ADB

India-ADB Development Partnership 2013

Asian Development Bank

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April 13, 2013

MESSAGE

1. Asian Development Bank (ADB) has been a valued development partner of the Government of India since it began operations in India in 1986. India has been among the top three borrowers from the ADB since 2007. Till date, ADB has approved 168 sovereign loans amounting to $ 27.2 billion.

2. I am happy to note that a large share of ADB's development assistance in recent years has been targeted at low income and special category States. The Government also appreciates the value addition that ADB projects provide in terms of sharing of international and regional best practices. Indeed, from the Government's perspective, external assistance must garner innovation impulse whereby projects contribute over and above the direct finance they bring – by making systemic or transformational impacts, introducing new technologies and piloting new approaches, and leveraging finance.

3. In this context, I am especially pleased to note that this publication not only provides an overview of the close development partnership between India and ADB through a compendium of ongoing projects and case studies, but it also highlights the elements of innovation impulse in the projects and showcases the impact of development assistance on people's lives and livelihoods.

4. I am delighted that the 46th Annual Meeting of ADB's Board of Governors this year provides an opportunity to reinforce the India-ADB partnership. As India marches towards prosperity for its people, we look forward to ADB's continued partnership in supporting India's development agenda. On its part, the Government will remain fully supportive of ADB's endeavors and for a poverty-free Asia.

(Arvind Mayaram)

Preface

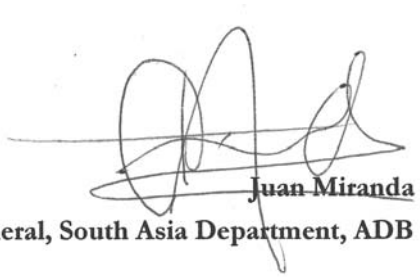
The growing partnership between the Asian Development Bank (ADB) and India is a matter of great satisfaction and pride for us. For ADB, it has been a privilege to partner with India and support the Government of India's endeavor to achieve growth that is high, inclusive, and sustainable.

Since the commencement of lending operations in India in 1986, ADB has continually sought to tailor its operations to support the government's evolving development agenda. ADB has been working in close cooperation with the government to enhance the reach and effectiveness of its program.

This publication captures the wide breadth and depth of ADB's India program and showcases the synergies with the government that have enabled ADB to incorporate thematic concerns such as inclusive growth, environmental sustainability, gender equity, private sector development, and capacity development into its operations. A case in point is the recent partnership between the India Infrastructure Finance Company Limited and ADB to develop credit enhancement products that support local bond issuances by infrastructure project special-purpose vehicles. Given India's burgeoning infrastructure financing requirements, innovative financing instruments that leverage private sector funds has become a development imperative.

It gives me pleasure to note that the publication has materialized at a time when India is the gracious host of the 46th Annual Meeting of ADB's Board of Governors. It is an apt tribute to the ever strengthening India-ADB collaboration.

I wish to thank ADB's stakeholders and partners on this occasion, and hope we will continue our productive partnership to strengthen the effectiveness and sustainability of our development efforts.



Juan Miranda
Director General, South Asia Department, ADB

Foreword

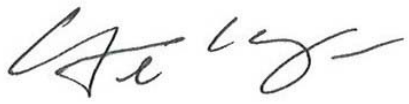
The 46th Annual Meeting of the Board of Governors of the Asian Development Bank (ADB), being held in Delhi, provides an excellent opportunity for ADB to celebrate a very constructive and mutually enriching development partnership with the Government of India. The theme of the Annual Meeting—Development through Empowerment—also symbolizes the core concern of Indian policy makers for growth that is high, inclusive, and sustainable. ADB's partnership with India supports these strategic goals of the government.

ADB remains committed to helping India strengthen its core infrastructure requirements in the energy, transportation, urban, and agriculture and natural resources sectors. ADB's interventions in these sectors are improving connectivity and helping create new growth centers leading to better livelihood opportunities as well as improving lives of people. They are also catalyzing private sector financing of infrastructure and supporting state-level public resource management reforms. Planned interventions in the human development sector are intended to support the government's endeavor to tackle the skills shortage among the workforce in India. Support for regional cooperation and private sector development, including public private partnerships, has been growing over the years. Support for environmental sustainability is being extended through development of clean and renewable sources of energy, interventions in integrated water resource management, and improving civic amenities in urban areas, among others.

In all its work in India, ADB is guided by the government's "Innovation Impulse with Investment" approach whereby external assistance must leverage international experience and its own knowledge base to support systemic transformations.

This publication captures the depth and range of ADB's operations in India and also provides a glimpse of how ADB's close engagement with the government is helping ADB improve the overall relevance of its assistance program. Building on the enthusiastic response to the first edition from various stakeholders, the second edition has been developed incorporating new approved projects and case studies. The publication includes project briefs and case studies covering a total of 52 projects across ADB's sectors of operation in India. The briefs focus on project outputs and outcomes as well as their innovative elements, giving a holistic overview of currently ongoing projects.

I would like to thank the Government of India for its continued encouragement and guidance that has helped ADB improve the development results of its assistance program. I hope the publication serves its purpose in disseminating key elements and lessons from ADB's operations in India—lessons that will be useful not just for development practitioners in India, but also for other developing member countries as well.



Hun Kim
Country Director, India Resident Mission, ADB

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In addition to the core team, contributions were made by ADB staff at INRM and headquarters, and spanning various sectors and areas, as follows:

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Contents

Abbreviations

ADB	Asian Development Bank
AEGCL	Assam Electricity Grid Corporation Limited
AGPRMP	Assam Governance and Public Resource Management Sector Development Program
ANR	Agriculture and Natural Resources
APDRP	Accelerated Power Development and Reform Program
APDCL	Assam Power Distribution Company Limited
APGCL	Assam Power Generation Corporation Limited
APSDP	Assam Power Sector Development Program
APSEIP	Assam Power Sector Enhancement Investment Program
ASEAN	Association of South East Asian Nations
ASEB	Assam State Electricity Board
ASEI	Asia Solar Energy Initiative
AT&C	Aggregate Technical and Commercial
BGFI	Bond Guarantee Fund of India
BEE	Bureau of Energy Efficiency
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BMRT	Bangalore Metro Rail Transit
BPL	Below Poverty Line
BRT	Bus Rapid Transit
BSEB	Bihar State Electricity Board
BSHP	Bihar State Highways Project
BSRDC	Bihar State Road Development Corporation
CAAN	Civil Aviation Authority of Nepal
CAD	Command Area Development
CCS	Cooperative Credit Scheme
CDM	Clean Development Mechanism
CDRC	Capacity Development Resource Centre
CEDMAP	Centre for Entrepreneurship Development in Madhya Pradesh
CGCs	Community Group Committees
CIDP	Chhattisgarh Irrigation Development Project
CKM	Circuit Kilometre
CO_2	Carbon Dioxide
CPS	Country Partnership Strategy
CPSU	Central Public Sector Undertaking
CS-DRMS	Commonwealth Secretariat Debt Recording Management System
CSP	Concentrated Solar Power
CST	Central Sales Tax
CTMIS	Computerized Treasury Management Information System
CWC	Central Water Commission
CWPRS	Central Water and Power Research Station
DBFOT	Design Build Finance Operate Transfer
DBO	Design-Build-Operate
DCCBs	District Central Cooperative Banks
DCT	Department of Commercial Taxes
DEAS	Double-Entry Accounting System
DFC	Dedicated rail Freight Corridor
DFID	Department for International Development
DISCOM	Distribution Company
DMC	Developing Member Countries
DMU	Debt Management Unit
DOA	Department of Agriculture
DOT	Department of Tourism
DOWR	Department of Water Resources
DTR	Distribution Transformers
EE	Energy Efficiency
EGM	Effective Gender Mainstreaming
ERA	Economic Reconstruction Agency
ERM	Enterprise Risk Management
ERP	Enterprise Resource Planning
ESSF	Environmental and Social Safeguards Framework
ETC	Electronic Toll Collection
F&L	Finance and Leasing
FRBM	Fiscal Responsibility and Budget Management
FRERM	Flood and Riverbank Erosion Risk Management
FREMAA	Flood and River Erosion Management Agency of Assam
FY	Financial Year
GAIL	Gas Authority of India Limited
GAP	Gender Action Plan
GDP	Gross Domestic Product
GHG	Green House Gas
GIS	Geographic Information System
GPS	Global Positioning System
GSDP	Gross State Domestic Product
GW	Giga Watt
GWh	Giga Watt Hour
ha	hectare
HDFC	Housing Development Finance Corporation Limited

HPC	High Power Committee
HPP	Hydro Power Plant
HPPCL	Himachal Pradesh Power Corporation Limited
HPSEB	Himachal Pradesh State Electricity Board
HPPTCL	Himachal Pradesh Power Transmission Corporation Limited
HUDCO	Housing and Urban Development Corporation
HVA	High Value Agriculture
HVDC	High Voltage Direct Current
HVDS	High Voltage Distribution System
ICT	Information and Communication Technology
IDBI	Industrial Development Bank of India
IDF	Infrastructure Debt Fund
IDFC	Infrastructure Development Finance Company Limited
IDSAP	Institutional Development and Strengthening Action Plan
IFMR	Institute for Financial Management and Research
IIDC	Integrated Infrastructure Development Centre
IEP	Integrated Energy Policy
IFC	International Finance Corporation
IIFCL	India Infrastructure Finance Company Limited
IIP	Intensive Intervention Program
IIPDF	India Infrastructure Project Development Fund
IIPFF	India Infrastructure Project Financing Facility
IL&FS	Infrastructure Leasing & Financial Services Limited
IMGC	India Mortgage Guarantee Corporation Private Limited
INR	Indian Rupees
INRM	India Resident Mission
IPC	Irrigation Potential Created
IPP	Independent Power Producer
IPU	Irrigation Potential Utilized
IR	Indian Railways
IT	Information Technology
IVC	Integrated Value Chain
IWRM	Integrated Water Resources Management
JFPR	Japan Fund for Poverty Reduction
JNNSM	Jawaharlal Nehru National Solar Mission
JSS	Jan Shikshan Sansthan
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
KEIP	Kolkata Environmental Improvement Project
KEIP	Kolkata Environmental Improvement Project
Kgoe	Kilograms of oil equivalent
kh	Kilowatt Hour
KI	*Khadi* Institutions
KL	Kilo Litres
KMC	Kolkata Municipal Corporation
kV	Kilo Volt
kVAR	Kilo Volt Amperes Reactive
KVI	*Khadi* and Village Industries
KVIB	*Khadi* and Village Industries Board
KVIC	*Khadi* and Village Industries Commission
KUIDFC	Karnataka Urban Infrastructure Development and Finance Corporation
LAEDCL	Lower Assam Electricity Distribution Company Limited
LDT	Lumbini Development Trust, Nepal
LPG	Liquefied Petroleum Gas
LT	Low Tension
LTU	Large Taxpayer Unit
M&E	Monitoring and Evaluation
MAPP	Municipal Action Plan for Poverty
MDONER	Ministry of Development of North Eastern Region
MDR	Major District Roads
MFF	Multi-tranche Financing Facility
MFI	Multilateral Financial Institutions
mha	Million Hectare
MHC	Mizoram Health Care
MIS	Management Information System
MIPMS	Management information and Project Management System
MLD	Million Litres per Day
MMI	Major and Medium Irrigation
MNRE	Ministry of New and Renewable Energy
MOF	Ministry Of Finance
MoU	Memorandum of Understanding
MOUD	Ministry Of Urban Development
MOWR	Ministry Of Water Resources
MPERC	Madhya Pradesh Electricity Regulatory Commission
MPPKVVC	Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company Limited
MPMKVVC	Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited
MPPTC	Madhya Pradesh Power transmission Company Limited
MPPSDIP	Madhya Pradesh Power Sector Development Investment Program
MPPSIP	Madhya Pradesh Power Sector Investment Program
MPRDC	Madhya Pradesh Road Development Corporation
MSME	Micro Small and Medium Enterprises

MSMEDP	Micro Small and Medium Enterprises Development Project
MSW	Municipal Solid Waste
MT	Million Tonnes
MTEF	Medium Term Expenditure Framework
MVA	Mega Volt Ampere
MVAR	Mega Volt Amperes Reactive
MW	Mega Watt
MWh	Mega Watt Hour
NABARD	National Bank for Agriculture and Rural Development
NAPCC	National Action Plan on Climate Change
NCR	National Capital Region
NCERT	National Council of Educational Research and Training
NCRPB	National Capital Region Planning Board
NER	North East Region
NERCCDIP	North Eastern Regional Capital Cities Development Investment Program
NESRIP	North Eastern State Roads Investment Program
NFSM	National Food Security Mission
NGO	Non-Government Organisation
NHB	National Housing Bank
NHDP	National Highway Development Program
NHAI	National Highway Authority of India
NMEEE	National Mission for Enhanced Energy Efficiency
NMSA	National Mission for Sustainable Agriculture
NPGDIP	National Power Grid Development Investment Program
NPS	National Pension Scheme
NRW	Non Revenue Water
NSDC	National Skill Development Corporation
NTPC	National Thermal Power Corporation of India Limited
NVEQF	National Vocational Education Qualifications Framework
NWM	National Water Mission `
O&M	Operations and Maintenance
OBB	Outcome Based Budgeting
OCR	Ordinary Capital Resources
OIIAWMIP	Orissa Integrated Irrigated Agriculture and Water Management Investment Program
OPGW	Optical Ground Wire
OTDC	Orissa Tourism Development Corporation
PACs	Primary Agriculture Credit Societies
PAT	Perform Achieve and Trade
PCG	Partial Credit Guarantee
PDF	Project Development Fund
PEARL	Peer Experience and Reflective Learning
PEFM	Public Expenditure and Financial Management
PFI	Partner Financial Institution
PFR	Periodic Financing Request
PGCIL	Power Grid Corporation of India Limited
PIM	Participatory Irrigation Management
PIU	Project Implementing Unit
PMGSY	Pradhan Mantri Gram Sadak Yojna
PMU	Project Management Unit
POWERGRID	Power Grid Corporation of India Limited
PP	Pani Panchayat
PPP	Public Private Partnership
PPPAC	PPP Appraisal Committee
PRAMC	Planning and Road Asset Management Center
PSDS	Private Sector Development Strategy
PSE	Public Sector Enterprise
PSM	Public Sector Management
PSO	Private Sector Operation
PSOD	Private Sector Operations Department
PSP	Private Sector Participation
PSU	Project Support Unit
PTCUL	Power Transmission Corporation of Uttarakhand Limited
PURA	Providing Urban amenities to Rural Areas
PWD	Public Works Department
R&M	Renovation and Modernization
R&U	Rehabilitation and Upgrade
R-APDRP	Restructured Accelerated Power Development and Reform Program
RAY	Rajiv Awas Yojna
RBL	Ratnakar Bank Limited
RCD	Roads Construction Department
RCI	Regional Cooperation and Integration
RCTRC	Rural Connectivity Training and Research Centres
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RKVY	Rashtriya Krishi Vikas Yojana
RKM	Route Kilometre
RMSA	Rashtriya Madyamik Shiksha Abhiyan
RN	Regional Network
RNFS	Rural Non Farm Services
ROB	Railway-Over Bridges
RRS	Rural Roads Sector
RTE	Right To Education
RTN	Research and Training Network
RUIDP	Rajasthan Urban Infrastructure Development Project

RUSDIP	Rajasthan Urban Sector Development Investment Program
SAARC	South Asian Association for Regional Cooperation
SAFTA	South Asia Free Trade Agreement
SARDP-NE	Special Accelerated Road Development Program for North-East
SASEC	South Asia Sub-regional Economic Cooperation
SCERT	State Council of Educational Research and Training
SCADA	Supervisory Control & Data Acquisition
SCICI	Shipping Credit and Investment Company of India Limited
SEWA	Self Employed Women's Association
SFCs	State Finance Corporations
SHDP	State Highway Development Program
SHG	Self Help Group
SHPP	Small Hydro Power Producer
SHS	Solar Home System
SIDBI	Small Industries Development Bank of India
SIO	Sub-project Implementation Office
SME	Small and Medium Enterprises
SMP	Shoreline Management Plan
SRS	Slum Rehabilitation Scheme
SPPS	Single Point Power Supply
SRRDA	State Rural Road Development Agencies
SSA	Sarv Shiksha Abhiyan
SSC	Sector Skill Council
SSDM	State Skill Development Missions
STA	State Technical Agency
STP	Sewerage Treatment Plant
SW	Surface Water
SWM	Solid Waste Management
SWP	State Water Policy
T&D	Transmission and Distribution
TA	Technical Assistance
TAG	Technical Advisory Group
TCT	Transport and Communications
TIMS	Tax Information Management System
tpd	Tonnes Per Day
TPRM	Tripartite Portfolio Review Meetings
TRADECO	Trade Company
TRANSCO	Transmission Company
UFW	Unaccounted-For Water
UID	Unique Identification
UIG	Urban Infrastructure and Governance
UJVNL	Uttarakhand Jal Vidyut Nigam Limited
ULB	Urban Local Body
UMPP	Ultra Mega Power Project
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UN-HABITAT	United Nations Human Settlements Program
UOP	Urban Operations Plan
UWSEIP	Urban Water Supply and Environment Improvement Project
VAT	Value Added Tax
VfM	Value for Money
VGF	Viability Gap Funding
VN	Village Network
VRS	Voluntary Retirement Scheme
WBM	Water Bound Macadam
WMM	Wet Mix Macadam
WRD	Water Resources Department
WRM	Water Resource Management
WSS	Water Supply and Sewerage
WTP	Water Treatment Plant
WUA	Water Users Association
WUE	Water Use Efficiency

1. Introduction

This publication showcases how Asian Development Bank (ADB) has been working closely with the Government of India to improve the overall design, delivery, and development effectiveness of ADB's India program. Drawing upon 52 ongoing projects in the country (50 sovereign and 2 RCI related) as of 31 December 2012, the publication highlights the outputs, development outcomes and innovative elements across ADB operations in India. The concept of 'Innovation Impulse with Investment'—which defines the government's guiding principle to external assistance—refers to the contributions of a project over and above the provision of finance.

The publication is divided into 10 chapters. The introduction (Chapter 1) briefly discusses ADB's India program highlighting ADB's partnership with the government with reference to the sectors and geographical areas covered, thematic, innovative and results-based approaches used for project execution, and ADB's portfolio performance in India over the past 26 years. Chapters 2 through 6 provide details of ADB's interventions in 5 major sectors. These are transport, energy, urban development—water supply and other municipal infrastructure services—finance and public sector management, and agriculture and natural resources. Chapter 7 provides an overview of the human development sector and how ADB is planning to enter into this sector. Chapter 8 provides details of ADB's interventions in the area of Regional Cooperation and Integration (RCI). Chapters 9 and 10 provide an overview, including project snapshots, of how ADB is supporting private sector operations (PSO) and public private partnerships (PPP) in the country.

Chapters 2 to 6 are further divided into three subsections each: sector overview, case studies and project briefs. Sector overviews present a description of ADB's strategy in the respective sector, providing a link between past, ongoing, and future operations and demonstrating how ADB has been responsive to India's changing needs. Details of ongoing ADB projects in each sector have been presented in the form of case studies and project briefs. Case studies provide detailed analysis of selected projects, listing outputs, outcomes, impacts and themes of the projects. These are based on field visits and stakeholder consultations, including those with beneficiaries. Project briefs concisely explain the background, objectives, outputs and outcomes and highlight the innovative elements of the projects. Case studies and project briefs also reflect various thematic areas and reforms supported through ADB's interventions, e.g. mainstreaming of governance, climate change adaptation and mitigation, gender and safeguard concerns, support for institutional development, policy reform, capacity development, private sector development and improving service delivery.

Celebration of 25 years of India-ADB partnership

AT A GLANCE

- *ADB commenced operations in India in 1986.*
- *ADB's assistance to India consists of various lending and non-lending products including loans, technical assistance, and grants.*
- *Between 1986 and 2012, ADB approved 168 sovereign loans ($27.2 billion) and 44 non-sovereign loans ($3.3 billion).*

India-ADB Development Partnership

India has been a founding member of ADB since its establishment in 1966. In 1986—during the initial stages of India's economic reforms—ADB commenced operations in the country and became a partner in its development efforts. ADB's first set of operations were designed to match the early priorities of the reform agenda, assisting with the infrastructure and foreign exchange requirements of an economy opening to international trade. Over the years, ADB's India program has developed and matured in terms of its sector, geographic, and thematic coverage.

ADB's India program is closely aligned with the government's focus on ensuring that economic growth is not only high, but also inclusive and sustainable. While continuing its support for infrastructure development in the energy and transport sectors—traditional areas of ADB support—ADB is today also engaged in the development of urban infrastructure, integrated water resource management, and agribusiness infrastructure, and is active in promoting innovative financing structures in the infrastructure sector, assisting states with public sector resource management reforms, and supporting initiatives in financial inclusion and skills development. A snapshot of outputs and outcomes of ADB's projects during 2009-2012 is provided in Table 1.1[1].

AT A GLANCE

- *The country and sector results frameworks are used by ADB and the government to track progress on the achievement of targeted results indicators.*
- *A comprehensive development effectiveness initiative is being undertaken by ADB to track sector outputs, outcomes and impacts.*

Development through empowerment

Table 1.1: Outputs and outcomes of ADB's projects during 2009-2012

Sector	Results
Transport	• Building/upgrading of 1,464 km of national highways, 4,125 km of state highways, 17,883 km of rural roads and double tracking of 353 km of railway tracks • About 202 million people were benefitted • Institutional outcomes: (i) technical , administrative and procurement procedures; (ii) project and financial management systems; (iii) safeguard preparation and implementation; and (iv) road safety
Energy	• Transmission lines of 7,904 km and distribution lines of 71,669 km were completed or in construction • About 0.6 million new households were connected to electricity • Reduction of about 0.5 million tons of greenhouse gas emission per annum • Extensive capacity building of sector agencies and promotion for private sector participation
Urban	• Installation of water treatment capacity of 130,855 m^3/day, creation of 952 km of waste water collection network and installing and/or rehabilitating 4,913 km of water supply network • About 7.6 million and 3.6 million new households were served with water supply and sanitation respectively • Development of regulatory frameworks, financial discipline in service providers, financial ring fencing of urban services, and sound pricing policies for urban services
Finance	• The IIPFF I and IIPFF II leveraged resources to an extent $5.2 billion and $ 2.7 billion respectively. Together they supported 37 PPP projects • Helped build significant PPP-related capacity: 21 PPP cells • About 0.49 million micro finance loan account opened • Design of a comprehensive tax information management; treasury computerization plan; and Medium Term Expenditure Framework
Agriculture	• Irrigated area expanded by 200,000ha and 800 effective WUA were operating the irrigation projects • Strengthening of WUA Act, establishment of PIM directorate and advisory commission for flood management

In line with the government's guiding principle of 'Innovation Impulse with Investment', ADB projects strive to contribute in terms of: (i) supporting systemic and transformational change (for example, through process reengineering, policy and sector reform, and institutional strengthening); (ii) introducing new technologies and piloting of new approaches; and (iii) leveraging development resources through innovative financing products and modalities, co-financing, and tapping of Clean Development Mechanism-type benefits.

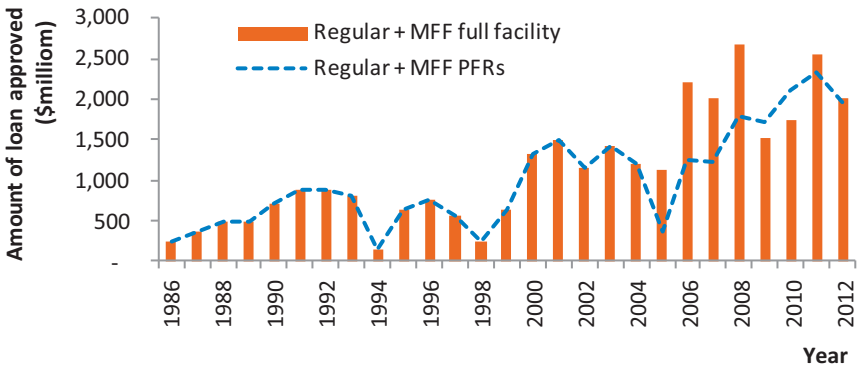
[1]All figures in this chapter have been sources from ADB.

Lending program

ADB's assistance to India consists of various lending and non-lending products including loans, technical assistance, and grants. In response to client demand for flexible lending products and streamlined business processes, ADB undertook the Innovation and Efficiency Initiative reforms in August 2005. A key outcome of the Initiative was the emergence of the Multi-tranche Financing Facility (MFF) modality of financing. A MFF establishes a partnership between ADB and a client and supports the client's medium- to long-term investment program. It provides executing agencies the freedom to pace and plan the implementation of projects according to progress and local context, and also suits the area- or time-slice of operations. MFFs have emerged as a preferred lending modality for large-scale infrastructure projects, especially in urban sector projects where detailed design is prepared under the first tranche and capital investments are financed in subsequent tranches[2].

Between 1986 and 2012, ADB approved 168 sovereign loans amounting to $27.2 billion for India on a cumulative basis[3]. Since the initiation of non-sovereign operations in 1987, ADB approved a total of $3.3 billion in financial assistance to 44 non-sovereign projects in India (including non-sovereign projects to state-owned enterprises and commercial loans approved under ADB's B-loan program). Figure 1.1 shows loans approved by ADB for India in the past 26 years demonstrating how the scale of ADB's India operations has expanded since 1986.

Figure 1.1: ADB lending since 1986



In the first ten years of operations (1986-1995), ADB supported Government of India's program of industrialization and public infrastructure development through loans to central public utilities in the transport and energy sectors. In 1996, ADB began to shift its focus to state governments to help maximize the developmental impact of its assistance. The following sub-sections present key trends in the India-ADB development partnership since inception of ADB's operations in the country. They also showcase a snapshot of the strategies and objectives that drive operations of ADB in the country.

AT A GLANCE

- *In 1996, ADB shifted focus from lending to central public utilities to assisting state governments in maximizing development efforts and bridge inter-state disparities.*
- *During 1986-2000, ADB focused on core infrastructure sectors such as energy and transport, private sector investment facilitation, housing finance and capital market development.*
- *The share of lending in ADB's urban sector operations more than doubled from 9% in 1986-2000 to 19% in 2001-2007.*

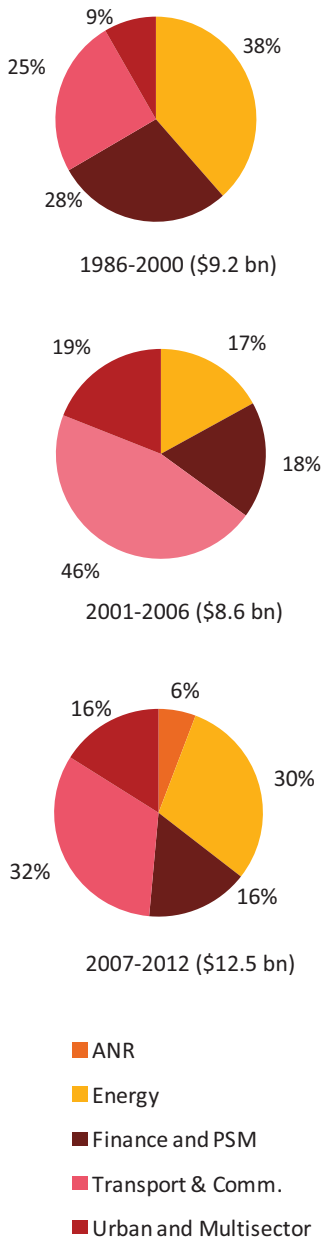
[2]ADB's lending to India comes from its Ordinary Capital Resources (OCR) and India has, in fact, been amongst the top three borrowers of ADB's OCR loans since 2007 and the top borrower in the last three years. OCR loans have been extended mostly in the form of sovereign loans, i.e., loans to Government of India. Support to private sector enterprises and financial institutions and selected non-sovereign public sector entities have been extended in the form of non-sovereign loans, guarantees, equity investments, and B-loans. Co-financing is another operation modality that enables ADB's financing partners - governments or their agencies, Multilateral Financing Institutions (MFIs), and commercial organizations - to participate in financing of ADB projects. Additional funds are provided in the form of official loans and grants; and commercial co-financing such as B loans, risk transfer arrangements, parallel loans, and co-financing for transactions under ADB's Trade Finance Program.

[3]Regular loans + MFF Periodic Financing Requests (PFRs)

AT A GLANCE

- *From the mid to late 1990's, ADB gradually expanded its operations in low income and special category states to support the government in addressing inter-state disparities.*
- *From 2007, ADB began to experiment with projects promoting integrated water resource management, agribusiness infrastructure, and financial inclusion.*

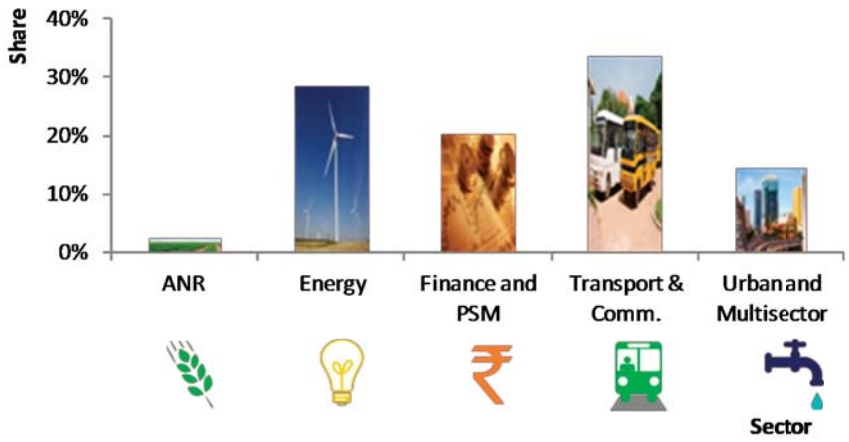
Figure 1.3: Sectoral allocation of ADB loans over the past 26 years (1986-2012)



Diversification to new sectors

The sectoral coverage of ADB's operations has broadened in response to the government's focus on achieving inclusive and sustainable growth. Figure 1.2 and Figure 1.3 (side bar) show sectoral allocations of ADB lending to India from 1986 to 2012 and the shifts in its sectoral focus over the years.

Figure 1.2: Total sectoral share in ADB's assistance from 1986 to 2012



Note: ANR: Agriculture and Natural Resources; PSM: Public Sector Management; Comm.: Communication

During 1986-2000, ADB confined much of its assistance to core infrastructure sectors such as energy, transport, private sector investment facilitation, housing finance and capital market development. Loans and grants for technical assistance were channeled through national level entities like Power Grid Corporation of India Limited (PGCIL), National Thermal Power Corporation of India Limited (NTPC), Gas Authority of India Limited (GAIL), National Housing Bank (NHB), Housing and Urban Development Corporation (HUDCO) and Infrastructure Leasing and Financial Services (IL&FS). Towards the end of this period, ADB began to broaden the focus of its finance sector operations by helping fiscally stressed states in the area of fiscal reform.

The period from 2001-06 witnessed an expansion in ADB's urban sector operations, with the share of this sector in total lending more than doubling from 9% in 1986-2000 to 19% in 2001-2007. From 2007, ADB began to experiment with projects promoting integrated water resource management, agribusiness infrastructure, and financial inclusion. Recognizing the employment generation potential of rural cooperatives and *Khadi* and Village Industries, ADB also designed and implemented reform programs targeted at reviving these traditional sectors.

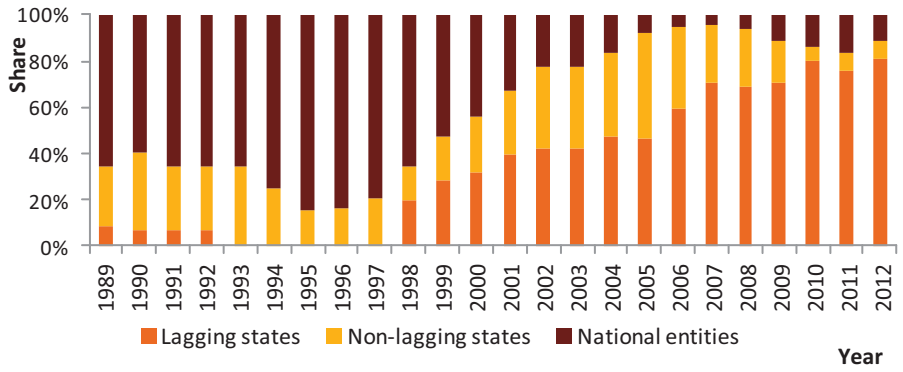
Given India's current demographic profile, the country is well-placed to reap the benefits of a 'demographic dividend'. However, realizing the full potential of the dividend requires that its young population is healthy, educated, and skilled. In recognition of this sector's importance, ADB will support the government's strategies in human development, focusing especially on skills development through technical assistance and lending operations.

Improved reach

In the first decade of its operations, ADB's initiatives focused on national level entities along with some support to states. From the mid to late 1990's, in order to support the government bridge inter-state disparities, ADB gradually expanded its

operations in low income and 'special category' states, i.e., states facing one or more of the following constraints—high poverty, low incomes, low levels of social development, weak capacity, and inadequate infrastructure. Accordingly, the 2000's saw a rapid expansion of ADB's assistance to states such as Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Madhya Pradesh, Mizoram, Odisha[4], Sikkim, and Uttarakhand among others. Figure 1.4 describes a 5-year moving average of ADB's lending shares to national and state entities. Table 1.2 depicts ADB's lending assistance by sector over 1986-2012.

Figure 1.4: 5-year moving average of ADB's lending shares to national and state entities, 1986-2012



Note: (1) Lagging states include: (a) low income states (i.e., those with per capita income lower than the national average and poverty rates of 25% or more as per 2009/2010 estimates by the Planning Commission); and (b) 'special category states' as defined by the Government of India.; (2) In certain cases, lending to national entities can be disaggregated by state. In such cases the lending to the entity has been allocated to the relevant state type.; (3) Shares have been computed on the basis of sovereign loan approvals on subproject basis (regular + PFRs of MFFs).

Table 1.2: Distribution of ADB's assistance by sector (1986-2012)[#]

	ANR[*]		Energy		Finance & PSM[b]		TCT[c]		Urban Development & Multisector		Total	
	No.	$ mn	No.	$ mn	No.	$ mn	No.	$ mn	No.	$ mn	No.	$ mn
Andhra Pradesh	—	—	1	230	—	—	—	—	—	—	1	230
Assam	1	57	5	450	3	250	1	26	1	81	11	864
Bihar	1	68	1	132	—	—	3	1,020	1	65	6	1,285
Chhattisgarh	1	46	—	—	—	—	2	480	—	—	3	526
Gujarat	—	—	3	450	1	250	—	—	1	500	5	1,200
Himachal Pradesh	—	—	5	845	—	—	—	—	1	23	6	868
Jammu and Kashmir	—	—	—	—	—	—	—	—	3	402	3	402
Jharkhand	—	—	—	—	—	—	1	200	—	—	1	200
Karnataka	1	41					1	315	6	496	8	852
Kerala	—	—	—	—	1	200	—	—	2	271	3	471
Madhya Pradesh	—	—	10	1,370	1	250	4	800	2	252	17	2,672
Maharashtra	2	35	—	—	—	—	—	—	—	—	2	35
Meghalaya	—	—	—	—	—	—	1	32	2	6	3	38
Mizoram	—	—	—	—	2	100	—	—	2	26	4	126
Nagaland	—	—	—	—	—	—	—	—	2	21	2	21
Odisha	1	17	—	—	—	—	—	—	—	—	1	17
Punjab	—	—	—	—	—	—	—	—	1	20	1	20
Rajasthan	—	—	—	—	—	—	—	—	4	523	4	523
Sikkim	—	—	—	—	—	—	1	17	3	37	4	54
Tamil Nadu	—	—	2	350	—	—	—	—	2	71	4	421
Tripura	—	—	—	—	—	—	—	—	2	28	2	28
Uttarakhand	—	—	4	285	—	—	2	190	3	183	9	658
West Bengal	—	—	—	—	1	400	1	210	2	330	4	940

Note: [*]ANR: Agriculture & Natural Resources; [b]PSM: Public Sector Management; [c]TCT: Transport & Communications; [#]: Regular Loans and PFRs of MFF. This table does not include lending to national entities

[4]In 2011, the Government of India approved the change in the name of the state of Orissa to Odisha. This document reflects this change. However, when reference is made to projects that predate the change in name, the previous name Orissa is retained.

Non-lending program

ADB's non-lending program, comprising TAs and project grants, complements its lending program in design and delivery. TA support is being used to build capacity, improve project preparedness and implementation, assist government's PPP initiatives, and undertake scoping studies and knowledge products. Project grants are used for improving livelihood condition of affected people through social development activities, stimulating widespread stakeholder's participation at the community level, and empowering self-help groups.

During 2006-2012, ADB approved 128 TAs amounting to $133.7 million on a cumulative basis. ADB also approved 5 project grants amounting to $15.5 million during the above period. Support received from the Japan Fund for Poverty Reduction (JFPR) for India has helped immensely in strengthening the poverty focus of India operations. These included JFPR projects to support micro entrepreneurship for women's empowerment, link small farmers to markets and agribusiness value chains, and promote participation of vulnerable groups in the formation and management of water user associations. Box 1.1 highlights the activities of ADB's Japan Fund for Poverty Reduction in India.

Box 1.1: Japan Fund for Poverty Reduction

The Japan Fund for Poverty Reduction (JFPR) is ADB's largest single-donor trust fund. JFPR was established on 23rd May 2000 to provide grants to ADB funded projects to support poverty reduction and social development activities in the developing member countries (DMCs). Individual projects under JFPR align with country partnership strategies and national poverty reduction strategies, and are designed in line with ADB's Strategy 2020.

JFPR provides support to DMCs through two financing modalities: project grants and TA grants. While the former supports well-targeted poverty reduction and social development activities that have direct impact on the poor and vulnerable groups, the latter focuses on enhancing capacity of executing agencies and other development partners along with funding studies related to sectors, policies and issues.

JFPR grants assistance to India

A total of 7 project grants amounting to $20.8 million have been approved for India in the period 2000-12. In addition, 38 TA grants amounting to $38 million have been approved in the period 2000-12[5]. Brief details for some of the closed/ongoing projects and TAs are as follows:

JFPR - Rain water harvesting and slum development in Rajasthan ($1.9 million) was approved in September 2002 (closed in January 2008) with the aim of reducing poverty and improving living conditions in slum and low income urban areas in Rajasthan through basic access to urban services. This project had six components: (i) rainwater harvesting, (ii) sanitation, (iii) micro-drainage, (iv) garbage collection, (v) capacity building and awareness, and (vi) project management and impact assessment. The project has benefitted about 100,000 people (20,000 households) in 18–20 slum areas of three Rajasthan cities and three smaller rural towns, through improved water supply and sanitation. They make up about 2.5% of the total population and 8.3% of the slum population of these cities. The project beneficiaries include 20% very poor (20,000 persons), 50% poor (50,000 persons) and 30% low income (30,000) people.

JFPR - Sustaining income and basic human needs of the poor in disaster prone areas of Gujarat ($3.4 million) was approved in November 2002 (closed in December 2007). The purpose of the project was to sustain income and basic human needs of the poor in disaster-prone areas of Gujarat. The project had five components: (i) provision of community rainwater harvesting structures for drinking water needs of the poor; (ii) setting up of community-owned tool centers; (iii) support for the poor's transport needs for commodities and goods produced; (iv) promotion of new technologies for village-based use, tribal development sub-component and a community-based marketing center in Bhuj town of Kutch district; and (v) project management including poverty impact assessment, project administration, and dissemination of policy implications. In total, the project has benefitted about 51,500 households in Gujarat of which 55% are very poor, 37% poor, and 8% from low-income households and families of economically weaker sections. This is about 5% of the poor in Gujarat.

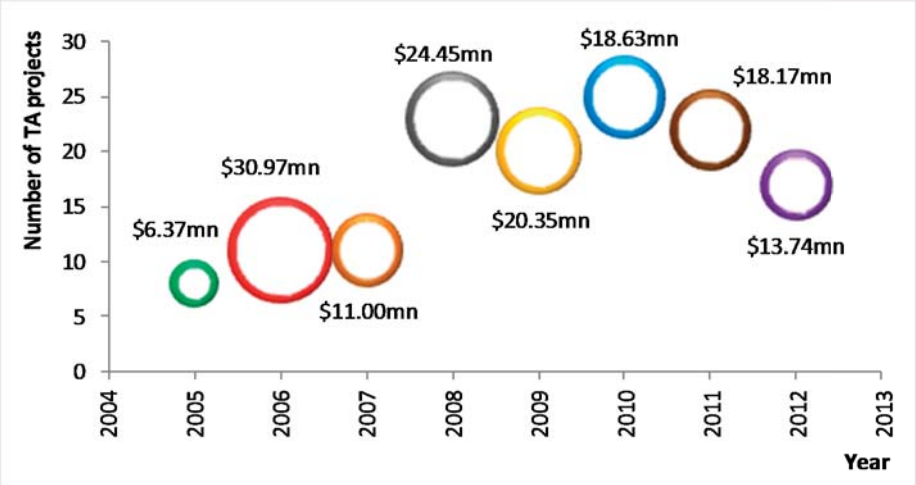
JFPR - Development of the International Center for Application of Solar Energy Technologies ($2 million) was approved in May 2011 (Ongoing). This TA has been undertaken for the establishment and operation of the International Center for Application of Solar Energy Technologies at Jodhpur in Rajasthan under an Indian Institute of Technology initiative. The Center will (i) carry out research and development in solar energy and deploy solar energy technologies; and (ii) develop human resources in the area of solar energy. This will strengthen energy security in the country, promote the use of solar energy and facilitate stable grid development, supporting Government of India's Jawaharlal Nehru National Solar Mission (JNNSM).

[5]Source: Japan Fund for Poverty Reduction, Annual Report, 2011

The United Kingdom's Department for International Development (DFID) has also been an important development partner in India. It has been providing support towards project preparatory and capacity building efforts since 2001. The on-going DFID-ADB Partnership for India (2009-2014) has a total contribution of US $22 million equivalent. The funding has helped leverage ADB's support for projects in lagging states such as Assam, Chhattisgarh, Jharkhand, and Odisha. The total ADB investment going to the poorest states rose from $870 million in 2008 to $1 billion in 2010, and to $1.64 billion in 2012. The assistance underlines support for pro-poor sectors and on focal areas such as water resources management, agriculture, rural development, development of less-developed regions, and urban poverty reduction, and gender. Till 2012, 26 component TA projects totaling $17.84 million were approved under the partnership and were associated with 12 loan approvals amounting to $2.32 billion.

Figure 1.5 shows the total number of TAs and the total amounts approved against these TAs every year for the period 2005-12.

Figure 1.5: Number of TAs and amounts approved against these TAs every year for the period 2005-12.



Thematic approach

ADB assistance strives to support cross cutting thematic goals. Key ones include achieving growth that is inclusive and environmentally sustainable; promoting private sector development and PPP; encouraging gender equity; building capacity, especially among executing agencies operating in the infrastructure domain; and supporting regional cooperation.

Inclusive growth

Underdeveloped infrastructure constrains not only growth, but also the inclusiveness of growth. In particular, deficiencies in power and transportation infrastructure place severe constraints on the operations and growth of small and medium-sized enterprises—major engines of job creation. Weak connectivity especially constrains access to dynamic markets and modern healthcare and educational services among others. In India, ADB's support for inclusive growth has come through:

- A focus on all aspects—technical, financial, and policy/institutional—of infrastructure development in the transport, energy, urban, and agriculture and natural resources sectors.

AT A GLANCE

ADB support for inclusive growth has come through:

- *A focus on technical, financial and institutional aspects of infrastructure development;*
- *Operations in lagging states;*
- *Supporting employment-friendly growth; and*
- *Creation of fiscal space for investments in health and education.*

Infrastructure led inclusive growth

Young girls attentively listening to a 'Women's Meeting' in Moya Village; gender empowerment in Madhya Pradesh Energy Efficiency Improvement Investment Program

AT A GLANCE

- *Gender equality and women's empowerment is vital for inclusive development. ADB tries to incorporate gender mainstreaming components in all its loan projects.*
- *ADB's support for capacity development is carried out across three main dimensions– institutional development, organizational development and network/partnership development amongst public sector, private sector and civil society.*

- Operations in lagging states i.e., low income and special category states.
- Employment-friendly growth through improvements in agricultural productivity and agricultural diversification, agribusiness development, support to small and medium enterprises, and skills development initiatives.
- Creation of fiscal space for investments in health and education through public resource management programs and improvements in quality and outreach of service delivery.

Gender equality and women's empowerment

Gender equality and women's empowerment is widely recognized as vital for inclusive development. ADB tries to incorporate gender mainstreaming components in all its loan projects. In India, the thematic area has been supported in recent years through:

- Dedicated project sub-components focused on empowering women and providing them with means to achieve economic independence, e.g. components focused on skill development and vocational training for women.
- Delivery of basic services which make a marked improvement in their social and economic well being, e.g. provision of water and sanitation facilities and rural roads to easily access health services, education, and job opportunities.
- Encouraging women's participation in community decision making mechanisms like self help groups and neighbourhood committees.
- Enhancing participation of women in planning, management and implementation of projects, thereby also improving gender sensitivity of the project, e.g. involving women in planning and implementation of resettlement programs.

Capacity development

Capacity development enables administrative bodies to formulate and implement sound policies, and plan and implement projects using modern methods of management and new technologies. ADB's support for capacity development is carried out across the following three main dimensions:

- Institutional development which includes development planning, governance and administrative machinery.
- Organizational development which involves training programs for executing and implementing agencies at all levels.
- Network/partnership development amongst public sector, private sector and civil society which are trained on various aspects of PPPs, under the ADB-GoI PPP Initiative.

Box 1.2 describes the detailed activities of the Capacity Development Resource Center based at the India Resident Mission of ADB.

Environmental sustainability

ADB operations have been supporting environmental sustainability through its operations across various sectors. Initiatives in this regard include:

- Expansion of clean and renewable energy development (including solar, hydro, wind, and development and diffusion of new technologies for low carbon development).
- Enhancing energy efficiency (including demand side management through feeder separation, reduction of transmission and distribution losses, smart grids and end-use efficiencies, and efficient pumps).

Box 1.2: Capacity Development Resource Centre

ADB's India Resident Mission (INRM) has been conducting capacity development programs for the executing agencies of ADB funded projects since 2008. The initial focus was on delivering training modules covering ADB procedures of procurement, consultant selection, disbursement, and safeguards.

In 2011, INRM established the Capacity Development Resource Centre (CDRC) with an expanded mandate involving:

1. Expansion in quantum of training delivered. After the establishment of CDRC in 2011, the number of trainees in 2012 almost doubled to 1,743 as compared to 898 trainees in 2011.
2. Diversification of training topics. In addition to earlier training modules in ADB procedures, training is now also provided in topics related to project planning and implementation, such as detailed project report preparation, pre-construction activities, contract management, construction management; and thematic areas such as financial management and accounting, municipal waste management, heritage conservation, road safety, PPPs, policy and regulatory design, and monitoring and evaluation.
3. Collaboration with national academic/training institutes. The CDRC is also collaborating with reputed national training institutes for developing and delivering training courses on sector and thematic issues.
4. New modes of delivering training modules. Procurement clinics are a recent initiative that enables executing agencies to raise procurement issues faced on the field and allow ADB experts to provide context-specific solutions and advice. CDRC has also introduced training courses for executing agencies of pipeline projects and plans to introduce "Help Line" via audio video conference facilities.

ADB Capacity Development Resource Centre's (CDRC) Training Calendar

The major functions of CDRC include:

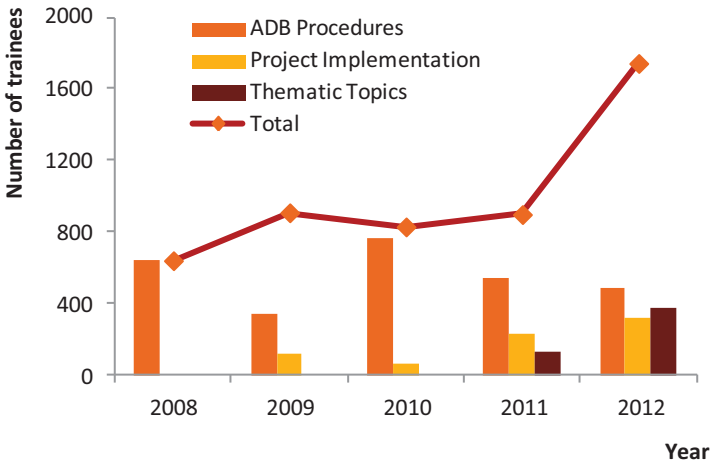
- Undertaking training needs and executing agencies capacity assessment survey to establish a baseline, prepare training strategy and target needy executing agencies.
- Preparing course content and identify resource persons for trainings in consultation with ADB sector groups, national academic/training institutes and select staff of executing agencies.
- Collaborating with national academic and training institutions to deliver training programs on project implementation and thematic topics.
- Preparing detailed report on each capacity development program.
- Maintaining database of staff of executing agencies trained on DEA website.

Figure 1.6 shows the number of trainees trained in the past five years through CDRC.

Moving forward, CDRC plans to expand its capacity development activities to strengthen implementation of ADB projects through the following initiatives:

- Identify weak executing agencies and target training programs towards their PMU/Project Implementing Unit staff.
- Pilot collaboration with administrative training institutes of state governments to conduct ADB training programs. The Training Division of the Department of Personnel and Training (DOPT) has just approved part-financing for 5 training programs to be held at the training institutes of the governments of Andhra Pradesh and Karnataka, at Hyderabad and Mysore respectively. These will include FIDIC contract management programs, project management programs and an ADB procurement procedures program. Personnel from implementing agencies as well as staff from World Bank, JBIC and other state government projects have been invited to participate.

Figure 1.6: Number of trainees trained in the past 5 years (2008-12)



- Organize videoconferences to guide executing agencies during various stages of bidding.

Breakwaters constructed at Nagapattinam port with disaster-resistant technology help to provide protection for vulnerable coastal communities

AT A GLANCE

- *ADB operations have been supporting environmental sustainability through promotion of renewable power, water resources management, expansion of railways and sustainable urban mass transit systems, modernization of sanitation, and wastewater management.*
- *ADB has supported the government's initiatives for promoting private sector participation by introducing financial modalities to leverage additional investments and attract commercial, insurance and pension funds.*
- *ADB supports RCI in South Asia sub-regionally through the SASEC program; regionally through SAARC, and inter-regionally through BIMSTEC.*

View of metro station in Bengaluru

- Supporting development of environmental and climate change policy and regulatory frameworks and strengthening compliance and enforcement of environmental laws and regulations.
- Supporting integrated water resources management to improve water productivity and irrigation efficiency and sector resilience to climate change, including irrigation development.
- Promoting coastal zone, river and watershed management and flood risk management.
- Promoting the expansion of railways and sustainable urban mass transit systems.
- Investing in modern sanitation, solid waste, and wastewater management.

Private sector development

Given India's large infrastructure needs, and the critical role that the private sector must play in meeting these needs, ADB has supported the government's initiatives for promoting private sector participation in the infrastructure sector and private sector development, more generally. Initiatives in recent years have included:

- Technical support to the government's PPP initiative including the establishment of PPP cells in DEA and 15 states and six central line ministries, contribution to policy frameworks (including the draft national PPP policy framework), establishment of prequalified legal and transaction advisory panels, and the creation of a pipeline of projects in challenging sectors, among others.
- Creating markets and crowding-in private investments through the provision of complementary and enabling infrastructure and regulations – as in ADB's investments in smart grid technologies that evacuate power from private sector solar and wind energy generators.
- Developing financing structures that help leverage additional investments, by drawing in retail and commercial funds as well as insurance and pension funds.

Regional Cooperation and Integration

Regional Cooperation and Integration (RCI) is a process by which national economies become more interconnected regionally. RCI plays a critical role in accelerating economic growth, reducing poverty and economic disparity, raising productivity and employment, and strengthening institutions. ADB's RCI strategy aims to build and deepen integration in four interrelated pillars:

- Regional and subregional programs on cross-border infrastructure and related software
- Trade and investment
- Money and finance
- Regional public goods such as prevention of communicable diseases and environmental degradation

The current Regional Cooperation Strategy for South Asia follows a two-pronged approach:

- Assistance for project implementation and for capacity development, including cross-cutting themes like gender mainstreaming, private sector participation, and promotion of green technologies.
- Focus on three priority areas of transport, energy, and trade facilitation.

ADB supports RCI in South Asia subregionally through the South Asia Subregional Economic Cooperation (SASEC) program; regionally through South Asian

Association for Regional Cooperation (SAARC), and interregionally through the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), and other initiatives such as connectivity between India and the Association of South East Asian Nations (ASEAN) and Greater Mekong Subregion countries.

Results-based approach

Through its results-based approach, ADB has been focused on deriving lessons from its completed and ongoing projects, and suitably adopting them in future operations to improve the development effectiveness of its overall program.

In collaboration with the Department of Economic Affairs (DEA), Ministry of Finance, ADB has been organizing, since September 2005, Tripartite Portfolio Review Meetings (TPRMs) to track progress in project implementation and monitor project outputs and results. In addition to ADB staff, TPRMs are attended by officials of DEA and representatives of executing agencies of ADB projects across all sectors and states and concerned central line ministries.

In addition to covering issues concerning contract awards and disbursements, each TPRM includes the presentation of detailed case studies of selected projects in order to discuss innovations and best practices and facilitate learning across executing agencies, sectors, and states. TPRM meetings have reduced the number of projects at risk of significant disbursement delays and problems in meeting development objectives. They have also helped immensely in timely resolution of implementation related issues.

The effectiveness of TPRMs has translated into significant improvements in India's portfolio performance since 2005. This is measured by an increase in contracts awarded, disbursements, and disbursement ratios. Figure 1.7 shows the increasing trend in contracts awarded and disbursements made by ADB over the years. Contracts awarded increased from $763 million in 1996 to $794.4 million in 2002 and fell to $550.5 million in 2004. However, in 2005, when the first TPRM was conducted, contracts awarded increased by more than 85% to $1.04 billion and further by 65% to $1.75 billion in 2006. Disbursements also followed a similar trend, rising by 68%, from $381.3 million in 2004 to $641 million in 2005, and increasing in line with the contract awards over the following years.

Figure 1.7: Trend in contract awards and disbursements

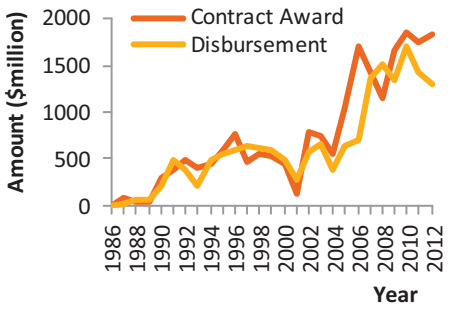
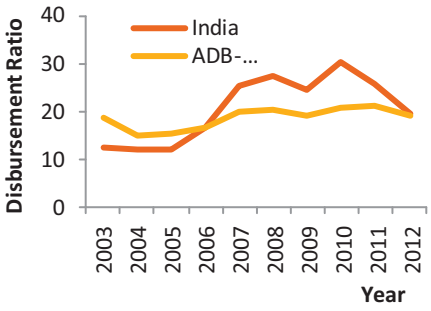


Figure 1.8: Trend in disbursement ratio



In addition, the disbursement ratio[6], which is an important indicator of ADB's portfolio performance, has shown significant improvement since 2005 as shown in Figure 1.8.

[6]Ratio of disbursement in a given year/period to net amounts available for disbursements at the beginning of the year/period, plus amounts that have become effective during the year/period, less cancellations made during the year/period.

Project monitoring through TPRM in Silvassa

AT A GLANCE

- *ADB has been focused on deriving lessons from its completed and ongoing projects, and suitably adopting them in future operations to improve the development effectiveness of its overall program.*
- *ADB organizes TPRMs to track progress in project implementation and monitor project outputs and results.*

AT A GLANCE

- *Moving forward, ADB will continue to support the strategic goals of the government as emphasized in the 12th Five-Year Plan and reflected in ADB's CPS, 2013–2017 for India.*
- *The strategic pillars of the new CPS will emphasize three agendas: support for inclusive growth, environmentally sustainable growth, and regional integration.*

Children smiling around Ashoka Pillar: India-ADB continued partnership

Disbursement ratio of project loans has increased from 12% in 2005 to 16% in 2006 and to 25.5% in 2011. In fact, ADB's India disbursement ratio has often been higher than ADB-wide averages since 2005.

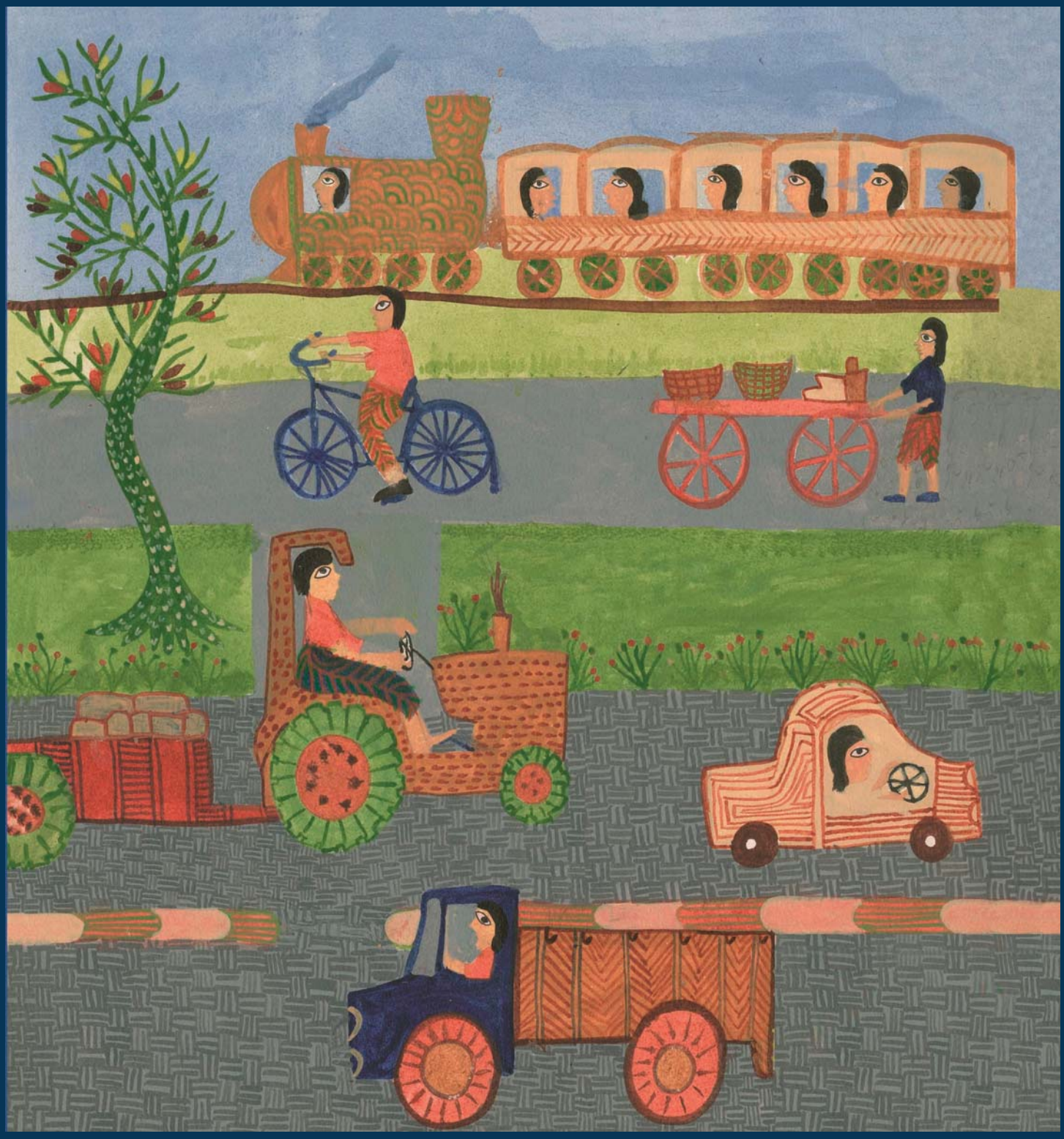
Given the tremendous improvement in the loan portfolio brought about by the TPRMs, DEA and ADB have recently initiated similar TPRMs for improving design and delivery of TA projects as well.

Another remarkable evolution of the TPRMs has been the Pipeline-TPRM initiated in 2013 and which utilizes the ADB-DEA Project Readiness Checklist to formulate time-bound actions for achieving readiness in projects comprising the indicative pipeline.

Future outlook

ADB will continue to support the strategic goals of the government - faster, more inclusive, and sustainable growth - as emphasized in the 12th Five-Year Plan and reflected in ADB's country partnership strategy (CPS), 2013 - 2017 for India, currently being formulated. The strategic pillars of the new CPS will emphasize three agendas: support for inclusive growth, environmentally sustainable growth, and regional integration.

Continued support to the development efforts of low income and special category states will remain a key plank of operations over the new CPS period. Concurrently, operations will be designed around selected flagship operations that support the development of high-priority economic corridors, create markets for infrastructure finance, and promote regional cooperation and integration through the SASEC platform.



TRANSPORT

2. Transport

Sector background and challenges

The transport sector comprises a diverse network of roads, railways, inland waterways, ports, coastal shipping and airways. In 2011-12, the transport sector contributed to 6.1%[7] of India's GDP and catered to the needs of over a billion people. The growth of transport sector is imperative for sustaining the growth in urbanization and development witnessed by India in recent times. A well-developed transport network not only bridges the rural-urban divide but also improves access to health and education services and new employment opportunities. In order to meet the requirements of the economy and sustain development, priority issues for the sector include the following.

Carrying capacity and outreach. Roads carry 60% of the freight traffic and 87% of the passenger traffic in India[8]. Comprising only 2% of the total network, the national highways carry 40% of the traffic. A large percentage of these roads need to be upgraded to two-lane standards. Meanwhile, state highways and major district roads (MDRs) which carry another 40% of the traffic face challenges like missing links and inadequate width of carriageway. Several measures are being undertaken by the government through programs including the National Highway Development Program (NHDP) and state government schemes to address these issues. Also, the progress made in connecting villages and rural habitations through construction of all-weather roads as part of the Pradhan Mantri Gram Sadak Yojna[9] (PMGSY/ Prime Minister's Rural Roads Program) must be maintained.

Railways carry 22 million passengers per day and 923 million tonnes of freight every year. The length of broad gauge route kilometre has doubled from 25,258 km to 55,188 km since independence. As with roads, expansion of capacity is imperative. Doubling of lines and gauge conversion to broad gauge is needed for augmenting the carrying capacity of trunk routes, which carry 50% of the traffic. Induction of high-capacity locomotives and expansion of the network to areas where it currently has limited reach, are other areas that need attention. Given that the emission factor for freight transport is 160 gm carbon dioxide per ton-km for road trips and only 29gm carbon dioxide per ton-km for rail trips (and 175 gm carbon dioxide per passenger-km versus only 75 gm carbon dioxide for rail journeys) expansion of railway capacity will also bring environment related benefits.

Supplementary infrastructure. More investment is also needed in augmenting supplementary infrastructure comprising bypasses, proper pavements, bridges/ culverts and railway over-bridges (ROBs) in the case of the national highway network and features like well-lit footpaths, pedestrian crossings, waiting sheds and traffic lights/signs in the case of state highways and MDRs. In the case of railways, expansion of rolling stock, lines, and equipment and introduction of new technology

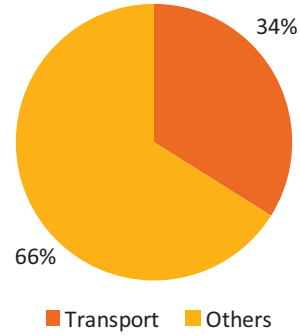


Figure 2.1: Transport's share in ADB portfolio (1986-2012)

AT A GLANCE

- *In 2011-12, the transport sector contributed to 6.1% of India's GDP and catered to the needs of over a billion people. Growth of the transport sector is imperative for sustaining the growth in urbanization and development witnessed by India in recent times.*
- *Inadequate carrying capacity of road networks leads to heavy congestion, increased travel times, and in case of rural roads, limitations in accessing health services, education, job opportunities, and markets.*
- *Like roads, railways are also in need of capacity augmentation and expansion.*

[7]All figures are sourced from the Draft Twelfth Five Year Plan (2012–2017) Faster, More Inclusive and Sustainable Growth – Volume II, unless otherwise mentioned.
[8]Source: Annual Report 2010-11, Ministry of Road Transport and Highways
[9]PMGSY is Government of India's flagship scheme in the sector, undertaken in December 2000 for the provision of all weather road connectivity to rural habitations with a population of 500 persons and above in plain areas, 250 persons and above in hill states, tribal areas, desert areas, and in 82 selected and tribal backward districts identified by the Ministry of Home Affairs.

AT A GLANCE

- *Other challenges facing the transport sector include maintenance of roads and institutional capacities.*
- *Inadequate integration amongst various modes of transport in the country, hindering coordination and leveraging of comparative and complementary advantages is another challenge.*

Uttarakhand State Road Investment Program is helping construct and upgrade around 10,800 km of state roads as part of its road development plan.

are needed. Dedicated planning to provide supplementary infrastructure is being undertaken in several sectoral plans of the government.

Road maintenance and institutional capacities. Maintenance of roads is treated as a non-plan activity and often faces funding constraints. Non-NHDP national highway sections maintained by state Public Works Departments (PWDs), state highways and MDRs, as well as rural roads constructed by PMGSY which are over five years old are in need of funds to support proper maintenance. In addition to funding support, improving monitoring of maintenance activities and capacity development of road agencies will help improve road asset management.

Pricing and revenue. As per the draft 12th plan, there has been a steady deterioration in the financial position of the Indian Railways (IR) over the 11th plan period which has impacted the capacity to generate additional resources for investments. Revenue from gross traffic receipts went up by 7.7%, but the total working expenses increased by 12.6%, thereby leading to a decline in net revenue by 17.9%. IR has undertaken initiatives to upgrade its accounting practices, improve its energy efficiency, adopt modern technologies, introduce freight marketing, and attract private sector investments to improve efficiencies and revenue. Given that low passenger fares, coupled with loss of freight business owing to high costs have led to constraints in internal resource generation, efforts toward tariff regulation and organizational reform may also be explored to further improve performance.

Multi-modal thrust. Improving coordination and integration amongst various modes of transport is an imperative with high payoffs. Key priorities include improving rail and road connectivity to ports, undertaking integrated planning of mass transit systems in urban areas, and facilitating an increase in the share of freight transport by rail and waterways, especially for bulk materials moving across large distances.

Government of India's sector strategy

Government of India recognizes the need for large investments for augmentation of capacities and modernization across the sector in its 12th plan. It intends to adopt a more integrated approach in addressing the challenges of the sector as a whole. A modal mix will be designed that will lead to an efficient, sustainable, economical, safe, reliable, environmentally-friendly and regionally-balanced transportation system. Special emphasis will be given on road expressways, dedicated rail freight corridors (DFCs), high speed trains and movement through inland waterways or coastal shipping so that the objective of speed and efficient energy usage is achieved.

The working group of the 12th plan identified an investment need of $220 billion[10] for the roads sub-sector. This will be utilized for completion and expansion of the NHDPs, expansion and rehabilitation of state and district roads, and provision of support for the universalization of rural connectivity. Public private partnership (PPP) will remain an important instrument for construction of new roads as well as capacity enhancement of existing ones. Two-laning of 20,000 km of national highways, which may not be viable through PPP given low traffic densities, will be taken up on engineering, procurement and construction basis, with resources mobilized through toll revenues, market borrowings and additional budgetary support. Two-laning of 50,000 km, four-laning of 6,000 km, strengthening of 108,000 km, and improving riding quality of another 130,000 km of state highways and MDRs will also be taken up. Construction of 158,000 km of new roads and rehabilitation of 84,181 km of existing roads will be undertaken in rural areas to ensure connectivity to all villages. To improve outreach, construction of about 14,000 km of roads in left wing extremist areas, and remaining roads under Special

[10] All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.

Accelerated Road Development Programme for North-East (SARDP-NE) will be completed in the 12th plan period. Additionally, a master plan will be drawn up for creation of 15,600 km of expressways, 1,000 km of which will be completed by 2017.

In case of the railways, development of the western and eastern dedicated freight corridors, and expansion of carrying capacity per wagon will be taken up in order to meet growing needs of the economy. The Eastern and Western DFCs are a mega rail transport project being undertaken to increase transportation capacity, reduce unit costs of transportation, and improve service quality. The Eastern DFC (1,839 route km-RKM) extends from Dankuni near Kolkata to Ludhiana in Punjab, while the Western DFC (1,499 RKM) extends from the Jawahar Lal Nehru Port in Mumbai to Dadri/Rewari near Delhi. A special purpose vehicle, the Dedicated Freight Corridor Corporation of India Limited, has been set up to implement the project[11]. Railways will be expanded to cover areas that have been unserved so far, including the Himalayan region and tribal areas. The 12th plan initiatives will also include correcting the imbalance between passenger and freight tariffs by setting up a tariff regulatory authority to suggest tariff structures consistent with the level of feasible cross-subsidies.

Capital dredging to increase the draught of ports to at least 14 meters in all ports and to 17 meters in hub-ports as per potential of trade will be taken up to improve ship handling capacities, while development of a shipping fleet commensurate with overseas cargo needs will be taken up to improve carrying capacities.

The government will also undertake several steps towards addressing deficiencies in other infrastructure in the sub-sectors. Modern technologies will be procured for road construction; bridges, ROBs and wayside amenities will be constructed on non-NHDP roads; electronic toll collection systems will be set up on all stretches of national highways by 2014; and truck terminals will be made operational in several cities and towns. These will help reduce congestion and improve the turnaround time in goods distribution. In the railways sub-sector, the government will develop logistic parks and matching terminal and handling facilities. It will adopt modern signaling systems and technologies for expansion of long haul and improving axle load of wagons. Containerization of goods will be expanded and manufacturing units for new generation locomotives will be developed. For improving safety performance, unmanned level crossings will be eliminated, infrastructure at manned level crossings upgraded and new subways/ROBs and Railway-Under Bridges constructed. Key strategies for other sub-sectors will include development of infrastructure for promoting inland water transport, including terminals, deeper stretches of rivers, bridges, silos and warehouses at ports.

Introduction of toll roads on Build-Operate-Transfer basis, coverage of maintenance under contracts of builders, involvement of Panchayati Raj Institutions and other innovative measures will be explored for financing maintenance of the various categories of roads. Capacity development of PWDs and state agencies in asset management, financing and leveraging PPPs will also be undertaken. This will also facilitate proper maintenance and upkeep of roads and road assets.

An investment need of $310 billion has been identified for the sub sector in the Railway Vision 2020. About 64% of this amount is expected to be met through revenues of IR and private sector participation (PSP) through PPP. The rest is planned to be met through budgetary support from the government. Economies of scale and differentiation strategies (premium prices for high quality services) will be explored for improving revenues. Enhancing project execution capacity of the IR will also be taken up on priority.

Integration of the various modes of transport will be another focus area. Strategies in this respect will include construction of special links for feeder roads to important

Road safety has been a key element of ADB projects since 1995. The picture shows stretches of the Surat Manor tollway, where ADB helped improve road safety features.

AT A GLANCE

- *Government of India recognizes the need for large investments for augmentation of capacities and modernization across the sector in its 12th plan.*
- *The working group of the 12th plan identified an investment need of $ 220 billion for the roads sub-sector.*
- *An investment need of $310 billion has been identified for the sub-sector by the Railway Vision 2020.*
- *Development of the western and eastern dedicated freight corridors, and expansion of the railway network to cover areas which have been unserved hitherto will be taken up on priority in the 12th plan period.*

[11]Source: Economic Survey 2012-13

railway routes and ports, and development of railway lines connecting the base network to privately developed ocean ports. Mass transit systems comprising of metro rail, electric buses, bus rapid transport corridors and trams will be developed for urban areas. Government of India has also set up a high level National Transport Development Policy Committee to develop the sector policy for transport up to 2030. It will look into aspects like competitive pricing and coordination amongst different modes, and will provide an integrated policy framework for the development of the sector in the 12th plan period.

