ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 43448
October 2013

Proposed Loan and Grant, and Administration of the Technical Assistance Grant
Nepal: Bagmati River Basin Improvement Project

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Asian Development Bank

CURRENCY EQUIVALENTS
(as of 4 September 2013)

Currency unit	–	Nepalese/s rupee (NRe/NRs)
NRe1.00	=	$0. 00946
$1.00	=	NRs105.76

ABBREVIATIONS

ADB	–	Asian Development Bank
BRB	–	Bagmati River Basin
EIA	–	environmental impact assessment
EMP	–	environmental management plan
HPCIDBC	–	High Powered Committee for Integrated Development of the Bagmati Civilization
IWRM	–	integrated water resources management
m	–	meter
m^3	–	cubic meter
MOUD	–	Ministry of Urban Development
RBO	–	river basin organization
SNNP	–	Shivapuri Nagarjun National Park
TA	–	technical assistance
WECS	–	Water and Energy Commission Secretariat

NOTES

(i) The fiscal year (FY) of the Government of Nepal and its agencies ends on 15 July. "FY" before the calendar year denotes the year in which the fiscal year ends, e.g., FY2013 ends on 15 July 2013.

(ii) In this report, "$" refers to US dollars.

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CONTENTS

PROJECT AT A GLANCE

1. Project Name: Bagmati River Basin Improvement Project **2. Project Number:** 43448-013

3. Country: Nepal **4. Department/Division:** South Asia Department/Environment, Natural Resources & Agriculture Division

5. Sector Classification:

Sectors	Primary	Subsectors
Agriculture and natural resources	√	Water-based natural resources management
		Forestry
		Irrigation, drainage, and flood protection

6. Thematic Classification:

Themes	Primary	Subthemes
Economic growth		Promoting economic efficiency and enabling business environment
		Widening access to markets and economic opportunities
Social development		Disaster risk management
Environmental sustainability	√	Natural resources conservation
		Urban environmental improvement
Capacity development		Institutional development
		Organizational development

6a. Climate Change Impact

Adaptation	High
Mitigation	Low

6b. Gender Mainstreaming

Gender equity theme (GEN)	
Effective gender mainstreaming (EGM)	√
Some gender elements (SGE)	
No gender elements (NGE)	

7. Targeting Classification:

General Intervention	Targeted Intervention		
	Geographic dimensions of inclusive growth	Millennium development goals	Income poverty at household level
√			

8. Location Impact:

Rural	High
Urban	High

9. Project Risk Categorization: Complex

10. Safeguards Categorization:

Environment	A
Involuntary resettlement	C
Indigenous peoples	C

11. ADB Financing:

Sovereign/Nonsovereign	Modality	Source	Amount ($ Million)
Sovereign	Project grant	Asian Development Fund	4.5
Sovereign	Project loan	Asian Development Fund	25.5
Total			30.0

12. Cofinancing:

Financier	Category	Amount ($ Million)	Administration Type
Multi-Donor Trust Fund under the Water Financing Partnership Facility	Official-Grant	.5	Full
Total		.5	

13. Counterpart Financing:

Source	Amount ($ Million)
Government	6.0
Total	6.0

14. Aid Effectiveness:

Parallel project implementation unit	No
Program-based approach	No

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed loan, and (ii) a proposed grant, both to Nepal for the Bagmati River Basin Improvement Project. The report also describes proposed administration of technical assistance (TA) to be provided by the Multi-Donor Trust Fund[1] under the Water Financing Partnership Facility, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, approve the TA.

2. The project will complement ongoing efforts of the Government of Nepal and civil society to improve water management and the river environment in the Bagmati River Basin (BRB). The project will invest in forming a river basin organization with adequate capacity and decision support systems for integrated water resources management (IWRM). It will finance the construction of upstream water storage, riverbed oxygenating weirs, riverbank beautification, and community initiatives to improve the river environment in Kathmandu Valley.[2]

II. THE PROJECT

A. Rationale

3. The BRB has significant cultural and economic values for the people of Nepal. The Bagmati river water is considered holy and is used for cultural and ritual ceremonies practiced at the many significant temples along the river's banks. The river flows through Kathmandu Valley, which is the administrative and economic center of the country as well as Nepal's gateway for tourism. It provides most of the city's drinking water in its upper basin, hydropower generation in the middle basin, and large-scale irrigation in the lower basin.

4. The BRB is considered the most water-stressed basin in Nepal with (i) declining available water resources due to natural and anthropogenic causes, (ii) significant increases in freshwater demand from the expanding population and industry sector, and (iii) a continuous need for irrigated agriculture. The rapid and unplanned expansion of Kathmandu City has placed tremendous pressure on water resources of the upper BRB. In the absence of appropriate solid waste and wastewater management, the river has become the main waste collector drain and now carries high fecal contamination, pathogenic bacteria, and physicochemical pollutants. The absence of effective pollution control measures is causing serious health hazards for local residents, livestock, and aquatic flora and fauna. The physical deterioration of the riverine environment has led to a loss of cultural and recreational amenities for local communities that no longer respect or cherish the river environment.

