



Report and Recommendation of the President to the Board of Directors

Project Number: 43253
September 2014

Proposed Multitranche Financing Facility India: Karnataka Integrated and Sustainable Water Resources Management Investment Program

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 1 July 2014)

Currency unit	–	Indian rupees (Re/Rs)
Re1.00	–	\$0. 01664
\$1.00	–	Rs60. 08000

ABBREVIATIONS

AC-IWRM	–	Advanced Centre for Integrated Water Resources Management
ADB	–	Asian Development Bank
CADA	–	command area development authority
GSDP	–	gross state domestic product
ha	–	hectare
IWRM	–	integrated water resources management
KNNL	–	Karnataka Neeravari Nigam Limited
m ³	–	cubic meter
MFF	–	multitranches financing facility
PIO	–	project implementation office
PMU	–	program management unit
PSC	–	project support consultant
QCBS	–	quality- and cost-based selection
TLBC	–	Tungabhadra Left Bank Canal
WRD	–	Water Resources Department
WUCS	–	water users cooperative society

NOTES

- (i) The fiscal year (FY) of the governments of India and Karnataka and their agencies ends on 31 March. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2013 ends on 31 March 2013.
- (ii) In this report, "\$" refers to US dollars.

Vice-President	W. Zhang, Operations 1
Director General	H. Kim, South Asia Department (SARD)
Director	T. Matsuo, Environment, Natural Resources and Agriculture Division, SARD
Team leader	Y. Siddiqi, Senior Water Resources Specialist, SARD
Team members	N.M. Amerasinghe, Environment Specialist, SARD
	B. Debnath, Senior Social Development Specialist, SARD
	T. Gallego-Lizon, Principal Urban Development Specialist, SARD
	J. Ghimire, Counsel, Office of the General Counsel (OGC)
	H. Iwasaki, Principal Infrastructure Specialist, Southeast Asia Department
	Y.A. Kim, Counsel, OGC
	I. Makin, Principal Water Resources Specialist, Regional and Sustainable Development Department
	H.K. Varma, Senior Project Officer (Natural Resources and Agriculture), SARD
Peer reviewer	R. Jones, Natural Resources and Agriculture Economist, Central and West Asia Department

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INVESTMENT PROGRAM^a AT A GLANCE

1. Basic Data		Project Number: 43253-013	
Project Name	Karnataka Integrated and Sustainable Water Resources Management Investment Program	Department /Division	SARD/SAER
Country	India	Executing Agency	Karnataka Neeravari Nigam Limited
Borrower	India		
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Agriculture, natural resources and rural development	Irrigation		90.00
	Rural water policy, institutional and capacity development		30.00
	Water-based natural resources management		30.00
		Total	150.00
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Adaptation (\$ million)	60.00
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	Climate Change impact on the Project	Medium
	Natural resources conservation		
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Civil society participation	Effective gender mainstreaming (EGM)	✓
	Institutional development		
	Organizational development		
Knowledge solutions (KNS)	Pilot-testing innovation and learning		
Partnerships (PAR)	Civil society organizations		
	Implementation		
	Private Sector		
	Regional organizations		
5. Poverty Targeting		Location Impact	
Project directly targets poverty	No	Rural	High
		Urban	Low
6. Risk Categorization:	Low		
7. Safeguard Categorization	Environment: B Involuntary Resettlement: C Indigenous Peoples: C		
8. Financing			
Modality and Sources	Indicative Tranches (\$million)		Amount (\$million)
	I	II	
ADB			150.00
Sovereign MFF-Tranche (Loan): Ordinary capital resources	31.00	119.00	150.00
Cofinancing			0.00
None			
Counterpart			75.00
Beneficiaries	0.40	4.60	5.00
Government	16.60	53.40	70.00
Total	48.00	177.00	225.00
9. Effective Development Cooperation			
Use of country procurement systems		No	
Use of country public financial management systems		Yes	

INVESTMENT PROGRAM^a AT A GLANCE

10. Country Operations Business Plan		
CPS	http://www.adb.org/sites/default/files/cps-ind-2013-2017.pdf	
COBP	http://www.adb.org/sites/default/files/cobp-ind-2013-2015.pdf	
11. Investment Program Summary		
<p>The investment program will improve water availability to meet competing water demands in selected river basins in the State of Karnataka (the state) by implementing integrated water resources management (IWRM). It will improve water use efficiency in irrigated agriculture to provide economic opportunities to improve rural incomes.</p> <p>Impact and Outcome: The impact (of the facility) is improved sustainable water security in selected river basins in Karnataka. The outcome (of the facility) is integrated water resources management successfully implemented in selected river basins in Karnataka.</p> <p>Outputs: (i) State and basin institutions strengthened for IWRM, (ii) Irrigation system infrastructure and management modernized, and (iii) Program management systems operational</p> <p>Implementation Arrangements: Karnataka Neeravari Nigam Limited will be the executing agency.</p> <p>Project Readiness: A. Status of Compliance with Detailed Design - Completed.</p> <p>B. Status of Recruitment of Consultants - EOI for Project Support Consultants advertised. EOI closing date was 15 Jan 2014. Submission-1 sent to ADB, under review.</p> <p>C. Status of Bidding Process for Civil Works 1. Standard bid documents prepared by EA and sent to ADB for review/ comments - Bids received for Gondi civil works (NCB) on 19 July 2014.</p> <p>2. Project unit to receive comments from OGC and OSFMD - NCB for telemetry (NCB goods) awaited - approved by ADB already. Technical specs approved July 2014.</p> <p>D. PMU established and core PMU staff designated - Yes.</p> <p>E. Status of Safeguard Clearances 1. Status of land acquisition - Not required.</p> <p>2. Status of statutory environmental clearances - Environmental clearance not required by CWC as existing project to be modernized.</p>		
12. Milestones		
Modality	Estimated Approval	Estimated Completion^b
Multitranches financing facility	25 September 2014	30 September 2021
Tranche I	3 October 2014	30 September 2018
Tranche II	15 September 2015	30 September 2021
13. Project Data Sheet (PDS)		
PDS^c	http://www.adb.org/projects/43253-013/main	