AT A GLANCE

- *ADB's operations in the transport sector in India began in 1987. ADB assistance has since worked in tandem with the government strategies to address the changing needs of the economy.*
- *Between 1986 and 2012, ADB's support to the sector comprised 79% for roads, 11% for railways, 6% for ports and 4% for ICT.*

ADB's sector assistance

ADB's operations in the transport sector in India began in 1987. ADB assistance has since worked in tandem with Government of India's strategies to address the changing needs of the economy. During the initial years, there was a need for strengthening existing infrastructure. Therefore, ADB focused on the physical rehabilitation of ports, railways and roads, and maintenance of assets generated. Post liberalization and up to the turn of the century, ADB aligned its strategy towards addressing implementation problems in ongoing projects and expanded it to include policy reform components. In the early 2000s, Indian economy started growing at a fast pace, and the government's strategy shifted to development of an extensive network of highways and state roads. ADB supported the newly-formed National Highways Authority of India (NHAI), and henceforth extended five loans to it. ADB also took up projects for the development of state roads across the country through several subsequent loans. Providing rural connectivity to ensure inclusive growth was another objective of the government during this period. ADB supported this objective by providing assistance for PMGSY through its rural roads projects.

Between 1986 and 2012, ADB's support to the sector comprised shares of 79%[12] for roads, 11% for railways, 6% for ports and 4% for Information and Communication Technology (ICT). These shares have changed over time, as shown in Figure 2.2. Figure 2.3 highlights actual amounts disbursed to each of the sectors.

Figure 2.2: Sub Sectoral Split

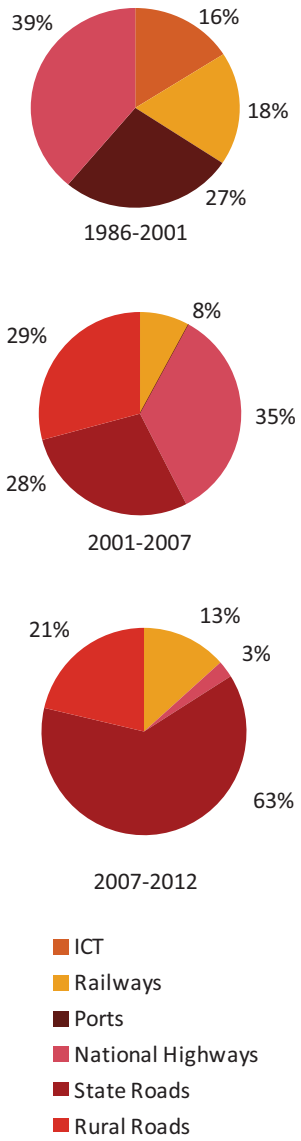
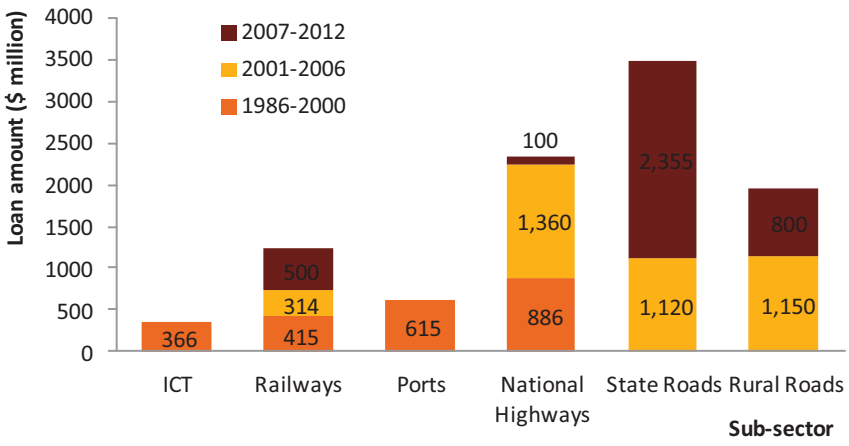


Figure 2.3: Loans provided for various sectors since 1986



Between 1999 and 2010, ADB provided six loans ($1.64 billion) for the development and improvement of 2,070 km of national highways. During this period, ADB also extended $1.25 billion for the development of state highways in Bihar (1,176 km), Karnataka (615 km) and West Bengal (140 km). Additionally,

[12]All figures in this subsection—ADB's sector assistance—have been sourced from ADB.

ADB extended loans for the development of state and district roads across various states, including Madhya Pradesh, Chhattisgarh, Uttarakhand, Jharkhand, and more recently, the North Eastern States of Assam, Meghalaya and Sikkim. Since 2002, ADB has spent $1.15 billion, for the strengthening of rural roads across the five states of Assam, Chhattisgarh, Madhya Pradesh, Odisha, and West Bengal in line with PMGSY. ADB has also provided loans amounting to $1.13 billion for the railways since 1987, thereby helping overcome several capacity bottlenecks. Meanwhile, another $615 million was provided for development of ports in the country.

Addressing infrastructural deficiencies has been an integral component of all ADB projects. Loans extended to the roads sub-sector have supported implementation of important road safety measures, creation of infrastructure like expressways, national roads, district and rural roads, road transport services, road safety, road maintenance and road transport policies and reforms. Similarly, railway sector projects have helped install safety features and structures like ROBs. Recognizing the problem of low investment, which leads to infrastructural constraints, ADB projects have helped in facilitating PSP in the sector.

Maintenance of roads and road assets is an issue and this is mainly attributable to lack of funding and poor institutional capacities. Across various projects, ADB has extended assistance for restructuring, development and strengthening of road agencies with focus on improving their capacities and efficiencies in asset development and management. Examples include NHAI, Bihar State Roads Development Corporation (BSRDC), and Madhya Pradesh Road Development Corporation (MPRDC).

Railways provide an energy efficient mode of transport, with a smaller carbon footprint than road transport. ADB has undertaken measures to improve IR's operational efficiency, implement accounting reforms, and facilitate institutional and policy reforms to improve commercial orientation.

Recognizing the importance of urbanization, ADB has also provided assistance for development of urban transport in various states across the country. Projects have included provision of non-sovereign finance and project preparatory support for the construction of metro rail and development of urban transport infrastructure.

Going forward, ADB's sector strategy will align closely with the government's 12th plan, so as to work in partnership towards its sector development goals. Key strategies will include:

- Exploration of innovative project financing options like modified annuity models for low traffic roads, commercial borrowings and PSP with support from central/state government for urban transport, leveraging private sector financing, and PPPs for projects in urban transport, ports and inland waterways. ADB will continue supporting development of new roads, and will further invest in augmentation of the railway network along key routes through double tracking and electrification of selected congested lines.
- Development of pedestrian-related infrastructure and infrastructure for improving safety associated with passenger transport. Support for construction of rail infrastructure along the golden quadrilateral and its diagonals, which carry a large number of passengers as well as large quantities of economically important freight, will also be taken up.
- To improve the maintenance of roads, which often suffers from inadequate funds, ADB will consider setting up of a maintenance fund for roads through credit enhancement. ADB will continue to strengthen road agencies and assist implementation of reforms through measures like setting up of road development corporations and capacity development of PWDs in asset management and financing.

AT A GLANCE

- *ADB has supported the development and rehabilitation of infrastructure for roads, railways as well as ports through several loans.*
- *ADB projects have also helped facilitate private sector participation in the sector.*
- *To help improve maintenance of roads and road assets, ADB has extended assistance for restructuring, developing and strengthening road agencies, with focus on improving their capacities and efficiencies in asset development and management.*
- *ADB has also undertaken several measures to improve IR's operational efficiency, implement accounting reforms, and facilitate institutional and policy reforms to improve commercial orientation.*

The Railway Sector Improvement Project approved in 2002 helped finance priority investments to overcome capacity bottlenecks and improve operational efficiency and safety of the Indian Railways.

- To strengthen IR's finances, ADB will help set up a mechanism for measuring and monitoring carbon emission reductions, in order to claim carbon credits under the UNFCCC Clean Development Mechanism scheme. ADB will also continue to support the implementation of accounting reforms in IR.
- To support the government's efforts toward integration amongst various modes, ADB will undertake development of rail and road connectivity to ports.

Other key strategies will include:

- Supporting the development of sustainable urban transport options for the growing urban population.
- Supporting regional connectivity initiatives, especially projects identified by the South Asia Sub-regional Economic Cooperation forum (SASEC) transport working group.
- Addressing urban transport concerns like women's safety and affordability.
- Generating knowledge products, including one to enable IR to claim carbon credits for infrastructure projects being financed by the government budget as well; and another study which analyzes gender implications of cross-border trade- and transport-related projects.

Table 2.1: ADB's project portfolio for the Transport sector (1986-2012)

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
1.	Ports Development Project	Regular	1987	87.6	Closed
2.	Railways Project	Regular	1987	190	Closed
3.	Telecommunications Project	Regular	1988	135	Closed
4.	Road Improvement Project	Regular	1988	198	Closed
5.	Second Telecommunications Project	Regular	1989	118	Closed
6.	Second Ports Project	Regular	1990	129	Closed
7.	Second Road Project	Regular	1990	250	Closed
8.	Second Railways Project	Regular	1991	225	Closed
9.	Coal Ports Project	Regular	1992	285	Closed
10.	National Highways Project	Regular	1993	245	Closed
11.	Bombay-Vadodara Expressway Technical Assistance Project	Regular	1993	12.7	Closed
12.	Rural Telecommunications Project	Regular	1996	113	Closed
13.	Mumbai And Chennai Ports Project - Mumbai Port	Regular	1997	97.8	Closed
14.	Mumbai And Chennai Ports Project - Chennai Port	Regular	1997	15.2	Closed
15.	Surat Manor Tollway Project	Regular	2000	180	Closed
16.	Western Transport Corridor Project	Regular	2001	240	Closed
17.	West Bengal Corridor Development Project	Regular	2001	210	Closed
18.	East West Corridor Project	Regular	2002	320	Closed
19.	Madhya Pradesh State Roads Sector Development Program (Program Loan)	Regular	2002	30	Closed
20.	Madhya Pradesh State Roads Sector Development Program (Project Loan)	Regular	2002	150	Closed
21.	Railway Sector Improvement Project	Regular	2002	313.6	Closed
22.	Rural Roads Sector I Project	Regular	2003	400	Closed
23.	National Highway Corridor (Sector) I Project	Regular	2003	400	Closed
24.	Chhattisgarh State Roads Development Sector Project	Regular	2003	180	Closed
25.	National Highways Sector II Project	Regular	2004	400	Closed
26.	Rural Roads Sector II Investment Program	MFF	2005	750	Ongoing
27.	Uttarakhand State Road Investment Program	MFF	2006	550	Ongoing
28.	Madhya Pradesh State Roads Sector Project II	Regular	2007	320	Closed
29.	Bihar State Highways Project	Regular	2008	420	Ongoing
30.	National Highway Corridor (Sector) I Project - (Supplementary)	Regular	2009	100	Closed
31.	Jharkhand State Roads Project	Regular	2009	200	Ongoing
32.	Bihar State Highways II Project	Regular	2010	300	Ongoing
33.	Karnataka State Highway Improvement Project	Regular	2010	315	Ongoing

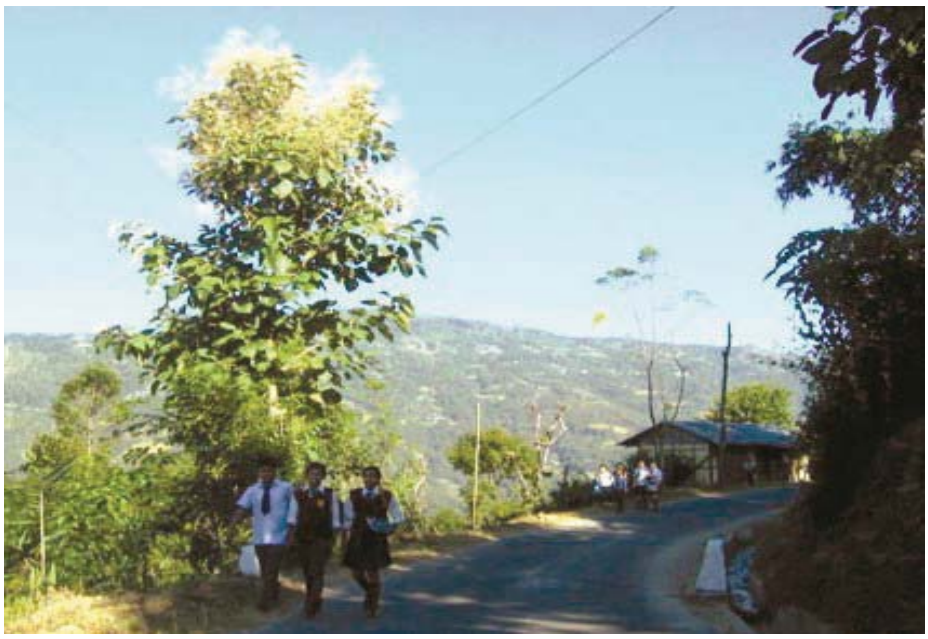
S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
34.	Madhya Pradesh State Roads Project III	Regular	2011	300	Ongoing
35.	North Eastern State Roads Investment Program	MFF	2011	200	Ongoing
36.	Railway Sector Investment Program	MFF	2011	500	Ongoing
37.	Rural Connectivity Investment Program	MFF	2012	800	Ongoing
38.	Bihar State Highways II Project - Additional Financing	Regular	2012	300	Ongoing
39.	Chhattisgarh State Road Sector Project	Regular	2012	300	Ongoing

CASE STUDY

Rural Roads Sector II Investment Program

"With the improved connectivity to my village now I can bring my child for regular health check-ups to the clinic in the adjoining Raheti town."

--- Sheela Devi of Cheech village of Madhya Pradesh



Students walking on newly built roads in West Bengal.

LOAN DETAILS

EXECUTING AGENCIES

State Rural Roads Development Agencies

MILESTONES

- **Dec 2005 - $750 mn approved for MFF**
- **July 2006 - $173.9 mn approved for Tranche 1**
- **March 2008 - $38.1 mn approved for Tranche 2**
- **Sep 2008 - $130 mn approved for Tranche 3**
- **Aug 2009 - $185 mn approved for Tranche 4**
- **July 2010 - $222.2 mn approved for Tranche 5**
- **Jan 2013 - $661.6 mn disbursed**
- **Jun 2014 - Closing**

In 2000, nearly 70% of India's population lived in rural areas. Majority of the villages relied on dry weather roads that were unsuitable for motorized traffic and were impassable during rains due to poorly finished road surfaces, missing bridges, and inadequate, defective, or missing drainage structures. Even where all-weather connections existed, the quality of rural roads was poor, maintenance was inadequate, and many roads were in need of rehabilitation. This had a significant impact on rural communities' access to state and national highways which, in turn, restricted their reach to markets for selling produce and finding employment opportunities. The immediate outcome was a more than desired level of migration to urban areas that put undue pressure on urban local bodies to keep up with the needs of an ever-increasing urban population.

To address this issue, Government of India launched a nationwide rural roads investment program, PMGSY, in December 2000. PMGSY aimed to provide all-weather roads to all habitations in the country with a population of 500 or more by 2007. ADB has been supporting PMGSY since its launch. Till date, ADB has provided support through two interventions—Rural Roads Sector Project I (2003) and Rural Roads Sector II Investment Program (2005). Rural Roads Sector Project I (RRS I) financed the construction and upgrade of 10,000 km of rural roads in Chhattisgarh and Madhya Pradesh. This $400 million project was successfully closed in 2009. Rural Roads Sector II Investment Program (RRS II), a $750 million Multi-tranche Financing Facility (MFF), was subsequently approved in December 2005 to help Government of India meet its target for rural road development

under PMGSY projects in the five states of Assam, Chhattisgarh, Odisha, Madhya Pradesh, and West Bengal. RRS II shared the same objectives as that of PMGSY, which is to reduce poverty and deprivation, and support economic growth of rural communities in India by providing them with enhanced access to markets, employment, and social services including health and education.

About 14,000 km of rural roads connecting 6,500 rural habitations in five states are being constructed and upgraded under RRS II. The MFF comprises five projects. Under Projects 1, 2 and 4, of the MFF, nearly 69% of the target length of rural roads was constructed. After having made substantial contributions to the implementation of PMGSY projects in Assam, Odisha and West Bengal, Projects 1, 2 and 4 were closed in 2009, 2011 and 2012 respectively. Projects 3 and 5 are ongoing. The key outputs of the two ongoing projects of the RRS II are:

- **Improved state road network.** Project 3 targets construction and upgrade of 1,670 km of priority roads in Assam and West Bengal; and Project 5 targets construction and upgrade of another 4,700 km priority rural roads in Chhattisgarh, Madhya Pradesh, Odisha, and West Bengal. All these roads will be constructed as per all-weather standards. Work will include various components such as widening of roads, creation of improved surfaces with proper base and bitumen overlay, raising of embankment, road safety features, cross drainage structures, conduits for future irrigation pipes and road furniture. As on February 2013, 84% of the work under Project 3, and 60% of the work under Project 5 were completed.
- **Strengthened rural road development agencies.** RRS I strengthened the capacity of rural road development agencies of Chhattisgarh and Madhya Pradesh to meet national level norms for road maintenance and road safety. It also included development and implementation of training programs. The capacity building support has been continued in RRS II and has been expanded to all five states. This support caters to six dimensions, namely project selection, financing, project implementation, project sustainability, safeguard policies, and road safety. Some of the key interventions are engaging consultants for project delivery, mandatory use of standard bidding documents for civil works and consulting services, introduction of maintenance planning process including mandatory allocation of sufficient funds for post-construction maintenance, introduction of road safety audits, and community based road safety programs. These are expected to empower rural road agencies to sustain benefits beyond the life of the program.

KEY DEVELOPMENTAL OUTCOMES

Improved business opportunities for rural communities. Improved road connectivity has helped rural business communities including farmers in program villages to access new markets, district headquarters, and other centers of economic activity. Travel time and vehicle operating costs have been reduced. Local rural economy in the program villages have significantly benefited from the interventions. Farmers are able to get a better price for their produce and the losses in transit have gone down. An impact assessment study of the program revealed that the percentage of agricultural produce that got spoilt in transit declined by 9.7% in program villages as against an increase by 2.6% in control villages. Small shops owners located at the junctions of rural roads and state highways have experienced increase in sales and profits due to increased traffic movement.

Improved access to health and education institutions. The program has improved villages' access to health and education facilities located in district headquarters or nearby towns. School attendance rate has improved due to safer travel and reduction in commuting time. In Chhattisgarh, the percentage of children dropping out of primary school decreased by 8% from the pre-program

Gender Empowerment

The program has improved transport facilities, thereby making travel easier for women. A recent impact assessment study revealed that while program villages experienced 61% increase in buses serving women, control villages experienced a 23% decline in the same period. Increased transport is contributing to safer motherhood by improving access to maternal and child health care services and reducing obstacles to health services within villages. It is also contributing to a decline in post-primary school dropout rates and an increase in attendance amongst girl students, as parents become more confident of sending their daughters to school unescorted. The program has also opened up opportunities for more girls to access higher education and better jobs outside their villages.

Policy and implementation improvements through community participation

RRS I supported important policy and implementation reforms that resulted in better management capabilities for the ongoing program. Initiatives included establishment of state-level rural roads development agencies, introduction of road safety audits and awareness campaigns, and mandatory use of standard bidding documents for civil works. In order to further strengthen the impact of these initiatives, Rural Roads Sector II Investment Program has laid particular emphasis on community participation. During the planning and implementation stages, village panchayats were consulted and the concept of voluntary donation of land was successfully introduced as a common community practice.

Two-wheelers are on an increase on rural roads.

levels. There has been an increase in the attendance rate of girls as parents have become more confident in sending their daughters to schools unescorted, owing to better roads. A recent study on the impact of the program reveals that attendance of teachers increased by 5.5% in program villages. Also, post primary school dropout rate among girls declined by 7.2% and 9.7% in control villages and program villages respectively.

Increased community participation. During the planning stage of the program, village panchayats played an important role in selecting and prioritizing eligible roads and subsequent road works to be implemented under PMGSY. Design of roads and their routes were also prepared in consultation with the local community. Thereon, program implementation units consulted with local communities for coordinating with the relevant panchayats to determine suitable road alignment, resolve issues of land availability, and address other adverse social and environmental impacts. Voluntary donation of land is a practice that has proved to be very effective under the program as it inculcates a sense of ownership amongst beneficiaries which, in turn, helps in sustaining program benefits, as the community develops a greater stake in the change.

INNOVATIONS AND GOOD PRACTICES

State level rural road development agencies, established under PMGSY, have helped improve efficiency and speed of implementation of the program. The program is supporting these agencies to engage specialized consultants in project delivery, use standard bidding documents for civil works and consulting services, plan maintenance expenditure, and conduct road safety audits and community-based road safety programs. These are expected to help introduce a more standardized and efficient institutional set up, which would be capable of making program benefits sustainable. With improvement in rural road connectivity, agricultural input distribution and dispatch of final products to markets is becoming easier. The cost of distribution is decreasing and investment in agribusiness is increasing, leading to a rise in rural incomes and jobs. The program is also strengthening community participation to increase ownership of road improvement works and minimize adverse social and environmental impacts of such works. All five beneficiary states have prepared community participation frameworks to establish a transparent community-based decision making process.

Chhattisgarh: Improved rural roads connecting villages to wider markets.

KEY LEARNINGS

The program has, so far, been successful in constructing/rehabilitating more than 9,611 km of rural roads across the five states of West Bengal, Odisha, Chhattisgarh, Assam, and Madhya Pradesh. RRS I identified gaps in the technical expertise available at program implementation units, state technical agencies, and State Rural Road Development Agencies (SRRDA) to meet technical, fiduciary and other procedural requirements under PMGSY and to process the workload under ADB financing. Incorporating key learnings from RRS I, RRS II is supporting rural road sector agencies in the five states to diversify and build capacity in handling safeguard issues that arise during project preparation and implementation. In recognition of the importance of community involvement in project implementation, this program is strengthening community participation to increase ownership of road improvements and minimize adverse social and environmental impacts of road improvements.

Improved rural roads in Odisha.

PROJECT SUMMARY

RATIONALE

- At the time of project inception, majority of the population relied on dry weather roads.
- Existing all-weather roads were in poor condition and needed maintenance and rehabilitation.
- Government of India undertook the nation-wide PMGSY in December 2000 to provide all-weather roads to all habitations in the country.
- ADB has been supporting PMGSY since its launch. It undertook the RRS I in 2003 followed by the RRS II in 2005.

DELIVERABLES

Improved rural connectivity

- Construction and upgrade of 14,000 km of rural roads across five states (Assam, Chhattisgarh, Odisha, Madhya Pradesh, and West Bengal)
- **Status of ongoing projects:**
  - Project 3: Target - 1,670 km. Achievement: 84% (Feb 2013)
  - Project 5: Target - 4700 km, Achievement: 60% (Feb 2013)
  - Projects 1, 2 & 4 completed in 2009, 2011 and 2012 respectively

Institutional development

Use of standard bidding documents for civil works as well as consulting services

Development of community participation frameworks

Implementation of road safety audits and community based road safety programs

Mobilization of centrally financed project implementation consultants to address safeguard issues in project preparation and execution

ACHIEVEMENTS

- As of August 2012, approximately 1,908 rural habitations were connected by all-weather roads, which is 77% of the targeted habitations.
- Community ownership of infrastructure is being promoted, resulting in voluntary donation of land and associated assets by the local people for investment related to the project.
- Rural population will have increased access to markets and social services like education and health.

CASE STUDY

Bihar State Highways Project I and II

Prior to 2008, farmers in Kenarkala village of the Vaishali district were forced to grow only conventional crops like wheat and maize. There was no demand for higher valued non-conventional crops in the village and the markets where they could sell these were inaccessible due to lack of roads. In 2008, ADB undertook the Bihar State Highways Project (BSHP) under which it reconstructed State Highway 74 that connected Kenarkala to larger markets in the district such as Hajipur, the district headquaters.

"I have now started growing non-conventional crops since I can sell them in larger markets"
--- Gyanendra Kumar, a farmer of Kenarkala village

"We have been getting higher returns for our produce from larger markets that have become accessible due to reconstruction of State Highway 74"
--- Akhilesh Prasad and Raghuvendra Prasad Sinha, farmers of Gopalbagh village, near Hajipur

Women cycle to nearby destinations on roads constructed under the project every day, improving their access to education and job opportunities in nearby cities.

Bihar has a well-developed rail network and a considerable potential for developing and utilizing inland waterways. However, the state roads network leaves much scope for improvement both in coverage and condition. At the time of project inception in 2008, road density in Bihar was 901 km per million population which was almost one-third of the national average of 2,567 km per million population. Most of the national and state highways, and major district roads had sealed (bitumen or concrete) surface but 55% of other district roads and village roads were unsealed. Mere 2% of the state highways had two or more lanes while 71% were single-laned. 83% of major district roads and all other district roads and village roads had single lanes. The condition of majority of state highways, major

LOAN DETAILS

EXECUTING AGENCY

Bihar State Road Development Corporation Limited

MILESTONES

- **Sep 2008 - $420 mn approved for Project 1**
- **Sep 2010 - $300 mn approved for Project 2**
- **Jan 2013 - $47.3 mn disbursed**
- **Jan 2013 - $351.5 mn disbursed; Project 1 Closed**
- **Jun 2015 - Closing**

district roads, other district roads, and village roads had severely deteriorated due to low maintenance and increasing traffic volumes and load. Half the villages in the state did not have access to all-weather roads. This highlighted the need to improve and expand the existing state road network.

Recognizing the importance of road sector development for enabling inclusive economic growth in the state, Government of Bihar designed and adopted the State Highway Development Program (SHDP) to rehabilitate and upgrade state highways to at least two lanes and expand the state highway network by upgrading major district roads. The program covered upgrade of 2,831 km out of the 3,127 km of state highways during the 11th plan period through government schemes and public private partnership schemes.

To achieve targets set under the State Highway Development Plan, ADB supported Government of Bihar with two project loans and one additional financing loan for road improvement. The first project loan amounting to $420 million for the BSHP I was approved in 2008 for construction/rehabilitation of 820 km of state highways. Over the period 2008-12, this project rehabilitated targeted roads and successfully implemented significant road sector reforms. Given the success achieved in BSHP I, a second phase of the project, BSHP, was approved in September 2010 with a loan amount of $300 million for rehabilitation of an additional 356 km of state highways. In September 2012, ADB approved additional financing of $300 million to scale up the support under BSHP II by increasing the target for highways upgrade to 610 km. ADB has also been providing support for institutional strengthening of Roads Construction Department (RCD) and Bihar State Road Development Corporation (BSRDC), which are the executing agencies for BSHP I and II respectively.

BSHP I and II were taken up with similar objectives. These included (i) improving the condition, capacity and efficiency of the state highway network; (ii) facilitating safe and appropriate road usage; and (iii) enhancing the state's capacity for road asset development and management. The projects have made a significant contribution to the successful implementation of Government of Bihar's SHDP which aimed at upgrading 2,831 km of state highways during the 11th plan period (2007–2012) through various schemes, and encouraging PPP initiatives in the state.

Key outputs of BSHP I and II are:

- **State road network rehabilitation.** BSHP I rehabilitated and reconstructed 820 km of state highways identified under SHDP. This comprised nine road segments or packages which are as follows:
  - i. 78 km Sheogunj–Baidrabad (State Highway 68);
  - ii. 153 km Dumaria–Ranitalab (State Highway 69);
  - iii. 58 km Gaya–Rajauli (State Highway 70);
  - iv. 85 km Jehanabad–Parwatipur (State Highway 71);
  - v. 88 km Siwan–Shitalpur (State Highway 73);
  - vi. 85 km Hajipur–Aseraj (State Highway 74);
  - vii. 47 km Darbhanga–Madhwapur (State Highway 75);
  - viii. 121 km Araria–Bhaptiyahi (State Highway 76); and
  - ix. 105 km Kursela–Forbesgunj (State Highway 77) segments.

  Road improvement works under BSHP I included upgrade of existing single lane roads to two lanes, strengthening of culverts and bridges, construction of new bridges and cross-drainage structures, and construction of structures for resettlement and rehabilitation. The project also provided consulting services

[13]Source: Road Accidents in India, 2010; Ministry of Road Transport and Highways, Government of India

Private sector participation

BSHP I and II have provided BSRDC the exposure to handling performance-based contracts, long -term operation and maintenance contracts, and PPP contracts. As a result, two state highways have been successfully awarded to the private sector under a PPP scheme. ADB is also providing support to the road sector development strategy that includes attracting private sector participation in road financing, and outsourcing of project preparation, design, construction, construction supervision, and quality audit to private entities.

Road safety

The severity of road accidents[13] in Bihar (44.8 fatalities per 100 accidents) was almost double the national average in 2007, and was expected to increase as traffic grew. ADB has been supporting modernization of road safety procedures followed by the Transport Department, Government of Bihar, through BSHP I and II. A road safety plan has been prepared to strengthen the state government's capacity for ensuring road safety in an environment of growing traffic.

ADB is also supporting (i) RCD in establishing state and district road safety councils to provide guidance on road safety; and (iii) BSRDC in developing a road safety unit to institutionalize road safety audits, and to ensure that safety elements of Indian Roads Congress standards are incorporated into design and construction of roads.

ADB, under BSHP I, has supported in setting up an overloading control mechanism and installing six weighbridges at state border points.

Construction and rehabilitation work underway on State Highway 78. Rehabilitation works undertaken by the project include upgrading of single lane roads to two lanes, strengthening of culverts and bridges, construction of new bridges and cross-drainage structures, and construction of structures for resettlement and rehabilitation.

Improved connectivity has provided farmers with improved access to larger markets, where they can get better prices for their produce. Farmers now have an opportunity to shift from subsistence farming to market oriented agriculture production.

BSHP I and II are providing an opportunity for the local construction industry to develop by awarding them a large number of civil works contracts. This will assist in transfer of necessary technical and managerial skills to the local population.

to support implementation and monitoring of civil works. As of December 2011, 77% of the total work under the 9 civil works packages had been completed.

BSHP II involves construction and upgrade of another 356 km of state highways. Key road segments being upgraded under project II include:

i. 100 km Bihta–Sarmera (State Highway 78);

ii. 85 km Sakkadi–Nasirganj (State Highway 81);

iii. 69 km Mohammadpur–Chapra (State Highway 90), and

iv. 102 km Birpur–Udakishunganj (State Highway 91).

- **Institutional strengthening.** Both the projects focused on capacity building of state agencies in designing, implementing, and maintaining Bihar's road network. Project I supported RCD under two components (i) institutional development, and (ii) technical assistance (TA). The institutional development component included equipment support to RCD for quality control, survey and design, road safety, and control of overloading and vehicle emissions in the road sector. The TA component included redefining and restructuring business processes of RCD to make it a state-of-the-art road agency and providing training to RCD staff for its smooth functioning. Through another TA under BSHP II, ADB is supporting BSRDC in better management of road assets, maintenance of project roads, improved project implementation, and design of future projects. This is expected to be achieved through piloting a performance based maintenance contract and development of a road asset registry for state highways by end of 2014.

KEY DEVELOPMENTAL OUTCOMES

Reduced travel time and costs. BSHP I will reduce vehicle operating costs on project roads by 30% for two-axle trucks and by 35% for passenger buses. Traffic growth on project roads is expected to increase by more than 8% for cars while travel time is expected to decrease by an average of 40%. Travel time between Gaya and Rajoli (58 km) has already reduced from 10 hours to 1 hour post project implementation[14].

Improved livelihoods and living conditions. BSHP I and II have led to enhanced connectivity through expansion and rehabilitation of road networks and construction of bridges and cross drainage structures to connect remote villages to towns and cities. This has provided farmers access to larger markets where they can get better prices for their produce. Farmers now have an opportunity to shift from subsistence farming to market oriented agriculture production. Project interventions have increased earnings of labourers, who were otherwise largely dependent on occasional and uncertain employment, through employment in road construction, tree planting and road maintenance works. Local people now have increased access to larger towns, cities and business centers with better employment opportunities. People in rural areas are now able to access social services like education and health centers, thus leading to improved living conditions.

Promotion of local construction industry. BSHP I and II are providing an opportunity for the local construction industry to develop by awarding them a large number of civil works contracts. Contracts under the two projects have been converted into large sized packages to attract qualified national contractors who are then expected to subcontract local contractors. This will assist in transfer of necessary technical and managerial skills to the locals.

Government of Bihar has set up infrastructure equipment banks which (i) lease

[14]Source: Discussions with BSRDC officials during field visit

construction equipment to local contractors; (ii) have simplified contractor registration rules to reduce barriers to entry; and (iii) make detailed information on potential projects public at early stages of project preparation to raise awareness amongst local contractors. These initiatives have helped strengthen the presence of local contractors and the local construction industry.

Improved maintenance and road asset planning. The state wide road asset registry being developed under BSHP II will help state authorities in identifying roads that require maintenance to avoid accidents and reduce costs incurred for re-construction/upgrade. The registry is planned to be updated on a bi-annual basis.

INNOVATIONS AND GOOD PRACTICES

BSHP I was the first road construction project in Bihar to have adopted international competitive bidding and outsourcing of construction supervision services in procurement and contract management. As part of the TA support under BSHP I, BSRDC officials are being trained to manage International Federation of Consulting Engineers based contracts. BSRDC is also developing a road safety unit to institutionalize road safety audits and to ensure that safety standards of Indian Roads Congress are incorporated into design and construction of roads.

Civil works contractors are using Wet Mix Macadam (WMM) material for road construction which is of a better quality as compared to the previously used Water Bound Macadam (WBM) material. Unlike in the case of WBM, black-topping can be done soon after laying WMM material for road construction. Roads paved with WMM dry faster and can be opened to traffic immediately once run over by a roller.

A geographic information system (GIS) and global positioning system (GPS) based mobile reporting system has been introduced to monitor progress of civil works from project sites on a day-to-day basis. This has aided in speedy and efficient project implementation and quick decision-making at different levels.

KEY LEARNINGS

BSHP I was successful in rehabilitating 820 km of roads targeted under SHDP and implementing significant sector reforms including establishment of BSRDC. Historically, low road maintenance, especially due to under utilization of allocated budget, was the primary reason for deterioration of the project roads. BSHP II was, thus, designed not only to upgrade 356 km of road network but also to develop a state wide road asset registry and implement measures for maintenance management of roads.

Advanced planning of land and material mobilization, purchase of machines, and hiring of labour to avoid any cost and time overruns, was adopted for timely completion of both the projects. As a result, BSHP I has been successfully completed in January 2013 as per schedule and construction work under BSHP II is expected to be completed by 2015.

Technical assistance

A $1 million TA was provided by ADB for restructuring RCD to a state-of-the-art road agency with improved business procedures and institutional and management structure. This included trainings on procurement and contracting, planning, quality assurance, designing of pavements, maintenance, and human resource management.

Follow on capacity development TA support of $1 million is being provided under BSHP II to BSRDC in adopting improved procedures in the same areas of road sector management as under the TA attached to BSHP I. It is also supporting BSRDC in project design and implementation, and for sustainable operations and maintenance (O&M) of the improved roads through efficient utilization of the budget allocated for road asset management.

Improved connectivity

Subodh Kumar Singh, head of village Sardi, district Darbhanga, says *"We used to be scared of accidents while going to Rajgir as the roads were very bad. But ever since SH-71 has been reconstructed, we go to Rajgir everyday to sell our crops. We also have access to the markets in Biharsharif and Katrisarai now. Land prices in my village have gone up and the village children now go to better schools and colleges in Biharsharif".*

PROJECT SUMMARY

RATIONALE

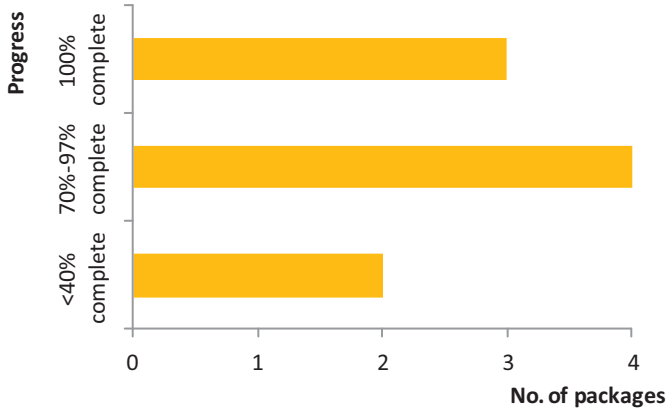
- Status of roads in Bihar was not in a good condition due to poor maintenance and low budget allocation.
- Half of the villages lacked connectivity to all weather roads.
- Only 2% of state highways in the state had two or more lanes.
- Bihar's road density was 1/3rd of national average at the time of project inception in 2008.
- GOB is undertaking the State Highway Development Program (SHDP) to rehabilitate and upgrade 2,831 km of state highways.
- ADB undertook the Bihar State Highways Project I and II to support in implementing SHDP and provided TA for institutional strengthening of the project executing agencies.

DELIVERABLES

Improved state road network

Project I

- 9 civil works packages awarded for rehabilitation and reconstruction of 820 km of state highways



- Existing single lanes up-graded to two lanes
- Culverts and bridges strengthened and structures for resettlement and rehabilitation constructed

Project II

- 4 civil works contracts awarded for rehabilitation/reconstruction of 356 km of roads

Institutional development

Equipment support for quality control, survey and design, road safety, and control of over-loading and vehicle emissions

Exposure to handle performance-based contracts, O&M contracts, and PPPs

RCD/ BSRDC

Development of state wide road asset registry

Trainings for restructuring business processes, better management of road assets, roads maintenance, project implementation and design

ACHIEVEMENTS

- BSHP I and II have led to enhanced road transport efficiency and safety in the state.
- BSHP I is expected to reduce vehicle operating costs on project roads by 30% for two-axle trucks and by 35% for passenger buses.
- Travel time is expected to decrease by an average of 40% on project roads.
- Improved connectivity has increased farmers' access to markets leading to increased income.
- Rural poor have better access to social services like education and health.
- Local construction industry are benefitting from the large number of contracts being awarded.

PROJECT BRIEF

Madhya Pradesh State Roads Project III

PROJECT OVERVIEW

The state highways network in Madhya Pradesh was characterized by poor road conditions and inadequate coverage that could not cope with the increasing demand for road transport. In line with its focus on promoting infrastructure-led growth in the state, Government of Madhya Pradesh targeted improving road connectivity through upgrading and strengthening 10,249 km of state highways.

Consultation by ADB staff with local beneficiaries near Agar-Barod-Alot-Jawra Road

ADB has in past supported the state government through two projects in state roads subsector in Madhya Pradesh - approved in 2002 and 2007 - that helped upgrade and rehabilitate 3,305km of state highways. In addition, ADB helped the state in implementing substantial reforms in the roads sector including incorporation of Madhya Pradesh Road Development Corporation (MPRDC) as the nodal road agency for development and management of state highways, and helping it adopt best practices of road planning and maintenance.

Through the Madhya Pradesh State Roads Project III, ADB continues support for the development of the state highway network that needs upgrading, and also helping to enhance road safety capacity of MPRDC transforming it into an efficient state highway agency. The project envisages rehabilitating and upgrading 1,080 km of state highways located in the eastern and west central parts of the state that significantly lag in development.

LOAN DETAILS

EXECUTING AGENCY

Madhya Pradesh Road Development Corporation

MILESTONES

Mar 2011 - $300 mn approved

Jan 2013 - $85.6 mn disbursed

Jun 2014 - Closing

OBJECTIVE

The project objective is to rehabilitate and upgrade state highways in the regions that are not at par with development in the rest of Madhya Pradesh. Improving the links in those areas together with the already strengthened road network is expected to help the entire population of the state to gain from the social and economic development opportunities. The project will help upgrade existing roads to two or more intermediate lanes, strengthen existing pavements, culverts and bridges, and construct new bridges and cross-draining structures.

OUTPUTS

Key outputs under the project are presented in the table below:

Rehabilitated and upgraded state highways	• Rehabilitation of about 1,080 km of state highways supplemented with measures for developing "green" highways
Improved capacity for road safety	• Establishment of road accident emergency response system

OUTCOMES

Improved transport operations

Rehabilitation of the state highways is expected to improve the efficiency of state highway network by reducing travel time on project roads by up to 25%.

Improved road safety capacity of MPRDC

Establishment of road accident emergency response system is expected to result in improved road safety and a decline in the number of accidents and fatalities by about 10%.

Improved connectivity

Improved connectivity provided by upgraded roads is expected to facilitate easier access to district headquarters, other local governments, development agencies, health centers, schools and colleges, as well as markets, production centers and other economic centers for people located in the project influence area.

WAY FORWARD

The project will provide continued support to MPRDC in development and management of state highways in Madhya Pradesh that will complete the rehabilitation of the entire state highway network in the state. Adoption of best practices is expected to help enhance MPRDC's efficiency as the state highway agency. Lessons learnt will be useful for future projects to provide key inputs in the area of capacity enhancement and asset management. In the long run, such projects should help the state in accelerating its economic growth.

INNOVATION IMPULSE

Systemic and transformational change

- The project will support capacity enhancement of MPRDC in road safety management through implementation of Road Safety Improvement Program and setting up of a Road Safety Cell.
- Response to road related emergencies will be improved.
- Environment friendly features on state highways will be improved.

Piloting new approaches

- The project will minimize the impact of climate change through proper engineering design and by developing the concept of "green" highways.
- The project will establish an accident response system for state roads network managed by MPRDC

Financing and leveraging

- The project will help MPRDC in preparing a long-term strategy for PPP, to enable larger private sector participation in the development and maintenance of road network.

PROJECT BRIEF

North Eastern State Roads Investment Program

PROJECT OVERVIEW

Condition of roads during project inception stage

The Government of India is increasingly focused on the development of the remote north eastern region, as part of efforts at reducing interregional disparities for facilitating inclusive growth. Due to weak physical infrastructure, the economic potential of the region remains untapped. With recognition that inadequate roads and bridges supporting road transport, the region's single most dominant transport mode, are the major constraints on development efforts, the government started a national investment program to improve road connectivity to remote places in the region. Special Accelerated Road Development Program in the North Eastern Region (SARDP-NE) is to improve higher class roads including national highway and state roads in the region. To complement SARDP-NE, ADB is assisting the government in improving intrastate road connectivity through the North Eastern State Roads Investment Program (NESRIP). Under NESRIP, about 430 km of priority roads in Assam, Manipur, Meghalaya, Mizoram, Sikkim and Tripura will be upgraded, improving road connectivity in these states.

LOAN DETAILS

EXECUTING AGENCIES

Ministry of Development of North Eastern Region; Public Works Departments of Assam, and Meghalaya; Roads and Bridges Department, Sikkim

MILESTONES

- **July 2011 - $200 mn approved for MFF**
- **Aug 2011 - $74.8 mn approved under Tranche 1**
- **Jan 2013 - Nil disbursed**
- **Dec 2016 - Closing**

OBJECTIVE

The investment program is aimed at improving state highways and district roads in the six states in the North Eastern Region that will improve intrastate connectivity. The program will also provide capacity building support to the executing agencies, including the Ministry of Development of North Eastern Region and the state Public Works Departments (PWDs) (or equivalent agencies) in the project states.

OUTPUTS

Key outputs under the program are presented in the table below:

Rehabilitated state roads	• Approximately 430 km of priority state road sections in six north eastern states of Assam, Manipur, Meghalaya, Mizoram, Sikkim and Tripura will be rehabilitated or reconstructed
Improved business process and staff skills	• Information technology based procedures will be established within PWDs for planning and project management purposes • Training of staff and capacity building in all essential road management functions will be undertaken • A road safety program with coordinated engineering, enforcement, and education component will be installed • Sustained funding for O&M of roads operation and maintenance will be ensured

OUTCOMES

Improved intra-state connectivity

Rehabilitation of the state roads is expected to improve intra-state connectivity to district headquarters and other places of administrative and economic importance. Other important outcomes will be reduction in travel time by 20-40%, and vehicle operating costs by 20%-50% on project roads. These roads would lead to high traffic growth rates of at least 9% and would, thereby, support growing traffic needs.

Improved accessibility and enhanced employment opportunities

Roads constructed/rehabilitated under the investment program are expected to directly benefit approximately 4.8 million people living in the vicinity of these roads. Improved roads will make it easier for beneficiaries to access health and education facilities as well as opportunities for employment and markets for their agricultural and other indigenous products. The investment program is expected to generate an estimated 3 million person-days of employment.

WAY FORWARD

The design of the investment program incorporates lessons learnt from past experiences. Increased exposure to best practices enhances the capacity of implementing agencies. In the long run, the project will improve connectivity of the north eastern region to the rest of the country and thus, facilitate execution of development schemes in other sectors and allow benefits from economic growth to reach the masses.

INNOVATION IMPULSE

Systemic and transformational change

- The program involves a separate TA to facilitate institutional development and capacity building of the state PWDs. It will strengthen capacities of these departments to undertake road management by introducing modern practices, more effective and efficient road management processes and systems, and establishing a road maintenance fund.

PROJECT BRIEF

Bihar State Highways II: Additional Financing

PROJECT OVERVIEW

Pre-project road condition in Ballopur village, Bihar

Road network in Bihar was hampered by poor connectivity and lack of maintenance. Majority of state highways were single-lane and lacked all-weather road connectivity. To strengthen the road network in the state, the Government of Bihar launched the State Highway Development Program (SHDP) that aimed at upgrading more than 3,989 km of state highways during the 11th plan period (2007-12). ADB has been supporting the SHDP through assistance to Bihar State Highways Project I in 2008 followed by another Project II in 2010 that together are rehabilitating 1,209 km of state highways identified under the Program, while promoting the institutional strengthening of Bihar State Road Development Corporation (BSRDC). The Additional Financing for Bihar State Highways II will provide funds to further strengthen the development impact of the two earlier ADB-supported interventions by upgrading additional 254 km of severely deteriorated highway sections in northern and southern parts of the state. The project will add value by addressing the challenges of climate change, improving road safety, gender mainstreaming and preparing long-term goals for Bihar's state highways.

LOAN DETAILS

EXECUTING AGENCY

Bihar State Road Development Corporation

MILESTONES

Sept 2012 - $300 mn approved

Jan 2013 - Nil disbursed

Mar 2018 - Closing

OBJECTIVE

The project aims to rehabilitate and upgrade state highway sections located in relatively laggard northern and southern parts of Bihar to optimize the access to the already developed state highway network for project beneficiaries in remote villages. It will upgrade existing roads to two lanes; strengthen pavements, culverts and bridges; and construct new bridges and cross-draining structures.

OUTPUTS

Key outputs under the program are presented in the table below:

Upgraded state highways	• 254 km of state highways will be constructed or rehabilitated
Improved institutional capacity for sustainable transport sector development	• A road master plan and an investment plan will be developed and approved for the next 20 years

Improved road safety	• Road safety measures such as installing signs and speed bumps will be implemented to protect targeted populations, including women and girls
Enhanced social awareness campaigns	• Grassroots road safety campaigns will be conducted ensuring participation by men and women facilitators (targeting 30% women) • Campaigns will be conducted to improve awareness on sexually transmitted diseases

OUTCOMES

Improved state road connectivity

The project will contribute to the development outcomes of the ongoing state highway projects by expanding the coverage to include other remote geographical locations of northern and southern Bihar. It will contribute to building a more efficient state road transport system, thereby supporting sustainable economic growth in the state.

Enhanced efficiencies in asset management and planning

Improved institutional capacity will result in better asset management and efficient utilization of funds. The 20-year strategic master plan developed under the project will also enable BSRDC to plan for sustainable transport sector development in the state.

Improved transport efficiency and road safety

Improved road conditions is expected to result in increased travel speed from 15-25km/hr to 40km/hr. Road safety measures undertaken through community engagement are expected to reduce the number of accidents and fatalities.

Improved environmental sustainability

Environmental sustainability will improve through stratified and multi-storied roadside plantations that will not only allow for greater greenery and reduced erosion, but also break the flood flow velocity and protect road embankments. The use of bioengineering techniques along strategic areas where breaches and inundation have occurred would further improve the environment.

Empowered Gender Action Plan (GAP)

The project will empower a large number of women through implementation of the GAP, which will include conducting a series of awareness campaigns, ensuring involvement of women in decision making committees and sensitizing members of the implementing agency on gender issues.

Enhanced awareness about social issues

The project will provide additional financing for all project-affected communities and contractors' personnel to participate in awareness programs on sexually transmitted diseases, with a target participation rate of 50% for women and poor households.

WAY FORWARD

Along with the construction of an efficient state road transport system, the project will prepare a 20-year strategic master plan for further developing Bihar's state highways. This master plan will include long-term vision and goals, an action program, a monitoring and evaluation system with performance indicators and targets, and an identification of alternative funding sources.

INNOVATION IMPULSE

Systemic and transformational change

- The project will address challenges such as the risk of flooding and increased carbon emissions caused by additional traffic generated by road improvement through interventions like the usage of stringent engineering design and green landscaping; usage of solar panels at construction sites to sequester carbon and reduce carbon emissions and compensatory reforestation in the ratio 1:10.

Financing and leveraging

- A financing plan, identifying potential funding sources from the state government, PPP, and development partners will be prepared to support the 20-year strategic master plan.

PROJECT BRIEF

Rural Connectivity Investment Program

PROJECT OVERVIEW


MP rural roads under construction

Given that the absence of all-weather road connectivity makes rural communities in India inaccessible for up to 90 days a year, the importance of roads in these areas cannot be undermined. Not only does the lack of access impact agricultural productivity and rural employment, it also hurts economic growth of the region. Government of India is addressing this problem through its nationwide rural roads investment program, Pradhan Mantri Gram Sadak Yojana (PMGSY), that aims to provide all-weather road connectivity to habitations in far-flung rural areas. ADB is supporting PMGSY through its Rural Connectivity Investment Program. Approved in 2012, the program will help construct 9,000 km all-weather roads in Assam, Chhattisgarh, Madhya Pradesh, Odisha, and West Bengal, resulting in improved connectivity of large rural population in these states to markets, district headquarters and other centers of economic activity.

OBJECTIVE

The program will help improve road linkages to 4,200 habitations in the rural areas of the five states. It will also focus on improving institutional arrangements, business processes, and capacity development.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved quality of rural roads	• 9,000 km of all-weather rural roads will be constructed across five participating states • All road designs will follow standardized detailed project report templates, undergo quality control with use of toolkits and account for climate change related impacts
Improved maintenance of roads	• At least 30 Rural Road Network Management Units will be established (25% of which will be female staff)
Improved road safety measures	• Road safety measures will be incorporated into the life cycle of the investment program, with at least 50% of designs and 30% of existing road networks undergoing road safety audits annually and being improved accordingly
Improved capacities and management	• Five Rural Connectivity Training and Research Centres (RCTRC) will be established and operationalized • Training and certification of at least 4,000 project

LOAN DETAILS

EXECUTING AGENCIES

Ministry of Rural Development; PWD (Assam); Department of Panchayat and Rural Development (Chhattisgarh, Madhya Pradesh, and West Bengal); Department of Rural Development (Odisha)

MILESTONES

July 2012 - $800 mn approved for MFF

Aug 2012 - $252 mn approved under Tranche 1

Jan 2013 - Nil disbursed

Jun 2018 - Closing

	implementation unit staff, 300 panchayati raj institution staff (at least 30% women), 100 design consultants, and 300 contractors will be introduced.

OUTCOMES

Improved connectivity

The project will result in improved connectivity in the five project states of West Bengal, Odisha, Assam, Madhya Pradesh and Chhattisgarh. Approximately 4,200 rural habitations will be newly connected with the all-weather program roads. Of these newly connected habitations, at least 10% of households will be headed by women and at least 40% of households will be from vulnerable socio-economic groups.

Improved employment opportunities

Improved connectivity will have a direct impact on employment opportunities and wages accessible to the rural population in project influence areas. Farmers will be able to access new markets, mainstream high value perishable goods and shift to commercially oriented agricultural production. Households will be able to access higher-paying jobs. Investments in non-agricultural enterprises in these areas are also expected to see a rapid growth. The program itself will also generate short-term labour opportunities for the rural poor.

Improved gender mainstreaming

The project includes a gender action plan that will incorporate important gender mainstreaming targets. These include (i) 30% participation of women in transect walks (an information gathering exercise); (ii) participation of women in road safety awareness sessions; (iii) 33% participation of women in road maintenance; and (iv) development and use of gender-sensitive training modules.

Improved social indicators

Creation of sustainable all-weather rural roads will improve social indicators such as maternal and infant deaths, safe delivery and immunization, and school enrolment rates by connecting rural communities to centers of economic activity and educational and health facilities. This is expected to have significant positive impact on their standards of living.

WAY FORWARD

The investment program will pilot the use of new construction technologies that will pave the way for knowledge sharing of good practices. Overall, the program is expected to result in improved connectivity between different geographical areas of the country and allow for increased economic opportunities and improved social indicators in the long run.

INNOVATION IMPULSE

Systemic and transformational change

- The investment program will support the establishment of RRNMUs for effective and high-quality rural road network management with emphasis on performance-based maintenance of created assets and establishment of RCTRCs.

Financing and leveraging

- A PPP approach to road maintenance will be followed and operationalized, 33% of which will be conducted by women.

PROJECT BRIEF

Uttarakhand State Road Investment Program

PROJECT OVERVIEW

Newly built state road under the project

More than 90% of intra and interstate freight and passenger traffic in Uttarakhand is dependent on roads for transport. However, the condition of the road network in the state needs immediate attention - 30% of the state highways and major district roads and 70% of other district and village roads require rehabilitation. The ADB supported Uttarakhand State Road Investment Program will provide funding for several investment projects to be implemented sequentially over a period of 10 years. Each project will have two main components - infrastructure improvement and infrastructure management. These projects collectively aim to improve 10,800 km of the state roads. The projects also aim to make the PWD of the state better equipped to manage road transport infrastructure through its capacity building component.

LOAN DETAILS

EXECUTING AGENCY

Project Management Unit, Public Works Department, Government of Uttarakhand

MILESTONES

- **Dec 2006 - $550 mn approved for MFF**
- **Jan 2007 - $50 mn approved under Tranche 1**
- **Oct 2008 - $140 mn approved under Tranche 2**
- **Jan 2013 - $123.1 mn disbursed**
- **Dec 2017 - Closing**

OBJECTIVE

The Investment Program is helping Uttarakhand to improve almost two third of the state road network thereby increasing the efficiency, safety, comfort, and reliability of transport services in the state. It also aims to increase sustainability of the investment by helping PWD restructure and adopt improved policies and operational procedures, and train its staff with relevant skills. Private sector involvement and improved governance are critical components of the program.

OUTPUTS

Key outputs under the program are presented in the table below:

Paved, repaired or rehabilitated state roads	• 10,800 km of state roads are being rehabilitated
Enhanced staff training and revised operating procedures	• Training of at least 200 PWD staff in areas of planning, quality control, contract administration , safeguard compliance and use of computerized Management Information and Project Management System (MIPMS) is being incorporated • Revised accounting, planning and asset management procedures based on MIPMS for financial management and monitoring is being conducted • Training of least 200 PWD staff in one or more areas of (i) establishing realistic performance targets; and (ii) development of routine maintenance performance-based contracts for non-ADB roads is being incorporated

	• Human Resource Development strategy and training programmes in developing course outlines, organization of training with external institutions and selection of trainees is being conducted

OUTCOMES

Improved road transport system

Higher efficiency in road transport services is being achieved through the program. This will be visible through increase in number of goods vehicle permits from 600 to 750 per month, increase in bus utilization rate from 200 to 250 km per bus per day and increase in stage carrier permits from 15 to 20 per month. There will be enhanced sustainability of road network through reduced routine maintenance cost and increase in average service life of periodic maintenance.

Enhanced operational transparency

Operational transparency will improve through the review of current structure of PWD following which recommendations will be made to restructure it and streamline its policies and operational procedures. On the other hand, institutional measures related to modernization of planning, management information and project management systems and road maintenance will be implemented. These will significantly enhance accountability and allow for greater PWD sustainability.

WAY FORWARD

The projects under the program are assisting Uttarakhand's road development plan by supporting repair and rehabilitation of its road network and strengthening its institutional capacity. The Investment Program is expected to have an incremental, positive long-term impact on Uttarakhand's economy and living standards of the rural population.

INNOVATION IMPULSE

Systemic and transformational change

- The program is expected to enhance the capacity of the state's PWD by reengineering business processes such as operationalizing the MIPMS, mainstreaming strategic planning and introducing new procedures. Staff skills will also be improved through long-term education and training programs. Enhanced awareness and skills of state road builders will improve their capacity of executing civil works.

Financing and leveraging

- PWD will adopt good practices including (i) performance-based contracts to procure physical infrastructure to attract good-quality private contractors, and (ii) ensure three consecutive years of maintenance following completion of road construction to reduce road maintenance costs.

PROJECT BRIEF

Jharkhand State Roads Project

PROJECT OVERVIEW

Construction of new flyover under progress

Jharkhand is one of the most well endowed states in natural resources and minerals and is home to some of the most prominent industrial townships in the country. However, majority of economic activity is concentrated in the region south of National Highway 2 while the area northeast of National Highway 2 lacks development despite presence of rich natural resources. A major factor constraining progress in this region is the poor quality of road infrastructure. ADB is assisting the government in addressing this disparity by undertaking the Jharkhand State Roads Project that will rehabilitate 311 km of state roads connecting the north east region of the state to National Highway 2 and to the larger national highway network. It would also enhance the project management skills of the Road Construction Department (RCD) through trainings in activities that are central to project management like designing, planning, procurement and contract management.

LOAN DETAILS

EXECUTING AGENCY

Road Construction Department, Government of Jharkhand

MILESTONES

Dec 2009 - $200 mn approved

Jan 2013 - $52.3 mn disbursed

Dec 2014 - Closing

OBJECTIVE

The project should help bridge inter-state disparities by providing improved transport connectivity. It would also help reduce the urban-rural divide by improving a key road section in one of the state's underdeveloped areas. The rehabilitation of state roads from Govindpur to Sahebganj (via Jamtara, Dumka and Barhet) to a two-lane standard will become the backbone of the north-eastern region of the state.

OUTPUTS

Key outputs under the project are presented in the table below:

Rehabilitated roads	• Approximately 311 km of road will be rehabilitated and upgraded to two lanes. As of March 2013, the physical progress is 55%.
Improved systems for project management	• A financial management system and a management information system has been established, while a quality assurance system is currently under development in order to improve project management
Enhanced capacity of RCD	• Quality assurance system will be developed for RCD • A technical assistance for strengthening the capacity of RCD is currently being implemented. Capacity of RCD officials is being strengthened in the areas of project design, implementation, procurement, land acquisition, resettlement and rehabilitation, environmental management, utility shifting, contract management, and financial management.

OUTCOMES

Improved mobility and accessibility

The project would improve connectivity within the state by connecting the area northeast of National Highway 2, to the state highway network. Travel time and vehicle operating costs are expected to decrease by 20%-40% and 12%-35% respectively. Improved roads will help encourage economic activities in the north-eastern region of the state.

Improved employment opportunities

In the short run, the project should provide employment opportunities and stability during the project construction period particularly to households that depend on occasional and uncertain employment. Over the long run, the project is expected to provide access to centers of economic activity, and health and educational facilities that would contribute to better standards of living.

WAY FORWARD

This ADB project is the first externally-financed project in Jharkhand. The project provides an opportunity to the state government to share knowledge of good practices. While the primary objective of the project is to improve connectivity and reduce inter-state disparities, the project will also catalyze policy reforms that allows for improved efficiency and greater private sector participation in the sector.

INNOVATION IMPULSE

Systemic and transformational change

- This project is Jharkhand's first major road infrastructure development project involving external financiers. International good practices will be adopted in procurement and contract management, which should strengthen RCD's capacity in the long run to design and implement large roads projects.

Financing and leveraging

- The state government has ensured that a dedicated state-level road fund will be created in order to provide sufficient funds for maintenance of roads under the project and the state's road assets in general.
- Improved roads will facilitate investments in the project areas, and will aim to reduce inter-state disparities.

PROJECT BRIEF

Karnataka State Highway Improvement Project

PROJECT OVERVIEW

Condition of one of the roads (AEP 6: Davangere – Birur Road) before the project

Karnataka, in recent years, has been facing increasing road traffic congestion owing to growth of traffic coupled with inadequacy of the existing road network. Only around 27% of Karnataka's state highways are in good condition, whereas 14% of state highways are in very poor condition. ADB is assisting Government of Karnataka in its endeavour to improve the state's road network through the Karnataka State Highway Improvement Project. The project is also assisting the state government in implementing its Institutional Development and Strengthening Action Plan (IDSAP) that was adopted in 2010, as a part of the project.

LOAN DETAILS

EXECUTING AGENCY

Project Implementation Unit, Public Works Department, Government of Karnataka

MILESTONES

Nov 2010 - $315 mn approved

Jan 2013 - $21.1 mn disbursed

Jun 2015 - Closing

OBJECTIVE

The project aims to upgrade 615 km of state highways and strengthen the capacity of the state's PWD to develop, operate and maintain the road network that will help ease traffic bottlenecks. The project is building sustainable capacity of PWD in road planning and asset management. The improved highway network will help achieve the long-term objective of the project in contributing to accelerated economic growth in the state.

OUTPUTS

Key outputs under the project are presented in the table below:

Upgrade of priority state highways	• Civil works on 615 km of project roads is being completed and operationalized
Road sector planning, programming, and policy formulation	• Planning and Road Asset Management Center (PRAMC) is being operationalized that will be responsible for objective and data driven processes for planning, programming and policy formulation
Enhanced road safety processes	• A road safety unit will be established and operationalized under PRAMC. The road safety unit will undertake implementation of system for incident management and enhance accident analysis system. • Accident black spot program will be implemented on a pilot basis

Strengthened PWD capacity	• PWD capacity for operation, maintenance, and protection of road asset will be strengthened

OUTCOMES

Improved efficiency of roads

Efficiency of the road sector operations is expected to improve. The travel on project roads is likely to be more comfortable. By the end of the Project, average travel time on the project roads is expected to reduce by 25%. Frequency of fatal and severe injury accidents on project roads is expected to reduce by 20%.

Enhanced capacity

The capacity of the state's PWD in developing, operating and maintaining the state road network, managing assets, improving road safety, and attracting private sector participation, will be enhanced.

WAY FORWARD

Road sector planning, programming and policy formulation will be transformed into an objective, data driven and sustainable process. This will allow for better long term planning in order to meet the overall objective of increasing efficiency and sustainability of the state highway network.

INNOVATION IMPULSE

Systemic and transformational change

- A Planning and Road Asset Management Centre (PRAMC) will be set up within the Karnataka PWD. It will be responsible for policy development and planning, programming, road safety and information technology support. It will establish various functional units and systems for efficient state road sector management.
- Safety will be incorporated into the life cycle of state roads including business processes and tools for the purpose.
- A training unit will be established exclusively for training and other human resource development activities of PWD.

PROJECT BRIEF

Railway Sector Investment Program

PROJECT OVERVIEW


View of Indian Railways

As per Government of India's 12th plan, the economy's requirement for transport services is expected to grow faster than the overall GDP growth. Railways make up a significant part of India's transport sector, catering to a large proportion of both passenger and freight traffic. Thus, there is a need to strengthen the existing railway network in the country. The Railway Sector Investment Program proposes to address issues like capacity enhancement of physical railway infrastructure, efficiency improvement of the existing infrastructure, and improvement of operational and financial efficiency of the Indian Railways. The program has been designed in coordination with development partners in order to have wide geographic coverage.

LOAN DETAILS

EXECUTING AGENCY

Ministry of Railways, Government of India

MILESTONES

- Aug 2011 - $500 mn approved for MFF
- Oct 2011 - $150 mn approved under Tranche 1
- Jan 2013 - $3.3 mn disbursed
- Dec 2018 - Closing

OBJECTIVE

The investment program aims to increase the capacity of the existing rail network and develop an energy efficient, safe, reliable, affordable, and environment-friendly railway system along corridors with heavy bulk freight traffic.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved railway network	• 840 km of rail route will be double-tracked, and 640 km of rail routes along high density corridors will be electrified
Enhanced institutional efficiency	• Equipments for implementing new accounting architecture will be procured • Institutional strengthening activities will be implemented as per action plan agreed with Ministry of Railways • New accounting systems synchronized with the Government Accounting Standards Advisory Board in at least one zone under the program, will be implemented
Improved environmental sensitivity	• Implementation support will be provided for monitoring Carbon Emission Reductions through provision of smoke and gas analyzers • Clean Development Mechanism (CDM) activities like tree planting along railways, installation of modern signaling and telecommunication systems using Light-Emitting Diode signals and solar panel systems will be implemented

OUTCOMES

Increased railway network capacity

Efficient utilization of the physical rail infrastructure will increase capacity of the existing rail network to handle growing traffic demands. Average travel times are expected to be reduced by half and accidents by 20%.

Improved institutional efficiency

Institutional reforms, especially accounting reforms, will improve operational and financial efficiencies. This will, in turn, lead to reduced fuel consumption and lower transport costs, benefiting railway users. Increased carrying capacities and timely and efficient services will eventually lead to modal shift to railways and improve financial sustainability of railway operations by approximately 20%.

Enhanced environmental sustainability

CDM component of the investment will focus on environmental concerns. Steps under this component will lead to a 0.9 million ton per annum reduction in the emission of carbon dioxide, due to modal shift from vehicles to railways.

Greater employment opportunities

Approximately 21 million people living in the project area will be positively influenced with direct or indirect economic benefits, and about 5,400 person-years of work will be created during the construction period of the program.

WAY FORWARD

Development of the Indian railway network is critical for supporting inclusive and environmentally sustainable growth. Through the program, the Indian transport network will be improved and faster mobility would be achieved.

INNOVATION IMPULSE

Systemic and transformational change

- The institutional efficiency enhancement component will provide equipment and support to push forward the implementation of the new accounting architecture. Accounting reform implementation, due to the recognition of its importance by the Indian Railways, is now being monitored by the Planning Commission. This has facilitated a continuing dialogue on sector development between ADB and the Ministry of Railways and has led to the development of a detailed institutional strengthening action plan.

Financing and leveraging

- A preliminary study indicated that the project will result in substantial (0.9 million ton) annual carbon emission reductions as a result of the modal shift from vehicular traffic along project corridors. This will have the potential to enable the investment program to register CER credits with CDM. A TA has been provided separately to pursue CER credits and enhance Indian Railways' CDM activities, including possible registration under UNFCCC.

PROJECT BRIEF

Chhattisgarh State Road Sector Project

PROJECT OVERVIEW

Pre-project condition of road in Nandghat, Chhattisgarh

Roads are the main mode of transportation in Chhattisgarh. National highways provide good east-west connectivity with neighbouring states, and the main north–south connection within the state. However, state highways and major district roads in Chhattisgarh are mostly in poor condition, and are not usable in the monsoon season. The road density in Chhattisgarh is less than 30 km per 100 sq km against the national average of 100 km per 100 sq km and 80% of its existing road network has high international roughness index. The state thus lacks an adequate road network to support the required mobility to markets, business centers and social amenities.

To improve connectivity, PWD, Government of Chhattisgarh prepared a 10-year master plan in 2002-03 for construction/rehabilitation of 5,000 km of state and district roads. The plan was updated in 2006, supported by a TA provided by ADB, to expand the coverage of focus to 8,871 km of state and district roads. The Chhattisgarh State Roads Sector Project aims at providing continued support in implementation of this master plan. This project will include improving 916 km of state roads, upgrading roads to two lanes, strengthening culverts and bridges, building new road sections and bridges, and supporting civil works implementation.

OBJECTIVE

The project aims to support economic growth in Chhattisgarh by improving the state's road transport network. Improved connectivity is expected to enable industrial centres and special economic zones in the state to reap the benefits of Chhattisgarh's rich natural resource base. At the same time, the state's population, majority of which is rural, would have increased access to markets, industrial centres, economic development zones, and social services like health and education.

OUTPUTS

Key outputs under the project are presented in the table below:

Upgraded state roads	• 916 km of state roads will be reconstructed and rehabilitated in 15 road sections • Reconstruction/rehabilitation work will include upgrading roads to two lanes, strengthening culverts and bridges, and building new road sections and bridges

LOAN DETAILS

EXECUTING AGENCY

Public Works Department, Government of Chhattisgarh

MILESTONES

Dec 2012 - $300 mn approved

Jan 2013 - Nil Disbursed

Jun 2018 - Closing

Improved capacity building of PWD	• PWD staff will be trained in procurement, contract management and project management • Computerized accounting system will be established at the Project Implementation Units
Enhanced efficiency through establishment of road asset management system	• A road asset management system will be established and made operational, for roads financed by ADB • Staff will be trained in the use of the road asset management system for planning of road maintenance activities and expanding the road asset management to cover all roads managed by PWD • Database on road assets will be prepared

OUTCOMES

Improved connectivity and reduced costs

Improved connectivity will increase mobility of people and goods on project roads from 0.91 average daily million vehicle-km in 2011 to 1.19 average daily million vehicle-km by the end of the project. Average travel time on the project roads is expected to be reduced by 35% from 2.1 minutes per km in 2011 to 1.37 minutes per km. Vehicle operating economic costs on project roads will decrease by 20% by 2018 from the current levels of $0.125 per km in case of cars and $0.3 in case of medium trucks in 2011.

Increased employment

Enhanced linkages to markets and production centers, due to improved roads connectivity, would increase economic and employment opportunities for people, especially those living in rural areas. Farmers should get better prices for their produce from larger markets contributing to increased income levels. Increased access to public and social services, like hospitals and schools, will improve the quality of life of the residents in the project areas.

WAY FORWARD

The project will incorporate lessons and good practices from the previous ADB loan to the state (in 2003) for state roads development. Appropriate policies for project preparation and project management will help in efficient and timely project implementation. In the long run, the project is expected to play a vital role in accelerating economic growth in the state through enhanced employment and business opportunities that will result from increased access to markets and business centers.

INNOVATION IMPULSE

Systemic and transformational change

- A capacity development TA for $1.0 million for institutional strengthening of the Chhattisgarh Public Works Department will support the institutional development initiatives of the GOC. The TA will assist and support the project implementation unit in improving project implementation, designing, enhancing road safety, and ensuring the future operation and maintenance of the project roads through an improved road asset management system. Consultants will be recruited to conduct district and statewide training and workshops as required.

ENERGY

3. Energy

Sector background and challenges

India will continue to need large investments in electricity generation to meet the demands of a fast growing economy. Per capita energy consumption in the country grew at an average annual rate of 5.3% during the 11th plan period (2007-2012)[15]. While nearly 55,000 megawatt (MW) of new generation capacity was created, a large growth in the demand for energy resulted in an overall energy deficit of 8.7% and peak shortage of 9%. Continued growth in the demand for energy will require substantially more generation capacity. The challenges for the sector are listed below.

Generation capacity and fuel availability. The Planning Commission's Working Group for formulating the power sector development program over the 12th plan period has estimated an additional capacity requirement of 75,785 MW to meet the power demand projections at the national level[16]. In order to meet this requirement, it will be critical to ensure the availability of fuel from both domestic and international sources. It is estimated that by 2016-17, around 38% of energy requirement (mainly coal, oil and natural gas) will have to be imported.

Tariff management. Energy prices in India do not adequately cover the average cost of power supply and, in general, have been lower than global prices. Electricity tariffs in India are low for agriculture (which contributes 15% of GDP yet consumes 25% of power supplies), and also below cost for many other consumer categories[17]. Rational energy prices will be necessary to ensure expanded energy supply as producers need investible surpluses to increase capacity.

Distribution subsector. Utilities operating in this subsector (the others being power generation and its transmission over longer distances at higher voltages) have been facing high aggregate technical and commercial (AT&C) losses. A reduction in AT&C is imperative for improving the financial viability of utilities and enabling them to undertake needed investments.

