Local Actions for Sustainable Development

Water and Sanitation in Asia-Pacific Region

UN-HABITAT

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Foreword

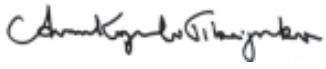
In a world where some 1.1 billion people lack access to safe water and 2.4 billion people lack access to basic sanitation, the provision of these vital and life sustaining services that protect their health and improve their productivity is, without a doubt, one of the best ways to alleviate poverty. Nearly two million children die, needlessly, every year for the lack of water or for its poor quality. Millions of girl children are forced to trade education for collecting water or drop out from schools for the lack of even minimal sanitation facilities. There is no better starting point to reduce child mortality or more effective way to promote universal primary education or gender equality other than providing basic water and sanitation. Access to these services is also a concrete way to make significant improvements in the lives of a billion people living in slums. Unfortunately, two thirds of the global poor without access to safe drinking water and three fourths of the global population without access to safe sanitation, live in the Asia and Pacific region.

Despite substantial investments by the Governments, access to these basic services remains a formidable challenge. The water and sanitation sector suffers from the tendency to invest in new assets and facilities, paying less attention to conserve and manage existing resources. The burden associated with inadequate coverage and access, and of inefficient service delivery, falls most heavily on the vulnerable and the poor.

These challenges are complex, but by no means insurmountable. There is no magical or universal solution to these problems due to wide variability of country-specific and local conditions. The first step is thus for Governments to translate the global goals on water and sanitation into country and city-level targets. This also requires the identification and adoption of innovative, appropriate, affordable and culturally acceptable solutions.

UN-HABITAT has been addressing these issues through its regional programmes to support participating Governments in attaining the water and sanitation and slum upgrading targets of the MDGs. It does so by promoting pro-poor water and sanitation investments and governance frameworks involving community participation and public-private partnerships with a focus on gender mainstreaming and capacity building.

I am happy that UN-HABITAT is bringing out this publication in support of its 'Vision 2020'on the delivery of MDGs on water and sanitation in the Asia-Pacific Region. My hope is that it will inspire Governments of the region in taking new initiatives for finding solutions that are replicable, sustainable and can be brought to scale. I believe that the experiences presented in this publication also provide examples of good practices that are relevant to other countries and regions in their respective initiatives for the timely attainment of the MDGs.



Anna Kajumulo Tibaijuka
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Foreword

Nearly half of the global population now lives in cities, and this is expected to rise to two-thirds by the year 2030. The world's cities today harbour one billion slum dwellers, who live with severe overcrowding, in temporary structures and without access to the most basic amenities. As a result of these harsh conditions, the urban poor face unprecedented risks to their health, ability to earn or stay in school, and face even deeper levels of poverty. This demographic shift is also putting significant pressure on water resources and services.

In the Asia and the Pacific Region, about 1.8 billion people - nearly half of the region's population - still live on $2 a day or less. More than 620 million of them live in extreme poverty of earning $1 a day or less. One in five people do not have access to safe drinking water and almost half of the population in the region do not have access to proper sanitation. Poverty in all its aspects remains the region's most daunting problem.

Water and sanitation are key factors in reducing poverty, improving livelihoods, and promoting economic growth. The Asian Development Bank in partnership with UN-HABITAT has been financing investments for pro-poor and community-based water and sanitation through initiatives that test new models for service delivery, and along the way, building the capacity of government, utilities and communities themselves. These initiatives help demonstrate and provide new knowledge to be shared about successful local actions in various countries.

This publication supports the initiatives of the Asia-Pacific Water Forum for universal access to safe drinking water and basic sanitation for all. It focuses on the themes of decentralisation, empowerment, and partnerships among local authorities, and capacity development of civil society and service providers.

Despite the challenges this region faces, we should be encouraged by the local actions documented in this publication. In all, this publication offers 58 local water actions in 26 countries in the Asia and the Pacific region, including various actions supported by ADB. These actions will be useful to governments and practitioners striving to identify affordable solutions that will accelerate their achievement of the Millennium Development Goals.

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Acknowledgements

UN-HABITAT and ADB have been addressing the issues of water and sanitation to support the participating governments in the Asia-Pacific region for achieving their localised Millennium Development Goals (MDGs) relating to Water and Sanitation (WATSAN). UN-HABITAT promotes city-level initiatives as local actions which are replicable, transferable and proven instruments on ground realities. These initiatives are expected to be the most appropriate solutions that would help in scaling up WATSAN services in a cost-effective and sustainable manner as per the requirements and acceptability of the communities.

In collaboration with the Government of India, UN-HABITAT organised the first Asia-Pacific Ministers Conference in New Delhi in December 2006, which formulated a Framework of Action for Meeting the MDGs on Water and Sanitation in the Asia-Pacific Region. This was based on the detailed deliberations on the 'Vision 2020' document prepared by UN-HABITAT in collaboration with Asian Development Bank (ADB), the Water and Sanitation Programme (WSP) of World Bank, WaterAid London, Gender and Water Alliance (GWA), the Netherlands, Asia-Pacific Water Forum (APWF), Japan and the Government of India. UN-HABITAT facilitated in developing the Vision 2020 document which was unanimously endorsed by all the participating governments at the Ministerial Conference. This Publication on "Local Actions for Sustainable Development on Water and Sanitation in the Asia-Pacific Region" has been prepared to lend support to the implementation of the Vision 2020.

The Publication has been prepared under the guidance of Mr. Bert Diphoorn, Director (Ag), Human Settlements Financing Division, UN-HABITAT and the close direction and overall supervision of Mr. Andre Dzikus, Chief, Water and Sanitation Section II, Water, Sanitation and Infrastructure Branch, UN-HABITAT. Dr. Kulwant Singh, Chief Technical Advisor, Water for Asian Cities Programme, UN-HABITAT, developed the concept, design and coordinated in bringing out the publication with the support of Mr. C. Vijaya Kumar, Publications Officer, UN-HABITAT who prepared and edited the local actions and Mr. Jogesh Arora, UN-HABITAT who provided the administrative assistance.

ADB has provided significant support in the preparation of the publication. ADB initiatives in partnership with UN-HABITAT have been helping to demonstrate and provide new knowledge about successful local actions to be shared among the participating countries. The recent ADB - UN-HABITAT enhanced MoU which focuses on urban water and sanitation infrastructure with a commitment of US$ 1 billion investments in the next five years (2008-12), would further facilitate in generating many new local actions in the region and enable the country governments to derive benefits for the timely achievement of water and sanitation related MDGs.

This publication would not have been possible without the contribution and timely support of various partner organisations and the UN-HABITAT professionals in the Asian region. For the professional support and for sharing their experiences, UN-HABITAT owes a great deal to The Energy and Resources Institute (TERI), New Delhi, Byrraju Foundation, Hyderabad, Rural Development Institute, Dehradun, Mahila Chetna Manch, Bhopal, Tamil Nadu Water Supply and Drainage Board, Sulabh International Social Service Organisation, New Delhi, Solutions Exchange for Water Community, United Nations Development Programme (UNDP), India and international organisations including Asian Development Bank, WaterAid, Gender and Water Alliance, Streams of Knowledge Global Coalition of Water and Sanitation Resource Centre Foundation, Best Practices and Local Leadership Programme of UN-HABITAT and Water and Sanitation Programme of World Bank and the UN-HABITAT professionals in the region.