^a Multitranches Financing Facility (MFF).

^b For MFF, this refers to the end of the availability period; for tranches, this refers to the tranche closing date.

^c Safeguard documents can be viewed by clicking the Document's hyperlink in the Project Data Sheet (PDS) page.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed multitranche financing facility (MFF) to India for the Karnataka Integrated and Sustainable Water Resources Management Investment Program.¹

2. The investment program will improve water availability to meet competing water demands in selected river basins in the state of Karnataka by implementing integrated water resources management (IWRM). It will improve water use efficiency in irrigated agriculture to provide economic opportunities to improve rural incomes.²

II. THE INVESTMENT PROGRAM

A. Rationale

3. The state, in the south of India, has a population of 61.1 million and covers an area of 191,976 square kilometers (5.83% of the area of India). It is home to one-third of India's information technology and other service industries, and has a gross state domestic product (GSDP) at current prices of \$97.1 billion (FY2012). The main contribution (about 53% in FY2012) to GSDP is from the service sector. The contribution of agriculture to GSDP is relatively small, at 16% in FY2012, and in a declining trend (from about 30% in FY2001). However, agriculture remains the main source of employment for 55% of the population and about 75% of the rural population. The state population is urbanizing, the urban population has increased from 34% to 39% from 2001 to 2011.³ The changing industrial structure and urbanization have had significant impact on the water balance in the state.

4. **Competing demands for water resources.** The state is water-stressed, with increasing water demands from urban and industrial sectors. This is exacerbated by uneven spatial and temporal distribution of water resources and the predicted impacts of climate change. Although Karnataka has two major river basins (the Krishna and Cauvery), its water resources are limited (about 1,072 cubic meters [m³]/person/year in eastward flowing rivers).⁴ Droughts are frequent and 70% of the annual rainfall occurs from June to September. The state's water demand (particularly for industry and household water) is projected to increase by 40% from 37,419 million m³ in 2000 to 52,366 million m³ in 2025.⁵ These demands will cause a decline in the agricultural proportion of total water from 84% in 2000 to 73% by 2025. Meeting the anticipated rise in demand is a major challenge which, if unmet, may constrain sustainable economic growth.

5. **Irrigated agriculture.** About 3.09 million hectares (ha) of land is under irrigation in Karnataka and over 84% of state water resources are used for agriculture. However, cropping intensities (110%–125%) and water use efficiency (40%) are low, and the gross area irrigated in 2009–2010 is about 59% of the potential area. The irrigation sector suffers from deficient infrastructure (resulting from insufficient maintenance and lack of water control structures),

¹ The design and monitoring framework is in Appendix 1.

² The Asian Development Bank (ADB) provided project preparatory technical assistance. ADB. 2011. *Technical Assistance to India for the Karnataka Integrated and Sustainable Water Resources Management Investment Program*. Manila (TA 7954-IND).

³ Government of India, Ministry of Home Affairs, Office of the Registrar General and Census Commissioner. Census 2011. <http://www.indiaonlinepages.com/population/karnataka-population.html> (accessed 9 June 2012).

⁴ The Falkenmark water stress indicator defines water supplies below 1,000 m³/person/year as water stress that will impede economic growth. M. Falkenmark. 1989. *The Massive Water Scarcity Now Threatening Africa: Why Isn't It Being Addressed?* <http://www.jstor.org/stable/4313541>

⁵ Government of India, Planning Commission. 2007. *Karnataka Development Report 2007*. New Delhi: Academic Foundation.

management constraints (low service quality of operators), and limited promotion of water-saving crops and practices. Efficient distribution is impeded by inadequate implementation of command area development works and low participation of water users cooperative societies (WUCSs) in irrigation management.⁶ Improving irrigation water productivity requires (i) increasing water use efficiency, (ii) reducing the gap between the actual and potential area that can be irrigated, and (iii) promoting water efficient techniques and technologies like drip irrigation.⁷ Greater efficiency will be required in water used for agriculture to meet the demands of other users, such as industry.

