Grant Assistance Report

Project Number: 39029
February 2006

Proposed Grant Assistance
Tajikistan: Community-Based Rural Power Supply Project
(Financed by the Japan Fund for Poverty Reduction)

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 22 June 2005)

Currency Unit	–	somoni (TJS)
TJS1.00	=	$0.3274
$1.00	=	TJS3.0544

ABBREVIATIONS

ADB	–	Asian Development Bank
BT	–	Barki Tajik
CBO	–	community-based organization
EA	–	executing agency
FSU	–	former Soviet Union
GDP	–	gross domestic product
GIM	–	grant implementation memorandum
ICM	–	implementation completion memorandum
JFPR	–	Japan Fund for Poverty Reduction
JRC	–	*jamoat* resource center
MOE	–	Ministry of Energy
MOU	–	memorandum of understanding
NGO	–	nongovernment organization
O&M	–	operation and maintenance
PIU	–	project implementation unit
PM	–	project manager
PPMS	–	project performance management system
SIA	–	social impact assessment
TA	–	technical assistance
UNDP	–	United Nations Development Programme
WB	–	World Bank

GLOSSARY

jamoat	–	collection of several villages; the lowest administrative division
rayon	–	district

WEIGHTS AND MEASURES

ha	–	hectare
km	–	kilometer
m	–	meter

NOTE

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

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Team leader	T. Oi, Social Development Specialist, ECRD
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JAPAN FUND FOR POVERTY REDUCTION (JFPR)

JFPR Grant Proposal

I. Basic Data	
Name of Proposed Activity	Community-Based Rural Power Supply
Country	Tajikistan
Grant Amount Requested	$2 million
Regional Grant	○Yes / ⊙ No
Grant Type	⊙ Project / ○ Capacity building

II. Grant Development Objective(s) and Expected Key Performance Indicators

Grant Development Objectives:

The objective is to improve the quality of life during winter in remote rural areas by improving electric supply services. The outcome will be the establishment and provision of sustainable and cost-effective community-based micro-hydropower supply system in remote rural areas. The outputs will be (i) identification of a maximum of six viable community-based energy organizations (CBOs); (ii) strengthening of distribution networks and rehabilitation or upgrading of a maximum of six pilot micro-hydropower projects, each with a minimum capacity of 200 kilowatt (kW); (iii) supplying energy in pilot project sites; and (iv) improving awareness of energy saving in the pilot project sites. Each micro-hydropower project will supply electricity to about 400 households.

Expected Key Performance Indicators:

(i) Power outages for households in project sites reduced by 50%.
(ii) A maximum six micro-hydropower projects, each with minimum capacity of 200 kW, implemented.
(iii) Electricity supplied to 2,400 households in a maximum of six project sites during winter.
(iv) One organization in each project site incorporated, and 80% of executive members appointed.
(v) One pilot energy-saving household established in each project site.

III. Grant Categories of Expenditure, Amounts, and Percentage of Expenditures

Category	Amount of Grant Allocated in $	Percentage of Expenditures
1. Civil Works	196,800	9.8
2. Consulting Services	455,101	22.8
3. Equipment	926,420	46.3
4. Local Training and Workshops	4,500	0.3
5. Project Management	236,400	11.8
6. Contingency	180,779	9.0
Total	**2,000,000**	**100.0**
Incremental Cost	0	0.0

JAPAN FUND FOR POVERTY REDUCTION

JFPR Grant Proposal
Background Information

A. Other Data

Date of Submission of Application	November 2005
Project Officer	Teruhisa Oi, Social Development Specialist
Project Officer's Division, E-mail, Phone	Energy Division (ECEN) teruhisaoi@adb.org 632-5706
Other Staff Who Will Need Access to Edit/Review the Report	X. Humbert, Energy Specialist, ECEN A. Maxwell, Environment Specialist, ECEN T. Anwar, Portfolio Management Specialist, TJRM
Sector	Energy
Subsector	Renewable energy generation
Themes	Environmental sustainability, inclusive social development
Subthemes	Cleaner production, control of industrial pollution; human development
Targeting classification	Targeted intervention
Name of Associated ADB Financed Operations	Power Rehabilitation Project Phase I
Executing Agency	Ministry of Energy (MOE)
Grant Implementing Agency	Project implementation unit (PIU) under Barki Tajik (BT)

B. Details of the Proposed Grant

1. Description of the Components, Monitorable Deliverables/Outcomes, and Implementation Timetable

Component A	
Component Name	Participatory Site Selection and Community Mobilization
Cost ($)	245,004
Component Description	**Hydrologic and Geologic Study.** The study will (i) review local hydrologic statistics and geologic stability (landslides, etc.) in the pilot project sites proposed by the Government, and (ii) ascertain project feasibility.
	Social Study. The study will identify functioning CBOs that will own and manage the pilot projects, taking into account the communities' keenness to own the project and willingness to

	pay for the supply of power services. In parallel, a socioeconomic survey, a household energy survey,[1] field surveys, and stakeholder and gender analyses will be carried out at these sites to comply with the safeguard policies of the Asian Development Bank's (ADB). **Project Technical Design Study.** A technical design and economic feasibility study will be carried out, including detailed cost estimates, contract packaging, and implementation schedules for the selected pilot projects under the hydrologic and geologic feasibility study. **Environmental Study.** The study will identify potential major environmental issues resulting from the project and ensure that these are all mitigated. The project design will maximize positive environmental impacts resulting from the project. **Economic and Financial Analyses.** The economic analysis will establish the viability of the proposed investment in terms of the use of natural resources. The analyses will compare the additional resource costs of the "with project" scenario and the "without project" scenario. These resource costs may include the use of alternative sources of generation (small diesel generators), use of more expensive generating facilities, economic loss caused by system reliability weakness, etc. The financial analysis will establish the hydropower schemes' ability to generate sufficient revenue through the sale of electricity to meet operating and construction costs. **Legal Studies.** The terms of reference specify a number of specific legal tasks. These are to (i) review the existing legal and regulatory framework, including the licensing fee, and propose improvements to accommodate the pilot projects; (ii) make policy makers and regulators in Tajikistan aware of the need for policy, regulatory, and licensing support for the development of community-based initiatives; and (iii) design an appropriate legal structure that will enable significant community ownership.
Monitorable Deliverables/Outputs	(i) A maximum of six project sites identified. (ii) Support letter from a maximum of six CBOs or local representative groups in each project site received. (iii) Organization structures, rules, and procedures for the project developed.
Implementation of Major Activities: Number of months for grant activities	3 months

[1] Questions will include (i) What types of energy are used for different purposes? (to understand the substitution effect) (ii) What portion of the household's income is spent on energy? (to understand trade-offs) (iii) What are the coping strategies in the face of unreliable energy supply, or the impact of large price increases? (to understand energy conservation possibilities).

Component B	
Component Name	Establishment of Micro-Hydropower System by Community-Based Organizations (CBOs) and Barki Tajik
Cost ($)	1,368,730
Component Description	**Institutional Capacity Building.** CBOs and BT, assisted by the consultants, will prepare the basic rules for operating the micro-hydropower plants and distributing electric power to each household. The rules will cover such areas as the organization, by-laws, appointment of executives, tariffs, billing and collection method, project monitoring and evaluation, customer relations management, and social and environmental monitoring mechanisms. A detailed design of the micro-hydropower plant project (including tender documents) will be prepared by the consultant. **Implementation of Pilot Project.** Community members, BT, CBOs, and consultants will work together to (i) procure goods and install and operate the maximum of six pilot micro-hydropower projects, and (ii) strengthen the distribution networks in the project sites. **Distribution of Electric Power.** During the first year of the project, CBOs and BT, assisted by the consultants, will manage the distribution of electric supply to poor households in a maximum of six project sites. **Selection Criteria.** The following criteria will be used to select subprojects: (i) the poor and poorest beneficiaries will be served; (ii) the community is committed and the beneficiaries involved; (iii) a technically, environmentally, economically, and financially sound and simple project design has been developed; (iv) matching funds based on communities' or government counterpart contributions are available.
Monitorable Deliverables/Outputs	(i) A maximum of six micro-hydropower projects with a minimum 200 kW capacity implemented. (ii) A 0.4 kV distribution network and connections to cover 75% households in the project site installed. (iii) Electricity to 2,400 households in project sites supplied during winter. (iv) One organization in each project site incorporated and 80% of executive members appointed.
Implementation of Major Activities: Number of months for grant activities	14 months