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Contents

Boxes

Abbreviations

AARAMBH	Advocacy for Alternative Resources, Action, Mobilisation and Brotherhood
ACT	Association for Community Transformation
ADB	Asian Development Bank
AIHPH	All India Institute of Hygiene and Public Health
AMC	Ahmedabad Municipal Corporation
ARG	Artificial Recharge of Groundwater
APWF	Asia-Pacific Water Forum
BGMS	Bhartiya Gramin Mahila Sangh
BPL	Below Poverty Line
CAP	Catchment Area Protection
CAWSS	Central Authority for Water Supply and Sewerage
CAWST	Centre for Affordable Water and Sanitation Technology
CBO	Community-based Organisation
CEE	Centre for Environment Education
CFT	Child-friendly Toilet
CLTS	Community-led Total Sanitation
CMG	Change Management Group
CMWSS	Community-managed Water Supply Scheme
CPF	Community Participation Fund
CPWS	Comprehensive Protected Water Supply
CRISIL	Credit Rating and Information Services of India
CWRM	Community-based Water Resource Management
CWASC	Community Water and Sanitation Committee
DDC	District Development Committee
DENR	Department of Environment and Natural Resources
DFID	Department for International Development
DMA	District Metered Area
DSK	Dushtha Shasthya Kendra
DTR	Direct Technical Report
DUDA	District Urban Development Agency
DWASA	Dhaka Water Supply and Sewerage Authority
DWSS	Drinking Water Supply System
ECOSS	Ecotourism and Conservation Society of Sikkim
ENPHO	Environment and Public Health Organisation
EPCO	Environmental Planning and Coordination Organisation
FGD	Focus Group Discussion
FIR	First Information Report
GAP	Gender and Poverty Approach
GIS	Geographic Information System
GMS	Gender Mainstreaming Strategy
GOAP	Government of Andhra Pradesh
GOMP	Government of Madhya Pradesh
GRET	Group Research Exchanges Technologies
GUARDIAN	Gramalaya Urban and Rural Development Initiative and Network
GVS	Gram Vikas Samithi
GWA	Gender and Water Alliance
HIHT	Himalayan Institute Hospital Trust
HLL	Hindustan Lever Ltd.
HUL	Hindustan Unilever Ltd.
HVWSHE	Human Values-based Water, Sanitation and Hygiene Education
IAFI	International Fund for Agriculture Development
IBRD	International Bank for Reconstruction and Development
IBSUM	Indian Bank's Special Unit for Micro Finance

IDP	Internally Displace Persons
IEC	Information, Education and Communication
IFI	International Financial Institution
IG	Income Generation
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
JNTU	Jawaharlal Nehru Technical University
JFPR	Japan Fund for Poverty Reduction
JSC	Joint Stock Company
KAF	Kanchan Arsenic Filter
KAP	Knowledge, Attitude and Practices
KMC	Kathmandu Metropolitan City
LCS-CAHE	Low Cost Sanitation and Community Awareness and Health Education
LGSP	Local Government Support Programme
LPCD	Litres Per Capita Per Day
L&T	Larsen and Toubro Ltd.
MAPP	Municipal Action Plan for Poverty Reduction
MC	Municipal Corporation
MCM	Mahila Chetna Manch
MDG	Millennium Development Goal
MEK-WATSAN	Mekong Region Water and Sanitation Initiative
MFI	Micro Finance Institution
MIS	Management Information System
MIT	Massachusetts Institute of Technology
MLALAD	Member of Legislative Assembly Local Area Development Fund
MoU	Memorandum of Understanding
MPLAD	Member of Parliament Local Area Development Fund
NASC	National Arsenic Steering Committee
NEWAH	Nepal Water for Health
NGO	Non-governmental Organisation
NGOFUWS	NGO Forum for Urban Water and Sanitation
NGPES	National Growth and Poverty Eradication Strategy
NRCS	Nepal Red-Cross Society
O&M	Operation and Maintenance
OPP	Orangi Pilot Project
PACB	Primary Agricultural Cooperative Bank
PCWS	Philippine Centre for Water and Sanitation
PDA	Pilot and Demonstration Activity
PDCA	Plan-Do-Check-Act
PGTWP	Puer General Tap Water Plant
PMC	Pune Municipal Corporation
PMU	Project Management Unit
POU	Point-of-Use Drinking Water Treatment
PP	Poverty Pocket
PPSA	Poverty Pocket Situation Analysis
PPWSA	Phnom Penh Water Supply Authority
PTA	Parent Teacher Association
PUB	Public Utilities Board
PWS	Protected Water Supply Scheme
PWSC	Provincial Water and Sanitation Centre
QEE	Quality and Equity in Education
RBI	Reserve Bank of India
RBTS	Reed-bed Wastewater Treatment System
RDI	Rural Development Institute

RGA	Rapid Gender Assessment
RHEP	Rural Health and Environment Programme
RO	Reverse Osmosis
RSF	Revolving Sanitation Fund
RWF	Revolving Water Fund
RWHPP	Rain Water Harvesting Promotion Programme
RWS	Rural Water Supply
RWSSSP	Rural Water Supply and Sanitation Support Programme
SADC	Swiss Agency for Development Cooperation
SCP	Sustainable City Programme
SEAMEO	Southeast Asian Ministers of Education Organisation
SESI	Slum Environmental Sanitation Initiative
SGSITS	Shri G.S. Institute of Technology and Science
SHE	Sanitation and Hygiene Education
SHG	Self-help Group
SMC	Surat Municipal Corporation
SODIS	Solar Water Disinfection
SRSP	Sarhad Rural Support Programme
SSSWSP	Sri Sathya Sai Water Supply Project
SWM	Solid Waste Management
TA	Technical Assistance
TCWM	Total Community Water Management
TDS	Total Dissolved Solids
TERI	The Energy and Resources Institute
TFET	Trust Fund for East Timor
TISA	Transitional Islamic State of Afghanistan
TOT	Training of Trainers
TWAD Board	Tamil Nadu Water Supply and Drainage Board
UCSF	Urban Community Support Fund
UFW	Unaccounted-for Water
UGD	Urban Ground Drainage
ULB	Urban Local Body
ULG	Urban Local Government
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UN-HABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VDC	Village Development Committee
VWSC	Village Water and Sanitation Committee
WAC	Water for Asian Cities Programme
WAN	WaterAid Nepal
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WCPC	Water Consumer Protection Committee
WDM	Water Demand Management
WHO	World Health Organization
WMR	Water Meter Reader
WRP	Water Resource Planning and Conservation
WSP	Water and Sanitation Programme
WSUC	Water and Sanitation Users Committee
WTF	Wastewater Treatment Facility
YWW	Yokohama Waterworks Bureau

Executive Summary

The Asian continent represents the world's most populous region with most of the world's largest cities and it is the global economic powerhouse of the future. By 2030, half of the Asian population will be living in the cities and Asia alone will account for more than half of the world's urban population. The Asian region is experiencing the dynamics of economic growth, rapid urbanisation and poverty. The reality is that more than two-thirds of the global poor live in Asia and more than 620 million people live on one dollar per day or less. Asia is the home to half of the world's slum population. Almost two-thirds of the global population without access to safe drinking water and three-fourths of the world's population without access to safe sanitation live in Asia. The burden is heaviest on the poor and on women, affecting their health, safety and dignity.

Despite substantial investments in providing drinking water and sanitation by the country governments, access to these services remains a challenge. The challenges are no doubt complex, but by no means insurmountable. A concrete, realistic and achievable plan of action with vision, implementation strategies and monitoring mechanisms is needed to meet the wide variance in country-specific conditions. While some countries do have plans but not the means of implementation, many developing countries do not even have plans on how to transform the principles and guidelines of the Millennium Summit into concrete actions.