5. Rapid urbanization has also increased demand on the valley's water supply distribution. During dry season, about 80% of the upper Bagmati River flow is diverted for domestic use leaving very little for irrigation and other sectors, including the environment. Current utilization of surface water is only 10% of the annual river runoff because of the lack of water storage facilities. As a result, municipalities, individuals, and companies extract groundwater at an unsustainable rate, estimated to be 4 to 5 times higher than the natural recharge. The water table has retreated by 35 meters (m) since 1993. The situation is aggravated by the conversion of recharge areas into residential areas and upstream catchment degradation. In Kathmandu Valley, the river is biologically dead; the remaining discharge is mainly heavily polluted sewage

[1] Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland.
[2] ADB. 2011. *Technical Assistance to Nepal for Preparing the Bagmati River Basin Improvement Project*. Manila (TA 8050-NEP).

water that endangers the health of the capital's population and downstream water users, especially the poor and vulnerable households. Throughout the basin, frequent floods and riverbank erosion are the main threat to infrastructure and people's lives and livelihoods.

6. The planning, development, and management of water resources in the BRB have been generally ad hoc, uncoordinated, and reactive. Government agencies have operated in isolation leading to ineffective investments and inequitable allocation of water for human needs and productive use, including the environment. This hampers the government's development efforts to improve water security in the basin. The government recognizes the importance of addressing these problems by moving away from a silo-management approach and the need to embrace the principles of IWRM.[3] The current Water Resources Act (1993) has sought to quantify existing use and allocation rights.[4] Subsequent strategy and planning documents recognize the importance of IWRM and established the need for holistic and systematic management and development of water resources.[5] They also commit to conservation of resources and protection of the environment. The Bagmati River Basin Improvement Project will support the development of appropriate legal and institutional frameworks to operationalize the IWRM approach and develop a model that can be replicated in other basins of the country.

7. In 2009, the government approved the Bagmati Action Plan, 2009–2014 to address the poor state of the upper BRB.[6] The plan's vision is for "a clean, green and healthy river system that is full of life and valued by all." The plan provides a long list of interventions that collectively aim to restore and conserve the river health[7] in Kathmandu Valley. The High Powered Committee for the Integrated Development of the Bagmati Civilization (HPCIDBC) is already implementing some of these, but lack of capacity and funds means that many of the plan's recommendations have not yet been implemented. The government has also sought to address drinking water scarcity and improve wastewater management in Kathmandu Valley through several Asian Development Bank (ADB)-financed projects.[8] While these projects will address immediate human needs, they do not resolve other critical priorities of the basin inhabitants or provide a long-term sustainable management framework for the BRB.

8. Such priorities were identified and developed under a capacity development TA that strategically assessed current and planned interventions from a river-basin perspective.[9] The TA produced a basin strategic investment road map and initiated studies aimed at resolving critical priorities. In particular, it produced a water balance and quality model to assess interventions required to restore the health of the upper Bagmati River and achieve bathing standards at Pashnupatinath and Gokarna temples. Interventions identified include (i) physical restoration of the urban riparian environment and social mobilization to reconnect riverine communities with their river, (ii) increase of river-water availability during the dry season to increase the river's

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[3] Silo management approach refers to an approach where each water user sector develops plans to utilize water in isolation, without considering the impact on other sectors' requirements.

[4] The act provided only 18 months to assess existing water rights. As the assessment could not be completed within this period, subsequently water use could not be managed or monitored, or allocations enforced.

[5] Government of Nepal. 2002. *Water Resources Strategy*. Kathmandu; Government of Nepal. 2005. *National Water Plan*. Kathmandu.

[6] Government of Nepal. 2009. *Bagmati Action Plan, 2009–2014.* Kathmandu.

[7] River health refers to the degree of ecological integrity of a river and its capacity or incapacity to provide an expected range of goods and services (social, environmental, economical, etc).

[8] ADB. 2011. *Technical Assistance to Nepal for Preparing the Kathmandu Valley Urban Environment Improvement Project*. Manila (TA 7936-NEP), later renamed to Kathmandu Valley Wastewater Management Project; ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Nepal for the Melamchi Water Supply Project.* Manila (Loan 1820-NEP); Kathmandu Valley Water Supply Augmentation through Public–Private Partnerships; ADB. 2012. *Country Operations Business Plan: Nepal, 2013–2015.* Manila.

[9] ADB. 2010. *Technical Assistance for Supporting Investments in Water Security in River Basins*. Manila (TA 7547).

assimilative capacity, and (iii) strategic placement of wastewater treatment facilities with higher standards for effluent treatment. The need for a flood forecasting and early warning system was identified as a critical priority, particularly in the lower basin where communities are regularly experiencing extreme flood hazards.

9. Lessons from past projects indicate the need to consider IWRM as a process rather than a finite intervention. Projects trying to address many basin issues at one time have often proven too complex to implement. Through a programmatic and gender-inclusive participatory process, the project will follow a phased approach and initially focus on priority issues identified by the basin stakeholders to (i) strengthen river basin governance through legal and institutional reform, (ii) improve the river environment in Kathmandu Valley, and (iii) reduce water-induced disaster impacts throughout the basin.