Renewable energy generation. India has a huge potential for both wind and solar energy. The 12th plan projects an addition of 30,000 MW in renewable power capacity against the present 25,000 MW installed capacity of renewable power. Meeting this projection will contribute significantly to sustainable development of the energy sector.

Rural electrification. In 2009-10, 94% of urban households and 67.3% of rural households in India had access to electricity. In order to universalize access to power, focusing attention on states such as Jharkhand, Bihar, Odisha and Assam where rural electrification is below the national average will help considerably.

Energy efficiency. India's energy efficiency, measured by energy intensity[18], has shown significant improvement. This improvement can be attributed to initiatives undertaken by the government, through the Bureau of Energy Efficiency (BEE), to

[15]All figures are sourced from the Draft Twelfth Five Year Plan (2012–2017) Faster, More Inclusive and Sustainable Growth – Volume II, unless otherwise mentioned.
[16]Source: Report of the Working Group on Power for Twelfth Plan (2012-17), Government of India
[17]Source: Economic Survey 2012-13, Government of India
[18]Energy intensity is defined as the energy input associated with a unit of gross domestic product (GDP); the lower the energy intensity the greater the energy efficiency. India's energy intensity has been declining from 1.09 Kgoe/US$ in 1981 to 0.62 Kgoe/US$ in 2006.

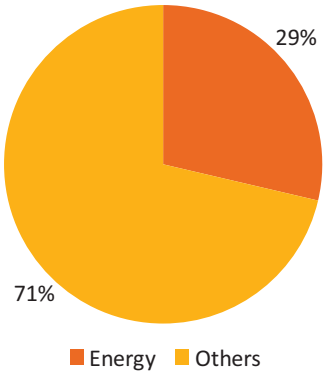


Figure 3.1: Energy's share in ADB portfolio (1986-2012)

AT A GLANCE

- *Energy demand in India has been growing, with nearly 55,000 MW of new generation capacity created during 2007-12. However, there exists an overall energy deficit of 8.7% and peak shortage of 9%.*
- *Ensuring availability of adequate fuel to meet the growing demand for power is a key challenge faced by the sector.*
- *Rationalization of energy prices will be necessary to ensure expanded energy supply as producers need investible surpluses to increase capacity.*
- *A reduction in AT&C is imperative for improving the financial viability of utilities and enabling them to undertake needed investments.*
- *Exploiting the country's renewable energy potential will be essential for sustainable development of the sector.*
- *Focus on states like Jharkhand, Bihar, Odisha and Assam is essential to improve rural electrification in the country.*

promote energy efficiency amongst consumers. These include *Bachat Lamp Yojana*, demand side management, labeling of appliances according to energy consumption, and green buildings among others. A continued focus on energy efficiency during the 12th plan will ensure even larger gains.

Government of India's sector strategy

In order to address the challenges in the power sector, the government has been undertaking several measures in recent years, such as establishing a stable and attractive policy regime, promoting fuel development projects, encouraging private sector investment and contributing to renewable energy development.

To address the problem of inadequate generating capacity, Government of India initiated ultra mega power projects (UMPPs). Further, to ensure greater fuel availability, the government approved an Integrated Energy Policy in 2006 under which tradable fuels are allowed to be priced in line with global prices. Role of private sector is envisaged to be of great importance in the generation subsector and hence, the 12th plan targets an increase in private sector participation in capacity expansion from 19% in the 11th plan to 53% during the 12th plan period. UMPPs also brought in private investment in the power sector. In its efforts to expand transmission capacity, the 12th plan proposes to build a national level policy framework for promoting more private sector investments.

The government has introduced several policies in order to rationalize energy pricing. In 2003, the government enacted the Electricity Bill advocating unbundling of state electricity boards, open access, and rationalization of tariffs. The National Tariff Policy introduced in 2006, mandates competitive bidding for power procurement by distribution utilities. In addition, the 12th plan aims to procure and allocate power in line with the National Tariff Policy and the guidelines/standard bid documents issued by the government under the Electricity Act, 2003.

In its efforts to reduce distribution losses, the government introduced the Accelerated Power Development and Reform Programme (APDRP) in 2002, which was restructured in 2008 (Restructured Accelerated Power Development and Reform Programme, i.e. R-APDRP). This programme aims at restoring commercial viability of the distribution sector by reducing AT&C losses faced by the distribution utilities. One part of the programme focuses on establishing reliable and automated systems for data collection and adopting information technology in energy accounting, auditing and consumer base services, while the other part of the program targets strengthening of the distribution system. The Working Group for the 12th plan has assessed a total investment requirement for the distribution sector at $56.15 billion[19] under the R-APDRP.

In order to promote renewable energy generation, the government launched the Jawaharlal Nehru National Solar Mission (JNNSM) under which it aims to create solar generation capacity of 22,000 MW by 2022. The 12th plan aims to tap the hydropower potential of the north eastern region by quickening the pace of environmental and other clearances required for projects. It has also projected a rise in share of hydro, thermal and nuclear energy supply from 26% in 2012 to 39% by 2030. It emphasizes technological development in the field of renewable energy to make it commercially viable. Off-grid renewable power is also encouraged, through policy interventions and catalyzing finance.

To increase access to electricity in rural areas, the government launched the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) in 2005 that aimed at electrification of all villages and households in the country, especially in rural areas and provide electricity connection to Below Poverty Line (BPL) families free of

AT A GLANCE

- *Government of India approved an Integrated Energy Policy in 2006 under which tradable fuels are allowed to be priced in line with global prices.*
- *12th plan targets an increase in private sector participation in capacity expansion from 19% in the 11th Plan to 53% during the 12th Plan period.*
- *The government introduced the National Tariff Policy in 2006 to make energy prices more economic by mandating competitive bidding for power procurement by distribution utilities.*
- *Accelerated Power Development and Reform Programme introduced by the government in 2002 aims at restoring commercial viability of the distribution sector by reducing AT&C losses faced by the distribution utilities.*
- *Government of India launched JNNSM under which it aims to create a solar generation capacity of 22,000 MW by 2022.*
- *Government of India's RGGVY aims at electrification of all villages and households in the country, especially in rural areas, and providing electricity connection to BPL families free of charge.*

[19]All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.

charge. As of 2011-12, about 70.6% of BPL households have been electrified under the program. The 12th plan emphasizes dealing with the backlog in RGGVY achievements in the states of Jharkhand, Bihar, Odisha, Assam and some of the north-eastern states on a priority basis.

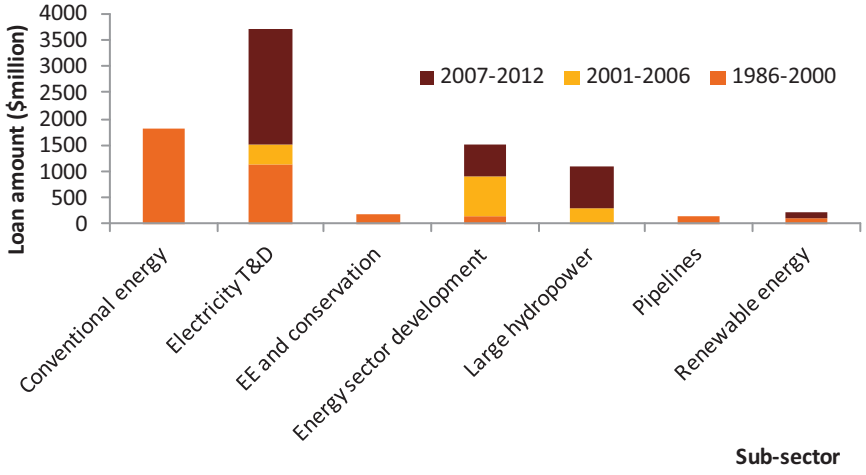
With an aim to incentivize and increase energy efficiency, the 12th plan focuses on rationalization of energy prices and implementation of other non-price initiatives such as continued support to the National Mission for Enhanced Energy Efficiency (NMEEE) adopted by the government in 2008. NMEEE was one of the eight mission programmes under the National Action Plan for Climate Change. In addition to promoting and up scaling the existing measures under NMEEE, the government has launched the Perform Achieve and Trade (PAT) scheme which aims to impose targets for reducing energy use in energy intensive industries. So far, different schemes for promoting energy efficiency have resulted in saving in avoided power capacity of 11,000 MW. Induction of super-critical technology in UMPPs is yet another step to ensure energy efficiency.

The government aims at 100% rural electrification in the country. About 70.6% of BPL households have been electrified under RGGVY program.

ADB's sector assistance

ADB has been extensively involved in energy sector projects in India. ADB has been shifting its focus from assistance to projects in conventional energy sector to projects related to improving transmission and distribution networks and those dealing with non-conventional energy sources, as shown in Figure 3.3[20]. In the first 15 years of its assistance, i.e. 1986-2000, ADB provided a majority of its support to conventional energy projects amounting to $1.8 billion. However, in recent years, it has focused largely on electricity transmission and distribution, which forms 59% of its total sectoral assistance in the period. ADB has also increased its contribution for promotion of hydropower which forms 21.6% of its total sectoral assistance in the period 2007-12.

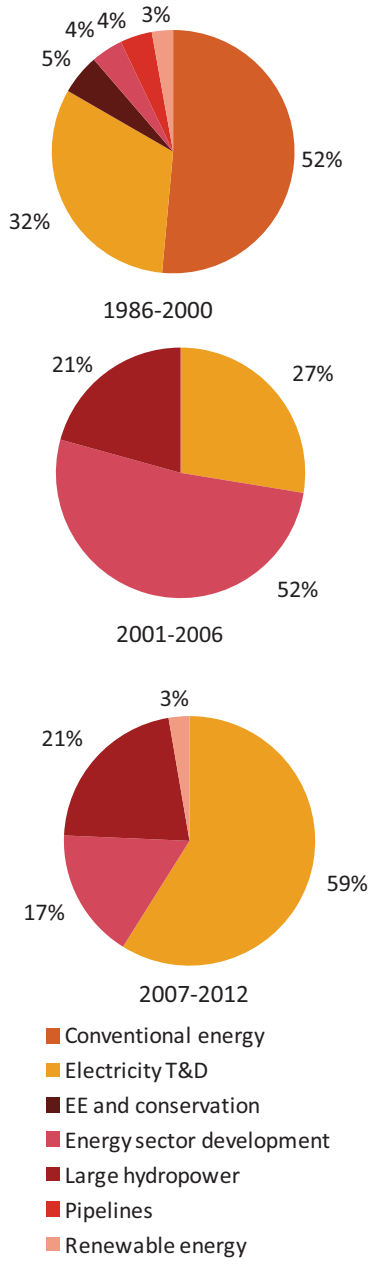
Figure 3.3: Intra-sectoral allocation of ADB's assistance in the power sector[21]



Notes: T&D- Transmission and Distribution; EE- Energy Efficiency

The largest share of ADB's assistance in the sector was given to national level projects in the initial years of its operations (1986-2000) in India (as shown in Figure 3.4), including support to central public sector enterprises such as the Gas Authority of India Limited (GAIL), Power Grid Corporation of India Limited (also known as POWERGRID), and National Thermal Power Corporation of India limited (NTPC). It later shifted its focus towards strengthening the power sector at the state level

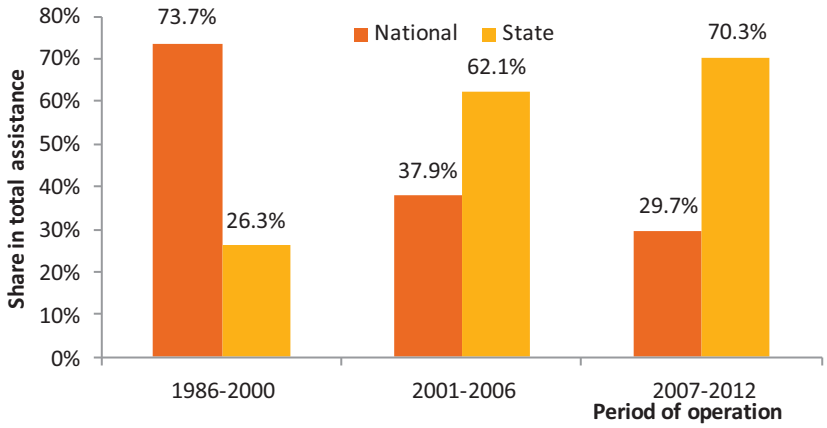
Figure 3.2: Sub Sectoral Split



[20]All figures in this subsection—ADB's sector assistance—have been sourced from ADB.
[21]Energy sector development includes assistance supporting sector reforms like unbundling of state electricity boards and other governance reforms.

through support in establishment of state regulatory commissions, unbundling of state electricity boards, transmission and distribution strengthening and increased consumer metering.

Figure 3.4: ADB's national and state level operations in energy sector



AT A GLANCE

- *ADB has shifted its focus from national level energy projects in initial years of its operations to state level projects in recent times.*
- *The present focus of ADB is more on projects related to transmission and distribution and those dealing with non -conventional energy sources.*
- *ADB has been supporting the APDRP and RGBVY for strengthening the transmission and distribution systems across states in the country.*
- *It assisted the Ministry of New and Renewable Energy, Government of India, on the commercial agreements for the first round of bidding under the National Solar Mission.*
- *ADB has provided technical assistance to state utilities in India in preparing the Clean Development Mechanism in thermal and hydropower generation sectors.*

Improving transmission and distribution and access to electricity. ADB has been supporting the APDRP for strengthening the sub-transmission and distribution systems across states in the country. It has been considering direct financing of transmission line projects to reduce power losses due to pilferage and transmission. Further, ADB is also supporting POWERGRID in setting up high voltage direct current (HVDC) transmission lines to support the development and improvement of the national grid. ADB is also supporting the Government of India's RGGVY programme that aims at providing electricity to all rural households.

Renewable energy development. ADB has supported Government of India's JNNSM across components through both sovereign and non-sovereign lending. It has assisted the Ministry of New and Renewable Energy (MNRE), Government of India, on the commercial agreements for the first round of bidding under the National Solar Mission. ADB has also been supporting MNRE on evaluating alternate technology options for cost-effective, expanded usage of solar power in India. It is supporting establishment of solar parks in selected states (Gujarat and Rajasthan) with dedicated infrastructure facilities which will facilitate setting up of large power plants for generation and transmission of solar power.

Supporting energy efficiency and clean energy development. ADB's Strategy 2020 focuses on supporting developing member countries to move to a low carbon growth process. In this respect, ADB has provided technical assistance to state utilities in India in preparing the Clean Development Mechanism (CDM) in thermal and hydropower generation sectors. This will enhance efficiency rates and reduce green house gas (GHG) emissions of existing power plants. In order to expand its current support for hydropower development in the country, ADB is working with the government to mobilize about $550 million of long term concessional financing from sources such as the Clean Technology Fund to finance innovative elements of the transmission network, ensure stable evacuation of power and bring down development costs in Gujarat and Rajasthan. ADB also plans to extend support for advanced transmission technology including smart grids and high voltage direct current lines to increase efficiency and help lower carbon dioxide emissions.

Under its Carbon Market Program, ADB is providing technical support to government organizations like Himachal Pradesh Power Corporation Limited and local self government departments of Rajasthan in increasing their capacity to manage the CDM process in their respective projects and building a stream of viable GHG mitigation projects for leveraging benefits in the carbon markets.

Institutional restructuring and capacity building. ADB has provided technical assistance to state utilities in the states of Assam, Madhya Pradesh, Himachal Pradesh, Bihar and Uttarakhand in areas of capacity building and institutional strengthening. ADB had assisted the Government of Assam to unbundle the Assam State Electricity Board, under the Electricity Act 2003, into three functional heads namely generation, transmission and distribution (one company each for generation and transmission and three companies for distribution business) in 2004.

Private sector support. ADB supported the first PPP project in energy transmission between POWERGRID and Tata Power Company Limited. It has supported several wind power projects in the states of Gujarat and Karnataka. ADB has made long-term financing for solar projects affordable by providing partial credit guarantees to local and foreign commercial banks that finance solar power plants. This is being done through its Solar Power Generation Guarantee Facility. ADB is also supporting the development of Asia's largest concentrated solar power project in Rajasthan.

Gender mainstreaming. In 2011-2012, ADB pilot-tested innovative modalities to promote gender equality and women's empowerment in the energy sector, with two projects being categorized as effective gender mainstreaming (EGM)[22]. These include the Madhya Pradesh Energy Efficiency Project (2011) with complementary technical assistance for enhancing energy-based livelihoods for women's entrepreneurship, and the Gujarat Solar Power Transmission Project (2011) with integrated technical assistance for vocational and livelihood training for women. ADB aims to improve women's energy-based livelihoods and entrepreneurship and their contribution to energy efficiency, while keeping in mind their preferences for various renewable energy technologies.

Regional cooperation and knowledge transfer. ADB is supporting sector governance studies on renewable energy policy formulation and encouraging exchange of lessons learnt from successes/failures and good practices amongst countries. It is also facilitating international knowledge transfer through the Regional Task Force, a knowledge platform to promote PPP. ADB is supporting capacity development at the International Center for Application of Solar Energy Technologies at the Indian Institute of Technology, Jodhpur for suitable deployment of solar and smart-grid technologies in South Asia.

In its future operations in the energy sector, ADB plans to adopt a 2-track approach:

Under Track 1, ADB will continue to provide support to state utilities in the form of investments and capacity development support to strengthen transmission and distribution networks. It will provide metering and systems to reduce AT&C losses for improving their financial health.

Under Track 2, ADB will explore development of renewable energy using innovative and new technologies, and knowledge products. It will provide support for solar power, focusing on leveraging co-financing and in creating an enabling environment for private sector participation. ADB will explore financial assistance to support solar power projects and also assist financial institutions which will lend funds to wind, solar, small hydro, bio-mass and energy efficiency projects.

AT A GLANCE

- *Support for advanced transmission technology including smart grids and HVDC lines to increase efficiency and help lower carbon dioxide emissions are being planned. Support to private sector energy projects is also being extended.*
- *In 2011-2012, ADB pilot-tested innovative modalities to promote gender equality and women's empowerment in the energy sector, with two projects being categorized as effective gender mainstreaming.*
- *ADB is supporting sector governance studies on renewable energy policy formulation and encouraging exchange of lessons learnt from successes/failures and good practices amongst countries.*
- *ADB plans to continue its support to state utilities to strengthen transmission and distribution networks while assist the development of renewable energy using innovative and new technologies, and knowledge products.*

In its efforts to encourage renewable energy generation and support private sector energy projects, ADB has supported several wind power projects in the states of Gujarat and Karnataka.

[22]A project is assigned EGM if the project outcome is not gender equality or women's empowerment, but project outputs are designed to directly improve women's access to social services, and/or economic and financial resources and opportunities, and/or basic rural and urban infrastructure, and/or enhancing voices and rights, which contribute to gender equality and women's empowerment.

Table 3.1: List of ADB projects in Energy Sector (1986-2012)

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
1.	North Madras Thermal Power Project	Regular	1986	150	Closed
2.	Unchahar Thermal Power Extension Project	Regular	1988	160	Closed
3.	Rayalaseema Thermal Power Project	Regular	1989	230	Closed
4.	Second North Madras Thermal Power Project	Regular	1990	200	Closed
5.	Special Assistance Project	Regular	1991	150	Closed
6.	Gandhar Field Development Project	Regular	1991	267	Closed
7.	Hydrocarbon Sector Program	Regular	1991	250	Closed
8.	Power Efficiency (Sector) Project	Regular	1992	250	Closed
9.	Energy Conservation And Environment Improvement Project	Regular	1992	39.3	Closed
10.	Gas Flaring Reduction Project	Regular	1993	300	Closed
11.	Gas Rehabilitation And Expansion Project	Regular	1993	260	Closed
12.	Industrial Energy Efficiency Project	Regular	1994	150	Closed
13.	Power Transmission (Sector) Project	Regular	1995	275	Closed
14.	Renewable Energy Development Project	Regular	1996	100	Closed
15.	LPG Pipeline Project	Regular	1997	150	Closed
16.	Power Transmission Improvement (Sector) Project	Regular	2000	250	Closed
17.	Gujarat Power Sector Development Program (Policy Loan)	Regular	2000	150	Closed
18.	Gujarat Power Sector Development Program (Project Loan)	Regular	2000	200	Closed
19.	Madhya Pradesh Power Sector Development Program	Regular	2001	150	Closed
20.	Madhya Pradesh Power Sector Development Program (Project Loan)	Regular	2001	200	Closed
21.	State Power Sector Reform Project	Regular	2002	150	Closed
22.	Assam Power Sector Development Program	Regular	2003	150	Closed
23.	Assam Power Sector Development Program (Project Loan)	Regular	2003	100	Closed
24.	Power Grid Transmission (Sector) Project	Regular	2004	400	Closed
25.	Uttaranchal Power Sector Investment Program	MFF	2006	300	Ongoing
26.	Madhya Pradesh Power Sector Investment Program	MFF	2007	620	Ongoing
27.	National Power Grid Development Investment Program	MFF	2008	600	Ongoing
28.	Himachal Pradesh Clean Energy Development Investment Program	MFF	2008	800	Ongoing
29.	Assam Power Sector Enhancement Investment Program	MFF	2009	200	Ongoing
30.	Bihar Power System Improvement Project	Regular	2010	132.2	Ongoing

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
31.	Madhya Pradesh Energy Efficiency Improvement Investment Program	MFF	2011	400	Ongoing
32.	Gujarat Solar Power Transmission Project	Regular	2011	100	Ongoing
33.	National Grid Improvement Project	Regular	2011	500	Ongoing
34.	Himachal Pradesh Clean Energy Transmission Investment Program	MFF	2011	350	Ongoing

CASE STUDY

National Power Grid Development Investment Program

National Power Grid Development Investment Program has incorporated state-of-the-art HVDC transmission technology that has proven to be the most cost effective means of transmitting bulk power over long distances.

LOAN DETAILS

EXECUTING AGENCY

Power Grid Corporation of India Ltd. (POWERGRID)

MILESTONES

- **March 2008 - $600 mn approved for MFF**
- **March 2008 - $400 mn approved for Tranche 1**
- **March 2009 - $124 mn approved for Tranche 2**
- **Dec 2011 - $76 mn approved for Tranche 3**
- **Jan 2013 - $415.6 mn disbursed**
- **March 2015 - Closing**

The importance of power as a key driver of economic growth and poverty reduction is well known. As the 12th plan (2012-17) moves forward towards its target to provide electricity to all households at affordable prices by 2017, it does so at the backdrop of severe shortages. In 2008, with the exception of the eastern and north-eastern regions, the other three — northern, southern, and western — regions faced shortages ranging between 300-6,000 MW. Power surplus in the eastern and north-eastern regions, on the other hand, was 12,000 MW and 3,000 MW respectively. This allowed for the possibility of reducing power shortages by transmitting surplus power from north-eastern and eastern regions to the other power deficit regions.

To exploit this opportunity, Government of India planned the creation of a national grid in a phased manner, by adding over 60,000 circuit km (ckm) of transmission network by 2012. The objective was to (i) strengthen regional grids; (ii) increase inter-regional capacity; and (iii) establish a unified load dispatch scheme. In order to achieve this objective, Power Grid Corporation of India Limited (POWERGRID), the central transmission utility in-charge of developing, operating, and maintaining the national transmission grid, was required to invest $13.75 billion during the 11th plan. To support the government's efforts, ADB approved a $600 million multi-tranche financing facility (MFF) loan under the National Power Grid Development Investment Program (NPGDIP). The key output under the program supported by ADB is setting up of 1,800 km of ±800 kV high voltage direct current (HVDC) northeastern–northern/western interconnector from Biswanath Chariyali to Agra.

KEY DEVELOPMENTAL OUTCOMES

Improved quality of electricity supply. The program is improving quality of electricity supply in deficit regions i.e. northern and western regions. Through development of HVDC transmission line, power generated in hydropower stations in north-eastern regions can be evacuated with minimal technical losses and used to meet rising energy demand of northern and western regions. A length of 38,365 ckm of transmission lines has been added resulting in an inter-regional transmission capacity of 28,000 MW (as of December 2012). Also, the transmission system reliability in FY2012 was maintained at 99.89% reflecting improved reliability of the system. Reliable power supply through expansion and augmentation of national transmission grid is likely to promote industry and services thereby contributing to national economic growth.

Introduced cleaner, environmentally sustainable solutions. In 2008, program preparation analysis revealed that Uttarakhand and north-eastern regions were endowed with a large hydropower potential, exploiting which would generate additional power of 35,000 MW. Given the slow growth of power demand in north -eastern region, it was estimated that about 42,000–45,000 MW would remain as surplus in these area, whereas the northern and western regions would remain in a high deficit situation. The program is facilitating the transmission of clean, less-polluting hydropower generated in phases from the remote north-eastern region of the country. This will reduce 821 million tons of carbon dioxide-equivalent emissions by replacing thermal generation at demand sites and tapping the hydropower potential of the country.

Improved energy efficiency. The program has incorporated state-of-the-art HVDC transmission technology. This has proven to be the most cost effective means of transmitting bulk power over long distances. The program is improving the overall power system efficiency by connecting 2,600 MW hydro generation facilities to the northern and western region grids.

INNOVATIONS AND GOOD PRACTICES

The program has undertaken a number of innovative and good practices to achieve enhanced transmission network reliability and efficiency through augmentation of the national transmission grid. Under the program, POWERGRID is implementing a state-of-the-art HVDC transmission technology which is more stable, efficient, flexible, and economical than conventional transmission lines. An HVDC interregional grid network can facilitate smart grid operations and help reduce emission of greenhouse gases. POWERGRID has also introduced an enterprise risk management system in 2011 to promote a new financing strategy.

KEY LEARNINGS

In order to compete in the open market, POWERGRID plans to bid on a tariff basis for transmission projects in future as compared to a cost-plus tariff on all its investments. To do this effectively, it needs to control its borrowing costs. In order to meet its large future investment needs, POWERGRID's funding sources also need to be extended strategically to private lenders in the form of syndicated loans, export credits and/or international bonds.

Power Grid Corporation of India Ltd. achievements

POWERGRID is mandated under the Electricity Act 2003 to carry out all the functions of planning and coordination relating to inter-state transmission system, as well as develop, own and operate the inter-state/inter-regional transmission system. As of 31 March 2011, POWERGRID operated and maintained one of the largest transmission networks of the world with about 82,354 circuit km of extra-high voltage lines and 135 substations with transformation capacity of 93,050 MVA. Nearly 53% of total power generated in India is wheeled through this transmission network. POWERGRID has demonstrated high productivity with its system availability above 99% and technical loss level at 3% -4%.

Diversifying capital resources

POWERGRID plans to diversify its capital resources by transitioning towards more commercial forms of borrowing. This is to mitigate risks from any adverse changes in bond markets that could impair its investment plans. In this respect, ADB has recently processed a large and innovative financing package consisting of a non-sovereign loan of $250 million and a sovereign loan of $500 million. Through the non-sovereign loan, ADB will help POWERGRID access new sources of funds namely the syndicated offshore banking market for foreign-currency loans and develop long-term relationships with the commercial market. This would improve POWERGRID's visibility and credibility as a reputable borrower and enhance its corporate profile.

PROJECT SUMMARY

RATIONALE

- Indian power system is divided into 5 regions- north, south, west, east and north east. Except for east and north east, all regions faced power shortages.
- In the absence of an integrated transmission network, the deficit regions tended to rely on energy imports to meet demand. In order to achieve energy security, Government of India planned on creation of a national grid to connect deficit and surplus regions.
- POWERGRID was required to invest $13.75 billion during the 11th plan for developing the transmission network of the national grid.
- ADB undertook the NPGDIP to support POWERGRID in achieving this objective.

DELIVERABLES

Establishment of HVDC transmission system

- Installation of 1,800 km of ±800 kV transmission system

ACHIEVEMENTS

- About 60,000 ckm of transmission network will be added to increase inter-regional power transmission capacity. As of December 2012, 38,365 ckm has been added.
- The program will reduce 821 million tonnes of CO_2-equivalent emissions by transmitting clean and non-polluting energy.
- Transmission system availability was maintained at 99.89% in FY2012 achieving its target of atleast 99%.
- Transmission loss in FY2012 achieved the target of 3-4%.

CASE STUDY

Assam Power Sector Enhancement Investment Program

"Once the 220 kV substation is constructed in Rangiya, our energy demands will be met and production in my factory will increase by 25%. Presently, we are getting 6-7 MW of power from the 132 kV substation in Serakundi while our demand is 13.5 MW"

--- Dilip Goenka, managing director of a steel factory in the Integrated Infrastructure Development Centre (IIDC) in Rangiya. IIDC houses a total of 16 industrial units which will benefit from the 220 kV Rangiya substation being built under this program.

LOAN DETAILS

EXECUTING AGENCY

Assam State Electricity Board

MILESTONES

- **Nov 2009 - $200 mn approved for MFF**
- **Nov 2009 - $60.3 mn approved for Tranche 1**
- **Oct 2010 - $89.7 mn approved for Tranche 2**
- **Nov 2011 - $50 mn approved for Tranche 3**
- **Jan 2013 - $30.6 mn disbursed**
- **Jun 2015 - Closing**

Transmission lines at Rangiya in Kamrup district of Assam. Tranche 1 will construct a 220/132 kV substation in Rangiya to expand transmission capacity and enhance energy efficiency.

Government of Assam introduced its Power Policy Statement in 2003 which highlighted the need to (i) increase commercial efficiency and financial viability of the power sector; (ii) carry out technical, managerial and administrative restructuring of power utilities; (iii) increase the number of state operational utilities and; (iv) promote private sector participation (PSP) in the sector. To achieve these goals, the Assam Power Sector Development Program (APSDP) supported by ADB was undertaken by Government of Assam in 2003. As a result of the reforms undertaken under this program, transmission and distribution (T&D) losses reduced from 42.5% in 2003 to 29.6% by the end of the program period in 2009.

However, in the face of a steep rise in Assam's electricity demand in recent years, limited capacity of T&D system poses a constrain in delivery of power to consumers in the state. Lack of sufficient and reliable power due to limited T&D capacity will erode competitiveness of the state's manufacturing and agriculture industries, impact food security and prevent it from accessing industrial and commercial investments. Moreover, a high proportion of the population in Assam lives in rural areas and hence, ensuring rural electrification is key for achievement of Government of Assam's goal of inclusive growth.

In the above context, Government of Assam has developed a Power Transmission

and Distribution Sector Road Map, linked to a comprehensive Transmission and Distribution Sector Investment Program to strengthen the T&D system in the state; enhance efficiency and quality of power supply, fully operationalize power utilities and promote PSP through innovative distribution franchising models. Assam Power Sector Enhancement Investment Program (APSEIP), supported by ADB, was undertaken under this Investment Program in 2009 to achieve sustainable T&D growth in the state.

APSEIP is a MFF loan and aims at achieving (i) increased transmission system power carrying capacity; (ii) enhanced transmission transformation capacity; (iii) reduction in transmission and distribution losses and; (iv) 100% village electrification and electricity access by the end of the program in 2014. The loan is being disbursed in three tranches: tranche 1 and 2 for transmission capacity expansion, transmission loss reduction and capacity development; and tranche 3 for improved access to power and energy efficiency enhancement. The program also includes implementation of multi-year tariffs as per the National Tariff Policy. The key outputs of the program are:

- **Establishment of new T&D infrastructure.** This component consists of installation of new T&D substations of varying capacities and construction of new T&D lines.
  1. **Tranche 1.** Construction of one new 220/132 kV substation, five new 132/33 kV substations, 180 km of 220 kV transmission lines, 82 km of 132 kV transmission lines and up-gradation of 611 km of ground wire to optical ground wire (OPGW).
  2. **Tranche 2.** Construction of two new 220/132 kV substations, six new 132/33 kV substation, 185 circuit-km of 220 kV transmission lines and 157 circuit-km of 132 kV transmission lines.
  3. **Tranche 3.** Construction of 29 new 33/11 kV substations, augmentation of 14 existing 33/11 kV substations, construction and upgrade of 631.6 km of 33 kV and 299 km of 11 kV distribution lines respectively.

  By improving the T&D infrastructure, the program aims at achieving:
  1. Increased active power carrying capacity of the transmission system from 766 MW in 2008 to 1,883 MW in 2014 (increase of 513 MW under tranche 1 and 604 MW under tranche 2)
  2. Increased substation capacity of the distribution system to 430 MVA by 2014 under tranche 3
  3. Decreased transformer loading to less than 80% through enhanced transmission transformation capacity
  4. Reduction in system losses to 19% (4% transmission and 15% distribution) by 2014
- **Improved existing T&D infrastructure.** The program supports extension and augmentation of transmission substations, refurbishment of existing substations, reactive compensation and introduction of new technologies to reduce losses.
  1. **Tranche 1.** Extension and augmentation of two existing substations
  2. **Tranche 2.** Extension, augmentation of 11 existing substations and reactive energy compensation schemes
  3. **Tranche 3.** Renovation and modernization (R&M) of four existing substations, conversion of 30 existing distribution transformers (DTR) to HVDS/LT-less systems and installation of 70 km of aerial bunched cables
- **Introduction of distribution franchising.** Completion of tranche 3 will support adoption of single power point supply (SPPS) scheme that was

Private sector development

The program involves engaging community-based private sector groups and NGOs, selected through a competitive bidding process, in electricity distribution. These private sector groups and NGOs, better known as franchisees, will buy bulk electricity from Assam Power Distribution Company Limited (APDCL) and distribute it to consumers in the franchisee areas based on tariffs set by the government.

Technical assistance

Technical Assistance for Assam power sector utilities, comprising APGCL, AEGCL and APDCL has been undertaken to assist them in introducing new business processes, strengthen human resources and financial management practices and further mainstream rural electrification. Total cost of the TA is estimated at $1.3 million with ADB's share of $1 million. The TA was implemented in two phases: Phase 1 for a diagnostic study on current business processes and Phase 2 was to support companies for implementing the action plan. A study on the implementation and feasibility of model off-grid rural electrification, mainly with different renewable energy options were completed under the TA.

The substation at Nalbari, is one of many that will be developed under the project. The new substations are expected to reduce load on existing stations and hence lead to lesser power cuts. The program also aims to reduce transmission losses to 4% and distribution losses to 15% by 2014.

introduced in the state power sector under APSDP. Under this system, franchisees, essentially private sector groups, buy electricity in bulk from the Lower Assam Electricity Distribution Company Ltd. (LAEDCL) and supply it to consumers in the franchisee areas. This model enhances power sector governance by increasing participation, competition, and transparency; and contributing towards improved financial viability of the sector. There are 952 franchisees under APDCL covering 3,200 DTRs and seven to eight feeders. Under the program, franchisees will provide support for investment in bulk metering and distribution lines. The project will also include information technology for billing, metering at franchisee level and franchisee data analysis for APDCL.

- **Improved capacity development.** Training programs are being held for Assam Power Generation Corporation Ltd. (APGCL), Assam Electricity Grid Corporation Lt. (AEGCL), and APDCL to develop their institutional capacity in project planning and management, corporate strategy, and human and financial resource management. The number of consumers under franchisees is expected to double from May 2009 to December 2014 through empowered and strengthened institutional capacity.

Construction of infrastructure and installation of information and communication technologies as a result of reliable electricity supply are expected to create at least 500 jobs.

KEY DEVELOPMENTAL OUTCOMES

Improved electricity delivery. Reforms focused on developing the state power T&D system along with capacity building will improve the technical, commercial and financial performance of utilities. The program aims to reduce transmission losses to 4% and distribution losses to 15% by 2014. Existing substations are presently overloaded, supplying more than their capacity. New substations will reduce their load and hence lead to lesser power cuts. For example, the 33/11 kV substation being built in Adabari area of Guwahati will benefit all adjoining residential areas, i.e. Guwahati University and the All India Radio Tower. Transmission capacity has already increased from 766 MW in 2008 to 1,152 MW in 2011.

Enhanced employment opportunities. Contractors are expected to hire skilled and unskilled workers for civil works undertaken during the five years of the program implementation period, thus generating employment opportunities. Construction under tranche 1 is expected to generate 172,200 person-days of employment comprising 40% skilled workers and 60% unskilled laborers. Through the distribution franchisee component, 720 entrepreneurs are expected to expand their operations with at least 1,500 employees. Construction of infrastructure and installation of information and communication technologies as a result of reliable electricity supply are expected to create at least 500 jobs.

Farmers at Nalbari have benefitted from high power pump sets that are expected to contribute to better crop yields and higher earnings for them. With 86% of Assam's population living in rural areas, and a rural poverty headcount ratio of 37.9% , the rural electrification component is expected to result in direct benefits for the poor.

Higher earnings. Electricity is a key necessity for socioeconomic development. With 86%[23] of Assam's population living in rural areas and with a rural poverty headcount ratio of 37.9%[24], the rural electrification component is expected to provide direct benefits to the poor, while distribution through franchisees should lead to improved electricity supply. This is expected to create a significant change in working conditions of poor households and small scale industries through provision of adequate power. Improved working conditions, in turn, should contribute to higher earnings for these establishments. An improved supply of electricity would also enable farmers in rural areas to set up high-powered pump sets that will contribute to better crop yields and hence, higher income.

Improved education and health. Better quality and reliable electricity supply will lead to larger investments in educational facilities, e.g. computers and internet

[23]Census 2011

[24]Poverty Headcount Ratio in rural Assam was 37.9% in 2009-10 as per Annual Report, 2012 of the Planning Commission of India. Assuming the same for the present.

access in classrooms. Guwahati University should benefit from the 33/11 kv substation being constructed in the city. With lesser power cuts and higher voltage, installation of electronic equipments like computers, air-conditioners, etc. will be possible in the university. Children and adults will be able to dedicate more hours for education at home. Enhanced electricity supply would also improve public health by contributing to improved operating conditions of medical establishments. Due to better access to power, hospitals should be able to introduce modern equipment and place more fans and tube lights in the patient areas. Vaccines will be maintained safely in freezers.

INNOVATIONS AND GOOD PRACTICES

The SPPS model introduced under APSDP has helped enhance revenue collection efficiency from 70% at the time of project inception to 85% as of December 2011. It is expected that the completion of tranche 3 of the APSEIP will benefit the SPPS roll out and for distribution of electricity. Additionally, remote areas will have greater access to power due to localized power distribution by franchisees.

Substation automation system has been adopted under the program that allows for better control of remote operations. Downtime to correct any faults will be reduced.

The program is facilitating private sector participation in off-grid rural electrification using renewable energy on the lines of the franchisee model. This, along with improved system efficiency, is expected to reduce the intensity of green-house gas and other harmful emissions.

KEY LEARNINGS

Private sector participation in power distribution has resulted in better access to power for all, especially those living in remote areas. Moreover, with a more systematic and dynamic structure and advanced technologies, private sector groups are better able to manage billing, collection and complaint addressal, besides distribution.

Capacity development support to meet increasing management capacity requirements of ASEB and other utilities has helped in improving the capability of officials to manage all programs and projects efficiently. This has led to more efficient T&D management and hence, significant commercial loss reduction.

Case study on benefits of the program

The SPPS scheme in Assam is an input-based franchisee model concept aimed at strengthening power sector governance while facilitating community-based participation, competition, transparency, and improving financial viability. Under the concept, the distribution licensee i.e., APDCL is responsible for providing power at a bulk supply point and the franchisee is responsible for the billing and collection from consumers. The franchisee buys electricity from APDCL and sells it to consumers at a preset margin. Under the 2003 Assam Power Sector Development Program (APSDP), power supply in Sualkochi was expanded in a reliable manner under the SPPS scheme enabling electrification of more village households and increased consumption. Field visits, interviews, and surveys of village residents, conducted during January–March 2009, found a positive impact of improved availability of electricity on small silk factories, local hospitals and schools.

For instance, in an ADB survey of one of oldest silk factories, the Braza Silk factory, in Sualkochi village (workforce of 40 women). Ms. Haritri Boro and Ms. Champa Boro, employees of the factory, explained how improved availability of electricity during working hours due to SPPS has helped them to produce more saris and improve their overall quality, which ultimately helped them to get a higher market value for their products.

PROJECT SUMMARY

RATIONALE

- Limited transmission and distribution (T&D) capacity led to inability to support the expected rise in demand.
- High T&D losses resulted in insufficient and unreliable delivery of power.
- Government of Assam aimed to strengthen T&D system of the state, enhance efficiency and quality of power supply, and promote private sector participation through innovative distribution franchising models.
- ADB has undertaken Assam Power Sector Enhancement Investment Program to support Government of Assam to achieve sustainability in state power sector.

DELIVERABLES

Strengthened T&D network

Transmission

- Creation of 14 substations (3 nos. of 220 kV/132 kV and 11 nos. of 132kV/33 kV)
- Addition of 324 ckt-km transmission lines
- Upgrading of 611 km ground wire to optical ground wire

Distribution

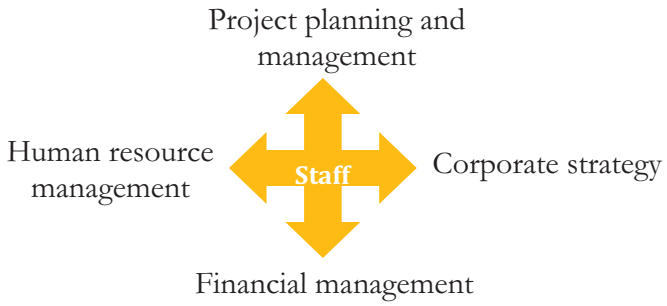
- Creation of 29 new 33/11 kV substations
- Augmentation of 14 existing substations
- Construction and upgrade of 631.6 km of 33 kV network and 299 km of 11 kV network

Enhanced energy efficiency

- Extension and augmentation of 13 existing substations
- Installation of reactive power compensation schemes
- Renovation and modernization of 4 existing substations
- Conversion of 30 existing distribution transformers to high voltage distribution systems
- Installation of 70 km of aerial bunched cables

Capacity development support

- Training programs for ASEB, APGCL, AEGCL, LAEDCL



Distribution franchising

- Introduction of single point power supply for distribution
- Investment in bulk metering and distribution lines
- Information technology based hardware for billing and metering

ACHIEVEMENTS

- Capacity of transmission system is being increased from 766 MW in 2008 to 1,883 MW in 2014 (1,152 MW achieved by 2011).
- Transformation capacity of transmission system is being enhanced with reduction in transformer loading to less than 80%. Distribution substation capacity has been increased to 1,781 MVA (as of December 2012).
- System losses are being reduced from 35% (6% transmission, 29% distribution) in 2008 to 19% (4% transmission, 15% distribution) in 2014. Transmission losses have reduced to 5.52% (as of December 2012).

CASE STUDY

Madhya Pradesh Power Sector Investment Program

"Power theft was rampant in Abbass Nagar in Bhopal. The 11kV line installed in Abbass Nagar, as part of this ADB program, has resulted in almost a 50% reduction in power theft."
--- Radha, a resident of Abbass Nagar

New 315 MVA 33/11 kV sub-station (and a 33 kV bay) under construction at village Kalibawdi under Dhar District of M.P. Discom West under ADB Loan No. 2520

LOAN DETAILS

EXECUTING AGENCIES[25]

MPPTC Ltd. (TRANSCO), MPPKVVC Ltd. (DISCOM-E), MPMKVVC Ltd. (DISCOM-C), MPPKVVC Ltd. (DISCOM-W), MPPTC Ltd.

MILESTONES

- **March 2007 - $620 mn approved for MFF**
- **April 2007- $106 mn approved for Tranche 1**
- **April 2007- $45 mn approved for Tranche 2**
- **Aug 2007 - $144 mn approved for Tranche 3**
- **Aug 2007 - $90 mn approved for Tranche 4**
- **Apr 2009 - $166 mn approved for Tranche 5**
- **Dec 2010 - $69 mn approved for Tranche 6**
- **Jan 2013 - $447 mn disbursed**
- **Dec 2014 - Closing**

In the early 2000s, a series of power sector reforms were introduced by Government of India and various state governments. Supporting this reform process, ADB designed and implemented the Madhya Pradesh Power Sector Development Investment Program (MPPSDIP) loan in 2001-2007 which catered to (i) increasing the delivery capacity of power systems; (ii) reducing transmission and distribution system losses; (iii) establishing and operating new power sector companies; (iv) improving sector governance; and (v) establishing fully operational state regulatory commission. MPPSDIP also supported implementation of the Electricity Act, 2003 which mandated unbundling of the state electricity boards, installation of meters for all connections to consumers, rationalization of tariffs that allow revenue realization, open access and competition to improve efficiency in the power sector.

Although MPPSDIP was fairly successful in implementing these key reforms, it did not enable the state to meet its rising power demand. During 2004-06, the state faced a shortfall in power supply by more than 20% of the demand during peak hours. Energy deficit during the day, on an average, was consistently close to 13%, highlighting the need for expansion in generation capacity. Since 2002, the length of transmission lines had increased by only 14% as against a 41% rise in

[25]MPPTC Ltd.: Madhya Pradesh Power Transmission Company Limited (TRANSCO); MPPKVVC Ltd: Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company Limited (DISCOM-E); MPMKVVC Ltd: Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited (DISCOM-C); MPPKVVC Ltd.: Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Limited (DISCOM-W); MPPTC Ltd.: Madhya Pradesh Power Trading Company Limited

transformation capacity indicating the alarming level of power overload on the transmission networks. Distribution losses for the unbundled power sector companies exceeded 35% and power quality was poor due to undersized conductors, long low-voltage circuits, and overloading of distribution transformers. The quantum of investment required for upgrade and expansion of the power sector was difficult to be met through public funds. Although Government of Madhya Pradesh, through MPPSDIP, had created an enabling environment for Private Sector Participation (PSP) and PPP, contributions from the private sector remained minimal. Moreover, diagnostic assessments by Government of Madhya Pradesh revealed several technical, commercial, financial, and management constraints that power sector companies faced in the state.

Against this background, in 2007, ADB approved a $620 million MFF loan for Madhya Pradesh Power Sector Investment Program (MPPSIP). The program focuses on key policy issues hitherto unaddressed under MPPSDIP with the objective of facilitating economic growth by increasing electricity supply to its urban and rural population. Its primary focus is on (i) transmission (ii) distribution and (iii) institutional strengthening. The transmission component aimed at establishment of transmission lines, substations, and auxiliary equipment to evacuate and transmit power from new power stations and substations to consumers. The distribution component includes revamping of existing power supply to the end consumer with the use of first of its kind HVDS technology with the primary imperative of loss reduction and reliability improvement. The institutional strengthening component of the program includes developing effective monitoring systems and financial management practices in the power sector companies to improve accountability, transparency and efficiency.

The program is being delivered in six tranches. Key outputs of the program are:

- **Improving transmission infrastructure.** Tranche 1 ($106 million) and tranche 3 ($144 million) of the program focused on construction of transmission lines for power evacuation and augmentation of the transmission systems. These include:
  - Substations- 400 kV: one new 315 MVA 400/220 kV; 220 kV: eight new 160 MVA 220/132 kV; ten new 40 MVA 132/33 kV
  - Transmission lines- 400 kV: 2 ckm; 220 kV: 1,435 ckm; 132 kV: 1,451.5 ckm
  - Transformers: 10x 160 MVA 220/132 kV, 3x100 MVA 220/132 kV, 10x 20 MVA 132/33 kV and 3x40 MVA 132/33 kV additional transformers at existing substations
  - Augmentation of 6 units of 132/33 kV transformers from 20 to 40 MVA and 14 units from 40 to 63 MVA
- **Improving distribution networks.** Other tranches of MFF totaling to $370 million (tranche 2-$45 million, tranche 4-$90 million, tranche 5-$166 million and tranche 6-$69 million) focused on revamping of distribution systems with green field technologies by (i) construction of high-voltage distribution systems in six distribution circles in the eastern distribution zone of MP, including conversion of low-voltage lines to high-voltage lines; (ii) remote metering of industrial consumers; and (iii) renovation of the protection system. Under tranche 2 and 4 the following works are being undertaken:
  - Conversion of about 8,399 km of low voltage lines to 11 kV lines, construction of 946.48 km new 11 kV lines and bifurcation of agricultural and village loads by construction of 1,852 km of 11 KV lines
  - 11/0.4 kV distribution transformers: 9,013 nos. of 25 kVA and 11,552 nos. of 16 kVA
  - Installation of 6,545 nos. of low capacity distribution transformers
  - Installation of remote meters for 18,992 consumers and installation of 12,026 nos. of meters

Improving governance

The program is undertaking various measures aimed at improving overall governance in power sector companies. Enterprise resource planning, use of ADB guidelines, and standard bidding documents for procurement have been followed and thereby transparency, accountability and efficiency have become a yardstick for compliance. To strengthen power sector companies (i) internal audit functions and guidelines have been followed in line with the international best practices; (iii) financial statements are being audited by independent external auditors and published regularly and reported to the shareholders and MPERC; (iv) performance indicators for each company are being set, evaluated and benchmarked by MPERC for future compliance; and (v) regular monitoring by ADB helped in sorting out implementation issues expeditiously. Other measures such as appointment of independent board members have considerably improved decision making system making it professional. Formal code of conduct for board members are expected to improve accountability and efficiency in power sector companies.

Full view of a new 315 MVA 33/11 kV sub-station at village Khandlai under Dhar District of M.P. Discom West under ADB Loan No. 2347

- Replacement of single phase service lines for 70,000 consumers and 12,500 nos. of three-phase consumers
- Installation of 588 new capacitor banks
- Construction of 33 KV bays and renovation of 526 nos. 33/11 KV substations, construction of 12 new 33/11 kV sub-station, installation of vacuum circuit breakers and addition of 94 new power transformers
- Augmentation of conductor for 1137.6 km of 11 KV lines

Under tranche 5 and 6 the following works are being undertaken:

- Conversion of about 8,170 km of low voltage lines to high voltage lines, construction of 3,853.7 km of new 11 kV lines, bifurcation of agricultural and village loads by construction of 2,758 km of 11 KV lines and additional 285 km of 33 kV lines and upgrade of 400 km of 11 kV lines
- Installation of automatic remote meter for 71,000 consumers
- Augmentation, renovation and modernization of 519 nos. of 33/11 kV substations and construction of 15 new 33/11 kV substations
- Installation of 136 nos. of 1,200 kVAR and 150 nos. of 600 kVAR capacitor banks in 33/11 kV substations
- Enhancement of information technology systems through installation of combined energy metering systems and 30,000 distribution transformer meters

11 kV control panel in control room of a new 315 MVA 33/11 kV sub-station at Bhawarasala in Dhar district of Madhya Pradesh Discom West under ADB Loan No. 2347

- **Strengthen institutional capacity.** The program is taking various measures for institutional strengthening of the power sector companies in the state. These include formation of an independent board, appointment of board of directors, facilitating independent external audits for these companies. As on 31st December 2011, independent directors at the board level have been recruited, and energy audits, business process audits, and performance audits were being conducted by independent private auditors. The program also includes capacity development of Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company Limited and TRADECO, the state trading company, in implementation of enterprise resource planning systems. Under this component, the program is providing implementation support for supervisory control and data acquisition systems in the distribution company; and development of a trading and settlements support system, metering, and communications for TRADECO. The program, as part of power sector reforms, also sets targets for distribution companies related to implementation of multi-year tariff, loss reduction, and achieve a certain target of billing and collection efficiency (as fixed by the regulatory body or policies). Substantial progress has been made in this regard. As on 31st December 2011 all three distribution companies had achieved respective targets of billing and collection efficiency.

A new 315 MVA 33/11 kV sub-station under construction at village Khurda under Manpur Block of Indore district of M.P. Discom West under ADB Loan No. 2520

KEY DEVELOPMENTAL OUTCOMES

Improved reliability of power. The program has helped distribution companies in improving the reliability of electricity supply to both industrial as well as household consumers. With respect to average system reliability index, as of December 2012, Discom-Jabalpur achieved 96.87% against baseline figure of 94.5%, Discom-Bhopal achieved 99.44% against baseline figure of 97.17% and Discom-Indore achieved 95.75% against baseline figure of 90.9% for urban areas. This has encouraged the use of electricity for productive uses against the stereotype concept of using electricity for consumptive purposes. This program is helping in improving the quality of service delivery by the distribution companies in rural areas.

Improved energy efficiency. The program has reduced transmission and distribution losses As of December 2012, technical losses in transmission had come

down to 3.51% from 4.9% in 2009 while distribution losses of Discom-Jabalpur reduced to 27.81% against a 2009 baseline figure of 37.25%, Discom-Bhopal reduced to 32.16% against a 2009 baseline figure of 38.93% and Discom-Indore reduced to 25.86% against 2009 baseline figure of 33.76%.

Facilitated private sector participation. Recognizing the need for further private sector participation to meet the sector's overall financing requirements and to enhance operational efficiencies, the state government has facilitated an enabling environment for private sector investment in the following areas: (i) electricity generation from renewable and nonrenewable resources, (ii) transmission network ownership and leasing, (iii) further distribution network franchising and leasing, (iv) bilateral electricity trading, and (v) maintenance contracting. The program inter alia will help the state in facilitating PPPs in the power sector including implementation of the opportunities mentioned above.

Enhanced efficiency in financial management. A diagnostic assessment done by Government of Madhya Pradesh has identified design and implementation of a "backbone" enterprise resource planning system to be imperative for better resource management. This should cover (i) billing and collection; (ii) finance and accounting; (iii) metering data management, (iv) management information systems; (v) maintenance management; (vi) materials management; (vii) project systems; (viii) human resources and e-mail solutions, together with the appropriate network infrastructure and support. The financial fragility of the sector is perceived to be the key impediment to overall growth. The program supported power sector companies in improving these systems and helped them in building efficient monitoring systems, internal audit practices and billing and collection efficiency to a level of (i) 99.95% for Discom-Jabalpur, (ii) 93.7% for Discom-Indore and (iii) 94% for Discom-Bhopal. These new accounting, internal controls practices are expected to further improve efficiencies and governance of these companies and of the state power sector in general.

Catalyzed growth. The program has resulted in reduction in technical and non-technical losses, removal of network constraints, and improved reliability of power supply. In rural areas, energy dependent enterprises are able to expand their businesses by engaging in high volume contracts requiring constant power supply. In addition, the program is creating short-term and long-term employment opportunities for the local population and tax revenues for the state government.

INNOVATIONS AND GOOD PRACTICES

Integrated project management practices namely (i) proper planning, (ii) effective project monitoring mechanisms, (iii) application of skills of motivated and well trained personnel, helped in successful implementation of infrastructure projects even in vastly spread terrains like in case of Madhya Pradesh. The knowledge and insights gained by utilities of Madhya Pradesh are noteworthy and may be harvested and disseminated to other executing agencies in appropriate fora.

Application of advance procurement actions greatly helped in timely project execution which is required to be adopted for future project executions. Further, partnership process with stakeholders particularly with contractors, addressal of complex techno-economic issues in an exemplary manner are noteworthy edifice of project implementation that can be applied to future ADB projects in India. In general good project management practices have been followed through sequencing activities and work break down structuring. This resulted to enhanced construction management practices to the next level of efficiency by adopting more formal project management methodology based on global standards.

Reduction of (i) technical and commercial losses, (ii) improved average system reliability index and (iii) enhanced energy efficiency would lead to improvement of financial health of the sector in long run .

Distribution franchisee model

ADB has been supporting Madhya Pradesh in developing a distribution franchisee model in the state. Under this model, local community organizations are awarded franchisees encouraging them to take up small segments of the distribution business such as metering and billing or collection based on PPPs. Franchisees are selected for managing the distribution functions for a complete division and/or circle whereby they manage a single feeder or distribution transformer in return for a fee. Given the flexibility of defining the scope of the franchisee as per the Electricity Act, the state may choose to delegate some or all of the distribution-related responsibilities to a third party on a contract basis.

The three distribution companies in Madhya Pradesh are presently following the franchisee model and have been experiencing reduced aggregate transmission and commercial losses. In addition, the tariff collection efficiency has increased thus, improving the financial viability of the distribution sector.

Government of Madhya Pradesh is planning to implement the largest franchisee scheme ever in India by giving out nine districts (all at one time) to private players.

A new 315 MVA 33/11 kV sub-station at village Khandlai under Dhar District of M.P. Discom West under ADB Loan No. 2347

KEY LEARNINGS

Since 2000, ADB has been focusing its lending on states committed to reforming and restructuring their power sectors. This strategy operates on the premise that improving power sector by achieving financial sustainability will increase state governments' ability to allocate resources for poverty reduction. In 2003, ADB conducted project performance evaluations of energy projects in India, which identified the following learnings: (i) ADB needed to be flexible and adaptable to changing conditions in India; (ii) land acquisition should be carried out expeditiously to minimize implementation delays; (iii) construction contracts should be properly packaged to facilitate implementation and coordination; and (iv) loan covenants should cater to capability of the executing agency and sector constraints. Successful implementation of this program has demonstrated that with proper planning and timely action on the four aspects identified, large scale transmission and distribution projects can be implemented effectively and on schedule.

PROJECT SUMMARY

RATIONALE

- Madhya Pradesh suffered from chronic power shortages—energy deficit touched 13% in the period 2004-06. Reasons were:
  - Insufficient generation and transmission capacity- transmission system served a maximum demand of 5,780 MW in peak hours in 2006;
  - High aggregate technical and commercial losses- 40% in 2007; and
  - Increasing energy demand at the rate of 7% every year and peak demand at 9%.
- ADB undertook the Madhya Pradesh Power Sector Investment Program to support the state government in undertaking power sector reforms to address the sector challenges.

DELIVERABLES

Strengthened transmission infrastructure

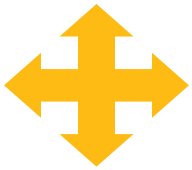
Under tranche 1 and 3:

- Substations- 400 kV: one new 315 MVA 400/220 kV; 220 kV: eight new 160 MVA 220/132 kV; ten new 40 MVA 132/33 kV
- Transmission lines- 400 kV: 2 ckm; 220 kV: 1,435 ckm; 132 kV: 1,451.5 ckm
- Transformers: 10x 160 MVA 220/132 kV, 3x100 MVA 220/132 kV, 10x 20 MVA 132/33 kV and 3x40 MVA 132/33 kV additional transformers at existing substations
- Augmentation of 6 units of 132/33 kV transformers from 20 to 40 MVA and 14 units from 40 to 63 MVA

Institutional strengthening

Internal audit guidelines of MPEB; annual financial statements and energy audit

Appointment of independent directors at the board level



Filing of multi-year tariff

Reduction in distribution losses and improving billing and collection efficiency

Improved distribution systems

Under tranche 2 and 4:

Conversion of about 8,399 km of low voltage lines to 11 kV lines, construction of 946.48 km new 11 kV lines and bifurcation of agricultural and village loads by construction of 1,852 km of 11 KV lines; 11/0.4 kV distribution transformers: 9,013 nos. of 25 kVA and 11,552 nos. of 16 kVA; Installation of 6,545 nos. of low capacity distribution transformers. Installation of remote meters for 18,992 consumers and installation of 12026 nos. of meters; Replacement of single phase service lines for 70,000 consumers and 12,500 nos. of three-phase consumers; Installation of 588 new capacitor banks; Construction of 33 KV bays and renovation of 526 nos. 33/11 KV substations, construction of 12 new 33/11 kV sub-station, installation of vacuum circuit breakers and addition of 94 new power transformers; Augmentation of conductor for 1137.6 km of 11 KV lines

Under tranche 5 and 6:

Conversion of about 8,170 km of low voltage lines to high voltage lines, construction of 3,853.7 km of new 11 kV lines, bifurcation of agricultural and village loads by construction of 2,758 km of 11 KV lines and additional 285 km of 33 kV lines and upgrade of 400 km of 11 kV lines; Installation of automatic remote meter for 71,000 consumers; Augmentation, renovation and modernization of 519 nos. of 33/11 kV substations and construction of 15 new 33/11 kV substations; Installation of 136 nos. of 1,200 kVAR and 150 nos. of 600 kVAR capacitor banks in 33/11 kV substations; Enhancement of information technology systems through installation of combined energy metering systems and 30,000 distribution transformer meters

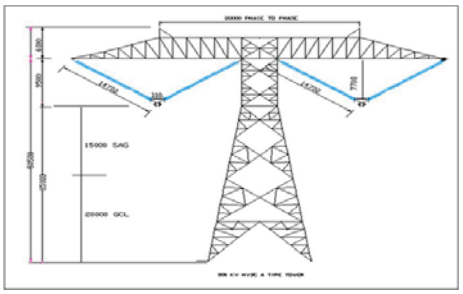
ACHIEVEMENTS

- Transmission loss reduced from 4.9% in 2009 to 3.51% in 2012.
- Distribution loss reduced from 2009 to 2012: 37.25% to 27.81% - Discom Jabalpur; 38.93% to 32.16% - Discom Bhopal; 33.76% to 25.86% - Discom Indore.
- Average system reliability increased from 2009 to 2012: 94.5% to 96.87% - Discom Jabalpur; 97.17% to 99.44% - Discom Bhopal; 90.9% to 95.75% - Discom Jabalpur.

PROJECT BRIEF

National GRID Improvement Project

PROJECT OVERVIEW



Pictorial View of +/- 800KV HVDC transmission tower

To fix shortfalls in both generation and transmission in the power sector, with a peak power deficit of 12.7% and average energy deficit of 10.1%, the Government of India, in the 11th plan (2007-2012), came up with a transmission system development programme. The objective of this program was to provide adequate inter-regional and intra-regional transmission capacity so as to consolidate and strengthen the national grid network for efficient and uninterrupted transmission of power.

The National GRID Improvement Project was approved in 2011 to assist Government of India in fulfilling its objective by strengthening the interregional transmission connection between the western grid region and the northern grid region. The project will support transmission of power generated by private generation companies of 14 independent power producers (IPPs) located in the state of Chhattisgarh (western region) to the power deficit states in the northern region.

LOAN DETAILS

EXECUTING AGENCY

Power Grid Corporation of India Limited

MILESTONES

- **Sept 2011 - $750 mn approved ($500 mn sovereign and $250 mn non sovereign)**
- **Jan 2013 - $61.40 mn disbursed**
- **Jun 2017 - Closing**

OBJECTIVE

The objective of the project is to build a high voltage direct current (HVDC) transmission system using smart grid technology to support stable, efficient, flexible and cost-effective transfer of power to all parts of the country. An additional 15,000 MW of electricity is expected to be available for supply after completion of the project. The project is expected to result in efficiency improvements through integration of electricity markets, creation of open trading opportunities and promotion of competition among private and public utilities.

OUTPUTS

Key outputs under the project are presented in the table below:

Enhanced inter -regional transmission network	• 1,365 km of 800 kV HVDC transmission lines, including terminals, will be constructed at Champa (Chhattisgarh) and Kurukshetra (Haryana) • Safeguards in compliance with ADB Safeguard Policy Statement (2009) and POWERGRID's environmental and social policy and procedures will be implemented

Improvements to POWERGRID's corporate credit, access to non-sovereign borrowing and risk management	• The non-sovereign loan component will support diversification of POWERGRID's capital sources and facilitate its first commercial due diligence process • Design and implementation of a financial risk management system will be completed

OUTCOMES

Increased energy security

The project will facilitate efficient transfer of power from surplus areas (western grid) to deficit areas (northern grid) in the country so that reliance on imports is reduced. An additional quantum of 3,000 MW of reliable power has been made available in the northern region initially. Further, an increase to 6,000 MW is expected with the addition of upgraded terminals. The rest of power generated from IPPs will be supplied within the western region. This will be used for consumption and trading. Hence, greater energy security is expected to be achieved through this project.

Reduced power losses

Construction of advanced 800 kV HVDC transmission lines will significantly reduce power loss and help stabilize power supply frequencies and voltages. Transmission loss is expected to be reduced by 3% by the end of the project.

Enhanced efficiency in electricity market

The project would facilitate integration of the electricity market and create power trading opportunities. Further, the augmented interregional transmission network is expected to allow consumers to receive power supply through open access (allowing them to choose the least expensive power from the various transmission/distribution utilities). This should promote competition among private and public utilities resulting in higher efficiency levels.

WAY FORWARD

This project is the first of its kind where ADB has combined sovereign and non-sovereign facilities for a single borrower. The project is expected to enhance POWERGRID's capacity in accessing commercial credit. The non-sovereign loan will help POWERGRID create a much-needed benchmark for foreign commercial borrowings and improve its capacity in dealing with foreign commercial lending institutions before launching any future commercial borrowing program. This modality will also demonstrate to other financially viable central public sector undertakings the various ways in which funds can be raised from domestic and international markets. It will, therefore, serve as a catalyst for sustainable economic growth while reducing strain on government finances and increasing fiscal space for other priority social sector programs.

Establishment of new linkages between the surplus and deficit regions will boost power supply in most regions of the country which, in turn, would generate new business opportunities and provide economic benefits to the society at large.

INNOVATION IMPULSE

Systemic and transformational change

- An enterprise risk management (ERM) framework will be introduced with the aim of strengthening POWERGRID's corporate governance. ERM envisages appointment of a chief risk officer and a risk management committee to increase accountability.

Piloting new approaches

- The project will involve construction of advanced 800 kV HVDC transmission lines. This is expected to reduce transmission losses by approximately 3% in the conventional transmission system. It will also lower carbon dioxide emissions from power systems by 536,000 tons a year.

Financing and leveraging

- The project includes a non-sovereign loan component which will enhance POWERGRID's ability to raise capital. Since the government has opened investment in inter-regional transmission to competitive bidding, the project is also expected to attract private developers to similar transmission projects in other regions.

PROJECT BRIEF

Madhya Pradesh Energy Efficiency Improvement Investment Program

PROJECT OVERVIEW

The average power losses in the distribution network in the central, eastern and western areas of the state in 2010 was as high as 46%. This was majorly on account of the existing mixed feeder system catering to both agriculture and domestic consumers in the rural areas, low-voltage lines and unmetered connections. With the existing system of mixed feeders, supplying power to farmers at heavily subsidized rates or often free led to over-usage of power, resulting in overloading of distribution lines and transformers. As a result, the high technical losses have forced distribution utilities to restrict supply of power to rural areas, adversely affecting economic activities and development in these areas.

Mr. Rabi Shankar Sahu (a farmer seen in the picture) of Killai village says that he now gets at least 8 hours a day of power supply to run his irrigation pump. The farm productivity has increased. Seen in the picture is a wheat field nearing harvesting time

The Government of Madhya Pradesh is undertaking a distribution improvement program (feeder separation program). The first phase of this program is already being implemented. The ADB assisted multi-tranche facility under the Madhya Pradesh Energy Efficiency Improvement Investment Program aims to provide funding support to the second phase of Government of Madhya Pradesh's Electricity Distribution Improvement Program.

LOAN DETAILS

EXECUTING AGENCIES

MPMKVVC Ltd. (DISCOM-C), MPPKVVC Ltd. (DISCOM-E), MPPKVVC Ltd.(DISCOM-W)[26]

MILESTONES

- **Jul 2011 - $400 mn approved for MFF**
- **Jul 2011 - $200 mn approved for Tranche 1**
- **Dec 2011 - $200 mn approved for Tranche 2**
- **Jan 2013 $72.8 mn disbursed**
- **Feb 2015- Closing**

OBJECTIVE

The Program aims to support the three power distribution companies - Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company (DISCOM-C), Madhya Pradesh Poorva Kshetra Vidyut Vitaran Company (DISCOM-E) and Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company (DISCOM-W) - to install separate feeders for households and irrigation water pumps, high voltage distribution systems and implement other supply quality improvement measures. The program's long-term goal is to enable inclusive economic growth in rural areas of Madhya Pradesh supported by access to continuous and high quality electricity supply. The Program also focuses on enhancing the livelihood of women employed in micro-enterprises which are power-intensive in nature.

OUTPUTS

Key outputs under the program are presented in the following table:

[26]MPMKVVC Ltd.: Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited (DISCOM-C); MPPKVVC Ltd.: Madhya Pradesh Poorva Kshetra Vidyut Vitaran Company Limited (DISCOM-E); and MPPKVVC Ltd.: Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Limited (DISCOM-W)

Construction of lines, feeder separation and installation of HVDS	• 38,400 km of new 11 kV supply lines will be constructed and 5,800 km of LT lines will be converted to 11 kV lines • 37,200 new transformers will also be installed • 27,800 km of LT lines will be upgraded to aerial bundle cables • 33 kV up-stream systems will be improved. 1,100 km of new 33 kV lines will be constructed, along with the installation/upgrade of 46 33/11 kV substations. 100 new 33/11 kV transformers will be installed
Enhanced household connections	• 1,297,000 new household connection will be operationalized • 410,000 new meters will be installed • A target of 10% increase in the number of women-headed micro-enterprises will be achieved • Asset maps will be prepared and energy audits will be conducted in project areas
Improved access to business development services for women	• Training will be provided to 20,000 women micro-entrepreneurs for business improvement • Capacity building of 500 women led self help groups across 32 districts through trainings on business development services, gender-sensitive user awareness and energy conservation will be conducted

OUTCOMES

Increased regular power supply to households and irrigation purposes

Interventions under the program will enable 24 hour power supply to households and restrict the supply of subsidized power for agricultural pumping sets to only 8 hours a day. This will address the issue of over-usage of subsidized power. The increase in supply of power has resulted in greater access to clean water, while uninterrupted power supply has reduced the monthly operating cost of several mills from around $74 to $3. With 8 hours of uninterrupted supply of power, agriculture productivity has also increased.

Improved efficiency in power distribution

The project will improve operational efficiency and reduce losses in the distribution network through installations of new connections and meters. In rural households, 100% metering in the 32 project districts will be achieved, resulting in reduction of distribution losses from 46% in 2010 to 32% by the end of the project period.

Improved gender equality

A technical assistance component has been developed under the program to enhance business opportunities for women-led micro-enterprises. Greater access to business development services to approximately 20,000 such enterprises and capacity building of women's self-help groups to deliver these business development services will be focused on.

WAY FORWARD

The program's increased focus on infrastructure development in the energy sector is expected to help address inter-state disparities, build capacity, and support inclusive growth. The investment program will improve power supply to rural households in Madhya Pradesh, enabling rural populations to be part of India's growth story.

INNOVATION IMPULSE

Systemic and transformational change

- Installation of the high-voltage distribution system will result in reducing both technical and commercial losses in targeted areas. This will result in the supply of reliable power for economically productive activities.
- The non-physical component of the assistance focuses on building capacity of executing agencies in project design and implementation, and financial management.

Piloting new approaches

- The investment program is using an effective technical solution called "feeder separation" to reduce overuse of subsidized power for pumping water for irrigation. This process will ensure that separate feeders cater to households and agriculture enabling control over power supply to each separately.
- The program also plans for a geographic information survey based asset mapping system that will uniquely identify each connection/feeder/transformer and maintain a database facilitating real-time information reporting on these assets. This system will also be of assistance for carrying out energy audits.

PROJECT BRIEF

Gujarat Solar Power Transmission Project

PROJECT OVERVIEW


Charanka Solar park

To exploit the potential for solar power generation that ranges from 4 kilowatt-hours (kWh) to 7 kh, Government of Gujarat launched its Solar Power Policy in 2009. Like the Jawaharlal Nehru National Solar Mission (JNNSM) that was launched in 2010 to promote the use of solar power to generate electricity, the intention of this policy is to shift reliance from scarce non-renewable sources of energy to non-conventional renewable sources to meet the ever-increasing demand for energy in India.

Solar Power Policy proposes to establish a number of large-scale solar parks starting with the Charanka solar park in the Patan district of Gujarat. A strengthened transmission network is needed to evacuate power to be produced in the solar parks. Through the Gujarat Solar Power Transmission Project, ADB is assisting the state government in developing reliable transmission infrastructure for successful evacuation of solar power generated in these parks.

LOAN DETAILS

EXECUTING AGENCIES

Government of Gujarat; Gujarat Energy Transmission Corporation Limited

MILESTONES

Sep 2011 - $100 mn approved

Jan 2013 - $0.40 mn disbursed

Mar 2015 - Closing

OBJECTIVE

The project will develop the transmission infrastructure of the Charanka solar park which will site over 500 MW of solar photovoltaic and concentrated solar power plants.