UN-HABITAT has been addressing these issues to support the participating governments in the Asia-Pacific region in attaining water and sanitation related MDGs in a sustainable manner by promoting city level:

- Pro-poor water and sanitation governance;
- Conservation and demand management;
- Environmental sanitation initiatives;
- Gender mainstreaming;
- Community-managed approaches;
- Capacity building; and
- Value-based water, sanitation and hygiene education.

These initiatives are proven instruments on ground realities and help to scale up water and sanitation (WATSAN) services in the region in a most cost-effective manner with sustainable means as per the requirements and acceptability of the communities. There have been several instances of local actions/practices evolved under these initiatives by the governments, the people themselves, non-governmental organisations or by appropriate partnerships, which have been successfully implemented. These local actions/practices are considered as appropriate solutions which are replicable and transferable to other cities and regions.

UN-HABITAT and its collaborators prepared a 'Vision 2020' document on the "Delivery of the MDGs for Water and Sanitation in the Asia-Pacific Region", which articulated the core elements on a region-wide approach to water and sanitation which are appropriate to the aspirations of the Asian countries despite varying conditions and challenges.

In support of this initiative, the publication on "Local Actions for Sustainable Development on Water and Sanitation in Asia-Pacific Region" aims at supporting the country governments of the region in achieving their localised MDGs relating to water and sanitation by sharing such solutions that can be easily replicated, scaled up and sustainable besides being cost-effective and innovative. It brings forward the proven practices in different parts of the region, which are pro-poor, appropriate, affordable and acceptable to the user communities.

The Publication presents 58 Local Actions being practiced in 26 Nations of the Asia-Pacific region which include Afghanistan, Azerbaijan, Bangladesh, Cambodia, China, India, Indonesia, Iran, Iraq, Japan, Kiribati, Korea, Kuwait, Kyrgyz Republic, Lao PDR, Nepal, Pakistan, Papua New Guinea, the Philippines, Qatar, Singapore, Tajikistan, Timor-Leste, Ukraine, Uzbekistan and Vietnam, organised under seven thematic areas in seven Sections:

Section I:	Pro-poor Water and Sanitation Governance
Section II:	Integrated Policy, Planning and Management
Section III:	Appropriate Technologies
Section IV:	Community-managed Initiatives and Awareness
Section V:	Gender Mainstreaming and Empowerment
Section VI:	Innovative Financing
Section VII:	Human Values-based Water, Sanitation and Hygiene Education

The thematic areas are considered in congruence with proven initiatives of UN-HABITAT in the Asia-Pacific Region, supporting the governing principles of the Vision 2020 - "Policy as Practice", with the main focus on Pro-poor Governance, Integrated Policy and Planning, Appropriate Technologies, Partnerships, Community Awareness and Participation with Gender Involvement and Value-based Education on Water, Sanitation and Hygiene.

The experiences presented in the Publication are expected to provide a road map to the implementing authorities, reflecting new knowledge, flexible strategies, and facilitating a framework towards faster WATSAN services in the region.

The Local Actions have been documented with the support of UN-HABITAT professionals in the region and in partner organisations. Each Local Action, in general, illustrates the situation before the initiative was started, the objectives and strategies, mobilisation of resources, the impact of the practice, lessons learned, sustainability and transferability.

Section I on **'Pro-poor Water and Sanitation Governance'** presents 9 Local Actions being practised in Azerbaijan, China, India, Pakistan, Tajikistan and Timor-Leste with primary emphasis on pro-poor sector reforms and transformation as well as principled governance in the promotion of WATSAN services.

'Integrated Policy, Planning and Management' practices governed by Leadership, Political Will, Democratisation, Regulatory Mechanisms and Transparency, are illustrated in **Section II** through 14 proven practices in Afghanistan, Cambodia, China, India, Iran, Japan, Kirabati, Korea, Kuwait, Kyrgyz Republic, Nepal and Uzbekistan.

Section III on **'Appropriate Technologies'** exhibits the importance of appropriate, affordable and culturally acceptable technologies, as instruments for augmenting the water and sanitation facilities and presents 10 such Local Actions being practised in India, Indonesia, Nepal, the Philippines, Singapore and Qatar.

The impact of **'Community-managed Initiatives and Awareness'** has been dealt under **Section IV** through 12 Local Actions from Bangladesh, India, Iraq, Japan, Lao PDR, Nepal, Pakistan, Papua New Guinea, the Philippines and Ukraine.

Developing '**Gender Mainstreaming Strategy and Empowerment'** has been the new strategy in promoting sustainable development and services in the water and sanitation sector, which is the subject of **Section V**. Five pioneering Local Actions from India, Nepal and Pakistan are presented in this Section.

'Innovative Financing' practices benefiting the small urban centres in particular, would help promote efficient and effective service delivery of water supply and sanitation services. Six Local Actions from Cambodia, India, Nepal and Vietnam are illustrated in **Section VI**.

UN-HABITAT recognises the need for promoting a new ethic on water and sanitation, based on universal human values of mutual respect and care for the environment. Human Values-based Water, Sanitation and Hygiene Education (HVWSHE) is a strategic and long-term intervention which can provide a foundation for more sustainable practices and are integrated in UN-HABITAT's governing policies. **Section VII** on '**HVWSHE'** showcases the experiences and the impact of value-based education on water and sanitation in the environment and the society in India and Southeast Asia.

In a nutshell, the publication presents various Local Actions from different countries of the Asia-Pacific Region which are pro-poor, affordable, appropriate, culturally acceptable and extremely useful. These local actions/practices share several 'lessons learned', which are significant for the country governments and practising professionals in support of their efforts to achieve the MDGs on water and sanitation. These primarily include:

- policy reforms – from policy as intention to policy as practice
- dynamic leadership and political will
- technical sustainability of facilities
- financial sustainability ensuring continued flow of funds to maintain services
- institutional sustainability to preserve the standards of consistent services
- environmental sustainability to ensure continued supply of quality services
- overarching the importance of gender mainstreaming
- indispensable role of NGOs and partnerships at all levels
- generating credibility in external interventions based on on-the-ground performance
- involvement of civil society organisations in design and management
- capacity building of CBOs and NGOs in project development and delivery as well as in sustainability, decision-making process, financial management, technical operations, monitoring, evaluation and extending proper linkages with local governments
- significance of HVWSHE in promoting changes in behaviour and attitudes
- instituting user contributions and use of revolving funds
- culture of accountability and transparency in operations
- improved public disclosures and information base.

The publication will serve as a Guide Book for country governments, functionaries at all levels of operation, professionals, NGOs, CBOs and those engaged in improving the quality of life by promoting drinking water supply and safe sanitation. It is hoped that the Local Actions illustrated in the publication would provide new directions and insights and act as tools for the practitioners and policy-makers for scaling up sustainable water and sanitation delivery to facilitate the achievement of the MDGs set for 2015. The authorities using these Local Actions are encouraged to modify and develop appropriate applications suitable to the local environment and also share the same with others.

Delivery of MDG on

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Water and Sanitation in Asia-Pacific Region: "Vision 2020"

Delivery of MDG on Water and Sanitation in Asia-Pacific Region: "Vision 2020"

Introduction: Water, Sanitation and Quality of Life

"Every citizen, woman, man or child, without exception, in every country in Asia has the right to safe water and safe water and sanitation for her or his health and well being. It is in the power of every country to meet this obligation by 2020 through commitment, leadership, innovation and with full participation of all its citizens."