6. **Vulnerability to climate change.** The predicted impacts of climate change for Karnataka include increased temperatures and increased mean annual rainfall, and decreased and more variable monsoon rainfall.⁸ Overall, the investment program area is found to be vulnerable to increased incidence of seasonal droughts.⁹ This will heighten the requirement for a well-planned and methodical approach to water resources management. An integrated approach to water resources management is a means to reconcile varied and changing water uses and demands since it provides greater flexibility and adaptive capacity than conventional water resources management approaches.¹⁰

7. **Road map, investment program, and lending modality.** An IWRM road map will guide the strengthening of institutional and policy frameworks, capacity building, and development of modernized infrastructure.¹¹ The road map, developed in consultation with senior management of Karnataka's Water Resources Department (WRD) during project preparation, combines the Karnataka state water policy, 2002; the state medium-term plan; and the National Water Mission, 2011 to guide the state government's water sector investments. The road map, through physical and nonphysical investments, will support the state to meet its objective of improved water resources management with milestone performance targets. To achieve this, the state has proposed an ambitious budget allocation of about \$8.5 billion during FY2014–FY2018 (in FY2014, the budgeted allocation is \$2.06 billion). The government has requested the Asian Development Bank (ADB) to contribute to the state's investment program through an MFF, which is well suited for this investment as it is the most effective modality to (i) provide a longer-term lending instrument suited to IWRM process; (ii) afford flexibility in terms of project scope, timing, and size, which may be adjusted to meet emerging priorities of the road map; and (iii) provide sufficient time for institutional strengthening in IWRM for key agencies and water users.

8. **Strategic context, link to government, and ADB strategies.** The state's medium-term plan emphasizes greater visibility of agriculture and allied activities to increase rural incomes, and achieving a sustainable and orderly process of industrialization and urbanization for poverty reduction and sustained human development.¹² The state's water policy of 2002 aims for holistic

⁶ Government of India, State Government of Karnataka, Cooperation Department. 1959. *Karnataka Co-operative Societies Act* (amended in 2012).

⁷ Government of India, Ministry of Water Resources. 2011. *National Water Mission under National Action Plan on Climate Change*. New Delhi.

⁸ Bangalore Climate Change Initiative—Karnataka. 2011. *Karnataka Climate Change Action Plan*. Bangalore.

⁹ The United Nations Convention to Combat Desertification defines drought as the "the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems." (UNISDR, 2009. *Drought Risk Reduction Framework and Practices: Contributing to the Implementation of the Hyogo Framework for Action*. United Nations secretariat of the International Strategy for Disaster Reduction [UNISDR]. Geneva, Switzerland.)

¹⁰ Climate risk screening was carried out. See Project Climate Risk Assessment and Management Report (accessible from the list of linked documents in Appendix 2).

¹¹ Integrated Water Resources Management Road Map (accessible from the list of linked documents in Appendix 2).

¹² State Planning Board. 2009. *Karnataka – A Vision for Development – 2020*. Bangalore.

water resources planning, development, and management to be undertaken for each hydrological unit. The National Water Mission, 2011; National Water Policy, 2012; and the Twelfth Five-Year Plan, 2012–2017 all support the requirement for integrated planning of water resources across various users.¹³

9. The investment program is consistent with ADB's Midterm Review of Strategy 2020 and country partnership strategy, 2013–2017 for India by reinforcing core areas of operations, like infrastructure development for water resources management, investing in irrigation infrastructure to enhance value addition in agriculture, and developing measures to increase water use efficiency.¹⁴ The investment program is also in accordance with the ADB Water Operational Plan, 2011–2020.¹⁵ It will improve water governance by embedding IWRM as an adaptive management process, including for climate change adaptation; and improve water use efficiency to increase availability for competing uses.

10. The state has a number of enabling factors to adopt an IWRM approach, including (i) recognition of the scarcity of, and threats to, water resources; (ii) progressive policy statements; (iii) major investments in water resources infrastructure; (iv) technical capacity; and (v) a progressive outlook, as exemplified by semi-independent institutions of the state WRD like the irrigation corporations or *nigams*, command area development authorities (CADAs), and the Advanced Centre for Integrated Water Resources Management (AC-IWRM).¹⁶

11. Improvements in urban water management will be addressed under a separate ADB-financed investment program.¹⁷ The two investment programs will be closely coordinated through the AC-IWRM.

B. Impact and Outcome

12. The impact of the proposed investment program will be improved sustainable water security in selected river basins in Karnataka. Its outcome will be IWRM successfully implemented in selected river basins in Karnataka.

C. Outputs

13. The program will produce three main outputs: (i) state and basin institutions strengthened for IWRM, (ii) irrigation system infrastructure and management modernized, and (iii) program management systems operational. There will be two key components: Gondi irrigation canal under project 1,¹⁸ and Vijaynagara and Tungabhadra Left Bank Canal (TLBC) under project 2.

1. Output 1: State and Basin Institutions Strengthened for Integrated Water Resources Management

14. The investment program will strengthen institutional capacities of the WRD and AC-IWRM to implement IWRM in selected river basins in Karnataka. This will include (i) the

¹³ Government of India, Ministry of Finance, Planning Commission. 2012. *Twelfth Five Year Plan (2012–2017): Faster, More Inclusive and Sustainable Growth*. New Delhi.

¹⁴ ADB. 2008. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila; ADB. 2013. *Country Partnership Strategy: India, 2013–2017*. Manila.

¹⁵ ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.

¹⁶ State-owned irrigation corporations or *nigams* include Karnataka Neeravari Nigam Limited (KNNL), Krishna Bhagya Jala Nigam Limited, and Cauvery Neeravari Nigam Limited.

¹⁷ ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Financing Facility to India for the Karnataka Integrated Urban Water Management Investment Program*. Manila.