OUTPUTS

Key outputs under the project are presented in the table below:

Substations	• A 400/220/66 kilovolt (kV) substation at Charanka in Patan district comprising two 315 MVA 440/220 kV transformers, six 100 MVA 220/66 kV transformers and one 125 MVAR bus reactor will be constructed • A 400/220/66 kV substation at Sankhari in Patan district
Cable grid	• 35 km of 66 kV underground cable grid within the solar park will be installed
Feeder bays	• Two feeder bays will be constructed at the substations located at Jangral in Patan district
Transmission lines	• 100 km of 400 kV double circuit transmission lines will be constructed from the solar park to Sankhari • 95 km of 220 kV double circuit transmission line will be constructed from the solar park to Jangral
Vocational training	• Vocational training for skilled employment will be provided to 300 people of which at least 30% will be women

	• Livelihood enhancement training to 100 poor households headed by women will be conducted

OUTCOMES

Increased power

The project aims to develop a transmission network capable of evacuating up to 500 MW of solar power generated in the Charanka solar park in an efficient and reliable manner. A quantum of 219 MW of power has been evacuated from the park (as of December 2012).

Enhanced skill and job opportunities

The project consists of various components which focus on pro-poor welfare and social inclusiveness. Work under these components will generate a significant number of local jobs requiring different skill sets. These skill sets will be developed through provision of vocational training to local people (30% women) and energy-based livelihood skill training to 100 women.

Increased gender mainstreaming

All interventions under the project will be gender inclusive and will aim to promote gender equality through empowerment of women in decision-making roles and by enabling them to actively participate in employment and skill training for energy-based alternative livelihoods. The project also includes a TA component which will offer vocational training to 300 people with at least 30% participation by women.

WAY FORWARD

ADB, through this project, continues to support Government of India in its efforts to harness the huge potential for solar energy-based power generation. In May 2010, ADB announced the Asia Solar Energy Initiative (ASEI) to catalyze development of 3,000 MW of solar power generation projects from 2010 to 2013 in member countries. This project is a step towards achieving the goals included under ASEI. The Gujarat Solar Power Transmission project highlights ADB's focus in the areas of transmission expansion and optimization, albeit, through development of a very high-tension power evacuation line from the solar park. Similar projects in the future will facilitate private sector participation and help in scaling up solar power generation in a significant manner in India.

INNOVATION IMPULSE

Systemic and transformational change

- The technical assistance component of the project will offer vocational training and livelihood enhancement opportunities to the local population in the Patan district. This objective of this component is to develop a qualified labor force to meet the employment demands of the proposed solar park development projects and increase incomes and empowerment of poor local women.

Financing and leveraging

- The project will establish a power evacuation line from the Charanka solar park. It will provide cost advantages to private players involved in solar power generation in Charanka solar park, thus enhancing project feasibilities and potential for further private investment.

PROJECT BRIEF

Himachal Pradesh Clean Energy Transmission Investment Program

PROJECT OVERVIEW

Among water abundant Indian states, Himachal Pradesh has the potential to produce 23,000 MW of hydropower, which is about one-fourth of the total hydropower potential of the country. The Government of Himachal Pradesh has targeted to exploit this comparative advantage to become the "Hydropower State" of the country. This will not only benefit the hill state, but will also provide a clean and indigenous source of energy to the country.

A sub-station under construction

ADB undertook the Himachal Pradesh Clean Energy Transmission Investment Program in September 2011 to support the state's stand-alone transmission utility, Himachal Pradesh Power Transmission Corporation Limited (HPPTCL) in upgrading and expanding the electricity transmission system in the state.

This project functions under the broader development of hydro power plants being critical not only for meeting India's growing demand for power, but also to ensure an environment-friendly hydro-thermal mix in power generation. The 12th plan aims to exploit India's 149 GW hydro power potential over the next two years, since the total capacity that has been developed so far is only 32% of this potential.

LOAN DETAILS

EXECUTING AGENCY

Himachal Pradesh Power Transmission Corporation Limited

MILESTONES

- **Sept 2011** — **$350 mn approved for MFF**
- **Oct 2011** — **$113 mn approved for Tranche 1**
- **Jan 2013 - $1.6 mn disbursed**
- **Jun 2018 - Closing**

OBJECTIVE

The program was formulated with the objective of empowering HPPTCL to fulfill its role as the state transmission utility through development of new assets and enhancement of its overall management capacities.

OUTPUTS

Key outputs under the program are presented in the table below:

Increased transmission substations and transformers	• 17 transmission substations will be commissioned • One 315 MVA transformer (at 220/400kV voltage level) at Gumma will be commissioned
Increased high voltage transmission lines	• 13 transmission lines totaling over 200 km, consisting of mostly 220 kV lines, but with some 132 kV lines and one 400 kV line will be commissioned

Enhanced management capacity of HPPTCL	• Processes for procurement, financial management and project monitoring will be strengthened • Computerized enterprise resource planning (ERP) solutions will be implemented and training of staff on ERP system use will be conducted • Financial accounting and preparation of reports will be achieved in a timely manner

OUTCOMES

Enhanced and more efficient utilization of natural resources

This program will result in increased dependence on clean energy through effective utilization of hydropower. On completion of the project, transmission substation capacity will increase by 2,281 MVA and 1,487 MW of additional hydropower will be transmitted through the grid. Transmission substation capacity has increased to 2,338 MVA (as of December 2012).

Improved environmental sustainability

The program will augment the transmission capacity to support hydropower development in Himachal Pradesh, thus, contributing to reduction in the carbon intensity of India's power supply mix.

Improved access to electricity

The project will support building additional transmission infrastructure which will have the potential to provide access to electricity to over 456,000 homes in India.

Enhanced livelihoods

With increased access to energy, use of electronic media such as television and radio will significantly improve, resulting in enhanced connectivity, greater knowledge and information sharing. Agriculture productivity will be positively impacted through greater farm mechanization. With regular electricity supply, household and cottage industries will also develop, thereby creating more employment opportunities.

WAY FORWARD

The Himachal Pradesh Clean Energy Transmission Investment Program will enable Himachal Pradesh to benefit from its huge hydro power generation potential and exploit its comparative advantage. It will provide the state and national grid with a clean indigenous source of energy to meet the rapidly increasing energy demand.

INNOVATION IMPULSE

Systemic and transformational change

- The TA will provide training on good practices for financial management, procurement, project monitoring, accounting and management information systems.

Financing and leveraging

- The project will promote private sector investment in hydropower generation in the state by building adequate transmission capacity, thus assuring project developers that their hydropower will be able to reach markets outside the state. This is also expected to free-up public resources for other development initiatives.

PROJECT BRIEF

Himachal Pradesh Clean Energy Development Investment Program

PROJECT OVERVIEW

Himachal Pradesh has an estimated hydropower generation capacity of approximately 23,000 MW, of which only about 6,256 MW has been tapped as of 2010. Harnessing the remaining untapped hydropower potential is not only vital for meeting state's own growing power demand, but will go a long way towards meeting the country's target of 50,000 MW of hydropower generation as per India's Hydro Policy, 2008.

A tunnel under construction at project site

Government of Himachal Pradesh's main strategy, outlined in its Hydro Power Policy 2006, is the development of the state as the "hydropower state" of the country, by providing affordable, reliable, and quality power to its residents and transmitting power to the national grid, which will serve as a major source of revenue to the state.

ADB undertook the Himachal Pradesh Clean Energy Development Investment Program in 2008 to assist the state government in fulfilling the objectives by creating a sustainable electricity sector in the state. The project is facilitating an increased production of clean energy as well as improvement in planning, implementation, management and sector governance in the state .

LOAN DETAILS

EXECUTING AGENCIES

Multi Purpose Projects and Power Department, Government of Himachal Pradesh

MILESTONES

- **Oct 2008- $800 mn approved for MFF**
- **Oct 2008- $150 mn approved for Tranche 1**
- **Dec 2009- $59.1 mn approved for Tranche 2**
- **Oct 2010 - $208 mn approved for Tranche 3**
- **Oct 2012 - $315 mn approved for Tranche 4**
- **Jan 2013 - $208.5 mn disbursed**
- **Sept 2016 - Closing**

OBJECTIVE

The objective of the program is to increase Himachal Pradesh's hydropower generation capacity through construction of hydro-power projects, developing the capacity of Himachal Pradesh Power Corporation Ltd. (HPPCL) (the state's hydropower generating company in project planning and implementation), and strengthening its corporate governance structure. The program also involves capacity development of Himachal Pradesh State Electricity Board (HPSEB) and HPPCL by supporting improvements in its accounting and management information systems.

OUTPUTS

Key outputs under the program are presented in the table below:

Increased hydropower generation projects	• The following hydroelectric power plants are being constructed: – Sawra Kuddu hydroelectric project (111 MW) – Kashang I, II, and III hydroelectric projects (195 MW) – Sainj hydropower project (100 MW), Shongtong-Karcham (450 MW) hydroelectric project • 1,121 GWh of energy is expected to be produced from 306 MW of incremental state hydropower capacity (Sawra Kuddu and Kashang I, II, III)

	• 2,135 GWh of energy is expected to be produced from 502 MW of incremental state hydropower capacity (Sainj and Shongtong-Karcham)
Enhanced corporate governance measures	• Capacity development of HPPCL will be conducted on: – Project preparation, implementation, and management – Financial management and accountability – ADB policies and procedures compliance – Governance, fiduciary oversight, organization structuring – Private sector participation modalities and CDM procedures • Enterprise resource planning solutions is being implemented at HPSEB

OUTCOMES

Increased hydropower generation capacity

The program will increase hydro-power production capacity from 413.5 MW in 2007 to 1,221.5 MW by 2016. This will increase access to electricity allowing for greater economic productivity in the project areas. A quantum of 471.5 MW of hydro-power has been generated (as of December 2011).

Reduced green-house gas emissions

The program will lead to reduction in greenhouse gas (GHG) emissions by approximately 2.3 million tons enabling it to earn carbon credits based on tons/year of CO_2 emissions avoided. These credits may be sold for additional revenue.

Enhanced management of the state's power sector

Capacity development and corporate governance strengthening initiatives are resulting in improved planning, implementation and management of the sector in the state. It is expected that generation of an additional 3,102.2 GWh of hydropower every year will lead to higher self-reliance and an additional source of state revenues. Training on project preparation, implementation and management has been completed. Internal audit functions have been strengthened.

WAY FORWARD

This program will help achieve the goal set under Government of India's Integrated Energy Policy of 2006 of providing adequate and reliable energy in a technically-efficient, economically-viable, and environmentally-sustainable manner. Special focus will be given to increasing the share of renewable sources of power in the power-mix, replicating energy efficient technologies and creating awareness amongst consumers for better demand side management.

INNOVATION IMPULSE

Systemic and transformational change

- Capacity development and institutional strengthening of HPPCL is expected to improve its performance and enable it to enter into joint ventures with private sector participants to develop and construct additional power generation facilities both, within and outside Himachal Pradesh.
- Employment opportunities would be created during the implementation of the program, of which 70% of hired labor will be reserved for recruits from within the state.

Financing and leveraging

- The program is expected to reduce GHG emissions by 2.3 million tons, thereby qualifying sub-projects under the program for carbon credits. With ADB assistance on the Clean Development Mechanism (CDM), HPPCL will enter into an agreement for the upfront sale of future carbon credits. Revenue thus generated will be utilized for HPPCL's project development activities.
- The Future Carbon Fund, a fund managed by ADB, will enter into a purchase agreement with HPPCL to buy post-2012 carbon credits.
- Sale of surplus power to other states will help in earning additional revenue.

PROJECT BRIEF

Bihar Power System Improvement Project

PROJECT OVERVIEW

The state of Bihar has shown an impressive growth during the 11th plan. The state GDP grew by around 12% during the 11th plan, vis-à-vis 4.7% during the 10th plan.

A sub-station at the project site

However, to sustain this growth trajectory, Bihar needs to attract new investments in its power sector. The per capita energy consumption is still low while the energy deficit is high. Against a national energy deficit of 8.5% and peak deficit of 10.3%, Bihar had an energy deficit of 14.0% and peak deficit of 22.5% in 2010-2011.

The ADB-supported Bihar Power System Improvement Project aims at reducing power outages in the state by upgrading the electric power system and improving energy efficiency. The project entails investment in physical infrastructure, which includes installation of new assets as well as R&M of existing ones in the transmission and distribution networks .

LOAN DETAILS

EXECUTING AGENCY

Bihar State Electricity Board (BSEB)

MILESTONES

Oct 2010 - $132.2 mn approved

Jan 2013 - $6.6 mn disbursed

Jun 2016 - Closing

OBJECTIVE

The project aims to develop a more sustainable power sector in the state, capable of providing better services to end users through an upgrade of T&D systems in four distribution circles (seven towns). The capacity development component of the project is addressing constraints in managerial and engineering practices that have contributed to high system losses.

OUTPUTS

Key outputs under the project are presented in the table below:

Expanding transmission capacity	• In order to expand transmission capacity, the following will be installed: – A 220/132 kV grid substation at Pusauli – Two new 132/33 kV substations at Dhanha and Gangwara – Two 220 kV bay and six 132 kV bays at different locations in the state – Approximately 328 km of new transmission line
Strengthened distribution capacity	• Upgrading of distribution system are being carried out in seven towns under four distribution circles • Construction of 33/11 kV substations and R&M of existing 33/11 kV substations is ongoing • 33 kV, 11 kV, and low tension lines are being constructed in various regions of the state

	• New distribution transformers are being installed and capacity augmentation and R&M of existing transformers, installation and replacement of consumer metering equipment are being carried out
Enhanced institutional development of BSEB	• Project implementation support and construction supervision are being provided • Training programs on financial management and corporate and managerial planning will be conducted, apart from those programs that help in developing and handling high-voltage distribution systems

OUTCOMES

Improved transmission and distributional capacity

The project will strengthen the transmission capacity of the state power sector by construction of additional sub-stations and installations of new transmission lines. The distributional capacity will be upgraded in seven towns under four distributional circles where a quantum of 270 MW of additional peak demand is expected to be met in the project areas by the end 2015. Procurement safeguards and financial consultants have been hired and mobilized. The institutional needs assessment has also been completed.

Increased efficiency and reliability of service

The projects will contribute to reduction in transmission and distribution losses by at least 3% from the current level. An additional quantum of 472,579 MWh of power will be accessible by consumers annually due to this distribution capacity enhancement initiative.

Improved social outcomes

Greater and more reliable power supply will help boost the quality of social services like hospitals, schools and other social entities which often suffer most from patchy and low-quality power supply and load shedding. Efficient power supply will increase access to electronic media such as television and radio, allowing better decision making by poor based on informed choices and greater understanding of civic affairs.

WAY FORWARD

The completion of the project will ensure a sustainable state power sector, which will be able to provide better services to end users. This would further translate into productivity improvements and welfare gains in the long-run.

INNOVATION IMPULSE

Systemic and transformational change

- A component of the project focuses on capacity building of the Bihar State Electricity Board's (BSEB's) staff in terms of handling project planning, implementation, financial management, and procurement.

Financing and leveraging

- BSEB's revenue collection will be improved through installation of static meters for measuring power consumption, computerized billing, and consumer indexing.

PROJECT BRIEF

Uttarakhand Power Sector Investment Program

PROJECT OVERVIEW

Uttarakhand has around 20,000 MW of untapped hydropower-generation potential. Harnessing this potential will enable the state to sell some of the surplus energy to neighboring states and improve the viability of the power sector in general.

The Government of Uttarakhand aims to strengthen the power sector by increasing capital investments to increase power generation and improve transmission and distribution infrastructure, apart from capacity building for policy reform and improved financial management.

A 400 kV sub-station under construction in Srinagar

The Uttarakhand Power Sector Investment Program supports the state government's goal of strengthening the power sector by facilitating reliable supply of power from large and small hydro plants located in the state by augmenting the transmission and distribution infrastructure. This involves construction of new assets and upgrades of existing ones. The program also provides assistance for institutional and capacity building of the various departments operating in the state power sector.

LOAN DETAILS

EXECUTING AGENCY

Uttarakhand Energy Department

MILESTONES

- **Mar 2006- $300 mn approved for MFF**
- **Jan 2007- $41.9 mn approved for Tranche 1**
- **Dec 2008- $62.4 mn approved for Tranche 2**
- **Jan 2009 - $30.6 mn approved for Tranche 3**
- **Oct 2012 - $150 mn approved for Tranche 4**
- **Jan 2013 - $32.7 mn disbursed**
- **Mar 2016 - Closing**

OBJECTIVE

The program consists of three components. The first component involves clean energy development, wherein generating capacity is being expanded by constructing new small hydropower power plants (SHPPs) and energy efficiency is being improved in existing grid-connected hydropower power plants (HPPs). The second component deals with transmission system expansion. Interstate high voltage transmission lines, substations, and auxiliary equipment are being constructed to evacuate power from various IPPs. The last component focuses on capacity building and strengthening of the institutional framework within the implementing agencies.

OUTPUTS

Improved energy efficiency	• 34 MW of new and 8 MW of renovated generating capacity (at 60% load factor) will be achieved • Installation of 462 circuit - kms of 400kV of transmission lines (including 156 km 400 kV double circuit line between Srinagar and Kashipur), and 400kV substation in Srinagar and Pipalkoti are being constructed • Auxiliary equipment and 33 kV transmission lines for evacuating power from the new HPPs are being constructed

	• 64 circuit - kms of new 220 kV transmission lines is being constructed
Enhanced capacity development and corporate management	• Training programs are being conducted for staff working in various agencies in the power sector of Uttarakhand • Compliance with tariff orders, including reduction in aggregate technical and commercial losses to meet international benchmarks is being ensured • A debt-service coverage ratio of not less than 1.2 and accounts receivables of no more than 2 months of billing are being maintained at the utility level. Independent audit departments, computerized accounting and management information system and development of online billing and collection systems will be completed

OUTCOMES

Shift to clean energy production

The program will result in clean and sustainable energy development through construction of new SHPPs along with renovation, modernization and upgrade of existing hydropower plants. In addition, energy efficiency will be promoted through various measures such as routine energy audits, incentives for energy efficiency and conservation and installation of low-tension capacitors at distribution transformers.

Increased supply of reliable power

21,900 gigawatt-hours per year of power will be injected to the state grid (5,000 MW running at 50% load factor) by the end of the project period. 1,310 MW of additional power has been generated by UJVNL (as of December 2011). The additional power available through the expansion of transmission network will not only to meet the demand within the state, but will also get exported to energy deficit states, thereby earning revenues for the utilities. 12,373 GWh of power is being transmitted (as of December 2012). Reliability of the power system is expected to be improved - a 45% reduction in load shedding is envisaged from 2005 levels.

Increased sustainability and capacity development

With the adoption of measures like installation of static meters, online billing, asset mapping and other demand side management initiatives, the revenue collection of the utility is expected to improve. Capacity development designed for better revenue management along with technical training for the staff of Uttarakhand Jal Vidyut Nigam Limited (UJVNL) and Power Transmission Corporation of Uttarakhand Limited (PTCUL) will also result in cost -effective functioning of processes. Audit is being done through the Controller and Auditor General of India and statutory audit is being done by independent chartered accountants. Computerised accounting is also being implemented.

WAY FORWARD

The program will contribute to the economic development of Uttarakhand, through hydro resource royalties, and of northern region of India by providing clean energy at competitive prices. It will catalyze the private sector development in hydropower resources in Uttarakhand. Implementation of the projects will enhance the project management capability of UJVNL and PTCUL, and create an environment conducive to investments.

INNOVATION IMPULSE

Systemic and transformational change

- Revenue management, collection of arrears (improving operational efficiency), and financial performance of the state's power sector will be areas where ADB will strengthen Uttarakhand Energy Department's capacity and performance through this program.
- The Uttarakhand Energy Department and other implementing agencies will be assisted by ADB to undertake power system expansion activities in a cost effective manner. It will also train staff in areas of policy formulation, project planning, management, and monitoring.

Piloting new approaches

- This program will mark the usage of the MFF in the power sector in India for the first time.

Financing and leveraging

- With increased financial sustainability resulting from improved demand side-management, it is expected that UJVNL will be able to attract private investments in the renewable energy sector.

URBAN

4. Urban

Sector background and challenges

India's growth over the past decade has been largely driven by the urban centers of the country. Today, these centers contribute to nearly 70%[27] of India's GDP and account for 31%[28] of its population. By 2031, projections indicate that urban centers will account for 43% of India's population[29]. In other words, in the next two decades, India's urban agglomerations will have to accommodate 600 million people[30], or twice the current population of the United States.

The process of urbanization underway in India represents a historical opportunity for achieving high, inclusive and sustainable growth. Realizing the promise of urbanization, however, requires meeting several challenges. Key issues that need to be addressed include the following.

Investments and fund availability. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was introduced in 2005 to address the critical need for investment in the development and maintenance of urban infrastructure. While there has been improvement in meeting investment requirements, the need for enhanced financing persists[31]. At the state level, urban local bodies (ULBs) which have varying levels of responsibilities, from planning and design to implementation and delivery of urban services, are in need of improved financial control and systems. Deficits in resources at the ULB level are expected to be addressed through a three-pronged approach of creating robust tax and non-tax revenue streams, encouraging private capital and systematically monetizing land. The viability of projects related to water supply, sewerage, management of municipal solid waste (MSW) and public transport also needs to be enhanced in order to encourage greater levels of private investment .

Institutional frameworks and governance structures. Census towns, which are agglomerations without proper urban governance structures or requisite urban infrastructure, constituted over 90% of the increase in number of towns between 2001 and 2011[32]. Where governance structures are present, the main challenge faced is the need to clarify responsibilities across multiple authorities. ULBs currently require adequate autonomy and financial resources that would improve accountability. Capacity development initiatives need to be undertaken by leveraging public private partnerships (PPPs) for administration and management personnel in order to improve financial and operational sustainability. Additionally, the policy environment needs to be made more conducive to cost-saving innovations.

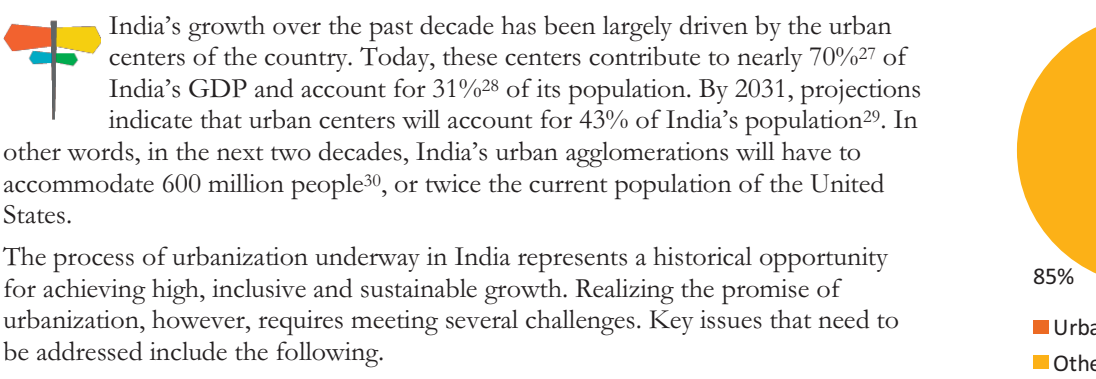


Figure 4.1: Urban and Multi-sector's share in ADB portfolio (1986-2012)

AT A GLANCE

- *Urban areas contribute to nearly 70% of GDP, and this contribution is expected to increase to 75% by 2021.*
- *In the next two decades India's urban agglomerations will have to accommodate 600 million people.*
- *Improvements in urban infrastructure and delivery of basic urban services needs to be brought about through adequate sectoral investment, strengthened institutional frameworks and governance capacities, and proper planning.*

[27]Source: Report of the Sub-Committee on Financing Urban Infrastructure in the 12th Plan, Government of India
[28]Source: Report of the Sub-Committee on Financing Urban Infrastructure in the 12th Plan, Government of India
[29]Source: Report of the Steering Committee on Urbanization, Eleventh Five Year Plan (2007-2012), Government of India
[30]Source: Chapter 18, Volume 2, Twelfth Five Year Plan (2012-2017), Government of India
[31]Source: Report of the Sub-Committee on Financing Urban Infrastructure in the 12th Plan, Government of India
[32]Source: Faster, Sustainable and More Inclusive Growth, An Approach to the Twelfth Five Year Plan (2012-2017), Government of India

Figure 4.2: Key indicators of urban service delivery in India[33]

Water Supply

- Coverage: 70.6% as of 2011 census;
- Duration of supply: 1 to 6 hours;
- Per capita supply: 37 lpcd to 298 lpcd;
- Non revenue water: 50% (70% corresponding to leakages from consumer connections and malfunctioning meters)

Sanitation

- Number of cities with no sewerage: 4861;
- Households without latrine facility (defecating in the open): 13%; as of 2011 census
- Households without closed drainage sewers: 55% as of 2011 census;
- Roads covered with storm water drainage: less than 20%;
- Sewage treatment in Class I and II towns: 20% as of 2009;
- Scientific disposal of solid waste: non-existent as of 2005

Public Transport

- Share: 27%;
- Cities with >0.5 million population with bus services: 24% as of 2009

Affordable Housing

- Projected shortage of dwelling units in urban areas for 2012: 18.78 million;
- Projected slum population in India in 2012: 94.98 million;
- Dwelling units sanctioned under JNNURM over 7 year mission period: 1.6 million

Urban planning. Strengthening the urban planning process to make it more comprehensive and participative will be important. Some focus areas include[34]:

1. Linkages between spatial planning carried out by town planning departments/ development authorities and sector-wise socio-economic planning carried out by state governments,
2. Integrated regional planning which includes peri-urban as well as surrounding rural areas,
3. Coordination between master plans and operating strategies,
4. Clarity on roles and responsibilities between agencies like Water Supply and Sewerage Boards, Urban Development Authorities, District/Metropolitan Planning Committees, and ULBs,
5. Adoption of enabling tools like geographic information system (GIS)/GIS enabled management information systems (MIS).

Government of India's sector strategy

Government of India's strategy for urbanization in the coming years aims to achieve universal access to water and sanitation, quality and affordable public transport, creation of a clean and healthy environment in cities/towns, provision of affordable housing and enabling sustainable livelihoods and enterprises. To achieve these, the government will focus on strengthening the five enablers of urbanization, which pertain to investment and financing, urban governance, capacity building, planning, and innovation. The government will also step up investment in the sector over the next five years through the second phase of its flagship program, JNNURM II. The 12th plan has indicated an outlay of $18.3 billion[35] for the program, which will consist of four components - (i) Urban Infrastructure and Governance (UIG); (ii) Rajiv Awas Yojna (RAY/Rajiv Housing Scheme); (iii) slum rehabilitation in cities not covered under RAY; and (iv) capacity building.

An investment need of $715.6 billion[36] has been estimated for urban infrastructure development over the next 20 years. To meet this requirement, the government plans to focus on strengthening the financial status of ULBs which would, in turn, attract and encourage private funds for investment in urban infrastructure. For strengthening municipal finances, reforms will include steps for institutionalization of robust tax and non-tax revenue streams, revenue sharing with state governments, adoption of innovative methods like monetization of land and accessing the municipal bond market, improving user charge collection, leveraging PPP and people–private–public partnerships, setting up of ring-fenced city development funds, and strengthening of state finance corporations (SFCs).

The strategy for improving governance will include steps for strengthening local governance systems, integrating planning organizations and processes, building capacity across all levels, and promotion of innovation. Emphasis will be provided on ensuring a convergence of programs administered by the Ministry of Urban Development and Ministry of Housing and Urban Poverty Alleviation. Due consideration will be given to setting up of independent regulators to monitor urban utilities at the state level. Other elements will include publishing of a citizen's charter containing information on service levels, and finalization of a national level e-governance architecture with sufficient flexibility for customization at the state and ULB levels. Creation of dedicated government agencies for provision of services like

[33]Source: Chapter 18, Volume 2, Twelfth Five Year Plan (2012-2017), Government of India
[34]Source: Report of the Steering Committee on Urbanization, Twelfth Five Year Plan (2012-2017), Government of India
[35]All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.
[36]Source: Report of the Sub-Committee on Financing Urban Infrastructure in the 12th Plan, Government of India

water supply and solid waste management in large metropolitan areas, and setting up of ward committees and gram sabhas for institutionalizing participatory urban development will also be considered.

Developing capacity at all levels of government for managing the urbanization process will be a significant priority within the strategy. A comprehensive framework consisting of issues such as staffing, training and skill development, and finances would be created. About 10% of the total outlay of JNNURM II is being considered for allocation as a separate sub-mission focused on capacity building. Information technology (IT) based training systems which provide improved flexibility and accessibility will be developed for capacity building for urban management. The strategy will also include institutionalization and professionalization of a separate municipal cadre with necessary technical skills, leveraging private sector expertise for meeting short term skill deficits, establishment of reforms and performance cell to address issues related to implementation of reforms and dissemination of best practices, setting up of five Indian Institutes of Urban Management, and facilitation of information sharing amongst urban managers.

To overcome the challenges posed by disjointed efforts and activities toward urban planning, Government of India plans to ensure mandatory preparation of a development plan with at least a 10-year perspective for all cities and towns. This master plan will cover plans for strategic densification, mobility (with special emphasis on safety of vulnerable groups), sewerage and sanitation, water, economic and commercial activity, infrastructure, affordable housing, environment conservation, urban poverty reduction, inclusionary zoning (old age homes, orphanages, working hostels, night shelters and so on) and planning for peri-urban areas. Steps will be taken for ensuring citizen's participation in metropolitan and district planning committees. Preparation of municipal plans by ULBs and revision of existing laws to reflect recent policy suggestions will be carried out. Adoption of land readjustment as an alternative to land acquisition will also be explored.

RAY has been outlined as the major program for slum rehabilitation and improving the living conditions of the urban poor. The 12th plan has suggested integration of RAY with JNNURM II to achieve coherence in reforms and interventions. The new integrated program will focus on needs of the poorest inhabitants of the city through a 'whole city' approach to planning. Finally, initiatives will be taken up for ensuring environmental sustainability of urban development across all facets, in line with objectives of the National Mission on Sustainable Habitats.

220 million litres per day intake well built under the Urban Water Supply and Environment Improvement project, at Jabalpur city in Madhya Pradesh.

AT A GLANCE

- *Government of India aims to achieve universal access to water and sanitation, affordable public transport, clean and healthy environment, affordable housing, and an enabling environment for livelihoods and enterprises in all cities/towns across the country, in the coming years.*
- *JNNURM II, consisting of four components i.e. Urban Infrastructure and Governance, Rajiv Awas Yojna, slum rehabilitation in cities not covered under RAY, and capacity building, with an indicative outlay of $18.3 billion, will be the key program for the sector in the 12th plan period.*

ADB's sector assistance

ADB recognizes the important role that urban centers play in stimulating the country's economic efficiencies, providing employment and industrialization opportunities, and driving social change. It has, hence, been supporting Government of India in developing urban infrastructure for towns and cities across the country since 1995. ADB's efforts in the sector have involved financing infrastructure development and improvements in service delivery, strengthening of urban governance through municipal reforms, and capacity building. Projects have also focused on slum rehabilitation, with targeted components for improving livelihoods, building up of community infrastructure, and provision of vocational training. As of 2012, ADB had lent $4.4 billion[37] for urban sector development in India. From an 8% share of ADB's total sovereign lending during the 1986-2000 period, the urban sector share has more than doubled to 17% during 2001-2012 period, emphasizing the sector's growing importance in ADB's sector portfolio. The sub-sectoral split of assistance provided is shown in the Figure 4.3.

Newly procured fire engines at one of the new fire stations created in Alwar city of Rajasthan under ADB's Rajasthan Urban Sector Development Investment Program.

[37]All figures in this subsection—ADB's sector assistance—have been sourced from ADB.

AT A GLANCE

- *ADB has provided loans amounting to $4.4 billion for the development of urban infrastructure in towns and cities across the country, since its India operations began in 1986.*
- *Share of the urban sector in ADB's overall country portfolio has more than doubled to 17% during 2001-2012, as compared to levels in the 1986 - 2000 period.*

Figure 4.3: ADB assistance to the sector during 1986 - 2012[38]

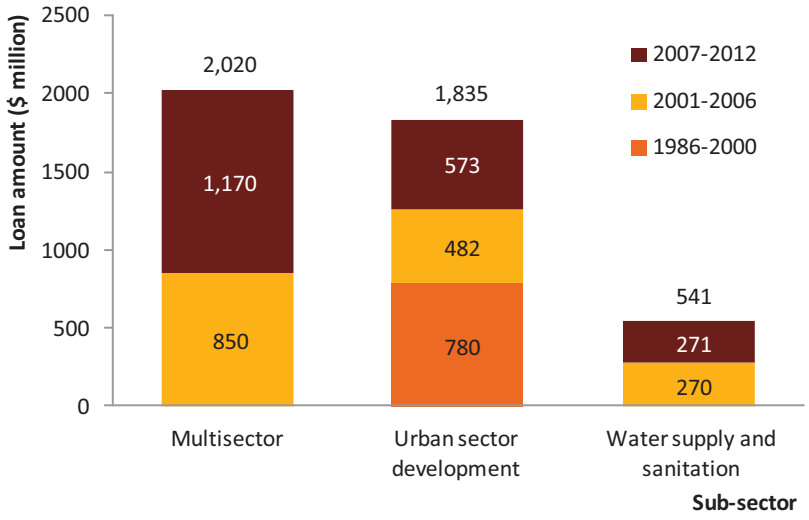
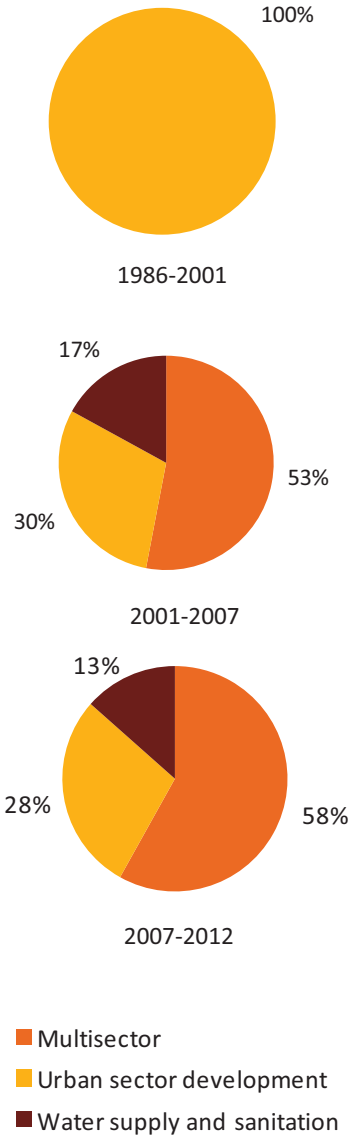


Figure 4.4: Sub Sectoral Split



Development and delivery of sustainable urban infrastructure and services. ADB projects have helped develop and strengthen infrastructure facilities for water supply, waste water management, solid waste management and urban transport services in cities across various states. ADB has also supported the formation of economic infrastructure components, like urban transport and support infrastructure for the labour intensive tourism sector. One of the recent projects undertaken by ADB plans to create a 10.5 km bus rapid transit (BRT) corridor in Guwahati. ADB also provided loans for financing 9.9% of the Bangalore metro rail project (phase I). Tourism has been supported through projects focused on preservation and development of natural and cultural heritage, and development of tourist destination connectivity and support infrastructure in the participating states of Himachal Pradesh, Punjab, Tamil Nadu and Uttarakhand.

Many of ADB's assistance programs focus on providing support for the development of urban infrastructure in smaller towns and cities, which face comparatively higher development pressures. One such project assisted the improvement of urban service delivery in 25 towns of north Karnataka. ADB has also undertaken urban sector projects in remote and economically backward regions, thus reinforcing Government of India's efforts towards addressing regional disparities.

Urban planning. In addition to providing financial support for the development of infrastructure in the sector, ADB has also provided technical assistance (TA) for urban planning and assessment and, project implementation and management. One important example of such TA is the support provided for the first phase of the $20 billion JNNURM program. In another ongoing project, ADB is helping four economically important ULBs of Bihar to ensure structured operations for the sustainable operation and maintenance of urban infrastructure and improving living conditions in the towns.

Financial innovations. ADB has also assisted financial innovations in the sector. A good example is the support being provided to Kerala for financial reform in urban infrastructure delivery. It involves (i) setting up of a revolving fund, the Kerala Local Government Development Fund, aimed at assisting ULBs in financing urban

[38]Projects under urban sector development category would include urban governance, urban planning, and urban environmental policies. Projects under Multisector category would include those that feature outputs across sectors (e.g. energy, finance, transport, urban infrastructure).

infrastructure; and (ii) restructuring of the Kerala Urban and Rural Development Finance Corporation Limited as an asset management company.

Environmental sustainability. Addressing environmental sustainability and climate change concerns form key components of ADB's sustainable development agenda. One of the earliest projects focused on this theme was the Kolkata Environmental Improvement Project, which undertook environment improvement in the outer areas/boroughs of Kolkata by improving sewerage and drainage, improving management of MSW, de-siltation of canals, and resettlement of slums. Similarly, initiatives under the Urban Water Supply and Environment Improvement Project in Madhya Pradesh helped curb contamination of water bodies and spread of communicable diseases. Additionally, ADB's initiatives in urban public transport will help in mitigation of greenhouse gas emissions in these cities, thereby contributing towards addressing climate change concerns.

Accomplishments in the three main subsectors of water supply, sanitation, and solid waste management made by all completed and ongoing urban projects as of 2010 are presented in Table 4.1.

Table 4.1: ADB's accomplishments in urban sub-sectors

Water Supply	2,502 MLD water treatment capacity installed	13,936 km of water supply network rehabilitated	25.9 million people will be benefitted
Sanitation	1,709 MLD of wastewater treatment capacity installed	6,405 km of collection of network constructed	16.6 million people will be benefitted
Solid Waste Management	2,470 tons per day of solid waste treatment capacity augmented		19.1 million people to be benefitted

Going forward, ADB's new urban sector strategy will be delivered through a Cluster City Development Initiative which will include cities that serve as vital nodal points along high-potential economic corridors, aiming to turn these cities into engines of socio-economic growth. The strategy will focus on (i) integrated and strategic regional planning; (ii) efficient provision of urban infrastructure and services; (iii) new municipal financial modalities to leverage infrastructure finances; (iv) strengthened governance and reforms of urban service delivery; and (v) institutional capacity building for sustainable management of ULBs.

The strategy also gives significant importance to private sector participation in generating finances and encouraging efficient management. In order to achieve this, ADB will support Government of India in (i) facilitating the creation of an enabling policy for PPP in the sector, and an institutional and regulatory framework for PPPs; (ii) introducing and scaling up performance-based management contracting; and (iii) identifying avenues for PSP/PPP for specific revenue generating infrastructure components. Appropriate and efficient allocation of resources, dissemination of best practices and capacity building will be key focus areas.

Extensive experience in the sector has provided ADB with a wealth of knowledge on good practices and lessons to be learnt. ADB will assist Government of India through a TA program to formulate a national framework on water tariffs, improve regulatory mechanisms and urban governance. Support to national Centers of Excellence in urban management and service delivery will also be considered.

ADB's TA to JNNURM

Reforms mandated under JNNURM fall into four broad areas: (a) governance reforms; (b) process and citizen oriented reforms; (c) land and property related reforms; and (d) financial sustainability reforms. Experts mobilized under the ADB TA have prepared various guidelines, manuals, brochures, toolkits, and primers for the benefit of the ULBs and states. They are also helping standardize procedures and documents, and build capacities of the ULBs. ADB support has been extended in the following areas:

- Managerial and technical support for establishing management units in the JNNURM Directorate and at the state level to monitor investments and reforms.
- Adoption of new technologies and systemic improvement for enhancing revenue through telemetry, utility mapping, computerization of revenue billing and collection, and spot billing.
- The Peer Experience and Reflective Learning (PEARL) program to foster cross learning among cities and institutions clustered into groups based on similar socioeconomic profiles.
- Training in double-entry accrual-based accounting, property tax reforms, enabling PPPs, establishment of information systems, urban governance, slum improvements and community planning, and training for representatives of state governments.
- Conducting credit rating exercise for 65 ULBs to help them secure funds from financial institutions.
- Creation of dedicated fund to help ULBs and other infrastructure agencies overcome their financial constraints.

Table 4.2: ADB's project portfolio for the Urban sector (1986-2012)

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
1.	Karnataka Urban Infrastructure Development Project	Regular	1995	85	Closed
2.	Karnataka Urban Infrastructure Development Project	Regular	1995	20	Closed
3.	Rajasthan Urban Infrastructure Development Project	Regular	1998	250	Closed
4.	Karnataka Urban Development And Coastal Environmental Management Project	Regular	1999	175	Closed
5.	Kolkata Environmental Improvement Project	Regular	2000	250	Closed
6.	Gujarat Earthquake Rehabilitation and Reconstruction Project	Regular	2001	500	Closed
7.	Urban Water Supply and Environmental Improvement in Madhya Pradesh Project	Regular	2003	181	Ongoing
8.	Multisector Project for Infrastructure Rehabilitation in Jammu and Kashmir	Regular	2004	250	Ongoing
9.	Tsunami Emergency Assistance (Sector) Project	Regular	2005	100	Closed
10.	Kerala Sustainable Urban Development Project	Regular	2005	221.2	Ongoing
11.	Kolkata Environmental Improvement Project (Supplementary Financing)	Regular	2006	80	Ongoing
12.	North Karnataka Urban Sector Investment Program	MFF	2006	270	Ongoing
13.	Jammu and Kashmir Urban Sector Development Investment Program	MFF	2007	300	Ongoing
14.	Rajasthan Urban Sector Development Investment Program	MFF	2007	273	Ongoing
15.	Uttarakhand Urban Sector Development Investment Program	MFF	2008	350	Ongoing
16.	Urban Water Supply and Environmental Improvement in Madhya Pradesh Project (Supplementary Loan)	Regular	2008	71	Ongoing
17.	North Eastern Region Capital Cities Development Investment Program	MFF	2009	200	Ongoing
18.	National Capital Region Urban Infrastructure Financing Facility	MFF	2010	150	Ongoing
19.	Infrastructure Development Sector Investment Program for Tourism	MFF	2010	250	Ongoing
20.	Assam Urban Infrastructure Project	MFF	2011	200	Ongoing
21.	Bihar Urban Development Investment Program	MFF	2012	200	Ongoing

CASE STUDY

Rajasthan Urban Sector Development Investment Program

"Water Supply has improved considerably…there is much more reliability now, with all areas receiving uniform supply at fixed hours."

--- Yogesh Chand Gupta from Ladia Bagh in Alwar

Augmentation and rehabilitation of the water supply system is one of the various interventions that have been carried under the Rajasthan Urban Sector Development Investment Program in Alwar, amongst the first cities selected for program implementation.

LOAN DETAILS

EXECUTING AGENCY

Local Self Government Department, Government of Rajasthan

MILESTONES

- **Oct 2007 - $273 mn approved for MFF**
- **Nov 2007 - $60 mn approved for Tranche 1**
- **Jan 2009 - $150 mn approved for Tranche 2**
- **Dec 2010 - $63 mn approved for Tranche 3**
- **Jan 2013 - $121.8 mn disbursed**
- **Jun 2015 - Closing**

Worker starting pumps at the Ladia Bagh Pump House in Alwar, which will feed a 1000 kl clear water reservoir. This will, in turn, feed 4 main over head service reservoirs, which will then serve various parts of the city with uniform water supply.

In late 1990s, urban areas in Rajasthan housed a quarter of the state's population. Productivity levels in these areas were 3.5 times higher than rural areas. A more than desired level of migration to urban areas consequently put undue pressure on urban infrastructure and associated facilities. Recognizing this issue, Government of Rajasthan identified expansion and development of sustainable urban infrastructure and services as a priority within the state's development agenda.

To assist Government of Rajasthan in addressing these developmental challenges, the Rajasthan Urban Infrastructure Development Project (RUIDP) was initiated by ADB in 1998, which covered six divisional headquarter cities in the state. The $250 million assistance project made significant improvements in the provision of urban services in Ajmer, Bikaner, Jaipur, Jodhpur, Kota and Udaipur. It also built capacities of ULBs in these cities to manage urban services efficiently. Following the success of RUIDP, similar initiatives were extended to other urban centers in the state where basic services were inadequate, owing to population pressures, influx of tourists, poor management and operations and maintenance (O&M) of public services, and lack of funds. RUIDP Phase II, named the Rajasthan Urban Sector Development Investment Program (RUSDIP) was, therefore, undertaken in

2007. The program aimed at improving living conditions and urban environment in 15 medium-sized cities of the state - Alwar, Baran, Barmer, Bharatpur, Bundi, Chittorgarh, Churu, Dholpur, Jaisalmer, Jhalawar, Karauli, Nagaur, Rajsamand, Sawai Madhopur and Sikar. The investment program cities were selected strategically to maximize the program's contribution to the state's overall economic growth, while maintaining regional balance.

ADB approved a multi-tranche financing facility (MFF) of $273 million for RUSDIP. The loan, disbursed in three tranches, has been helping finance urban infrastructure components in the 15 program cities. The key outputs of the program are:

- **Increased water supply.** System rehabilitation and unaccounted-for water (UFW) reduction will be implemented for all 15 ULBs under the program. This includes rehabilitation of water treatment plants; repair and reconstruction of 231 km carrier mains and 677 km distribution mains; and construction of 44 pump houses. About 171,400 consumer water meters will be installed in all existing connections and 370 bulk meters will be installed at all supply points. The project will also increase supply coverage to 90% through laying of new distribution pipelines and construct a water quality testing laboratory in Jhalawar.
- **Improved wastewater management.** The program covers rehabilitation of the entire sewerage system including outfall, trunk sewers, 1008 km sewer networks and connection of over 85,000 households in priority areas; and the construction of sewage treatment plants (STPs) in 13 ULBs, increasing their volume to 30 MLD.
- **Improved systems for solid waste management.** The program has undertaken provision of household waste containers; collection and transportation containers; and equipment and vehicles for handling municipal solid waste in all program ULBs. Engineering of three municipal sanitary landfills with a capacity of 108 metric tons was 62% complete, as on August 2012. A SWM ratio (collection/generation) of 1 and a treatment-collection ratio of 0.45 is being targeted under the program.
- **Improved urban drainage.** The program has undertaken preparation of drainage master plan for all program ULBs, as well as construction of roadside drains and trunk outfalls to carry storm-water runoff into natural channels in 4 ULBs. Provision of adequate tools and resources to maintain the drains are also covered under the program. The target construction of 13.3 km new drains has already been achieved.
- **Improved urban transport and roads.** The program includes preparation of comprehensive traffic management plans for all 15 ULBs; resurfacing of major roads; and construction of transport infrastructure, including roads and under bridges in 9 ULBs.
- **Enhanced social infrastructure.** The program will ensure provision of social infrastructure, including major entry and exit roads; streetlights and drainage; community hall; rainwater harvesting structures; and facilities for emergency services like firefighting. The program will also support the development of infrastructure and facilities for tourists in program ULBs, thus enhancing cultural heritage tourism opportunities.
- **Enhanced capacity development and institutional development of state systems.** This component includes (i) preparation of infrastructure base maps, (ii) holding events under Community Action Participation Program, (iii) establishment of databases and GIS for planning, design and monitoring of urban services, (iv) setting up of appropriate institutional structure for O&M, (v) governance, O&M and financial and institutional management training, (vi)

Bridging technical assistance

ADB provided funding under a bridging TA, which supported the state government in capacity development and implementation of the investment program early on. Activities under the TA included (i) preparing infrastructure base maps for all investment program ULBs; (ii) undertaking necessary surveys, data collection, and studies to complete the detailed design of identified subprojects in the three sample ULBs; (iii) creating detailed design of the subprojects in the sample ULBs; (iv) assisting in preparation of bid documents for identified subprojects; and (v) supporting the executing agency in updating the resettlement plans and environmental assessment documents for the sample subprojects. The bridging TA also encouraged the executing agency to use the CDM for solid waste management subprojects.

A 20 MLD waste stabilization pond type STP created in Alwar, one of the first project cities. Proper wastewater management is expected to gain momentum through creation of such assets. This is expected to reduce direct discharge of wastewater into water bodies, thereby, reducing their contamination.

Mounted refuse compactors provided under RUSDIP for handling and transfer of solid waste in Jaisalmer. ULBs in the project cities are being provided many such resources to improve collection, handling and disposal of municipal solid waste. Proper solid waste management will result in improved environmental and living conditions in these areas.

The Itarana railway over-bridge (ROB) created under RUSDIP, in Alwar, overrides a railway crossing, thereby eliminating man-hours lost to stoppages. Creation of transport infrastructure coupled with traffic management planning is expected to improve traffic flows, reduce travel time, and improve connectivity in all program ULBs.

introduction of double-entry accounting system, (vii) computerization of financial management systems, and (viii) improvement of asset management systems. Capacity development and institutional strengthening measures undertaken under the program are expected to enable ULB staff to manage urban assets and provide urban services in accordance with the 74th Constitutional Amendment Act.

KEY DEVELOPMENTAL OUTCOMES

Improved access to basic urban services. The investment program aims to provide 1.4 million people with piped water supply of 135 litres per capita per day (lpcd). About 124% piped water supply coverage, against a lesser target of 90%, has been achieved resulting in improved quality and per capita supply of water. On the other hand, introduction of meters is expected to encourage responsible use of water at the consumer end and monitoring of UFW at the supply end. About 1.6 million people in the ULBs will likely gain access to total and appropriate sanitation facilities, thereby reducing sanitation-related diseases. Proper wastewater management measures should result in less wastewater being directly discharged to water bodies reducing their contamination. All program ULBs will also gain access to resources for collection, management and appropriate disposal of municipal waste. The program will improve living conditions for the urban poor through development of proper drainage and road access in slum areas. A total of 0.21 million poor people living in notified slum areas across the 15 ULBs are expected to benefit under the program.

Improved connectivity. Creation and rehabilitation of transport infrastructure coupled with the traffic management plan is expected to improve traffic flow, reduce travel time, and improve connectivity in all program ULBs. Improvements in drainage through creation of outfalls and roadside drains will reduce risks of flooding and prevent spread of water-borne diseases.

Increased tourism. The program has supported infrastructure development for identified heritage monuments that have the potential to attract tourists. This should help increase the inflow of tourists to program ULBs in the long run.

INNOVATIONS AND GOOD PRACTICES

Several projects under RUSDIP have the potential to become eligible for CDM registration under the United Nations Framework Convention on Climate Change (UNFCCC). These include (i) installation of composting plants to treat organic municipal solid waste, (ii) treatment of municipal sewage in sewage treatment plants instead of direct discharge to open drains or water bodies, and (iii) replacement of low efficiency water pumps or other equipment by higher energy efficiency equipment. RUSDIP has been developing a CDM Program of Activities called "Rajasthan Urban Solid Waste Composting Program" to help ULBs register their SWM projects under UNFCCC. This will earn them CDM revenue through sale of Carbon Emission Reductions, which will directly accrue to them during the O&M periods, reducing the financial burden for operating such projects.

KEY LEARNINGS

RUSDIP has incorporated various lessons learnt from RUIDP I and other urban sector projects undertaken in India, particularly in Rajasthan. These have helped improve the program's relevance to the state's development agenda, and have significant potential to improve the developmental impacts upon replication in similar cases. RUSDIP undertook a collaborative approach in program design and preparation through (i) designing the program in close coordination and dialogue with Government of Rajasthan and was based upon extensive consultations with

stakeholders; (ii) receiving assistance from the program ULBs, district collectorates, and the concerned state agencies for necessary support in collecting data and program preparation; and (iii) designing the tranches under the program with ULBs priorities in mind. This collaborative approach shortened the preparation period of the investment program by half and increased the relevance and alignment of the program components with the objectives, priorities and absorption capacities of the program ULBs. RUSDIP is designed to deal with areas of institutional and financial reform. This will help enhance capacities of the 15 ULBs to undertake planning, implementation and management of urban projects, thereby enabling sustained developmental outcomes, beyond the program life.

RUIDP - the previous project

Rajasthan Urban Infrastructure Development Project (RUIDP) was undertaken by ADB in the year 1998. Preceding RUSDIP, RUIDP aimed to improve living conditions and investment climates in the six largest cities of Rajasthan - Ajmer, Bikaner, Jaipur, Jodhpur, Kota, and Udaipur. It included six components: (i) community awareness and participation programs aimed at encouraging participation in delivery of urban services; (ii) water supply rehabilitation and expansion to reduce exposure to pathogens, expand supply to new areas, and to provide systems with full metering, computerized billing and financial management systems; (iii) improvements in wastewater management, solid waste management, drainage, living conditions in slums, fire services, and hospitals; (iv) upgradation of roads and bridges; (v) assistance and capacity building for effective project implementation; and (vi) phase 1 of the Bisalpur water supply system including a 400 MLD water treatment plant. The project resulted in improved water supply, waste water management, drainage, urban transport, slum environments, hospitals, and institutional capacity of the executing agency for project implementation. It also led to economic impacts like rise of property values in project areas due to improved living conditions and increased access to outlying areas due to construction of flyovers. Overall, the project was rated successful on completion.

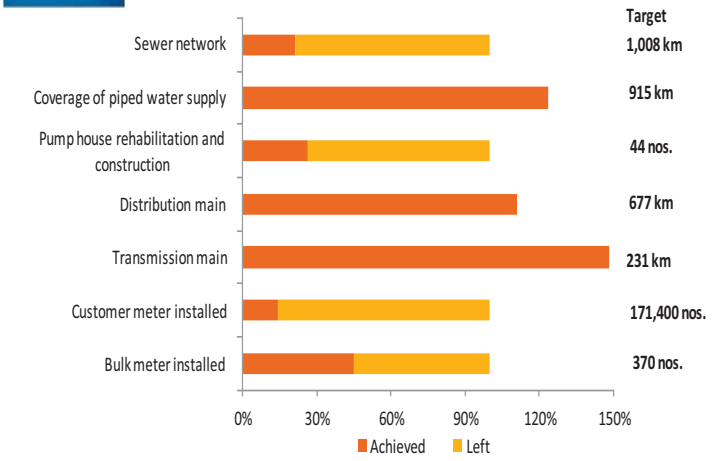
PROJECT SUMMARY

RATIONALE

- High population growth in urban areas in Rajasthan led to increased pressure on urban services.
- 80% of state population had access to piped water but received less than 80 litres per capita per day (lpcd).
- 24% of urban households had no access to in-house sanitation.
- Less than 50% of solid waste was collected and house-to-house services was provided to 35% of households.
- RUIDP was undertaken in 6 cities in 1998.
- Capitalizing on the success of RUIDP, similar initiatives were extended to 15 additional cities.
- ADB undertook RUSDIP in 2007 to support Government of Rajasthan in its initiatives.

DELIVERABLES

Improved urban infrastructure



- Preparation of:
  - Drainage master plan for all program ULBs √
  - Traffic management plans √
  - Heritage conservation plans √
- Provision of emergency services like fire fighting

Institutional development

Financial and institutional management

Water tariff collection efficiency of 85%

ULBs

Introduction of Infrastructure Development Tax

Establishment of databases and GIS for planning, designing and monitoring

ACHIEVEMENTS

- The program is providing 1.4 million people with piped water supply.
- 1.6 million people in the ULBs are expected to gain access to total and appropriate sanitation facilities.
- 0.21 million poor people living in notified slum areas are expected to benefit under the program.
- Improvement in drainage will reduce risk of flooding.

CASE STUDY

Kolkata Environmental Improvement Project

"The project has really benefited us. We have been relocated from slums along the canal banks into modern houses. My children now are able to attend school regularly and do not suffer from frequent ailments."
--- Sita, a canal bank dweller who is now residing in a formal establishment.

Pre-project slum area. KEIP has improved provision of basic urban services for 100 slums in the city.

LOAN DETAILS

EXECUTING AGENCIES

Kolkata Municipal Corporation;
Irrigation and Waterways Department

MILESTONES

- **Dec 2000 - $250 mn regular loan approved**
- **Dec 2006 - $80 mn supplementary loan approved**
- **Jan 2013 - $227.7 mn disbursed**
- **June 2013 - Closing**

Rapid urbanization of Kolkata, one of India's most populous cities, has placed a considerable burden on the urban infrastructure of the city. In the pre-project period, sanitation facilities, sewerage and drainage systems areas were under-developed, and overcrowding in the traditional working-class settlements posed serious pollution problems. While more than 85% of Kolkata Municipal Corporation's (KMC's) population had access to piped water, only 50% had a sewer connection. In the outskirts of the city, this percentage dropped to 17%. Coverage of solid waste collection was 70-90% of urban population for inner core areas, whereas it was much lower in the outer areas. Registered *bustees* (slum or low income communities) represented almost 30% of the population, with unregistered *bustees* and illegal squatters accounting for approximately an additional 9%. Threat to public health with respect to spread of communicable diseases was a major concern in these areas.

In the 1990s, faced with severe environmental degradation and growing urban poverty, Government of West Bengal prepared two long-term plan documents–the Basic Development Plan and the Master Plan–for Water Supply, Sewerage, and Drainage, Kolkata Metropolitan District (1996-2001). These plans have been progressively implemented, addressing institutional and planning aspects of development as well as physical investment requirements. Kolkata has also benefitted from India's Megacity Scheme, which promotes establishment of

revolving funds for sustained investment in urban infrastructure; and the *Bustee* Improvement Program which focused on sanitation. The ADB-supported Kolkata Environmental Improvement Project (KEIP) was based on the foundations laid down by these plans and schemes. It consisted of a regular loan of $250 million approved in 2000 and a supplementary loan of $80 million approved in 2006. Key outputs of the project are:

- **Extended sewerage and drainage infrastructure.** As of December 2012, 365 km (out of a target of 378 km) of combined sewerage and drainage networks were laid, 210 km of existing sewers and drains were de-silted and renovated, 16 new pumping stations were set up, and 22 old pumping stations were rehabilitated under KEIP. In addition, three sewage treatment plants (STPs) were fully augmented and rehabilitated, 14 small water bodies were rehabilitated, and 65% out of a target of 70,000 households were connected to sewage facilities.
- **Improved drainage canals and resettlement of informal canal bank dwellers.** As a part of providing integrated drainage solutions, KEIP has improved the hydraulic capacity of the outfall drainage canals through de-siltation, renovation, and lining of canal banks. As of December 2012, 123 km of drainage canals were de-silted; 7.5 km of drainage canals were lined and 51 canal bridges were constructed. This required resettlement and rehabilitation of 3,365 families of canal bank dwellers under ADB's Involuntary Resettlement Policy and Resettlement Plan, which was prepared for the project. Out of these, 2,880 families were resettled as of December 2012.
- **Improved solid waste management (SWM) facilities.** The project has helped KMC to improve collection and disposal of solid waste by providing 62 dumper placer vehicles, 310 containers, five wheel type loaders, four bull-dozers, and three large mechanical sweepers.
- **Improved urban infrastructure for slum dwellers.** The project has improved basic urban services for 100 slums in the city. It has set up a number of water stand posts, upgraded 700 community latrines, constructed 280 bathing platforms and widened 28 km length of drains for the benefit of poor living in the slums.
- **Strengthened institutional capacity of KMC.** The project has strengthened institutional capacity of KMC through regular training, use of computerized applications, and improvement in business processes. During the project, KMC has made substantial progress in e-governance initiatives. These include: (i) computerization of all revenue-earning departments of KMC; (ii) issuance of birth certificates from any borough (administrative blocks of KMC area) in Kolkata; (iii) payment of property tax and utility bills via e-centers, borough offices, and treasury offices; (iv) scrutiny and sanctioning of building plans through computerized applications; and (v) establishment of a fully operational grievance redressal mechanism. A policy and institutional framework has been established to sustain investments in sewerage and drainage, SWM, slum improvements, and canal rehabilitation.

  The accounts of KMC had been not been reviewed for a long period (1992 to 2001). This project has helped prepare the accounts in the recent past and has introduced the practice of regular accounting and auditing. Use of electronics measurement books by KMC has ensured release of timely payments to contractors, improved confidence of bidders in KMC, lowered tender premiums and increased bid competition. It has also reduced the average time lag for processing claims of contractors.

  CRISIL, a credit rating agency, has acclaimed the overall financial health improvement of KMC by rating it "CCR A+" in 2008 and has reaffirmed this

Gender empowerment

KEIP provided microcredit and marketing support to women. This facilitated the formation of 230 self help groups (SHGs) with a membership of 2,500 women. Group loans of $2,272 were granted to selected SHGs out of the 230 SHGs. Women were trained in trades like embroidery-making and as beauticians and are now adding substantially to their family incomes. KEIP shared knowledge of government-financed poverty reduction schemes with women so that that they were fully informed of their entitlements and gained easier access to basic public services. ADB has ensured that gender concerns are suitably incorporated into the resettlement component of KEIP. Of the households resettled, 11% were headed by women and had a monthly income less than $52. About 300 individuals from resettled communities, half being women, have been trained on alternative livelihoods options.

Slum resettlement

The project involves resettlement of canal bank dwellers and residents of land acquired for other components of the project. The resettlement component has been successfully dovetailed with Government of India's housing scheme for the urban poor (Basic Urban Services for the Poor). The slum resettlements have also been provided with greater access to basic facilities such as water supply and sanitation, thus improving their standard of living. The project is expected to benefit up to 5 million people, half of who reside in slum resettlements.

Resettlement complex at Nonadanga. KEIP has resettled canal bank dwellers to formal establishments.

Construction of a 200 meter long DIA segmental tunnel boring at Jessore Road

Laying of a 1600 m DIA pipe near Bama Charan at Raja Ram Mohan Roy road

rating in 2010. KMC has also received an ISO certification for its store management system and improved planning and management practices.

KEY DEVELOPMENTAL OUTCOMES

Improved sanitation facilities and slum conditions. It is estimated, as of December 2012, that improved sewerage and drainage facilities constructed under KEIP have benefitted close to 1.2 million people and improved SWM facilities have benefitted 5 million people. KEIP has followed a consultative approach to facilitate the slum improvement process. Using community networks, slum dwellers have been encouraged to get involved in project design, implementation, O&M and monitoring. The project has benefitted around 0.3 million slum dwellers by improving their living environment and overall hygiene conditions.

Improved urban living conditions for poor. Under KEIP, the project resettlement component has been successfully dovetailed with Government of India's housing scheme for urban poor (Basic Services to the Urban Poor). All the 2,880 families residing on canal banks have been provided with 1-bedroom apartments. This has substantially improved their living conditions. Each apartment is in the name of the head woman of the household, and conditions of allotment prevent its resale. Many families, who previously had no individual identity, have now become part of the formal system. With ownership of apartments has come financial flexibility–they are now able to access bank loans and provide formal education to their children. These families are also provided vocational training that help develop their skills, increase their livelihood opportunities and provide them with a stable source of income. Moreover, health and hygiene conditions have improved significantly. Consequently, children are able to attend school regularly since they do not suffer from frequent ailments.

INNOVATIONS AND GOOD PRACTICES

Construction of infrastructure in a congested urban environment, such as that prevalent in Kolkata, posed daunting challenges. Thus "trenchless technology" involving innovative micro-tunneling techniques was adopted to minimize disruption to everyday life that would have otherwise arisen due to narrow lanes, underground mesh of utility pipes, heavy rains and water logging. The micro-tunneling method required only localized shifting of electric cables at pit locations. Examples include laying down of sewer lines along the Cossipore Road where there are extensive underground electric cables restricting open cut excavation. In Biren Roy Road, use of micro-tunneling allowed light vehicular movement throughout the construction period with only localized blockades at pit locations. This activity was completed in eight months as against 18 months that would have been required under the open cut method.

KEY LEARNINGS

Executing agencies for urban development projects in India, including KEIP, have faced significant delays in the past, in undertaking activities during the project start-up period. In addition, unlike other experienced national agencies, states and ULBs usually do not have the provision of a dedicated project management unit (PMU) at the time of project appraisal that can undertake advance procurement activities. Thus, there was a need to set up a new PMU for each ADB-funded project and build their capacity from the scratch. However, in the case of KEIP, appointment of consultants for PMU was postponed due to delay in loan signing, and the first civil works contract was awarded two years after appointment of consultants, leading to a further lag in project implementation.

Realizing the time and cost overruns that occurred due to the start-up delays under

KEIP, Government of India and ADB undertook extensive discussion and review of urban development projects in India in 2003-04. These discussions led to the following agreements to avoid such delays in future urban sector projects - Government of India would set up dedicated PMUs at the time of project appraisal, while ADB would provide specialized support to the concerned executing agencies. This support would include assistance in (i) establishing project management and implementation units far ahead of loan effectiveness assessments; (ii) strengthening managerial and institutional capabilities of such units; (iii) developing tender documents, selecting consultants, and prequalifying contractors; (iv) familiarizing project staff with ADB policies and procedures; and (v) developing a strong sense of ownership among state and municipal governments and promote public participation. Since then, provision of advance support to the executing agencies has shown positive results and has now been adopted in all urban projects in India and other South Asian countries.

Micro-tunneling technique

Construction and rehabilitation of sewerage system in highly congested areas of the city is a problem due to narrow lanes, underground mesh of utility pipes and water logging. Micro-tunneling technique is thus, being used in such areas to overcome these problems. It has helped in hassle-free and faster completion of works.

Examples include laying down of sewer lines along the Cossipore Road where there are extensive underground electric cables restricting open cut excavation. In Biren Roy Road, use of micro-tunneling allowed light vehicular movement throughout the construction period with only localized blockades at pit locations. This activity was completed in 8 months as against 1.5 years that would have been required under the open cut method.

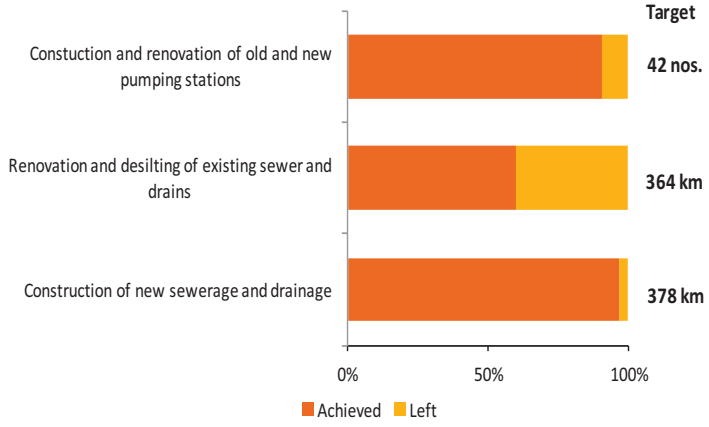
PROJECT SUMMARY

RATIONALE

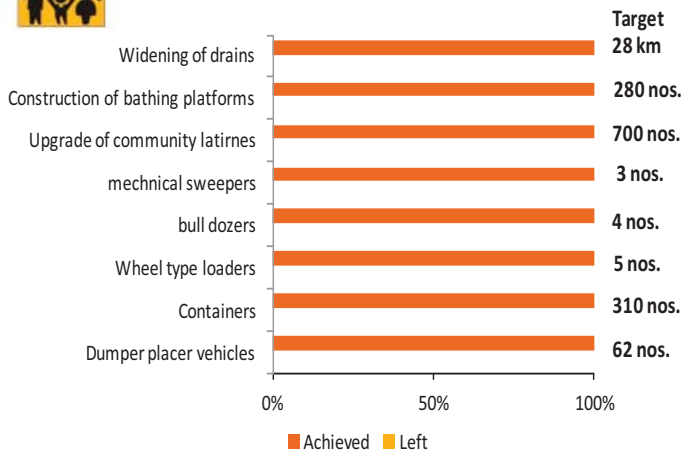
- Sewerage, sanitation and drainage systems in Kolkata were underdeveloped.
- Working class settlements were overcrowded causing pollution problems and it was difficult to provide urban services to Kolkata's population of 4.58 million prior to project inception in 2001.
- There were disparities in access to sewerage connections between inner and outer areas- 50% of the population in inner areas had access to sewerage connection while 17% had access to the same in outer areas.
- Extent of solid waste collection was only 70%-90% of urban population in inner areas and was much lower in outer areas.
- Government of West Bengal prepared the Basic Development Plan and the Master Plan for Water Supply, Sewerage, and Drainage.
- ADB undertook the Kolkata Environmental Improvement Project to support Government of West Bengal in implementing its plans for urban improvement.

DELIVERABLES

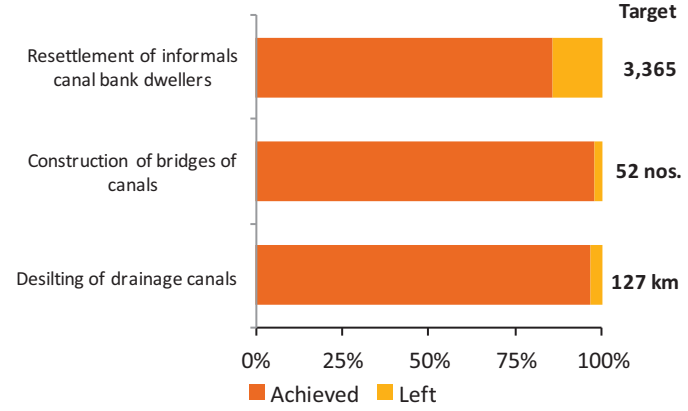
Improved sewerage and drainage infrastructure



Improved SWM and basic urban services



Improved drainage canals and resettlement of informal canal bank dwellers



Strengthened capacity of KMC

Computerized applications

Efficient collection of taxes and user charges

Staff Training

Preparation and audit of account statements

Policy and institutional framework for sustained investments in urban services

ACHIEVEMENTS

- 1.2 million people have benefitted from improved sewerage and drainage infrastructure.
- 5 million people have benefitted from improved SWM facilities.
- 0.3 million-slum dwellers have benefitted from improved basic urban services.

CASE STUDY

Multi-sector Project for Infrastructure Rehabilitation in Jammu and Kashmir

"Water logging in the streets of Srinagar has considerably reduced post project construction. Reaching our destinations take less time now as a result of reduced road blockages."

---Mohammed Ibrahim, resident of Srinagar and beneficiary of improved hydraulic capacity of city drainage networks and constructed pumping stations.

A Storage facility with a capacity of 10 million gallons constructed

LOAN DETAILS

EXECUTING AGENCY

Economic Reconstruction Agency

MILESTONES

Dec 2004 - $250 mn approved

Jan 2013 - $230.1 mn disbursed

Sept 2013 - Closing

The economy of the area has historically lagged owing to relatively low levels of investment. Low investments, in turn, led to inadequate employment opportunities, low income levels and therefore, weak economic growth. Additionally, the area suffered from inadequate financial resources and weak institutional capacities, which adversely impacted the quality of public services offered, including roads, bridges and water supply and sanitation. Together, these resulted in the deterioration of socio-economic conditions of communities, particularly those living in key urban centers such as the cities of Jammu and Srinagar.

Tourism was the main business activity in the area but needed better infrastructure facilities to thrive. Other economic sectors consisted of horticulture, agribusiness and manufacturing which needed better access to markets and inputs. Giving due consideration to the strong tourism potential and favourable climatic conditions for successful horticultural and agricultural production, a path of rapid economic growth was charted. This included investment plans for repairing and upgrading existing infrastructure and public services such as roads, bridges, water supply and sanitation, solid waste management, power generation and supply, health and education.

The ADB supported Multi-sector Project for Infrastructure and Rehabilitation in Jammu and Kashmir, initiated in 2004, was designed to support the government in their economic development plan. The project involved upgrade of water supply

and drainage infrastructure in the two main cities of Jammu and Srinagar, and repair and restoration of damaged or poorly maintained roads and bridges in various districts. Capacity building and project management support was also provided to the Economic Reconstruction Agency (ERA), which functioned as the executing agency for the project, to ensure timely and efficient delivery of project interventions.

Key outputs of the project are:

- **Urban infrastructure development.** The project has addressed rehabilitation needs of the water and drainage system in the cities of Jammu and Srinagar.
  - **Water supply.** The project has constructed and/or rehabilitated 423 km of water supply network. It has helped augment water supply to 135,000 cubic metres/day by improving systems at source and by reducing system losses. In Srinagar, interventions included replacement of dilapidated water supply transmission lines, upgrading of old/damaged pumping machinery, and providing standby generators and power supply protection equipment. Work in Jammu included rehabilitation of damaged networks and facilities, pipes, pumps and standby generators, and development of a low cost sanitation system for selected migrant areas.