Where We Are: Realities and Challenges

In September 2000, governments across the world, including Asia-Pacific region, made a commitment to the UN Millennium Development Goals. This unprecedented step was a universal acknowledgement of the seriousness of the problems of poverty, its causes and consequences globally. The importance of providing safe water and sanitation in the fight against poverty was recognised from the outset. Specific targets were set to halve the proportion of people without access to safe water and sanitation by 2015.

Since then, the importance of the provision of safe water and sanitation to fundamental aspects of development and well being, and indeed the linkages to the other MDGs, has been widely acknowledged. Subsequently, several studies and task forces, including the UN Millennium Project Task Force on Water and Sanitation and the Asia Water Watch 2015, have emphatically made the case for the importance of the water and sanitation MDG target, and highlighted its pertinence to improving health, education and economic development and quality of life generally. The challenges, however, are considerable.

Scale of Service Shortfalls

Progress towards these targets in the Asia-Pacific Region has been less rapid than anticipated. The Human Development Report of 2006 States that almost two out of every three persons in the world without access to safe water and three out of four without access to safe sanitation live in Asia. Over 635 million people in the region are without safe water, and 1,880 million without safe sanitation.

According to the Asia Water Watch 2015 report, the number of people without safe sanitation in urban areas actually increased between 1990 and 2002. At current rates of progress, the MDGs will not be met for sanitation in many countries of Asia.

The Challenge

A heavy burden on the poor, women and children

The burden associated with inadequate coverage and access and of inefficient service delivery falls heaviest on the most vulnerable and the poorest. Two out of three of the unserved earn less than $2 per day, and are unable to make household level investments to compensate for unreliable and unsafe services. Poor citizens, women and children are also the most excluded from decision making. Lack of access to safe sanitation affects women the most not only in terms of their health but also their dignity and safety, particularly in areas of conflict or those affected by disasters. Women and girls especially find their productivity impaired by their social roles and the costly and time-consuming tasks of collection and storage of water. Because of the lack of access and the poor quality of services, low tariffs often do not help the poor, who are less likely to be connected in the first place and rely on informal vendors.

Sector transformation – a priority

The task ahead is, therefore, not just a mechanistic one about finance and infrastructure. The sector unfortunately suffers from a tendency to invest in the creation of new assets and facilities, while neglecting the management and maintenance of those assets over time. Financial dependence on higher tier funds further weakens local jurisdiction, leads to waste and a disregard for the requirements of customers and citizens. Higher tier support, ostensibly aimed at the poor, is often misdirected as generic subsidies fail to reach the poor. Rigid policy and legal frameworks deny the actual and potential roles of large and small-scale private sector providers. The financiers remain and deprive the sector from the full contributions and innovations they could provide. These realities have left the sector inefficient, costly and out of touch with those it is supposed to serve.

Dealing with these challenges requires an unswerving commitment to address issues of equity and inclusion, balance the multiple requirements of urban, peri-urban and rural areas at a time of rapid and unplanned urbanisation, and bring service provision in touch with the people required to use and pay for those services. Such a challenge calls for a sense of urgency and far-reaching transformation to instill sensitive, imaginative and accountable governance and fundamental changes in attitudes and behaviour, a culture of service and responsibility and awareness by governments and citizens alike.

Above all, the response needs to be imbued with a sense of urgency. Given the huge backlog and numbers involved, it is no longer enough for countries in Asia to aspire to meet the Millennium Goals. As an obligation to their people and as an example to the rest of the world total provision of safe water and sanitation for basic human needs by 2020 can be the only option.

Closing the Gap: Two Cardinal Sets of Principles

Asia is a region of great diversity in all its aspects - systems of administration, culture and availability of water. There can, therefore, be no one blueprint approach for the full provision of safe water and sanitation services to the people of each country. There are multiple routes to match different set of circumstances, particularly at the micro level. However, there are a number of general or macro principles which, when adapted to the contextual circumstances of each country, can result in big and beneficial changes, particularly for the poor and vulnerable.

The fundamental premise on which progress can be made is that ensuring (which is different from directly providing) the delivery of water and sanitation services is squarely the responsibility of each national government in Asia. But to be successful, they will need above all, determined leadership and the political will that is absolutely necessary to maintain the commitment that will be needed.

Principled Governance

The first step on this journey and the overarching framework is principled governance which, in the context of the provision of safe water and sanitation will have its different nuances in each country in the region. But there are certain aspects of governance which are common and cover policy, attitudes and practices.

Pro-poor Approach

Of these, there are several attributes related to attitude and approach which are particularly important in ensuring that governance is principled, both in the setting of policy and its practice, and goes beyond efficiency (which is undoubtedly important) to a commitment to equity and the interests of poor and vulnerable people and in particular, to women.

- The first is according the provision of water/ sanitation services to poor communities (which in the urban context means a focus on slum settlements, both 'recognised' and 'unrecognised') top priority in the setting of policy and following it up with a commitment to provide the necessary resources. This would mean that MDGs are not just national targets and the first step to full provision but also targets at local level. The consequences of such an emphasis would be that reliable and affordable water and sanitation services for poor communities would not merely be the outcome of planned projects but the starting point in their design and execution and be based on an attitude of respect not patronage.
- The second is embracing a culture of accountability which would necessitate not just 'passive' transparency (e.g., putting out information on policies on the website) but also an active engagement in debate and discussion on policies and their consequences, project designs and their alternatives and impact assessments with unserved communities in locations and idioms where the participation of communities as key stakeholders is real and not a token activity on a checklist.
- The third which is a natural consequence of the above two is a determination to reach the 'last mile', an emphasis on speedy delivery, especially to poor communities. This can only be done if there is a willingness to understand the inherent diversity of communities and their different needs, try new approaches and avoid prevarication.
- The fourth, which is especially important in an environment where there is a general shortage of resources, should be an emphasis on sustainability in all its aspects (technical sustainability of facilities e.g. operation and maintenance, financial sustainability ensuring the continued flow of funds to maintain services, institutional sustainability to preserve

the standards of consistent service and environmental sustainability to ensure the continued supply of water and to avoid deterioration in quality).

Institutional Reform

While there is now a broad agreement about the need for institutional reform, performance remains patchy and, in several countries, urban policy in particular remains mired in confusion. There is no doubt that policy reform is a complex subject at a time of rapid growth and the diverging interests of several stakeholders. However, there are some issues that need to be addressed as a matter of urgency.

- While decentralisation in the governance arrangements to local levels of government is important, it has to move off the statute books and be accompanied by real devolution of fiscal and managerial responsibility and a clear understanding of roles. Timing and terms of transfer of responsibility are equally important so that changes in governance structures are accompanied by measures to ensure the requisite management capacity exists to undertake the expected tasks before transfer of responsibilities and that local entities are not saddled with unsustainable levels of debt. This may require 'write-off' of debts in some cases.
- Whoever is the service provider, whether a government-owned entity with independent authority or a local community-owned network or a private sector or NGO provider or contractor, the introduction of independent regulatory systems to ensure the affordability and reliability of safe water and sanitation services, particularly to poor people, combined with a system of incentives and sanctions to be applied to encourage the swift in the completion of projects, is important.
- Finally, given the record of delayed projects or initiatives that have been reversed, short duration projects, using fast track mechanisms, which begin to deliver safe and affordable water and sanitation, within the span of a political cycle, can protect the interests of poor communities from the effects of political changes, which can result from a competitive political environment.