Component C	
Component Name	Energy Conservation Demonstration Project
Cost ($)	29,513
Component Description	At least one household model introducing energy-saving bulbs and other extensively used appliances will be established in

	each project site. The energy bills of the model household and a regular household will be compared to show the savings. The result will be shared with community members, local authorities, MOE, BT, and local merchants, in community workshops.
Monitorable Deliverables/Outputs	(i) At least one pilot energy saving household in each project site established. (ii) Results of the energy bill savings and expenditures of the model and a regular household compared and analyzed. (iii) At least two workshops to present the results of the pilot project held during the project period. (iv) Results disseminated through local media.
Implementation of Major Activities: Number of months for grant activities	12 months

Component D	
Component Name	Project Management, Monitoring, and External Auditing
Cost ($)	356,753
Component Description	The component will support the following activities: (i) overall project coordination, supervision, management, and reporting, with the assistance of the project consultant; (ii) preparation of work plans and implementation guidelines and procedures for grant financing; and (iii) an independent poverty impact assessment and annual independent external auditing.
Monitorable Deliverables/Outputs	(i) Comprehensive project work plan, implementation schedule, and guidelines that adhere to the grant implementation memorandum prepared. (ii) Funds for each component utilized cost effectively. (iii) Inception, quarterly progress, and completion reports; evaluation of staff performance; and financial and poverty impact assessments prepared and submitted on time and in good quality.
Implementation of Major Activities: Number of months for grant activities	17 months

2. Financing Plan for Proposed Grant to be Supported by JFPR

Financier	**Amount** ($)
JFPR	2,000,000
Government	81,470 (including in-kind contribution)
Other Sources (Community)	317,500 (including in-kind contribution)
Total	**2,398,970**

3. Background

Tajikistan is the poorest of the Central Asian republics (CARs) and one of the poorest countries in the world, with a per capita gross domestic product (GDP) of $236 and a poverty incidence of at least 64% in 2003.[2] Average wages are less than $1 per day.[3] Tajikistan is a landlocked country. Approximately 98% of the population was connected to the main electricity grid under the former Soviet regime. Approximately 95% of Tajikistan's internally generated electricity comes from hydropower from mountain streams, which has a lower output during the winter season (7 months from October to April). The electricity system is very old and needs a significant amount of investment for rehabilitation and modernization. The Government's focus is on modernizing the existing energy infrastructure for industry and commercial use. Meanwhile, the electricity supply in remote rural areas is deteriorating. Supply is low during the harsh winter season when many communities become very vulnerable. Households, particularly women and children, resort to using fuelwood, animal dung, and kerosene for heating, cooking, and lighting, causing respiratory diseases and environmental damage from deforestation. Therefore, the Government has identified the poor's increased access to electricity as one of the main issues to be addressed in the poverty reduction strategy paper (PRSP)[4] in 2002. The Government requested ADB to support the poverty reduction strategy through this Japan Fund for Poverty Reduction (JFPR)-financed Project, which is linked to ADB-financed power sector projects.

The focus of the Tajikistan country strategy and program (CSP) for 2004–2008 is on integrated rural development. Energy is a key building block for successfully integrated rural development. The project will target ongoing ADB-financed road project areas to complement the activities and maximize the benefits. Despite a relatively high generation cost, off-grid electricity is considered to be a viable way of supplementing the existing unreliable energy supply. Because of the mountainous topography, "run-of-river" micro-hydropower generation tends to be the least-cost way of providing additional electricity to remote communities. "Run-of-river" hydropower is based on local resources and has minimal environmental impacts as it does not require a water reservoir, and hydropower has no air emissions. The environmental advantages of hydropower include reduced deforestation (because of the lower demand for fuelwood supplies), and improved indoor air quality. Tajikistan has very limited oil, natural gas, and coal, and relies on imports from Kazakhstan and Uzbekistan. Other renewable sources of energy, such as wind and solar, are likely to have a higher life-period cost because of the high initial costs and a lack of maintenance capacity.

People living in remote areas have not yet been introduced to efficient and modern appliances such as neon and compact florescent lights, convection heaters, or electric blankets. With the use of efficient appliances, electricity will be supplied to more consumers using the same power generation capacity. For example, a 200 kW micro-hydropower project will provide electricity to 340 households that use incandescent light bulbs and radiant heaters, but to 1,360 households when efficient appliances are used.

The Project was formulated in close consultation with the Ministry of Energy (MOE), BT, local governments, CBOs, external funding agencies, and other international organizations. The project scope has been carefully defined and outlined in a memorandum of understanding (MOU) signed in October 2005. In accordance with the Government's policy of decentralizing

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[2] ADB. 2005. *Country Strategy and Program Update (2006–2008): Tajikistan.* Manila. The Poverty incidence is based on $2.15 purchasing power parity (PPP) per capita per day poverty line.

[3] International Monetary Fund. 2003. *Country Report No. 03/10*. Washington, D. C.

[4] Government of Tajikistan. 2002. *Poverty Reduction Strategy Paper*. Tajikistan.

infrastructure provision, the proposed Project will be implemented in communities, with assistance from local governments and the *jamoat* resource center (JRC),[5] which will directly collaborate with communities.

The subprojects may require very small land donations of about 10–15 square meters for the powerhouse, intake water pipes, and a few wooden poles for the distribution network. Since the Project will directly benefit communities and involve community decision making and management, social safeguards will be built into the community decision-making process. The consultant will assist in dealing with any losses that arise.

MOE will be the Executing Agency (EA) for the Project. The project implementation unit (PIU) under BT and CBOs at the project sites will be the implementing agencies. The EA will assign a project leader and counterpart staff, and will monitor the domestic consultants' work in close coordination with ADB. The Project will be implemented over 15 months beginning March 2006 and ending in July 2007. The outline terms of reference for consulting services are given in Appendix 3.

4. Innovation

Two innovations are introduced in the Project. First, the Project will work directly with existing CBOs such as JRCs. This will reduce the project cost, increase the sustainability and efficiency of the project, and ensure a community-driven project design. Moreover, the project will build the existing organization's capacity. At the same time, MOE and BT will accumulate working experience with CBOs or local representative groups for future project implementation. Second, one model energy-saving household will be established in each pilot project site by using energy-saving bulbs and other commonly used appliances. The energy bills of the model and the regular households will be compared to measure savings. The result will be shared with community members, local authorities, MOE, BT, and local merchants in community workshops.

5. Sustainability

Technical Sustainability. The micro-hydropower system will use a simple technical structure. BT and the project consultants will train local staff on the technical skills required for operation and maintenance (O&M), through on-the-job training during the construction and operation stages.

Financial Sustainability. With assistance from the consultant, BT and CBOs will design user's rules such as electricity tariff, and billing and collection procedures. Since the micro-hydropower plant does not require high O&M costs,[6] the electricity generated will be affordable even for poor households. The financial consultant will train staff on basic accounting, writing financial reports, and collecting money owed by consumers. The trained members and the affordable tariff will reinforce the project's financial sustainability.

Organizational Sustainability. JRCs are already well-organized institutions, trained by the United Nations Development Programme (UNDP) to some degree. According to the UNDP report, the JRCs have created, for instance, income opportunities for more than 40,000 persons

[5] JRC's committee members represented by village committee and jamoat government.

[6] It is estimated that O&M costs are TJS5,400/($1,680) per annum for 200 kW power plant. Assuming (i) the plant will provide electricity for 340 households, (ii) current average energy consumption per household per month is 210 kWh, (iii) current average electricity expenditure per month is TJS10/($3), and (iv) willingness-to-pay is at the same level, then energy revenue will be TJS714,000/($216,300).

since 1996. Additionally, the JRCs' total planned budget from 2004 to 2006 is about $19.7 million, including $17.0 million in interventions for community development work. UNDP's contribution is $2.7 million (14%) and the remainder is contributed by the members and local communities. JRCs' organizational capacity will be strengthened by the Project.

Environmental Sustainability. The generic initial environmental examination and the environmental assessment and review procedure, including the subproject selection and public consultation procedure, have been prepared.[7] Micro-hydropower is an environmentally clean technology that relies on a renewable, small-scale, locally available, and relatively stable energy resource. Environmental benefits from micro-hydropower include (i) no use of fossil fuels; (ii) no air emissions; (iii) virtually no generation of solid or liquid wastes; (iv) reduced deforestation (because improved electricity supplies partially replace fuelwood); and (v) improved indoor air quality (because of the reduction in the indoor burning of kerosene, coal, and fuelwood).

Selection Criteria. The following criteria will be used to select subprojects: (i) poor and poorest beneficiaries served; (ii) communities committed and beneficiaries involved, (iii) technically, environmentally, economically, and financially sound and simple project design; and (iv) matching funds based on communities' or government counterpart contributions allocated.