¹⁸ Feasibility Report for the Karnataka Integrated and Sustainable Water Resources Management Investment Program (accessible from the list of linked documents in Appendix 2).

development and implementation of river basin plans to manage water resources better; (ii) capacity building and certification of the WRD (and its associated agencies like Karnataka Neeravari Nigam Limited [KNNL]) in IWRM, with about 30% of trainees being women; and (iii) the establishment of a state water resources information system.¹⁹ The activities to be undertaken are detailed in the IWRM road map.

2. Output 2: Irrigation System Infrastructure and Management Modernized

15. This output will include activities under projects 1 and 2: (i) modernization²⁰ of irrigation infrastructure on three irrigation subprojects within the K-8 subbasin (under project 1) and Vijaynagara and TLBC (under project 2); (ii) strengthening of asset management and main system operation and maintenance (O&M); and (iii) capacity building of more than 82 WUCSs, with at least 30% women's representation on management boards for decision making.

3. Output 3: Program Management Systems Operational

16. This output will be delivery of the above program outputs on time and within budget. The main activities to be undertaken include (i) establishing a fully staffed program management unit (PMU) and project implementation offices (PIOs) with an appointed program director, (ii) procuring equipment, (iii) recruiting and monitoring project support consultants (PSCs) within 6 months after commencement of project 1, (iv) operationalizing a program management information system database within 3 months after commencement of project 1, (v) meeting annual disbursement projections, and (vi) conducting periodic program performance reviews.

17. Activities under project 1 will be (i) IWRM certification for at least 200 WRD staff (of which 75 will be women) under output 1; (ii) modernization of the Gondi irrigation subproject, assistance for capacity building of at least seven WUCSs, and support for the preparation of asset management plans and O&M systems under output 2; and (iii) operationalization of the PMU and PIOs to prepare implementation plans and commence contract awards and disbursements under output 3.

D. Investment and Financing Plans

18. The investment program is estimated to cost \$225 million (Table 1).

19. The government has requested an MFF in an amount up to \$150 million from ADB's ordinary capital resources to help finance a part of the investment program. The MFF will consist of two tranches, subject to the government's submission of related periodic financing requests, execution of the related loan and project agreements for each tranche, and fulfillment of terms and conditions and undertakings set forth in the framework financing agreement.

20. The first tranche of the MFF will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year, and such other terms

¹⁹ The Advanced Centre for Integrated Water Resources Management will be accredited by United Nations Educational, Scientific and Cultural Organization-Institute for Water Education (UNESCO-IHE) as an institute for professional training in integrated water resources management.

²⁰ Irrigation modernization is a process of technical and managerial upgrading (as opposed to mere rehabilitation) of irrigation schemes combined with institutional reforms, with the objective to improve resource utilization (labor, water, economic, environmental) and water delivery service to farms (Food and Agriculture Organization. 1999. *Modernization of irrigation system operations: proceedings of the 5th ITIS network international meeting. Aurangabad. 28–30 October 1998*).

and conditions set forth in the draft loan and project agreements.²¹ The first tranche will be implemented over 4 years from 2014 to 2018. The second tranche is expected to commence in 2015 and last for 6 years until September 2021. The financing plan is in Table 2.

Table 1: Investment Program
(\$ million)

Item	Amount ^a
A. Base Cost^b	
Output 1: State and basin institutions strengthened for IWRM	21
Output 2: Irrigation system infrastructure and management modernized	163
Output 3: Program management systems operational	16
Subtotal (A)	200
B. Contingencies^c	20
C. Financing Charges During Implementation^d	5
Total (A+B+C)	225

IWRM = integrated water resources management.

^a Includes taxes and duties of \$9 million to be financed from government resources.

^b In February 2014 prices.

^c Physical contingencies computed at 5% for civil works, 10% for consulting services and equipment, and zero for other items. Price contingencies computed at 1.8%–2.2% on foreign exchange costs and 8.0% to 9.6% on local currency costs using Asian Development Bank (ADB) domestic cost escalation factors for FY2012–FY2016 as of November 2013; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^d Includes interest and commitment charges. Interest during construction for ADB loans has been computed at the 5-year forward London interbank offered rate plus a spread of 0.5000%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

Table 2: Financing Plan

Source	Investment Program		Project 1	
	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)
Asian Development Bank	150.0	67.0	31.0	64.0
Government	70.0	31.0	16.6	35.0
Beneficiaries ^a	5.0	2.0	0.4	1.0
Total	225.0	100.0	48.0	100.0

^a Beneficiaries are water user cooperative societies, which will provide up-front contributions for implementation of command area development works. The contributions will be the equivalent of 10% of the cost of the command area development works. However, failing such contributions, the government will be responsible for the beneficiaries' portion of financing.

Source: Asian Development Bank estimates.

E. Implementation Arrangements

21. Implementation arrangements are summarized in Table 3 and described in detail in the facility administration manual.²² The existing state steering committee for IWRM, chaired by the chief secretary of the state and comprising representatives from relevant departments, will provide policy direction and strategic guidance on IWRM matters, and oversee coordination of IWRM programs in the state and between agencies. The program coordination committee chaired by the principal secretary of the WRD will provide overall program and policy guidance.