From Policy as Intention to Policy as Practice

Meeting the exacting standards of good governance as described above and to actually deliver results is no easy task and would need a number of steps and initiatives. These include the following:

Focused Generation and Application of Resources

Inadequate and ill directed financial flows, together with poor technical and management capacities can and do frustrate otherwise positive policy initiatives and cripple water and sanitation service delivery. Corrective measures in the area of finance are often painful but necessary for the expansion of supply, for proper maintenance and for an equitable distribution of costs and user charges. Measures to introduce improvements could examine the following:

- While there is an overall need for financial resources from general budgetary sources and in some cases from external sources (grants or loans) especially for capital expenditure, in many situations there is a need to transfer resources from the better off including industrial and commercial establishments (who often benefit from perverse subsidies and low tariffs) to poor communities (who suffer from high costs in terms of time and money from unreliable supplies of expensive water) through bold increases in tariff levels with generous and targeted subsidies for poor families. This politically unpopular move is necessary not only to generate resources to maintain and improve service levels but also to manage demand from a conservation point of view.
- Provision of sufficient resources for operation and maintenance may seem obvious but is often neglected in actual practice and may require continued subsidies for central funds to those local bodies/service providers who are not able to generate enough resources from consumers in their areas (applicable to both urban and rural situations where there are large numbers of poor people and fewer high payers including industrial and commercial establishments).
- Investment in training and skill development at all levels of local service providers (often the most neglected tier of government when the service provider is the local municipality) not just as a one-off exercise but on a continuing basis to keep up with technical and system improvements as they happen in different parts of the region is necessary to ensure that water and sanitation services receive the kind of professional management that is proportionate to their importance as a fundamental basic service. A case can also be made for similar

inputs focused on local elected representatives (mayors, members of locally elected bodies at town and village level) who can only discharge their obligations with proper information and some subject knowledge.

- Civil Society organisations not only champion the cause of poor people but introduce innovations in technical designs, management systems (including the role of women's groups in traditionally male bastions such as technical maintenance of public water and sanitation facilities) and accountability measures such as social audits. They are also generally more cost-effective than either government departments or the private sector. Specific resources allocated to them would be a big step forward, particularly in outreach to poor communities.
- Public disclosure of water and sanitation budgets and the regular scrutiny of expenditure is part of an accountability mechanism, which can help to direct resources to the right places (such as slum settlements) and to combat corruption. This is a measure to be applied across the board whoever is the user of funds, whether government departments or civil society organisations.
- Often it is the problems of big metropolitan centres that occupy the attention of policy makers and service providers. Secondary towns and peri-urban areas receive disproportionately small amounts of time, attention and resources. This is a situation that has to be corrected if there is to be any chance at all of achieving full provision of water and sanitation services.

In order that positive policy initiatives facilitate sustained water and sanitation delivery following measures may be considered within country context.

- **Targeted fiscal support** for those that cannot obtain access otherwise. The challenge is to achieve economic costing of water, and then to target those specific groups of consumers that need support.
- **A focus on operation and maintenance:** Fiscal, political and professional incentives are often towards asset creation. The need, however, is to develop and encourage appropriate fiscal incentives to improve operations and maintenance, and to mobilise the support of policy makers at all levels for such an approach.
- **Investment in training and skill development:** Concerted effort is needed to enhance the skills of officials at provider level, and the awareness of issues and options among providers, policy makers and regulatory agencies. At an institutional level such professionalisation will benefit from a clearer separation of these roles. A well-designed awareness and capacity set of programs could bring to the fore the need for new approaches and equip those concerned to pursue those options. The area of greatest need is arguably that of local service providers, and it will be important not just to build capacity as a one-off exercise but on a continuing basis. It should keep track with technical and system improvements, and knowledge-sharing throughout the region. Care should be taken to not merely focus on professional staff, but also to build awareness and understanding among local elected representatives (mayors, members of locally elected bodies at town and village level) who can only discharge their obligations with proper information and some subject knowledge.
- **Improved public disclosure:** The disclosure of water and sanitation budgets, regular scrutiny of expenditure, and release of information on operational conditions is part of an accountability mechanism which can help to direct resources to the right places. There is a need to create fiscal and legal incentives and systems that would enhance better disclosure. It should be applied to all government departments, public utilities or contracted private operators. A fully transparent sector would also entail accessible information on the activities of civil society organisations.
- **Improved Data:** Better information will make it more possible to measure performance, address problems (such as leakages) and serve consumers according to their specific requirements. Key elements of such improvement would be integrated information management, including reform of accounting and budgeting practices, development of monitoring and evaluation mechanisms, consumer feedback systems and communications strategies and improving data about water production, infrastructure, payment, subsidies and operating costs, as well as customers. Civil society organisations can play an important part in the generation of accurate information about water and sanitation facilities, not just their availability but also their usage and their impact on the lives of poor people.
- **Fast-tracked project mechanisms:** The sustainability of improved delivery hinges on institutional change, but the record of delayed

projects or initiatives requires special mechanisms to expedite projects. This is essential to address urgent backlogs and also a potentially powerful tool to develop good practices and approaches.

Integrated Policy and Planning

Confusion in policy development, administration and accountability between government departments with a stake in safe water and sanitation provision including the ministries of health, urban development, water resources and possibly others is not unusual and more likely in rapidly growing urban conglomerations. Various Government departments with a stake in safe water and sanitation provision including the ministries needed to take various steps to handle the situation arising out of rapidly growing urban conglomerations. Practical steps to improve the situation could include the following:

- **Inclusive and coherent policy and planning:** As far as national policy and planning is concerned, it is important to cut across different types of contexts – from big metropolitan centres to secondary towns and peri-urban areas. The requirements may be different, and it is important to adopt a differentiated approach that allows those at the implementation level to be creative and flexible, but within coherent policy frameworks on aspects like standards, issues of universal access, core governance criteria and fiscal and financial sustainability.
- **Environmental considerations:** In order to avoid harmful environment consequences such as water logging and mixing of sewage with storm water, it is important to plan water and sanitation projects in an integrated manner and not sequentially. Sector planning can, therefore, not be insulated from broader city, district or local planning, or from, for example, planning for waste management, which could have serious consequences in terms of water pollution and the obstruction of natural drainage flows.
- **Dealing with wider planning and land issues:** Policies relating to land tenure and occupancy rights in 'unrecognised' slums in urban conglomerations sometimes result in very large number of poor people being left out of water and sanitation projects. This is an issue that cannot be neglected or delayed. People, rather than formal land titles, should be the basis for water and sanitation coverage efforts if full provision water and sanitation facilities are to be achieved of. Equally rehabilitation policies for people evicted from their dwellings should include provision for safe water and sanitation facilities.
- **Role separation to govern the policy-implementation link:** The effective implementation of projects, management of assets and delivery and financing of services requires a set of institutions with clear responsibilities and roles, on the basis of which they can be held accountable. The MDG targets will remain out of reach unless institutional transformation takes place.