10. The project is consistent with ADB's country partnership strategy for Nepal, which supports Nepal's peace and development by promoting (i) broad-based and inclusive economic growth, (ii) inclusive social development, (iii) governance and capacity building, and (iv) environmental sustainability.[10] The project will improve governance, build capacity, and improve environmental sustainability. The project fits into the priority sector of agriculture and natural resources and theme of environment sustainability outlined in the country partnership strategy. It is included in the country operations business plan, 2013–2015.[11]

B. Impact and Outcome

11. The impact will be increased water security in the BRB. The outcome will be improved river health and flood management. The project is the first attempt in Nepal to apply the concept and principles of IWRM since its adoption under the 2005 National Water Plan.

C. Outputs

12. The project focuses on priority issues selected by the basin stakeholders from the basin strategic investment road map. The road map is based on the 2009 Bagmati Action Plan and further consultations with basin stakeholders. The project has five outputs:

(i) **Established systems and capacity for integrated and participatory river basin management**. Activities include (a) provide legal and institutional strengthening for IWRM and formation of a river basin organization (RBO), (b) mobilize basin stakeholders, (c) build capacity for increasing RBO competence, (d) establish a central water resources information system including a decision support system and an operating water quality monitoring network, and (e) prepare a 15-year participatory integrated river basin master plan.

(ii) **Improved riverbank environment in urban areas.** Activities include (a) remove contaminated riverbed material; (b) construct weirs and provide phyto-remediation to enhance the river's self-cleaning capacity; (c) stabilize and beautify the riverbank; (d) mobilize, raise awareness, and build capacity of local government and communities for riverbank management and maintenance; and (e) collaborate with the private sector, which has expressed interest in setting up recreational businesses along the riverbanks through public–private partnerships or finance maintenance as part of social corporate activities.

(iii) **Increased water availability in the basin during the dry season and watershed conservation.** Activities include (a) construct an 861,000 cubic

[10] ADB. 2009. *Country Partnership Strategy: Nepal, 2010–2012.* Manila.
[11] ADB. 2012. *Country Operations Business Plan: Nepal, 2013–2015.* Manila.

meters (m^3) Dhap dam and complete detail design of the 8 million m^3 Nagmati dam, (b) provide rooftop rainwater harvesting and groundwater recharge, and (c) implement upstream watershed management.

(iv) **Functioning flood forecasting and early warning system for the Bagmati River Basin.** Activities include (a) upgrade the existing flood forecasting system, (b) install a flood early warning system, and (c) increase community awareness and build capacity for flood response.

(v) **Efficient project management with effective stakeholder communication.** Activities include (a) establish competent project management and project implementation units, (b) undertake timely procurement and disbursement, and (c) implement the project communication strategy and monitoring.

D. Investment and Financing Plans

13. The project is estimated to cost $36 million (Table 1).

Table 1: Project Investment Plan
($ million)

Item			Amount[a]
A.	**Base Cost**[b]		
	1.	Established systems and capacity for integrated and participatory RBWM	2.2
	2.	Improved riverbank environment in urban areas	15.1
	3.	Increased water availability in the basin during the dry season and watershed conservation	6.5
	4.	Functional flood forecasting and early warning system in the BRB	0.5
	5.	Efficient project management with effective stakeholder communication	3.7
		Subtotal (A)	**28.0**
B.	**Contingencies**		**7.3**
C.	**Financing Charges During Implementation**		**0.7**
		Total (A+B+C)	**36.0**

BRB = Bagmati River Basin, RBWM = river basin water management.
[a] Exchange rate of $1 = NRs87 is used.
[b] In mid-2013 prices.
[c] Physical contingencies computed at 10% for all items. Price contingencies computed at 2.2%, 1.9%, and 1.8% thereafter for each year respectively starting from 2014 on foreign exchange costs, and 9.0% and 7.0% thereafter in local currency costs; includes provision for potential exchange rate fluctuation.
[d] Interest during construction for the Asian Development Bank loan is computed at 1.0% per annum.
Source: Asian Development Bank estimates.

14. The government has requested (i) a loan in various currencies equivalent to SDR16,770,000 ($25,500,000 equivalent) and (ii) a grant not exceeding $4.5 million from ADB's Special Funds resources to help finance the project. The loan will have a 32-year term, including a grace period of 8 years, an interest rate of 1.0% per annum during the grace period and 1.5% per annum thereafter, and such other terms and conditions set forth in the draft financing agreement. The financing plan is in Table 2.

Table 2: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank	30.0	83.3
Special Funds resources (loan)	25.5	70.8
Special Funds resources (grant)	4.5	12.5
Government	6.0	16.7
Total	**36.0**	**100.0**

Source: Asian Development Bank estimates.

E. Implementation Arrangements

15. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.[12] The Ministry of Urban Development (MOUD) will be the executing agency. The HPCIDBC will be the main implementing agency; will establish the project coordination and management unit; and manage outputs 2, 5, and part of 3. The Department of Irrigation will implement the design and construction of dams under output 3 and will establish a project implementation unit in the project coordination and management unit. The Water and Energy Commission Secretariat (WECS) will be the implementing agency for outputs 1 and 4.

16. Additional financing may be considered if the project performs well. Necessary provisions were made in the loan to achieve readiness for additional financing. These include surveys and detail design of Nagmati dam and additional river riparian environment works.