6. Participatory Approach

To ensure effective participation from all stakeholders, particularly from communities, the Project will work with the CBO and local representative groups such as the JRCs that have been trained under ongoing UNDP assistance. The fieldwork at grassroots level (component A) will ensure that the Project reflects the communities' priorities and needs. To build ownership and mobilize local resources, the community will be a key decision-making body for planning, implementing, monitoring, and evaluating the Project. For example, under component A, a workshop will be held to draw the needs of communities. Under component B, where micro-hydropower projects are identified, the communities will participate in project implementation by providing labor or as owners and operators of the power plant. Communities will also benefit from the electricity supply. Electricity distribution will be decided on through extensive participatory discussion among community members.

Primary Beneficiaries and Other Affected Groups and Relevant Description	**Other Key Stakeholders and Brief Description**
Primary beneficiaries are about 2,400 poor households in pilot project sites whose source of income is mainly from farming and remittances from abroad. The targeted project site was a scene of civil war in the mid-1990s which caused a high level of poverty and destroyed basic infrastructure. The income poverty incidence in the area is 68% (population with an income of less than TJS600 per capita per year). The Project's benefits will include (i) better health status, (ii) improved quality of life in winter, (iii) prolonged hours of activities in	(i) MOE will benefit from improved micro-hydropower maintenance planning and operation. (ii) At the local level, BT will increase its micro-hydropower maintenance capacity through participation in civil works tenders. (iii) The local government will gain from the social and economic development derived from improved electricity. (iv) Local CBOs (JRCs) will increase their capacity and experience from rural infrastructure projects.

[7] The summary of initial environmental examination will be available upon request.

Primary Beneficiaries and Other Affected Groups and Relevant Description	Other Key Stakeholders and Brief Description
households in the evening, (iv) strengthened social capital around the targeted communities, and (v) enhanced capacity and expertise on micro-hydropower plant maintenance.	

7. Coordination

This project proposal was developed in a participatory way with all stakeholders concerned. The project preparation involved field visits and interviews as well as consultations with the Aga Khan Foundation,[8] Embassy of Japan in Tajikistan,[9] JRCs, National Social Investment Fund of Tajikistan (NSIF),[10] Swiss Corporation, UNDP, World Bank, and local residents. JRCs, comprised of local leaders and government officials, were established through UNDP's assistance to implement local development projects that aim to increase community representation, participation, and ownership in all aspects of development assistance.

A total of eighty-four JRCs were formed in the country during 1999–2004. JRCs are registered nongovernment organizations (NGOs) established to promote local economic development, poverty reduction, transparency and accountability in local governance, and civic education. JRCs emphasize an inclusive participatory process of decision making. Each constituent village is represented on the JRC on the basis of population, with a minimum of one representative. An executive board management team is elected from among JRC members through a secret ballot. The board consists of a chairperson, deputy chairperson, secretary, and bookkeeper. Individuals can hold a given executive office for only two consecutive terms of 2 years. In addition to elected representatives, a designated representative of the local *jamoat* administration also serves on the JRC, but is precluded from holding an executive board position. Specialists from the local community may be invited to participate in JRCs, but unless elected as a representative by eligible voters among the local population, these invited specialists participate as nonvoting members of the JRC. JRC members have been trained by UNDP in tendering, monitoring, reporting, and financial oversight for small-scale projects, which are needed to implement the Project according to international practice. The JRCs in the project site have experience of working with local government and local communities. The Project will build on this experience in other domains (such as irrigation, education, microcredit, water supply, etc.) for the planning, monitoring, and evaluation of micro-hydropower project implementation.

The Tajikistan Resident Mission was officially inaugurated in November 2003, and is now a permanent focal point for ADB. In the energy sector, the key external agencies include the European Bank for Reconstruction and Development, Islamic Development Bank, and the Kuwait Fund. So far, no Japanese agencies have been actively involved in the energy sector in Tajikistan. The Project will become a good source of information for Japanese agencies such as

[8] The Aga Khan foundation runs the Mountain Societies Development Support Program (MSDSP) in the project area.
[9] The Fact-finding Mission consulted the chargé d'affaires, second secretary, in-charge of economic affairs, Embassy of Japan, Tajikistan.
[10] The NSIF is the umbrella organization for the World Bank's initiatives at grass roots level.

the Japan Bank for International Cooperation and Japan International Cooperation Agency when they plan to start working on the energy sector.

8. Detailed Cost Table

The summary and detailed cost estimates presented in Appendix 1 are based on locally tendered prices and preliminary quantity estimates.

C. Linkage to ADB Strategy and ADB-Financed Operations

1. Linkage to ADB Strategy

Document	Document Number	Date of Last Discussion	Objective(s)
Country Strategy and Program (2006–2008)	Sec.M54-05	19 July 2005	ADB's operational strategy[11] in Tajikistan focuses on promoting country progress through (i) rural development, and (ii) regional cooperation, including rehabilitating basic infrastructure. ADB activities and strategy in energy, one of the significant development sectors are directed towards (i) improvement of efficiency, (ii) financial sustainability that will promote new investments in the sector, and (iii) utilization of hydropower export potential and development of renewable energies (micro-hydropower). Furthermore, ADB is especially focused on community-based rural power supply with a grant.
Poverty Reduction Partnership Agreement (PAP) between Tajikistan and ADB	IN.322-02	December 2002	Achieve the Millennium Development Goals: Halve, between 1990 and 2015, (i) the proportion of the people whose income is less than one dollar a day, and (ii) the proportion of people who suffer from hunger. Specifically, by 2015, poverty will be reduced from 82.6% in 1999 to 58%.

2. Linkage to Specific ADB-Financed Operation

The proposed project is linked to the ADB-financed Power Rehabilitation Project (Phase I). The loan project will rehabilitate a large portion of the hydropower plant to meet nationwide residential and commercial energy demands, while the proposed Project discussed here will focus on households' minimum energy demands. The Government has requested ADB to provide significant concessional assistance for rural electrification because of the shortage of energy supply during the winter season (October–April) in targeted areas. The micro-hydropower plants will be pilot-tested in a maximum of six communities in ADB-financed road

[11] ADB. 2005. *Country Strategy and Program (2004–2008): Tajikistan*. Manila.

corridor projects (the Dushanbe–Kyrgyz Border Road Rehabilitation Project phases I and II) and will incorporate all lessons learned to maximize the project outputs and impacts.

Project Name	Power Rehabilitation Project (Phase I)
Project Number	32513-TAJ
Date of Board Approval	20 December 2000
Loan Amount (SDR million)	26.576 (Asian Development Fund)

Project Name	Power Rehabilitation Project (Phase II)
TA Number	4596-TAJ
Date of Board Approval	10 June 2005 (loan is expected to be approved in 2006)
TA Amount ($)	500,000 (Japan Special Fund)

Project Name	Community-Based Micro-hydropower Development in Remote Rural Areas of Tajikistan
TA Number	4423-TAJ
Date of Board Approval	5 November 2004
TA Amount ($)	800,000 (Poverty Reduction Cooperation Fund)

3. Development Objective of the Associated ADB-Financed Operation

The Power Rehabilitation Project (Phase I) will (i) improve the people's quality of life and support poverty reduction in the project sites by increasing the availability of electricity, and (ii) assist in the postconflict recovery of Tajikistan's economy. This will be achieved by increasing the availability and reliability of power supply in an environmentally-friendly manner, through the rehabilitation of existing generation, transmission, and distribution facilities.

4. Main Components of the Associated ADB-Financed Operation

No.	Component Name	Brief Description
1.	Civil Works	(i) Rehabilitate Central hydropower plant, strengthen transmission and distribution networks, installing consumer meters; (ii) rehabilitate Nurek HPP and associated transmission facilities; and (iii) rehabilitate two major distribution substations in Dushanbe region.
2.	Consulting Services	Support project implementation, audit corporate and project accounts of BT, and develop implementing regulations for the energy law.
3.	Equipment	Procure transmission equipment, telecommunication system, 500kV and 200kV switchgear, and protection relays.

5. Rationale for Grant Funding versus ADB Lending

The Project requires flexibility in developing the appropriate organizational mechanisms and community-accessible technology before its full-scale expansion. The proposed activities require the close involvement of the local communities and officials in the villages. It would not be possible to organize such interfaces under a regular loan without first establishing a viable implementation model. The Project will demonstrate the effectiveness and sustainability of the community-based micro-hydropower system and provide the resources required to develop and

adapt the concepts to Tajikistan circumstances to replicate the project impact on poverty reduction.