The Use of Appropriate Technology and System Models

Current demographic trends and the rapid and chaotic growth of urban centres in many countries in Asia together with growing demands on existing water sources make the search for innovative technologies and neighbourhood-centred approaches a task of considerable importance. A number of technological and system techniques and approaches can help in the rapid and focused spread of water and sanitation services, particularly among poor communities. Among the ones, which are worth pursuing, are the following:

- The use of GIS to map urban and rural settlements to plan water and sanitation projects and to track coverage patterns, particularly those of poor communities. This is a technique which could well be used by poor communities themselves and provide an important tool to ensure accountability;
- The use of e-governance systems for open administration including transparent user charge collection, attention to customer complaints and regular scrutiny of maintenance hot spots where special attention is needed to maintain service levels and quality;
- The development of systems to track leakages in piped networks, a measure with wide ranging benefits including reduction of wastage and increase in revenues. This is an area where the expertise of the private sector could be particularly relevant;
- The recycling of wastewater using newer technologies including membranes and filters;
- The introduction of local or in situ sewage treatment systems and technologies to avoid the environmentally unsustainable and financially unaffordable models of city-wide water-borne sewage systems;

- The introduction of techniques to collect and store rainwater to augment water supplies as a rigorously enforced policy;
- The introduction of small piped networks where the operation and maintenance of water and sanitation services are left to local communities or local entrepreneurs acting as service providers; and
- The introduction of simple water quality testing kits which can be used widely and by many stakeholders including educational institutions.

All these are measures where there is a wealth of experience in Asia and where all stakeholders, including governments and their agencies, the private sector and civil society organisations have played a notable part.

Partnerships

While the primary responsibility for water and sanitation services is that of national governments there is enough experience to show that they will need partnerships with others such as civil society organisations (not just NGOs but also user groups, community-based organisations and associations, research institutions and others) and the private sector to be able to reach the levels of coverage, especially among poor communities, that will be necessary to reach the ambitious objective of full coverage.

The need for clarity of roles for CSOs is particularly important. Currently, they are often used in the role of contractors to develop 'awareness' or in the task of community organisation to facilitate participation in water supply projects and schemes, the designs and operating parameters of which have already been decided. This approach is not likely to lead to the kind of joint effort that is necessary. The involvement of CSOs in the design phase, and particularly in the scrutiny and assessment of progress, will add huge value to joint efforts and in reaching the last mile of reaching poor communities. It is also worth mentioning that civil society organisations can play an important part in the generation of accurate information about water and sanitation facilities, not just their availability but also their usage and their impact on the lives of poor people.
Partnerships by their very nature depend on trust. This will require not only demonstrated competence among the partners but also changes in attitude. Government authorities and civil society organisations, including NGOs, will need to adopt an open attitude to the sharing of information and the ability to work together.

Awareness

Though the task of reaching the MDGs and full service provision in countries is formidable but certainly achievable. It will require the active participation of all citizens. There needs to be a big investment in massive awareness campaigns involving educational institutions, legislatures, mass contact organisations and people at large with a concerted and imaginative use of the media and all types of communication methods to overcome the taboos relating to discussions about sanitation and generate the levels of interest and understanding of issues relating to water and sanitation and most essentially, hygiene and the enthusiasm which can sustain the energy and commitment to reach the goal of safe water and sanitation services for all the people of Asia.

Three imperatives are particularly important:

- The need for a concerted campaign over the next five years to raise awareness and generate the drive and momentum to change policies and governance practices and build sector capacity;
- The need for a multi stakeholder approach in each country to achieve synergies and a united effort; and
- The need for active sharing of information and experience across the region as part of a region wide initiative.

With clarity of purpose and unity of effort, the 2020 vision can be achieved.

Local Actions for

Sustainable Development on Water and Sanitation in Asia-Pacific Region

2

Section I : Pro-poor Water and Sanitation Governance
Section II : Integrated Policy, Planning and Management
Section III : Appropriate Technologies
Section IV : Community-managed Initiatives and Awareness
Section V : Gender Mainstreaming and Empowerment
Section VI : Innovative Financing
Section VII : Human Values-based Water, Sanitation and Hygiene Education

SECTION I

Pro-poor Water and Sanitation Governance

Pro-poor Water and Sanitation Governance

It is widely accepted that good governance is vital for improving the quality of life in cities. Studies have established that there is a clear relationship between governance and human development. Better water and sanitation governance for the urban poor implies that the government needs to ensure the poor and the vulnerable to obtain adequate water and sanitation. The operational experience of UN-HABITAT confirms that good governance is the difference between a well-managed and inclusive city and the one that is poorly managed and exclusive. The result of good governance is 'sustained development' that gives priority to the poor, advances the cause of women, sustains the environment and creates needed opportunities for employment and other livelihood. The UN-HABITAT approach to pro-poor governance is to develop a framework that allows water and sanitation reforms and investments to reach the poorest of the poor. The approach emphasises the building of partnerships as well as the governing principles that include:

- Involving civil society to influence priorities and investments;
- Specific attention to women, adolescent girls and boys, children and the marginalised people;
- Mechanisms to articulate interests of the vulnerable and hold accountability to stakeholders;
- Regulatory frameworks that protect providers and consumers alike; and
- Encouraging responsive, affordable and sustainable services.

Addressing the key features of this approach, 9 local practices from Azerbaijan, China, India, Pakistan, Tajikistan and Timor-Leste are illustrated in this Section, as summarised below:

Azerbaijan: the efforts in building water infrastructure provide a model for much-needed reform that supports partnership between private sector participation and the consumers.

Peoples' Republic of China: the Puer City in Yunnan Province focused on pro-poor reform policies, pricing measures and efficiency in the management by mobilising political will, raising awareness through advocacy, information and education, capacity building, promoting new investments in the sector.

India: under Slum Environmental Sanitation Initiative of UN-HABITAT in the cities of Bhopal, Indore, Gwalior and Jabalpur in the State of Madhya Pradesh, significant improvements have been made in the lives of slum communities through creating 'open defecation free' slums, improving access to safe water, sanitation and hygiene practices and mobilising men and women for community action. The initiative has used Poverty Mapping as an instrument to prioritise the slums for investments based on poverty and environmental infrastructure deficiency matrix. A Water Demand Management Strategy and Implementation Plan has been evolved for these cities to assess and regulate non-revenue water. The municipal reforms brought out in the city of Surat, Gujarat, have been a model approach in addressing the problems of the Environment and Public Health by adopting the principles of good urban governance.

Pakistan: the financial and environmental sustainability with social equity has been the unique feature of the Gujarat Sanitation initiative to provide sanitation services to the poor and the socially excluded.

Tajikistan: a pilot and demonstration activity in Jomi District, has been initiated to create a new institutional framework for managing drinking water supply.

Timor-Leste: the experience illustrates how partnerships between various water sector stakeholders can reconstruct the war-torn country and provided water to the people.

1

AZERBAIJAN

Building Infrastructure and Improving Institutions

No other country in Central Asia comes close to Azerbaijan in expanding its water coverage in both urban and rural areas. The country's efforts in building water infrastructure and improving its institutions and services are sure to bring Azerbaijan closer to its goal of providing access to adequate potable water at low costs. Improvements in Azerbaijan's water supply and sanitation services (WSS) will be felt by its urban populace by 2010 with increased support from Asian Development Bank (ADB) and other donors for WSS infrastructure, as well as the Government's initiative to improve the quality, reliability and sustainability of these services in the towns of Goychay, Agdash, and Nakhchivan. This project shall provide a model for much-needed reform that supports private sector participation and effective partnership with consumers by bringing Infrastructural and Institutional Development.