17. Procurement of works, goods, and services financed by ADB will be carried out in accordance with ADB's Procurement Guidelines (2013, as amended from time to time). Consultant selection and engagement will be carried out in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). ADB will undertake the recruitment of the project management design and supervision consultants on behalf of the government. MOUD retains the responsibility for negotiating and signing the contract with the consultant, issuing the notice to proceed, and supervising the consultant's services.[13]

Table 3: Implementation Arrangements

Aspects	**Arrangements**		
Implementation period	May 2014–May 2019		
Estimated completion date	31 May 2019		
Management			
(i) Oversight body	Project Steering Committee: Secretary, MOUD (chair); Joint Secretary, MOUD; Project Manager, HPCIDBC; General Director, DOI; General Director, DHM; Chief Warden, SNNP; a representative each from DHM, MOF, PID KUKL, KVDA, KVWSMB, and WECS; representative from the civil society (members); Project Director, PCMU (member secretary)		
(ii) Executing agency	MOUD		
(iii) Key implementing agencies	HPCIDBC, WECS, DOI		
(iv) Coordination, management and implementation units	PCMU located in Kathmandu HPCIDBC building with 35 staff PIU DOI located in Kathmandu HPCIDBC building with 13 staff PIU WECS located in Kathmandu WECS office with 5 staff		
Procurement	International competitive bidding	3 contracts (works)	Above $1,000,000 for works Above $500,000 for goods
	National competitive bidding	1 contract (goods)	$1,000,000 or less for works $500,000 or less for goods

[12] Project Administration Manual (accessible from the list of linked documents in Appendix 2).
[13] ADB. 2012. Specific Requirements for Recruiting Consultants by the Executing Agency. *Project Administration Instructions.* PAI 2.05, Manila (para. 47).

Aspects	Arrangements		
	Shopping	Minor works and goods packages	Less than $100,000
Consulting services	PMDSC QCBS FTP 90:10	364 person-months	$2,750,000
	Outputs 1 and 4 QCBS FTP 90:10	128 person-months	$1,720,000
	Detailed design Nagmati dam QCBS FTP 90:10	252 person-months	$2,550,000
	Individuals	10 person-months	$65,000
Community initiatives	Social mobilization and solid waste QCBS STP 80:20	78 person-months	$850,000
	Rainwater harvesting QCBS STP 80:20	18 person-months	$680,000
	Watershed management QCBS STP 80:20	40 person-months	$255,000
Retroactive financing and/or advance contracting	Retroactive financing will be up to 10% of the total ADB loan amount for eligible expenditures incurred prior to loan effectiveness but not earlier than 12 months prior to the signing of the loan agreement. It will be required for initiating tendering of consultants, equipment, and works.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, DHM = Department of Hydrometeorology, DOI = Department of Irrigation, FTP = full technical proposal, HPCIDBC = High Powered Committee for the Integrated Development of the Bagmati Civilization, KUKL = Kathmandu Upatyaka Khanepani Limited, KVDA = Kathmandu Valley Development Authority, KVWSMB = Kathmandu Valley Water Supply Management Board, MOF = Ministry of Finance, MOUD = Ministry of Urban Development, PCMU = project coordination and management unit, PID = project implementation directorate, PIU = project implementation unit, PMDSC = project management design and supervision consultant, QCBS = quality- and cost-based selection, SNNP = Shivapuri Nagarjun National Park, STP = simplified technical proposal, WECS = Water and Energy Commission Secretariat.
Source: Asian Development Bank estimates.

III. TECHNICAL ASSISTANCE

18. The TA will support WECS and HPCIDBC in implementing output 1. The TA outputs will include (i) policy and legal framework reviewed and amended to support operationalization of IWRM, (ii) institutional setup of the Bagmati RBO agreed and necessary legislation finalized to establish the RBO, and (iii) core RBO staff trained and first river basin council successfully held. Activities include (i) review existing water policy and propose amendment and/or revisions for IWRM; (ii) mobilize stakeholders to finalize and agree on the Bagmati RBO mandate and setup, including staffing plan and recurrent budget; (iii) draft legislation required for establishing the RBO; and (iv) assess training requirements and support identification and contracting of training on IWRM and for the RBO.

19. The TA will provide 21 person-months of international consultants. WECS will be the executing agency. ADB will recruit and engage the consultants as individual consultants in accordance with its Guidelines on the Use of Consultants (2013, as amended from time to time). The TA will be implemented over 3 years. The TA is estimated to cost $500,000, which will be financed on a grant basis by the Multi-Donor Trust Fund (footnote 1) under the Water Financing Partnership Facility, and administered by ADB. The government will provide counterpart support in the form of counterpart staff and office accommodation.