D. Implementation of the Proposed Grant

Provide the Name of the Implementing Agency	Project Implementation Unit , Barki Tajik

The EA is the Ministry of Energy (MOE) and the Implementing Agency is the project implementation unit (PIU) under BT and CBOs. All procurement under the Project will be conducted in accordance with ADB's *Guidelines for Procurement*. Local CBOs and consultants will be contracted in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for the selection and recruitment of domestic consultants.

1. Risks Affecting Grant Implementation

Type of Risk	Brief Description	Measure to Mitigate the Risk
Governance	Problems of corruption associated with low pay and weak governance	ADB policies and guidelines on anticorruption, procurement, financial reporting, and external auditing will be strictly adhered to. Capacity building will focus on transparency, accountability, performance level benching, and financial management by the project manager. Local community members will be mobilized to monitor each process and the use of funds.
Inadequate maintenance after the project completion	The installed micro-hydropower plant may not be properly maintained after project completion, thus the Project's full benefit may not be realized.	The selection of subprojects will be focused on communities with the highest demand and willingness to pay for village maintenance fund created under the Project. Local communities will gain ownership and capacity after project completion. Local communities will commit to undertake routine maintenance before the subproject approval.

2. Incremental ADB Costs

Component	Incremental Bank Cost
Amount requested	$0
Justification	Not applicable
Type of work to be rendered by ADB	Not applicable

3. Monitoring and Evaluation

Key Performance Indicator	Reporting Mechanism	Plan and Timetable for M&E
Average score of level of service satisfaction and quality of life index is more than 3.5 out of 5.	Customer satisfaction survey Consultant monthly and quarterly reports	Every month after power generation (after month 9) until end of project period
Reduce ratio of power outage for households in project sites by 50%.	Customer satisfaction survey Consultant monthly and quarterly reports	Every month after power generation (after month 9) until end of project period
Number of households with increased awareness of energy saving	Baseline surveys (social impact assessment and implementation completion memorandum)	Baseline surveys at the beginning of component C implementation Final social impact assessment and implementation completion memorandum
Number of workshops and practical trainings delivered at different community locations	Progress reports Social impact assessment and implementation completion memorandum	Quarterly report Final social impact assessment and implementation completion memorandum

4. Estimated Disbursement Schedule

Year	Amount ($)
2006	400,000
2007	1,600,000
Total Disbursements	**2,000,000**

Appendixes

1. Summary Costs Table and Detailed Cost Estimates
2. Implementation Arrangements
3. Fund Flow Arrangement
4. Outline Terms of Reference for Consultants
5. Detailed Implementation Schedule

SUMMARY COSTS TABLE

($)

Inputs/Expenditure Category \ Grant Components	Component A Participatory Site Selection and Community Mobilization	Component B Establishment of Micro-Hydropower System by CBOs and Barki Tajik	Component C Energy Conservation Demonstration Project	Component D Project Management, Monitoring, and External Auditing	Total (Input)	Percent (%)
1. Civil Works	0	196,800	0	0	196,800	9.8
2. Equipment and Supplies	56,280	860,400	480	9,260	926,420	46.3
3. Training, Workshops, Seminars, Public Campaigns	2,000	2,000	500	0	4,500	0.2
4. Consulting Services	164,451	185,100	25,850	79,700	455,101	22.8
5. Grant Management	0	0	0	236,400	236,400	11.8
6. Contingencies (0–10% of total estimated grant fund) (Use of contingencies requires prior approval from ADB.)	22,273	124,430	2,683	31,393	180,779	9.0
Subtotal JFPR grant-financed	**245,004**	**1,368,730**	**29,513**	**356,753**	**2,000,000**	100.0
7. Government Contribution	0	0	1,400	80,070	81,470	3.4
8. Other External Funding Agencies' Contributions (e.g., from NGOs, multi- and bilateral aid agencies)	0	0	0	0	0	0.0
9. Community's Contributions (cash or in kind)	8,500	280,000	29,000	0	317,500	13.2
Subtotal Other Contributions					**398,970**	
Total Estimated Costs	**253,504**	**1,648,730**	**59,913**	**436,823**	**2,398,970**	
Incremental Costs						

[a] Equipment and supplies will be purchased by project manager and transferred to the Government (Ministry of Energy) upon completion of services except for component B.

Source: Asian Development Bank estimates.

DETAILED COST ESTIMATES

($)

Code	Supplies and Services Rendered	Unit	Costs: Quantity Units	Costs: Cost Per Unit	Costs: Total $	Contributions: JFPR Amount	Contributions: JFPR MOP	Contributions: Gov't	Contributions: Comm
Component A: Participatory Site Selection and Community Mobilization				**Subtotal:**	**231,231**	**222,731**			**8,500**
1.1	**Equipment and Supplies**				**56,280**	**56,280**			
	Office equipment various: on-site locations								
1.1.1	Telephone, telefax machine	No.	4	400	1,600	1,600	DP		
1.1.2	PC modem, printer UPS	No.	2	1,200	2,400	2,400	DP		
1.1.3	Laptop	No.	1	2,000	2,000	2,000	DP		
1.1.4	Scanner	No.	4	150	600	600	DP		
1.1.5	Copying machine with sorter	No.	1	3,500	3,500	3,500	DP		
1.1.6	Copying machine (manual feed)	No.	3	500	1,500	1,500	DP		
1.1.7	Slide projector	No.	1	2,400	2,400	2,400	DP		
1.1.8	Office running costs (paper, toner, small equipment, computer servicing, cleaning, etc.)	Month	17	500	8,500	8,500	DP		
1.1.9	Mobile phones	No.	4	120	480	480	DP		
1.1.10	Communication costs (telephone, internet, etc.)	Month	17	300	5,100	5,100	DP		
1.1.11	Local transport costs to/from Dushanbe - sites - NGO - communities, including bilingual driver, fuel, servicing, and occasional vehicle hire, etc.	Month	17	1,600	27,200	27,200	DP		
1.1.12	Camera (digital still)	No.	1	400	400	400	DP		
1.1.13	Camera (digital video)	No.	1	600	600	600	DP		
1.2	**Consulting Services**				**172,951**	**164,451**			**8,500**
	International consultants		7						
1.2.1	Hydropower specialist (team leader)	Person-month	3	19,850	59,550	59,550			
1.2.2	Economist	Person-month	0.75	19,850	14,888	14,888			
1.2.3	Financial specialist	Person-month	0.5	19,850	9,925	9,925			
1.2.4	Environment specialist	Person-month	0.5	19,850	9,925	9,925			
1.2.5	Social development specialist	Person-month	1.5	19,850	29,775	29,775			
1.2.6	Legal expert	Person-month	0.75	19,850	14,888	14,888			

Code	Supplies and Services Rendered	Unit	Costs: Quantity Units	Costs: Cost Per Unit	Costs: Total $	Contributions: JFPR Amount	JFPR MOP	Contributions: Gov't	Contributions: Comm
	Local consultants		51						
1.2.7	Civil engineers (two)	Person-month	6	500	3,000	3,000			
1.2.8	Elector-mechanical engineers (two)	Person-month	6	500	3,000	3,000			
1.2.9	Hydrological engineer	Person-month	3	500	1,500	1,500			
1.2.10	Geologist	Person-month	3	500	1,500	1,500			
1.2.11	Power economists (two)	Person-month	6	500	3,000	3,000			
1.2.12	Financial analyst	Person-month	3	500	1,500	1,500			
1.2.13	Environment specialists (two)	Person-month	6	500	3,000	3,000			
1.2.14	Lawyer	Person-month	3	500	1,500	1,500			
1.2.15	Social development specialists (five)	Person-month	15	500	7,500	7,500			
1.2.16	Community organizers (five)	Person-month	17	500	8,500				8,500
1.3	**Workshops**				**2,000**	**2,000**			
1.3.1	Rental of seminar rooms	Day	30	50	1,500	1,500			
1.3.2	Translation of materials	Page	100	5	500	500			
Component B: Establishment of Micro-Hydropower				**Subtotal:**	**1,524,300**	**1,244,300**		**0**	**280,000**
	System by CBOs and Barki Tajik								
2.1	**Civil Works**				**446,800**	**196,800**		**0**	**250,000**
2.1.1	Civil works of micro-hydropower system	Person-month	500	500	250,000	0		0	250,000
2.1.2	-Intake (concrete, excavation, reinforcement, and gates)	LS	6	3,500	21,000	21,000	CPP		
2.1.3	-Canal	m^3	1,380	46	63,480	63,480	CPP		
2.1.4	-Headpond (concrete, excavation, reinforcement, and gates)	LS	6	4,000	24,000	24,000	CPP		
2.1.5	-Pipeline connection	LS	6	5,500	33,000	33,000	CPP		
2.1.6	-Powerhouse (earthwork)	LS	6	9,000	54,000	54,000	CPP		
2.1.7	Tailrace channel	m^3	330	4	1,320	1,320	CPP		
2.2	**Equipment and Supplies**				**860,400**	**860,400**		**0**	**0**
2.2.1	-Powerhouse (electro-mechanical equipment, 200 kW)	Unit	6	92,000	552,000	552,000	IS		
2.2.2	-Powerhouse (400V/10kV step up transformer)	Unit	6	6,400	38,400	38,400	IS		
2.2.3	-Powerhouse (10 kV overhead power line 1.5 km from powerhouse switches)	km	9	30,000	270,000	270,000	IS		
2.3	**Consulting Services**				**215,100**	**185,100**		**0**	**30,000**
	International consultants		6						
2.3.1	Hydropower specialist (team leader)	Person-month	3	19,850	59,550	59,550			
2.3.2	Social development specialist	Person-month	2	19,850	39,700	39,700			
2.3.3	Procurement specialist	Person-month	1	19,850	19,850	19,850			