22. For project 1, the state—acting through KNNL—will be the executing agency. The PMU

²¹ The interest includes a maturity premium of 10 basis points. This is based on the above loan terms and the government's choice of repayment options and dates.

²² Facility Administration Manual (accessible from the list of linked documents in Appendix 2).

will be located within KNNL. The managing director of KNNL will be the program director, and will implement the program under the overall guidance of the state IWRM steering committee and the program coordination committee, with the support of PSCs. The PMU will have day-to-day responsibility for implementing the investment program. A PIO for output 1 will be established within the AC-IWRM to be responsible for implementation of all IWRM-related activities of output 1. For output 2, each irrigation subproject to be modernized will have a dedicated PIO that will comprise field staff of KNNL who will be strengthened with specific technical expertise from CADAs and PSCs. The PMU working with the PIO and PSCs will monitor overall program execution and will be responsible for monitoring and reporting.

23. Consulting services will provide technical support for program implementation. The three main consulting services packages will be for the (i) PSCs, (ii) IWRM, and (iii) services for monitoring and evaluation (including environmental and effects monitoring). The PSCs will be initially engaged for 4 years under project 1 and another 3 years under project 2.²³ Firms will be recruited using the quality- and cost-based selection method.²⁴ The total inputs required for PSCs for project 1 will be 230 person-months, including 20 person-months of international and 210 person-months of national consultants. For IWRM, the AC-IWRM will recruit 27 person-months of international individual consultants and seven person-months of national individual consultants.

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	October 2014–September 2021		
Estimated completion date	30 September 2021		
Management			
(i) Oversight body	State IWRM steering committee, chaired by chief secretary		
(ii) Executing agency	The state acting through KNNL (and other agencies with responsibilities concerning water resources issues)		
(iii) Key implementing agencies	The Advanced Centre for IWRM will be responsible for the implementation of output 1. KNNL, other <i>nigams</i> (irrigation corporations), and agencies with responsibilities concerning water resources issues, including CADAs and WUCSs, will be responsible for implementing all other activities.		
(iv) Implementation unit	Program Management Unit, Bangalore (8 technical staff) Advanced Centre for IWRM, Bangalore (6 technical staff) Project 1 Implementation Office, Shimoga (10 technical staff)		
Procurement	Gondi civil works for project 1 (NCB)	1 contract	\$16.00 million
	Vijaynagara civil works for project 2 (ICB)	1 contract	\$64.00 million
	TLBC for project 2 civil works (ICB)	1 contract	\$85.00 million
	Installation of telemetry (ICB)	1 contract	\$3.50 million
Consulting services	PSC (QCBS)	230 person-months (20 international and 210 national)	\$3.70 million
	IWRM consultants (individual)	34 person-months (27 international and 7 national)	\$0.80 million
	Environmental monitoring (QCBS)	Lump sum contract	\$0.48 million
	Effects monitoring (QCBS)	Lump sum contract	\$0.18 million
Retroactive financing and/or advance	ADB may, subject to its policies and procedures, allow upon request advance contracting of civil works, equipment and materials, and consulting services. Any		

²³ The consulting firm for PSCs for project 1 may be reengaged for project 2 using single source selection subject to its satisfactory performance and availability of funds.

²⁴ The priority for PSCs is quality outputs. The innovative approach of IWRM and specialist expertise required justifies a 90:10 weighting that will be used for technical and financial evaluation.

Aspects	Arrangements
contracting	approval of advance contracting will not constitute a commitment by ADB to finance the project. Retroactive financing may be considered for eligible expenditures incurred for consulting services, and procurement of goods, service, and civil works, no earlier than 12 months before the loan signing date, and not exceeding 20% of the relevant loan amount.
Disbursement	The loan and/or grant proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.

ADB = Asian Development Bank, CADA = command area development authority, ICB = international competitive bidding, IWRM = integrated water resources management, KNNL = Karnataka Neeravari Nigam Limited, NCB = national competitive bidding, PSC = project support consultant, QCBS = quality- and cost-based selection, TLBC = Tungabhadra Left Bank Canal, WUCS = water users cooperative society.

Source: ADB. 2013. *Final Report for the Karnataka Integrated and Sustainable Water Resources Management Investment Program*. Consultant's report. Manila (TA 7954-IND).

24. For monitoring and evaluation, two separate consulting services will be required: (i) environmental monitoring, and (ii) baseline and effects monitoring surveys at midterm and program completion. A baseline study will be undertaken in November 2014.

25. All procurement of works and equipment will be undertaken in accordance with ADB's *Procurement Guidelines* (2013, as amended from time to time), while recruitment of consultants and other services will be undertaken in accordance with ADB's *Guidelines on the Use of Consultants* (2013, as amended from time to time).²⁵

III. DUE DILIGENCE

26. The investment program will contribute to holistic water resources management in selected subbasins by implementing IWRM principles. The quantifiable benefits will be irrigation system modernization and improved farm practices, which will result in water savings that may be productively utilized within the subbasin by other users. Improved irrigation water use efficiency will potentially benefit about 1.5 million people, and will result in an additional 1,700 million m³ of water that can be saved and used irrigating an additional 160,000 ha). Farmers' incomes will also increase from incremental crop production by \$1,054 for marginal households and \$3,911 for small households.²⁶

A. Technical

27. The program will contribute to improved water resources management by introducing automatic flow measurement and telemetry within the K-8 sub-basin and on projects 1 and 2 irrigation subprojects. System modernization will include installation of gravity pipe distribution within the command area to improve water use efficiency.