IV. DUE DILIGENCE

A. Technical

20. **Civil works.** The designs for the structural works in the upper Bagmati River were produced with the support of an urban architect and cultural heritage specialist. They favor local engineering systems, such as use of stones and bricks, and design with local cultural amenities and architectural features. The design capacity of the improved river corridor will meet the appropriate local design standards for flood management incorporating anticipated impacts of climate change. Construction equipment, material, and labor are all readily and locally available. The size of the dam and reservoir was determined based on stakeholder priorities and using detailed water quantity and quality models accounting for future developments including population growth, urbanization, and investments in water (Melamchi Water Supply Project) and wastewater management (Kathmandu Valley Wastewater Management Project).[14] Feasibility studies for the dams included hydrologic and geotechnical investigations as well as seismic hazard and dam break analysis. Design standards for the dams are based on the Guidelines of the International Commission on Large Dams and Australian National Committee on Large Dams. The Dhap dam is a moderate-size dam: 24 m high with 861,000 m^3 storage. While it is not classified as an extreme hazard dam, prudent conservative design criteria were adopted: (i) earthquake standard of 1:100 annual exceedence probability and maximum credible earthquake associated with the closest active fault to the site; and (ii) probable maximum flood design accounting for anticipated impacts of climate change. Machinery used to construct the dams will access the site via an existing road that will be upgraded in places under the project. Construction machinery, equipment, materials, and labor are readily and locally available. International specialists reviewed the final designs.

21. **Climate change.** An analysis of likely changes of temperature and rainfall was conducted to appraise the resilience of the proposed infrastructure investments to climate change. The analysis used the latest downscaled projections including those from a 2010 TA.[15] The analysis revealed the average mean maximum temperature in the BRB will increase by 1.5°–2.1° Celsius under various emission scenarios for 2070–2099 compared with 1970–1999. Similarly, annual rainfall in the upper BRB is projected to decrease by 2% and monsoon rainfall by 8% from 2020 to 2040, and by 11% and 6% from 2041 to 2060 compared with 1994–2000. The reduction in rainfall during the first 20 years may not affect the filling capacity of the Dhap reservoir as current available runoff is estimated at 160% of reservoir capacity. Variations from year-to-year are projected to increase with more extremes. Therefore, regulation through reservoirs will be beneficial in maintaining the required flow in the river during the dry season.

B. Economic and Financial

22. The estimated economic internal rate of return is 14.5%; the net present value is $4.5 million. The economic internal rate of return is higher than the economic opportunity cost of capital estimated at 12.0%, indicating sufficient economic return. The sensitivity analysis with adverse variation in the project costs and project benefits indicates an economic internal rate of return above 12.0% even with increased costs and reduced benefits. The risk analysis confirms that the project is resilient to downside risks.

[14] ADB. 2011. *Technical Assistance to Nepal for the Kathmandu Valley Urban Environment Improvement Project.* Manila (TA 7936-NEP).

[15] ADB. 2010. *Technical Assistance to Nepal for Strengthening Capacity for Managing Climate Change and the Environment*. Manila (TA 7173-NEP, completed in July 2012).

23. A financial sustainability analysis of the project assessed the capacity of implementing agencies to sustain project-related recurrent expenditure and its debt service obligations. In 2011–2012, the Department of Irrigation, HPCDIBC and WECS, had total recurrent expenditure of NRs97 million. The project recurrent expenditure is estimated at NRs6.2 million, which is 6% of the recurrent expenditure of the implementing agencies. Therefore the project will not impose a significant burden on the recurrent expenditure of these agencies.

C. Governance

24. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and MOUD, and specific measures were built into the project design to mitigate risk, including (i) a project communication strategy, (ii) reduced number of contracts, and (iii) provision of procurement consultant expertise. Financial management and procurement capacity assessments of the implementing agencies were conducted and mitigation measures adopted to address the weaknesses. Other risk assessments were conducted during project design with tools specifically designed for Nepal. Based on these assessments, some mitigation measures incorporated in the project design are to (i) implement the project communication strategy for regular disclosure of project-related information to citizens; (ii) develop and regularly update a project website to enhance transparency in project implementation, procurement, and safeguards; and (iii) establish a grievance redress mechanism to ensure effective resolution.

D. Poverty and Social

25. The project is classified as effective gender mainstreaming. A poverty and social analysis was completed. While the primary project beneficiaries are the people living in the BRB, the project specifically includes the poor and socially excluded. Investment activities for (i) improved water security, (ii) conservation of watershed and augmentation of water in the river, (iii) improved sanitation due to better river environment, (iv) reduction of flood hazards, (v) good governance through establishing a dedicated RBO, and (vi) capacity development of local residents will directly benefit all, including the poor and the socially excluded. A gender equality and social inclusion action plan was prepared with clear targets, responsibilities, and resource allocation. Specific gender design features are included in 50% or more of project outputs. The project will contribute to improving women's access to benefits from the project; 30% of employment generated from rehabilitation works will be reserved for women. The project has prepared a stakeholder communication strategy for community awareness and participation to help mobilize key stakeholders for widespread and meaningful participation.

E. Safeguards

26. **Social safeguards.** The project is classified as category C for involuntary resettlement and indigenous peoples. A resettlement framework was prepared in accordance with ADB's Safeguard Policy Statement (2009) as a prudent measure to address any involuntary resettlement-related uncertainty during project implementation, should any issue arise. The project does not include any component that will require land acquisition leading to involuntary resettlement, or involve involuntary restrictions on land use or on access to legally designated parks and protected areas. All civil works related to the Bagmati River channel improvement will be limited to the existing government-owned right-of-way, and the proposed Dhap dam will be located within a national park (it is proposed to submerge an older dam). No adverse impacts on indigenous peoples are anticipated. Indigenous peoples living in the river basin area will benefit from the project like other residents. The project does not directly or indirectly affect the dignity, human rights, livelihood systems, or culture of indigenous peoples or affect the territories or natural or cultural resources that indigenous peoples may own, use, occupy, or claim as their

ancestral domain. The project preparatory team has carried out meaningful consultations with relevant stakeholders and MOUD will continue to do so with all communities in the project area, especially with reference to community mobilization for a better environment.