Code	Supplies and Services Rendered	Costs				Contributions			
		Unit	Quantity Units	Cost Per Unit	Total $	JFPR Amount	MOP	Gov't	Comm
	Domestic consultants		132						
2.3.4	Civil engineers (two)	Person-month	24	500	12,000	12,000			
2.3.5	Electro-mechanical engineers (two)	Person-month	24	500	12,000	12,000			
2.3.6	Hydrological engineer	Person-month	12	500	6,000	6,000			
2.3.7	Financial analyst	Person-month	12	500	6,000	6,000			
2.3.8	Social development specialists (five)	Person-month	60	500	30,000	30,000			
2.3.9	Community organizer and project administration	Person-month	60	500	30,000	0			30,000
2.4	**Workshops**				**2,000**	**2,000**		**0**	**0**
2.4.1	Rental of seminar rooms	Day	30	50	1,500	1,500			
2.4.2	Translation of materials	Page	100	5	500	500			
Component C: Energy Conservation Demonstration Project				**Subtotal**	**57,230**	**26,830**		**1,400**	**29,000**
3.1	**Demonstration Kit**				**480**	**480**	DP		
3.1.1	Florescent light bulb	Unit	60	8	480	480			
3.2	**Workshops**				**1,900**	**500**		**1,400**	**0**
3.2.1	Rental of workshop rooms	Day	28	50	1,400	0		1,400	
3.2.2	Translation of workshop materials	Page	100	5	500	500			
3.3	**Consulting Services**				**54,850**	**25,850**		**0**	**29,000**
	International consultant		1						
3.3.1	Energy conservation specialist (model household selection, development of monitoring sheet, and organizing workshops)	Peson-month	1	19,850	19,850	19,850			
	Local Consultants		12						
3.3.2	Energy conservation specialist	Peson-month	12	500	6,000	6,000			
3.3.3	Community organizer	Peson-month	58	500	29,000	0			29,000
Component D: Project Management, Monitoring, and External Auditing				**Subtotal**	**405,430**	**325,360**		**80,070**	**0**
4.1	**Equipment and Supplies**			**2,740**	**9,260**	**9,260**		**0**	**0**
4.1.1	For PIU								
4.1.2	Telephone, telefax machine	No.	1	400	400	400	DP		
4.1.3	PC modem, printer UPS	No.	1	1,200	1,200	1,200	DP		
4.1.4	Scanner	No.	1	120	120	120	DP		
4.1.5	Copying machine (manual feed)	No.	1	500	500	500	DP		
4.1.6	Office running costs (paper, toner, small equipment, computer servicing, cleaning, etc.)	Month	17	200	3,400	3,400			
4.1.7	Mobile phones	No.	2	120	240	240	DP		
4.1.8	Communication costs (telephone, internet, etc.)	Month	17	200	3,400	3,400			

Code	Supplies and Services Rendered	Unit	Costs: Quantity Units	Costs: Cost Per Unit	Costs: Total $	Contributions: JFPR Amount	Contributions: JFPR MOP	Contributions: Gov't	Contributions: Comm
4.2	**Consulting Services**				**39,700**	**39,700**			
	(for project management)								
	International consultant		2						
4.2.1	Project management activities	Month	2	19,850	39,700	39,700			
4.3	**Consulting Services (for project**				**40,000**	**40,000**			
	monitoring/evaluation)								
4.3.1	Annual audit (2 years)	Year	2	10,000	20,000	20,000			
	Local consultant (all inclusive cost)								
4.3.2	Baseline survey and impact assessment	Month	4	1,000	4,000	4,000			
4.3.3	Monitoring and evaluation, including ex-post	Month	6	1,000	6,000	6,000			
	poverty and social assessment								
4.3.4	Outreach and publications	Lump sum	1	10,000	10,000	10,000			
4.4	**Grant Management**				**316,470**	**236,400**		**80,070**	
4.4.1	Office rent at project site	Month	17	830	14,110	0		14,110	
4.4.2	Office rent - MOE Dushanbe	Month	17	880	14,960	0		14,960	
4.4.3	International airfares (international consultant)	Round trip	8	5,000	40,000	40,000			
4.4.4	Per diem for international consultant	Day	400	150	60,000	60,000			
4.4.5	Per diem for local consultants	Day	2,388	50	119,400	119,400			
4.4.6	PIU deputy executive director	Month	17	1,000	17,000	0		17,000	
4.4.7	PIU project officers (two)	Month	34	1,000	34,000	0		34,000	
4.4.8	PIU bilingual secretary	Month	17	500	8,500	8,500			
4.4.9	PM bilingual secretary/translator	Month	17	500	8,500	8,500			
	Subtotal (Components A to D)				**2,218,191**	**1,819,221**		**81,470**	**317,500**
	Contingency				**180,779**	**180,779**			
	(maximum 10% of JFPR contribution)								
	Total Project Cost				**2,398,970**	**2,000,000**		**81,470**	**317,500**

Comm = communities, CPP = community participation procurement. DP = direct purchase, IS = international shopping, Gov't = government, MDP = mode of payment.

Source: Asian Development Bank.

IMPLEMENTATION ARRANGEMENTS

A. Implementation Arrangements

1. Executing Agency

1. The Ministry of Energy (MOE) will be the Executing Agency (EA) of the Community-Based Rural Power Supply Project (the Project). The Minister of MOE will have overall responsibility for project management.

2. Implementing Agency

2. The existing project implementation unit (PIU) established under previous and ongoing loans and technical assistance projects, and which performed satisfactorily, will be the Implementing Agency (IA). The IA will (i) monitor the progress of day-to-day project implementation, (ii) prepare withdrawal applications, (iii) prepare project progress reports, and (iv) maintain project accounts and complete grant financial records for auditing the Project. The current executive director, who is acceptable to the Asian Development Bank (ADB), and has adequate experience in project management, will be responsible for the overall project management, and a deputy executive director will be responsible for supervising the day-to-day implementation activities, including approving contracts and payments. One additional staff (an accountant–administrative assistant–interpreter) will be added to the PIU to ensure that it has sufficient capacity to implement all ADB-financed energy projects simultaneously.

3. Project Manager

3. A project manager will be appointed to guide project implementation, assess poverty impact, and administer the Project, including reporting to ADB and the Government. The project manager will also provide technical assistance to PIU, where he will be stationed. MOE has offered good and sufficient office space for the Project in Dushanbe and in the field. The project manager will liaise with PIU, community-based organizations (CBOs), local communities, and contractors in the field, and will work intermittently in Dushanbe. He or she will be supported by local consultants with expertise and experience in related fields. The project manager may contract out for other services from CBOs.

4. CBO and Community Involvement

4. To achieve project benefits and sustainability, local CBOs or local representative groups such as jamoat resource centers (JRC)[1] that have guided village community development programs for at least 5 years will be selected. The CBOs or local representative groups should be authorized to sign a contract for procurement purposes and should follow ADB's *Guidelines for Procurement*. The Project will be implemented in close consultation with relevant local government agencies, with active participation by local beneficiaries. JRCs will be involved in various tasks including tendering and mobilization of local communities. With assistance from JRCs, targeted beneficiaries (the poor and poorest from the local communities) will be engaged under contracts. Women's groups organized under JRC and the Rural Poverty Reduction Project (ADB JFPR 9008-TAJ)[2] will facilitate greater participation of women in the maintenance work for which they will receive fair compensation.

