fine sediments from an embankment thus leading to formation of an expanding hole that would ultimately lead to total collapse.

Situations to deal with all matters related to Sarez Lake. The World Bank, on 23 June 2000, approved the Lake Sarez Risk Mitigation Project, which includes (i) design and installation of a monitoring and early warning system, (ii) helping communities prepare for natural disasters, and (iii) studies on long-term solutions. In addition to the tasks being undertaken by the World Bank, there is a need to (i) examine the Sarez Lake problem in the broader context of countrywide flood management, (ii) determine the magnitude of additional assistance, if any, required for investigations, studies, and mitigation measures; and (iii) analyze emergency procedures and institutional arrangements for possible improvements.

10. As a result, there is an urgent need for (i) a comprehensive review of the flood sector, including the current practices and institutional arrangements for flood management; (ii) establishment of a hydrometeorological database, integrated with other sectors of environmental monitoring; (iii) assessment of the suitability of structural and nonstructural measures; and (iv) preparation of a strategy for improved flood management, including involvement of beneficiaries in the planning and implementation processes, and real-time flood management. These studies and activities are vital to reduce risk and exposure to floods of the agricultural lands, physical infrastructure, and human settlements, and are prerequisites to undertaking major development activities. The creation of a computerized hydrometeorological database and consolidation of water resources information will make a useful contribution preparing the future agricultural development projects, and lay the foundation for implementing ADB's emerging water policy. The integration of a hydrometeorological database with other sectors of environmental monitoring will facilitate creation of a comprehensive monitoring network that is necessary to prevent environmental degradation. The initiative of involving beneficiaries in the development process will promote their awareness, and pave the way for their participation in future agriculture and water resources sector projects.

11. The operation of the international development agencies in Tajikistan started relatively recently; therefore, there are no project completion or implementation evaluation reports available. Nonetheless, the implementation of ongoing projects, particularly of the ADB-financed Emergency Flood Rehabilitation Project,⁴ and Flood Disaster Management TA,⁵ and the World Bank-financed Emergency Flood Assistance Project, has been rated as satisfactory. The staff of the Center for Liquidation of Consequences of Natural Disasters (CLCND), the executing agency (EA) of these projects, who were already adequately qualified and experienced, have now gained valuable experience working with international agencies. However, World Bank staff, during their last June 2000 review mission, identified a need to improve financial controls. The Agha Khan Foundation, an international nongovernment organization has been very active in implementing small-scale development projects including flood protection works. It is particularly recognized for its grassroots operations involving vulnerable groups, specially in remote areas.

III. THE TECHNICAL ASSISTANCE

A. Objective

12. The objective of the TA is to assist the Government develop a strategy for improved flood management by identifying systemic, institutional, and other constraints in efficient flood

⁴ ADB Loan 1714(SF)-TAJ: *Emergency Flood Rehabilitation Project* for SDR3.601 million approved on 2 December 1999.

⁵ TA 3319-TAJ: *Flood Disaster Management Project* for \$205,000 approved on 2 December 1999.

management; and preparing recommendations regarding policy reforms, institutional strengthening, further studies, and investment projects. The TA will consolidate the hydrometeorological information and prepare a framework for improved flood management. This is expected to form the basis for future ADB involvement in the subsector.

B. Scope

13. The TA scope will comprise (i) a study of climatological and physical factors contributing to floods; (ii) consolidation of hydrometeorological information, and assistance in creating a computerized database and its integration to other sectors of environmental monitoring; (iii) identification of major constraints in design practices, structural and nonstructural measures, and institutional arrangements for flood management; and arrangements for flood-forecasting and warning, disaster preparedness, and flood damage rehabilitation; and (iv) preparation of a flood protection plan, including a prioritized list of recommended investment projects together with outline terms of reference and estimated costs. A typical flood management plan would consist of the following four components: (i) physical infrastructure such as flood control structures, levees, and riverbank erosion control structures; (ii) nonstructural measures like flood zoning, flood-forecasting and warning, and use of existing reservoirs for reducing flood peaks; (iii) improvement in procedures and design practices; and (iv) strengthening of the relevant institutions. Beneficiaries will be identified and consulted during the course of the study on their aspirations, expectations, and potential role in various activities of flood management.