27. **Environment safeguards.** The project is classified as category A and an environmental impact assessment (EIA) including environmental management plan (EMP) was prepared in accordance with ADB's Safeguard Policy Statement and is uploaded on ADB's website. The EIA covers proposed project interventions, including the construction of an 850,000 m^3 storage reservoir (Dhap dam) with a 24 m high dam, constructed 375 m downstream of an existing dam within Shivapuri Nagarjun National Park (SNNP). Construction of the new dam will increase the inundation area from 1.5 hectares to 12.5 hectares. The EIA also assesses the impacts of the inclusion of a second reservoir, the Nagmati dam, which is to be located downstream of the Dhap dam, also within SNNP, for which only detailed designs are to be prepared. The main adverse impact of the project is the inundation of land within a protected area. Due to past activities in SNNP, the forest area within these two sites is re-grown forest and contains only a few large mature trees. Among impacts to flora and fauna, construction of the Dhap dam will result in habitat loss of approximately 0.03%. The EIA confirms that the small loss of habitat will not adversely affect the nesting, feeding ground, and reproduction system of wild fauna in the area, as similar habitats are found within SNNP. Any residual impact will be offset by the conservation of watershed of the area, which is supported by the project. Several alternatives were considered for augmenting river flows, including interbasin transfers and alternative dam locations within and outside SNNP. The analysis demonstrates that the options selected under the project are the most feasible. The project will not lead to significant negative cumulative impacts on biodiversity, water quality, or ecological flows.

28. The EMP includes measures to minimize negative impacts and the dam design includes a minimum environmental flow to support the limited aquatic fauna and fish supported by the river's ecosystem. Given the high pollution within the Bagmati River, the project will result in several positive impacts, which will outweigh the negative. The positive impacts include (i) improved water quality and urban river environment; (ii) increased groundwater recharge; and (iii) ensured bathing water quality standard at the Pashupatinath temple to meet the community ritual requirements during cultural festivals in the dry season.

29. An environment specialist will be engaged to update the EMP after detailed designs are completed, supervise its implementation, and provide capacity building to implementing agency staff. The Department of Irrigation and HPCIDBC will supervise EMP implementation. An independent environment consultant will monitor EMP implementation. Stakeholders were consulted during project design; this will continue during project implementation in accordance with the project's communication strategy. The project will establish a grievance redress mechanism for resolving grievances of project-affected people.

F. Risks and Mitigating Measures

30. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[16] The integrated benefits and impacts of the project are expected to outweigh the costs.

[16] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Nepal adopts a federal structure that fails to recognize water as a state subject.	The project adopts the IWRM approach for subbasins rather than whole basin.
Parliament is not in place for adoption of necessary policy, legal, and institutional reforms, including RBO establishment.	MOUD, with support from ADB and the technical assistance, will secure approval to establish an RBO through Presidential ordinance.
WWTP effluent quality at Gokarna and Guheshwori is lower than standards agreed during design of the KVWMP.	MOUD is also the KVWMP executing agency. The project directors for both projects are members of the steering committees for their counterpart project.
The environmental flow generated for improved water quality in the Bagmati River is withdrawn for other uses.	The Bagmati River Basin Improvement Project provides technical and legal support to amend the Water Act and a new regulation to enforce environmental flows into the Bagmati River.
Objections are received to the construction of water storage reservoirs in SNNP.	An EIA was prepared and discussed with stakeholders. EMP implementation will be monitored by independent monitors and disclosed to the public.

ADB = Asian Development Bank, EIA = environment impact assessment, EMP = environment management plan, IWRM = integrated water resources management, KVWMP = Kathmandu Valley Wastewater Management Project, MOUD = Ministry of Urban Development, RBO= river basin organization, SNNP = Shivapuri Nagarjun National Park, WWTP = wastewater treatment plant.
Source: Asian Development Bank.

V. ASSURANCES AND CONDITIONS

31. The Government of Nepal and MOUD have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in the project administration manual and loan documents. The government and MOUD have agreed with ADB on certain covenants for the project, which are set forth in the financing agreement.

VI. RECOMMENDATION

32. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the loan in various currencies equivalent to SDR16,770,000 to Nepal for the Bagmati River Basin Improvement Project, from ADB's Special Funds resources, with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; for a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft financing agreement presented to the Board; and

(ii) the grant not exceeding $4,500,000 to Nepal, from ADB's Special Funds resources, for the Bagmati River Basin Improvement Project, on terms and conditions that are substantially in accordance with those set forth in the draft financing agreement presented to the Board.