[1] JRCs are CBOs set up by UNDP at jamoat level in Tajikistan for several years.
[2] ADB. 2001. *Tajikistan Rural Poverty Reduction Project*. Manila (JFPR 9008-TAJ).

5. Procurement

5. All procurement under the Project will be in accordance with ADB's *Guidelines for Procurement*. The proposed project under JFPR financing will be identified for implementation through community participation. The estimated cost of each contract package awarded to CBOs should be less than $10,000[3] and designed to use local labor as far as practicable. Contractors (particularly local and small-scale) with expertise and training in micro-hydro will be preferred and engaged by PIU, and will be assisted by the project manager.

6. Consulting Services

6. ADB will engage the international and domestic consultants using quality- and cost-based selection procedures in accordance with its *Guidelines on Use of Consultants*, and simplified technical proposals will be requested. Consulting services will be conducted over 15 months, requiring approximately 16 person-months of international and 197 person-months of domestic input. The international consultant will be appointed as the project manager. The outline terms of reference for consultants is in Appendix 4.

7. The detailed grant implementation memorandum (GIM) will be prepared by ADB and agreed upon with MOE before project inception. The GIM will further detail the implementation and procurement arrangements.

7. Flow of Funds

8. The flow of funds arrangements are summarized in Appendix 3. To facilitate disbursements, an imprest account will be established by PIU of MOE at a commercial bank acceptable to ADB in accordance with ADB's *Loan Disbursement Handbook*. Disbursements from the imprest account will be supported by an appropriate withdrawal application and related documentation. Such documentation will demonstrate, among other things, that the goods and/or services were (i) produced in and procured from ADB members, and are (ii) eligible for JFPR financing. The initial amount to be deposited in the account will not exceed $70,000. Total advance at any time to the account should not exceed $300,000, the estimated average expenditures for a 6-month period. The statement of expenditures (SOEs) procedure will be used in reimbursing eligible expenditures; any individual contract to be reimbursed or liquidated under the procedure will not exceed $5,000 per payment. PIU will disburse the imprest fund, directly to the contractors, suppliers, and service providers, upon certification of contractor's bill by the project manager and approval by the PIU. The imprest fund account will be replenished by ADB based on a budget request prepared by the project manager and endorsed by the executive director or deputy executive director of the PIU. The imprest fund procedure will be detailed out in the GIM. In addition, there will be various counterpart contributions in-kind from the Government and other stakeholders.

8. Reporting

9. The project manager will prepare quarterly, semiannual, and annual reports on project implementation, the form and content of which will be agreed with ADB. The PIU, through the EA, will officially endorse these reports to ADB with its comments. MOE will maintain separate accounts for all project components financed by JFPR and the Government, and have them audited by an independent auditor with adequate knowledge and experience of international

[3] The limit can be increased to $20,000 if the community has previously implemented a project successfully.

accounting practices and is acceptable to ADB. The audited project accounts and the auditor's reports will be furnished to ADB within 6 months after the end of each financial year. The Government has been informed of ADB's requirement on the timely submission of audited project accounts and financial statements, including the suspension of disbursements in case of noncompliance. ADB will also finance, through the Project, annual audits through an independent audit company acceptable to ADB. To facilitate post evaluation of the Project, the Government has agreed to provide an implementation completion memorandum to ADB with the support of the project manager within 3 months of physical completion of the Project.

9. Monitoring and Evaluation

10. A preliminary set of indicators for monitoring and evaluating the performance of the Project has been agreed upon with MOE during project fact-finding mission. The final project performance management system will contain these indicators in GIM. At the beginning of project implementation, the project manager will collect and confirm baseline values for social, environmental, and poverty reduction impact indicators. Monitoring indicators will be measured during project implementation. Comments and findings regarding these project indicators will be incorporated by MOE and included in every other quarterly report to ADB. In addition to indicators for implementation monitoring, indicators for project evaluation will be measured at project completion. Where relevant, indicators will be disaggregated by gender. Participatory surveys will be conducted and results will be compared with the baseline. A final report will consist of an evaluation of changes that occurred during the project. MOE has developed its monitoring capability for the ongoing loan projects, and has the capacity to monitor the proposed grant Project as well.

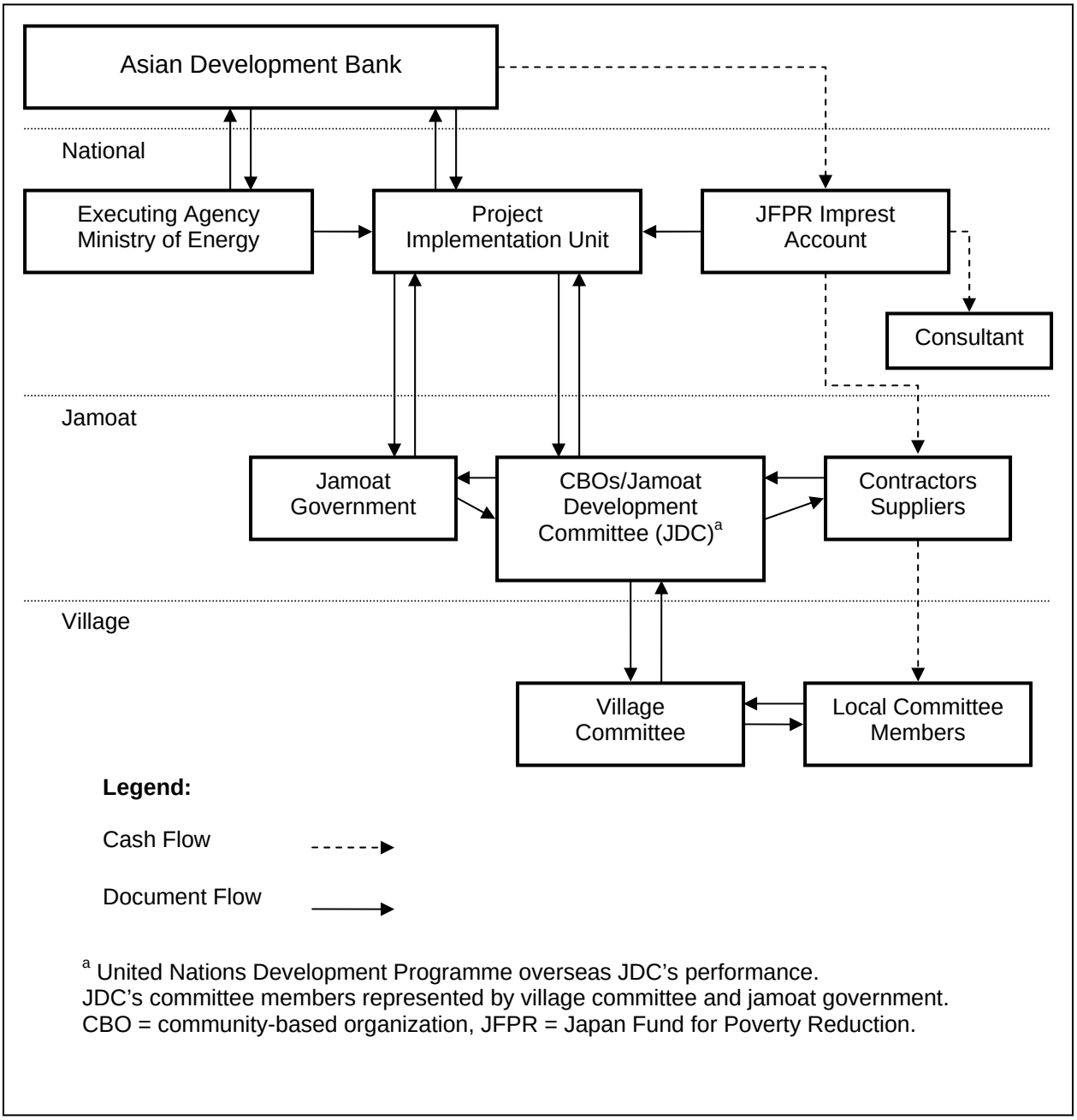
B. Implementation Schedule

11. The Project will be carried out over 17 months by a team of international and domestic consultants. The Project is expected to begin in March 2006 and will be completed by July 2007. The detailed implementation schedule is in Appendix 5.