Background

The WSS sector in the Republic of Azerbaijan is burdened with inefficient operations, outdated and rundown physical infrastructure, and severe financial constraints. As paying customers, Azerbaijan's citizens receive water at irregular times of the day and is usually unfit for consumption. The Government Service Providers or SuKanals have focused on engineering-designing and constructing expansions of the system and neglected the operations and maintenance of the current system, including its financial management and commercial performance.

Objectives

To provide adequate potable water supply at low cost to the people of Goychay, Agdash, and Nakhchivan by promoting infrastructure and institutional development.

Resources

ADB and other donors ramp up their support for water supply and sanitation infrastructure in Azerbaijan's towns.

Process

The WSS Project consists of two components:

- Infrastructure development: Construction of new and efficient distribution systems for Goychay and Agdash, and rehabilitation of the Nakhchivan system; and

- Institutional development: Promoting institutional reform and capacity building through private sector participation, the establishment of Joint Stock Companies (JSCs) in each of the towns and community involvement through water user associations.

The project will also pilot new approaches for the WSS sector as a basis for other sector-wide reforms in the three towns.

Institutional reform in Azerbaijan's WSS sector will begin with replacing the State-owned and operated SuKanals with open-type, JSCs in each of the project towns. These new water utilities are co-owned by the Government and private sector operators. The private sector will be involved to provide international expertise in operating, managing and maintaining the new WSS facilities through a management contract and to train local personnel to take full responsibility for the operating services.

The new utility companies will:

- own assets constructed and rehabilitated under the project, and be responsible for the operation, management, and maintenance of new WSS systems;

- have independence on financial, managerial, operational, and staffing decisions; and
- report to specific State agencies, and be accountable for their performances.

The project will also test the innovation of town water users associations, which will be formed as advocacy groups to represent consumer interests. They will be recognised by the water utilities as important partners in customer satisfaction and service delivery. They undertake public information campaigns about effective use of WSS services and represent members' concern over service standards, quality, and tariffs.

Expected Results

The urban water supply and sanitation project shall bring change to benefit 147,000 people in Goychay, Agdash and Nakhchivan, providing access to adequate potable water at low costs by 2010 through WSS improvements and new infrastructure.

These include:

- New well fields to replace non-functioning ones, including those destroyed by floods;
- New pipe systems, elevated reservoirs, and chlorinating facilities to replace the existing water distribution system;
- New main and branch sewers, sewerage pumping stations, and waste stabilisation ponds.

Sustainability of the initiative

The improvements to the Azerbaijan WSS system are in accordance with ADB's water policy for increasing people's access to water supply and sanitation. The ADB water policy advocates projects that support optimisation of agency for functions, private sector participation, autonomous service providers, tariff restructuring, user participation, greater water quality and system efficiency, and better wastewater management. The Azerbaijan urban water supply and sanitation project undertakes all of these issues with the new utilities in the three project towns. The project's design was rated as "exemplary" by ADB for its attention to Institutional improvements, partnering of Government, Private Sector, and Communities in new service delivery and new water systems.

2

PUER, YUNNAN PROVINCE, P.R. CHINA

Policy Reforms and Sustainable Service Delivery

A cooperation project between Puer General Tap Water Plant (PGTWP — a Local Water Utility) and UN-HABITAT has been initiated for promoting Community-based Water Supply and Sanitation facilities in Puer City, Yunnan Province, P.R. China, under the Mekong Region Water and Sanitation (MEK-WATSAN) initiative. The Project's priority is to provide safe water and sanitation to low-income residents. The project focuses on the reform policies, pricing measures towards the poor and efficiency in management. The initiative seeks to achieve by mobilizing political will, raising awareness through advocacy, information and education; training and capacity building; by promoting new investments in the urban water and sanitation sector; and by systematic monitoring of progress towards MDGs relating to water and sanitation. The project is a useful demonstration of how communities can mobilize and work effectively with the local authorities to meet the MDGs.

Background

Puer City is located in southwest of Yunnan. It is an important secondary town on the express highway from Kunming to Bangkok. Historically, it was a key commercial place for the tea industry. The rural immigration has been increasing because of the reform of production system in rural areas and improvisation of production efficiency. Water supply and sanitation service coverage in Puer City is about 60%. Some communities are still using water from shallow wells and water ponds. Sanitation is also a big problem of the city, particularly in the city outskirts where more poor people are staying.

Scope of the Project

The Project has three components comprising of Water Supply, Policy Support and Capacity Building, and Sanitation. The scope of the Project includes an initial rapid assessment to address the ethnic or gender issues, as well as assist in the development of a participatory framework. In conjunction with the surveys and the designs, work plans have been developed for all stakeholders, including implementation arrangements and procurement packages. Parallel to the implementation facilities, pricing policies and structures are being developed and implemented, billing and collection systems will be established, operation and maintenance systems initiated, and community awareness programmes organised. A simple and appropriate monitoring system has been evolved for the sustainability of the project. In essence, a framework of sustainability will be developed.

Objectives and Strategies

- Achieve pro-poor water and sanitation investments in the city;
- Enhance institutional and human resource capacities at local and regional levels for the sustainability of improved water and sanitation services;
- Enhance local private sector participation;
- Reduce the environmental impact of urbanisation on the Mekong River and its tributaries;
- Enhance economic development through improved water and sanitation, as well as related income-generating activities;
- Demonstration of how a community can work with a water supply entity to acquire safe water and adequate sanitation that meet its needs;
- Improved community awareness of environmental sanitation; and
- Enhanced capacity of PGTWP and local artisans.

Mobilisation of Resources

The pilot project is to construct a branch pipeline to connect four communities with population of 3,200. The total investment is US$ 120,000 for which UN-HABITAT provides US$ 60,000. Puer Municipal Government committed to provide US$ 30,000 through its General Tap Water Plant, which is responsible to organise and implement the project. The Communities will provide US$ 30,000 in kind. The local Government is committed to make the follow-up investment on water treatment plant and main pipes to increase the water supply capacity.

The project has drawn the attention of the provincial and municipal governments. The government officials have expressed full support towards the project. The urban planning authority has provided the geographical map free of charge. The Water Resources Management Bureau has coordinated the implementation of the project. Nanping township government took the responsibility of organising communities.

Puer General Tap Water Plant provides technical support to the project. It is responsible for the design, procurement of materials, training the local artisans and public awareness about the project. With the financial and technical support of UN-HABITAT, local resources in terms of finance, technical and human resources have been mobilised.

Process

The stakeholders' workshop of MEK-WATSAN programme was convened by the Ministry of Construction in July 2005 in Kunming, Yunnan Province. There was participation from the Department of International Relations of MOC, Yunnan Provincial Construction Department, Jinghong, Puer (Simao) and Shuangjiang Governments and Design Institutes. For ensuring the implementation of the programme, a leading group was set up in Yunnan Provincial Construction Department and project offices were set up in each of the three cities.

After signing the cooperation agreement, Puer General Tap Water Plant has organised a consultation meeting attended by all stakeholders. A participatory framework and an integrated implementation plan have been developed, and accordingly, PGTWP made a survey and the assessment. A detailed network design was made in consultation with the communities to make the design, meeting with the demand of the community development as well as the investment. Based on the design, PGTWP procured the materials by tendering.

The residents of the communities have contributed to the water supply network and sanitation facilities either by labour or in-kind. Some poor people have increased their income by working for the project. The drainage system was jointly constructed with community road project that was invested by the township government. PGTWP provided construction materials and technical guidance for drainage system construction.

To ensure the quality of the project and capacity building of the local artisans, PGTWP organised two workshops with onsite training. With the training and working in this project, some people will be benefited by getting jobs in labour market after its completion.