Takehiko Nakao
President

8 October 2013

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Improved water security in the Bagmati River Basin	By 2025: Water allocation recommendations by the RBO council approved (baseline: no water allocations currently in the basin) Water availability in the upper BRB during the dry season improved by 50% from 2013 baseline (average 38 l/s at Gaurighat) Water quality in the upper Bagmati River improved to bathing water standards of World Bank and World Health Organization (DO > 3 mg/l) at Pashupatinath temple on a perennial basis (baseline: highest DO = 1 mg/l in 2012–2013 dry season) Water downstream of Pashupatinath temple in Kathmandu City improved to standards for partial contact[a] (DO > 1.5 mg/l) (baseline: highest DO = 0 mg/l in 2012–2013 dry season)	WECS annual reports DHM and GWRDB surface and groundwater annual records RBO Secretariat (HPCIDBC) water quality assessment reports RBO Secretariat (HPCIDBC) water quality assessment reports	**Assumption** Related projects in Kathmandu addressing problems in drinking water supply and sewage collection and/or water treatment are successfully completed on time. **Risk** Climate change impact exceeds model projections.
Outcome Improved river health and flood management	By the end of the project (by 2019): Bathing water quality standard (DO> 3 mg/l) achieved at Pashupatinath when reservoir water is released (baseline: highest DO = 1 mg/l in 2012–2013 dry season) Annualized cost of flooding in Bagmati River Basin reduced by 10% (baseline 1993–2013: $850,000)[b]	RBO Secretariat (HPCIDBC) water quality assessment reports DWIDP annual reporting	**Assumption** KVWMP is implemented without delay and achieves the target of effluent standards of WWT plants at Gokarna and Guheshwori
Outputs 1. Established systems and capacity for integrated and participatory river basin management	By 2016: 15-year IRBDMP for Bagmati approved by majority of basin stakeholders By 2017: Water resources (including quality and quantity) real-time data and decision support systems in place By 2018: RBO legally established, financed, and staffed (20% are women and 15% representatives of diverse communities in the river basin, in leadership and non leadership positions)	For all indicators: Project progress reports prepared by WECS and HPCIDBC	**Assumption** Frequent turnover of government officials does not affect commitment for IWRM. **Risk** Nepal adopts a federal structure that fails to recognize water as a state subject.
2. Improved riverbank environment in urban areas	By 2017: 7.2 km of river corridor constructed with aesthetic river walls, green zones, and recreational amenities employing 20% of women and 10% poor and socially excluded as workers during construction 11 aeration weirs constructed 2 regulators rehabilitated By 2018: 7 VDCs and user community groups, comprising at least 33% women members	For all indicators: Project progress reports prepared by MOUD and HPCIDBC	**Assumption** Solid waste problems related to provision of collection services and deposition are solved through the implementation of the 2011 Solid Waste Act **Risk** Political instability compromises

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	and 20% from poor and socially excluded groups, mobilized to monitor and prevent solid waste disposal into the river corridor 300 households adopt improved solid waste management By 2019: 2 km of riverbank maintained with private sector support		necessary coordination between municipalities, VDC and HPCIDBC on river bank monitoring and maintenance
3. Increased water availability in the basin during dry season and improved watershed conservation	By 2017: 850,000 m^3 of storage capacity established with the Dhap dam By 2019: 178,000 m^3 rooftop water harvested annually by 2,500 households to provide 45,000 m^3 of water supply and recharge 135,000 m^3 of groundwater 12.5 ha erosion-prone cultivated area in SNNP stabilized with fruit-tree planting and improved cropping practices 80% of households converted from traditional wood stoves to energy-saving stoves (baseline 2013: 296 households in SNNP use traditional stoves)	For all indicators: Project progress reports prepared by MOUD and DOI	**Assumption** SNNP authorities continue to cooperate with the project. **Risk** Construction of water storage in SNNP is resisted by other stakeholders.
4. Functioning flood forecasting and early warning system for the Bagmati River Basin	By 2016: Flood early warning system in place By 2017: Flood warnings disseminated 72 hours before flood events (baseline 2013: 24 hours before flood events with low reliability) By 2018: 25 most flood-prone riverine villages implement community-based flood adaptation programs with protocols that consider needs of women, children, disabled, and elderly during disasters	For all indicators: WECS and DHM annual reports	
5. Efficient project management with effective stakeholder communication	By 2013: PCMU established with at least 33% women representation Sector PIUs established The project communication strategy is successfully implemented By 2019: Annual project contract award and disbursement targets met	For all indicators: PCMU and PIU annual and quarterly progress reports	

Activities with Milestones	Inputs
1. Established systems and capacity for integrated and participatory river basin management	**Loan** **ADB:** **$25.5 million** **Government:** **$6.0 million**
1.1 Recruit DSS, FFEW, IRBDMP water quality consultants (Sep 2013–May 2014)	
1.2 Select and mobilize RBO and legal consultants (Oct 2013–Feb 2014)	
1.3 Conduct consultations to finalize the RBO structure (Feb–Oct 2014)	
1.4 Draft new water act and legislature for the RBO (Mar 2014–Apr 2015)	
1.5 Procure equipment for DSS and water quality (Jun 2014–Aug 2014)	
1.6 Develop and implement DSS and water quality monitoring system (Jun 2014–Aug 2016)	
1.7 Develop IRBDMP (Mar 2014–Apr 2016)	