C. Subproject Selection Criteria

12. Eligible subproject selection criteria are (i) the poor and poorest beneficiaries served, (ii) communities committed and beneficiaries involved, (iii) technically, environmentally, economically and financially sound and simple, (iv) matching funds based on communities' or government counterpart contributions allocated. A written agreement will be reached among the MOT, CBOs, and the local beneficiaries to ensure the local in-kind contribution on maintenance activities and subsequent maintenance after project completion.

FUND FLOW ARRANGEMENT



[a] United Nations Development Programme overseas JDC's performance.
JDC's committee members represented by village committee and jamoat government.
CBO = community-based organization, JFPR = Japan Fund for Poverty Reduction.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The grant assistance will be implemented in consultation with the stakeholders concerned—local communities, nongovernment organizations (NGOs), national and local governments, private sector bodies, and other development agencies. The project consultant will review evaluation reports of similar projects funded by the Asian Development Bank (ADB) and other agencies, especially with regard to the lessons learned and factors that influence sustainability.[1]

A. Scope of Work

1. Component A: Participatory Site Selection and Community Mobilization

2. The international consultant team will perform the following tasks:

3. The hydropower specialist (team leader) (3 person-months) will (i) establish a project advisory board, to include government and ADB staff, existing small hydropower development professionals, experts within the Ministry of Energy (MOE), the President's office, and BT; (ii) analyze existing micro-hydropower projects, evaluate lessons learned, and recommend solutions for implementation problems faced by other community-based projects in rural areas; (iii) review previous hydropower studies, discuss the suitability of the possible location of the pilot projects with the Government, and liaise with various NGOs, in particular with the Aga Khan Foundation; (iv) evaluate and confirm suitability of micro-hydropower against other alternatives for providing electricity in remote areas; (v) based on engineering surveys, identify and rank the identified sites for pilot projects, confirm potential electricity demand, and develop a maximum of six candidate sites where micro-hydropower is the least-cost alternative; (vi) select a maximum of six micro-hydropower sites for pilot projects, based on, but not limited to, local hydropower potential, village-level demand and number of users, proximity to community infrastructure potential grid connections, access to telecommunication facilities, and access to largest number of households; (vii) assess the local community's ability to construct, operate, and manage a micro-hydropower project; (viii) prepare detailed cost estimates for the pilot hydropower projects and associated costs of strengthening the distribution network and connections; and (ix) in consultation with the other members of the team, prepare the technical design, contract packaging, project implementation schedule, and drawings for each of the pilot micro-hydropower projects, including a proper assessment of environmental and social impacts, as well as costs and benefits according to ADB policies, (x) manage overall grant project, (xi) execution, monitoring and evaluation (Component D).

4. The economist (0.75 person-month) will (i) summarize the current and projected energy situation in the possible locations; (ii) conduct a least cost analysis of alternative energy sources (diesel and connection to the grid) to micro-hydro; (iii) analyze the energy consumption and possible energy savings by demand-side management; (iv) assess the willingness to pay for electricity; (v) determine the economic internal rate of return; (vi) determine financial, institutional, and operational parameters for sustainability and replication of pilot projects; (vii) analyze energy efficiency initiatives in the project site, and examine cost-effective options for heating; (viii) assess economic costs and benefits of the pilot projects; and (ix) design simple tariff structure, billing, and revenue collection systems to ensure future financial sustainability.

[1] Smail, Khennas and Andrew Barnett. 2000. *Best Practices for Sustainable Development of Micro Hydropower in Developing Countries*. Department for International Development: United Kingdom.

5. The financial specialist (0.5 person-month) will (i) in accordance with the *Guidelines for the Financial Governance and Management of Investment Projects Financed by the Asian Development Bank*,[2] carry out financial analysis of the proposed projects, including the financial internal rate of return and weighted average cost of capital, and conduct relevant sensitivity analysis on the financial results; (ii) prepare a financing plan for the projects; and (iii) identify specific sources and projection of revenue from the projects.

6. The environmental specialist (0.5 person-month) will (i) assess the potential environmental impact for the each pilot projects according to ADB's environmental policy[3] and quantify them to the extent possible; (ii) recommend appropriate environmental mitigation measures for identified significant impacts and monitoring plans to address these impacts; and (iii) ensure that the cost of implementing recommended mitigation measures, environmental management, and monitoring plans are included in the cost of the pilot projects.

7. The social development specialist (1.25 person-months) will (i) assist in maximizing community participation in the technical design, institutional building, procurement, installation, operation, and monitoring and evaluation; (ii) identify one viable community-based organization (CBO) in each project site; (iii) determine the willingness to pay; (iv) assess the potential for involuntary resettlement impacts and, if required, prepare a draft resettlement framework and/or plans in accordance with ADB requirements; (v) identify project stakeholders including the poorest people and vulnerable groups; (vi) describe current household monthly energy expenditure by energy source, and energy consumption patterns in winter; (vii) propose the structure of the village organization responsible for the construction, and operation and maintenance of the pilot projects; and (viii) prepare an initial customer satisfaction survey form and initial quality of life index; and (ix) prepare initial grant proposal in each pilot project site in conjunction with international and/or local NGOs, CBOs, and local government funded by Japan Grassroots Fund administrated under the local Japanese embassy. The proposal will focus on school, and hospital and/or clinic rehabilitation, with emphasis on insulation in those facilities for energy saving.

8. The legal expert (0.75 person-month) will (i) review the existing legal and regulatory framework and propose improvements to accommodate the pilot projects; (ii) make policy makers and regulators in Tajikistan aware of the needs for policy, regulatory, and licensing (environment, land acquisition, corporate, energy supplier) support for developing community-based initiatives; and (iii) design an appropriate legal structure that will enable significant community ownership and prepare all necessary documents for required licensing.

9. The team of domestic consultants (including NGOs as consultants where possible) will assist the international team leader in preparing detailed terms of reference for the domestic consultants under components B and C of the Grant, and will assist the international consultants in the following tasks:

(i) Two civil engineers (6 person-months total) will assist in (a) collecting data; (b) assessing local resources for implementing the projects (experts, local contractors, and communities and local materials); (c) designing the dam and associate civil works; (d) preparing detailed cost estimates and bill of quantities; and (e) preparing the relevant drawings, draft technical specifications, and implementation schedule.

[2] ADB. 2002. *Guidelines for the Financial Governance Management of Investment Projects Financed by Asian Development Bank*. Manila.
[3] ADB. 2002. *Environment Policy of Asian Development Bank*. Manila.

(ii) Two electro-mechanical engineers (6 person-months total) will assist in similar tasks as the civil engineers (9i) with respect to equipment.

(iii) One hydrologist engineer (3 person-months) will assist in (a) reviewing and updating the hydrological studies and records; and (b) assessing the potential river flows and power generation, probable maximum flood flow and level, river sediment carrying characteristics, minimum environmental flow requirements of the river, and the effect on the dam, water, and river level bed.

(iv) One geologist/geotechnical specialist (3 person-months) will assist in (a) reviewing the data and results of previous studies; (b) recommending additional geological and geotechnical investigations, if needed; and (c) assessing the geological risk with regards possible landslide, mudslide, and earthquake hazards.

(v) Two power economists (6 person-months total) will assist in (a) assessing the energy consumption and possible energy savings; (b) identifying and analyzing economic uncertainties and carrying out risk analysis; and (c) designing simple tariff structure, billing, and revenue collection.

(vi) One financial analyst (3 person-months) will assist in (a) preparing a financial plan for the pilot projects, (b) identifying sources and projections of revenue from the Project, and (c) designing a simple tariff structure.

(vii) Two environmental specialists (6 person-months total) will assist in (a) assessing the potential environmental impact for the selected project sites, (b) recommending the appropriate environmental mitigation measures and monitoring plans, and (c) assessing the cost associated to the implementation of the mitigation measures and the monitoring plan.

(viii) One lawyer (3 person-months) will assist in (a) reviewing existing legal and regulatory frameworks, and (b) designing the appropriate legal structure that will enable significant community ownership.

(ix) Four social development specialists (15 person-months total) will assist in (a) identifying viable CBPs in each project site; (b) assessing the willingness to pay; (c) assessing the potential involuntary resettlement impact; (d) identifying the project stakeholders, including poorest people and vulnerable groups; (e) describing current household monthly energy expenditure by energy sources and energy consumption practice and pattern during winter; (vi) preparing the initial satisfaction survey form and initial quality of life index; and (vii):screening each project for involuntary resettlement impacts and, where necessary, preparing resettlement plans in accordance with ADB requirements.