C. Cost Estimates and Financing Plan

14. The total cost of the TA is estimated at \$650,000 equivalent, comprising \$430,000 for foreign exchange costs and \$220,000 equivalent for local currency costs. ADB will finance \$550,000 equivalent, consisting of the entire foreign exchange cost and \$120,000 equivalent of the local cost. The TA will be financed by ADB on a grant basis from the Japan Special Fund, funded by the Government of Japan. The Government will cover local costs equivalent to \$100,000 to cover the costs of office accommodation, data acquisition and compilation, and logistical support. Detailed cost estimates are in Appendix 2.

D. Implementation Arrangements

15. CLCND will be the Executing Agency. CLCND staff are adequately qualified and experienced, have gained valuable experience by working with ADB and the World Bank, and are considered well-prepared for implementing the TA. The director, CLCND, will act as the TA director. A steering committee will be established to provide policy direction and guidance to the TA team. The chairperson of the committee will be nominated by the Executive Committee, Government of the Republic of Tajikistan. The steering committee will include the Tajik head of geology; and representatives of the Sarez Agency and ministries of transport and roads, environmental protection, and water management and land reclamation.

16. A working group will be established comprising representatives of the Tajik head of geology; Sarez Agency; and ministries of transport and roads, environmental protection, and water management and land reclamation. The group will work under the guidance of the steering committee, take charge of the study, work closely with the consultant, review and comment on consultant's reports in a timely manner, and report to ADB on any issues related to TA implementation.

17. The Government has agreed to establish a water resources information center prior to commencement of the TA studies. This center will be the (i) main working space for the consultants; (ii) repository of all water resources information; and (iii) focal point for the exchange of information with the national and international institutions, and other countries. Thus, the center will facilitate coordination and continuity of efforts by various Government and international agencies improve water management, including flood management.

18. The TA will be implemented over six months from January to July 2001. The TA will finance a total of 58.7 person-months of consulting (i) 13.7 person-months of international consulting comprising team leader and flood management specialist, hydrometeorologist, flood-forecasting and warning specialist, hydraulic structures design engineer, disaster management specialist, and hydrometeorological database management specialist; and (ii) 45 person-months of domestic consulting comprising deputy team leader and flood management specialist, meteorologist, hydrologist, legal expert and flood zoning specialist, flood-forecasting and warning specialist, hydraulic structures design engineer, disaster management specialist, sociologist, and database management specialist. The outline terms of reference for consultants are in Appendix 3. All consultants will be recruited through a firm in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements for the engagement of domestic consultants. The consultants will produce four reports: (i) an inception report about three weeks after commencement; (ii) a midterm report, two-and-a-half months after commencement; (iii) a draft final report five months after commencement; and (iv) a final report upon completion of the TA.

19. Equipment and supplies, e.g., computer systems, and fax and photocopy machines necessary for the implementation of the TA, will be procured by the consultants in accordance with ADB's *Guidelines for Procurement*.

20. The TA activities will be closely coordinated with other international agencies involved with flood management, in particular, the World Bank and the Agha Khan Foundation. The consultants will work closely with the beneficiaries to examine their potential role in various aspects of flood management, and ensure that their aspirations and concerns are adequately reflected in the recommendations.

IV. THE PRESIDENT'S DECISION

21. 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 Republic of Tajikistan in an amount not exceeding the equivalent of \$550,000 for the purpose of preparing the Strategy for Improved Flood Management, and hereby reports such action to the Board.

TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions And Risks
<p>Goal</p> <p>Reduce risk and exposure to floods, especially among the poor.</p>	<ul style="list-style-type: none"> • Damages caused by the floods reduced • Productivity increased 	<ul style="list-style-type: none"> • Economic surveys • Rural surveys • Postevaluation 	<ul style="list-style-type: none"> • The procedures and physical facilities recommended by the technical assistance (TA) are implemented • Peace and security situation remains stable
<p>Purpose</p> <p>Develop a strategy for improved flood management</p>	<ul style="list-style-type: none"> • Acceptance of the strategy by the Government • Incorporation by the Government of the TA findings and recommendations in the long-term flood management plan • Future project preparation and investments in the flood subsector follow the investment plan recommended by the TA studies • Government implements the legal instruments recommended by the TA studies 	<ul style="list-style-type: none"> • Government's long-term investment plan for the flood subsector • TA and investment portfolio of the multilateral and bilateral assistance agencies • Decrees and resolutions issued 	<ul style="list-style-type: none"> • The Government's interest in the sector is sustained. • The Government continues to invest in the sector. • Concerned Government agencies coordinate. • There is effective coordination with other assistance agencies and nongovernment organizations (NGOs).
<p>Outputs</p> <ul style="list-style-type: none"> • Flood-related data and information consolidated • Hydrometeorological database established and last nine years data published • Constraints in the existing flood management system identified • Prioritized list of proposed policy reforms, studies, and projects to improve flood management prepared 	<ul style="list-style-type: none"> • Project reports • Feedback from the beneficiaries • Government's feedback on consultant reports • Regular publication of annual hydrometeorological data reports 	<ul style="list-style-type: none"> • Consultant's progress reports • ADB's review missions • Annual hydro-meteorological data reports 	<ul style="list-style-type: none"> • The data collected in the past is reliable • The Government agencies extend their full cooperation • Government counterpart facilities are made available, and adequately qualified and suitably experienced staff are provided promptly

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions And Risks
<p>Activities:</p> <ul style="list-style-type: none"> • Study climatological, physical, and other factors contributing to floods. • Review existing hydrometeorological network and recommendations for improvements. • Review existing institutional arrangements for design, construction, maintenance, and emergency rehabilitation of flood-related facilities. • Review system of data collection, analysis, publication, and its use in the design of flood-related structures. • Help establish hydrometeorological database, and publish the last nine years data. • Review existing flood forecasting and warning system. • Review norms and specifications for design of flood-related structures. • Examine current practices for disaster preparedness, and emergency rehabilitation of facilities damaged by floods. 	<ul style="list-style-type: none"> • Reports of the assessment • Feedback from the Government agencies • Feedback from the beneficiaries 	<ul style="list-style-type: none"> • Consultant's progress reports • ADB's review missions 	<ul style="list-style-type: none"> • The security situation in the country remains stable. • The Government's strong interest in the Project is sustained. • The TA steering committee is formed in time, meets regularly, and provides useful guidance to the TA team. • The Ministry of Environmental Protection extends cooperation in providing historical data. • The Department of Hydrometeorology nominates suitably qualified counterpart staff. • All relevant agencies provide the required information.
<p>Inputs:</p> <ul style="list-style-type: none"> • 13.7 person-months of international consulting • 45 person-months of domestic consulting • \$10,000 for equipment • \$10,000 to support establishment of hydrometeorological database 		<ul style="list-style-type: none"> • Consultant's progress reports • ADB's review missions 	<ul style="list-style-type: none"> • The security situation in the country remains stable. • The Government provides the counterpart facilities and staff promptly. • The working group functions satisfactorily.