B. Economic and Financial

28. Economic and financial analyses undertaken for project 1 indicate that the project is economically viable. It provides benefits through increased agricultural productivity and household incomes. Improved irrigation service delivery will lead to increased yields of up to 46% for paddy rice and 20% for other crops. The economic internal rate of return for project 1 is

²⁵ Procurement Capacity Assessment and Financial Management Assessment (accessible from the list of linked documents in Appendix 2).

²⁶ ADB. 2013. *Economic and Financial Analysis for Karnataka Integrated and Sustainable Water Resources Management Investment Program* (TA 7954-IND). Consultant's report. Manila. A marginal household is defined as holding up to 1 ha of land, while a small household holds 1 ha–2 ha (Bimal Misri. 1999. *Country Pasture/Forage Resource Profiles*. India).

estimated at 17%. The sensitivity tests and risk analysis confirm that project 1 is robust. However, incremental benefits to the project are sensitive to construction delays. Benefit distribution analyses confirm that a substantial proportion of the total project benefits will be shared by farmers and the poor.²⁷

29. The WUCSs and KNNL will continue to maintain systems through WUCS contributions and state budget support. KNNL and the AC-IWRM are not directly responsible for loan repayment, which will be from the state. Overall, the state shows good fiscal health with a GSDP for FY2012 of over \$97.1 billion, and a declining trend in fiscal deficit from 3.24% in FY2010 to 2.92% in FY2012. The repayment of \$150 million is not considered to pose a serious debt burden on the state.

C. Governance

30. Financial management assessments carried out for KNNL and the AC-IWRM confirm the absence of substantive financial management and procurement risks. Although neither agency has experience with implementing externally financed development projects, the risk for each agency is considered minimal. This is because KNNL has extensive experience in financial management, procurement, and implementation of large irrigation projects in accordance with the statutory requirements of the state and India. The AC-IWRM, though it is a recently established organization, has suitably qualified and experienced staff and is already operational and managing a sizeable budget for operations. Both KNNL and the AC-IWRM will be supported by the state, which has extensive experience in water resources-related and externally financed projects.

31. The investment program has established clear input and output targets to facilitate good governance, accountability, and transparency. Procurement of works, goods, and services financed by ADB will be in accordance with its Procurement Guidelines and Guidelines on the Use of Consultants. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and the executing agency. The specific policy requirements and supplementary measures are described in the facility administration manual. Financial management capacity within KNNL and the AC-IWRM will be strengthened by (i) providing capacity building on ADB disbursement, financial, and project management guidelines; (ii) assigning existing staff in KNNL at several levels (state, chief accounts officer, and zonal levels) with additional responsibility for financial management of the project; (iii) introducing mandatory e-procurement for all contracts valued at more than \$4,000, subject to assessment and clearance of the systems used for electronic bidding by ADB;²⁸ (iv) ensuring civil works contracts include a condition that contractors adhere to ADB's Anticorruption Policy (1998, as amended to date); and (v) reporting on project activities and implementation on the KNNL and program websites to foster transparency and timely awarding of contracts.

D. Poverty and Social

32. Assessments have been completed for project 1 subprojects to prepare strategies for poverty reduction and social development impact.²⁹ The project interventions will (i) strengthen WUCSs for improved water use efficiency on irrigation systems and collective actions to increase agricultural productivity; (ii) improve irrigation infrastructure and practice for equitable access to water by small, marginal, and landless farmers; (iii) improve annual farm incomes by over 50% from \$693 to \$1,053 for marginal households; (iv) introduce sustainable and innovative irrigation

²⁷ Detailed Economic and Financial Analysis (accessible from the list of linked documents in Appendix 2).

²⁸ e-GP System Assessment Report (accessible from the list of linked documents in Appendix 2).

²⁹ Summary Poverty Reduction and Social Strategy (accessible from the list of linked documents in Appendix 2).

and agricultural practices, like drip irrigation; and (v) facilitate social inclusion.

33. Women will benefit from (i) capacity building in IWRM; (ii) capacity building in water governance by participating in WUCSs; (iii) skills training in improved land and water management; (iv) participation in infrastructure development; and (v) overall benefits from increased agricultural production.³⁰ Specific activities will include (i) professional training of about 200 women in IWRM; (ii) at least 30% representation of women from the current 20% in 2014 in WUCS management boards; and (iii) gender-specific capacity building for women in water management and WUCS participation. The PSCs will include a social development and gender specialist for 24 person-months and each PIO will include one female community organizer. Tranche 1 is categorized as effective gender mainstreaming.

E. Safeguards

34. **Environment.** Project 1 is categorized B for environment in accordance with ADB's Safeguard Policy Statement (2009). It comprises canal modernization for the Gondi medium irrigation subproject and installation of flow measurement devices within the subbasin. An initial environmental examination has been prepared for project 1.³¹ An environmental assessment and review framework has also been developed for the MFF to guide subsequent subprojects and development interventions.³² Consultations were undertaken with affected stakeholders, and the existing grievance redress mechanism of the state will be adopted.