    Bulk flow meters have been installed at source and at distribution centers within project areas to check for water leakages. To ensure financial sustainability of the water supply system, water tariffs have been doubled compared to the rates in June 2005 with the project's support.
  - **Drainage.** Rehabilitation of 87 km of drains has been completed under the project. Work in Srinagar included extension of drainage systems in selected areas; rehabilitation of pump stations; unclogging of drains; and purchase of equipment/vehicles for garbage collection. In Jammu, restoration of drain linings; widening and re-grading of drains; and purchase of equipment and vehicles for garbage collection for drain cleaning were undertaken. The project has also reduced water logging in Jammu and Srinagar by improving the hydraulic capacity of the city drainage networks, constructing pumping stations and procuring preventive maintenance equipment.
- **Improved road networks.** A total of 524 km of roads have been rehabilitated and 14 bridges have been reconstructed in areas that required urgent roads rehabilitation in various districts. The project has funded procurement of equipment required for road maintenance management systems. Existing single lane carriageways have been widened, paved shoulders and roadside drains have been constructed, gravel roads have been upgraded to paved roads and adequate road safety measures have been provided.
- **Capacity building.** Adequate staff skills and capacity have been ensured in ERA and project implementation units (PIUs) established under the project. This project component had two main modules: (i) project management support and, (ii) design/supervision support.
  - **Project management support.** Operational support, including training, was provided for carrying out appraisal of subprojects; due diligence of all aspects of sub-projects; review and authorization of designs; review and endorsement of procurement decisions and overall monitoring including financial and non-financial audits. Master plans for cost recovery and sustainability of basic urban services namely water supply, sewerage and solid waste management were also prepared. The state public works department (PWD) was supported in setting up a road maintenance system and updating sector development plans.
  - **Design/supervision support.** PIUs have been provided operational

Key Initiatives

Initiatives for sustainability

- Comprehensive training program introduced on O&M for the line agencies.
- Operations manual has been prepared.

New technologies

- Computer simulation model has been used to design water supply systems. This has helped in optimizing cost.
- Use of trenchless technology for construction of drainage has reduced travel inconveniences for people and traffic diversions.
- Introduction of road asset management system and provision for dedicated fund for road maintenance.

Water conservation strategy

- The project has helped introduce metering for bulk water supply at source, distribution centers, and commercial establishments, as well as nominal user charges for potable water supply.

A drain under construction in Om Nagar area

support for preparation of subprojects including feasibility studies, environmental impact assessments and resettlement plans; preparation of preliminary and detailed designs; preparation of bidding documents and evaluation of bids; and construction supervision including checking of adherence to safeguard arrangements. Trainings have been held for (i) preparation of feasibility studies, preliminary and detailed designs; (ii) carrying out safeguards work including environmental assessments, poverty assessments, land acquisition and resettlement plans, indigenous people development plans, gender assessments, community participation in planning and implementation of works; (iii) procurement and bid evaluation; and (iv) best practices related to engineering design, quality assurance and O&M.

KEY DEVELOPMENTAL OUTCOMES

Improved living conditions. Living conditions of the urban population in Jammu and Srinagar have improved due to rehabilitation of key water and drainage infrastructure. As of December 2012, 1.45 million people in the two cities now have improved access to safe drinking water, while 346, 564 people have access to improved drainage systems. Increased access to clean drinking water has reduced instances of waterborne diseases, contributing to better health conditions in project communities. Improved basic urban infrastructure services provided under the project have helped these cities in meeting needs of their growing urban population.

Front View of Intake Boria

Improvements in storm water drainage systems under the project have benefitted flood affected households by eliminating expenses incurred for house repair work. Cost savings have also been achieved on account of flood mitigation measures, cleaning of drains and medical expenses for treatment of water borne diseases.

Improved rural connectivity and enhanced incomes. The project has led to improved rural connectivity by linking local communities with all-weather roads. The rural population now has increased access to essential socio-economic services such as basic medical care, education, administrative services and markets.

Majority of the households in the project influence area derive their livelihoods from agriculture and allied agricultural activities. Improved transport linkages have reduced dependence of farmers on local markets by providing them access to distant and larger markets where they can get higher prices for their produce. Farmers are investing more in high value perishable products as timely reach to markets is ensured by the improved road networks. These developments have contributed to an increase in their income levels.

A sizeable share of the project population derives its livelihood from wage labour (agricultural and non-agricultural). Improved connectivity has provided increased opportunities to access higher-paid, non-agricultural work, thereby improving their incomes and quality of life.

Work completed on the 37.7 km long Sidhra Surinsar Mansar road including reconstruction of 4 Bridges (double lane/ intermediate lane)

INNOVATIONS AND GOOD PRACTICES

The Multi-sector Project for Infrastructure Rehabilitation was the first ever standalone multilateral development project in the area. Through policy dialogues the ERA, a special purpose vehicle, was created in 2004 for implementing this project. In line with the establishment of ERA, ADB introduced a project support unit (PSU) consisting of long-term consultants to provide capacity building support and hands-on assistance to the ERA. The PSU also undertook identification of additional needs related to finances, systems and people, and tailored plans for addressing any weaknesses found.

KEY LEARNINGS

ADB's involvement in past urban, transport, and emergency projects have led to several learnings. These include: (i) setting up project management and implementation units before loan negotiations help remove or reduce implementation delays; (ii) encouraging advance actions to be taken towards engagement of project management consultants to improve efficiency of implementation; (iii) agreeing on counterpart funding requirements at all stages; (iv) using standard ADB documents for international and local competitive bidding improves efficiencies, (v) preparing and issuing an operational manual, stating roles and decision making and delegation powers of the various stakeholders involved in the project to enhance transparency and efficiency; and (vi) developing capacity at the project management units, to enable any advance actions on procurement, engagement of consultants and implementation. Through these initiatives, project implementation and efficiency is expected to improve resulting in greater achievement of project targets.

Economic Reconstruction Agency

ERA, a special purpose vehicle, was created by the government in 2004 to implement this project. The establishment of this nodal agency provides an opportunity to ring fence project implementation work while working on broader capacity, governance and policy needs. ERA will operate on both fronts, using this first project to develop its own in-house capabilities and will be responsible for preparing social analysis and resettlement plans for all subprojects, including sample subprojects (if required) as per this framework and submit to ADB for review and approval prior to contract award for each subproject. Establishment of this separate entity and work-specific trainings resulted in timely and efficient completion of works. ERA has gained in strength and experience over the years, and has become the nodal agency for executing all externally aided projects.

PROJECT SUMMARY

RATIONALE

- Low levels of investment and institutional capacity challenges adversely impacted the quality of public services offered.
- The ADB supported Multi-sector Project for Infrastructure and Rehabilitation in Jammu and Kashmir, initiated in 2004, was designed to support the government's economic development plan.

DELIVERABLES

Water supply

- 423 km of water supply network constructed and/or rehabilitated meeting its target
- Water supply augmentation increased to 135,000 cubic metres/day meeting its target

Drainage

- Rehabilitation of 87 km of drains out of a target of 97 km has been completed under the project

Improved road network

- 524 km of roads out of a target of 613 km have been rehabilitated
- 14 bridges out of a target of 24 bridges have been reconstructed in areas that required urgent roads rehabilitation in various districts

Capacity development

- Establishment of Economic Reconstruction Agency (ERA) √
- Establishment of Project Support Unit (PSUs) √

ACHIEVEMENTS

- Access to safe drinking water has improved for 1.45 million people in the two cities out of a target of 1.5 million.
- Access to drainage systems has improved for 346,564 people out of a target of 385,071 people.
- Instances of waterborne diseases has reduced
- Rural connectivity to essential socio-economic services such as basic medical care, education, administrative services and markets has improved.

CASE STUDY

Urban Water Supply and Environment Improvement in Madhya Pradesh

"We can finally take our vegetable carts inside Nayi Basti slum thanks to the concrete cement road. Before, the roads used to be very slushy and dirty, making it almost impossible for us to sell vegetables."

--- Shiv Lal, a local vegetable vendor

Women of Ambedkar Nagar slum now have improved access to water.

LOAN DETAILS

EXECUTING AGENCY

Urban Administration and Development Department, Government of Madhya Pradesh

MILESTONES

- **Dec 2003 - $181 mn regular loan approved**
- **Oct 2008 - $71 mn supplementary loan approved**
- **Jan 2013 - $186.1 mn disbursed**
- **Dec 2013 - Closing**

With the creation of Chhattisgarh in 2000, Madhya Pradesh lost 31% of its geographical area, 30% of its mineral rich land and 148 large and medium scale enterprises. Much of the urban area, however, remained within the state. Consequently, the role of the urban sector in the state economy increased in importance. This, in turn, made the provision of robust infrastructure and basic services in urban areas essential so as to improve their economic potential.

In 2003, the estimated state population below poverty line in urban areas and slum population amongst the poor was higher than the national average. Even the six largest cities of the state, i.e. Bhopal, Indore, Gwalior, Jabalpur, Ujjain and Ratlam, suffered from widespread deficiencies in basic urban services. On an average, 42.3% of households did not have access to in-house water supply while 15.1% were deprived of access to piped water; 18.8% of households did not have private toilets and members of one in eight households defecated outdoors; and 40% reported no solid waste collection. As a result, incidence of waterborne and bacterial diseases remained high, particularly among children.

In light of these statistics, ADB designed and implemented the Urban Water Supply and Environment Improvement Project (UWSEIP) in 2003. ADB has since been working with the urban administration and development department, Government of Madhya Pradesh, to strengthen urban infrastructure in four main

cities namely Bhopal, Gwalior, Indore and Jabalpur. The project comprises three parts. Part A focuses on urban water supply and environmental improvement covering expansion of infrastructure and services for (i) water supply; (ii) sewerage and sanitation; (iii) storm water drainage; and (iv) SWM. Part B looks at public participation and awareness program designed to strengthen capacities of project cities to plan and manage urban development through (i) two community-level funds for participatory planning by municipal authorities and poor communities with the objective of integrating slum improvements with citywide infrastructure, and (ii) Water for Asian Cities Program covering urban water conservation and demand management, to be supported through parallel co-financing by UN-HABITAT. Part C involves support to state project management and implementation units in activities related to implementation of the project.

In 2008, the project ran into cost overruns owing to appreciation of the rupee and escalation of construction material prices. ADB approved a supplementary loan to ensure that the project was completed in its original scope and smooth execution of project activities was not disrupted. Key outputs of the project are:

- **Improved water supply systems.** The project scope includes laying of 267 km of transmission mains, construction of three new and rehabilitation of 10 old water treatment plants (WTPs), laying of 2,447 km of distribution lines and creation of 50 overhead reservoirs, across the 4 cities. As on 31st December 2012, most components were nearing completion.
- **Improved sewerage and sanitation infrastructure.** The project is helping expand the sewerage network to underserved sections of cities and slums. Several community toilets have been constructed in slum areas and proper segregation of waste at source and disposal has been facilitated through community participation. The project has initiated development of 300 km of sewerage network, two sewerage treatment plants (STPs) and one pumping station, across the four cities. As on 31st December 2012, most work in Bhopal under this component had been completed while work was in progress in other cities.
- **Improved SWM.** The project is helping implementing agencies to expand coverage and increase efficiency of collection and disposal of solid waste. Each project city has been provided with equipment like community waste collection containers, compactor trucks, and dumper placer vehicles. Sanitary landfill sites have been constructed and provided with required equipment for safe handling and disposal of refuse. This component was nearing completion as of 31st December 2012.
- **Construction of storm water drainage.** 45 km of storm water drainage networks of Gwalior and Jabalpur are being upgraded on the basis of citywide drainage master plans and designs. Roadside drains have been improved to address problems of flooding and water logging during heavy rain. As of 31st December 2012, all contracts had been awarded and work was in progress.
- **Increased community participation and awareness program.** The project has a special component on community participation and awareness for urban services improvement. This includes preparation of Municipal Action Plan for Poverty (MAPP) Reduction framework to (i) integrate delivery of tertiary urban services for urban poor settlements into the citywide development plan, and (ii) build capacity within municipal corporations for participatory planning with community groups. The plan is being financed through two funds i.e. Area Improvement Fund ($3.28 million), and Community Initiatives Fund ($1.28 million). The project, in collaboration with UN-HABITAT, is also implementing capacity building programs, small-scale projects, studies related to water and sanitation management and various workshops of municipal

Gender empowerment

Sub-project UDAY, "Urban Development Around You", under UWSEIP, in collaboration with the Centre for Entrepreneurship Development in Madhya Pradesh (CEDMAP), has been promoting entrepreneurship, skill development and livelihood activities in the slum and poorer areas of the project cities. It has been providing vocational training to women in stitching, beauty courses and computer education. Women are given constant guidance and motivation to complete courses and are thereafter assisted in finding employment opportunities. Many of these young women, who were unable to complete their schooling owing to financial compulsions, are now benefitting from alternative economic opportunities. 93% of beneficiaries of skill/vocational training programs conducted were women.

During the appraisal stage, women cited toilets as the most important, and fetching and storing water for domestic use as their second most important area for improvement. Defecating outdoors for women was not only inconvenient but a cause for insecurity, especially in unlit and marginal communities. ADB, through this project, is constructing community toilets which are managed by women community groups. With respect to water supply, interventions under this project have improved its availability closer to their houses. This, in turn, has also saved time for women who can now participate in other economic and social activities including those under "UDAY".

Project UDAY, in collaboration with CEDMAP, supporting many vocational courses to train the women of slums in activities such as tailoring, beauticians, and computers.

Computer training courses being provided to women of slums under the Project UDAY.

Community toilet constructed in Ambedkar Nagar Slum in Bhopal under UWSEIP

corporation staff on metering, leak detection and repair, rationalization of tariffs, and accounting and billing reforms.

KEY DEVELOPMENTAL OUTCOMES

Improved access to water supply. The project has improved the frequency as well as accessibility of water supply to households in the four project cities. Water supply has improved to one hour per day from less than an hour on alternate days in the dry season and only a few hours a day during the wet season. As on 31st December, 2012, nearly 5.3 million people have benefited from improved water supply in four project cities. The project is expected to provide 24 hour access to treated water supply at 135 liters per capita per day to 5.6 million people (83% of the population in the project cities).

Improved financially sustainability of water utilities. The project has significantly contributed towards improving financial sustainability of water utilities through increased efficiency in water production, processing, distribution, and revenue collection. UWSEIP has helped water utilities in reducing wastage in water distribution and keeping non-revenue water (NRW) in check.

Improved community ownership. The project is promoting community ownership of various urban facilities developed under the project. Mid-term evaluation of the project has revealed that women members of the community groups clearly understand the importance and benefits of ensuring proper maintenance of infrastructure developed under the project. Communities are actively participating in supervision of works, investment prioritization, and usage of facilities, such as toilets, and collection of user charges.

Improved hygiene and living conditions. The project targets all areas that suffer from inefficient solid waste disposal, inundation, water-logging on streets, and outdoor defecation, all of which contribute to unhygienic living conditions. Under the project, access to sewerage network has been improved across cities, especially in slum areas. Improved efficiency in collection and disposal of solid waste has benefited approximately 4.7 million people. Better storm water drainage network has resulted in easier and hassle-free commutation for people, especially in the rainy season. The roads within slums which were usually slushy and dirty and with open drains, are now cleaner reducing the threat of diseases and enabling residents to commute with more ease.

INNOVATIONS AND GOOD PRACTICES

The project has, during the course of implementation, adopted unconventional measures and undertaken good practices. Some of these involved improving the capacity of ULBs to design and implement large urban projects; facilitating community development through MAPP reduction; empowering women through vocational training; and supporting the Water for Asian Cities program in collaboration with UN-HABITAT and Government of India. The project has also focused on creating sustainable solutions for several issues such as creation of a sustainable service delivery model by reducing NRW, introducing volumetric metering and tariff reforms.

KEY LEARNINGS

The project was the first large scale investment handled by Government of Madhya Pradesh and its municipal corporations. But since existing implementation procedures were not aligned to such a scale of project, its execution was traditionally marred by delayed decision making, variation in bid prices and cost estimate leading to rebidding. Collaborative efforts of ADB, executing agencies,

and project implementation units since 2005 have led to major reforms in business procedures and custom. These include (i) restructuring the organization structure for quicker decision making, (ii) organizing a series of workshops in project cities with contractors to avoid zero bidder scenario and promote competition, and (iii) introducing a system of reliable costing during detailed engineering design. These new business processes provided lessons for project implementation in other parts of India.

The project has significantly contributed towards sustainable urban service delivery through reduction in NRW and leakages. Construction of community toilets in slum areas and efficient collection and disposal of solid waste have contributed to improved hygiene. Initiatives for developing change ownership in beneficiary communities, like enhancing capacities of ULBs and government officials, as well as empowering individual beneficiaries is leading towards sustainable project benefits. Vocational training provided through the Community Initiatives Fund program has resulted in women empowerment, enabling them gain vocational skills to fulfill their aspirations.

Integrating communities through MAPP

Under UWSEIP, detailed citywide surveys of slums were undertaken to map their poverty and demographic profiles, identify main infrastructure deficiencies, prioritize interventions required for improving access to water and sanitation, and provide basic community infrastructure. This process of preparing MAPP reduction was carried out in collaboration with Municipal Corporations of Bhopal, Indore, Jabalpur and Gwalior, Water Aid and local counterpart NGOs. Finance from the Area Improvement Fund (AIF) was made available to the corporations within the framework of MAPP for implementing schemes for improved water supply, sanitation, drains, roads, and street lighting in slums and poor settlements. This has improved living conditions in many slums covered.

Community group committees (CGCs) have been formed in each of these slums, so that they can supervise the use and maintenance of facilities created and coordinate with project authorities regarding the relative prioritization and sequencing of different investments, so that views of the entire community can be heard. There is more than 50% women representation in these CGCs.

PROJECT SUMMARY

RATIONALE

- 42.3% of households in Madhya Pradesh did not have access to in-house water supplies.
- 40% households in the state reported no solid waste collection.
- Non-revenue water was more than 50% in the six largest cities of the state.
- Unhygienic streets were posing threat to public health and businesses.
- ADB approved UWSEIP in 2003 to strengthen urban infrastructure in 4 main cities of Madhya Pradesh– Bhopal, Gwalior, Indore and Jabalpur.

DELIVERABLES

Water supply system

Targets:

- Transmission mains – 267 km
- Overhead reservoirs – 50
- Water distribution lines – 2,447 km
- Rehab of old WTPS – 10

As of 31 Dec 2012, most components were nearing completion

Waste water management system

Targets:

- Upgrade of storm water drainage network– 45 km
- Sewerage pumping stations – 1
- STPS – 2
- Sewerage network – 300 km

Solid waste management

- Construction of sanitary landfill sites
- Equipments such as community waste collection containers, compactor trucks and dumper placer vehicles were provided.

Public participation and awareness

- Municipal Action Plan for 4 cities √
- Public awareness programs √
- Integrated upgrading of slum and poor settlements for better basic services √

ACHIEVEMENTS

- As of August 2012, 5.3 million people have improved access to water supply out of a target of 5.6 million people.
- Improved waste water management has benefited 0.5 million people out of a target of 1.6 million people.
- Improved solid waste management has benefitted 4.7 million people, meeting its target.
- Capacities of state agencies in implementing large scale projects is being improved through decentralized decision making authority for quick decision making and reliable costing during detailed engineering design.

PROJECT BRIEF

Jammu and Kashmir Urban Sector Development Investment Program

PROJECT OVERVIEW

A Claritube Settler Tank constructed under the project

The lack of well-developed urban infrastructure currently constrains growth in Jammu and Kashmir. Low investment in asset creation, inefficient operation and maintenance of urban infrastructure and lack of structured institutional systems limits urbanization. Promoting economic growth through better service delivery, improved public health services and environmental conditions by investing in urban infrastructure and improving the management capabilities of line agencies is required. The Jammu and Kashmir Urban Sector Development Investment Program will support the government in its efforts toward achieving balanced urban development by improving water supply and sanitation facilities in key urban areas, especially in the two principal commercial cities of Jammu and Srinagar.

LOAN DETAILS

EXECUTING AGENCY

Economic Reconstruction Agency (ERA)

MILESTONES

- **May 2007 - $300 mn approved for MFF**
- **June 2007 - $42.2 mn approved under Tranche 1**
- **Oct 2012 - $110 mn approved under Tranche 2**
- **Jan 2013 - $19.8 mn disbursed**
- **Mar 2017 - Closing**

OBJECTIVE

The primary objective of the program is to provide investment funds in a prioritized manner, building on the infrastructure rehabilitation being carried out under the ongoing Multisector Project for Infrastructure Rehabilitation in Jammu and Kashmir and allowing for improvements in urban governance and reforms. The program will expand and improve basic urban services such as water supply, sanitation, waste management, urban transport, and other municipal functions in Jammu, Srinagar, and other important towns and commercial centers.

OUTPUTS

Key outputs under the program are presented in the table below:

Construction of water supply infrastructure and tariff reforms	• 67 km of raw water pipeline in two principal cities is being constructed • 10 new storage reservoirs are being constructed • Tariffs will be designed to recover 30% of the O&M cost of water supply within 3 years of loan effectiveness
Construction of sewerage facilities	• 146 km of sewerage network to expand coverage are being constructed • 38 km of drains are being laid or rehabilitated. • Sewage treatment facilities of 30 MLD capacity will be developed

	• Sanitary landfills with 250MT capacity are being improved/constructed
Enhanced road capacity	• Roads are being widened and 3.8 km of four-lane flyover are being constructed • Car parking capacity will increase by 288 cars
Enhanced capacity building	• Staff will be trained to perform management and delivery services

OUTCOMES

Improved living environment

The program is providing approximately 2.2 million people with greater access to water supply in Srinagar. It is also providing 1 million people with enhanced municipal sewage systems and 2 million people with improved solid waste management facilities in Jammu. These measures are expected to raise the living environment for the 2.4 million people living in Srinagar, Jammu and other participating towns.

Improved capacities of line agencies

The enhanced capacity of line agencies will be demonstrated in the effective O&M performance of assets through cost reduction measures and more efficient project management.

WAY FORWARD

The program will focus on (i) urban infrastructure and services and (ii) capacity building, institutional development, governance and project management. Together these will address the deficiency in infrastructure and simultaneously improve sustainability of interventions. The program will not only provide growth opportunities for the area, but also support the government in its efforts towards bridging disparities in the level of urban infrastructure across cities.

INNOVATION IMPULSE

Systemic and transformational change

- The ecosystem of the area will be protected through construction of a modern landfill site in Srinagar, and development of alternative water sources for Srinagar. This will reduce the extraction of water from the environmentally sensitive Dal Lake.
- ADB is providing capacity-building support to the counterpart agencies to manage and implement physical works under the program more efficiently.
- Institutional reforms under the program are also supporting the achievement of key targets under JNNURM.

Financing and leveraging

- The program is promoting PPPs for improving service delivery through the use of management contracts for O&M of landfill sites and sewage treatment plants.

PROJECT BRIEF

Uttarakhand Urban Sector Development Investment Program

PROJECT OVERVIEW

Laying of concrete base for a clear water reservoir in Nainital

Government of Uttarakhand has identified investments in urban infrastructure as one of its priority areas of intervention to cater to the needs of a rapidly-growing urban population and to support growth of the state's key economic sectors of tourism and industry. These priorities are in line with JNNURM, an initiative by the central government that focuses on the urban agenda of the country. ADB is supporting the priorities and initiatives of the state and central governments through the Uttarakhand Urban Sector Development Investment Program that targets 31 urban centers as project areas and aims to develop key urban infrastructure and services in the state. It combines capital investments to the Uttarakhand's urban reform action plan to ensure sustainable outcomes. The investment program is the first ADB urban sector lending assistance in Uttarakhand.

LOAN DETAILS

EXECUTING AGENCY

Uttarakhand Development Department, Government of Uttarakhand

MILESTONES

- **Jan 2008 - $350 mn approved for MFF**
- **Feb 2008 - $60 mn approved under Tranche 1**
- **Nov 2011 - 100 mn approved under Tranche 2**
- **Jan 2013 - $26.3 mn disbursed**
- **Jul 2016 - Closing**

OBJECTIVE

The investment program is expected to increase access to improved quality of urban infrastructure and services for 3.8 million people living in the 31 towns targeted under the program by 2016. Two major areas of intervention under the program are: (i) rehabilitation, improvement, and expansion of urban infrastructure and services, and (ii) support for investment program management including a comprehensive plan for capacity development to assist in urban governance and finance, and to develop a service delivery improvement action plan.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved water supply	• 1,006 km long water pipelines are being installed • 160,000 house connections are being installed • Potable water production capacity is being augmented by 68 MLD and 13 new reservoirs are being constructed • 88 old water pumps and pumping stations are being replaced and rehabilitated. As of August 2012, 112 pumps had been procured and supplied. • 5 new pumping stations are also being constructed (37% progress as of August 2012)

Enhanced sewerage system	• 245 km long sewer pipes are being installed • 47,000 household connections are being increased • Sewerage treatment capacity is being increased by 96 MLD • Sewerage sub project in Dehradun and Rudrapur will be implemented
Strengthen ULBs	• 3 ULBs will recover their O&M costs • ULB staff will be trained via workshops and training programs • PPP packages for selected sub projects will be prepared and at least one PPP contract will be awarded • All JNNURM reforms will be implemented

OUTCOMES

Improved access to urban services

The program will rehabilitate, improve and expand water supply, sewerage and sanitation, and solid waste management facilities. About 3.2 million people will have access to treated water supply, 2.8 million people will have access to solid-waste management services with sanitary disposal and 2.3 million people will have access to sewerage and sanitation facilities as a result of the investment program.

Improved health and hygiene

Through improved access to urban services, particularly the management of solid waste and the discharge of waste water, health and hygiene in the project areas will significantly improve with the prevalence of water borne diseases reducing by approximately 20%.

Inclusive urban growth and gender mainstreaming

The investment program includes measures for inclusive urban development by (i) supporting the development of a state-wide slum strategy to integrate the urban poor into urban development, (ii) targeting interventions in the form of a slum upgrading component which will address the basic needs of urban poor communities, and (iii) addressing affordability constraints of the poor through measures such as lifeline tariffs and free service connections. Under the gender component of the project, a total of 155 women have benefited from employment opportunities.

Environment conservation

The investment program will significantly improve environment quality and living conditions in urban areas. This will be achieved through (i) reduced pollution of water resources from discharge of untreated sewage and indiscriminate solid waste disposal; and (ii) reduced exposure to suspended particulates and noise pollution.

WAY FORWARD

The program combines investments for construction of urban infrastructure and for management of urban services. Thus, the program will provide the opportunities to ULBs to hone their infrastructure management skills and improve financial sustainability. Efficient techniques such as the double entry accounting system and the encouragement of PPP in urban service delivery will catalyze this process and improve living conditions in project areas through infrastructure sustainability.

INNOVATION IMPULSE

Systemic and transformational change

- The program will assist integration of urban poor into development reforms through upgrade of slums, awareness campaigns, and livelihood programs. Further, under the program, the state government will be provided assistance in preparation of the state's Slum Improvement Policy and Solid Waste Management Policy.
- The program will also support recycling of plastic components of municipal solid waste in a few pilot towns.

Piloting new approaches

- The program aims to develop the town of Nainital with a 24x7 water supply system which, if successful, would be the first town in India to achieve this feat.

Financing and leveraging

- The program will strengthen private investment in urban development creating an enabling framework and building capacity for designing and managing private sector participation, and for developing PPP schemes.

PROJECT BRIEF

National Capital Region Urban Infrastructure Financing Facility

PROJECT OVERVIEW

Upgraded Badli bypass 1

The emergence of National Capital Region (NCR) as one of the fastest growing urban agglomerate regions in India has necessitated a paradigm shift in the way urban infrastructure is planned and executed. Upgrading the infrastructure in the NCR that comprises rural areas as well as other smaller towns requires a regional approach. Investments required for massive scaling up of urban infrastructure, as envisaged under the NCR Planning Board's (NCRPB) Regional Plan 2021, are difficult to mobilize given the domestic debt market limitations, poor project management capacities of stakeholders and weaknesses in project execution. The National Capital Region Urban Infrastructure Financing Facility has been designed to develop both regional and city-specific urban infrastructure based on priorities set by the Regional Plan 2021. In addition, the facility's implementation support will enable NCRPB and various sub-borrowers to enhance effective and sustainable urban infrastructure services in NCR.

LOAN DETAILS

EXECUTING AGENCY

National Capital Region Planning Board (NCRPB)

MILESTONES

- **Aug 2010 - $150 mn approved for MFF**
- **Aug 2010 - $78 mn approved under Tranche 1**
- **Jan 2013 - $18.1 mn disbursed**
- **Jun 2017 - Closing**

OBJECTIVE

The project aims to develop sustainable urban infrastructure with a regional approach and address the critical challenges of urbanization. It will strengthen the ability of sub borrowers to design and execute high-quality infrastructure and enable private sector participation in basic urban service provision. Introducing best practices in infrastructure planning, execution, and operations, and enabling connectivity and sector inclusiveness are also part of the project initiatives.

OUTPUTS

Key outputs under the project are presented in the table below:

Improved connectivity: development of the regional road network and urban intermodal transport facilities	• The road network in the state of Haryana will be improved, notably in Jhajjar and Sonepat districts where roads have already been rehabilitated, and in Badli where a by-pass road has been constructed • Multi-modal transit centers in Anand Vihar and Sarai Kale Khan will be developed • Investments by NCRPB in intercity regional roads will be increased by 5 percentage points

Improved public health and environmental urban infrastructure	• Water supply schemes will be implemented in various cities of the NCR, such as Nuh, Pataudi, and Panipat • Drainage scheme will be implemented in Sonepat • Investments for urban waste management and water supply in overall portfolio of NCRPB will be increased by 5 percentage points • NCRPB's concessional lending to public health and environmental urban infrastructure will be introduced
Strengthened capacity of NCRPB	• Executive effectiveness of NCPRB will be enhanced by arrangement of pooled municipal fund facility, strengthening of project management unit, capacity building of sub borrowers, and strengthening of risk, treasury and project management processes • Inclusive and balanced geographical and sector infrastructure will be developed by preparing at least five detailed project reports. Social and gender-relevant processes and practices will also be institutionalized through capacity development • Private sector participation in urban infrastructure development and urban basic services will be increased

OUTCOMES

Improved urban infrastructure

Urban infrastructure in the areas supported by the facility in NCR and counter magnet area is expected to improve. Intercity road movement in Haryana would increase by 10% and use of multimodal public transport in Delhi by 10% by 2016. Piped water supply in various cities in the NCR is expected to increase by 10%, thereby decreasing effort required for fetching water.

Improved health and hygiene

With improved access to urban infrastructure services, particularly improved sewerage systems and solid waste management systems, the prevalence of water borne diseases will decrease by 10% by 2019.

Effective gender mainstreaming

The gender action plan under the project encompasses targets such as incorporating women into project design and project implementation. At the same time, training for gender sensitization will occur for executing agencies' staff and contractors. Awareness campaigns for women will also be conducted on sexually transmitted diseases and best practices in sanitation and hygiene.

WAY FORWARD

This ADB project is expected to catalyze the transformation of the NCPRB into a strong entity capable of executing the regional infrastructure plan by developing new projects, attracting private sector participation, mobilizing additional finance and providing technical assistance support to sub-borrowers. The project will introduce a shift from the specific city-centric approach to a more regional approach to urban infrastructure development. It would pave the way for future projects that will strive to develop urban regions as sustainable economic engines.

INNOVATION IMPULSE

Systemic and transformational change

- Capacity of NCRPB and other participating sub-borrowers will be enhanced in order to scale up urban infrastructure and improve basic urban services. This includes strengthening financial management and procurement, project approval and management practices and IT based solutions. Technical support for mainstreaming social and gender related concerns and improving project readiness will also be provided.

Piloting new approaches

- This is an innovative "regional urban loan" which will support regional development. The project will establish the facility, which will develop region specific urban infrastructure in India's NCR based on the priorities set by the Regional Plan 2021.

Financing and leveraging

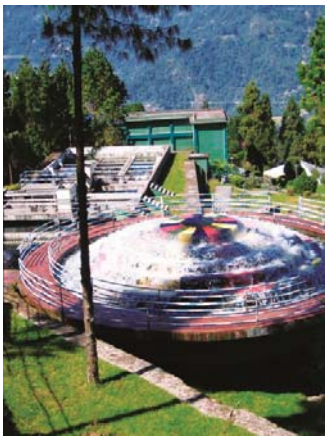
- The project will attract greater private sector participation in urban infrastructure development by supporting the structuring and execution of at least one urban infrastructure project within the PSP or PPP framework. The project will also support the establishment of a pooled municipal fund facility to leverage the implementing agency's financial resources.

PROJECT BRIEF

North Eastern Region Capital Cities Development Investment Program

PROJECT OVERVIEW

The capital cities of Agartala, Aizawl, Kohima, Sikkim and Shillong are expected to play an important strategic role in north east region's (NER) economy as business hubs and administrative centers. Investments in urban infrastructure and services will be the key developing and catalyzing growth in the region. ADB, guided by the policy framework of JNNURM, is providing assistance through the North Eastern Regional Capital Cities Development Investment Program (NERCCDIP). The program has been designed to improve the urban environment and promote reforms for sustainable and responsive urban service delivery in these capital cities.



A water treatment plant aerator constructed in Gangtok under the project

OBJECTIVE

NERCCDIP aims to improve the urban environment by creating better living conditions leading to better health and raising productivity of residents in the five capital cities by 2015. The program will (i) improve and expand urban infrastructure and services in the cities, with particular focus on slums and (ii) strengthen the urban institutional, management, and financing capacity of local institutions. Through these initiatives women and vulnerable group beneficiaries are being targeted.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved water supply	• 129,000 metered connections are being established for water supply provision in the 4 project areas • 137 km of primary and 356 km of secondary pipelines are being improved/replaced • NRW program is being implemented
Improved sewerage treatment, collection and management	• 24,792 household sewerage connections are being established and sewerage systems of primary mains and secondary collectors are being developed • 24 toilet blocks will be constructed

LOAN DETAILS

EXECUTING AGENCIES

MOUD[39]; Urban Development Department for Tripura and Nagaland, Mizoram; Urban Affairs Department for Meghalaya; Urban Development and Housing Department of Sikkim

MILESTONES

- **Jun 2009 - $200 mn approved for MFF**
- **July 2009 - $30 mn approved under Tranche 1**
- **Dec 2011 - $72 mn approved under Tranche 2**
- **Jan 2013 - $8.6 mn disbursed**
- **Jun 2016 - Closing**

[39]MOUD: Ministry of Urban Development, Government of India

Improved waste management	• House-to-house waste collection are being introduced to 23,000 households in all project areas • 50 tpd compost plants and sanitary landfill sites are being developed
Improved utility management	• Asset management systems will be improved and performance-based operational systems will be introduced for urban services
Enhanced institutional strengthening	• Double entry accounting systems will be installed and financial systems will be computerized • Property tax will be strengthened to yield at least 0.5% of property value and GIS will be installed and operationalized • Municipal staff will be trained in O&M services, financial management and regulation enforcement

OUTCOMES

Improved access to urban services

The program will result in sustainable and increased access to better urban services in the five program cities. About 1.2 million people are expected to receive improved water facilities, 0.3 million people would be provided with sewerage systems and 0.9 million people should have access to solid waste collection treatment facilities through the program.

Integrated and inclusive city development

NERCCDIP has been based on city growth strategies and infrastructure master plans. NERCCDIP follows the principle of integrated provision of infrastructure and services to harness synergies and realize the full potential from individual sector improvements. The strategy, thus, has potential to develop the region into an integrated and sustainable growth engine.

Improved health and hygiene

The program will contribute to Millennium Development Goal 7 of halving the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015. Free water connections and lifeline tariffs under the program is expected to result in better access to drinking water. Improved access to urban services should lead to public health improvements with reduced prevalence of water-borne diseases and significant reduction in treatment costs and productivity losses.

Effective gender mainstreaming

A gender action plan has been developed under the program that incorporates a gender responsive participation framework. Gender sensitization seminars will be conducted to improve and sustain women's involvement in the implementation of services. This would allow women to move away from traditional females roles and contribute to infrastructure implementation thus, empowering them.

WAY FORWARD

The program is the first large scale and complex urban project being implemented by the 5 project states and their ULBs. Developing capacity of ULBs to operate and maintain project facilities during implementation is crucial for successfully achieving and sustaining the objectives of this program. The program will also play a critical role in addressing inter-state disparities in the north eastern states and in India's regional cooperation with other countries.

INNOVATION IMPULSE

Systemic and transformational change

- This program will be assisting north eastern states in undertaking urban reforms, improving service delivery, and facilitating decentralization as per the JNNURM mandate.
- NERCCDIP will seek to identify opportunities for environmental improvement and climate change mitigation. It will, therefore, promote improvements in urban sanitation and a reduction in methane emissions by providing treatment systems for sewage and biodegradable waste.

Piloting new approaches

- The program is also the first externally funded urban development project covering multiple states of NER. Technical challenges posed in execution of such a program such as difficulty in upgrading urban infrastructure in cities with hilly and uneven terrain have encouraged the use of innovative technologies like use of low-noise pumps.

PROJECT BRIEF

Infrastructure Development Investment Program for Tourism

PROJECT OVERVIEW

Conservation of the Shimla Town Hall heritage building

The government, in 2002, adopted a new policy that recognized tourism as a sector with high growth potential and employment generation possibilities, particularly in less-developed areas. This has been further reiterated in the government's five year plan and ADB's Country Partnership Strategy. ADB strives to implement this policy through the Infrastructure Development Investment Program for Tourism. The program will support four participating states of Himachal Pradesh, Punjab, Tamil Nadu and Uttarakhand in developing their tourism sector while preserving their natural and cultural heritage. The tourism sector in India has been growing rapidly with an annual growth of 14.6% in foreign tourist arrivals and 13.1% in domestic tourist footfalls between 2002-08. The rapid expansion and upgrade of infrastructure and services to international standards will help increase the sector's attractiveness, efficiency, and competitiveness vis-à-vis other international destinations. Development in the sector will create opportunities for employment and contribute to growth in livelihood programs.

LOAN DETAILS

EXECUTING AGENCIES

Tourism Departments of Government of Himachal Pradesh, Government of Punjab, Government of Tamil Nadu, Government of Uttarakhand

MILESTONES

- **Sept 2010 - $250 mn approved for MFF**
- **Oct 2010 - $43.4 mn approved under Tranche 1**
- **Dec 2011 - $43.8 mn approved under Tranche 2**
- **Jan 2013 - $3.5 mn disbursed**
- **Jun 2020 - Closing**

OBJECTIVE

The program aims at tapping the tourism potential of four states to stimulate their rural non-agriculture sectors and generate economic and employment opportunities. The program will address some of the key challenges faced by the sector such as (i) inadequate operation and maintenance of tourism infrastructure; (ii) weak institutional capacities for heritage site management; (iii) absence of an enabling environment for attracting PPPs; and (iv) lack of institutional mechanism to engage local communities in tourism value chains.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved urban infrastructure	• Basic infrastructure and facilities in tourist clusters of the participating states such as water supply, sanitation, road transport, solid waste management, information signage and information centers are being improved
Improved connectivity to tourist places	• Signage and last-mile connectivity to tourist sites are being improved through upgrade of several short road stretches in each state - 60 km in Himachal Pradesh, 30 km in Punjab, 35 km in Tamil Nadu and 100 km in Uttarakhand

Enhanced quality of natural and cultural attractions	• Quality of attractions in the tourist clusters of participating states are being improved to ensure convenience and safety for visitors. The program will also assist states in preparing management plans for developing natural and cultural heritage sites and for prioritizing future investment decisions
Enhanced gender-led community participation	• Community-based societies are being established for management of natural and cultural heritage sites with a target of 30% women participation • Community-based tourism products including bed and breakfast facilities, homestay arrangements and traditional culture and crafts will be fostered
Capacity strengthening	• About 1,000 staff of state tourism offices and related organizations (tour operators and guides) will be trained in tourism planning, coordination, monitoring, and marketing • Around 500 individuals spread over 25 communities will be trained on heritage management and tourism related skills with a target of 30% of women participation

OUTCOMES

Increased tourism

The program includes various measures for improvement in tourist arrivals across the four states. This is expected to result in 40% increase in total domestic tourism and international tourists and 30% increase in average length of stay of tourists in the participating states.

Increased employment opportunities

With a more competitive tourism sector, local employment opportunities are likely to increase by 50% in each participating state. As a result of this, aggregate contribution to GDP of each participating state will also increase by approximately 30%.

Effective gender mainstreaming

In order to ensure gender equality in the project consultation process, a gender action plan will be developed. At least 30% participation by women in such consultative processes will be encouraged for selection of subprojects sites. This will allow women to have equal access to employment and training opportunities on core labour standards (including equal wages for work of equal value). Information, education, communication and awareness campaigns will also be carried out under the gender action plan to mitigate social and gender-related risks associated with infrastructure development.

WAY FORWARD

The investment program emphasizes on development of the tourism potential as a means to creating productive employment opportunities and generating domestic and foreign income. This will be achieved through focused development of the tourism sector in states endowed with a rich cultural and natural heritage. Establishment of world renowned heritage sites will allow for greater number of tourists and subsequently enable sustainable revenue generation for local communities. The program will also assist states in the transition from service providers to promoters and regulators of tourism development with increasingly more private sector participation in the industry.

INNOVATION IMPULSE

Systemic and transformational change

- Community participation and capacity building schemes will be implemented under the program. This will include promotion schemes for homestay programs and training for community-based tourism activities. Staff, private sector parties, and communities will also be exposed to international best practices during program implementation.
- Environmentally sustainable tourism will be promoted through improvement of on-site and off-site hygiene and sanitary conditions at tourist destinations, promotion of ecotourism and spreading environmental awareness.

Piloting new approaches

- This is ADB's first ever multi-state operation in the tourism sector in India. The project will develop community-based tourism products like bed and breakfast facilities and traditional culture and crafts. It will also train stakeholders in tourism related activities (ensuring 30% participation by women) to improve the tourism sector potential.

Financing and leveraging

- The program will support policy driven reforms to attract PSP, ensure financial sustainability of tourist places and encourage adaptive reuse of publicly owned heritage buildings.
- The program will strengthen PSP and small businesses in the sector by building community level units and PPPs (at least two per state).

PROJECT BRIEF

Assam Urban Infrastructure Investment Program

PROJECT OVERVIEW

Poor condition of drainage in Assam prior to project inception

Urban infrastructure development in Assam is of strategic significance particularly due to its proximity to other north eastern states and its relatively large population. With increasing urbanization, the state faces mounting pressures in urban service delivery. The Government of India has been providing significant assistance to north eastern states including Assam through various national schemes. ADB's country partnership strategy stresses on continuing assistance to urban development in Assam and thus the Assam Urban Infrastructure Investment project was introduced to improve urban services in the two cities of Guwahati and Dibrugarh. These cities are home to a population of nearly 445,000 and water demand is projected to increase to 88 million litres per day by 2025.

LOAN DETAILS

EXECUTING AGENCY

Guwahati Development Department

MILESTONES

- **Sep 2011 - $200 mn approved for MFF**
- **Nov 2011 - $81 mn approved under Tranche 1**
- **Jan 2013 - $0.50 mn disbursed**
- **Jun 2018- Closing**

OBJECTIVE

The primary objective of the program is to formulate and implement a roadmap that will help meet national and state-level targets for water supply, sewerage and SWM in Guwahati and Dibrugarh and for urban transport in Guwahati.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved water supply infrastructure in Guwahati	• Approximately 350,000 residents will be connected to metered water supply of which 20% will be from low income groups and 11% from female headed households
Increased sewerage treatment in Guwahati	• Sewerage treatment coverage will be increased from a negligible level to almost 95% of population in Southeast zone
Improved public transport system in Guwahati	• BRT service will be made available along 10.5 km in the city to support public transport

Improved SWM infrastructure in Dibrugarh	• In-house waste collection, segregation, recycling facilities as well as improved solid waste collection, transportation, treatment, and disposal facilities will be created
Improved drainage in Dibrugarh	• Accumulated silt and waste will be removed, drains enlarged, and road and flood relief culverts, bridges and sluice gates will be widened and reconstructed
Enhanced capacity building	• At least 250 ULB staff of the implementing agency will be trained in socially inclusive and gender responsive operation and maintenance services and financial management • Community awareness campaigns on gender and health issues will be organized in all project ULBs. (At least 50% of the facilitators and participants in sanitation campaigns will be women)

OUTCOMES

Improved access to urban infrastructure

As a result of the program interventions, more than 90% households will have access to water supply and 95% households will have service area coverage to the piped sewerage system in the south east zone of Guwahati. Access to SWM services in Dibrugarh will be improved covering 80% of the target population of which 12% will be low income households.

Reduced flooding

Flooding incidents are expected to reduce by 20% in the city due to the improvement of existing drains, removal of accumulated silt and waste, drain enlargement, widening and reconstruction of roads, and reconstruction of flood relief culverts, bridges and sluice gates.

Environmental sustainability

The program will (i) provide more and better drinking water in Guwahati; (ii) reduce contamination of soil and waterways emissions of harmful gases from improved solid waste management, and (iii) reduce waterborne diseases. The BRT, under the urban transport component, is also expected to encourage a progressive modal shift from private to public transport, thereby reducing GHG emissions and pollution levels in the city.

Gender mainstreaming

A gender action plan and a consultation and participation strategy were prepared to ensure widespread and meaningful participation by women. This will be implemented with the assistance of an NGO and regular monitoring and reporting of progress will be carried out. Through this, access to employment opportunities will be generated for approximately 2,000 women resulting in greater economic independence.

WAY FORWARD

The investment program will help the state achieve the Millennium Development Goals on environmental sustainability and increase access to safe drinking water and basic sanitation. Through improved sewerage systems, the risk of severe flooding and drainage pollution in the project areas will considerably reduce. This coupled with the state's strategic position will encourage greater business opportunities and enhance greater regional cooperation.

INNOVATION IMPULSE

Systemic and transformational change

- The project will strengthen project management and implementation skills through trainings of ULB staff in socially inclusive O&M services, financial management and gender responsiveness. A capacity building TA has also been approved for the program. Simultaneously, community awareness campaigns will be conducted on social, sanitation and gender issues.

Piloting new approaches

- A central knowledge center will be developed in the state, from which sector-related information and best practices in urban municipal services can be sourced and where training can be provided to ULB staff.

PROJECT BRIEF

Bihar Urban Development Investment Program

PROJECT OVERVIEW

Bihar, historically one of the low-income states in the country, has grown at a remarkable pace in the past couple of years. The state's gross domestic product depends largely on economic activities in its urban areas. Therefore, the provision of quality urban services is essential for sustained economic growth in the state. Bihar state government, with assistance from ADB formulated a roadmap for 2010-2021 through a project preparatory TA that determines short- and long-term goals to achieve national and state targets for water supply, sewerage and solid waste management services. The Bihar Urban Development Investment Program was undertaken in March 2012, to improve access to sustainable urban water supply and sewerage services, especially to vulnerable households in the major towns of Bihar.

Renovation of water head tank in Bhagalpur, Bihar

LOAN DETAILS

EXECUTING AGENCY

Urban Development and Housing Department, Government of Bihar

MILESTONES

- **Mar 2012 - $200 mn approved for MFF**
- **April 2012 - $65 mn approved under Tranche 1**
- **Jan 2013 - Nil disbursed**
- **Dec 2021 - Closing**

OBJECTIVE

This program aims to improve and expand water and sewerage infrastructure in four of the largest towns and economic centers in the state - Bhagalpur, Darbhanga, Gaya and Muzaffarpur. The project will also help the ULBs of these towns to ensure discipline and structured operations for sustainable maintenance of this infrastructure.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved water supply infrastructure in three towns	• New raw water intakes, clear water pumping mains, water treatment plants, overhead tanks, distribution networks, and water meters will be developed/procured for Bhagalpur, Darbhanga and Gaya • Continuous water pressure at consumer-end will be increased from zero to at least 8 meters in all areas by 2019
Improved sewerage infrastructure in one town	• New household connections, sewer networks, pumping stations, sewage treatment plants, and maintenance equipment will be procured and installed in Muzaffarpur
Project management	• Training of 4 PMU and 14 PIU staff (at least 30% of whom are women) will be conducted • Project information and audit report will be published regularly starting from the first year of operation

Improved O&M of assets created	• All major infrastructure by Design-Build-Operate contractors will be constructed and operationalized • Provision of additional O&M staff will be ensured • Five year on-the-job trainings and in-country technical courses on asset operation to ULB staff will be conducted
Improved management of urban service delivery	• Long-term business plans, user charge plans, and proposals for creating financial statements for water and sewerage operations will be prepared • 100 % metering of the connections linked to new water supply system with invoicing will be introduced for all the customers by 2021

OUTCOMES

Improved urban infrastructure and services

The program is expected to facilitate improved access to quality and sustainable urban water supply and sewerage services for the people of Bhagalpur, Darbhanga, Gaya, and Muzaffarpur. The improved infrastructure is expected to reduce NRW levels to 20%, improve continuity of water supply to 24 hours, water pressure to 8 meters, coverage of sewerage services to 70% of households, and quality of STP effluents to government standards.

Improved urban service management

The program will involve preparation of business and user charge plans and provision of trainings on O&M and management. These will help ULBs manage urban service delivery and maintain and operate related infrastructure more efficiently.

Social outcomes

The program targets Millennium Development Goals 7 by improving the access of poor and non-poor households (especially slum dwellers) to water supply and sanitation services. This will lead to a decrease in incidence of water- and vector-borne diseases and will have a positive impact on public health, among other outcomes of the program. An equally significant outcome will be the reduction of time spent by women in procuring water, disposing waste, and caring for the sick, thus, providing women with the opportunity to engage in other productive activities.

Effective gender mainstreaming

The gender action plan outlines activities that will bring about equitable access to water supply and sewerage services, particularly to vulnerable households headed by women. This will be carried out through a concessionary arrangement for user charges and increased women participation in project offices (30% of PMU and PIU positions will be occupied by women), and among contractors and operators.

WAY FORWARD

The investment program will support ongoing and future national and state poverty reduction programs in Bihar by improving the access of poor and non-poor households to water supply and sanitation services. Provision of key urban services through the program will enhance the potential of participating towns to develop as engines of economic growth in Bihar. An improved urban system would also provide support for implementation of future investment programs in the state.

INNOVATION IMPULSE

Systemic and transformational change

- The capacity of ULB staff for carrying out O&M of assets created, management of urban service delivery and project management and implementation, will be developed through on-the-job training, technical courses and day-to-day collaboration.
- ADB will help the state government design an administrative body for recommending user charges through the investment program management consultants, thus separating user charge setting from the political influences. Conditional disbursement of tranche 4, based on the action by ULBs on user charges and accounting, coupled with awareness-raising programs for decision makers and beneficiaries, will provide adequate incentive to ULBs to undertake necessary reforms.

PROJECT BRIEF

Kerala Sustainable Urban Development Project

PROJECT OVERVIEW

Upgraded urban roads under the project

Kerala's prospects for economic development are constrained by deficiencies in its existing urban infrastructure and its management, which have not kept pace with increasing urbanization. The Government of Kerala's decentralization policy delegated most urban functions and responsibilities to ULBs. In order to improve the capacity of ULBs, the Kerala Sustainable Urban Development Project was designed to upgrade basic urban infrastructure as well as help strengthen municipal governance to improve delivery of urban services in the state. It is expected to result in a better environment, a stronger economy, and improved living conditions for 2.6 million people living in the project cities and ULBs.

LOAN DETAILS

EXECUTING AGENCY

Local Self Government Department (LSGD), Government of Kerala

MILESTONES

Dec 2005 -
$ 221.2 mn approved

Jan 2013 -
$72.4 mn disbursed

Jun 2014- Closing

OBJECTIVE

The project is expected to help improve, upgrade and expand urban infrastructure and environmental services in five municipal corporations of Kochi, Kollam, Kozhikode, Thiruvananthapuram and Thrissur, and 53 urban municipalities of Kerala. It would also help build capacity of the state's municipal agencies in the areas of urban management and service provision.

OUTPUTS

Key outputs under the project are presented in the table below:

Enhanced water supply	• 60 km of water transmission mains are being constructed and 255 km of existing distribution network will be upgraded
Improved sewage and sanitation	• 30 pumping stations and 550 km of sewer lines are being rehabilitated or installed. • 196 MLD sewage treatment plant is being constructed. 80% progress had occurred as on August 2012. • New composting plants and drains are being constructed or improved
Improved drainage and solid waste management	• 125 km of local drainage is being constructed • Three landfill sanitary locations and a compost plant of 105MT/day capacity are being developed and equipment worth around $6.6 mn for primary collection and transportation of waste will be procured

Improved roads and flyovers	• 40 km urban roads and flyover works including street lighting for 100 km of roads have been upgraded • Works including street lighting, safety measures like construction of foot paths, traffic islands and signals have been improved for over 100 km of roads
Institutional building	• O&M is being conducted at a higher frequency with 5% increase in budget allocation • Cost recovery rate will be increased to nearly 100% of O&M cost

OUTCOMES

Improved urban infrastructure and services

The project will improve access to basic infrastructure services by the urban population in the project areas. Approximately 1.3 million people will have continued access to piped water supply, 1.9 million people will have access to sanitation facilities, 1.7 million people will receive adequate solid waste collection and disposal services and 1.2 million people will have access to better road facilities.

Upgraded urban community

The project is supporting community development activities and improving basic community infrastructure, especially for low income group colonies. Funds are also being provided to finance livelihood interventions for income generation. These measures should help improve the economic and living conditions of the 2.46 million people living in these five municipal corporations of Kerala.

Effective gender mainstreaming

83 workshops and sanitation awareness campaigns were organized in five project cities with 7,113 participants, of which 71% were women. Simultaneously, in order to develop participatory plans for poverty reduction for each city, 57 workshops were organized. Out of a total of 4195 participants, 75% were women.

WAY FORWARD

The project will catalyze economic development in the state with increased availability of efficient urban infrastructure and services. The institutional strengthening component will improve the level of skills for ULB personnel and allow for greater efficiency in functioning of municipalities and management of services. With most urban functions and responsibilities being delegated to local governments based on state's decentralization policy, sound planning, efficient implementation, resource mobilization and effective O&M is required for ensuring sustainability in the long run.

INNOVATION IMPULSE

Systemic and transformational change

- The project will result in improved capacity of ULBs in Kerala to undertake urban planning, create an asset inventory, improve financial management, mobilize new revenue sources, and explore PSP.

PROJECT BRIEF

North Karnataka Urban Sector Investment Program

PROJECT OVERVIEW

Construction of Davanagere water pipeline in progress

Rapid urbanization and inadequate investment in water and sanitation infrastructure have resulted in environmental and health problems in several urban areas in Karnataka, especially in the northern region of the state. Water supply in most areas of the state is irregular with only 67% service coverage and an inadequate storm-water drainage and sewerage systems. Roads are generally unpaved and slums exist in most of the ULBs. A high power committee (HPC) was appointed by the state government to study regional imbalances within the state and provide solutions to address the issue. In line with the HPC report's recommendation, ADB approved the North Karnataka Urban Sector Investment Program in 2006. The program is assisting 25 ULBs located in the northern part of the state in the delivery of basic urban infrastructure and services. The program is expected to improve access to urban services for 4.3 million people living in the identified ULBs.

LOAN DETAILS

EXECUTING AGENCY

Karnataka Urban Infrastructure Development and Finance Corporation

MILESTONES

- **Dec 2006 - $ 270 mn approved**
- **Jan 2007 - $33 mn approved under Tranche 1**
- **June 2010 - $123 mn approved under Tranche 2**
- **Aug 2012 - $60 mn approved under Tranche 3**
- **Jan 2013 - $48.6 mn disbursed**
- **Jun 2016- Closing**

OBJECTIVE

The program aims to improve and sustain infrastructure services related to water supply and sanitation, slum improvement and urban transport within the 25 cities. It is also intended to develop other non-municipal infrastructure related to tourism and emergency services, and undertake capacity building and institutional strengthening activities for the investment program ULBs.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved water supply infrastructure	• Existing systems of water supply, distribution networks, transmission mains and treatment plants are being rehabilitated • Around 70,000 household connections are being installed • 137 MLD water production capacity will be added, 863 km of new pipeline will be laid and 236 km of existing pipeline will be rehabilitated
Improved sewerage and sanitation infrastructure	• Sewage connection chambers for around 140,000 households installed • 325 km of sewer networks rehabilitated • 1,550 km of sewer and 12 km of drains constructed • 253 MLD capacity of wastewater treatment added or rehabilitated.

Improved slum settlements	• Basic water supply and sanitation services to over 8,000 households in slums spread across investment program ULBs provided • Community development programs covering over 1,000 households organized
Improved non municipal infrastructure development	• Infrastructure for fire fighting, tourism related civil works, lake rehabilitation, and district information centers in select ULBs will be developed
Enhanced urban transport infrastructure development	• Selected roads resurfaced • Road junction alignments and markings to agreed standards improved • Road safety and traffic management measures strengthened
Enhanced institutional development	• Performance-based management contracts for implementation of subprojects will be used • Support to computerization, property tax assessment, utility line mapping using GIS, and volumetric water and sewerage tariff introduced • Transition of ULB accounting functions to fund-based accounting system carried out

OUTCOMES

Improved access to urban services

People in the project areas will receive 90 liters per capita per day of potable water and improved access to sanitation facilities. Reduction of wastewater discharge to open drains will control spread of communicable diseases. Almost 60,000 households are expected to benefit from improved roads and traffic flow.

Enhanced institutional capacity

Upon completion of the program, ULBs will be able to implement, operate and maintain urban services more efficiently, equitably and on a sustainable basis. Implementation of financial management practices based on cost-recovery principles will help improve financial health of institutions.

Effective gender mainstreaming

The gender strategy under the program focuses on increased participation of women in decision making for program design, implementation, and monitoring. The program is expected to result in benefits for women that include reduced burden in collecting water, health benefits, and employment opportunities. Monitoring and evaluation systems will generate gender-disaggregated information to enable tracking of the program's gender impacts.

WAY FORWARD

The Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC) will establish a dedicated cell to examine the detailed O&M requirements, prepare an O&M manual and help ULBs to enhance their revenue base. These initiatives will significantly strengthen urban sector operations in the state. The program will address the critical issue of intrastate disparities and will bring the northern regions of Karnataka at par with the rest of the state.

INNOVATION IMPULSE

Systemic and transformational change

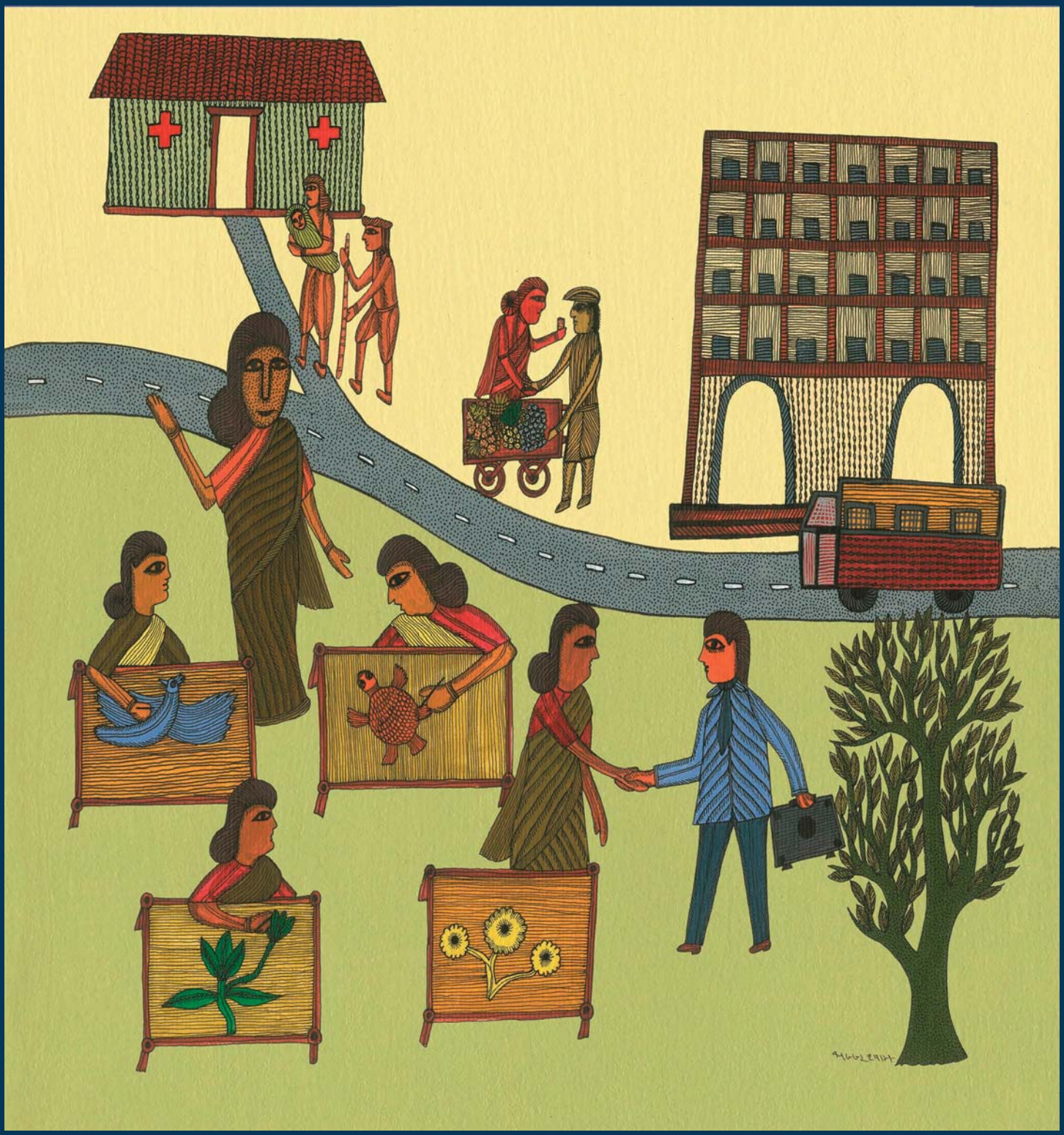
- The program is assisting ULBs in implementing volumetric water and sewerage tariffs by undertaking detailed analysis of operations and maintenance costs.
- Community development programs such as formation of self-help groups and health and sanitation awareness campaigns are being undertaken to ensure that the program benefits the vulnerable groups of the project areas.

Piloting new approaches

- An alternative procurement modality referred to as the performance based management is being used in selected ULBs. Introduction of this modality is expected to help increase private sector interests ultimately facilitating greater leverage of public funds and create higher accountability on the part of contractors by combining construction and actual service delivery during the operational phase into a single contract package.

Financing and leveraging

- The program is supporting the introduction of PPP contracts to achieve continuous water supply in the selected ULBs.



FINANCE AND PUBLIC SECTOR MANAGEMENT

5. Finance and Public Sector Management

Sector background and challenges

The finance sector consists of the banking network, financial markets and financial services, whereas the public sector management sector focuses on government finances at the center, state and local level. Development and expansion of the finance sector is essential for optimal allocation of private sector funds across productive uses. An efficient and mature finance sector, along with healthy government finances are instrumental for achieving inclusive and sustainable economic growth. Key challenges faced by the country in this sector are as follows.

Financial markets. The 12th plan aims for an average GDP growth of 8.2% during 2012-17 as compared to 7.9% GDP growth achieved during the 11th plan[40]. It identifies infrastructure as a key enabler of growth and estimates a total investment requirement of $1 trillion[41] in infrastructure sectors to meet the overall growth target. The private sector will be crucial for meeting the investment and growth targets. In particular, while the share of private investment in total investment in infrastructure rose from 22% in the 10th plan to 38% in the 11th plan, it will have to increase still further to about 48% during the 12th plan. To promote and facilitate private sector participation (PSP) in infrastructure investment, the market for infrastructure finance in India needs to expand and mature. In particular, the market needs to develop and offer financing instruments tailored to incentivize participation by the private sector.

State level finances. After a setback in the late 2000's—precipitated in part by the global economic slowdown—the overall fiscal balance of Indian states was budgeted to improve in 2012-13, as reflected in the reduction in the ratios of gross fiscal deficit and primary deficit to gross state domestic product and increase in capital outlays in a majority of the states in the country[42]. Certain issues that state governments now need to focus on include increasing tax revenues by effectively tapping available resources; reorienting expenditure policies to improve the quality of expenditure while also aiming at fiscal sustainability in the medium term; and enhancing fiscal transparency so as to enable effective monitoring of the quality, durability and effectiveness of the fiscal correction process.

Access to finance. The organized financial sector in India does not reach out to large segments of the population. People continue to borrow from informal financial entities at terms and costs that retard their growth prospects. The recent success achieved by innovative approaches for expanding access to finance such as those adopted by self-help groups (SHGs), Kisan Credit Cards, experiments with mobile banking and business correspondents, as well as by stand-alone micro

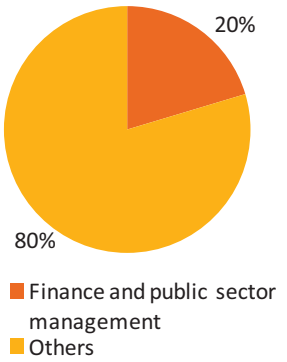


Figure 5.1: Finance and Public Sector Management's share in ADB portfolio (1986-2012)

AT A GLANCE

- *An efficient and mature finance sector along with healthy government finances underlies sustainable and inclusive economic growth.*
- *To promote PSP in infrastructure investment, the market for infrastructure finance in India needs to expand. Financing instruments need to be developed which are tailored to incentivize participation by the private sector.*
- *State governments need to focus on increasing tax revenues, reorienting expenditure policies to improve the quality of expenditure and enhancing fiscal transparency.*
- *Innovative approaches for expanding access to finance need to be explored to bring affordable finance to the doorsteps of the needy.*

[40]All figures are sourced from the Draft Twelfth Five Year Plan (2012–2017) Faster, More Inclusive and Sustainable Growth – Volume I, if unless otherwise mentioned.

[41]All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.

[42]Source: State Finance: A Study of Budgets of 2012-13, Reserve Bank of India

financial institutions could be built on by the government to bring affordable finance to the doorsteps on the needy.

Government of India's sector strategy

In order to achieve the projected growth rate of 8.2% and meet infrastructure development needs, the 12th plan has estimated investment in infrastructure to increase from about 6.9% of GDP in 2011-12 to about 9.0% of GDP in 2016-17, amounting to a total investment of over $1 trillion. Financing this level of investment will require larger outlays from the public sector coupled with a more than proportional rise in private investment. As noted earlier, the share of private sector investments will have to rise to 48% of total investment in the 12th plan as compared to 38% in the 11th plan.

To address the problem of weak financial markets, the 12th plan lists the following measures: (i) pension and insurance reforms, (ii) creation of a vibrant and liquid corporate bond market, (iii) establishment of the Infrastructure Debt Funds (IDFs) to refinance short term bank debt with long term debt, (iv) economies of scale in public sector banking, and (v) financial inclusion using banking correspondents' model in under-served areas. In addition, use of guarantee products by way of credit enhancement is also being encouraged as a new avenue for infrastructure financing in the country. The Reserve Bank of India introduced Credit Default Swaps on corporate bonds in 2011 in order to transfer and manage the credit risk associated with them. This is expected to increase the viability of the corporate bond market in infrastructure financing.

The 12th plan encourages PSP in infrastructure investment, directly as well as through various forms of public private partnerships (PPPs). The government has already established independent regulatory authorities for power, telecom and civil aviation sectors, while the 12th plan has proposed initiating further improvements in the regulatory structures and practices. The Planning Commission of India has operationalized a scheme for technical assistance to PPP project authorities by providing consultants for projects. The Ministry of Finance (MOF), Government of India, has created an India Infrastructure Project Development Fund (IIPDF)—to which ADB has contributed (see Chapter 10 for more details)— to provide loans for meeting development expenses, including the cost of engaging consultants for PPP projects. Given that state governments usually do not have the requisite capacity to handle PPP projects, the 12th plan has proposed that the Planning Commission will provide financial assistance to state governments for setting up nodal secretariats for PPP.

To address the problem of inadequate flow of long-term funds for financing infrastructure projects that typically involve long gestation periods, MOF established the Indian Infrastructure Finance Company Limited (IIFCL) in 2006. IIFCL provides financial assistance up to 20% of the project cost both through direct lending to project companies and by refinancing banks and financial institutions. The 12th plan aims at preparing IIFCL to catalyse mobilisation of resources for financing of infrastructure, in addition to providing loans. To this end, IIFCL will provide guarantees for bonds issued by private infrastructure companies rather than expanding its direct lending operations. This would enable mobilisation of insurance and pension funds, external debt and household savings. In this regard, ADB also approved a project in 2012 to support credit enhancement of infrastructure project bonds, in partnership with IIFCL. Under the project, IIFCL will issue partial credit guarantees in support of infrastructure project bonds and ADB will assume a portion of the credit risk on the underlying project from IIFCL, by issuing it a counter guarantee. IIFCL would also make subordinated debt available as an additional source of finance and may substitute its take-out financing scheme with an IDF.

AT A GLANCE

- *12th plan has estimated investment in infrastructure to increase from about 6.5% of GDP in 2011-12 to about 9.0% of GDP in 2016-17.*
- *12th plan aims to strengthen the financial market through pension and insurance reforms, creation of a vibrant and liquid corporate bond market, establishment of IDFs and financial inclusion using banking correspondents' model.*
- *Government of India aims at a credible fiscal consolidation path by strictly adhering to stipulated fiscal targets as set in the FRBM Act, 2003.*
- *12th plan targets to provide access to banking services to 90% of the households in the country.*

To improve the deteriorating fiscal status of the Indian economy and weak institutional capacity at the sub-national level, the government, in its 12th plan, focuses on ensuring efficient public sector management through better implementation of programs and improved accountability. It aims at a credible fiscal consolidation path that will bring the central government's fiscal deficit to manageable levels. Stipulated fiscal targets as set in the Fiscal Responsibility and Budget Management (FRBM) Act, 2003 will be strictly adhered to. The government is also designing tax structure reforms, both at national and sub-national levels, to increase revenue mobilization and reduce subsidies as a percentage of GDP. Tax administration reform, especially the implementation of the goods and services tax, is expected to increase revenues for both centre and states. The 12th plan also envisages improving the institutional capacity of local governance institutions and small enterprises.

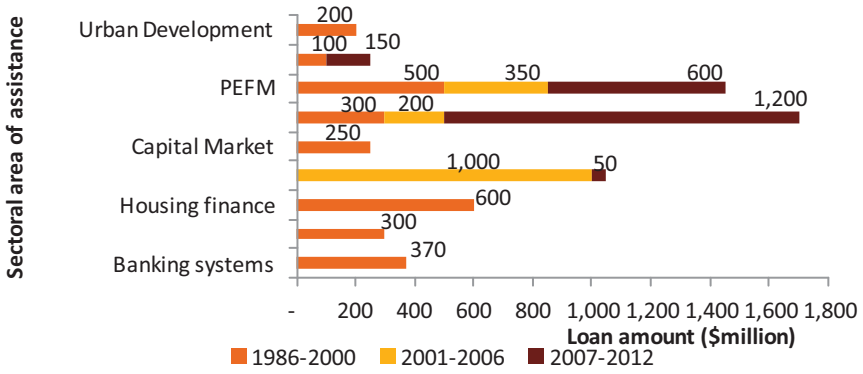
To increase access to finance in the country, the government has envisaged financial inclusion as a major thrust area in its developmental strategies. The 12th plan targets to provide access to banking services to 90% of the households in the country. Advanced technologies like banking correspondents and weather insurance, which cut down on overhead costs, are proposed for adoption. Also, cooperation will be further strengthened through SHG–bank linkage, Joint Liability Groups or the Primary Agricultural Co-operative. Emphasis is being laid on promoting financing through cooperatives because potential benefits and cost of inaction in this case are both very high.