Activities with Milestones	Inputs
2. Improved riverbank environment in urban areas	**Grant ADB: $4.5 million WFPF: $0.5 million**
2.1 Recruit NGOs for river community mobilization, gender, and solid waste management (Jan–Jul 2014)	
2.2 Form community groups, establish stakeholder consultations and gender groups for the duration of the project (Jul 2014–Dec 2015)	
2.3 Undertake community mobilization, stakeholder interaction, and gender activities (Apr 2016–Oct 2018)	
2.4 Undertake detailed design by PMDSC (Feb–Aug 2014)	
2.5 Construct river improvement works (Apr 2015–Dec 2017)	
3. Increased water availability in the basin during dry season and watershed conservation	
3.1 Process approval of EIA for Dhap dam (May 2013–Apr 2014)	
3.2 Tender design and build contract for Dhap dam (Sep 2013–Mar 2014)	
3.3 Recruit Nagmati dam design consultants (Oct 2013–Jun 2014)	
3.4 Recruit NGOs for watershed management and rainwater harvesting (Mar–Jul 2014)	
3.5 Process approval of EIA for Dhap dam (May 2013–Apr 2014)	
3.6 Undertake detailed design for Dhap dam by contractor (Jul 2014)	
3.7 Undertake detailed design for Nagmati dam (Jun 2014–Jul 2015)	
3.8 Implement EMP for Dhap dam construction (Nov 2014–Jun 2017)	
3.9 Construct Dhap dam (Nov 2014–Jun 2017)	
3.10 Implement rainwater harvesting and watershed management (Apr 2014–Oct 2015)	
4. Functional flood forecasting and early warning system in the Bagmati River Basin	
4.1 Mobilize FFEW consultants under DSS contract (May 2014)	
4.2 Procure equipment for FFEW (Aug 2014–Oct 2014)	
4.3 Develop, implement, and test FFEW (Oct 2014–Jun 2016)	
5. Efficient project management and stakeholder coordination	
5.1 Recruit project management design and supervision consultants (Jul 2013–Feb 2014)	
5.2 Form a PCMU (May–Nov 2013) and PIUs (May–Dec 2013)	
5.3 Set up financial management system and open imprest account in the PCMU (Oct–Nov 2013)	
5.4 Set up monitoring and evaluation system in the PCMU (Oct 2013–Apr 2014)	
5.5 Implement communication strategy (Apr 2014–Oct 2018)	
5.6 Produce quarterly and annual reports (Feb 2014)	
5.7 Establish grievance mechanism in the PCMU (Aug 2014)	

ADB = Asian Development Bank, BRB = Bagmati River Basin, DHM = Department of Hydrology and Meteorology, DO = dissolved oxygen, DOI = Department of Irrigation, DSS = decision support system, DWIDP = Department of Water Induced Disaster Prevention, EIA = environmental impact assessment, EMP = environmental management plan, FFEW = flood forecasting and early warning system, GWRDB = Ground Water Resource Development Board, ha = hectare, HPCIDBC = High Powered Committee for the Integrated Development of the Bagmati Civilization, IRBDMP = integrated river basin development master plan, IWRM = integrated water resources management, km = kilometer, KVWMP = Kathmandu Valley Wastewater Management Project, l/s = liter per second, m^3 = cubic meter, mg/l = milligram per liter, MOUD = Ministry of Urban Development, NGO = nongovernment organization, PCMU = project coordination and management unit, PIU = project implementation unit, PMDSC = project management design and supervision consultant, RBO = river basin organization, SNNP = Shivapuri Nagarjun National Park, UBR= upper Bagmati River, VDC = village development committee, WECS = Water and Energy Commission Secretariat, WFPF = Water Financing Partnership Facility.

[a] The PCMU will select the water quality monitoring points.

[b] The costs of flooding are based on average costs from 2000 to 2004 and the costs of the large flood in 1993, amortized. (SILT et.al. 2005. *Preparation of Water-Induced Hazard Maps of the Bagmati River Basin*. Volume 1 (Main Report). Report to Ministry of Water Resources, Department of Water Induced Disaster Prevention; and Flood Disaster Impacts and Responses in Nepal Terai's marginalized Basins. http://www.i-s-e-t.org/images/pdfs/Winds%20Ch_6.pdf

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=43448-013-3

1. Financing Agreement
2. Sector Assessment (Summary): Agriculture and Natural Resources
3. Project Administration Manual
4. Contribution to the ADB Results Framework
5. Development Coordination
6. Financial and Economic Analysis
7. Country Economic Indicators
8. Summary Poverty Reduction and Social Strategy
9. Gender Equality and Social Inclusion Action Plan
10. Environmental Impact Assessment
11. Resettlement Framework
12. Risk Assessment and Risk Management Plan

Supplementary Documents

13. Stakeholder Communication Strategy
14. Nepal Post-Conflict Sensitive Approach: Peace-Building Tool (Peace Filter) for Project Design and Implementation
15. Disaster and Climate Change Risks Screening Tool
16. Climate Change: Project Adaptation Action (PAA) Report
17. Financial Management Assessment
18. Participation and Institutional Strategic Plan