35. **Involuntary resettlement.** Project 1 is categorized C for involuntary resettlement. This is because the project involves modernization of an existing canal system within the existing right-of-way, and the WRD already owns the right-of-way of 5 meters alongside the canals for facilitating maintenance works and for access. No land acquisition or other losses will result in involuntary resettlement under project 1. A resettlement framework has been prepared for the entire MFF pursuant to the Safeguard Policy Statement, and it will be followed for the subsequent projects.³³

36. **Indigenous peoples.** Project 1 is categorized C for the indigenous peoples safeguard. There are no indigenous peoples, as defined by the Safeguard Policy Statement, in any of the areas of project 1 or subsequent projects under the investment program. As subsequent projects would also be categorized C, an indigenous peoples planning framework has not been prepared.

37. Based on preliminary investigation, project 2 subprojects are expected to be categorized similarly to project 1 subprojects. The resettlement framework and the environment and assessment review framework are sufficiently comprehensive to consider any subprojects that may deviate from the anticipated categorization.

38. In accordance with ADB's Public Communications Policy (2011), the investment program communication strategy sets out the KNNL and implementing agencies' requirements for (i) types of information to be disclosed; (ii) mechanisms for notice, including language and timing; and (iii) implementation and monitoring responsibilities for information disclosure and dissemination.

³⁰ Gender Action Plan (accessible from the list of linked documents in Appendix 2).

³¹ Initial Environmental Examination (accessible from the list of linked documents in Appendix 2).

³² Environmental Assessment and Review Framework (accessible from the list of linked documents in Appendix 2).

³³ Resettlement Framework (accessible from the list of linked documents in Appendix 2).

F. Risks and Mitigating Measures

39. Major risks and mitigating measures are summarized in Table 4 and detailed in the risk assessment and risk management plan.³⁴ The integrated benefits are expected to outweigh the cost.

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Lack of experience of KNNL and AC-IWRM in implementation and/or management of externally financed projects	Capacity building in advance of loan approval in ADB financial management, disbursement, procurement, and safeguard policies and procedures. Training for PMU, AC-IWRM, and PIO staff to expedite loan disbursements. Advance actions for timely recruitment of PSCs to provide technical backstopping to PMU, AC-IWRM, and PIO.
Infrastructure sustainability	Asset inventory and MIS for infrastructure performance monitoring and maintenance planning. Progressive increase of maintenance fund allocation by the state government of Karnataka in public infrastructure. Improved technical management of O&M of assets established at field level, with higher transparency and accountability. WUCS capacity building in operating and maintaining infrastructure.

AC-IWRM = Advanced Centre for Integrated Water Resources Management, ADB = Asian Development Bank, KNNL = Karnataka Neeravari Nigam Limited, MIS = management information system, O&M = operation and maintenance, PIO = project implementation office, PMU = program management unit, PSC = project support consultant, WUCS = water user cooperative society.

Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

40. The government, the state, and the KNNL have assured ADB that implementation of the investment program shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the facility administration manual and loan documents.

41. The government, the state, and KNNL have given ADB certain undertakings for the MFF, which are set forth in the framework financing agreement. Specific covenants agreed on by the government, state, and KNNL with respect to individual tranches under the MFF are set forth in the loan agreement and project agreement for the respective tranches.

V. RECOMMENDATION

42. I am satisfied that the proposed multitranche financing facility would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the multitranche financing facility to India for the Karnataka Integrated and Sustainable Water Resources Management Investment Program in an aggregate principal amount not exceeding the equivalent of \$150,000,000, which comprises the provision of loans from ADB's ordinary capital resources, with interest and other terms to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, and is subject to such other terms and conditions as are substantially in accordance with those set forth in the framework financing agreement presented to the Board.

Takehiko Nakao
President

3 September 2014

³⁴ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

DESIGN AND MONITORING FRAMEWORK FOR THE INVESTMENT PROGRAM

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>Impact Improved sustainable water security in selected river basins in Karnataka</p>	<p>By 2025: Nonagricultural use increases from 16% (in 2000) to 27% of total water use</p> <p>State gross value in real terms of annual agricultural production increases from Rs620.6 billion to Rs931.0 billion</p>	<p>WRD and/or KNNL annual reports and scheme monitoring reports</p> <p>Economic Survey of Karnataka, FY2013</p>	<p>Assumption Interstate water agreements are maintained</p> <p>Risk Climate change impacts exceed projections</p>
<p>Outcome IWRM successfully implemented in selected river basins in Karnataka</p>	<p>By 2021: State water resources management strategies institutionalized</p> <p>Systems for quantitative water use by sectors are established (from 2018)</p> <p>99 out of 110 WUCSs confirm receipt of water service (baseline = 0)</p>	<p>WRD and/or KNNL annual reports and scheme monitoring reports</p> <p>WRA annual reports</p> <p>AC-IWRM annual report and state annual budget report</p> <p>KNNL annual and scheme monitoring reports</p>	<p>Assumption Continued political and community and stakeholder support at the national level to sustain and proceed with reforms</p>
<p>Outputs 1. State and basin institutions strengthened for IWRM</p>	<p>By 2021: At least three river basin plans are developed (baseline = 0)</p> <p>At least 600 WRD staff (of which about 200 are women staff) are certified in IWRM (baseline = 0)</p> <p>State water resources information systems established (baseline = 0)</p>	<p>River basin management meeting minutes</p> <p>WRD and KNNL reports and minutes</p> <p>AC-IWRM and WRA annual reports</p>	<p>Assumption Certified WRD staff remain in office</p>