ADB's sector assistance

ADB's financial sector strategy will focus on three broad areas of intervention: (i) innovative infrastructure financing to leverage private investments for infrastructure development; (ii) state and municipal level public resource management programs to assist states in undertaking public resource management initiatives, help consolidate state financial management, realize resources for social development, and ensure sustainability up to the local government levels; and (iii) broadening the access to finance through financial inclusion initiatives.

During the period 1986-2012, ADB provided a total of $6,170 million[43] as assistance for finance and public sector management, which is 20.4% of total ADB lending to the country. Figure 5.2 shows the evolution of ADB's operation in various areas within the sector in the past 26 years (1986-2012).

Figure 5.2: ADB assistance to the finance and public sector management sector during 1986-2012[44]



Notes: Capital Market: includes money market; PEFM: Public Expenditure and Fiscal Management; SME: Small and Medium Enterprises

Several women entrepreneurs have availed loans from SIDBI under ADB's MSME Development Project to start their own *chikan* embroidery units. This has enabled these women to enhance their family's income and fulfill their aspirations.

AT A GLANCE

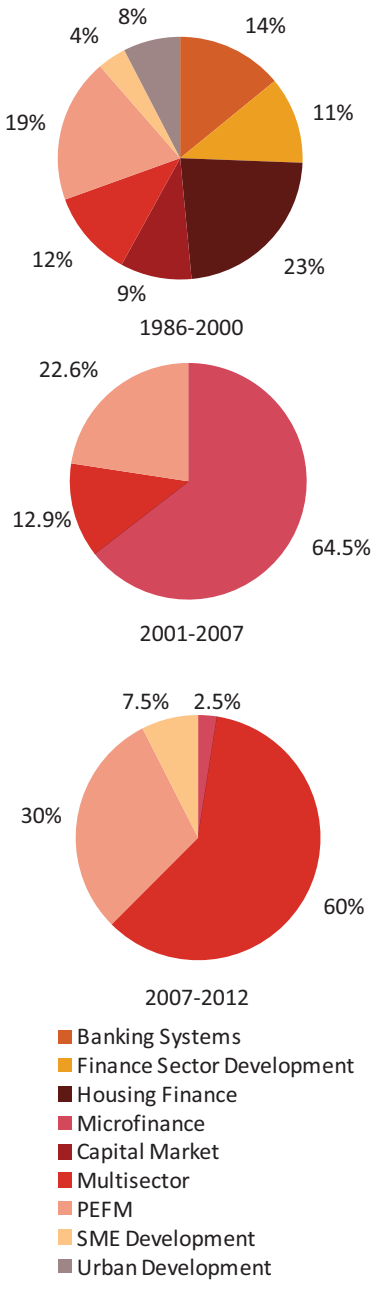
- *ADB's areas of interventions in the finance sector are: leveraging private sector investment including mainstreaming PPPs; undertaking fiscal reforms at state and municipal levels; and financial inclusion.*
- *Largest share of ADB's loan assistance in the sector in the past 26 years has been extended to leveraging private sector financing for infrastructure investments (27.6%) followed by public sector management programs (23.5%) and micro-financing (17%).*

[43]All figures in this sub-section— ADB's sector assistance— have been sourced from ADB.
[44]Multi–sector consists of the Private Sector Infrastructure Facility (IFC, SCICI, IL&FS, IDBI) in India.

AT A GLANCE

- *To support the government in catalyzing PSP in infrastructure development, ADB focused mainly on capital market development in the initial years of its operations in India.*
- *ADB also assisted the IIFCL to leverage public resources to draw in private sector funding.*

Figure 5.3: Sub Sectoral Split



In the early years of its operation during 1986-2000, ADB's focus was more on the banking sector, housing finance, capital market development and catalyzing private sector investment in infrastructure. From mid-1990's onwards, the focus shifted to public expenditure and fiscal management of state governments and micro-financing. Between 2001 and 2006, more than 60% of ADB's sectoral assistance was dedicated towards financial inclusion and 22% was dedicated for public resource management programs. In more recent times, between 2007 and 2012, ADB further expanded its operations in public sector management (30% share of ADB's sectoral assistance in 2007-12), along with leveraging private sector investments and undertaking initiatives for small and medium enterprises (SME) development. The largest share of ADB's loan assistance in the sector in the past 26 years has been extended to leveraging private sector financing for infrastructure investments (27.6%) followed by public expenditure and fiscal management programs (23.5%) and micro-financing (17%).

Leveraging private sector investment including mainstreaming PPPs. ADB has been assisting Government of India in catalyzing private sector participation in infrastructure development, given the ever-increasing requirement of investment in infrastructure improvement for sustainable growth, including an estimated $1 trillion investment in the 12th plan period. Between 1986 and 1996, ADB focused mainly on supporting the government in the areas of capital market development; housing finance, through entities such as the National Housing Bank (NHB), Housing and Urban Development Corporation (HUDCO), and Housing Development Finance Corporation (HDFC); and catalyzing private sector financing in the infrastructure sector, through entities such as IIFCL, Infrastructure Leasing and Financial Services (IL & FS).

ADB has assisted IIFCL to leverage public resources to draw in private sector funding and build-up management expertise for infrastructure investment by providing it with $1.2 billion in loan assistance as well as through technical assistance (TA) for capacity development. It has proposed a number of financing instruments to leverage private sector funds. These include jointly developing the credit enhancement product in association with IIFCL to support local bond issuances by infrastructure project special purpose vehicles (SPVs) and the associated Bond Guarantee Fund for India (BGFI).

It has also extended a $155 million non-sovereign loan to the Export-Import Bank (Exim Bank) to boost the export potential of SMEs in poor and disadvantaged regions that have largely missed out on the country's trade boom.

The "ADB-GoI PPP Initiative: Mainstreaming PPPs in India", launched in 2006, is managed from the central PPP cell in the Department of Economic Affairs (DEA), Government of India, jointly by the government and ADB staff. Under this initiative, ADB has supported the government across the PPP value chain - PPP cells, capacity building, policy assistance, development facilities, and pilot projects structuring. Details on the ADB-GoI PPP initiative are described in Chapter 10.

Undertaking fiscal reforms at the state and municipal levels. Since mid 1990s, ADB has been focusing on helping stressed states in creation of fiscal space through public resource management programs. Through its first generation loans, ADB has been supporting fiscal stabilization in the states of Gujarat (1996), Madhya Pradesh (1999), Kerala (1999), Assam (2004 and 2008) and Mizoram (2009). Due to implementation of public resource management programs and FRBM legislations, there has been moderation in fiscal deficit of the states. ADB's second-generation loans have, hence, provided for improvements in service delivery in areas such as health and education in addition to creation of fiscal space.

Decentralized governance is critical for improving delivery of public utilities at local levels in a financially sustainable manner. This can only be ensured when local governments have adequate financial autonomy and institutional capacity to take

ownership in designing and sustaining service delivery initiatives. Third-generation loans of ADB will explore support to local governments for improved development financing and sustainable public service delivery. Local government capacity will also be enhanced. As a result of strengthened municipal finance, increasing number of PPPs will be facilitated at local levels, thus attracting larger private sector investments.

Supporting financial inclusion. The 12th plan lays emphasis on promotion of cost-effective delivery of banking and other financial services to vulnerable groups and creation of productive employment opportunities. ADB has undertaken several measures in this regard in the past and present. ADB assisted the government in implementing the Co-operative Credit Scheme (CCS) to improve rural household's access to affordable financial services in selected states, thus expanding access to finance and invigorating the rural economy in these states. ADB has also reinforced the efforts of Small Industries Development Bank of India (SIDBI) to reach out to small borrowers or micro-enterprises that have potential and have performed well in the past, but have now grown too large for traditional microfinance support and at the same time remain unable to access more conventional (bank) financing. ADB has been supporting access to credit for women entrepreneurs, with particular attention to those who have the potential but not access to credit to enable them to expand beyond the microenterprise level.

Going forward, ADB will continue to lend support to these activities. In a bid to leverage private sector investment ADB will build, as feasible, on the extensive support it has provided for developing the PPP enabling value chain in India, especially in the most challenging sectors—water supply, sanitation, solid waste management, affordable health and education, rural infrastructure and urban transport. ADB will also explore the use of a credit enhancement—through partial credit guarantees from sovereign or private sector operations—to increase the flow of long-term debt to infrastructure projects from contractual saving institutions such as insurance companies and pension funds. Credit enhancements will also be examined for municipal bond issuances and for road funds. The objective of such credit enhancement measures would be that ADB's use of such guarantees would leverage its resource envelope more effectively than direct lending would. Box 5.1 outlines the major highlights of ADB's Credit Enhancement Project.

Box 5.1: Credit Enhancement of Project Bonds

The Indian government aims to invest $1 trillion in infrastructure by 2016, it also estimates a financing shortfall of $350 billion. The longstanding method of financing Indian infrastructure projects almost exclusively through loans from banks is no longer sustainable. The banks do not have resources large enough to meet all the country's projected infrastructure financing needs and are also fast approaching their allowed sector and group exposure limits. The financing gap could be addressed by tapping into India's large resource pool of insurance and pension funds through bond markets. However, these funds have not been utilized for financing infrastructure; a chief constraint being that the statutory requirements require that these funds invest only in assets rated AA or above, while infrastructure assets are typically rated BBB– to A, at best.

To bridge this gap, ADB's Private Sector Operations Department and South Asia Department joined hands with India Infrastructure Finance Company Limited (IIFCL) to develop a credit enhancement product. The product provides credit enhancement in form of first loss guarantee to infrastructure project bonds raising their rating to the required AA rating thereby allowing the mobilization of financing from pension and insurance funds. Under the facility, IIFCL (or other domestic AAA financial institution) will provide the credit guarantee and ADB will risk participate for upto 50% of the underlying project risk. ADB proposes to assist in the credit enhancement of 3-5 project bonds to pilot the credit enhancement concept across the market. ADB's involvement is critical in introducing a new product and giving comfort to all stakeholders including, ADB partner financial institutions, investors and project developers.

Shiva Kant stands in front of the large printing machine which he bought with a $9174.3 loan from SIDBI under ADB's MSME Development Project. This has helped him to scale up his business.

AT A GLANCE

- *Under the 'ADB-GoI PPP Initiative', ADB has been supporting Government of India across the PPP value chain - PPP cells, capacity building, policy assistance, development facilities, and pilot projects structuring.*
- *Since mid 1990s, ADB has been focusing on helping stressed states in creation of fiscal space through public resource management programs, and strengthening of local governments towards improving service delivery.*
- *ADB has also supported cost-effective delivery of banking and other financial services to vulnerable groups and creation of productive employment opportunities in the country.*

Table 5.1: ADB's project portfolio for the Finance and Public Sector Management sector (1986-2012)

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
1.	Industrial Credit and Investment Corporation of India Limited	Regular	1986	100	Closed
2.	Small-And Medium-Scale Industries Project	Regular	1987	100	Closed
3.	Industrial Finance Corporation of India	Regular	1989	150	Closed
4.	Second Industrial Credit and Investment Corporation Of India Ltd.	Regular	1990	120	Closed
5.	Financial Sector Program	Regular	1992	300	Closed
6.	Capital Market Development Program	Regular	1995	250	Closed
7.	Private Sector Infrastructure Facility Project: Industrial Credit & Investment Corp. Of India	Regular	1996	150	Closed
8.	Private Sector Infrastructure Facility: Industrial Finance Corporation Ltd	Regular	1996	100	Closed
9.	Private Sector Infrastructure Facility Project: Scici Limited	Regular	1996	50	Closed
10.	Gujarat Public Sector Resource Management Program	Regular	1996	250	Closed
11.	Housing Finance Project (National Housing Bank)	Regular	1997	100	Closed
12.	Housing Finance Project (Housing And Urban Development Corporation)	Regular	1997	100	Closed
13.	Housing Finance Project (Housing Development Finance Corporation)	Regular	1997	100	Closed
14.	Madhya Pradesh Public Resource Management Program	Regular	1999	250	Closed
15.	Urban And Environmental Infrastructure Facility Project (HUDCO)	Regular	1999	90	Closed
16.	Urban And Environmental Infrastructure Facility Project (ICICI)	Regular	1999	80	Closed
17.	Urban And Environmental Infrastructure Facility Project (IDFC)	Regular	1999	30	Closed
18.	Housing Finance II Project (HUDCO)	Regular	2000	100	Closed
19.	Housing Finance II Project (NHB)	Regular	2000	40	Closed
20.	Housing Finance II Project (HDFC)	Regular	2000	80	Closed
21.	Housing Finance II Project (ICICI)	Regular	2000	80	Closed
22.	Private Sector Infrastructure Facility at State Level Project (IL&FS)	Regular	2001	100	Closed
23.	Private Sector Infrastructure Facility at State Level Project (IDBI)	Regular	2001	100	Closed
24.	Modernizing Government and Fiscal Reform in Kerala Program (Subprogram I)	Regular	2002	200	Closed
25.	Assam Governance And Public Resource Management Sector Development Program (Program Loan)	Regular	2004	125	Closed

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
26.	Assam Governance And Public Resource Management Sector Development Program (Project Loan)	Regular	2004	25	Ongoing
27.	Rural Cooperative Credit Restructuring and Development Program	Regular	2006	1000	Ongoing
28.	India Infrastructure Project Financing Facility (IIPFF)	MFF	2007	500	Closed
29.	Assam Governance and Public Resource Management Sector Development Program (Subprogram II)	Regular	2008	100	Closed
30.	*Khadi* Reform and Development Program	Regular	2008	150	Ongoing
31.	Mizoram Public Resource Management Program	Regular	2009	94	Ongoing
32.	Developing Public Resource Management Program in Mizoram	Regular	2009	6	Ongoing
33.	Second India Infrastructure Project Financing Facility (IIPFF II)	MFF	2009	700	Ongoing
34.	Micro, Small, and Medium Enterprise Development Project	Regular	2010	50	Ongoing
35.	West Bengal Development Finance Program	Regular	2012	400	Ongoing

CASE STUDY

Assam Governance and Public Resource Management Sector Development Program

"I and many of my friends did not receive salary for months at a stretch despite being on the official payroll of a public sector enterprise (PSE). It is only when the State Government decided to shut down the PSE and provided compensation to us under a Voluntary Retirement Scheme (VRS) that we can now think of making our ends meet again and even go for self-employment."

--- Maniram, a worker in one of the loss-making PSEs of the state, is one amongst the many employees who received compensation from the Government of Assam, with support from this program, as a part of the reformative actions taken to restructure several of the loss-making PSEs.

LOAN DETAILS

EXECUTING AGENCY

Department of Finance, Government of Assam

MILESTONES

- Dec 2004 - $125 mn approved for Subprogram I
- Jun 2007 - Subprogram I Closed
- Dec 2008 - $100 mn approved for Subprogram II
- Feb 2012 - $225 mn disbursed; Subprogram II Closed
- Dec 2004 - $25 mn approved for Project Loan
- Jan 2013 - $21.3 mn disbursed
- Feb 2013 - Closing

Composite check posts created under the project are designed to provide a common tax administration facility to reduce corruption, effectively control border evasion of taxes, track noncompliant taxpayers, and impose penalties for violations.

During the 1990s, Government of Assam faced severe fiscal and governance-related structural problems. Revenue expenditures were rising, especially due to Pay Commission revisions of salaries of government employees, which led to crowding out of capital expenditure. Deterioration of the fiscal and revenue deficit was further compounded by stagnation of tax and non-tax revenues. The state was straddled with high interest debt and pension liabilities. Private sector participation was deterred by several loss-making PSEs that imposed a considerable budgetary burden on the state. These factors posed impediments in the path of the state's economic growth— real gross state domestic product growth of the state was 2% per annum in the 1990s as compared to 5.4% GDP growth of the country during this period. Moreover, Government of Assam had limited institutional capacity in carrying out its core functions due to inadequately aligned organizational structures, skills and incentives, human resource management, and performance and accountability rules. Fiscal stabilization and consolidation was, thus, required along with effective governance reforms to promote efficiencies and reduce leakages.

In 2004, Assam Governance and Public Resource Management sector development Program (AGPRMP) was undertaken by ADB to support Government of Assam in carrying out policy, legal, regulatory and institutional reforms in order to achieve fiscal stabilization and consolidation, and improved governance. It targeted at making the livelihoods of more than 26 million people in the state, 36% of who were poor, better.

The program comprised a policy loan and a project loan. The policy loan consisted of two subprograms. Subprogram I helped put Assam's finances on a positive trajectory of increased revenue and controlled expenditure. Subprogram II strengthened the fiscal reforms and built institutional capacity leading to improvement in the level and quality of public service delivery. The project loan was designed to address institutional capacity and system related constraints through consulting services and procurement. The objective of this loan was to support implementation of the fiscal and governance reforms envisaged under the two subprograms.

Key outputs of the program are as follows:

- **Improved revenue administration.** In order to mobilize additional revenue efficiently, reforms undertaken under subprogram I included (i) setting up of composite check posts; (ii) operationalizing an information and communication technology-based tax information management system (TIMS); and (iii) introducing an objective valuation for calculating property taxes based on unit area method of taxation. A value added tax (VAT) audit manual was also prepared for taxpayers. Under this subprogram, Government of Assam also approved and notified setting up of composite check posts at Srirampur, Boxirhat, and Digarkhal. The composite check post at Srirampur was made operational under subprogram II with department of commercial taxes (DCT) as the nodal authority. DCT implemented additional functionalities in TIMS, including (I) system upgrading in light of impending changes in tax regime; (ii) enabling e-filing of VAT returns; (iii) enabling e-filing of motor vehicles data; (iv) enabling interface between TIMS and computerized treasury management information system (CTMIS); (v) making audit module in TIMS operational; and (vi) providing online taxpayer services. A large taxpayer unit (LTU) was set up as an additional circle in each of the four commercial tax units in Guwahati, called "Circle 99". LTU caters to dealers with a turnover of $2.3 million or a tax liability of around $11,300. Department of revenue and disaster management set up a computerized property registration system called "Dharitree" in its offices across 21 districts. The staff of the department was trained to use this software application. Land records were computerized. Computer centers were set up at 180 locations across 26 districts.
- **Increased non-tax revenues.** Under subprogram I, Government of Assam undertook a strategic review of user fees in health, education, transport and water supply sectors, including an assessment of affordability, service quality and feasibility issues. It also approved a user fees policy, committing to increased total non-tax revenue from user fees. Under subprogram II, Government of Assam demonstrated its commitment to provision of adequate funds for operation and maintenance (O&M) and enhanced service delivery through facilitation of private sector participation for infrastructure services. It also revised tariffs for cost recovery and levied additional fees in accordance with the user fees policy.
- **Improved budget and expenditure management.** The program supported the state in introducing outcome based budgeting (OBB). Government of Assam issued guidelines for OBB to all administrative departments based on which 12 departments prepared outcome budgets for FY2010. Government of

Private sector development

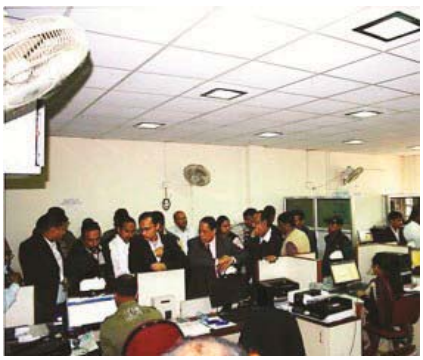
A PPP task force consisting of representatives from labor, management, private sector, civil society, and Government of Assam was established. The task force was responsible for formulating policy actions directed at private sector facilitation and generating alternative business and employment opportunities in the private sector. The program has strengthened fiscal governance and public financial management systems in Government of Assam. This, in turn, has supported better allocation of priority spending for investment in social and economic infrastructure. Cost recovery methods and institutional reforms adopted to improve collection efficiency under subprogram 1 have formed the basis for enhanced service delivery through private sector participation under subprogram 2.

Adoption of unit area method for property tax

Funds received by the state under AGPRMP have been utilized for property tax reforms using the unit area method in areas under the Guwahati Municipal Corporation. Earlier, building owners had to pay property tax on the whole plot of land even if their building occupied just a part of it. As a result of reforms introduced, property assessment and valuation for land and buildings is now done on unit area basis. This has reduced excessive tax burden on those who were already paying regularly, and also brings more people under the tax net. This unit area method will also ensure the proper demarcation of commercial and residential zones where different tax rates apply.

Server infrastructure procured under the program for tax information management system.
Development and rollout of TIMS under AGPRMP has improved efficiency of tax administration and made the systems more user-friendly.

Six departmental weighbridges have been installed at the Srirampur check post. Commercial tax department, the nodal authority for its functioning coordinates with other departments including the excise department, transport department, forest department, and the agricultural marketing board.



Office of the sub-registrar in Assam post computerization of property registration.

Assam also took measures to ensure sustainable O&M in all departments. These included creation of an asset database, preparation and updating norms for O&M on periodic basis, estimation of the resource gap, and identifying ways and means to bridge the gap to ensure availability of financial resources as per norms.

For forecasting expenditure on maintenance requirements and facilitating eventual transition toward accrual-based accounting, AGPRMP supported preparation of fixed asset registers for two departments—public work department (PWD) (buildings) and department of tourism (DOT). PWD (buildings) created fixed asset registers for 14 divisions, while DOT completed preparation and updating of a fixed asset register. O&M expenditure estimates for FY2011 were prepared for PWD (roads), PWD (buildings), and department of health and family welfare and were approved by respective departments.

Government of Assam had mounting employee pension liabilities. New Pension Scheme (NPS), although notified under subprogram I, was not operationalized. Therefore, specific policy actions were introduced in subprogram II to operationalize NPS.

- **Improved systems for debt management.** An automated and comprehensive debt data management system, commonwealth secretariat debt recording management system (CS-DRMS), was set up under AGPRMP. Government of Assam set up a debt management unit (DMU) with clear job descriptions for its officials. AGPRMP also supported DMU in standardizing debt processes and procedures through preparation of a debt management policy and procedure manual.
- **Facilitated restructuring of public sector enterprises.** Restructuring program for PSEs designed under subprogram I ensured a one-time settlement of liabilities of selected loss-making PSEs and provided a social safety net program for employees opting for a Voluntary Retirement Scheme (VRS). As of October 2011, sum of $78.13 million has been disbursed by PSEs towards VRS and related compensation involving 6,062 employees. This helped close 15 PSEs at an approved cost of $124.54 million. For the purpose of subprogram II, closure cost and disbursement for VRS were approved. In the 12 PSEs notified for closure, 5,093 employees received their compensation.

KEY DEVELOPMENTAL OUTCOMES

Increased efficiency in revenue collection. Development and rollout of TIMS under AGPRMP has improved efficiency of tax administration and made it more user-friendly. Various business processes have been computerized and automated under this program. Support in adopting objective valuation methods has eliminated ad hoc valuation of properties for registration. Registration of properties in Kamrup sub-registrar's office has been computerized.

Improved expenditure allocation. Expenditure management has improved due to introduction of OBB. The program implemented a mechanism for ensuring adequate allocation for O&M expenditure, establishing fixed asset registers, and addressing pension liabilities by adopting the defined contribution pension scheme for employees joining Government of Assam on or after 1st February 2005. Expenditure has been reoriented to allow greater allocation for investments in assets.

Reduced unproductive public expenditure. Closure of loss-making PSEs and the social safety net provided by the program to the employees of these PSEs through VRS have saved the state from extra budgetary burden in future. All these PSEs were loss making and had outstanding and growing liabilities. There was no

loss of regular employment due to closure of the PSEs as these units were already inoperative.

Improved management of state debt. Establishment of CS-DRMS is helping in sustainable management of public debt through automated systems that maintain inventory of all debt related data such as terms of borrowing, maturity, loan amount, source, debt-servicing dates, outstanding balances, and guarantees. Functions of debt management, which were earlier spread across various departments and agencies, have been consolidated under the DMU.

INNOVATIONS AND GOOD PRACTICES

The program adopted several good practices and came up with innovative methods of reforming state finances and governance. Operationalization of TIMS is one such reform under subprogram II. TIMS records all information related to tax collection in a common database and has improved efficiency of tax administration. DCT runs a portal (http://taxassam.in), which provides information and transaction services to taxpayers for VAT and central sales tax (CST). Online services offered include (i) filing of returns; (ii) paying taxes; (iii) reporting motor vehicle details; (iv) reporting utilization of statutory forms; and (v) facilitating online dealer information search. Introduction of unit area method of computing property taxes has helped to widen the tax net while reducing scope for arbitrariness in tax assessment.

This project, on account of the reformative computerization of property registration system, won the prestigious Gold Icon National Award by the union department of administrative reforms and public grievances for 2012-13. Under the project, the sub-registrar offices across the state have been computerised replacing the earlier manual system of maintaining records and registers. Process re-engineering through application of information technology has brought about a remarkable change in the service delivery system and improved efficiency.

The program included revision of existing user fees and levy of additional fees in sectors including health, transport, education and water supply. Under the program, Government of Assam introduced reasonable user fees for different investigations and curative procedures in hospitals to improve the financial sustainability of Assam's medical colleges and health centers. As a result, people now get quality services at lower cost and the staff has become more accountable. There is better maintenance and additional facilities such as silent generators, mobile vans and blood storage facilities have been provided.

Subprogram I aimed at establishing composite check posts linked to automated processing and systems for various tax regimes. These composite check posts were designed to provide a common tax administration facility to effectively control border evasion of taxes, track non-compliant taxpayers, and impose penalties for violations.

KEY LEARNINGS

Government of Assam has shown strong commitment in carrying out the reform program to its logical conclusion. There have been significant achievements in several key areas such as reforming PSEs, introducing OBB, upgrading TIMS and CTMIS, and introducing licenses for country liquor based on a competitive auction process. It has shown resolve to curtail expenditure and prioritize allocating resources for maintaining public assets based on updated norms. AGPRMP has turned out to be a successful public resource management program as can be concluded from the outcomes achieved under the program. Its success has motivated other north-eastern states such as Mizoram to embark upon public resource management reform programs on similar lines.

Creation of composite check posts

Subprogram I aimed to establish composite check posts linked to automated processing and systems for various tax regimes. These composite check posts were designed to provide a common tax administration facility to reduce corruption, effectively control border evasion of taxes, track noncompliant taxpayers, and impose penalties for violations.

Under subprogram I, the Government of Assam also approved and notified the setting up of composite check posts at Srirampur, Boxirhat, and Digarkhal.

Subprogram II has made the composite check post at Srirampur operational. The commercial tax department has been made the nodal authority for its functioning. It coordinates with the other departments including the excise department, transport department, forest department, and the agricultural marketing board.

Tax information management system

Tax information management system was installed and made functional under subprogram I. It has been upgraded under subprogram II to provide additional online taxpayer services. The commercial tax department of Assam runs a portal (http://taxassam.in), which provides information and transaction services to taxpayers for VAT and CST. The online services delivered currently include (i) filing of returns, (ii) paying taxes, (iii) reporting motor vehicle details, (iv) reporting utilization of statutory forms, and (v) facilitating online dealer information search.

PROJECT SUMMARY

RATIONALE

- In 1990s, fiscal position of Government of Assam weakened due to stagnation of revenues and growing expenditure. The situation was reflected in high fiscal, revenue and primary deficit.
- Real GSDP growth was as low as 2% per annum, as compared to 5.4% GDP growth of the country.
- ADB's Assam Governance and Public Resource Management Sector Development Program was undertaken to support Government of Assam in carrying out policy, legal, regulatory and institutional reforms in order to achieve fiscal stabilization and consolidation and improved governance.

DELIVERABLES

Improved revenue administration

- Information and communication technology-based tax information management system
- Computerization of property registration system
- Setting up of large taxpayer unit
- Setting up of composite check posts

Improved expenditure management

- Introduction of outcome-based budgeting
- Efficient allocation of operation and maintenance expenditure
- Creation of fixed asset registers
- Pension liability management

Better systems for debt management

- Automated debt management system- CS-DRMS set up
  - Setting up debt management unit
  - Preparation of policy and procedural manual
  - Trainings for debt management
- Setting up of guarantee redemption fund
  - Management of guarantees issued by Government of Assam against borrowings by public sector enterprises (PSEs)

Restructuring of PSEs

- Closure of 15 loss-making PSEs
- Liquidation of assets of at least one PSE
- Voluntary Retirement Scheme (VRS) to cover employees of closed PSEs
- Statutory audit of at least one PSE

ACHIEVEMENTS

- 12 administrative departments prepared outcome based budgets for FY2010 based on guidelines issued by the Government of Assam.
- PWD (buildings) created fixed asset registers for 14 divisions.
- Compensation of $78.13 million has been disbursed by PSEs towards VRS and related compensation to 6,062 employees (as of October 2011).
- Computerization of property registration system has won the prestigious Gold Icon National Award by the union department of administrative reforms and public grievances for 2012-13.

CASE STUDY

India Infrastructure Project Financing Facility

"Last time I was in Delhi it took at least an hour and a half to get through immigration. With the new airport, it took me only 30 minutes. Even in terms of facilities, the New Delhi airport, I think, is at par with international ones"

---Katie Taylor, traveler from the United Kingdom on her second visit to Delhi.

Indira Gandhi International Airport, Delhi

LOAN DETAILS

EXECUTING AGENCY

India Infrastructure Finance Company Limited

MILESTONES

- Dec 2007 - $500 mn approved for IIPFF
- Dec 2007 - $300 mn approved for Tranche 1
- Feb 2009 - $200 mn approved for Tranche 2
- Aug 2011 - $500 mn disbursed; Closing
- Nov 2009 - $700 mn approved for Second IIPFF
- Nov 2009 - $210 mn approved for Tranche 1
- Dec 2010 - $250 mn approved for Tranche 2
- Dec 2011 - $240 mn approved for Tranche 3
- Jan 2013 - $544.6 mn disbursed
- Dec 2014 - Closing

The 11th plan recognized the importance of robust infrastructure for supporting the GDP growth rate of 9% targeted for the economy during 2007-12. It was estimated that India needed to increase its infrastructure spending from 4-5% (as of 2007) to 9% of GDP in order to achieve its growth targets. This required an investment of $475 billion during the 11th plan which could not have been met by the public sector alone. There was, thus, an urgent need for encouragement and promotion of PSP and PPP in infrastructure projects. With the objective of mobilizing more than a third of targeted funding requirement from the private sector over the 11th plan period, Government of India set up the India Infrastructure Finance Company Limited (IIFCL) as a special purpose vehicle in 2006. This would help mobilize for long-term funds in the infrastructure finance market in India that was historically characterized by inadequate flow of long-term funds.

ADB's Country Operations and Business Plan 2007-09 recognized that raising $475 billion infrastructure investment posed a challenge to India's projected economic growth. Thus, as a part of its sector strategy, ADB undertook the India Infrastructure Project Financing Facility (IIPFF), complementing Government of India's parallel initiatives in contractual savings, corporate bonds, and PPPs devised for infrastructure development. With ADB assistance through IIPFF, IIFCL is providing funds at commercial terms with over 20-year maturities for commercially viable infrastructure projects developed through the PPP model. IIFCL functions as part of a lending consortium and all its projects are structured by professional

project developers and appraised by lead banks in the financing consortium.

ADB has provided two MFF loans under this project - IIPFF I and II. IIPFF aims at (i) creating high quality and valuable infrastructure assets; (ii) creating institutional capacity of IIFCL including getting it rated by international credit rating agencies; (iii) increasing private sector participation; (iv) co-financing and providing innovative financing instruments; and (v) enhancing investor participation. IIPFF I, approved in 2007, less than two years after formation of IIFCL, helped it to strengthen its presence in the country's infrastructure finance market.

Key outputs of the project are:

- **Financed infrastructure.** IIPFF I aimed at financing 30-40 subprojects during 2007-11 with an average sub loan size of $20 million-$30 million for creating high-quality infrastructure assets across subsectors. IIPFF I has been providing long-term funding to IIFCL for reducing the duration gap between asset-liability of IIFCL's loan portfolio, which generally results from infrastructure financing. IIPFF II includes catalyzing private sector investment for financial closure of 14 identified subprojects by December 2014.

  IIPFF has been fully committed to two major international airport projects and 28 road subprojects. The two airport projects include the upgrade of Delhi and Mumbai airports which have for long been constrained by limited terminal capacity, congestion, poor infrastructure, and inadequate ground handling systems. In 2003, Airport Authority of India approved the modernization proposals for these two airports through the privatization route and since then, ADB has been providing assistance worth $97 million for this initiative. Recently, the Mumbai and Delhi airports were ranked second best and fourth best in the world respectively, by the Airport Council International Airport Service Quality Awards 2010. These airports, today, boast of handling 15 million–25 million passengers per annum. IIPFF I also supported the National Highway Development Program of Government of India by financing the upgrade of the national and state highway network through widening existing roads and building new highways. So far, the project has supported upgrading and expansion of more than 1,100 km of road network across India.
- **Developed environmental and social safeguards framework (ESSF).** A comprehensive ESSF was developed in association with other development partners under IIPFF I for ensuring compliance by the infrastructure projects identified for funding. Adoption and implementation of the framework commenced in October 2007. It was further updated in November 2010.
- **Supported institutional development.** IIPFF I has supported improvements in the financial policies of IIFCL and developed asset-liability management policy, which involved designing documentation formats, pricing tools and risk appraisal templates for IIFCL. IIPFF II has been supporting development and adoption of an integrated risk management system and installation of risk management tools. It has also supported improving resource management and project risk assessment capabilities in IIFCL.

  With the project support, IIFCL has received its first international credit rating, which will enable it to source stable long-term funding from international markets. Standard & Poor's has rated IIFCL at par with India's sovereign rating in 2007.
- **Provided financing options.** IIFCL has been successful in providing innovative financing options for supporting heterogeneous infrastructure delivery models by integrating a range of financing instruments (equity, debt, and guarantee) and financing sources (domestic markets, multilateral sources, international equity, domestic and international borrowings). This has helped it

Institutional development

IIPFF has helped IIFCL get rated by international credit rating agencies for facilitating access to international markets. It has developed capacity of IIFCL for implementation of ESSF to screen and monitor subprojects and to develop reporting formats. It has also provided capacity building and institutional development support to strengthen IIFCL's resource management, project risk appraisal capability, and investment policies.

Funds for modernization of Delhi and Mumbai Airports

In 1999, a survey by the International Air Transport Association revealed that the Delhi and Mumbai international airports ranked amongst the three least-favored airports in the Asia Pacific region across the 19 service parameters considered. Given the strategic importance of these airports, their upgrade and expansion was urgent. Public sector investment was not available owing to fiscal constraints, and hence, Airport Authority of India approved the modernization proposals for these two airports through the privatization route in June 2003.

Under IIPFF, ADB assistance worth $97 million was provided for this initiative. At present, as per the Airport Council International Airport Service Quality Awards 2010, Mumbai airport is ranked second best worldwide and Delhi airport is ranked fourth best worldwide in the category of airports handling 15-25 million passengers per annum.

National Highway 8 - Delhi Jaipur Road. IIPFF I supported the National Highway Development Program of Government of India by financing the upgrade of national and state highway networks. In total, it has supported the upgrading and expansion of more than 1,100 km of national and state highway networks across India.

Industries are developing at a faster pace due to availability of long-term funds under IIPFF.

Subprojects financed through IIPFF have resulted in significant increase in employment opportunities across sectors.

to leverage core competencies of promoters and project development agencies for building a shelf of PPP subprojects.

- **Assisted the setting up of the partial credit guarantee (PCG) facility:** In order to catalyze and tap additional funding for infrastructure projects, ADB is assisting IIFCL to set up a pilot PCG facility. The level of PCG provided by IIFCL will depend on the standalone rating of the project.

KEY DEVELOPMENTAL OUTCOMES

Increased employment opportunities. The project has helped open up new opportunities for entrepreneurs and create employment especially in public works. Subprojects financed through IIPFF have resulted in significant increase in employment opportunities especially in the roads sector, given that on an average, 20,000 person-days of employment is generated per km of road construction. IIPFF I has supported upgrading and expansion of national and state highway networks of more than 1,100 km across India.

Increased private sector participation. IIPFF aims at containing and reducing the national fiscal deficit by attracting private sector investments in infrastructure projects across sectors. IIPFF II aims to achieve 30% of overall infrastructure investment from the private sector. Among development partners, ADB is uniquely placed to finance PPP subprojects by offering customized financing options through its public and private sector windows. It is estimated that under IIPFF I and II, IIFCL catalyzed investment of $2.5 billion–$3.5 billion and $7.6 billion respectively, from the private sector for financing PPP subprojects. Under IIPFF I, IIFCL has leveraged about five times its lending. IIPFF II is expected to achieve a leverage ratio of about seven.

Leveraged innovative financing modality. IIPFF I was the first MFF loan to a financial intermediary designed to leverage ADB resources to benefit a wide range of projects across sectors in a programmatic manner as opposed to the conventional approach of discretely financing individual projects. The traditional model of developing and financing infrastructure predicated on government ownership with government bearing all risks, is being replaced by a new business model based on PSP largely through PPPs.

Government guarantee of IIFCL's borrowings (including ADB loan) and IIFCL's supplementary financing initiatives have enabled it to offer innovative financing instruments such as subordinated debt and risk capital, which are currently scarce in the market. ADB's support to IIFCL provides an additional layer of assurance to investors in IIFCL's longer-tenor corporate debt issuances. With IIFCL providing an independent source of funding, financial institutions are more willing to undertake exposure to projects in line with their risk return capital allocation framework.

Enhanced sensitivity towards environmental and social issues. ESSF developed under the project enabled IIFCL to comply with the policies, law and regulations governing land acquisition, compensation, relocation, and resettlement of Government of India. IIPFF I has improved the capacity of IIFCL staff in understanding and using ESSF to assess proposed subprojects.

Enhanced bond rating. PCG facility supported by the project will enhance the rating of domestic bond issuances by eligible infrastructure SPVs to make them eligible for investments by institutional investors. ADB support to IIFCL will involve guaranteeing a certain percentage of IIFCL's exposure in the underlying project risk, depending on needs of the transaction. Under IIPFF, the level of PCG to be decided will also take into account the advice of reputed national rating agencies on the level of credit enhancement required to enhance the rating of

project bonds. Based on experience gained through pilot PCG transactions, Government of India may consider mainstreaming a PCG scheme within IIFCL.

INNOVATIONS AND GOOD PRACTICES

IIPFF has helped develop and establish the concept of PCGs for project bonds. Lending benchmarks for project finance transactions have also been developed under IIPFF. Through the ADB TA, IIFCL has strengthened its in-house capacity for managing market and credit risks, and in undertaking risk assessments, management, and mitigation. It has also supported IIFCL's capacity development in risk-based pricing, project appraisal, credit risk assessment, and guarantee structuring.

ADB is assisting in transforming IIFCL from a consortium lender to a provider of innovative project financing solutions including takeout financing, re-financing, subordinated debt, and guarantees. The project supported launch of credit enhancement transactions in the market through discussions with major infrastructure players. Discussions with rating agencies, investment banks, and investors are also in process.

Design of a harmonized ESSF is helping to ensure that ADB resources flow only to those projects that are compliant with national and ADB's environmental and social safeguard norms.

KEY LEARNINGS

IIFCL is well-positioned to finance PPP subprojects emerging from the ongoing ADB support for mainstreaming PPP. Development of PPP subprojects by professional project developers and consideration of such subprojects for financing by a consortium of investors and lenders, including IIFCL, ensures deepening of project preparation and financing skills in the country.

IPFF II is designed to enable ADB to finance a wide range of subprojects across subsectors rather than to discretely finance individual projects. Transaction costs for ADB and Government of India are significantly reduced as project evaluation, appraisal, and financial structuring are conducted by specialized agencies seamlessly. The success of this approach is evidenced from the IIPFF I, which has financed 30 infrastructure PPP subprojects.

The PCG facility enables bond issuance by infrastructure project SPVs for investment by local institutional investors. Funding of infrastructure in the past has been almost solely reliant on bank financing primarily from loans by scheduled commercial banks. PCG facility enhances rating of infrastructure project bonds to expand funding sources to capital market instruments and catalyzes financing from domestic institutional investors. While scheduled commercial banks have requisite skills and risk capital for taking initial project risk at construction stage, institutional investors are more suited to provide long-term capital required once construction phase has been completed and revenue generation begins. Through this modality, the pilot PCG facility should help develop the project bond market in India by expanding the range of investment instruments and investable resources in accordance with the government's debt market development strategy. In this context, financing of infrastructure through bond market marks one of the first such initiatives in the Indian capital market.

Technical Assistance

A $500,000 TA project was undertaken along with IIPFF I to build additional internal capacity required to expand operational strength and enhance functional capabilities of IIFCL in line with its business plan and the scheme. The TA was expected to help IIFCL improve its resource management (treasury) capabilities, develop its ability to conduct an independent risk assessment of subprojects, and create risk-based pricing benchmarks for infrastructure financing.

The TA was successful and achieved the expected outcomes in general. IIFCL has been expanding its balance sheet - during FY2010–11 alone, its balance sheet size increased by 15%, while its operating income rose by 25%. Hardware and software was procured under the TA to enable IIFCL to undertake an independent credit risk assessment of projects and develop an internal credit rating and migration model. Relevant staff was trained, and the risk model is being improved on a continuous basis. The TA further supported the effective adoption of the environmental and social safeguard framework and capacity development of the internal team to undertake due diligence for subprojects. As of August 2012, IIFCL comprises a fully fledged in -house safeguard team.

Through ADB's TA, IIFCL has received its first international credit rating which will enable it to source stable long-term funding from international markets.

PROJECT SUMMARY

RATIONALE

- 11th plan growth target required infrastructure spending to increase from 4%-5% (as in 2007) to 9% of GDP during 2007-12, entailing an investment of $475 billion.
- Public funds were inadequate to meet this requirement; so private sector investment was required.
- India Infrastructure Finance Company Limited (IIFCL) was set up by Government of India to facilitate private sector investment in the infrastructure sector.
- ADB undertook the India Infrastructure Project Financing Facility (IIPFF) to support Government of India's infrastructure development agenda by enhancing availability of long-term funds through IIFCL for infrastructure financing.

DELIVERABLES

Catalyzing infrastructure financing

- Financing of 30-40 subprojects in 5 years with average loan size of $20 million-$30 million
  - Modernization of 2 major airports- Delhi and Mumbai
  - Upgrade of 1,100 km of roads in the country

Institutional development

Integrated risk management system

Development of Environment and Social Safeguards Framework

- ESSF based institutional capacity improvement of IIFCL

Finance leveraging

- Provide innovative financing options by integrating range of financing instruments with financing sources
- Assist IIFCL in setting up a pilot partial credit guarantee facility

ACHIEVEMENTS

- IIPFF 1 and 2 (two PFRs under the MFF) will catalyze investment of $2.5 billion–$3.5 billion and $7.6 billion respectively, from private sector for financing PPP subprojects.
- IIFCL has received its first international credit rating, enabling it to source stable long-term funding from international markets. Standard and Poor's has rated IIFCL at par with India's sovereign rating in 2007.
- IIFCL will succeed in leveraging about five times its lending under the project.
- Private investment in infrastructure reached over 30% of overall infrastructure investment during the 11th plan.
- Sensitivity towards environmental and social issues will increase under the ESSF.

PROJECT BRIEF

Khadi Reform and Development Program

PROJECT OVERVIEW

Display of *Khadi* clothes for sale in a *Khadi* Emporium, Delhi

Rural non-farm services (RNFS) currently employ close to 90 million people or 18% of the workforce in India. *Khadi* industry accounts for 10% of the total employment in RNFS and has been identified as one of the sectors with the highest potential for generating productive employment. However, *Khadi* sales have stagnated over the years owing to production and marketing inefficiencies. To address these concerns, the government is providing financial support through subsidies to promote *Khadi*. Simultaneously, the *Khadi* and Village Industries Commission (KVIC) is also providing policy, technical and marketing support. ADB, in order to complement these initiatives, has designed a comprehensive *Khadi* reform package under the *Khadi* Reform and Development Program that will help to revitalize this critical sector by facilitating a transition to an approach wherein *Khadi* production, marketing and pricing will be better aligned to market demands. It aims to revive the sector through increased employment generation and incomes, increased artisan welfare and development of select traditional village industries.

LOAN DETAILS

EXECUTING AGENCY

***Khadi* and Village Industries Commission**

MILESTONES

Oct 2008 - $150 mn approved

Jan 2013 - $20 mn disbursed

Sept 2013 - Closing

OBJECTIVE

The program aims at increasing productivity of RNFS by revitalizing the *Khadi* and Village Industries (KVI). It targets at providing nearly 9 million jobs in the sector. It seeks to increase the involvement of private entrepreneurs by promoting the use of the *Khadi* mark, phasing out subsidies, and ensuring professionalism in marketing. The program comprises (i) establishing a policy reform and implementation framework, (ii) promoting and marketing *Khadi* as a brand, (iii) generating procurement and production efficiencies, and (iv) implementing institutional reforms.

OUTPUTS

Key outputs under the program are presented in the table below:

Reformed policy and implementation	• Policy, legal, marketing and institutional reforms for achieving sustainability of the sector and enhancement of artisan welfare have been completed
Improved marketing of *Khadi*	• *Khadi* sales are expected to increase by 10% (on an annual compounded basis) through effective marketing strategies • A "*Khadi* Mark" is being established to register *Khadi* as a

	brand name under the Trade Marks Act
Improved procurement and production efficiencies	• Quality norms for raw material procurement are being established by KVIC. Raw material cost would be reduced by 15% training programs are being conducted for 300 *Khadi* institutions (KIs) for quality testing of raw materials
Enhanced institutional reforms	• A comprehensive capacity building program will be developed for KVIC, *Khadi* and Village Industries Boards (KVIBs), KIs, and artisans. IT and e-governance systems and practices of KVIC will be strengthened. A reform plan will be implemented for 300 eligible KIs • A capacity building plan is being implemented parallely for *Khadi* industries and five other linked village/ traditional industries (such as herbal products, honey, handmade paper and cane)

OUTCOMES

Increased employment generation and incomes

Through the program interventions, there is expected to be an increase of at least 15% in the number of artisans employed and a rise of 20% in the current earnings of *Khadi* artisans. It is expected that the increase in production on account of improved raw material procurement, enhanced working capital and new *Khadi* ventures using producer company model and entrepreneur model will contribute in increasing employment opportunities to artisans. The program is expected to enhance incomes of more than 1 million workers of which three-fourth will be women.

Empowering artisans

Under the program, KVIC will shift towards a new system of production incentives, replacing the existing system of sales rebates/interest subsidies. This approach will help in removing inefficiencies in the existing inflexible cost-based pricing system. Further, working capital requirements of *Khadi* institutions will be assessed and necessary amount of working capital will be accordingly facilitated to sustain operations efficiently. These measures should enhance production and contribute towards artisan income generation. Additionally, new *Khadi* ventures under the producer company model (comprising artisans, spinners and weavers) and an entrepreneur model will be set up. Such structures empower artisans by making them a part of the decision-making process by collectively appointing a governing body. Finally, usage of the *Khadi* mark is intended to ensure payment of at least base wages to all producers of *Khadi*.

WAY FORWARD

Going forward, KVIC, under this program, plans to organize a series of workshops with *Khadi* institutions at state and divisional level. A new marketing organization for *Khadi* is in process of being incorporated. Further, a *Khadi* marketing extension program will be formulated. KVIC has proposed new staffing norms for institutional strengthening which will be implemented post approval from the Ministry of Agro and Rural Industries. Restructuring of PPP models to attract more investors for the central sliver plant is also under progress. All these initiatives will positively impact the future of the *Khadi* industry by improving productivity and artisan welfare and reducing organizational and functional inefficiencies.

INNOVATION IMPULSE

Systemic and transformational change

- KVIC would shift its focus from direct commercial activities to other measures to enhance the competitiveness and quality of the *Khadi* industry.
- The program will assist KVIC in developing an integrated management information system to improve monitoring of various *Khadi* institutions. The program proposes to work on a cluster development strategy by developing synergies with village industries producing herbal products, honey, handmade paper, cane and pottery.

Piloting new approaches

- The program would help to promote use of the *Khadi* mark, discontinue the archaic cost chart system, establish a private-owned marketing organization to end the controlled production and marketing of *Khadi* items, and use the PPP modality to improve efficiency and management of the sliver plants.

Financing and leveraging

- The program will adopt innovative reforms to reinvigorate one of India's most traditional sectors and empower artisans by facilitating greater private participation and using modern PPP modalities.

PROJECT BRIEF

Micro, Small & Medium Enterprises Development Project

PROJECT OVERVIEW

The Self-Employed Women's Association (SEWA), established in 1988 in Lucknow, is an autonomous organization of chikankari artisans. SEWA supports poor women artisans by training them in chikankari work. Nearly 100 women come to the SEWA center each day to do their embroidery work.

The micro, small and medium enterprises (MSME) sector in India is the second largest employer, next to agriculture. However, the huge potential of the sector for generating highly productive jobs remains largely untapped. One of the crucial factors constraining growth and competiveness of this sector is the lack of access to adequate and timely finance on competitive terms. This has adversely affected not only the establishment of small companies, but also their transition to medium-sized enterprises and the overall development of MSME sector. The Micro, Small and Medium Enterprises Development Project (MSMEDP) aims to improve access to finance and entrepreneurial skills which will enhance competitiveness of the sector and facilitate employment creation. MSMEDP will provide financing to the "missing middle" borrower segment through a loan to the Small Industries Development Bank of India (SIDBI). In addition, a special capacity building grant of $3 million from JFPR will be provided to SIDBI to train and help women entrepreneurs in accessing financial resources.

LOAN DETAILS

EXECUTING AGENCY

Small Industries Development Bank of India (SIDBI)

MILESTONES

- **Feb 2010 - $50 mn regular loan approved**
- **Jan 2013 - $12.5 mn disbursed**
- **Jun 2015 - Closing**

OBJECTIVE

MSMEDP aims to support Government of India's efforts in facilitating better access for micro as well as small and medium sized enterprises to various financial resources on more competitive terms. One of the major objectives of the project is to provide financing to those borrowers (termed as the "missing middle") that have grown too large to receive financial support from micro finance institutions (MFIs), but are still unable to access bank financing on account of their low creditworthiness or operations in the informal sector. Also, MSMEDP will help in developing various training programs for enabling entrepreneurs to improve profitability, competitiveness and creditworthiness of micro enterprises. Special emphasis will be given to enterprises led by women.

OUTPUTS

Key outputs under the project are presented in the table below:

Enhanced credit delivery through SIDBI and participating MFIs	• Under ADB's ordinary capital sources, a loan of $50 million is being provided to SIDBI, with a guarantee from the Government of India, for it to lend to the "missing middle" segment of borrowers in a few selected states – ADB loan will be used by SIDBI for direct lending

	and indirect lending through participating financial institutions – At least 30% of the loan under SIDBI's direct lending operations will be earmarked for lending to qualified women micro and small entrepreneurs
Increased SME productivity and managerial capacity	• Training and capacity-development initiatives will be undertaken. Those entrepreneurs under SIDBI's direct lending component who are provided training will be monitored on a timely basis • There will be constant monitoring of the number of jobs created through SIDBI's direct lending component

OUTCOMES

Improved MSME access to commercial financing

The project will assist in the development of an improved system of delivery of finance to MSMEs. A target of 10% increase in the number of MSMEs receiving financing would be achieved every year. A target of 20% increase per annum in direct lending to MSMEs by SIDBI is expected to be achieved by the end of the project. A total of 9.3 million MSMEs have received financing from scheduled commercial banks (as of March 2011).

Improved MSME growth, competiveness and employment

This enhanced access of MSMEs to credit on commercial terms is expected to foster growth of the MSME sector and help in job creation. A total of 1,176 jobs have been created (as of September 2011). Productivity growth induced in the sector will also support a sustainable development framework that will attract greater private sector participation in the sector.

Enhanced gender mainstreaming

The project also focuses on gender participation and capacity development initiatives that target specific needs and constraints faced by low-income women micro-entrepreneurs. It targets to increase the number of successful applications submitted by low-income women entrepreneurs by 20% every year at SIDBI branches across selected states. The $3 million JFPR grant has also been provided to SIDBI for institutionalizing gender-related policies, programs and training which address specific needs of female entrepreneurs. A total of 113 women entrepreneurs benefitted from this grant (as of March 2011).

WAY FORWARD

This project will pave the way for deeper financial markets for the small scale sector in India. The partnership between ADB and SIDBI under the MSMEDP will continue to mainstream the "missing middle" entrepreneurs. It is expected that each of the microenterprises being supported has the potential of creating productive work and empowering women. This will help to make the country's growth story an inclusive one.

INNOVATION IMPULSE

Systemic and transformational change

- The project will provide a mix of financial support as well as training and capacity building to assist the all-round development of microenterprises. This is in line with the "credit plus" approach of SIDBI.
- The special grant for building capacity of women entrepreneurs will play an important role in building confidence, nurturing and empowering women entrepreneurs.

Piloting new approaches

- The capacity building grant from the JFPR will strengthen the gender focus of this loan. The grant will support stocktaking of current practices and identifying gaps in the existing system, promoting direct interventions for female micro-entrepreneurs by way of gender-specific product and technological innovations, training state-level women's associations and networks and monitoring and evaluation of results for ensuring effectiveness.

PROJECT BRIEF

Mizoram Public Resource Management Program

PROJECT OVERVIEW

The newly computerized Aizawl South Treasury

The Mizoram Public Resource Management Program is assisting the Government of Mizoram in undertaking fiscal reforms aimed at increasing the revenue base, rationalizing expenditure and restructuring the government debt portfolio to arrive at optimal debt servicing costs. The program also targets to limit the drain on state finances by loss-making public sector enterprises (PSEs) and improve delivery of state services in health and education. In addition, a TA loan of $6 million has been provided to Government of Mizoram to support the program's executing agency and implementing agencies in improving their capacity in the area of fiscal management.

Mizoram, a small hill state in the northeastern region, has made considerable progress in social development sector including education, and has achieved low infant mortality and death rates and decadal decline in population growth rate. However, the state's economy has been hampered by mounting fiscal deficit with increasing debt service liability that limits resources for development funding. The fiscal deficit of the state was around 6.4% of gross state domestic product in 2006-07, while the ratio of Mizoram's public debt to stood at 80% in 2007-08, as against 28% recommended by the 12th Finance Commission.

LOAN DETAILS

EXECUTING AGENCY

Finance Department, Government of Mizoram

MILESTONES

- **Aug 2009 - $100 mn approved (including $6 mn for TA loan)**
- **Jan 2013 - $87.3 mn disbursed**
- **Jan 2013 - Closing**

OBJECTIVE

The program's objective is to create fiscal space through the following initiatives (i) increase tax and nontax revenues; (ii) rationalize expenditures through adoption of medium term expenditure frameworks (MTEFs); (iii) initiate reforms in areas such as pensions and PSEs; (iv) facilitate debt restructuring; and (v) improve services in two key sectors (health and education) in a cost-effective manner.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved revenue administration	• Tax reform is being implemented resulting in a 20% improvement in own-source revenue collection including revenues from stamp duties, apart from a 50% reduction in tax arrears • Support for bid process management (bid document preparation) is being given. Audit processes are being strengthened and trainings for revenue department officers are being conducted

Enhanced project appraisal and monitoring	• Support is being given to establish a state finance commission and project monitoring cell
Reforms in health and education sectors	• A health insurance scheme-Mizoram Health Care (MHC) Scheme- with a target coverage of at least 30% of households headed by women and 60% of BPL families has been introduced • In the education sector, at least 90% of the teachers who opted for the VRS are being replaced by qualified teachers
Automated treasury systems	• Processes under nine treasuries of department of finance are being automated/computerized. Also, equipment and training support for management of the new systems are being provided
Enhanced debt management	• Support is being given to enhance capacity in areas of debt management and policies/strategies formulation • At least 80% of the high-cost debt (with interest rate of above 9% p.a.) are being retired prematurely
Restructured PSEs	• Restructuring or consolidation of loss-making PSEs and implementation of pension reforms is undertaken

OUTCOMES

Greater fiscal space for socio-economic infrastructure development and inclusive growth

The program is providing assistance for implementation of a tax information system for better work monitoring and training of tax officials in identifying cases of non-compliance. It is expected that there will be a 20% improvement in the state's revenue base. The program is also supporting Government of Mizoram in implementing the CS-DRMS to facilitate better debt management. These initiatives are expected to free some resources for building social and economic infrastructure, which will, in turn, facilitate sustainable and inclusive growth in the state.

Automated treasuries

The program is supporting Government of Mizoram in automation of nine treasuries in the state. This will contribute to better expenditure monitoring and recording.

Better and improved health and education sectors

The program is also supporting three departments - health and family welfare, school education, and finance- in preparation and implementation of MTEFs to strengthen expenditure planning. In health sector, sustainability of MHC Scheme is being ensured through establishment of a corpus fund to deal with all payments judiciously without burdening the state. In the education sector, the program is supporting Government of Mizoram to improve the quality of education in schools by replacing under-qualified teachers with qualified ones.

WAY FORWARD

The program has initiated reforms to bring about fiscal consolidation in the state and improve efficiency and quality of service delivery of various departments such as health and education. It is expected that the fiscal space so created will help the state government in focusing on addressing development issues to put the state on a path of sustainable and inclusive growth.

INNOVATION IMPULSE

Systemic and transformational change

- In addition to addressing fiscal reforms, this program aims to improve public service delivery in key developmental areas in a cost-effective, equitable and sustainable manner. The program also includes training government staff in identifying and supervising private insurance providers for better service delivery.

Piloting new approaches

- The program has introduced a universal health insurance scheme- Mizoram Health Coverage Scheme and also build a corpus in order to safeguard the fiscal sustainability of this scheme in the long run. This health scheme won the prestigious Mizoram award for outstanding improvement in programme implementation of Rashtriya Swasthya Bima Yojana in north eastern region.
- A Voluntary Retirement Scheme will be set up for the untrained and under-qualified primary school teachers which will enable replacing inefficient teachers with qualified and efficient ones. Also, training programs (including vocational training) are supported under this project.

Financing and leveraging

- The objective will achieve fiscal consolidation to create fiscal space and enable the government to concentrate on development issues, including on gender issues.

PROJECT BRIEF

West Bengal Development Finance Program

PROJECT OVERVIEW

Introduction of computerized work-flow registration replacing manual registration system

The fiscal situation in West Bengal was characterized by high revenue and fiscal deficits. In FY2010, West Bengal's revenue deficit amounted to 3.7% of gross state domestic product (GSDP) and the fiscal deficit to 4.1% of GSDP. This resulted in limited capacity of Government of West Bengal to spend on policy priorities on economic and social infrastructure. Consequently, capital spending was severely affected with outlays declining from 1.2% of GSDP in FY1994 to 0.7% in 2010-2011, one of the lowest in the country. Through the West Bengal Development Finance Program, approved in October 2012, ADB is helping the state government implement a comprehensive fiscal consolidation program. This program targets to create greater fiscal space in the state, which can be used to augment and sustain development financing. It will reinforce the central government's efforts toward bridging inter-state disparities and enable inclusive growth. The program will also be supported by a TA, which will focus on strengthening the key institutions responsible for implementing reforms to improve fiscal management in the state.

LOAN DETAILS

EXECUTING AGENCY

Department of Finance, Government of West Bengal

MILESTONES

Oct 2012 - $400 mn approved

Jan 2013 - $200 mn disbursed

Nov 2014 - Closing

OBJECTIVE

The objective of the program is to provide assistance for fiscal consolidation and to align state finances with a revised and sustainable medium term fiscal framework, through expenditure rationalization, revenue reforms and improved debt management.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved expenditure efficiency	• A fiscal policy and management unit will be established to monitor all investment decisions of the state government • Well documented pro-poor and gender responsive medium term expenditure framework (MTEFs) will be developed for departments of health, school education and public works, based on long term sector strategy • Less than 5% variance in the annual budgets of health and education from their respective MTEFs will be ensured
Improved revenue efforts	• An increase of at least 20% in VAT revenue by 2014 as compared to $2.1 billion in 2010 will be achieved

	• An annual increase of at least 17% in revenue from stamp duties and registration fees will be targeted • A 25% annual increase in revenues from excise duties by 2014 is expected • At least 2% additional annual growth in revenues from profession is expected
Enhanced efficiency of debt management	• Debt management strategy will be put in place • 100% documentation of incurred debts and contingent liabilities in a debt database will be done. All staff responsible for debt management will be trained to use debt database management software

OUTCOMES

Enhanced fiscal space

The primary outcome of the program will be reduction of fiscal deficit to meet the ceilings prescribed by the Fiscal Responsibility and Budget Management Act 2010. The program is also expected to lead to at least half a percentage point increase in own revenue to GSDP ratio, and a 5% decline in the debt stock to GSDP ratio by 2014.

Improved and sustainable development financing

The program is expected to improve development financing in the state in a sustainable manner. The capital outlays to GSDP ratio is expected to improve to at least 2.5% by 2016, and the share of education and health therein is expected to improve to 15% by 2017.

WAY FORWARD

The program is expected to stabilize Government of West Bengal's public finances. It will help improve the availability of finances and sustainability of development financing in the region. The measures adopted in the program should ensure fiscal consolidation and rationalize public expenditure which is expected to support growth of the state.

INNOVATION IMPULSE

Systemic and transformational change

- The focus of the program is towards developing capacity (human and institutional) of the key departments, leading to improved public financial management. Capacities will be improved in the areas of tax administration, project appraisal and evaluation, planning and designing departmental budgets based on MTEFs, and debt management.
- A project management unit will be set up in the finance department that will be supported by a technical assistance team. This team will have a one-to-one counterpart staffing of Government of West Bengal personnel to enable on the job-learning and knowledge transfer.
- The program proposes to strengthen the debt management function of the finance department through implementation of a debt recording and management system. The audit function of the tax directorate will be strengthened through development of an audit manual.
- Creation of employee and pensioner databases will help in proper resource planning.

Piloting new approaches

- Introduction of MTEF as a tool for multi-year planning and budgeting with an outcome orientation linked to performance targets for key spending departments will be a new approach at the state level to enhance the allocative efficiency of public resources.

Financing and leveraging

- The project is expected to develop capacity for designing feasible PPP projects in the state.

PROJECT BRIEF

Rural Cooperative Credit Restructuring & Development Program

PROJECT OVERVIEW

Women beneficiary of the program doing embroidery work

India's Co-operative Credit Scheme (CCS) constituted one of the world's largest rural finance scheme with about 135 million members around 1990s. However, share of the CCS in agricultural credit fell from 62% in FY1992 to 34% in FY2002. Government of India consequently set up a task force on revival of rural cooperative credit institutions in 2004 to develop a countrywide reform program. On government's request, ADB approved Rural Cooperative Credit Restructuring and Development Program for a record amount of $1 billion. The program is a package of reforms undertaken to (i) initiate legal and institutional reforms necessary for democratic, self-reliant and efficient functioning of small and marginal farmers; (ii) introduce measures to improve quality of management; and (iii) provide assistance to bring the system to an acceptable level of financial health. This program has links to the broader cooperative movement comprising processing, marketing, input distribution, dairy, and weaving, apart from providing a base for better access to more efficient and affordable financial services by the poor. The program is targeting 41 million cooperative credit societies members in the participating states.

LOAN DETAILS

EXECUTING AGENCIES

Banking Division, Ministry of Finance, Governments of Andhra Pradesh, Madhya Pradesh, Maharashtra, Rajasthan and Gujarat

MILESTONES

Dec 2006 - $1000 mn approved

Jan 2013 - $800 mn disbursed

Jun 2013 - Closing

OBJECTIVE

The goal of this ADB program is to assist the government in implementing its CCS reform agenda of (i) enhancing income and employment growth for rural poor, and (ii) improving rural households' access to affordable financial services. CCS focuses on five states - Andhra Pradesh, Bihar, Madhya Pradesh, Maharashtra and Rajasthan.

OUTPUTS

Key outputs under the program are presented in the table below:

Strengthened nationwide policy framework	• CCS preparation of nationwide reform package is being reviewed • MoUs have been signed by five participating states accepting the CCS reform package • State level implementation committee and district level implementation committees to oversee the CCS reform process are being established • NABARD has established department for cooperative

	revival reforms to support the CCS reform • National Implementation and Monitoring Committee and state task forces have been constituted and are operational
Amended legal framework for autonomous CCS operations	• Amendment to the Cooperative Societies Act, issuance of corresponding rules and regulations, assessment and amendment of NABARD Act and other acts are being carried out • Banking Regulation Act will be amended to introduce regulations at par with commercial banks
Enhanced institutional reforms for sustainability	• International best practices of accounting standards, management information system, computerization plans, human resource development plans, linking refinance to CCS reform implementation are being adopted • Model action plans for revival/development for primary agriculture credit societies (PACSs), district central cooperative banks (DCCBs) and state cooperative banks, including financial and operational benchmarks are being prepared • Democratic character of CCS are being restored with enhanced governance by election planning, annual audits and independent ratings of state cooperative banks/ DCCBs

OUTCOMES

Improved governance and efficiency

Restructuring measures such as revival/development action plans for PACSs, DCCBs and state cooperative banks are being implemented for improved governance, cost savings, and lower transaction costs. While ensuring prudent lending and investment decisions through effective formal regulation of state cooperative banks and DCCBs, the program will help harmonize and strengthen CCS regulation and improve its sustainability. It is expected that there will be a reduction of at least 5% in the share of non-performing assets in the portfolio of CCSs.

Improved access to affordable financial services

The program is facilitating greater access to cheap credit to small and marginal farmers, increase employment through diversification and new enterprises, improve responsiveness to emerging rural nonfarm enterprise opportunities, increase accumulation of financial assets and, therefore, improve risk management. An approximate growth of 5% is envisaged for such cheap credit lending during the program period.

WAY FORWARD

Upon program completion, the financial and organization structure of CCS is expected to be strengthened. The reforms are likely to be instrumental in making cooperatives independent and thereby, improve access to financial resources. This is expected to strengthen the rural financial sector, which is a major driving factor in facilitating inclusive economic growth.

INNOVATION IMPULSE

Systemic and transformational change

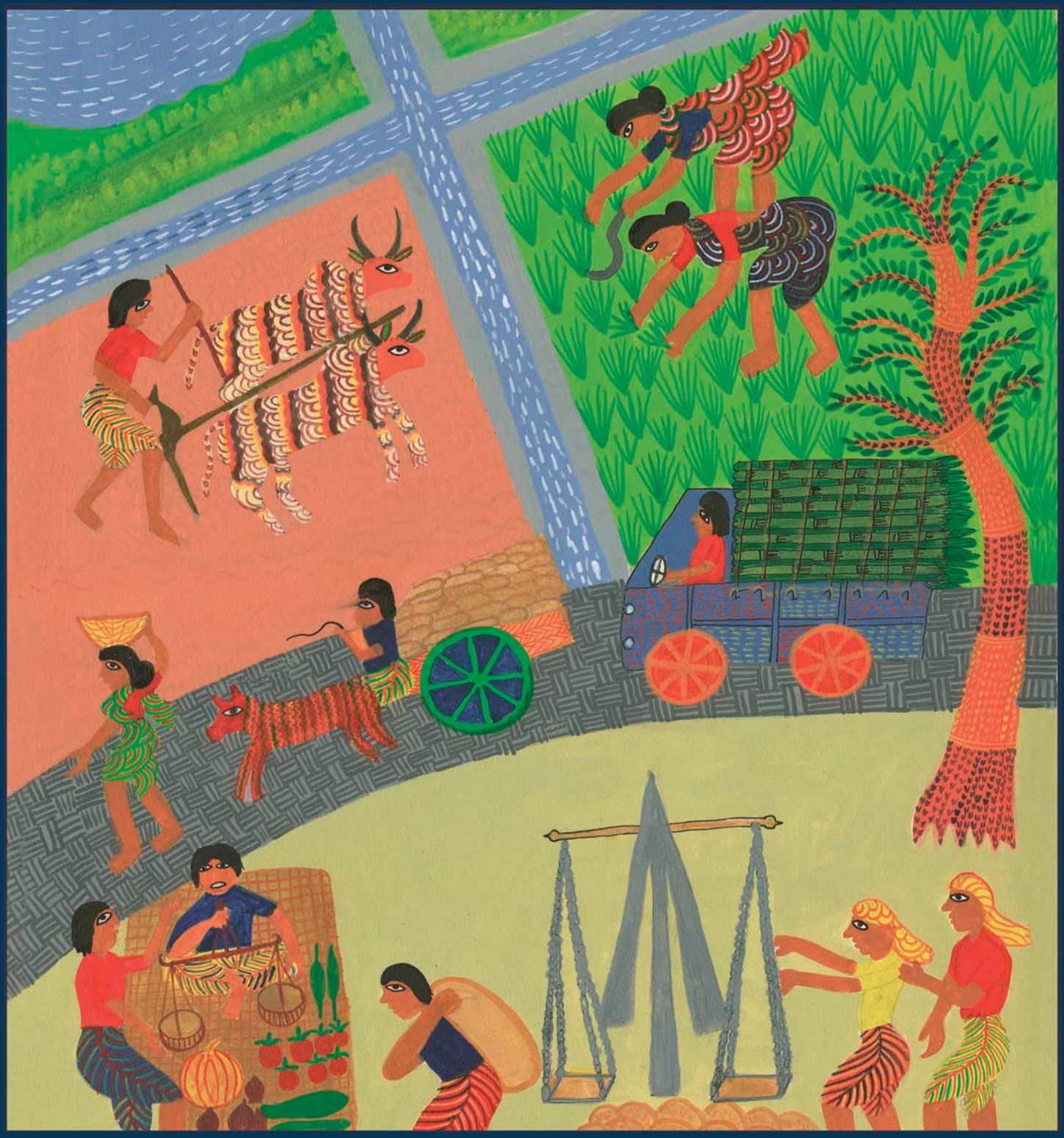
- Legal and regulatory framework will be established for the autonomous and efficient operation of CCS. Business plans and capacity will be established for product development and outreach.

Piloting new approaches

- Higher transparency and accessibility has been ensured by computerization and implementation of the common accounting systems.
- Cooperatives have been freed from state control through reduction of government equity to 25% and the number of government nominees being restricted to one in the districts.

Financing and leveraging

- Mobilizing financial resources upfront to ensure support to early adopters is expected to initiate a demonstration effect and encourage other states to join the reform program.



AGRICULTURE AND NATURAL RESOURCE MANAGEMENT

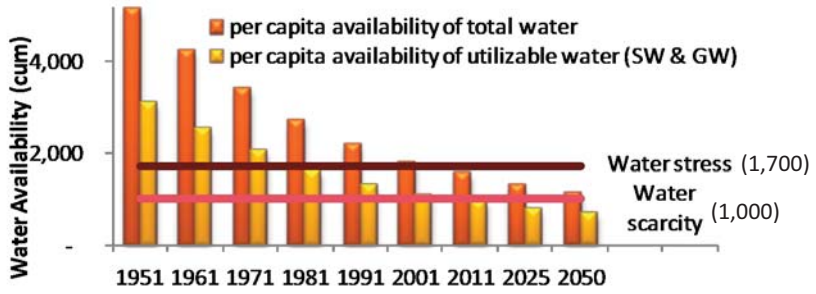
6. Agriculture and Natural Resource Management

Sector background and challenges

Although agriculture and allied activities account for only 14.1 % of GDP[45], its importance to the Indian economy is captured by the fact that 52% of India's workforce is employed in the sector[46]. Performance of the sector, thus, has large implications for welfare of a majority of India's population. While GDP from agriculture grew at an average of 3.6% during the 11th plan period (2007 -12), and agricultural production grew twice as fast as the population[47], India is still at a juncture where further reforms are required to achieve greater efficiency and productivity in agriculture. Some key issues facing the sector are as follows.

Water use efficiency. With 16%[48] of the world's population and only 4% of the world's fresh water, India is confronted by scarcity of water resources. Given that agriculture currently consumes 80% of the country's water resources, the sector faces the threat of inadequate availability of water for irrigation. Indeed, per capita availability of utilizable water had fallen to 'scarcity' levels by 2011, as shown in Figure 6.2. Given that water use efficiency is only at 38%, there is much scope for utilizing scarce water resources more efficiently.