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	286.3	0.0	286.3
ii. Domestic Consultants	0.0	58.5	58.5
b. International and Local Travel	50.0	13.6	63.6
c. Reports and Communications	10.0	0.0	10.0
2. Equipment and supplies ^b	10.0	0.0	10.0
3. Support for Hydromet Data Management	10.0	0.0	10.0
4. Beneficiary Consultation Workshops	0.0	5.0	5.0
5. Interpreters/Translators	0.0	20.0	20.0
6. TA Administration and Support Costs	0.0	7.0	7.0
7. Representative for Contract Negotiations	8.0	0.0	8.0
8. Contingencies	55.7	15.9	71.6
Subtotal (A)	430.0	120.0	550.0
B. Government Financing			
1. Office Accommodation and Transport	0.0	20.0	20.0
2. Data Compilation	0.0	15.0	15.0
3. Remuneration of Counterpart Staff	0.0	15.0	15.0
4. Travel and Per Diem Cost of Counterpart Staff	0.0	15.0	15.0
5. Logistical Support in Provinces	0.0	20.0	20.0
6. Contingencies	0.0	15.0	15.0
Subtotal (B)	0.0	100.0	100.0
Total	430.0	220.0	650.0

^a Financed from the Japan Special Fund, funded by the Government of Japan.

^b For purchase of three computers, software, three printers, and fax and photocopy machines.

Source: Staff estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

Consulting Requirements

1. The TA will require the services of a total of 58.7 person-months of well-qualified and suitably-experienced consultants, preferable with working experience in Tajikistan and/or other Central Asian Countries. An outline of the envisaged consulting input follows (input in person-months is given in parenthesis):

- (i) international consultants (13.7): team leader and flood management specialist (5.5), hydrometeorologist (2.0), flood-forecasting and warning specialist (1.5), hydraulic structures design engineer (1.5), disaster management specialist (0.7), and hydrometeorological database management specialist (2.5);
- (ii) domestic consultants (45.0): deputy team leader and flood management specialist (6.0), meteorologist (5.0), hydrologist (5.0), legal expert and flood zoning specialist (4.0), flood-forecasting and warning specialist (5.0), hydraulic structures design engineer (4.0), disaster management specialist (5.0), sociologist (5.0), and database management specialist (6.0).

Description of Tasks

1. Assessment of Existing Situation and Recommendations for Improvement

a. Flooding Phenomena and Flood Damages

2. Study the climatic, topographic, catchment area, and land-use conditions; river morphology; and other factors contributing to floods. Assess the relative importance of various sources of floods, analyze major historical floods; relate flood damage to flood peak flows and/or duration; and identify river reaches, infrastructure, and settlements under flooding threat. Also assess the short- and long-term impact of the floods.

b. Current Flood Management Practices

3. Assess the current practices for planning, design, implementation, maintenance, and emergency rehabilitation of flood related works and emergency assistance; and identify weaknesses in the current practices. Assess the suitability of various structural and nonstructural measures, particularly flood zoning, use of reservoirs to reduce flood peaks, and improvements in the catchment areas for flood management.

c. Hydrometeorology

4. Prepare an inventory of the existing climatological and stream gauging stations giving the location, type of equipment, frequency of observation, period and quality of records, agency responsible for operation, and the current status. Assess the adequacy of the existing network, and propose improvements in the network, type of equipment, frequency of observations, etc. Review the current arrangement for data transmission to the headquarters, its storage, retrieval, processing, and publication; and suggest improvements. Procure suitable hardware and software for establishing a database; assist the staff of the Department of Hydrometeorology in

(Reference in text: page 5, para. 18)

establishing the database; train them in storage, retrieval, processing, and publication of the data; and assist in publishing unpublished data from the last nine years.

d. Design Practices

5. Assess the quality of analyses of hydrometeorological data and information, and timely updating of the hydrologic parameters for use in the design of various flood-related facilities. Review the suitability of hydrologic and hydraulic design parameters being used for the flood-related facilities, and recommend systemic and procedural improvements.

e. Flood Forecasting and Warning

6. Review the existing hardware, software, and institutional arrangements, including coordination with external agencies in flood-forecasting and warning. Assess the performance of this system during the past major floods, and recommend improvements.

f. Disaster Preparedness and Rehabilitation

7. Review the existing arrangement for disaster preparedness at the central, province, and district levels. Assess the adequacy and appropriateness of the arrangement particularly for the major floods experienced during the last few years, and recommend improvements.