2. Component B: Establishment of Micro-Hydropower System by Community-Based Organizations and Barki Tajik

10. The hydropower specialist (team leader) (3 person-months) will (i) prepare the detailed technical specifications and bidding documents in accordance with ADB's *Guidelines for Procurement*; (ii) assist the Executing Agency (EA) advertise the bids, carry out the bid evaluation, and prepare bid evaluation reports, contract negotiations, and contract awards;

(iii) supervise the supply and installation of equipment, including related activities, until commissioning of the projects; (iv) carry out on-the-job training on the different aspects of the project; (v) prepare the grant completion report in accordance with ADB's requirements; (vi) assist stakeholders formulate an action plan for awareness campaign on energy saving; and (vii) identify appropriate institutions for replication of pilot projects in other areas, develop project packages of various sizes that can be replicated, estimate the capital and human resource requirements, the optimum village organizational structure, operational procedures, decision-making and dispute resolution frameworks, and prospective sites for replication of pilot projects to be built over 3 years.

11. The social development specialist (2 person-months) will (i) maximize community participation in technical design, institutional building, procurement, installation, operation, and monitoring and evaluation; (ii) supervise domestic consultants who are responsible for institution building and awareness raising on energy saving to maintain a high standard; and (iii) follow up on the grant proposal application under Japan Grassroots Fund and ensure submission of the proposal by the end of the project period to the Japanese Embassy.

12. The procurement specialist (1 person-month) will (i) prepare the bill of quantity and bidding documents for procurement of goods and civil works, (ii) prepare bid evaluation report, and (iii) monitor the procurement activities.

13. The domestic consultants and/or NGOs (total 132 person-months) will assist the international consultant in the design, construction, and commissioning of the pilot projects. The breakdown of allocated person-months are (i) two civil engineers (24 person-months total), (ii) two electro-mechanical engineers (24 person-months total), (iii) one hydrological engineer (12 person-months), (iv) one financial analyst (12 person-months), and (v) five social development specialists (60 person-months total). They will also assist in (i) setting up, training, and capacity building of the village organization, awareness campaign, and (ii) conducting customer satisfaction surveys. The detailed terms of reference and allocation of person-months will be developed during component A.

3. Component C: Energy Conservation Demonstration Project

14. The hydropower specialist (same person as in component A and B)/energy specialist (1 person-month) will (i) design demonstration project, (ii) organize workshops in participatory manner, and (iii) supervise domestic consultants who are responsible for institution building and awareness raising on energy saving to maintain a high standard.

15. The domestic consultant–energy conservation specialist (1 person-month)–will assist the international consultant in designing and commissioning the demonstration project.

4. Reporting

16. All reports should be submitted to ADB, Barki Tajik and MOE in three copies in both English and Russian. The final study report at the end of component A and the final completion report at the end of components B and C will also be submitted as a soft copy on CD-ROM.[4]

[4] Compact disc read-only memory.

a. Component A

17. The consultant will prepare and submit the following reports: (i) 2 weeks after the beginning of the assignment, the consultant will submit a brief inception report; (ii) 3 months after the beginning of the assignment, the consultant will submit a draft report, including the result of the study with technical specification, economic analysis, financial analysis, and environmental and social assessment; and (iii) 1 month after its review, a tripartite meeting will be held to endorse the component A report. Thereafter, the consultant will submit the final component A report, after which component B will follow. The approval of the component A report will involve the Government and ADB.

b. Components B and C

18. The following reports will be submitted by the consultant: (i) 2 months after the beginning of the component B, the consultant will submit the bid evaluation report and the signed contracts for the main equipment for the each pilot projects; and (ii) 8 months after the beginning of component B, the consultant will prepare a draft final report of the Grant which includes information of lessons learned in community-based approach and assessment on sustainability. One month after receiving the comments, the consultant will submit the Project final report.

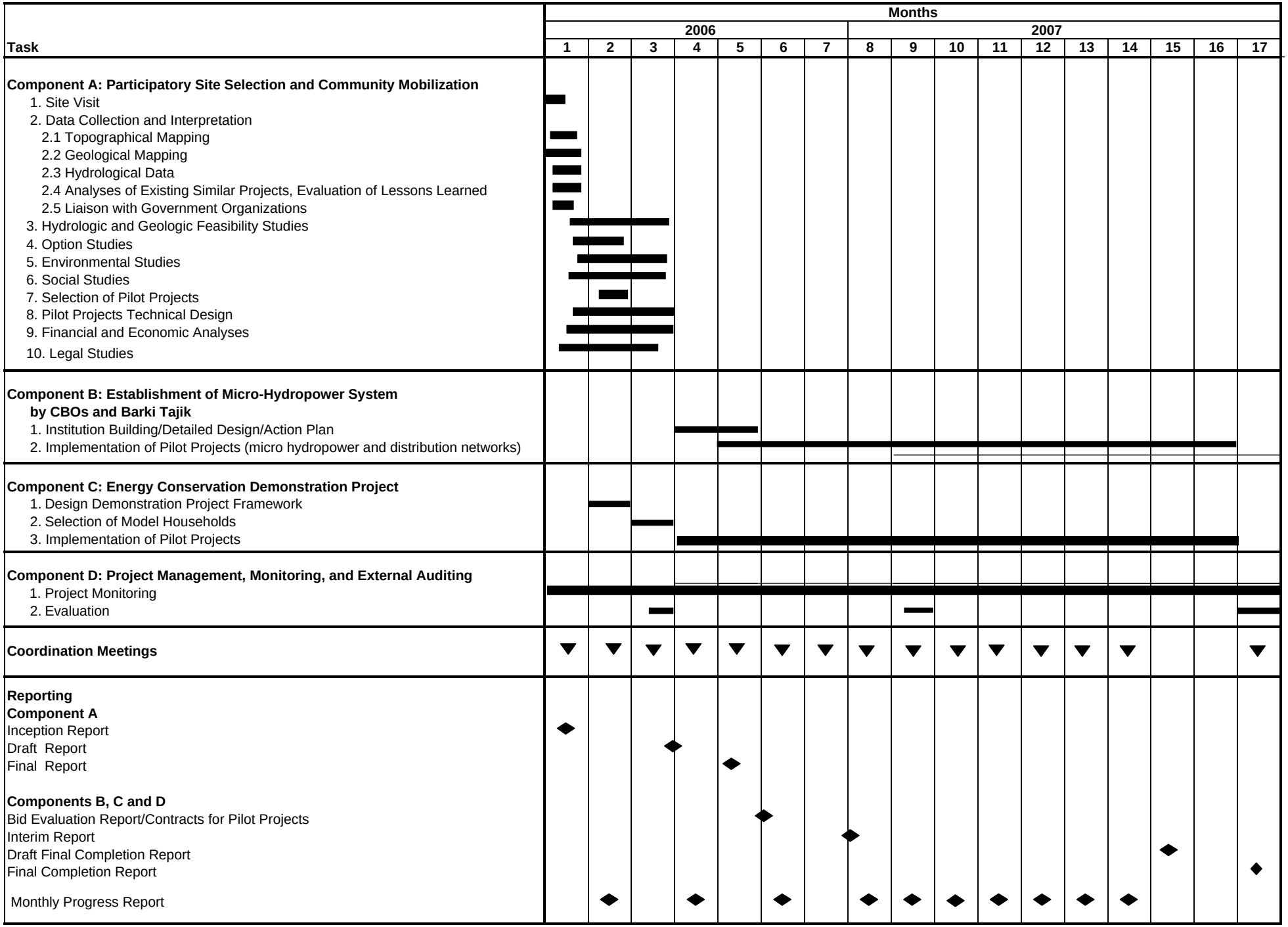
19. In addition to the abovementioned reports, the consultant will prepare an interim report at month 4 after the beginning of component B, which will include, among others, (i) activities carried out; (ii) activities planned; (iii) contract awards and actual disbursement; (iv) projected contract award and disbursement, if any; (iv) updates of the implementation schedule; and (v) issues, if any, with action taken or proposed actions.

Table A4: Consultants' Input by Components

Consulting Inputs by Component	Number of Person-Months
Component A	
1. International consultants	7
2. Local consultants/NGOs	51
Subtotal A	**58**
Component B	
1. International consultants	6
2. Local consultants/NGOs	132
Subtotal B	**138**
Component C	
1. International consultants	1
2. Local consultants/NGOs	12
Subtotal C	**13**
Component D	
1. International consultants	2
2. Local consultants/NGOs	2
Subtotal D	**4**
Total (international and local)	**213**

NGO = nongovernment organization.
Source: Asian Development Bank estimates.

DETAILED IMPLEMENTATION SCHEDULE



Source: Asian Development Bank estimates.