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks								
2. Irrigation system infrastructure and management modernized	<p>By 2021: 300 km of irrigation canal upgraded (baseline = 0 km)</p> <p>Asset management plans implemented for main system infrastructure on three selected systems (baseline = 0)</p> <p>More than 82 of 110 WUCSs operate and maintain transferred infrastructure, including fee collection (baseline = 0)</p> <p>About 30% of WUCS management boards are women</p>	<p>WRD and/or KNNL annual reports and scheme monitoring reports</p> <p>CADA annual report</p>	<p>Assumption State government continues to support irrigation management transfer, and WUCSs collecting irrigation service fees</p>								
3. Program management systems operational	Project outputs delivered on time and within budget	Quarterly disbursement and contract award projections and financial reports prepared by WRD and/or KNNL									
<p>Activities with Milestones</p> <ol style="list-style-type: none"> 1. State and basin institutions strengthened for IWRM <ol style="list-style-type: none"> 1.1 Complete institutional and/or capacity assessment (WRD, KNNL, AC-IWRM) (November 2014) 1.2 Appoint staff for AC-IWRM (November 2014) 1.3 Implement IWRM certification program (September 2015) 1.4 Prepare river basin resources inventories prepared (May 2017) 1.5 Endorse State IWRM strategy by IWRM steering committee (May 2019) 1.6 Establish water resources system and use for river basin planning (September 2020) 1.7 Complete pilot projects for land and water management, remote sensing of water consumption, water use efficiency, and water productivity (March 2021) 1.8 Prepare river basin plans and implement in three subbasins (August 2021) 2. Irrigation system infrastructure and management modernized <ol style="list-style-type: none"> 2.1 Identify location for telemetry systems throughout subbasin (July 2014) 2.2 Initiate civil works for Gondi irrigation subproject (April 2015) 2.3 Prepare feasibility studies and detailed project reports for Vijaynagara and TLBC irrigation subprojects (before May 2015) 			<p>Inputs (\$ million)</p> <table border="0"> <tr> <td>ADB (Loan)</td> <td style="text-align: right;">150.0</td> </tr> <tr> <td>Government</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Beneficiaries</td> <td style="text-align: right;">5.0</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">225.0</td> </tr> </table>	ADB (Loan)	150.0	Government	70.0	Beneficiaries	5.0	Total	225.0
ADB (Loan)	150.0										
Government	70.0										
Beneficiaries	5.0										
Total	225.0										

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<ul style="list-style-type: none"> 2.4 Initiate civil works for Vijaynagara and TLBC irrigation subprojects (May 2016) 2.5 Prepare main system asset management and operation and maintenance plan for all irrigation subprojects (May 2020) 2.6 Install telemetry systems throughout selected subbasins (May 2021) 2.7 Complete capacity building of 110 WUCSs and sign service agreement with KNNL at Vijaynagara and TLBC irrigation subprojects (August 2021) <p>3. Program management systems operational</p> <ul style="list-style-type: none"> 3.1 Fully staff PMU and PIO with an appointed project director by loan effectiveness (October 2014) 3.2 Operate program MIS 3 months after project 1 effectiveness (December 2014) 3.3 Procure all required equipment (December 2014) 3.4 Recruit PSC and monitor within 6 months of loan effectiveness (December 2014) 3.5 Meet annual disbursement projections (commencing May 2015) 3.6 Submit periodic financing for project 2 (August 2015) 3.7 Complete midterm effects monitoring (January 2018) and investment program effects monitoring (May 2021) 			

AC-IWRM = Advanced Centre for Integrated Water Resources Management, ADB = Asian Development Bank, CADA = Command Area Development Authority, FY = fiscal year, IWRM = integrated water resources management, km = kilometer, KNNL = Karnataka Neeravari Nigam Limited, MIS = management information system, PIO = project implementation office, PMU = project management unit, PSC = project support consultant, TLBC = Tungabhadra Left Bank Canal, WRA = Water Resources Regulatory Agency, WRD = Water Resources Department, WUCS = water users cooperative society.

Note: Baseline data supplied by project preparatory technical assistance for Karnataka Integrated and Sustainable Water Resources Management Investment Program (TA 7954-IND).

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=43253-013-3>

1. Framework Financing Agreement
2. Periodic Financing Request for Project 1
3. Sector Assessment (Summary): Agriculture and Natural Resources
4. Facility Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Economic and Financial Analysis
8. Country Economic Indicators
9. Summary Poverty Reduction and Social Strategy
10. Gender Action Plan: Gondi Subproject – Tranche 1
11. Initial Environmental Examination
12. Environmental Assessment and Review Framework
13. Resettlement Framework
14. Risk Assessment and Risk Management Plan

Supplementary Documents

15. Integrated Water Resources Management Road Map
16. Feasibility Report for the Karnataka Integrated and Sustainable Water Resources Management Investment Program
17. Procurement Capacity Assessment
18. e-GP System Assessment Report
19. Financial Management Assessment
20. Water Users Cooperative Society and Agriculture Development at Subproject and State Level Implementation
21. Detailed Economic and Financial Analysis
22. Project Climate Risk Assessment and Management Report
23. Comparison of Financing Modality