Figure 6.2: Decline in per capita water availability (surface and ground water)[49]



Source: Census and Central Water Commission
Notes: GW: Ground Water; SW: Surface Water; cum: cubic meter; Figures for 2025 and 2050 are projected figures

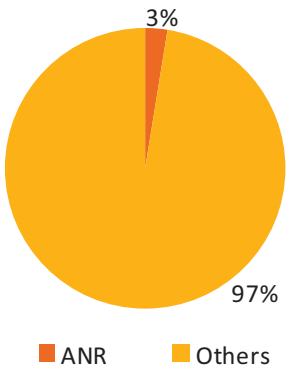


Figure 6.1: Agriculture and Natural Resource Management's share in ADB portfolio (1986-2012)

AT A GLANCE

- *Agriculture accounts for 52% of employment in the country and 14.1% of GDP.*
- *Agricultural production improved remarkably, growing twice as fast as population in the 11th plan period.*
- *However, reforms are required to achieve greater efficiency and productivity in agriculture.*
- *Agriculture currently consumes 80% of the country's water resources with a water use efficiency of only 38%.*
- *Increasing water use efficiency through efficient irrigation and flood control practices and systems, and effective water resource management are issues that need immediate attention.*

[45]As in 2011-12; Source: Status of Indian Agriculture, 2011-12, Department of Agriculture and Cooperation
[46]Source: NSS 66th Round
[47]Source: Agriculture and Food Management, Economic Survey of India, 2012-13
[48]All figures are sourced from Draft Twelfth Five Year Plan (2012–2017) Faster, More Inclusive and Sustainable Growth – Volume I, unless otherwise mentioned.
[49]Per capita availability of renewable fresh water has decreased from about 5,200 cum in 1951 to 1,584 cum in 2011 and is expected to decrease further to about 1,140 cum by 2050. Some of the major river basins like Krishna, Cauvery, Pennar, Mahi, Sabarmati, Tapi, Subarnarekha, East-flowing rivers between Mahanadi and Pennar, East-flowing rivers between Pennar and Kanyakumari, and West-flowing rivers of Kutch and Saurashtra including Luni are already water scarce while Godavari and Indus (up to the Indian border) are water stressed at present.

AT A GLANCE

- *To improve agricultural efficiencies and production, there is a need for upgrading post-harvest infrastructure, maintenance of irrigation systems, and spreading awareness amongst farmers.*
- *Improved project preparedness and a more proportionate spreading of available resources is required to avoid time and cost overruns in irrigation projects.*
- *Other challenges include narrowing the gaps between irrigation potentials created and utilized, and improving river basin planning and management.*
- *To achieve rapid, sustainable and inclusive agricultural growth along with efficient water resource management, the government has undertaken several programs in recent years.*

A farmer at the Gaohira subproject of the Odisha Integrated Irrigated Agriculture and Water Management Investment Program.

Maintenance of irrigation systems. As noted by the Central Water Commission (CWC), water use efficiency level in 30 completed major and medium irrigation projects is 38% on an average. This has been attributed to inadequate maintenance of canal and distribution systems, leading to seepages. Lack of proper regulation gates on head regulators of minor canals have led to uneven distribution of water. It is thus, required to improve the maintenance of canal and distribution networks to improve water use efficiency levels.

Major and medium irrigation projects. A study carried out by the 12th plan working group reveals that major irrigation projects have average cost overruns of 1,382%. The cost overruns were relatively lower for medium projects with the average being 325%. These overruns can be tackled through improved project preparation and implementation as well as by more proportionate spreading of available resources over project life cycle.

Irrigation potential created and utilized. The huge investments in irrigation made over the last 60 years led to nearly five-fold increase in irrigation potential—created through major and medium irrigation projects—from 9.72 million hectare (mha) in the pre-plan period to around 46 mha by the 11th plan period. The irrigation potential utilized was almost equal to the potential created in the pre-plan period (9.70 mha). However, during the 11th plan period it was about 35 mha, thus falling short of the potential created during the same period. In order to bridge this gap between the potential created and utilized, measures need to be undertaken to improve water discharge and distribution mechanisms, ensure correct recording of irrigated area and diversify cultivable land to other purposes within the command area.

River basin planning and management. River basins in India are an important source of surface irrigation for agriculture. Rapid urban and industrial growth is increasing water shortages in many river basins. On the other hand, over-capture of water within some basins such as the Krishna river basin, has led to more than usual water evaporation contributing to a change in the regional climate and temperature regimes. The Brahmaputra-Meghna, Ganga and Indus river basins have been facing the problem of flooding. An integrated approach to river basins management is, thus, an important area of focus for the government.

Post-harvest infrastructure for high value agriculture. Small and marginal farmers, constituting 80% of farming households, sell most of their produce in local markets at low prices due to inadequate post-harvest infrastructure. Improved post-harvest handling and processing is essential to ensure that high-quality products reach the markets and farmers get the right price for their produce. There is, thus, a need to undertake measures to improve the agricultural value chains and production systems in the country to save on intermediation costs and wastages. Diversification of agricultural activities through development of horticulture, dairying and other animal husbandry, and expansion of cash crops needs to be explored to increase sources of income for the rural poor.

Government of India's sector strategy

Given that agriculture is the main source of livelihood for majority of the rural population in the country, Government of India's strategy in the sector focuses on achievement of rapid, sustainable and inclusive agricultural growth along with efficient water resource management. In this respect, the government has undertaken several reform programs in the past decade. Key programs in recent years include (i) the Rashtriya Krishi Vikas Yojana (RKVY/National Agriculture Development Program), launched in 2007, to encourage states to draw up district and state agricultural plans and increase their own spending on the sector so as to reorient agricultural development strategies; (ii) the National Food Security Mission, also initiated in 2007, to increase production of

rice, wheat and pulses in districts of selected states that had lower productivity than the state average but had the potential to augment productivity and production of these three crops; and (iii) the National Water Mission (NWM), adopted under the National Action Plan on Climate Change in 2011, targeting an increase in water use efficiency by 20% and promoting basin level integrated water resource management.

The 12th plan aims at improving the viability of farm enterprises and returns on investments in the sector, increasing availability and dissemination of appropriate technologies, increasing plan expenditure on agriculture and infrastructure, and improving delivery of services and quality inputs. For expanding agricultural marketing and processing, it focuses on modernization of the *mandi* infrastructure with adequate provision for communication and transportation facilities and on empowering small producers through their organizations and marketing extensions. It also proposes a RKVY window for Public Private Partnership for Integrated Agricultural Development for States to facilitate large scale integrated projects led by private sector players with a view to aggregating farmers and integrating agricultural supply chains. This would help in leveraging corporate interest and marketing solutions to form Farmer Producer Organisations and infuse technology and capital to enhance farm production and value addition.

For ensuring proper operation and maintenance of major and medium irrigation systems, the 12th plan proposes strengthening incentives in irrigation service provision through rationalization and collection of irrigation service fee. It recommends setting up of a National Irrigation Management Fund to catalyze and support demand for irrigation management and institutional reform by farmers. The non-lapsable National Irrigation Management Fund will reimburse to each state irrigation department, a matching contribution to its own irrigation service fee collection from irrigators on a 1:1 ratio. The fund will encourage participatory irrigation management by providing a bonus on the portion of each state's irrigation service fee collection collected through water users associations (WUAs). This will expand resources with WUAs to undertake proper repair and maintenance of distribution systems and increase their stakes in water management.

A major thrust area of the 12th plan is completion of the huge backlog of ongoing major and medium irrigation projects by prioritizing allocation of investible funds to these projects, while taking up new projects only as a matter of exception. To check these huge time-overruns, the 12th plan proposes to put in place a systematic mechanism to monitor progress achieved and suggests measures needed to restore time schedules and link them to the annual allocation of plan resources to the states. The 12th plan aims to close the gap between irrigation potential created and utilized by at least 10 mha by prioritizing investments in Command Area Development and Management and restoring an additional 2.2 mha of lost irrigated potential through extension, renovation, modernization works in old major and medium irrigation projects. It proposes that all irrigation project proposals (major, medium and small) should include command area development works from the very beginning. This will ensure that all proposals plan for irrigation water from the reservoir to the farm gate and not just the present outlets.

For integrated water resources management, including integrated flood management, the 12th plan proposes setting up of river basin authorities with requisite managerial skills and appropriate delegation of powers. The CWC, Ganga Flood Control Commission and Brahmaputra Board under the Ministry of Water Resources (MOWR) will be required to play vital roles in the preparation of master plans for specific river basins. Strengthening of CWC will be required in view of the proposed expansion of its hydrological and flood data collection network, flood data transmission and management of floods. The National Water Academy, located at Pune, will be developed as a centre of excellence for international training programmes on matters pertaining to flood mitigation to share updated and globally available know-how under such training programmes.

ADB staff and representatives of the Department of Water Resources, Government of Odisha, discuss implementation experience of Tranche 1 of the Odisha Integrated Irrigated Agriculture and Water Management Investment Program.

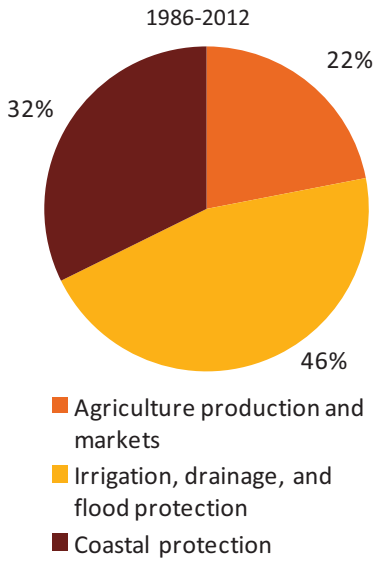
AT A GLANCE

- *Key focus areas of 12th plan include improving viability of farm enterprises and returns on investments in the sector, increasing availability and dissemination of appropriate technologies, increasing plan expenditure on agriculture, and improving delivery of services and quality inputs.*
- *Completion of huge backlog of major and medium irrigation projects, formation of river basin authorities, and launch of a National Mission for Sustainable Agriculture will be other major initiatives.*

AT A GLANCE

- *Agriculture and natural resource management was introduced as an agenda for ADB in India under the Country Strategy and Program 2003-06.*
- *Three main areas of ADB focus in the ANR sector have been (i) agriculture production and markets, (ii) irrigation, drainage and flood protection, and (iii) coastal protection.*
- *ADB has identified 8 main areas for inclusive agricultural growth and market development in India. It has also supported innovation in several areas of the sector.*
- *ADB has been providing support for the promotion of participatory irrigation management, upgrade of major and medium irrigation schemes, and development of capacities of stakeholders in irrigation management.*
- *ADB has also designed and implemented projects to address constraints hampering high value agriculture.*

Figure 6.3: Sub Sectoral Split



The 12th plan proposes launch of the National Mission for Sustainable Agriculture (NMSA). Conceived originally as part of the NAPCC, this aims at transforming Indian agriculture into a climate-resilient production system through adoption and mitigation of appropriate measures in the domains of both crops and animal husbandry. Since a number of activities relating to sustainable agriculture are already parts of other proposed missions, NMSA as programmatic intervention, will primarily focus on synergising resource conservation, improved farm practices and integrated farming for enhancing agricultural productivity especially in rain-fed areas. Key deliverables under this mission will be developing rain-fed agriculture, natural resource management, enhancing water and nutrient use efficiency, improving soil health and promoting conservation agriculture.

ADB's sector assistance

ADB's agriculture and natural resources (ANR) sector operations in India started in 2005 with a range of sector studies, TA projects and stakeholder consultations to establish and share knowledge on sector needs and priorities. Although, ANR forms only 6%[50] of ADB's total assistance to India in the period 2007-12, several measures have recently been undertaken by ADB, which are expected to have a significant impact in the long-term in addressing the challenges faced by the sector.

Three main areas of ADB focus in the ANR sector have been (i) agriculture production and markets; (ii) irrigation, drainage and flood protection; and (iii) coastal protection. As shown in Figure 6.3, irrigation, drainage and flood protection have received the maximum share (46%) of ADB's sector assistance.

Based on lessons learned from sector studies, stakeholder discussions and success from other regional countries, ADB has identified the following main areas for inclusive agricultural growth and market development in India: (i) empowerment of small and marginal farmers; (ii) commercialization of high-value crops; (iii) expansion of support services; (iv) export promotion; (v) value addition; (vi) access to finance; (vii) policy reforms; and (viii) more cooperation between the public and private sector. ADB has been undertaking projects designed to bring innovations in irrigation improvement and river basin and water resource management, agribusiness, flood management and coastal protection.

Interventions in water resource management. ADB's first project in the ANR sector was undertaken for the state of Chhattisgarh in 2005. Support was provided in promoting participatory irrigation management and strengthening of WUAs in line with the government's strategies. It also supported rehabilitation and up-grade of major and medium irrigation schemes and promoted crop diversification with focus on less water-intensive *rabi* crops. ADB has been following the strategy of developing capacities of stakeholders in irrigation management in order to improve irrigation efficiency.

Interventions in post-harvest infrastructure development and promoting private sector participation. ADB has designed and implemented projects to address constraints hampering high value agriculture, including weak post-harvest and market infrastructure and fragmentation in value chains. This is also one of the priorities set in the 12th plan. One such project is Agribusiness Infrastructure Development Investment Program. ADB's private sector operations take into account new investments in agribusiness to support the government's strategy of developing high value agriculture. ADB is assisting the government build marketing networks that operate as linked hierarchies from modern terminal markets through agribusiness centers to rural centers, including on-farm processing facilities. It is also promoting private sector involvement for developing modern food processing infrastructure and post-harvest handling systems that reduce waste and increase returns throughout the value chain.

[50]All figures in this sub-section— ADB's sector assistance— have been sourced from ADB.

Irrigation and agriculture infrastructure development projects represented 55% of ADB's planned and approved investments in agriculture sector in 2011[51].

Promoting public private partnerships in irrigation. ADB's India Resident Mission undertook a study in July 2011 to explore the scope of promoting PPPs in irrigation and drainage sectors in India. It concluded that standalone irrigation projects may not be economically attractive for private partners even with some viability gap funding. Other options for revenue generation and sharing need to be explored such as flood control projects linked with expressways and speedways on embankments, collection of tolls from road use, cess from protected areas, and development of tourism along embankment roads or of micro-hydroelectric schemes linked through sharing of power. Promotion of pisciculture, development of water front areas, facilitation of cooperative or contract farming, and agribusiness value chain development are some additional options which need to be considered to make PPP projects in irrigation sector viable. Through its PPP initiative, ADB aims to support promotion of public-private investments for augmentation of storage and market facilities, especially for food grains.

In the next five years, ADB has proposed to keep its sector focus mainly on water resource management and agribusiness. These will include three key areas of the government's National Water Agenda, which are vital for climate change adaption: (i) improving water use efficiency/water productivity in irrigation, (ii) reducing water induced disaster impact, and (iii) developing river basin and water resource management. ADB's programs will support adaption of the Cauvery delta to the impact of sea level rise and reduction in river run-off. It will focus on developing options to improve river basin and water resource management and water use efficiency in Karnataka, India's one of the most water stressed states.

ADB has established close working relationship with MOWR, CWC and various state water resource departments. It has been undertaking discussions with MOWR to develop a national water use efficiency program in order to support NWM and 12th plan water reform agenda. A strategic framework for meeting the climate challenges posed in the water sector will be developed, assessing potential for improving water use efficiency, and developing a roadmap for effective institutions, specialist training, and awareness building for Integrated Watershed Management Program.

ADB realises the vulnerability of the agriculture sector to climate change including projected changes in temperature and rainfall, increased frequency and intensity of extreme weather events such as flood and drought, a rise in sea level, and intensification of storm surges. It, hence, plans to design its future agriculture investment projects keeping in mind the consequences of climate change.

AT A GLANCE

- *Through its PPP initiative, ADB aims to support promotion of public-private investments for augmentation of storage and market facilities, especially for food grains.*
- *In the next five years, ADB has proposed to keep its sector focus mainly on water resource management and agribusiness, thereby including 3 key areas of the government's National Water Agenda.*
- *ADB is also in discussions with MoWR to develop a national water use efficiency program to support the National Water Mission and the 12th plan water reform agenda.*

Interaction of ADB team with the water user's association of the Pipariya

[51]Source: Guidelines for climate proofing, investment in agriculture , rural development and food security

Table 6.1: List of ADB projects in Agriculture and Natural Resource Management Sector (1986-2012)

S. No.	Project name	Type of loan	Year of approval	Original loan amount ($ million)	Status
1.	Chhattisgarh Irrigation Development Project	Regular	2005	46.1	Ongoing
2.	Orissa Integrated Irrigated Agriculture & Water Management Investment Program	MFF	2008	188.2	Ongoing
3.	Agribusiness Infrastructure Development Investment Program	MFF	2010	170	Ongoing
4.	Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program	MFF	2010	120	Ongoing
5.	Sustainable Coastal Protection and Management Investment Program	MFF	2010	250	Ongoing

CASE STUDY

Chhattisgarh Irrigation Development Project

"*Under the Kosrangi scheme water users association, the number of farmers cultivating diversified rabi crops has gone up several fold. As a result, irrigation and crop intensity have also increased significantly*"
— Vishnu Prasad, from Bana village, Chhattisgarh.

Farmers meeting for *rabi* planning being conducted as part of the project

The Chhattisgarh Irrigation Development Project (CIDP) was undertaken by ADB in 2005 to address the problem of low irrigated agricultural productivity. The agriculture sector in the state suffered from poor crop diversification and inefficient irrigation systems. Only wet season rice was grown in most areas, although *rabi* cropping, supported by a robust irrigation system, presented a potentially profitable opportunity to improve the livelihood of farmers. Irrigation system performance was weak primarily due to inadequate operations and maintenance (O&M), poor service delivery by the state water resources department (WRD) and weak empowerment and capacity of water users associations (WUAs). These WUAs were formed in 1999 under Madhya Pradesh Participatory Irrigation Management (PIM) Act.

CIDP has been designed to assist Government of Chhattisgarh to (i) improve ability of WRD to better manage irrigation systems; (ii) develop capacity of WUAs to play a principal role in management and O&M of irrigation systems; (iii) undertake rehabilitation and upgrade (R&U) of minor and medium irrigation systems through a participatory process with WUAs; and (iv) review and improve the practices adopted by WUAs and farmers. Key outputs of the project are:

- **Developed irrigation infrastructure.** CIDP is undertaking R&U of 144 medium and minor irrigation schemes covering over 173,984 ha, including lining of canal systems, repair of damaged structures and cross drainage works, and construction of outlets to improve water distribution. As of January 2013, 134 schemes covering 151,210 ha have been completed. Remaining 10 schemes are expected to be completed shortly.

LOAN DETAILS

EXECUTING AGENCY

Water Resources Department (WRD), Government of Chhattisgarh

MILESTONES

Mar 2005 - $46.1 mn regular loan approved

Jan 2013 - $31.5 mn disbursed

March 2013 - Closing

- **Promoted PIM.** CIDP involves activities for promotion and operation of the PIM Act. It conducts all R&U work through a participatory process that actively involves WUAs. This promotes a sense of ownership amongst WUAs and facilitates them in assuming responsibility for management and O&M of irrigation systems. The project has supported development of a revised PIM Act, with some policy changes, ensuring that irrigation systems that receive R&U are assigned to their own WUA, which will be responsible for O&M.
- **Promoted development of WUAs.** Under CIDP's Intensive Intervention Program (IIP), WUA's capacity development is being conducted through a "hand-holding" process following a "learning-by-doing" approach, i.e. experiential capacity building through WUA-managed irrigation O&M and agriculture interventions under IIP. WUAs are being involved in input-output marketing and are developed as "multi-functional organizations". Capacity development support, particularly to make PIM Act operational, has been delivered initially under 25 CIDP pilot schemes which has later been extended to all schemes under IIP through non-government organizations (NGOs). In IIP areas, WUA-managed: (i) irrigation water distribution, (ii) seed supply, (iii) supply of other inputs, and (iv) marketing (partnerships with private sector) are being facilitated. In addition, periodic capacity building through formal sessions in the balance CIDP systems and state-wide basic (formal) training with focus on (i) implementation of the PIM Act; and (ii) sharing the strategy, process and experience of the IIP with non-CIDP WUAs have also been conducted.

  To ensure financial sustainability of WUAs, Government of Chhattisgarh has approved an increase in the proportion of water fee to be shared with WUAs from 25% of total fee collected to 50%. Amendment to PIM Act to allow WUAs to retain part of the collected water fee at the source is under consideration of the Government of Chhattisgarh. Moreover, many WUAs have increased their profit by producing and/or organizing seeds in-house and engaging in input and output marketing. They have successfully developed marketing plans and managed output marketing for schemes under IIP. In *rabi* 2011-12, 69 WUAs of 40 schemes under IIP managed marketing of 2,640 tonnes of their produce to the private sector and received better prices. Four producer companies, covering WUAs of four irrigation schemes, have been formed and are active.
- **Supported institutional development.** Under CIDP, four new operational units have been set up in WRD, while three regional training centers have been established in Ambikapur, Bilaspur, and Raipur for undertaking capacity development and PIM activities. Training is being provided to WRD staff on technical issues including PIM aspects.
- **Diversified cropping patterns.** *Rabi* diversification has been introduced to all schemes under IIP. Also, farmers took up non-paddy crops like wheat, groundnut, mustard, sunflower, gram, maize etc. During *rabi* 2012-13 cropping intensity reached 46% as compared to 40% during 2011-12 and 25% during 2010-11 *rabi* seasons.

KEY DEVELOPMENTAL OUTCOMES

Empowered WUAs. To foster greater ownership and facilitate handover of irrigation schemes to WUAs, CIDP has been promoting community participation at all stages of the R&U process. Walk-through surveys of irrigation system are undertaken by WRD staff, WUA representatives, and other stakeholders to jointly assess the requirements for R&U. WRD monitors the quality of works along with WUAs and the last payment to contractors is issued only after concurrence from the concerned WUA. WUAs are also encouraged to take up construction of small

Institutional development

CIDP has been providing capacity development support to WRD to improve its capacity to manage irrigation systems. It has also been supporting WUAs to enable them to carry out O&M of irrigation systems. Capacity development support, particularly to make PIM Act operational, is being delivered. Community participation is being promoted at all stages of R&U process to foster greater ownership and facilitate handover of irrigation schemes to WUAs.

Technical assistance

A TA of $2.7 million, with $2.15 million financed by a grant from the Government of the United Kingdom, has been integrated with the project under the WUA strengthening component. ADB is in-charge of administration of this grant. The TA includes (i) the WUA capacity development program that provides WUA training; (ii) training of trainers for contracted and WRD staff; (iii) designing ways to promote WUA participation in irrigation system R&U; (iv) strengthening institutional framework of PIM and WUAs; and (v) development of a comprehensive monitoring and evaluation (M&E) program. M&E activities will involve all stakeholders with focus on livelihood impacts.

Farmers were trained to improve agricultural practices as a part of the project

priority R&U works and field channels.

Improved applicability of PIM Act. Chhattisgarh's PIM Act has been made more progressive to (i) ensure greater representation of women and weaker sections of the society, and (ii) enhance financial autonomy of WUAs to undertake construction work and O&M.

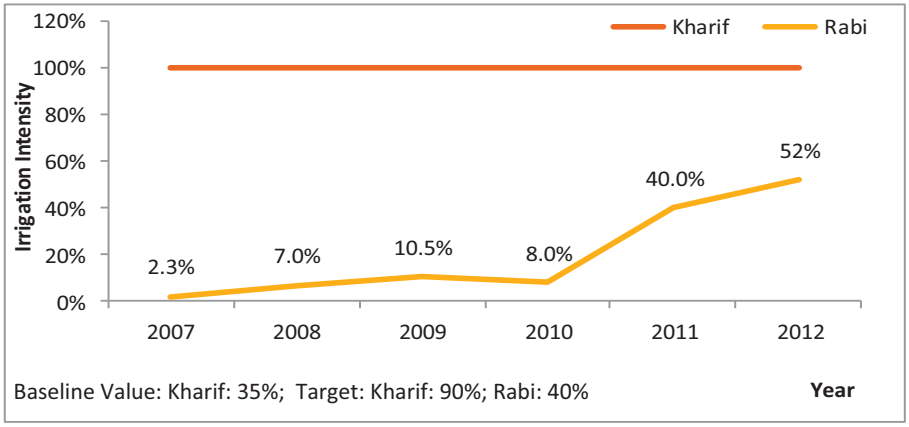
Effective gender mainstreaming. The project includes measures to ensure that benefits to women are maximized. Under the revised PIM policies, following institutional changes have been made: (i) membership to the WUA is on a household basis so that both men and women are members and have the right to attend meetings and cast votes; and (ii) women, who are part of a WUA member household, are able to stand for elections and hold office on the WUA management committee and any subcommittee. An awareness campaign, undertaken in 2007, to promote gender equality revealed that: (i) over 33% of women became elected members of territorial constituencies of WUAs, (ii) 2,487 women were elected as WUA members out of a total of 8,797 members, and (iii) eight women became presidents of WUAs.

Improved agricultural practices. Awareness created under CIDP through IIP, has brought about a significant change in the mindset of farmers and they are, as a result, diversifying their cropping patterns to more profitable cash crops. Number of farmers cultivating diversified *rabi* crops has increased several-fold under CIDP and *rabi* diversification has now been introduced to almost all IIP schemes.

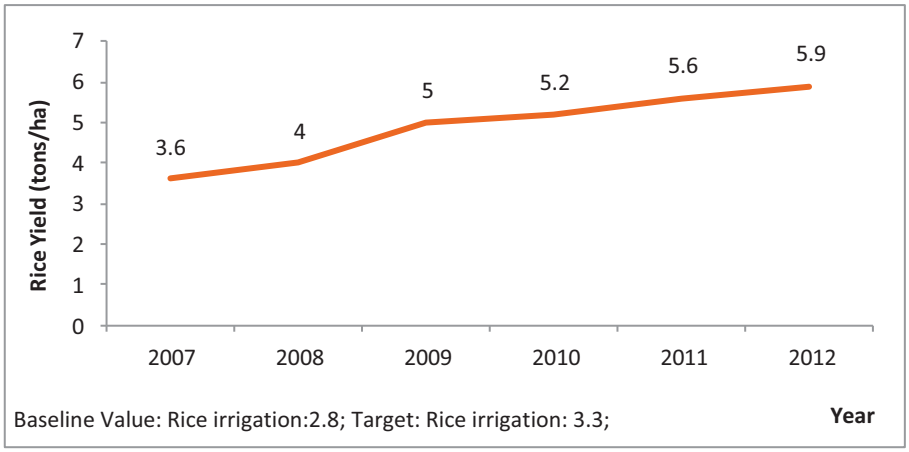
Irrigation area under the project has increased

Improved irrigation intensity and increasing yields. Measures under CIDP have contributed to an increase in irrigated cropping intensity and crop yields for rice (irrigated and rain-fed) and wheat.

Growth in irrigation intensity during project period



Growth in average rice yield during project period



Production has increased due to better irrigation facilities with crop yield increasing from 3.6 tons/ha in 2007 to 5.9 tons/ha in 2012.

INNOVATIONS AND GOOD PRACTICES

With support provided under CIDP, Chhattisgarh adopted a progressive PIM Act in 2006 which ensures participation by farmers in irrigation management. It also promotes equitable distribution and efficient use of water through empowerment and capacity building of WUAs. For the first time in India, seats have been reserved for women and weaker sections of the community (SC, ST, and OBCs) in the management committees of WUAs. Awareness campaigns are being conducted to promote gender equality and for ensuring percolation of the demonstrative effect of women's empowerment to other sectors.

CIDP targets to strengthen the irrigation network and ensure sustainable irrigation and agricultural practices through institutional strengthening of WRD and WUAs and conducting R&U of irrigation schemes. R&U activities include lining of canal systems, repairs of damaged structures and cross drainage works, construction of new structures, sluices, and outlets to improve water distribution and reduce water losses.

KEY LEARNINGS

CIDP has been promoting crop diversification by undertaking awareness programs. Research and surveys by project staff, agricultural specialists, and NGOs have revealed that farmers of some villages are constrained to cultivate only one paddy crop a year due to lack of availability of adequate water to irrigate *rabi* crops. Farmers are, thus, being trained on irrigation water management in *kharif* season so as to save water for *rabi* crops. As a result, a culture of growing crops in both *kharif* and *rabi* season is developing. This has led to increased incomes for farmers. Increased production is also generating substantial on-farm employment for landless laborers, many of whom were previously forced into seasonal migration due to underemployment.

Improving irrigation infrastructure, while necessary, is not sufficient in itself, to ensure that irrigation water is available equitably and used efficiently and sustainably. Other key institutional changes such as, capacity development of WRD and operationalizing and empowerment of WUAs, are also essential. These areas are also targeted under CIDP.

CIDP has followed a comprehensive approach in promoting legal and institutional changes while at the same time supporting farmers to take on their new responsibilities, change their practices and engage collectively in more remunerative farming. Higher incomes and better organization is the key for farmers to take on the responsibility for managing their irrigation systems.

Improving irrigation water management

CIDP staff, along with agriculture specialists and NGOs, had undertaken a survey in Dhaurabata village in Kasol block of district Raipur, Chhattisgarh, where farmers practiced only traditional farming. It was found that the farmers were constrained to one paddy crop in kharif season per year due to lack of irrigation water availability for rabi crops and little exposure to advanced agricultural techniques. Subsequently, CIDP staff trained farmers in improving irrigation water management during kharif season so as to save water for the rabi crops. They also provided them with the required know-how and seeds for rabi crop cultivation. This motivated 80 farmers of Dhaurabata and two neighbouring villages (Simiriya and Kasdol) to sow wheat in 100 acres of land on a trial basis. Based on successful trial runs, farmers in these villages have made it a regular practice to sow and take advantage of two crops in a year and thus, have higher incomes. This practice is being gradually adopted by farmers in nearby villages.

PROJECT SUMMARY

RATIONALE

- Low irrigated productivity, inspite of abundant agricultural land, was one of the key causes of rural poverty in Chhattisgarh.
- Inefficient water management and operations and maintenance were the main reasons for poor irrigation facilities.
- Farmers grew only wet season rice although *rabi* cropping, supported by irrigation facilities, provides a high-value opportunity to improve income levels.
- Water resources department was in need of intensive training to improve service delivery.
- WUAs in the state needed greater empowerment and capacity building.
- Investment in irrigation was Government of Chhattisgarh's key strategy to improve food security, reduce poverty and encourage rural development.
- ADB undertook the CIDP to support Government of Chhattisgarh in implementing its strategies.

DELIVERABLES

Improved irrigation infrastructure

Target	Achieved
Rehabilitation and upgrade (R&U) of 144 medium and minor irrigations schemes over 173,984 ha	R&U works of 134 schemes covering 151,210 ha complete (as of Jan 2013)

Empowered WUAs

- Capacity development support to WUAs delivered in 25 CIDP pilot schemes
- Increase of water fee returned to WUAs from the standard 25% of total fee collected to 50%

Greater enforcement of PIM

- Enhancement of financial autonomy of WUAs to make PIM Act more progressive
- Trainings of farmers on irrigation water management in *kharif* season to save water for *rabi* season
- Reservation of at least 33% seats in WUAs' management committees for women
- Revision of PIM Act with policy changes ensuring active involvement of WUAs

Rabi diversification

- Promotion of *rabi* cropping through efficient irrigation water management techniques
- *Rabi* diversification extended to 69 irrigation systems

ACHIEVEMENTS

- Irrigation intensity for *rabi crops* increased from 2.3% in 2007 to 52% in 2012, overshooting its target of 40% (to be achieved by the end of the project)
- Irrigation intensity for *kharif* crops has remained at 100% since 2007, overshooting its target of 90% (to be achieved by the end of the project).
- Rice yield has increased from the baseline value of 2.8 tons/ha to 5.9 tons/ha in 2012 indicating a jump of more than 100% and over achievement of its target value of 3.3 tons/ha.
- 2,487 women (28% of total members) were elected as members and 8 women were elected as presidents of WUAs.

CASE STUDY

Orissa Integrated Irrigated Agriculture and Water Management Investment Program

"We can finally reclaim our land and begin cultivation once the field irrigation channels are completed under the program."
--- Pankaj Behara and Mandan Mohan Sahu, farmers

Orissa Integrated Irrigated Agriculture and Water Management Investment Program has been supporting the institutionalizing of WUAs including equal representation of men and women, with one-third seats in the executive committees reserved for women.

LOAN DETAILS

EXECUTING AGENCY

Department of Water Resources, Government of Odisha

MILESTONES

- **Sept 2008 - $188.2 mn approved for MFF**
- **Sept 2008 - $16.5 mn approved for Tranche 1**
- **Jan 2013 - $9.3 mn disbursed**
- **Sept 2017 - Closing**

Agriculture has been the backbone of Odisha's economy, accounting for 33% of the state's domestic product (as of 2008) and employing over 60% of total labor. In the pre-project period, the state's value of agriculture output per hectare (ha) was lower than the national average due to low yields and low cropping intensity. Diversification in cropping patterns was not widely adopted and food crops accounted for 75% of the cropped area against a national average of 67%. Majority of the agricultural land, although equipped with irrigation facilities, barely received any irrigation or suffered from irregular water supply due to poor system design, inefficient operation, lack of field channels, limited accountability entrusted to farmers in system management, and insufficient maintenance.

Government of Odisha, thus, identified improved performance of existing irrigation infrastructure in partnership with WUAs as a priority, to expand reliable irrigation and increase value of agricultural outputs. Government of Odisha aims to (i) improve the sector's institutional structure including enhanced accountability of Department of Water Resources (DOWR) to WUAs; (ii) refine the WUA legal framework; (iii) operationalize participatory irrigation management (PIM); and (iv) attain sustainable Operations and Maintenance (O&M) financing and management.

In support of these objectives of Government of Odisha, ADB approved the Orissa Integrated Irrigated Agriculture and Water Management Investment Program (OIIAWMIP), with a value of $188.2 million, for the four northern river

basins of Odisha (Brahmani, Baitarani, Budhabalanga, and Subarnarekha) and parts of Mahanadi River delta. The program targets to strengthen irrigation schemes covering around 0.2 million ha and, thus, contribute towards increased incomes and improved livelihoods in the state. Key outputs of OIIAWMIP are:

- **Improved irrigation Infrastructure.** The program has been helping in rehabilitation and upgrade (R&U) and extension of four major and medium irrigation schemes and 650 community-based minor lift irrigation schemes, which should cover a net irrigated area of 70,000 ha by 2013. As of December 2011, upgrade of 200 community-based minor lift irrigation schemes is in advanced stages of implementation while another 200 are being reviewed for implementation. For the four targeted major and medium schemes, work is in full swing in the command areas of Taladanda, Sunei, Gohira, and Remal, which cover some of the poorest districts of Odisha. Civil work in all four schemes for modernization of main and distribution canals is ongoing. Programs for development of irrigated agriculture through collective actions, as defined in WUA micro plans, have been completed for 96 WUAs out of 122 WUAs targeted under the program. Plans for sustainable O&M systems in four schemes have been prepared and are under review.
- **Institutionalized WUAs.** ADB is working closely with DOWR and Department of Agriculture (DOA) to make PIM operational through WUAs. Effort is being put to institutionalize WUAs by mobilizing local farmers and by building their awareness and capacity in PIM and agriculture planning so that they can gradually take greater responsibility for O&M of irrigation infrastructure being created under the program. The program is supporting strengthening of 122 WUAs or *pani panchayats*. Participatory micro-planning for one major and three medium schemes has been undertaken. Of the 122 WUAs, 69 WUAs have already prepared the micro-plans and an additional 26 WUAs have started the process of contracting a non-government organization for the same. Odisha's WUA Act has been amended to ensure (i) greater and equal representation of head, middle and tail end farmers and women; (ii) institutional continuity of WUAs by introducing overlapping and extended tenure of *chak* (turnout) and executive committee members; and (iii) women's participation by reserving one-third seats in executive committees. The State Water Policy has also been revised and approved.
- **Strengthened institutions.** A specialized multidisciplinary PIM-Command Area Development (CAD) Directorate has been set up in Odisha DOWR. The Directorate has appointed multidisciplinary experts in the areas of capacity development, CAD, on-farm water management, agriculture and marketing, environment, and vulnerable people's development. The Directorate has initiated state-wide programs for WUA awareness and promotion. A comprehensive action roadmap has been drafted for strengthening water management to meet the increasing demand for water while maintaining sound basin water balance and safeguarding water security for basic human needs, river environment and livelihoods of small farmers. A reorganization plan for DOWR for improving client orientation has also been approved. The program has also undertaken to improve performance of the Water and Land Management Institute as a research and training institution.
- **Diversifying crops and contract farming.** Unless cropping patterns are in line with agro-climatic conditions and water resource endowment of a region, even the best designed irrigation network will not be sustainable over the long run. The program encourages farmers to cultivate a diversified range of crops, especially those that are water efficient. Also, discussions with WUAs have revealed the importance of encouraging localized food processing units and contract farming. Farmers can enter into contracts for selling their produce to firms in return of genetically-superior high yielding varieties of seeds, planting

Institutional development

The program is supporting strengthening of DOWR and WUAs by: (i) establishing a specialized PIM-CAD Directorate in DOWR with multidisciplinary experts; (ii) establishing and upgrading O&M guidelines and the management information system for performance monitoring and planning; (iii) operationalizing third-party internal technical auditing using externally hired experts; (iv) training DOWR staff and WUAs; (v) undertaking awareness campaigns for PIM; and (vi) setting up staff incentive and performance evaluation systems to internalize PIM.

Technical assistance

In March 2007, Government of Odisha promulgated the revised State Water Policy (SWP) which set out the step-by-step actions to introduce and operationalize Integrated Water Resource Management (IWRM), to address issues of competition among bulk water users and environmental requirements. Building on the government's initiative, a technical assistance (TA) was provided to support the initial process of implementing the SWP. A grant for institutional development of IWRM was implemented in 2010-2011. Total cost of the TA was $313,000 out of which $250,000 was provided by ADB Water Financing Partnership Facility on a grant basis. The remaining $63,000 was financed by Government of Odisha. The TA has led to a recommended institutional framework for IWRM systems, a short- to medium-term IWRM roadmap and the gazette notification of a river basin organization in the Baitrani river basin.

Joint assessment of the irrigation distribution network with DOWR to consider options for modernization and improved system performance

materials, efficient water and fertilizer management systems and agronomical guidance.

KEY DEVELOPMENTAL OUTCOMES

Established sustainable irrigation systems. The program aims to establish productive and sustainable irrigation systems through renovation of existing facilities and associated infrastructure and provision of O&M support in a command area of 215,000 ha. It is, thus, supporting implementation of R&U of select major and medium irrigation schemes and community-based minor lift irrigation schemes. The program targets to increase (i) irrigated area by 40%, (ii) CI by 20% (including that of high value crops by 10%), (iii) crop production by 50%, and (iv) water use efficiency by 10% over the life of this program.

Empowered WUAs. WUAs will have a major role in the process by endorsing implementation plans, monitoring program delivery, and executing minor civil works. Regular sub-project implementation office and WUA meetings will be institutionalized as a major forum for decision making, thus empowering WUAs.

Enhanced gender impacts. Gender action plan prepared under the program includes (i) creating a staff position in the DOWR PIM–CAD directorate to look after social and vulnerable groups; (ii) developing training programs for program staff to enhance gender participation; (iii) increasing the number of women engaged as field implementation team members (towards 20% of total), with increased female staff in the DOWR; (iv) promoting women representatives elected to WUAs following the WUA Act being revised; (v) establishing links with the Department of Women and Child Development, (vi) forming women's groups and delivering programs in the WUA; and (vii) undertaking gender-disaggregated surveying and monitoring.

Access to markets can often be difficult for remote communities of Odisha with reliance on animal traction limiting the opportunities for more perishable crops.

Enhanced income and livelihood opportunities: The program aims to directly improve the incomes and livelihoods of about 1.7 million people by raising performance of 215,000 ha within command areas of existing irrigation schemes. Increased agricultural production will lead to increased labor opportunities, enhanced incomes and better nutrition. The social strategy adopted under the program aims to enhance participation of the poor in WUAs, linking them to existing poverty reduction programs of the Government of Odisha such as forming self help groups and facilitating delivery of rural credit.

Carrying water can be an arduous task for remote rural communities of Odisha. The ADB program provides shallow wells and hand pumps for those communities which are entirely reliant on the irrigation system for household water supply.

INNOVATIONS AND GOOD PRACTICES

The program combines R&U of irrigation infrastructure with institutional reforms including support to Government of Odisha in establishment and operationalization of IWRM. This is to ensure water security for essential human use, including by marginal irrigation farmers, and for environmental sustainability. A participatory river basin organization is also being established in the Baitarani River basin to support local initiatives toward this end.

ADB, through this program, has followed the strategy of strengthening irrigation network and ensuring sustainable irrigation and agricultural practices with promotion of PIM, i.e., asset creation with improved service delivery through empowerment of WUAs. OIIWAMIP targets to make the state irrigation and agriculture departments more "farmer focused" and multi-disciplinary, and also to increase the involvement of NGOs in empowering rural communities.

KEY LEARINGS

Constructing good quality and durable irrigation infrastructure, while important, is not adequate, especially in an environment of growing water stress and uncertain

rain patterns. ADB's major efforts have, thus, been channeled toward working closely with DOWR and DOA to make the PIM Act operational through WUAs. Most WUA members are enthusiastic and appreciate the need to take a more proactive role in managing and maintaining fields and small irrigation channels and following a mixed and sustainable cropping pattern including vegetables, groundnuts, wheat, mustard, and cash crops, as well as water-intensive crops such as paddy. Agriculture and livelihood development related activities have been initiated by many of these WUAs. Ensuring empowerment, effectiveness and sustainability of WUAs requires long-term capacity building and mentoring. This is a far more challenging task than that of building quality irrigation infrastructure. The PIM Act, if made operational effectively, has the potential of truly transforming rural communities in Odisha and other states.

Capacity building and livelihood enhancement of poor water users

A Japan Fund for Poverty Reduction (JFPR) grant is under implementation in parallel to the loan program. It focuses on poor water users, marginal cultivators (including sharecroppers and landless people), women, scheduled tribes, and scheduled castes benefitting from irrigation systems financed under OIIAWMIP tranche 1 in Sunei, Remal, Gohira medium irrigation subprojects[52] and the Taladanda major irrigation subproject1. These cover a total of 55,300 ha with 121 WUAs. Many of the poor water users are landless people who depend on agricultural and casual wage labor, sharecropping of tribal and low castes origin with very marginal landholdings for subsistence purposes in the tail end of the system, which is often deprived of reliable irrigation supplies. The overall goal of the JFPR project is poverty reduction through capacity building and livelihood enhancement of poor and marginalized water users/ cultivators in the OIIAWMIP subproject command areas. Specifically: (i) increased equitable representation of disadvantaged people in WUAs of four subprojects; (ii) increased incomes from on-and -off farm activities of the poor; and (iii) improved livelihood activities to support increase in agriculture production and incomes. The grant is for $2 million with an addition $1 million provided by Government of Odisha. The grant has a three year implementation period which commenced in 2011.

[52]As defined by the Ministry of Water Resources, Government of India a medium system has a cultivable command area between 2,000 hectares to 10,000 hectares and major system is greater than 10,000 hectares.

PROJECT SUMMARY

RATIONALE

- Irrigation system in Odisha had poor design with inefficient operation and maintenance, lack of field channels and limited accountability entrusted to farmers in system management.
- Value of agriculture output per ha was lower than national average.
- Over 30% of area accounted under irrigation received negligible irrigation.
- Government of Odisha aimed at improving the existing inefficient performance of irrigation infrastructure in partnership with WUAs.
- ADB undertook the Orissa Integrated Irrigated Agriculture and Water Management Investment Program to support Government of Odisha in achieving its objectives.

DELIVERABLES

Improved irrigation infrastructure

Target	Achieved
Minor lift irrigation schemes: renovation of 200 systems in years 1-2 and 450 systems in years 3-4	200 schemes in advanced stage of implementation

Operationalized PIM and WUAs

Target	Achieved
Strengthening of 122 WUAs with micro planning	Done for 69 WUAs. 26 WUAs started process

- Awareness campaigns and capacity building of WUAs to take responsibility of operation and maintenance of irrigation facilities
- Revision of State Water Policy

Institutional strengthening of DOWR

Establishment of specialized multidisciplinary PIM-Command Area Development Directorate

Setting up of quality control cell

DoWR

Reorganization plan for improving client orientation

Implementation of state-wide programs for WUA awareness and promotion

Crop diversification

- Introduction of field channels for efficient water distribution to tail-ends that will put an end to plot-to-plot flooding, constraining crop choice
- Intensification of staple crops to increase food self-sufficiency for marginal farmers thus, motivating them to produce high-value crops
- Encourage farmers to cultivate water efficient crops in dry-seasons

ACHIEVEMENTS

Pilot initiatives have shown good results. However, measurement methods to capture these results are currently being devised.

- Irrigated area is expected to increase by 40% from the baseline area of 45,000 ha.
- Cropping intensity is expected to increase by 20% from the baseline level of 125-150%.
- Crop production is expected to increase by 50% from baseline value of 325,000 tons.
- Water use efficiency is expected to increase by 10% from baseline level of 30%.
- Incomes and livelihoods of 1.7 million people will improve by the end of the project.

PROJECT BRIEF

Agribusiness Infrastructure Development Investment Program

PROJECT OVERVIEW

Agricultural marketing in India suffers from inefficiencies, disconnect between farmer and consumer prices, fragmented marketing channels and poor infrastructure. To overcome these constraints, the government has focused on building agribusiness infrastructure with backward linkages.

Photo of ED Japan visiting a farmer's vineyard

ADB is supporting the government's priorities through the Agribusiness Infrastructure Development Program, an intervention launched in Bihar and Maharashtra that aims to address constraints like lack of technologies, lack of public investment particularly in linking infrastructure, and lack of private sector participation and management in modern marketing infrastructure. The program aims to establish eight or more integrated value chains (IVC) in the two states and leverage private sector investment for creating agribusiness and marketing infrastructure.

LOAN DETAILS

EXECUTING AGENCIES

Department of Agriculture, Bihar and Maharashtra
Department of Cooperation, Marketing and Textile

MILESTONES

- Sept 2010 - $170 mn approved for MFF
- Sept 2010 - $67.6 mn approved for Tranche 1
- Dec 2011 - $24.3 mn approved for Tranche 2
- Jan 2013 - $0.20 mn disbursed
- Jun 2018 - Closing

OBJECTIVE

The program involves investment in physical and institutional links along IVC by (i) supporting site development and agribusiness infrastructure, (ii) linking infrastructure to ensure connectivity to basic services, (iii) developing backward links to production areas through contract farming and producer companies, and (iv) building capacity to strengthen technical and managerial skills along the value chain. The investment program covers selected regions of Bihar (Muzzafarpur and Patna-Nalanda under tranche 1) and Maharashtra (Aurangabad and Nasik under tranche 2), each of which have adopted different agri-marketing policies. While Bihar promotes the provision of agri-marketing as a private sector led function, Maharashtra promotes the public sector as the market manager and regulator while simultaneously encouraging greater private sector participation. The supply of modern infrastructure under private sector management will improve quality of produce, reduce post-harvest waste, and add value to lower-value produce.

OUTPUTS

Key outputs under the program are presented in the table below:

Improved IVC infrastructure	• A total of 50 market sites with modern IVC infrastructure will be set up • 600,000 tons per annum of horticulture crop will be marketed through IVC infrastructure
Strengthened capacity of farmers	• At least 20% of the IVC farmer groups will be converted into producer companies by 2013

Strengthened capacity of farmers	• At least 20% of farmer groups will enter into long-term agreements with IVC • 50% of IVC stakeholders will be trained within the first year of IVC operations on value chain technology and management systems
Strengthened PPP management	• At least eight PPP transactions per state will be completed by 2015 • Construction and equipment installation will be achieved at all spokes and hubs to specifications by 2016 • All executing agencies officials in the project management unit (PMU) will be trained on the job for managing a transparent bidding process, awarding and implementing a PPP contract

OUTCOMES

Increased output and incomes of IVC suppliers

The establishment of IVC infrastructure, capacity development, inflow of world class technologies and modern management techniques through the private sector, will result in better markets and improved prices for IVC suppliers. This, in turn, is expected to increase quantity of output produced by IVC suppliers by at least 10% and incomes by about 5%.

Improved IVC infrastructure and expanded value chains

The program is expected to reduce post-harvest losses on an average from 30% to 21% of product output. Frequency of power outage is expected to be reduced by 50% and about 95% of the water demand will be met. At least 30,000 producers will be supplying more than 250,000 metric tons of high value crops to modern value adding infrastructure.

Improved employment opportunities

The program is expected to benefit rural areas, in particular, by creating on-farm and off-farm employment opportunities along the IVCs and its ancillary industries. Farm-gate prices are also expected to increase, resulting in possible long term impacts of income generation for the farmers and on food security.

Enhanced women empowerment

Female agricultural workers are expected to be empowered through participation in farmer societies providing them an opportunity to voice their opinions in decision making and gradually integrating them into the value chain. Effective integration will their raise incomes and reduce gender-based wage discrimination, thereby, accomplishing core labour standards in a sector where majority of the operations are in the informal sector.

WAY FORWARD

The rural focus of the investment program helps in addressing the growing rural–urban divide, in terms of incidence of poverty, and economic development of the country. Also, complementing public sector investment with private investment will accelerate growth, employment, and economic prosperity in rural areas. Provision of linking infrastructure will help complete the connectivity, reduce costs, increase mobility, and have supplementary social benefits.

INNOVATION IMPULSE

Systemic and transformational change

- The program will organize farmers groups into producer companies, thereby providing specialized training, stimulating their entrepreneurial skills and enabling them to get much better price for their produce.
- PMUs in each state will be formed to provide implementation support, conduct baseline surveys, and in undertaking monitoring and evaluation. PMUs will establish and maintain a website with information on project activities, including procurement procedures and results.

Piloting new approaches

- An IVC approach will be adopted to strengthen agribusiness infrastructure, institutions and related capacity along the horticulture value chain. This will allow value chain stakeholders to improve their products and processes and compete in end markets.

Financing and leveraging

- PPPs are expected in provision and management of agri-marketing facilities. The influx of private sector capital and management will increasingly provide stronger value chains that are backward -linked to producers. A technical advisory group will simultaneously be engaged by each PMU to ensure that PPP transactions for IVC infrastructure are successfully completed.

PROJECT BRIEF

Sustainable Coastal Protection and Management Investment Program

PROJECT OVERVIEW

Coastal erosion in the pre-project period

The coastal states of Goa, Karnataka and Maharashtra are affected by severe coastal erosion. Approximately 550 km of the coastline is facing erosion; 530 km is prone to erosion; and 330 km requires protection. With increasing pressure on coastal regions contributed by human-induced activities and rise in sea level, there is an urgent need to find sustainable solutions for coastal protection. In line with the government's priority of integrating environmental concerns into policy, planning, and development activities, ADB has lent support for sustainable measures for coastal protection with a focus on enhancing capacity of state authorities to design, implement, monitor, and finance coastal protection and management measures. The ADB-supported Sustainable Coastal Protection and Management Investment Program targets suitable environmental and social solutions, with a focus on elements such as artificial reefs, beach nourishments, and dune management.

LOAN DETAILS

EXECUTING AGENCIES

Goa Water Resources Department; Maharashtra Maritime Development Board; Karnataka Public Works, Ports and Inland Water Transport Department

MILESTONES

- **Sept 2010 - $250 mn approved for MFF**
- **Oct 2010 - $51.60 mn approved under Tranche 1**
- **Jan 2013 - $1.90 mn disbursed**
- **Dec 2019 - Closing**

OBJECTIVE

The program aims to protect and manage 150 km of coastline in the three states. It also focuses on developing institutional capacities to meet long-term needs of sustainable coastal protection and management, and supports initiatives to encourage community and private sector participation. The capacity enhancement component, an intrinsic part of the program, will ensure that benefits of policy and institutional reforms undertaken are realized and sustained.

OUTPUTS

Key outputs under the program are presented in the table below:

Reduced coastal erosion and instability	• Coastal erosion, salinity and instability will be reduced for 150 km of coastal line through economically-viable and environmentally- and socially-appropriate solutions. Measures such as navigation of inlets, training of river and drain mouths, development and planting of dunes, planting of mangroves and coastal management, including water quality, dredging, and reclamation are expected to protect and manage the coastline in the states • 50 communities with up to 30% women beneficiaries at each intervention district will be supported

Enhanced participatory shoreline management plans	• Shoreline management plans (SMPs) will be prepared for three coastlines, ensuring participation by women to meet long-term management needs • Coastal management information systems will be developed and established within each state executing agency with linkages to central agencies
Enhanced operations management	• Coastal management information systems will be designed and implemented within each executing agency to enhance linkages with the relevant central agencies and improve operational management
Enhanced capacity for integrated shoreline planning and development	• Capacity at district and state levels will be enhanced to prepare and implement participatory SMPs • Trainings will be held to provide specialist support for planning, modeling, designing, checking, and reviewing coastal protection and management. About 70 staff members at CWC, Central Water and Power Research Station (CWPRS) and other central agencies will be trained • Shoreline management organizations will be established with at least 10% women membership. Training will be provided to these stakeholders in shoreline management and income-generating activities

OUTCOMES

Improved and sustainable environment

Introduction and development of new technologies will provide solutions that include construction of artificial reefs. These solutions provide a beneficial habitat for fish and other marine species, thus, resulting in improved beaches, artisanal fisheries and a thriving tourism industry.

Increased job opportunities in coastal areas

The number of businesses on intervention beaches, coastal shipping and fish landings is expected to increase by 10%. Interventions to prevent coastal erosion and protect beaches and adjoining land will benefit port operators and users, fishermen, tourism operators, beach users, farmers, and other property owners and local communities living near, or depending on, the coast for livelihood.

Increased community and private sector involvement

The community and the private sector will be engaged in reduction of coastal erosion and instability through the project. District project committees will be established and PPP projects will be identified. About 50 communities with up to 30% women beneficiaries at each intervention district will also be developed.

WAY FORWARD

Over time, the program is expected to play a significant role in the future of sustainable zone management in India. It should provide additional benefits of safeguarding the traditional livelihoods of the poor coastal communities and create further economic and tourism opportunities.

INNOVATION IMPULSE

Systemic and transformational change

- The program will involve development of shoreline management plans and information systems to identify key issues, enable monitoring and prepare long term protection strategies. Participatory and integrated SMPs would help executing agencies in long term sustainable management of coastal processes and shoreline land use. Capacity development of various stakeholders is expected to promote community participation in coastline protection and management.

Piloting new approaches

- The program is the first coastal zone management intervention by ADB in India. Introduction of new technologies such as artificial reefs, beach nourishment, and dune management will facilitate transition to environment-friendly solutions to mitigate the impact of climate change.

Financing and leveraging

- The program will facilitate private sector participation in tourism, marinas, jetties, harbors, dredging, water treatment, land reclamation and regeneration.

PROJECT BRIEF

Assam Integrated Flood & Riverbank Erosion Risk Management Investment Program

PROJECT OVERVIEW

Mar 2013. Gumi Subproject area: Ongoing Cost -effective underwater riverbank erosion protections works with systematic sand-filled geo-textile bags dumping.

Assam is located along the Brahmaputra River, and is predominantly flood-prone. Riverbank erosion, which is caused by dynamic channel shifting of the Brahmaputra River, is another prominent disaster in the state's 17 riverine districts. About 7% of the land in the riverine districts has been lost because of riverbank erosion in the last 50 years. The chronic threat of devastating disaster damages is restricting economic growth of the state, while potential losses by floods and riverbank erosion are rising with high population growth in flood-prone areas. The poorest segment of society often suffers the greatest risk and damages. Effective flood and riverbank erosion risk management, thus, remains high on Assam's development agenda. Strengthening resilience against flooding is also a key element of the government's climate change action plan.

The ADB-supported Assam Integrated Flood and Riverbank Erosion Risk Management Investment Program assists Assam in designing and implementing a comprehensive flood and riverbank erosion risk management (FRERM) system for reducing economic vulnerability and social disruption caused by floods and riverbank erosion along the Brahmaputra River.

LOAN DETAILS

EXECUTING AGENCY

Flood & River Erosion Risk Management Agency of Assam

MILESTONES

- **Oct 2010 - $120 mn approved for MFF**
- **Oct 2010 - $56.90 mn approved for Tranche 1**
- **Jan 2013 - $4.30 mn disbursed**
- **Sept 2017 - Closing**

OBJECTIVE

The program aims at protecting key urban and productive rural areas along the Brahmaputra River. These are three existing flood embankment systems namely, Dibrugarh (Dibrugarh district), Kaziranga (upstream of National Park in Golaghat district), and Palasbari (downstream of Guwahati in Kamrup district). A holistic risk management system will be put into operation with a balanced combination of structural and non-structural measures, including establishment of community disaster management committees and a sustainability mechanism of infrastructures. The program also aims to provide focused support for institutional development, including development of a knowledge base and capacity strengthening of the state water resources department (WRD) and the executing agency, flood and river erosion management agency of Assam (FREMAA).

OUTPUTS

Key outputs under the program are presented in the following table:

Enhanced and sustainable FRERM measures	• Disaster management organizations at district, block, and gram panchayat and highly vulnerable villages will be established with 30% women participation. • Community based flood risk management plan will be implemented. • Cost-effective FRERM structural measures with innovative technologies will be implemented. These include: (i) riverbank protection works, (ii) revetment pro-siltation screens (ii) embankment strengthening and (iii) sluice gate renovation • Nonstructural and other community-based flood risk management measures will be in place. • Measures for sustainable maintenance will be in place.
Integrated FRERM Planning, and institutional and knowledge base	• Comprehensive state FRERM plan and Assam State Water Policy will be adopted and implemented. • FRERM agencies' performance will be improved aligned with the policy and plan. • Data and knowledge base will be developed, and knowledge sharing and networking will be established at national and international levels.
Strengthened Institutions	• Specific measures on participatory mechanisms and social development, including gender actions, will be incorporated into FRERM operations. • Integrated FRERM programs will be introduced and replicated in other affected districts.

OUTCOMES

Enhanced resilience to flood and riverbank erosion

Interventions under the program are expected to provide enhanced resilience to flood and riverbank erosion in the identified program areas, benefiting about 1 million people. This in turn, is expected to result in sustained reduction of annual flood damages, rehabilitation costs and land loss resulting from embankment breach. These steps will also protect urban, agricultural, and other flood prone lands along the 90 km critical reaches of the Brahmaputra River totaling 53,000 ha.

Effective gender mainstreaming

The program aims to implement a livelihood improvement strategy to enhance incomes of women in the most vulnerable sections of the program areas. This will be done through organizing them into self-help groups and providing training, technological and marketing support in areas of silk spinning, weaving, yarn production and vegetable cultivation.

WAY FORWARD

The program will introduce innovative and cost-effective approaches for riverbank erosion technology, and progressive knowledge development to manage risks of flooding and riverbank erosion. With the program and an associated capacity development technical assistance addressing specific objectives, the Government of Assam expects this program to be at the forefront in addressing chronic riverbank erosion and flooding risks.

INNOVATION IMPULSE

Systemic and transformational change

- FREMAA has been established under the program as a special purpose vehicle with a multi-disciplinary setup to cover comprehensive structural and non-structural FRERM measures. ADB is also helping the state government in mainstreaming the FRERM framework, including institutionalization of the Assam State Water Policy.

Piloting new approaches

- The program uses innovative, environment-friendly and cost-effective technologies, such as riverbank protections with sand-filled geo-textile bags and flow-retarding screens inducing silt deposition. To promote advance planning and effective implementation of erosion risk mitigation measures, erosion-prediction modeling will be developed. This program is ADB's first intervention in flood and river bank erosion risk management in India.

HUMAN DEVELOPMENT

7. Human Development

Sector background and challenges

India has a young population and a labor force that is expected to increase rapidly over the next 20 years. To reap the benefits of this potential 'demographic dividend', India has to provide good quality education to its youth and ensure that its workers have the skills needed in a rapidly modernizing economy. Recognizing the importance of education and skill development, the Government of India has deployed large scale interventions and initiatives in the sector in recent years. For example, per capita public spending on education has increased from $16.3[53] in 2004-05 to $54.8 in 2011-12, representing an increase in the share of education in GDP from 3.3% to over 4%[54]. These efforts are beginning to show results. During the last decade, adult literacy improved from 64.8% in 2001 to 74.% in 2011, mean years of schooling for adults increased from 3.6 years in 2000 to 4.4 years in 2011[55], and enrollment of children in primary education has now reached near universal levels.

Focusing on secondary education and skills development, some key issues in the sector are as follows.

Enrolment in secondary schooling. India has been able to reach near universal level of enrolment at the primary education level. However, this has not led to a commensurate increase in secondary education enrollments. In 2009-10, gross enrollment rates at the secondary (Class IX–X) and senior secondary (Class XI–XII) levels were 62.7% and 35.9%, respectively, leading to a combined gross enrolment rate of 49.3% for Class IX–XII . With the enforcement of Right To Education Act, demand for secondary schooling is expected to grow rapidly in coming years, thus putting pressure on the existing system. One of the central challenges for improving student retention will be to make secondary education much more job relevant through introduction of selective vocational modules in secondary schools.

Focus on vocationalization. In India, only 5% of the population of 19–24 age group acquires some sort of skills through vocational education. In countries such as South Korea and Australia, on the other hand, 25-40% of high school students opt for vocational courses, making them job-ready once they finish Class XII. It is, thus, critical to align vocational education within the composite framework of secondary schooling. Vocational education at the secondary stage helps enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provides an alternative for those pursuing higher education.

AT A GLANCE

- *During the last decade, adult literacy improved from 64.8% in 2001 to 74% in 2011, mean years of schooling for adults increased from 3.6 years in 2000 to 4.4 years in 2011 and enrolment of children in primary education has now reached near universal levels.*
- *With growth in elementary education enrolments, and enforcement of the Right To Education Act, demand for secondary schooling is expected to grow rapidly.*
- *Making secondary education more job relevant through introduction of selective vocational modules in secondary schools is one of the central challenges in improving student retention.*
- *There is a need to align vocational education within the composite framework of secondary schooling in the country.*

Government of India's sector strategy

The 11th plan had proposed expansion of educational facilities and improvement in quality of education as key instruments for achieving faster and inclusive growth. During 2007-12, there was notable success in

[53]All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.
[54]All figures are sourced from Draft Twelfth Five Year Plan (2012–2017) Faster, More Inclusive and Sustainable Growth - Volume III, unless otherwise mentioned.
[55]International Human Development Indicators, UNDP

AT A GLANCE

- *The 12th plan will focus on improving school infrastructure; increasing enrolment at the upper primary and secondary school levels; lowering dropout rates across the board; and broad-based improvement in the quality of education.*
- *Meeting residual needs of access with sharper focus on the needs of the disadvantaged social groups and the difficult-to-reach areas will also be given high importance.*
- *Achieving Rashtriya Madyamik Shiksha Abhiyan (RMSA/National Secondary Education Scheme) targets of universalization of secondary education and universal retention by 2017 will be given importance.*
- *Vocational education courses based on the national occupation standard brought out by the Sector Skill Councils will be implemented from class IX onwards.*
- *ADB's involvement in the education sector will consist of assistance for: (i) promoting and encouraging skill development, and (ii) universalization of secondary education through support to RMSA.*

Computer training being provided through ADB support under project UDAY in collaboration with Centre for Entrepreneurship Development in Madhya Pradesh (CEDMAP)

expanding capacity and improving primary education, both with respect to enrolment and in reduction of dropout rates. However, improving quality of school education and provision of appropriate vocational training remain concerns which still need to be addressed.

The 12th plan seeks to address the challenges highlighted in the previous section in an integrated manner. The focus is on broad-based improvement in the quality of education, with special emphasis on improving learning outcomes, increasing enrolment at the upper primary and secondary school levels, improving school infrastructure in keeping with the Right To Education Act stipulations, lowering dropout rates across the board, and meeting the residual needs of access with sharper focus on needs of the disadvantaged social groups and on difficult-to-reach areas.

As regards secondary education, the 12th plan envisages addressing issues of coverage and quality under Rashtriya Madyamik Shiksha Abhiyan (RMSA/National Secondary Education Scheme), launched in 2009. RMSA targets universalization of secondary education and universal retention by 2017. For expansion of secondary education, private sector capabilities will be tapped since majority of secondary schools in the country are under private management. Public private partnership (PPP) models will also be explored in this respect.

Vocational education is a key area of focus under the 12th plan and will be implemented from class IX onwards, unlike the present provision for its implementation from class XI, and would be subsumed under RMSA. Vocational education courses will be based on the national occupation standard brought out by the Sector Skill Councils that determine the minimum levels of competencies for various vocations. Academic qualifications would be assessed and certified by educational bodies and vocational skills would be assessed and certified by respective Sector Skill Councils. Vocational education at the higher secondary stage will be aligned with National Vocational Education Qualifications Framework to create clear educational pathways from school to higher education level and provide more options to students to choose vocational modules depending on their aptitude and economic requirements. Vocational education will also be aligned with skills training under the Ministry of Labour through Industrial Training Centers and modular training programs as well as short-term training provided through National Skills Development Corporation (NSDC).

ADB's sector assistance

ADB's involvement in the education sector will consist of assistance for: (i) universalisation of secondary education, and (ii) promoting and encouraging skill development. Focus will be on improving and strengthening the three E's of Education, Employability and Employment through:

i. Education reform: Strengthening secondary education in line with RMSA, thus creating efficient labor supply for demand.

ii. Employability reform: Modernizing skill development program and promoting private sector participation to enhance relevance and quality thus, improving labor supply for demand.

iii. Employment reform: Linking vocational training and skill development to private sector's needs to plug in the demand-supply gap.

ADB will dovetail skill development with strengthening secondary and higher education as also strategized in the 12th plan. As a first step, ADB approved a $1.1 million[56] grant in December 2011 for providing capacity development technical

[56]All figures in this sub-section— ADB's sector assistance— have been sourced from ADB.

assistance that will assist NSDC in establishing one sector skills council (SSC) in each service sector (such as health care) and infrastructure sector (such as transport and logistics or construction). By building capacity of two pilot SSCs, the TA will provide a template for other SSCs, thereby helping NSDC in strengthening the skills ecosystem. The TA will also support two states (as pilots) in linking their skills development missions more effectively with the new, PPP-driven skill development initiatives being promoted by NSDC and other government-run schemes at the national level. Further, ADB approved a $225,000 grant in May 2012 for providing project preparatory TA for the proposed $100 million loan under the 'Supporting Human Capital Development in Meghalaya' project. Interventions planned under this proposed project are given in Box 7.1. ADB is also in discussions with other selected states to develop such state-specific projects.

In its efforts to improve secondary education and promote vocational training in line with the 12th plan, ADB will follow a two-pronged approach supporting both national and state initiatives. ADB will try to catalyze PPPs, where relevant, to ensure that skill development is linked to demand/employment. It will also promote the use of innovative information and communication technology (ICT) applications to improve delivery of skills training, secondary education, and teacher training programs. ADB will support introduction of vocational modules selectively at secondary school levels and mainstreaming of gender concerns. Focus will be on adoption of improved monitoring and evaluation techniques to improve monitoring and tracking of results in schools. ADB will undertake the following measures to assist national as well as state level initiatives in the sector.

Assist selected State Skill Development Missions (SSDMs). ADB will be supporting selected SSDMs in their endeavor for skill augmentation. It will also undertake a skill -gap analysis and assess changing skill demands of the market. Outcomes-based skills training programs will be planned and executed as per a coherent strategy. Training institutes with proven track records may also be reinforced. ADB will also assist in drawing up monitoring and evaluation and due diligence systems for the programs.

Support skill development through selected ministries. According to the National Skill Policy 2009, some ministries have high skill development targets, e.g. by 2022, Ministry of Rural Development has a target of providing skills to 20 million people; Ministry of Micro, Small, and Medium Enterprises has target of developing skills of 15 million people; and Ministry of Health and Family Welfare has a target of providing skills to 10 million people. ADB will explore the scope for supporting these ministries in strengthening their skills programs.

Strengthen skills in physical infrastructure. ADB will design its interventions for skill development ensuring synergy with its operations in the area of infrastructure development particularly in energy, transport, and urban sectors where there is acute shortage of skills. In formulating these interventions, ADB will give equal emphasis to women's access to skilled training and subsequent employment.

Gender mainstreaming. Women's participation will be encouraged in diversified trades and non-traditional occupations, including existing and emerging technological fields. ADB will ensure that curriculum and teaching materials reflect a positive attitude towards girls and women and to their capacities and role in society.

Box 7.1 highlights the objectives and expected outputs of the proposed ADB project in Meghalaya.

ADB has been providing support for the empowerment of women entrepreneurs through the Self-Employed Women's Association (SEWA) in Lucknow, Uttar Pradesh

AT A GLANCE

- *ADB will follow a two-pronged approach, supporting both national and state initiatives.*
- *Efforts will be made to catalyze PPPs, where relevant, to ensure that skill development is linked to demand/ employment.*
- *Use of innovative ICT applications to improve delivery of skills training, secondary education, and teacher training programs will also be promoted.*
- *Infrastructure development particularly in energy, transport, and urban sectors will be given importance as there is acute shortage of skills in these sectors.*

Table 7.1: ADB's project portfolio for the sector

S. No.	Project name	Type of loan/ grant	Year of approval	Original loan amount ($ million)	Status
1.	Skills Development for Inclusive Growth	TA	2011	1.1	Approved
2.	Supporting Human Capital Development in Meghalaya	TA	2012	0.225	Approved
3.	Supporting Human Capital Development in Meghalaya	Loan	-	100	Proposed

Box 7.1: Supporting Human Capital Development in Meghalaya

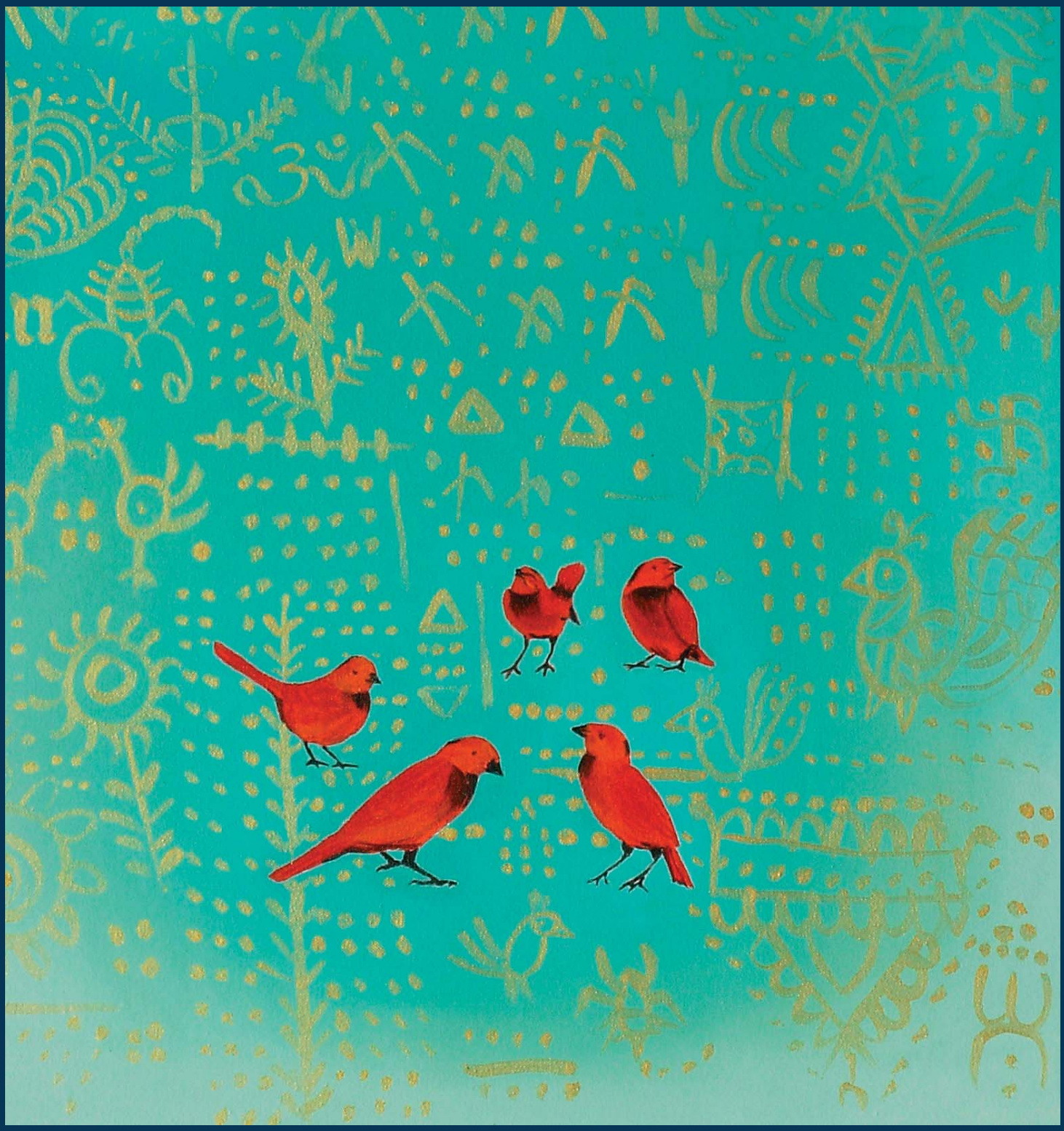
During the 12th plan, Government of India plans to extend the Rashtriya Madhyamik Shiksha Abhiyan (RMSA/ National Secondary Education Mission), to the higher secondary stage, and increase its coverage to all government, and government-aided schools. The government also plans to skill 80 million persons during the period through the National Skill Development Mission (NSDM), by adopting appropriate strategies, including support to state governments/state skill missions. In view of these plans and the low employability levels being faced in Meghalaya, ADB is designing a loan for developing human capital in the state.