g. Sarez Lake Flooding Potential

8. Closely coordinate with the World Bank team working on the Lake Sarez Emergency Mitigation Project, and using largely the output of the ongoing World Bank study, describe the potential of flooding, the river reaches likely to be flooded should the embankment breach, and the measures being proposed for mitigation of the damages. Recommend any additional investigations, mitigation measures, and other works/procedures or institutional arrangement deemed necessary.

h. Legal Framework and Nonstructural Measures

9. Assess the adequacy of the existing legal instruments for implementing various strategies and procedures for efficient flood management, and suggest modifications to the existing or additional instruments if any are required. Assess the effectiveness of flood zoning, use of reservoirs for alleviating flood peaks, and any other nonstructural measures; and make recommendations for more effective use of the nonstructural measures.

i. Community Involvement in Flood-Related Tasks

10. Assess to what extent communities can be involved, and the reliability of their involvement in various flood-related tasks like planning and maintenance of flood protection works, registering of peak flood flows and flow patterns in remote areas, communicating emergency flood situations, flood warning, reporting of critical flood damages, and emergency flood rehabilitation.

j. Financial Control

11. Assist the Center for Liquidation of Consequences of Natural Disasters in keeping proper accounts of the TA.

2. Coordination

12. The international and domestic consultants will work very closely with various Government agencies, international agencies involved in flood management, counterpart staff, and the beneficiaries, particularly the vulnerable groups to come up with pragmatic recommendations. The international consultants will ensure transfer of knowledge to and hands-on training of the domestic consultants and the Government counterpart staff.

3. Assistance in Establishing Computerized Hydrometeorological Database

13. The consultant will procure suitable hardware and software, and assist and train the Department of Hydrometeorology staff in establishing a computerized hydrometeorological database. The database will be integrated with other sectors of environmental monitoring. Department of Hydrometeorology staff will also be trained in updating and retrieving the data, printing various reports, and publishing annual reports. The consultant will also assist the staff in clearing the backlog by publishing the last nine years reports on climatic, river flow, and sediment data.

4. Recommendations Regarding Actions, Studies, and Investment Projects

14. Based on these studies, the consultant will make recommendations on the following:

- (i) improvements in climatic and river-gauging station networks together with recommendations on the required equipment;
- (ii) repair of existing equipment, and rehabilitation of existing hydrometeorological stations;
- (iii) improvements in operation, observation, transmission, storage, retrieval, and publication of the hydrometeorological data;
- (iv) improvements in existing arrangements for planning, design, construction, maintenance, and interagency coordination in flood management;
- (v) equipment, procedural, and institutional changes required to make flood-forecasting and warning more effective;
- (vi) improvements in existing practices of flood preparedness and emergency rehabilitation;
- (vii) changes in legal framework, policies, flood zoning, improvements in catchment areas, and other nonstructural measures; and
- (viii) involvement of the communities in flood-related tasks.

15. The consultant will also prepare (i) a prioritized list of studies and investment projects, together with outline scopes of work and estimated costs; (ii) an estimate of operation and maintenance costs of the proposed works; (iii) an implementation schedule of the proposed works consistent with the agreement of the Government with International Monetary Fund regarding the ceiling of expenditures; and (iv) an estimate of operation and maintenance costs of the hydrometeorological database established under the TA.

C. Reporting

16. The consultant will produce four reports: (i) a brief inception report about three weeks after commencement, focusing on the consultants' detailed program of work, and implementation and organizational arrangements; (ii) a midterm report, two-and-a-half months after commencement presenting initial findings; highlighting issues, if any; and presenting outline of the draft final report; (iii) a draft final report five months after commencement; and (iv) a final report upon completion of the TA. The first three reports will be reviewed by the Government, ADB, and other concerned parties, and discussed in tripartite meetings. The final report will incorporate comments on the draft final report as agreed at the tripartite meeting.