A predominantly tribal state, 70% of the Meghalaya's labor force remains employed in low-skilled agricultural jobs, while a recent skills-gap analysis prepared by the NSDC shows that there is scope for absorbing skilled workers of different levels in several sectors.

ADB's proposed loan, titled 'Supporting Human Capital Development in Meghalaya', aims to improve the quality, delivery, access, and result orientation of secondary education (including teacher training) and skill development programs in the state, thereby enhancing the employability of its youth in economically productive activities. It will primarily be guided by NSDM and RMSA, and will help operationalize these missions more effectively.

Key outputs of the program will include (i) upgrading infrastructure in 20% of government-aided secondary and higher secondary schools to RMSA standards, (ii) establishment of classes XI and XII in 40 schools, (iii) training of 3,500 untrained and under-qualified teachers currently serving in 591 government-aided secondary and higher secondary schools, (iv) upgrading teacher training centres, (v) setting up a skill challenge fund to assist results oriented skill development, and (vi) upgrading Meghalaya's public training organizations. The program will also spread awareness amongst youth, encouraging them to complete schooling and acquire soft skills critical for employment and informing them about vocational training options suitable for different opportunities.

The proposed project is expected to improve the quality and delivery of education in government-aided secondary and higher secondary schools in the state. It is also expected to result in an improvement in teaching methods adopted, through usage of interactive methods and ICT-based modules. Skill development trainings under the program are expected to result in 65% of the trainees being employed within the first year of project implementation and another 20% starting their own businesses.



REGIONAL COOPERATION AND INTEGRATION

8. Regional Cooperation and Integration

Sector background and challenges

South Asia accounts for one-fourth of the world's population while contributing only 6.8% to the world GDP (in purchasing power parity terms). In order to improve efficiency and achieve a higher regional growth rate, regional cooperation is important. Deeper regional cooperation will allow for increased economies of scale and cost advantages, and will help jointly tackle barriers to development.

Currently, despite liberalization measures and relatively strong performance of the South Asian economies, the region continues to be one of the least integrated in world. Only 5% of South Asia's trade is intra-regional, compared to 51% in East Asia and 26.4% in South-East Asia. This is primarily because South Asia still has the highest levels of tariff and the pace of tariff reforms under the existing South Asia Free Trade Agreement (SAFTA) has been slow. Impediments also exist in the form of non-tariff barriers. Weak integration in South Asia is also seen in the form of poor physical connectivity among member countries. Poor transport corridors and inadequate trade infrastructure hamper trade, a large proportion of which is carried over land. India is the largest exporter in the region, contributing to over 70% of intraregional exports, with over 60% of its exports carried over road and 13% by rail. India also shares borders with most of countries in South Asia. Any initiative taken by India, therefore, has vast potential for strengthening regional cooperation in South Asia.

Economic and social development is facilitated not just by the expansion of trade but also through regional cooperation in sectors like transport and energy. Regional cooperation becomes even more critical when individual economies grow, as it will facilitate collective actions among countries to respond increasing to spill-over impact of global and regional economic shocks[57].

AT A GLANCE

- *South Asia accounts for 1/4th of the world's population but only 6.8% of the its GDP (in PPP terms). Regional cooperation is important for improving efficiencies and economic growth in the region.*
- *Currently, South Asia is one of the least integrated regions of the world, owing mainly to high levels of tariff, and non-tariff barriers like lack of physical connectivity.*
- *Any initiative taken by India has vast potential for strengthening regional cooperation in South Asia.*
- *The government plans to take up two strategic priorities: developing policies and reforms which support international trade and developing infrastructure that will facilitate this trade.*

Government of India's initiatives

The Government of India has two key strategic priorities: (i) to develop relevant policies and reforms that provide a suitable environment for international trade, and (ii) to develop infrastructure that will facilitate trade encouraged by policy reforms. In line with these priorities, the 12th plan highlights initiatives for transport and energy cooperation in South Asia with policies such as the 'Look East Policy' that aims to develop road connectivity to link India with countries such as Thailand, Myanmar and Bangladesh. Such initiatives are necessary for developing border trade and economic activity particularly in the north-east region of the country. The 12th plan also gives special

[57]With Bhutan and Nepal, free trade and commerce agreements date back to 1949 and 1950 respectively. India now accounts for over 40% of FDI in Nepal and is the only supplier of fuel to the country. When the Indo-Sri Lanka FTA became effective in 2000, trade doubled from $71 million in 2001 to $168million in 2002 and had an immediate effect on narrowing Sri Lanka's trade deficit. India is now the third largest foreign investor in Sri Lanka.

focus to developing policies which will strengthen mutual dependence with neighboring economies, particularly with Bangladesh.

Government of India's key initiatives in the areas of trade facilitation, transport and energy are detailed in following paragraphs.

AT A GLANCE

- *India has undertaken several bilateral initiatives for trade facilitation with countries in the region, in the recent past. These are critical for strengthening regional ties.*
- *Development of waterways transport and tourism, and expansion of railways and air landing strips will be undertaken to explore business opportunities in the north-eastern states with Bangladesh, and other countries in Southeast Asia.*
- *In light of high energy deficits in the region, India recently signed a deal with Bangladesh to help address chronic power shortages in the country. India also plans to engage with Sri Lanka in a new 500 MW coal-based power project.*

The South Asia Tourism Infrastructure Development Project is helping to develop tourism related infrastructure, improve connectivity, and upgrade destination infrastructure and services in major culture based tourism sites across India, Nepal, and Bangladesh.

Trade facilitation

India's role in the recent historic bilateral developments in the region is critical to strengthening ties amongst countries in South Asia. The India-Bangladesh Joint Communique signed in January 2010 set a new path for cooperation between the two countries. India extended duty-free access beyond SAFTA commitments by reducing the number of items from the negative list. Results of the India-Pakistan talks include a dedicated Attari-Wagah gate to facilitate movement of goods; export of petroleum products to Pakistan by Indian refineries; investments by Pakistani businesses in India through changes to the Foreign Exchange Management Act; and reciprocal possibilities of Pakistani and Indian banks opening branches for which dates have been set.

Transport facilitation

A comprehensive framework for cooperation between India and Bangladesh has been agreed and includes cooperation in transportation and connectivity, water resources, power, tourism and education. Under this framework, Ashuganj in Bangladesh and Silghat in India will be declared ports of call and the Inland Water Transit and Trade Protocol will be amended through exchange of letters. Also, Government of Bangladesh will allow use of Mongla and Chittagong sea ports for movement of goods to and from India through road and rail, and Nepal and Bhutan will be given access as well. Work for improving the Agartala-Akhaura road and rail links is currently in process.

The 12th plan highlights potential business opportunities available for north eastern states especially Assam, Tripura, Meghalaya, Mizoram, Manipur and Nagaland with Bangladesh and South East Asia. These will primarily be achieved through the development of waterways transport, tourism and the expansion of railways and air landing strips, which will contribute to a regional transport network essential for improving connectivity of the north eastern region. Construction of roads in the north east will also be focused on to enable connectivity with Myanmar and Bangladesh.

Development of existing infrastructure at land custom stations and support facilities such as warehouses, parking lots, banks, hotels, and fuel outlets are being taken up through development of integrated check posts at identified points and under the Assistance for States in Development of Exports scheme. These include Agartala in Tripura, Borsorah in Meghalaya, Dawki in Meghalaya, Demagiri in Mizoram, Ghasuapara in Meghalaya, Karimganj Steamer Ghat in Assam, Moreh in Manipur, Old Raghana Bazar in Tripura, Srimantapur in Tripura, Sutarkhandi in Assam, Zokhawthar in Mizoram, Phulbari, Ghojadanga, and Hili in West Bengal.

Energy

The benefits from energy trade in South Asia, a highly energy-deficit region, is expected to be significant. Currently, only Bhutan, India and Nepal engage in electricity trading through bilateral hydro-energy trading agreements through the PPP route. In 2011, Bangladesh and India signed a deal to build a $1.5 billion plant to help address Bangladesh's chronic power shortages. Also, in a major step for India-Sri Lanka co-operation in the power sector, NTPC Ltd and Ceylon Electricity Board announced plans to set up a 500 MW coal-based power project. Government

of India's Ministry of Power is expected to shortly complete a feasibility study for putting in place infrastructure for inter-connectivity of grids between the two countries to allow smooth exchange of power. The feasibility study envisages laying cable at a depth of 25 meters below the mean sea level for 500 meter span while crossing the Setu Samudram Canal.

The 12th plan stresses the importance of expansion and strengthening of power transmission in order to support the large expansion in production and consumption of electricity. Simultaneously, the government will aim to build on private sector investments made in transmission in the 11th plan and to develop a policy framework within which more private sector investments will be encouraged. A special project on power evacuation from the north east will be planned with the possibility of such lines passing through Bangladesh to reflect mutually beneficial interdependence.

ADB's sector assistance

India plays a vital role in regional and sub-regional initiatives such as South Asia Subregional Economic Cooperation (SASEC), South Asia Association for Regional Cooperation (SAARC), and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). Keeping in mind the broader strategic vision for an Asian Economic Community and India's imperative involvement and participation for the success of any sub-regional initiative in South Asia, ADB has sought India's full involvement in all RCI initiatives.

ADB's Regional Cooperation Strategy 2011-2015 for South Asia focuses on (i) improving regional connectivity, (ii) boosting cross-border trade, and (iii) strengthening regional energy cooperation. The Regional Cooperation Operations Business Plan for 2012-2014 was also endorsed on 17 November 2011 with the cumulative value of the indicative lending and grant programs amounting to $1.6 billion, and the indicative non-lending products in the same period comprising 18 projects with a cumulative value of $10.6 million.

ADB and SASEC

ADB initiated an umbrella regional technical assistance in 2000 for the identification and prioritization of sub-regional projects in South Asia involving Bangladesh, Bhutan, India and Nepal. Currently, the participating countries agreed to have a project-focus in three areas: (i) Transport, (ii) Trade Facilitation, and (iii) Energy. The forthcoming SASEC transport project in India will aim to identify transport and trade facilitation development requirements along the chicken-neck area near Siliguri, and also along the AH 1 through Silchar-Imphal-More, which connects India and other SASEC countries with emerging economies in Southeast Asia and East Asia. Improvement along these roads to standardized two-lane roads with paved shoulders along with road safety requirements will be undertaken. Further, a combination of program loan for policy support to the three countries other than India and TAs for all countries have been processed to cover trade logistics development, capacity building, and application of business process analysis and time-cost-distance methodologies to measure trade facilitation.

ADB and SAARC

Since the 2004, ADB-SAARC MoU, ADB has provided the SAARC Secretariat and member countries assistance to prepare the SAARC Regional Multimodal Transport Study, the SAARC Regional Energy Trade Study, and SAARC Initiatives on Food Security. ADB has also supported the SAARC Finance Ministers meeting alongside

The SASEC Information Highway Project aims at achieving improved ICT connectivity between the SASEC countries.

AT A GLANCE

- *India plays an important role in sub-regional initiatives like SASEC, SAARC, and BIMSTEC. ADB has therefore, sought India's full involvement in all its RCI initiatives.*
- *ADB's Regional Cooperation Strategy, 2011-2015, for South Asia focuses on (i) improving regional connectivity, (ii) boosting cross-border trade, and (iii) strengthening regional energy cooperation.*
- *ADB has been supporting SASEC through an umbrella TA since 2000. The four participating countries have currently agreed on having project focus in three areas—transport, trade facilitation, and energy.*

the ADB Annual meeting since 2006. The SAARC Inter-Governmental Groups for various sectors base discussions on these reports. Recently, ADB supported SAARC to undertake a number of important studies for SAARC cooperation, including studies on SAARC economic integration, SAARC capital markets development, methodology for collection of data on SAARC trade in services, and establishment of SAARC statistical portal. The Transport Group, SAARC initiated the "Indian Ocean Cargo and Passenger Ferry" project, which is initially on a sub-regional basis for Sri Lanka, India, and the Maldives.

AT A GLANCE

- *After an MoU signed in 2004, ADB has also been supporting SAARC in its studies and initiatives covering areas like transport, energy, and food security in the region.*
- *Recently, ADB supported SAARC to undertake a number of important studies including studies on economic integration, capital markets development, methodology for collection of data on trade in services in South Asian countries.*
- *ADB has also partnered with BIMSTEC, assisting its studies, and providing technical assistance for its regional institutions.*

ADB and BIMSTEC

ADB has partnered with BIMSTEC since 2005 and has supported meetings for the preparation of the BIMSTEC Transport Infrastructure and Logistics Study. In December 2011, ADB approved a technical assistance to support BIMSTEC's regional institutions including its Secretariat which was recently established in Dhaka and expert groups in rail, road, aviation, maritime and logistics cooperation. Update and enhancement of the BIMSTEC Transport Infrastructure and Logistics Study will be undertaken in 2013. The BIMSTEC Expert Group Meeting on Road Development is scheduled to be held in 2013. Tables 8.1 and 8.2 present the list of projects involving India that have been undertaken by ADB in the past 12 years in RCI.

Table 8.1: Sub-regional transport sector projects involving India

Sector	Project name	Year approved	Total project cost ($ million)	Status
Roads	West Bengal Corridor Development	2001	323	Closed
Roads	East-West Corridor	2002	576	Closed
Roads	National Highway Corridor (Sector) I	2003	761	Closed
Roads	National Highway Sector II Project	2004	671	Closed
Roads	National Highway Corridor (Sector) I Supplementary	2009	100	Closed
Roads	North Eastern State Roads Investment	2011	298	Ongoing
Rail	Railway Sector Investment Program - Tranche 1	2011	1,145	Ongoing

Table 8.2 Other ongoing sub-regional projects having India involvement without borrowing

Sector	Project Name	Year approved	Status
Trade Facilitation	SASEC Trade Facilitation Program (formerly Regional Trade Facilitation Program)	2012	Ongoing
Power	Bangladesh-India Electrical Grid Interconnection	2010	Ongoing
Information Technology	South Asia Sub-regional Economic Cooperation (SASEC) Information Highway Project	2007	Ongoing

PROJECT BRIEF

South Asia Tourism Infrastructure Development Project (Bangladesh, India and Nepal)

PROJECT OVERVIEW

A Buddhist monastery in Gangtok

Tourism in the South Asian region of India, Nepal and Bangladesh has been constrained despite a rich cultural heritage. This is primarily due to (i) inadequate connectivity and destination infrastructure; (ii) weak protection and management of heritage assets; and (iii) inadequate community engagement. The South Asia Tourism Infrastructure Development Project addresses the infrastructure and management deficiencies, and fosters community participation in nature and culture-based tourism. This will be done by supporting integrated development of priority destinations in high-potential circuits of sub-regional importance. The project includes infrastructure interventions along with a program for capacity building of each country's sector agencies for protection and management of natural and cultural heritage. It also involves engaging local communities to enhance economic linkages between local populations and tourism and to increase benefits from tourism to the communities.

LOAN DETAILS

EXECUTING AGENCIES

Department of Tourism, Sikkim, India; Department of Archaeology, Ministry of Cultural Affairs, Bangladesh; Ministry of Tourism and Civil Aviation, Nepal

MILESTONES

Nov 2009 - $44.75 mn approved; $20 mn (India)

Jan 2013 - $0.96 mn disbursed; $0.4 mn (India)

Mar 2015 - Closing

OBJECTIVE

The project aims to develop and promote popularity and significance of the region as a tourist spot by concentrating on improving infrastructure and building capacity of sector agencies. It has been undertaken to (i) improve connectivity, (ii) provide a better environment and visitor service, (iii) develop natural and cultural heritage and capacity for sustainable heritage management, and (iv) promote greater engagement of communities in heritage management and tourism benefits.

OUTPUTS

Key outputs under the project are presented in the table below:

Enhanced connectivity	• Gautam Buddha Airport in Nepal will be upgraded to an international airport • In India, construction of (i) 20 km road from Sajong to Gangtok via Lingdum, (ii) 800 m road to Rey khola around Rumtek, (iii) 3 km road to Himalayan Institute in Chemchey, and (iv) a road to Guru Padma in Sandruptske around Himalayan Institute is being undertaken • In Bangladesh, construction of (i) an access road of about 475 meter to Paharpur, (ii) a pedestrian road to avoid

	trespassing of the Paharpur heritage site, and (iii) last mile connectivity roads to other three key destinations in Bangladesh Heritage Highway is being undertaken
Enhanced capacity building	• Capacity building of relevant agencies including Sikkim's Department of Tourism is being carried out • Support is being provided for city building and human resource development of Lumbini Development Trust, Nepal; Civil Aviation Authority of Nepal; and Department of Archaeology, Bangladesh
Improved tourist destinations	• Upgrade of Lumbini development area in Nepal and Sikkim's Rumtek Monastery complex in India is being taken up • Improvements in nature based destinations of western Sikkim and development of Himalayan Training Institute in Sikkim is being undertaken • Village tourism infrastructure is being developed in three villages within the vicinity of major tourism attractions in Sikkim. These will include water, sanitation and waste management, trekking trails, village walks, view points and cultural performance stages. • In Bangladesh, upgrade of 4 key cultural heritage sites—Paharpur, Kantajee, Mahastangarh and Bagerhat—is being undertaken

OUTCOMES

Enhanced tourism-related jobs

The development of tourism infrastructure would tap the economic potential of contiguous and complementary tourism assets in the region, resulting in an increase in tourism and employment opportunities for the locals. Improved connectivity is contributing towards increased tourism arrivals, targeted at 25% by the end of the project period. By developing heritage sites and improving their management, the project aims to increase the average daily expenditure incurred by tourists by 10% and the average length of stay by international tourists by one day. As a result, 45,000 jobs are expected to be created in tourism and related industries.

Improved connectivity

Under this project, air access to Lumbini (Nepal) has been improved by upgrading the Gautam Buddha Airport to international standards. The project will further fund the construction of car parking lots and bus stops resulting in reduced congestion. In Bangladesh, measures have been taken to improve last-mile connectivity to tourist sites, manage visitor movement and build pedestrian pathways.

WAY FORWARD

The sub-region of South Asia, consisting of India, Nepal and Bangladesh, has diverse cultural and natural resources. This project will harness the potential of the sub-region to market itself as a world destination for nature- and culture-based tourism. Since this is the first ADB project that supports multi-country tourism, its success will ensure that the path for similar sub regional projects is paved in the future.

INNOVATION IMPULSE

Systemic and transformational change

- Inclusive tourism is expected to be an integral part of the project. This will be achieved by engaging local communities, creating community awareness and supporting skill development programs on ecotourism. The project will also initiate the formation of eco-development committees comprising of local communities. In order to assist the government's efforts in encouraging tourism and preserving sites of tourist significance, the project has undertaken strengthening of responsible public sector agencies to enable sustainable heritage management.

Piloting new approaches

- This is the first project on multi-country tourism development that has been taken up by ADB. Therefore, its success in South Asia region will pave the way for similar projects in other parts of the world. Projects like these have the potential to address both development concerns and encourage communication and co-operation at a global level.

Financing and leveraging

- The project will explore opportunities for PPP in management of heritage sites, and for enhancing revenues by introducing site entry fees and user charges for services, where appropriate.

PROJECT BRIEF

South Asia Sub-regional Economic Cooperation Information Highway Project

PROJECT OVERVIEW


SASEC government officials at BSNL, Siliguri

The SASEC countries (Bangladesh, Bhutan, India and Nepal) are in different stages of ICT development. This offers opportunities for cooperation to leverage regional good practices. The concept of the SASEC information highway was developed to deliver and facilitate modern broadband information, communication and knowledge services within and across borders to governments, businesses, research institutes, and rural and remote communities. This project aims at expanding ICT facilities in rural areas and setting up village networks and community electronic centers across the four countries. Cross-border ICT connectivity would be vital for creating links and providing high-quality, affordable and reliable broadband capacity to the region.

LOAN DETAILS

EXECUTING AGENCIES

Ministry/Department of Information and Communication Technology of the SASEC countries

MILESTONES

Dec 2007 -
$16.8 mn approved;
$3.1 mn (Bangladesh);
$4.7 mn (Bhutan);
$9 mn (Nepal)

Dec 2014 - Closing

OBJECTIVE

The project aims to improve cross-border connectivity in ICT, rural access to information and human resource capacity both within the member countries and across borders. It has three components: (i) a SASEC regional network with fiber-optic and data interchange capacity, directly connecting the four SASEC countries; (ii) a SASEC village network expanding broadband ICT access to 110 rural communities in the SASEC countries and directly connecting the communities for local networking and information sourcing; and (iii) a SASEC research and training network focusing on technical and business skills in ICT.

OUTPUTS

Key outputs under the project are presented in the table below:

Enhanced research and training centers	• A Research and Training Network is being developed to build technical and business skills in ICT, particularly in developing local content and e-applications • Necessary goods and services for SASEC countries is being procured at various stages of formulating regional network's design, technical specifications, and bid documents • SASEC research and training centers will be established in four ICT research and training institutes connected through the SASEC regional network
Enhanced research and training programs	• A series of research and training programs are being implemented • An ICT innovation fund will be established

	• An open content and online training program will be developed and implemented
Enhanced business and development support	• Business proposals and entrepreneurs will be selected and development support provided

OUTCOMES

Enhanced inter-agencies cooperation

The project will work towards executing the bilateral agreements between service agencies to enable physical deployment of the regional network. Strong cooperation among the four SASEC countries as demonstrated by the effective integration of the regional network, village network, and research and training network components will be achieved during the course of this project.

Increased knowledge sharing

High-quality research and training programs for communities, businesses and government will be conducted. The result is expected to be an increase in the number of research papers produced by the SASEC research and training network.

Increased community-driven innovations in ICT

Interactive communications, research and training will increase the number of ideas and discussions exchanged between SASEC village and SASEC research and training networks. An increase in the number of business proposals made by local entrepreneurs is expected.

WAY FORWARD

The SASEC countries are at different stages of ICT development. This diversity in adoption of ICT presents considerable opportunities for cooperation. A regional approach will enable the SASEC countries to capitalize on the digital opportunity as a group by pooling in resources, eventually leading to greater regional cooperation.

INNOVATION IMPULSE

Systemic and transformational change

- The project will help in transferring knowledge in ICT, training, business innovation and information connectivity across member countries.

Piloting new approaches

- Activities such as regional e-trade, e-tourism and e-training will increase as a result of improved broadband connectivity made possible by the SASEC information highway.

Financing and leveraging

- The cost of internet connections for Bhutan and Nepal will be reduced as a result of the shift from expensive satellite links to cable landing stations set up through the SASEC network.

PRIVATE SECTOR OPERATIONS AND PUBLIC PRIVATE PARTNERSHIPS

9. Private Sector Operations

Introduction

Over the past two decades, India's private sector has been the main driver of domestic economic growth and now contributes over 75% of total domestic capital formation[58]. Private sector participation has not only enabled capacity expansion, but has also brought in expertise, improvements in service quality, diffusion of technology, competition, cost efficiencies and productivity improvements. It has thus generated employment and contributed significantly to economic growth.

It is widely recognized that today, access to adequate physical and social infrastructure is a pre-requisite for higher growth in India. A significant share of the private sector investment in the country is in the infrastructure sector. In fact, three-fourths of the jump in the share of infrastructure investment in GDP (from 5% in 10th plan period to 7.1% in 11th plan period) came from higher private sector participation. Private sector investment in this sector is expected increase to 48% of the estimated $1.03 trillion[59] investment in the 12th plan[60].

However, private sector operations, particularly in infrastructure sectors, are constrained by the existing business regulatory environment. For instance, the National Manufacturing Policy highlights that on an average, manufacturing units need to comply with nearly 70 regulations which lead to multiple inspections and filing of over 100 returns in a year. This disincentivizes private firms from becoming more efficient, scaling up operations and contributing to infrastructure projects. Recognizing these challenges, Government of India aims to create an environment conducive to private sector participation through innovative financing and regulatory reforms.

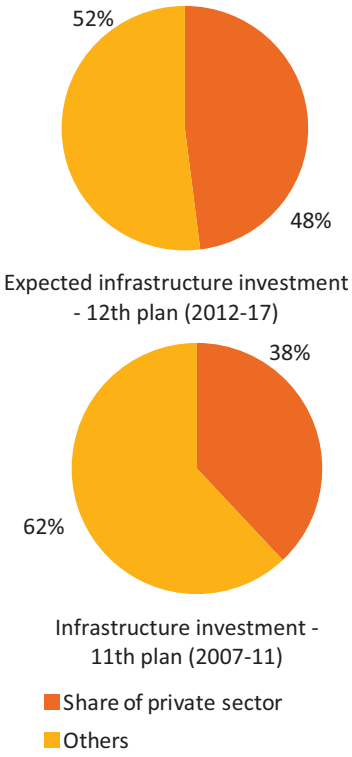


Figure 9.1: Infrastructure investment in the 11th and 12th plan

ADB sector assistance at a glance

'Private sector development and private sector operation' is one of the five drivers of change identified in ADB's Strategy 2020[61] to support inclusive and environmentally sustainable growth in developing member countries (DMCs) including India. ADB's Private Sector Development Strategy (PSDS)[62], adopted in 2000, guides it in effectively promoting private sector-led growth in support of its vision of an Asia-Pacific region free of poverty. ADB has also prepared a strategic direction paper[63] (2001) that analyzes the operational and resource implications of the PSDS and makes recommendations for the same. Three main focus areas to support private sector growth in DMCs as per the PSDS are:

i. Creating an enabling institutional and policy environment for private sector,

ii. Promoting public sector goods and services that attract and sustain private sector thus helping generate business opportunities in DMCs, and

AT A GLANCE

- *India's private sector presently contributes over 75% of total domestic capital formation.*
- *Infrastructure investment has increased from 5% of GDP in 10th plan period to 7.1% in 11th plan period. Three-fourths of this increase in infrastructure investment has come from higher private sector participation.*
- *12th plan has estimated a 48% share of private sector in a total estimated investment of $1.03 trillion in infrastructure.*

[58]Source: Economic Survey 2012-13, figure for 2011-12
[59]All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.
[60]Source: Draft Twelfth Five Year Plan (2012–2017) Faster, More Inclusive and Sustainable Growth
[61]Source: ADB, 2008, Strategy 2020: The Long-term Strategic Framework of the Asian Development Bank, 2008-2020, Manila
[62]Source: ADB, 2006, Private Sector Development: A Revised Strategic Framework, Manila
[63]Source: Private Sector Operations, Strategic Directions and Review, 2001, ADB

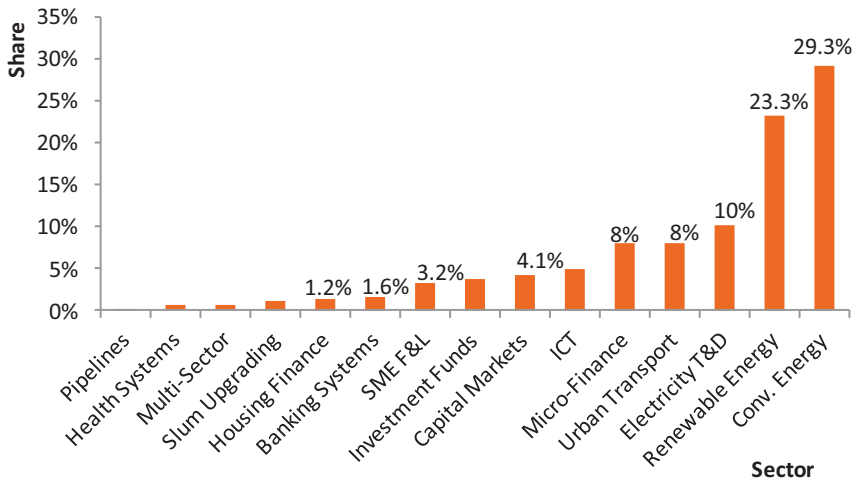
iii. Introducing direct private sector investments in 'market-developing' transactions that promote a larger and sustained flow of private capital into specific sectors and countries. This will be done through direct financing, credit enhancement and risk mitigation instruments.

In the light of the operational and institutional goals of Strategy 2020, ADB plans to scale up private sector development and private sector operations. It also plans to increase its private sector operations progressively at the regional and sub-regional levels[64].

ADB's Private Sector Operations Department (PSOD) has been actively engaged in India since 1987. PSOD works in consultation with various stakeholders in the market, including sponsors, investors, financiers and policy makers. In the Indian context, PSOD's operations expanded in recent years, crossing the threshold figure of $1 billion in 2008[65]. An important element of ADB's Private Sector Operations (PSO) strategy will be to build up on recent synergies between ADB's South Asia Regional Department and PSOD, through projects such as the National Grid Improvement Project which provides an innovative package combining sovereign guarantee and non-sovereign funding to POWERGRID, and the jointly processed Credit Enhancement of Project Bonds project which issues partial credit guarantees in favour of Indian financial institutions providing credit enhancement for infrastructure project bonds.

Development of economic and physical infrastructure and interventions in the finance sector has been the focus area of ADB's private sector operations in India. Figure 9.2 shows the private sector operations of ADB in India across different sectors during 1987-2012[66]. Majority of ADB's private sector operation investments are in conventional and renewable energy projects with a share of 29.3% and 23.3%, respectively. In the finance sector, it has mainly supported micro-financing (8%), capital markets (4%), housing finance (1.2%) and banking systems (1.6%). Other areas of private sector operations include slum up-gradation, urban transport, and information and communication technology. ADB has invested a total of $3.1 billion in private sector operations in India during the 1987-2012 period.

Figure 9.2: ADB's private sector operations in India during the period 1987-2012[67]

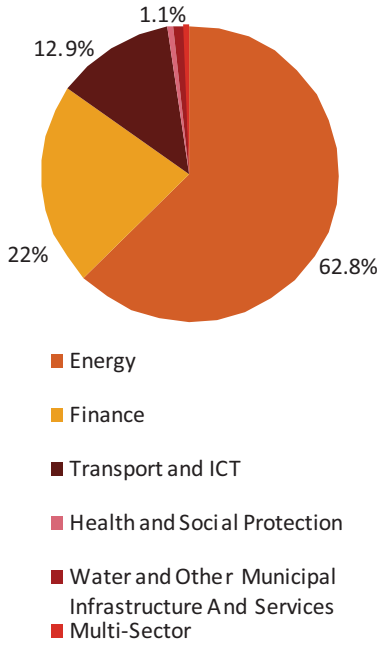


Notes: SME F&L: Small and Medium Enterprise Finance and Leasing; ICT: Information and Communication Technology; T&D: Transmission and Distribution; Slum upgrading includes housing

AT A GLANCE

- *Private sector operations in India is constrained by the existing business regulatory environment. Government of India thus aims to create an environment conducive to private sector participation through innovative financing and regulatory reforms*
- *Private Sector Development Strategy (PSDS), adopted by ADB in 2000, provides guidelines to effectively promote private sector-led growth in support of its vision of an Asia-Pacific region free of poverty.*
- *ADB's private sector operations are focused on conventional and renewable energy projects. Other important areas include micro-finance, housing finance, capital markets and banking systems.*
- *Adopting a sector-based approach, ADB has undertaken 39 private sector projects across 5 main sectors over the last ten years.*

Figure 9.3: ADB's sector-based approach in its private sector operations in India during 2002-12[9]



[64]Source: ADB, 2008, Strategy 2020: The Long-term Strategic Framework of the Asian Development Bank, 2008-2020, Manila
[65]Source: India- ADB Development Partnership, Asian Development Bank, 2011
[66]All figures have been sourced from ADB unless otherwise mentioned.
[67]Multi– sector: PSO operations that cater to more than one sector

Sector-based approach

ADB in its private sector operations, has undertaken a total of 39 projects across five main sectors since 2002. i.e., energy (conventional and renewable), finance, transport and ICT, health and social protection, and water and other municipal infrastructure services. Figure 9.3 presents ADB's private sector operations across these sector.

Finance sector

ADB's private sector operation have provided support towards micro-financing and for improving access to finance for small-and medium-sized enterprises, home buyers and infrastructure companies. This has been done by providing financing to banks, non-banking financial institutions, and through private equity funds.

Housing: PSOD directed its funds towards expanding access of finance for lower-and middle-income home buyers by providing a low currency loan to a housing finance company[68] in 2004 when the mortgage finance market in India was in its nascent stage. This increased the availability of mortgage loans and spurred growth in the residential sector in the country. In order to further develop the housing sector, ADB has recently helped the government establish a mortgage guarantee corporation to expand access to finance to home buyers.

Box 9.1: India Mortgage Guarantee Corporation Pvt. Ltd.

Government of India has been undertaking several initiatives to support growth in housing and housing finance industries in the country. The Reserve Bank of India issued guidelines on registration and operations of a mortgage guarantee company in 2008 which created the necessary regulatory framework to establish a mortgage guarantee industry in India.

To support the government in developing the housing finance market, ADB assisted establishment of the India Mortgage Guarantee Corporation Pvt. Ltd. (IMGC) in June 2012. ADB has an equity investment of 13% in the corporation's shareholding.

In developing countries like India, down payments for home loans are very high as compared to developed countries. Due to this, purchasing a home is difficult even if servicing a mortgage loan on a monthly basis is affordable. IMGC provides coverage to mortgage guarantors against partial loss on borrower default, thereby enabling housing lenders to provide loans on the basis of lower down payments. This in turn increases home buyers' access to housing finance. Housing market development is expected to increase GDP growth through increase in rate of job generation and revenues, generating the multiplier effect of growth in the housing sector to approximately 270 other industries.

Private equity funds: ADB has supported many projects through investments in private equity funds. ADB made an equity investment in the Infrastructure Development Finance Company (IDFC) in 2002, in response to the need for a specialized financial intermediary for infrastructure for channelizing private capital into commercially viable projects. Some of the other projects include (i) a $20 million assistance to the South Asia Clean Energy Fund, sponsored by the Global Environment Fund, for investment in clean energy-related companies; (ii) a commitment of $20 million to Berkeley Energy's Renewable Energy Asia Fund, to be invested in small-scale renewable energy projects at pre-construction stage; and (iii) $20 million to the VenturEast Life Fund III, to make venture capital investments in life sciences-related companies in the clean energy, agriculture, and health care sectors.

Capital markets: ADB has also pioneered an innovative guarantee facility for credit enhancement of project bonds. The facility is assisting the launch of a new financing modality and is a first of its kind for the Indian market. Through this intervention, ADB is promoting development of the domestic bond market, helping to create a new asset class and encouraging a new class of institutional investors. The details of the project are given in Chapter 5.

Micro-financing: As its first large scale private sector microfinance initiative, ADB's Board of Directors approved the Regional Microfinance Risk Participation and Guarantee Program in December 2010, allocating about $50 million for India. This was a part of its commitment to achieving poverty alleviation through financial inclusion. The program is also the first large-scale partial credit guarantee program for microfinance institutions in India and will facilitate expansion of the existing partner financial institutions' (PFIs) lending volumes to microfinance institutions.

Box 9.2: Microfinance Risk Participation and Guarantee Program in India

ADB has approved a $250 million Regional Microfinance Risk Participation and Guarantee Program to address the significant local currency funding needs of microfinance institutions in its DMCs. Under this program, ADB will assume up to 50% of the default risk on loans made by PFIs to microfinance institutions. As the first project under this program, ADB has allocated $50 million of the total assistance for India. The project is in partnership with Institute for Financial Management and Research (IFMR) Capital, a non-bank financing company that provides access to financial services to millions of under-served households in the country.

[68]Dewan Housing Finance Ltd.

Eligible microfinance institutions and local currency providers that meet ADB's credit and development standards have been identified under the project. Ratnakar Bank Limited (RBL), the first domestic banking partner for this facility, provides liquidity to microfinance institutions by extending two to three year tenor Indian Rupee loans, backed by partial credit guarantees (PCGs) of ADB and IFMR Capital . In addition, IFMR Capital and RBL recommend microfinance institutions eligible for Rupee loans to ADB. Portfolio monitoring and surveillance support to ADB and RBL on the underlying microfinance institutions are provided by IMFR Capital.

ADB has planned to expand this facility to an additional three local currency lenders by end of 2013. This will provide access to finance to over 2 million under-served households in over 300 districts across the country.

Transport sector

Through its private sector operations in transport sector, ADB has been keenly supporting projects focused on improving urban infrastructure. Bangalore Metro Rail Transit (BMRT) System Project approved by ADB in 2011 is one such example.

Box 9.3: Bangalore Metro Rail Transit System Project

ADB's Private Sector Operations Department and South Asia Department have jointly processed the BMRT project loan. This project consists of development and operation of an urban metro rail transit system in Bengaluru city. Under the project, a direct loan of up to $250 million, without sovereign guarantee, is being provided to Bangalore Metro Rail Corporation. The project will establish a sustainable urban transport company with sound institutional and governance structures, based on an innovative urban transport financing model.

The project comprises of two intersecting corridors over a length of 42.3 km, with 40 stations, two station depots, signalling, electro-mechanical systems, and all ancillary facilities and rolling stock. It is expected to create employment of 1,700 staff during its operation. Monoxide, nitrous oxide and hydrocarbons emissions are also expected to reduce in the city by 2.5% by 2020.

Conventional energy sector

Private sector operations of ADB in the energy sector have been substantial. The first private sector transmission line in India established by a private company, between Tala and Delhi, was supported by ADB. Successful implementation of the project prompted the government to further liberalize the power sector through the Electricity Act 2003, with 14 power transmission ventures identified for private sector investment on a PPP basis.

In 2004, ADB supported Petronet LNG, a joint venture company formed by Government of India to import LNG and set up LNG terminals in the country, via equity participation. In 2006, it provided a loan for development and operation of India's first and largest LNG terminal. This led to diversification of India's energy sources. The western and northern regions of the country were able to have access to cleaner and cheaper fuel.

In 2006, ADB also lent $300 million, including co-financing of $225 million, to National Thermal Power Corporation (NTPC) for two super-critical thermal projects in Bihar and Chhattisgarh. ADB also supported India's first Ultra Mega Power Project (UMPP), the Coastal Gujarat Power Plant, in Mundra in 2008. This is India's first private sector operated super-critical power plant.

Renewable energy sector

Under Strategy 2020, ADB focuses on establishment of environment-friendly and sustainable mechanisms to meet future energy needs. To this end, it has supported a number of projects in renewable energy generation. In 2007, ADB approved a loan to Tata Power Company Limited, a private sector entity in India, to finance construction, operation and maintenance of two wind power generation facilities. The project is expected to reduce carbon dioxide emissions by 2.6 million tonnes during the minimum project life of 20 years. The loan catalyzed unfunded risk participation by a commercial bank and direct loan co-financing from Indian Renewable Energy Development Agency Limited.

In 2008, ADB approved loans to subsidiaries of the CLP Group (Hong Kong, China) for partial financing of two wind power projects in Gujarat and Karnataka. The project is expected to reduce carbon dioxide emissions by about 4.4 million tons during the minimum project life of twenty years.

In order to increase accessibility of power, ADB has provided assistance to Simpa Networks in 2013, a private firm, which has devised a mechanism to provide simple, affordable and clean energy to all underserved areas of the country.

Box 9.4: Simpa Networks: Off-Grid Pay-as-you-go Solar Power Project

ADB is providing assistance to Simpa Networks, a venture-backed technology company, that offers a simple and affordable clean energy solution for under-served consumers in India. The solution uses latest technology to account for energy demand from consumers and simultaneously provides risk mitigation for the company that finances the solar equipment. The technology platform comprises a very low-cost prepaid meter supported by sophisticated cloud -based software. It can be used in solar home systems (SHSs) (lighting product that uses solar power) and can also be offered to solar micro-grid developers as an extremely flexible metering, customer, and revenue management solution.

A customer who chooses a Simpa metering system-enabled SHS is given a choice of paying 10%, 20%, or 30% of the total cost of the SHS as a down payment for installation of the SHS on his/her premises. The customer is also required to choose the amount of energy credit to be purchased. The down payment amount is sent partly for repayment of the capital cost of the SHS while the rest goes to Simpa to cover for operation costs. Once the capital cost of the SHS is recovered, customers get ownership rights for the SHS. The pricing plan is completely flexible and can be customized to suit the customer's needs and ability to pay. As a result of this system, access to electricity in off-grid rural areas has increased. In addition, use of solar photovoltaic technology in the project has enabled more efficient use of indigenous renewable energy resources with no emissions.

Simpa, in addition to its existing presence in Karnataka, intends to expand its operations to seven states—Andhra Pradesh, Kerala, Gujarat, Madhya Pradesh, Maharashtra, Uttar Pradesh and West Bengal—by 2015. The success of the business plan will help attract additional investment capital for off-grid energy access projects.

In 2012, ADB approved a loan to Moser Baer Clean Energy Limited to finance six grid-connected photovoltaic solar plants totaling 145 MW in Gujarat. The transaction strongly complements ADB's current initiatives in solar energy in India and represents ADB's first private sector assistance by way of a direct loan to a transaction supported by a state solar tariff program. This is expected to catalyze similar projects and programs in other Indian states.

Box 9.5: 145 MW Grid-Connected Solar Project

In 2012, ADB approved a loan of up to $100 million of which up to 50% is denominated in Indian Rupees to finance six grid-connected photovoltaic solar plants totaling 145 MW. The project has been developed by Moser Baer Clean Energy Limited and constitutes one of the largest solar power undertakings in India.

The project entails the construction of five 25 MW and one 20 MW solar photovoltaic power generation plants, across six locations in Gujarat state. ADB's approach in financing six subprojects, is to demonstrate the benefits of scale: financing and developing an aggregate set of projects to reduce construction mobilization, financing, and management overhead costs. This approach maximizes the development impact by enabling a private sector developer to deliver clean energy to the regional grid at a sustainable tariff.

ADB is also providing credit guarantees worth up to $150 million to help India scale up its use of solar power. The guarantees will be made available to selected local and foreign commercial banks that finance private sector solar power plants and will cover up to 50% of the payment default risk on bank loans made to project developers. This will help mobilize long-term funding for solar energy development and support Government of India's Jawaharlal Nehru National Solar Mission (JNNSM).

ADB has approved a $103 million direct loan in 2012 to support Rajasthan Sun Technique Energy Private Limited (RSTEPL) for construction of a 100 MW of concentrated solar power (CSP) plant. The project is in line with ADB's India Country Partnership Strategy 2009-12 which supports environmentally sustainable growth through continued focus on infrastructure development and enhanced focus on renewable energy. It promotes more efficient use of indigenous renewable energy resources with almost no emission of pollutants or greenhouse gases.

Box 9.6: Rajasthan Sun Technique Energy Private Limited

The Rajasthan Sun Technique Energy Private Limited has been given a $103 million direct loan, without sovereign guarantee, by ADB to construct a 100 MW CSP plant near Dhusar, Jaisalmer district, Rajasthan. This project is a part of National Vidyut Vyapar Nigam's initiative for development of 470 MW of CSP and 150 MW of solar photovoltaic capacity, under the Jawaharlal Nehru National Solar Mission (JNNSM).

The project is the largest among the 37 projects under Phase I of JNNSM and accounts for 16% of the total capacity of JNNSM Phase I. It will complement ADB's current solar sector initiatives in India. The project will also demonstrate the feasibility and financial viability of large, utility scale CSP projects in the country. Its success would prove to be critical in achieving goals of the JNNSM by promoting private sector participation in solar energy.

Water and other municipal infrastructure services sector

ADB's Urban Operations Plan includes providing support to urban shelter sector programs of slum upgrading, housing, land tenure and development, housing finance, in addition to infrastructure development and support of community services, employment opportunities, and livelihood development. In this respect, ADB is considering providing assistance to Kumar Urban Development Limited, a real estate developer based in Pune, for developing free housing, water supply and sewage services for the slum dwellers under the slum rehabilitation scheme.

Box 9.7: Pune Nirvana Hills Slum Rehabilitation Project

ADB is considering assisting Kumar Urban Development Limited, a private real estate developer in Pune, in undertaking slum rehabilitation in the city under the Slum Rehabilitation Scheme (SRS) of the Government of Maharashtra, regulated by the Slum Regulatory Authority. The project entails rehabilitation of 4,324 slum households living on 76 acres of land that would be used in developing residential (1,800 commercial apartments and new, free housing for the slum dwellers), office space (about 300,000 sq. ft.) and retail space (1.3 million sq. ft.). Under this innovative SRS scheme the sale of commercial space will fully subsidize the rehabilitation of the slum dwellers and provide them free housing. Amenities like a housing society office, a self-employment centre for women, playgrounds, day care facilities, exercise rooms, community and senior-citizen recreation centres, primary and secondary schools, and parks will be constructed. Urban infrastructure components consisting of water supply and storage, rainwater harvesting systems, sewage treatment and disposal systems, fire fighting systems, power supply and back-up systems for elevators and water pumps will also be provided.

Local currency lending

In 2002, India was the first country where ADB started local currency lending instead of US dollar-based lending. This was in response to the needs of the Indian borrowers who wanted to avoid the currency mismatch as their project revenues were denominated in Indian Rupees. Avoiding currency mismatch in borrowings was also the important lesson learned from the Asian Currency Crisis in 1997-98. Powerlinks and Dewan Housing were the first projects which ADB financed in Rupees. This has been followed with loans with most of ADB's private sector operations transactions now being denominated in Rupees. ADB has been able to meet the needs of Indian borrowers of local currency borrowing so far by raising Rupees either in the swap market or issuing rupee bonds in the Indian market. ADB uses the most cost efficient of the two methods to raise Rupees depending on the market conditions so as to minimize the final cost of borrowing to Indian borrowers.

Table 9.1: ADB's Private Sector Operations in India (2002-12)

S. No.	Name of Company	Sector	Year of approval	Total assistance ($ million)	Modality
1.	Henderson Infrastructure Fund Ltd. Liability Co.	Finance	2002	15	Equity
2.	Medical Service Network	Health and Social Protection	2002	20	Loan
3.	Centurion Bank Limited (Supplementary)	Finance	2003	0.7	Equity
4.	Tala-Delhi Power Transmission	Energy	2003	62	Loan
5.	Dewan House Finance Corporation, Ltd.	Finance	2003	20	Loan
6.	Petronet LNG Ltd	Energy	2004	9.7	Equity
7.	Baring India Private Equity Fund	Finance	2004	20	Equity
8.	BTS India Private Equity Fund	Finance	2005	15	Equity
9.	Infrastructure Development Finance Company	Finance	2005	50	Loan
10.	Central Uttar Pradesh Gas Limited	Energy	2006	2.6	Equity
11.	Infrastructure Development Finance Company	Finance	2006	45	Equity
12.	Blue River Capital I, L.L.C.	Finance	2006	20	Equity
13.	NTPC Capacity Expansion Financing Facility	Energy	2006	300	Loan & B-Loan
14.	Petronet LNG Limited for the Dahej Liquefied Natural Gas Terminal Expansion Project	Energy	2006	150	Loan
15.	The Tata Power Company Limited	Energy	2007	79.3	Loan
16.	India Mortgage Guarantee Company	Finance	2008	18.6	Equity
17.	Coastal Gujarat Power Limited	Energy	2008	450	Loan
18.	Gujarat Paguthan Energy Corporation Private Limited	Energy	2008	45	Loan
19.	CLP Wind Farms Private Limited	Energy	2008	60	Loan
20.	GTL Infrastructure Limited	Transport and ICT	2008	150	Loan
21.	Public-Private Partnership for Renewable Energy Development	Energy	2009	40	Equity
22.	Export-Import Bank of India	Finance	2009	100	Loan
23.	Small Industries Development Bank of India	Finance	2010	250	PCG
24.	Solar Power Generation	Energy	2011	150	PCG
25.	VenturEast Life Fund III	Multi-Sector	2011	20	Equity
26.	Bangalore Metro Rail Corporation	Transport and ICT	2011	250	Loan
27.	POWERGRID	Energy	2011	250	Loan
28.	Dahanu Solar Power Private Limited	Energy	2011	48	Loan
29.	Credit Enhancement of Project Bonds	Finance	2012	128	PCG

S. No.	Name of Company	Sector	Year of approval	Total assistance ($ million)	Modality
30.	Industrial Credit and Investment Corporation of India	Energy	2012	100	Loan
31.	Rajasthan Sun Technique Energy Private Limited	Energy	2012	103	Loan
32.	Chattel Constructions Private Limited	Energy	2012	19.1	Loan
33.	Ganges Green Energy Private Limited	Energy	2012	20.7	Loan
34.	Hiraco Renewable Energy Private Limited	Energy	2012	16.3	Loan
35.	Responsive Sutip Limited	Energy	2012	19.1	Loan
36.	Sand Land Real Estate Private Limited	Energy	2012	13.7	Loan
37.	Ujiwala Power Private Limited	Energy	2012	11.2	Loan
38.	KUL Urban Development Private Limited	Water and Other Municipal Infrastructure And Services	2012	35	Loan
39.	Simpa Networks Off-Grid Pay-as-you-go Solar Power	Energy	2013	2	Equity

10. Public Private Partnerships

Introduction

The 12th plan has identified an investment need of over $1 trillion for infrastructure development. Given the need for prudent fiscal management in current times, which limits the scope of raising huge public debts, and the need for dedicating scarce public resources to health and education, this investment requirement cannot be met from exchequer funding alone. Therefore, there is a need for increasingly engaging the private sector through promotion and adoption of public private partnership (PPP) modes for development and operation and maintenance (O&M) of sectors such as roads, ports, telecom, railways, power, airports, and urban utilities. Taking cognizance of this fact, the 12th plan, projects a need to increase the share of private investment in infrastructure from 38% in the 11th plan period, to about 48% in the 12th plan period.

In addition to meeting the investment requirements, leveraging PPP reduces the quantum of public funds needed per project, thereby enabling the government to facilitate a considerably larger number of projects. Therefore, the Government of India has been focusing on developing enabling tools and activities to encourage private sector investments through PPPs. Some of the key measures undertaken by the government for promoting PPP are:

i. Creation of a dedicated PPP cell in Department of Economic Affairs (DEA), Ministry of Finance (MOF) to administer various PPP proposals and coordinate activities to promote PPPs

ii. Preparation of standardized documents such as model concession agreements for various infrastructure sectors

iii. Introduction of viability gap funding (VGF) scheme to improve financial viability of projects which are economically justifiable but not commercially viable in the immediate future, through provision of upfront grant assistance of up to 20% of the project cost

iv. Creation of the India Infrastructure Finance Company Limited, a wholly-owned Government of India enterprise, for providing long-term finance to infrastructure projects directly or through re-financing

v. Constitution of the PPP appraisal committee (PPPAC) consisting of the Secretary of the DEA as Chairman, and Secretaries of the Planning Commission, Department of Expenditure, Department of Legal Affairs and the administrative department concerned, as members, for speedy appraisal and approval of PPP projects.

As of 31 March 2012, 390 PPP projects involving an investment of about $55 billion had been approved across various sectors in India. PPPs are being considered and attempted across various central, state and local agencies, and across different sectors, from transportation to municipal services, and in social sectors.

ADB sector assistance at a glance

In order to support the government's efforts towards the development of PPPs in the country, ADB in partnership with the Centre undertook a pioneering initiative—

Mobile health vans in Uttarakhand - ADB has supported the project undertaken by Directorate General of Health and Family Welfare, Government of Uttarakhand.

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- *The 12th plan has identified an investment need of over roughly $1 trillion for infrastructure development.*
- *There are constraints which limit the extent of investment that can be met from the exchequer alone. Therefore, there is a need to increasingly engaging the private sector through promotion and adoption of PPP modes.*
- *The government has been focusing on developing tools, frameworks, and activities to encourage private sector investments through PPP.*
- *The government's initiatives for promoting PPP include creation of a dedicated PPP cell, preparation of model concession agreements, provision of viability gap funding, creation of a finance company to support PPP projects and constitution of a dedicated appraisal committee for PPP projects.*

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- *To support the government's efforts towards the development of PPPs in the country, ADB undertook a pioneering initiative – Mainstreaming PPPs in India, jointly with the Centre, in 2006.*
- *Implemented through eight TA projects, amounting to a total of $16.5 million, this is ADB's largest program of its kind.*
- *The Mainstreaming PPPs in India initiative aims to address weak institutional capacity to undertake PPP projects; weak legal, policy and regulatory frameworks for PPP; constraints in developing PPP projects in sectors such as water supply, health, and education; and the problem of inadequate knowledge exchange.*

"Mainstreaming PPPs in India", in 2006. The initiative, managed from the PPP Cell in the DEA, MOF, is supported by the PPP Cell in ADB's India Resident Mission. Being supported through eight TA projects, amounting to a total of $16.5 million, this is ADB's largest initiative of its kind. It aims to develop knowledge, institutions, capacities, processes, and model structures to enable the PPP environment in the country. A summary of TA projects comprising the initiative is provided in Table 10.1.

Table 10.1: Summary of the Technical Assistance Projects

TA No.	Description	Amount (in $ million)	Approval	Closing
4890	Mainstreaming PPP at State Level	5.00	2006	2011
4993	Mainstreaming PPP at Central Ministries	2.00	2007	2011
7152	PPP Pilot Projects	2.00	2008	2013
7221	Preparing Non-Sovereign Urban Infrastructure Projects	1.25	2008	2012
7342	Supporting PURA	1.50	2009	2013
7441	Assisting in Framework Development for Mainstreaming PPP	1.00	2009	2013
7463	Sustaining Initiative for Mainstreaming PPP	0.80	2009	2013
7625	Deepening Capacity Building for Mainstreaming PPP	3.00	2010	2013

The Mainstreaming PPPs in India initiative aims to address issues like institutional capacity to appraise, develop, finance and undertake PPP projects; legal, policy and regulatory frameworks for PPP; constraints in developing PPP projects in sectors such as urban water supply, health and education which attract low commercial interest upfront; and inadequate knowledge exchange.

To address these issues, a core PPP architecture was created, at the outset, to provide a base for future activities to be undertaken in the sector. It covered capacity development of officials, creation of policies and schemes, provision of implementation assistance, and development of an effective project pipeline. This architecture consists of four major components:

- **Supporting capacity of Government of India PPP cells.** The initiative supported the institutionalization and strengthening of 22 PPP cells across India. Tools, reports, marketing plans and support mechanisms like databases were developed, and skills for appraisal and development of PPP projects were institutionalized in these entities. Of the 22 cells, 15 were supported at the state level (one each in Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttarakhand and Delhi), six in central line ministries (one each at ministry of urban development, ministry of rural development, ministry of road transport and highways, ministry of home affairs, ministry of shipping and ministry of labour) and one at the DEA, MOF managed jointly by Government of India and ADB staff. Each of these PPP cells undertakes a large number of activities which include managing overall coordination amongst sector stakeholders, appraisal of project risks and funding, project development, preparation of policies and guidelines, and management of funds (including

VGF, state funds, and ADB project development funds (PDFs)). Capacity building and knowledge dissemination activities, including development of toolkits, best practice documents and model structures aimed at addressing sector challenges are also undertaken by the cells.

- **Pilot Projects Initiative.** One of the eight TAs, the 'Pilot Projects Initiative' was approved by ADB in 2008 with the objective of developing, structuring and implementing well-structured PPP 'pilot' projects in sectors like water, sanitation, health, education, rural and urban transport. The initiative provides 25% of the funds needed for the project from the concept development to the bid closure stage, while the rest (75%) is financed by the India Infrastructure Project Development Fund (IIPDF) scheme of the MOF. The initiative has developed a strong project pipeline of about 30 commercially sustainable projects in various sectors, which are at different stages of development and bidding. Of these, 21 projects have received structuring support and 3, with a total value of $176 million, have been awarded. These projects have the potential to act as replicable models for future projects in the corresponding sectors. The PPP Pilot Projects initiative includes a transaction advisory panel consisting of 10 firms/consortiums each, based on ADB's indefinite delivery contract modality. These panels provide expert advisory (technical, financial, legal) to project sponsors both at the central and state level in respective areas. The transaction advisory panel is capable of providing expert advice on all aspects of PPP structuring from concept development, technical review of costs, financial modeling, PPP options analysis, and finally to bid award to a private sector party. The legal panel has experience in PPPs in India and overseas and is capable of providing short term review and legal evaluation of project documents for PPP projects at an advanced stage of development.
- **Improving the PPP enabling environment.** The framework assisting TA supports the development of key policies and documents for a more PPP conducive environment, including a national PPP policy framework, PPP manuals, sector specific regulatory inputs, and a business plan for the proposed new national PPP entity, "3 P India". Under the TA, the draft PPP policy, PPP rules, a PPP manual, a PPP compendium, a business plan for "3 P India" (which is the corporate entity proposed to provide PPP services under the aegis of DEA) and a greenbook for PPPs in the health sector are being developed.
- **Providing urban amenities to rural areas (PURA).** The PURA scheme aims at developing a PPP implementation modality for the development of rural sector. The PURA TA includes assistance for sector policy framework development, development of a PURA PPP unit in the ministry of rural development, capacity building in local governments, and development of PURA pilot PPP projects. Under the TA, nine pilot PURA projects have been developed, out of which two projects in Kerala have been approved by the empowered committee and the agreements have been signed. Additional seven PURA projects are expected to be approved and agreements will be signed shortly. On the basis of the successful experience with the first nine pilot projects, MORD has now launched a second phase (PURA Phase II), which builds on the lessons learnt and aims at developing an additional 10-15 projects.

A whole range of activities are being undertaken in the country for mainstreaming PPPs by utilizing this four-pillared architecture. Reasonable momentum has been created in building awareness about PPPs amongst governments at the centre and state levels, as well as amongst prospective private sector partners. A pipeline of PPP projects have been developed and there is a continual demand for more assistance from the initiative to new projects and government departments. As procedures are standardized and the public sector trained on execution of various PPP modalities, private participants have been gaining confidence in the system,

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- *To address these issues, the initiative has helped create a core PPP architecture, consisting of:*
  - *22 PPP cells, wherein reports, marketing plans and support mechanisms for appraisal and development of PPP projects have been institutionalized;*
  - *The Pilot Projects Initiative has developed a strong pipeline of projects;*
  - *A framework assisting TA to improve the PPP enabling environment; and*
  - *A TA focused on leveraging PPP for rural development.*
- *Activities being undertaken under this architecture have created reasonable momentum in building awareness about PPPs amongst governments at the centre and state levels, as well as amongst prospective private sector partners.*

thereby encouraging them to engage in an increasing number of PPP projects. Some of the key activities and outcomes of the initiatives are:

- **Development of policies, guidelines and schemes.** The initiative has been supporting the conceptualization, development and implementation of a number of enabling frameworks and tools at the national and state levels for promoting PPPs. These include:
  i. Development of policies, schemes and tools at the national level, e.g. a Draft National PPP Policy to facilitate the expansion of PPPs in a consistent and effective manner; Annuity Scheme for leveraging private investments in PPPs; PPP manuals and toolkits for guiding project proponents through various stages of the project lifecycle; and PPP rules to govern preparation, procurement and management of PPP projects
  ii. Implementation assistance for national PPP schemes like the VGF Scheme and the IIPDF Scheme
  iii. Assistance to the PPPAC and institutional development for a National PPP Entity Structure (3P India), including preparation of a PPP compendium and business plan for the entity
  iv. Development of specific policies, schemes and tools at the state level, e.g. Haryana PPP Policy, Madhya Pradesh PPP Guidelines, Karnataka Swiss Challenge Guidelines, Uttarakhand PPP Framework have already been approved, while several others like PPP policies for Uttarakhand, Madhya Pradesh, Tamil Nadu, Maharashtra and Chhattisgarh; and PPP Act for Rajasthan are under preparation
  v. Implementation assistance to funds and schemes, e.g. VGF scheme in Uttarakhand and PDF assistance in Karnataka, Madhya Pradesh, Maharashtra and Assam.
- **Capacity building.** The initiative has been conducting various capacity building programs for government officials. These programs cover generic topics like rationale for PPP projects, different PPP modalities, best practices and PPP programs/schemes; as well as specific trainings on subjects like value for money (VfM), project structuring, financial modeling, bid process management, and usage of manuals, toolkits and guidelines prepared. By the end of 2011, 4,495 officials had been trained through more than 181 capacity building programs.
- **Knowledge management.** The initiative has helped prepare and launch several knowledge products related to PPP. These include a quarterly newsletter, 'Bulletin 3P'; case studies on bid completed/awarded projects, summary notes of information on PPP projects under bid process, and a knowledge series covering various PPP areas. To address the issue of the lack of a real time database of ongoing PPP projects for effective monitoring, management information systems, including state and central level websites managed by corresponding PPP Cells; state level project databases and a website on ADB-PPP in India have also been developed. Appropriate outreach to potential private sector partners to increase their awareness about the private sector's role in PPP and the PPP project cycle has also been extended by TAs under the initiative.

In addition to the preparation of such products, the initiative has also facilitated exchange of ideas and knowledge between stakeholders in India and international private sector operators, financiers and governments that have shown an interest in India's approach to PPP. This has been done mainly through the PPP X-Change, a pioneering international PPP event conducted under the initiative. Sectoral workshops are also conducted by PPP cells periodically.

ADB has also reengineered and tailored new financing solutions, as well as modified

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- *The Mainstreaming PPPs initiative has helped create framework policies, tools and guidelines for PPP at the national and state level. It has also supported the implementation of PPP schemes like the VGF and IIPDF schemes.*
- *The initiative has been conducting capacity building programs focused on generic as well as specific concepts related to PPP for government officials.*
- *It has also facilitated the preparation and launch of PPP knowledge products like 'Bulletin 3P', as well as provided support to 'PPP X-Change', a pioneering international event for the exchange of ideas and knowledge on PPPs.*
- *ADB has also reengineered and tailored new financing solutions, as well as modified its policies and procedures to support needs and priorities of PPP projects in the country.*

its policies and procedures to respond to the needs and priorities of PPP projects. These include adoption of new financing instruments such as the multi-client financing facility, sub-sovereign/non-sovereign lending, and local currency loans. The range of goods and services eligible of ADB financing has also been expanded, to include land, recurrent costs, and severance payment and leased assets. Procedural requirements for procurement and engagement of consultants have also been streamlined[69]. ADB has been encouraging central and state government agencies to make greater use of these financing modalities.

Project snapshots

ADB has supported PPP projects across various sectors. Snapshots of key projects are listed below:

1. Urban

Aurangabad water supply – Design Build Finance Operate Transfer (DBFOT)

This water supply project for Aurangabad city with a population of 1.2 million was the first-ever full city water supply project undertaken in Maharashtra with a PPP modality. With a project cost of $144.95 million[70], the project covers augmentation of bulk water supply, provision of 24x7 water supply, reduction of non-revenue water (NRW), distribution and metering of water supply. Sponsored by the Aurangabad Municipal Corporation, the concession was awarded in 2011 to the developer consortium, SPML-NWSC-VA Tech Wabag, for a concession period of 20 years. The selection of concessionaire was based on a two-stage bidding process, with least annual operational support grant as the bid criterion. The project funding comprises of Government of India, Government of Maharashtra and developer's equity in the ratio 36:14:50.

Kolhapur sewerage treatment plant – DBFOT

This project for the city of Kolhapur located in the south-western part of Maharashtra, was undertaken to address the issue of inadequate and poor sewerage services, covering less than 40% of the 550,000 population. At a project cost of $13.76 million, the project covers construction, operation and maintenance of a 76 MLD sewerage treatment plant; upgrade of existing pumping stations; construction of a new pumping station, rising mains and lines for discharging waste. Sponsored by the Kolhapur Municipal Corporation, the concession was awarded in 2010 to the developer Vishwa Infrastructure & Services Private Limited, for a concession period of 15 years. The selection of concessionaire was based on a two-stage bidding process, with least annuity payment as the bid criterion. The project funding comprises of Government of India and developer's equity in the ratio 70:30.

Khandwa 24x7 water supply project – Built-Operate-Transfer

To overcome the problem of acute water scarcity in the town of Khandwa in Madhya Pradesh, its municipal corporation developed a project to meet the town's long term water supply needs. The $21.1 million project covers development of an independent source of water, a new treatment and transmission system, rejuvenation of the distribution system, 24x7 water supply and metering of all connections. Sponsored by the Khandwa Municipal Corporation, the concession was signed in 2009, with the developer Vishwa Infrastructure (Hyderabad), for a concession period of 25 years. The selection of concessionaire was based on a two stage bidding process, with tariff to be charged per kilolitre of water as the bid criterion. The project funding comprises of Government of India, Government of Madhya Pradesh and developer's equity in the ratio 60:7:33.

2. Energy

Catalyzing private sector efficiency in hydro power production

Government of Mizoram has planned to set up a 210 MW hydro-electric power project in the state under PPP modality. It has applied for VGF from Government of India and plans to fund the project through VGF, developer's equity and debt. Request for proposal and power purchase agreements are under finalization, after which bids will be invited from seven bidders shortlisted at request for qualification stage.

[69]Source: Workshop Report, Facilitating Public Private Partnerships for accelerated infrastructure development in India, 2006

[70]All amounts in INR have been converted to US$ using the exchange rate of 54.5 INR/US$ averaged over the period 1st April 2012 to 31st March 2013.

3. Human development

Gyanodaya - Providing secondary education through PPP mode

In many semi-urban areas of Rajasthan, there are primary schools but no secondary schools (Classes V to XII). Through Gyanodaya, a pioneering initiative, the Government of Rajasthan plans to enhance reach and coverage by utilizing the PPP modality for construction of 50 new secondary schools in 10 districts of the state. The bid process for the project is underway and the project has applied for VGF from Government of India. This will be one of the first voucher based innovative PPP projects in the education sector in India.

4. Health

Mobile health vans, Uttarakhand – O&M

Residents of remote areas in Uttarakhand often face difficulties in accessing timely medical services. To address this issue, the Government of Uttarakhand procured 13 mobile health vans, one for each district, capable of providing emergency services in case of disasters/epidemics. The current project was undertaken by the directorate general of health and family welfare, Government of Uttarakhand for the operation and maintenance of these complex vans. With a project cost of $2.38 million, the concession was awarded in 2009, to two operators, M/s Rajbhra Medicare and M/s Jain Video for two and 11 districts respectively, for a concession period of five years. The selection of concessionaire was based on the criterion of lowest annual grant. The project funding comprised 100% Developer's equity. The operators charge user fees as stipulated by the All India Institute of Medical Sciences and serve below poverty line (BPL) patients for free.

5. Tourism

Eco Resort at Odisha - O&M

An eco-camp centre consisting of 20 cottages was developed by the Orissa Tourism Development Corporation (OTDC) in the beach area of Ramchandi in Puri. Connecting two major tourism destinations namely Puri and Konark, and located near to the sea, OTDC decided to further develop the centre through the PPP mode. With a project cost of $0.22 million, the current project was undertaken for upgrading existing facilities, developing a minimum of 20 cottages and other tourism related activities at the site. Sponsored by OTDC, the concession was awarded to Kamat Hotels India Limited, for a concession period of 10 years, in 2009. The selection of concessionaire was based on a single-stage bid process, with upfront and annual lease premiums as the bid criterion. The project, whose funding comprises 100% developer's equity, started commercial operations in 2010.

Way forward

The government has been emphasizing the need for PPP in the construction and operation of infrastructure projects in sectors including social sectors like health and education. DEA brought out the Draft National PPP Policy for consultation in 2011. The policy asserts that the government will formalize PPPs as the preferred model for infrastructure development, where adequate examples and a strong track record exist. The project pipeline being created by the Mainstreaming PPPs initiative will prove to be useful in providing the state with relevant experience and examples of PPP projects across challenging sectors like urban (water supply and sanitation and solid waste management), health and education, where several projects have already been taken up. The policy also mentions the need for the government to publish a set of rules to help officials with the structuring of projects. Knowledge products including guidelines and sector toolkits created under the initiative, as well as knowledge and best practices shared during 'PPP X-Change' events will assist the drafting of these rules. Capacity building training programs conducted for government officials on generic topics like modalities and best practices as well as specific trainings on project structuring, financial modeling, and on manuals, toolkits and guidelines prepared will assist in a more efficient implementation of the four phase PPP process defined by the policy. The panel of experts created under the initiative will be able to contribute to the centre of expertise and technical support envisaged.

Going forward, ADB's Country Operations Business Plan 2012-14 draws attention to the need for enabling PPPs to maximize development impact of its assistance. Interventions planned include:

i. Promotion of PPP in infrastructure development, through improving capacities at all levels of government to identify and develop PPP projects, which will contribute to the government's plans to strengthen the institutional framework for PPPs; and

ii. Provisioning of loan assistance to make PPP projects bankable which will supplement the financial support provided through the government's IIPDF and VGF schemes.

The 12th plan emphasizes the need to explore PPP options in secondary education and teacher's training, as well as for strengthening secondary and tertiary healthcare. The Mainstreaming PPPs initiative is exploring innovative models like voucher-based PPP format for financing secondary education in Rajasthan. These may further be extended to other states. PPP projects for health have also been ventured under the initiative. Further innovation in healthcare PPP may be explored in line with the plan objectives in the coming years.

Strategy 2020, ADB's long term strategic framework for the period 2008-2020 also identifies private sector development and private sector operations as the drivers of change in the Asia and Pacific regions. Under this strategy, ADB will expand its work with the private sector to enhance economic growth in the region. In this context, PPP is seen as an important modality and hence, ADB's will emphasize on the promotion of PPPs in all of its core operations in the coming years.

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- *Activities being carried out by ADB's initiative will support the government in addressing needs and suggestions highlighted by the Draft National PPP Policy (2011).*
- *Going forward, ADB's initiatives will focus on:*
  - *Promoting PPPs through the development of capacities and institutional frameworks; and*
  - *Provisioning of loan assistance to make PPP projects bankable.*

India-ADB Development Partnership 2013

The India-ADB Development Partnership 2013 report describes key features of ADB's operations in India and how these have evolved to support the Government of India's focus on high, inclusive and sustainable growth.

As of December 2012, ADB had approved 168 sovereign loans amounting to $27.2 billion and 344 technical assistance projects amounting to $258 million on a cumulative basis for India. Today, ADB operations cover over 20 states in India.

While infrastructure projects in the energy, transport, and urban sectors comprise over 75 per cent of ADB's operations in the country, ADB is also engaged in promoting water resources management, agribusiness infrastructure development, financial inclusion, skills development, and regional cooperation and integration. The report provides a compendium of ongoing projects and case studies across ADB's sectors of operations in India. It also highlights the innovative elements of projects and showcases the impact of development assistance on people's lives and livelihoods.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.7 billion people who live on less than $2 a day, with 828 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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