PGTWP has worked with price control authority to adjust the price structure. The Table-1shows the current price:

PGTWP, together with governments, developed the policy to subsidise the low-income households for implementation of the new water price.

Results Achieved

The main branch pipes of water supply have been laid down. The length is about 1000 metres. About 100 connections have been completed. Meter has been installed in each household. Some public taps will be installed for the poor rural immigrants (tenants). The project will provide tap water for more than 3,200 residents on completion. With the road construction, about 980 metres drainage system has been developed and connected to the trunk main. Some municipal solid waste collection facilities are being implemented.

The express highway from Kunming to Bangkok is under construction, and the Chinese section has been completed. This road has promoted the tourism industry and economic development of Puer City as it is situated along the road. The project has several advantages. It does not only

Table-1: Price Structure

Category	Final Price	Among		Users Specification
		Tap Water	Waste water	
Household	2.8	2.00	0.80	Household, social welfare units and fire fighting, etc.
Administration	2.8	2.00	0.80	Government, school, research institute, social communities, hospital, gardening, etc.
Industrial	3.8	3.00	0.80	Industrial plant, transportation and fish farming, etc.
Commercial	4.10	3.30	0.80	Commercial trade, restaurant, hotel, construction site, etc.
Special	8.00	7.20	0.80	Sauna, car washing, etc.

provide the water and sanitation services to more than 3,200 residents, but also provides a model that shows how communities can mobilise and work effectively with local authorities to meet MDGs. It has also promoted the follow-up investment. The third water treatment plant with an investment of US$ 675,000 is under construction to meet the increasing water demand. An industrial development park is under construction.

Women have participated in the project both at the planning and construction stages. Local artisans were trained during the implementation of the project. PGTWP has increased its own capacity by attending the international workshop and information exchange. PGTWP staff have been more familiar with the international practices through the implementation of the project. This project has facilitated income generation to the poor families.

Sustainability

The project was initiated at the request of community residents for improving their living standards and living environments. The interviews have shown that the residents desire to obtain clean water and safe sanitation. They have the willingness to pay for the service in future. They would like to make their contribution to support the project.

The project has obtained the support of city governments. The Municipal Government has set up the policy on subsidy for the low-income households. Nanjing Township Government has committed to help the community to establish a management mechanism to manage the water and sanitation facilities.

The project has conducted public awareness campaign. The city residents, particularly in the four project communities, have improved their knowledge on water conservation and water saving. Further more, PGTWP will be responsible for the maintenance of network to ensure the normal operation of the project.

With the improvements in the environment and living conditions, more and more people are coming forward to invest in Puer City.

Lessons Learned

Installation of 'meter' for each household is an important measure to ensure water conservation, billing and cost recovery. Due to the resident registration system in China, some rural immigrants cannot obtain the subsidy from the governments. This needs to be addressed and improved in other projects. The project has done some work on policy improvement, such as water price policy. However, the focus should be broadened towards wider policy regulatory issues.

Transferability

During the project implementation, PGTWP has derived inspiration from Lao PDR, India and Nepal and also shared experience from Jinghong city. The experience obtained from this project will be used in Puer, Jinghong, Shuangjiang and other cities in Yunnan Province and China.

3

MADHYA PRADESH, INDIA

Slum Environmental Sanitation Initiatives

Slum Environmental Sanitation Initiative (SESI) is a part of UN-HABITAT's Water for Asian Cities Programme, which focuses on developing approaches for making interventions at city and local levels, to extend coverage to unserved households with higher levels of sustainability. The cities selected for SESI are the same cities - Bhopal, Gwalior, Indore and Jabalpur, where the ADB is investing in upgrading the city-wide water and sanitation infrastructure. The overall purpose is to demonstrate and develop approaches for slum improvement (with focus on water, sanitation and hygiene) with select local Non-governmental Organisation (NGO) partners, which could influence the larger investments in the cities and access to services by the marginalised. It is envisaged that this pilot project will demonstrate ways to promote pro-poor water and sanitation governance so that the poor have affordable access to safe drinking water and sanitation facilities which may improve their health, productivity and alleviate poverty through better income generation and livelihood opportunities. It is also hoped that this project will be able to influence the adoption of community approaches including community financing and low cost technology options to influence the larger urban sanitation welfare schemes.

The project covers about 65 slums in the four cities. Significant improvements have been made in the lives of slum communities through creating open defecation-free slums, improving access to safe sanitation and water, improving hygiene practices and mobilising men and women for community action.

Introduction

In Madhya Pradesh, a central Indian State, the process of urbanisation gained momentum when the State registered an urban growth rate of 52.92% between 1971 and 1981. The rate of growth seems to be tapering off since then, yet the growth of urban population in the State (31.19%) was higher than the national average (31.13%) during 1991-2001. The urban population constitutes 26.6% of the total population of the State which is comparable to the national average of 27.7%, making it the sixth most urbanised State in India.

A study by WaterAid, on Water and Sanitation Status in Urban Areas of Madhya Pradesh (2005) found very poor coverage of urban population through tapped water source apart from inadequacies in proximity of sources. While availability of infrastructure is accounted for accessibility to water in the government records, the study noted that 93% of towns in Madhya Pradesh have less than 70 lpcd of water as against the minimum supply norm of 135 lpcd. The study also revealed that only 63% of the urban centres receive water daily, while 28% of towns receive water supply once in two days and 9% towns once in two or more days. Sanitation coverage is also reported to be very low and no city is covered by a sewage network. Base-line studies in the selected slums of the four cities have revealed that almost 40% of the population is dependent on water that is available for less than 1 hour per day.

Objectives and Strategies

The primary purpose of the project is to demonstrate and develop approaches for pro-poor investments to improve water and sanitation conditions in slums. This pilot project is to test a new partnership model involving different stakeholders including NGOs, Communities, Government, and elected representatives, where each of them have a specific role to play. This pilot project aims to improve the water, sanitation and hygiene status amongst 20,000 families in 65 slums in the four cities, leading to open defecation-free poverty pockets, while demonstrating an approach for pro-poor urban governance. The objectives of the project are:

- To demonstrate a community-led approach for changing urban governance in favour of the poor and improving the conditions of slums;

- To test as a pilot, the partnership between UN-HABITAT, WaterAid India and the Municipal Corporations;
- Improving access to safe water and sanitation in selected slums to end the practice of open defecation; and
- Developing sustainable community-owned, managed and operated water and sanitation facilities.

Mobilisation of Resources

The project is jointly implemented by UN-HABITAT, WaterAid India and the City Municipal Corporations, with the support of implementing partners, viz. Advocacy for Alternative Resources, Action, Mobilisation and Brotherhood (AARAMBH) in Bhopal, SAMBHAV Social Service Organisation in Gwalior, Bhartiya Gramin Mahila Sangh (BGMS) in Indore, KSHITIJ and Association for Community Transformation (ACT) in Jabalpur. UN-HABITAT, WaterAid and the Municipal Corporations financially support this project. All the three partners have a unique and significant role to play in the project to enhance the outputs and learnings.

Process

SESI aims to develop best practice models for implementing integrated water, sanitation and hygiene projects, to maximise the health benefits, which are also cost-effective and sustainable. This pilot project emphasises on enhancing people's capacities for adopting safe hygiene behaviours and generates demands for sanitary facilities through use of relevant information, education and communication (IEC) materials.

The key activities under this project include:

- Mapping the poor in the 4 cities – a city-wide mapping for all poverty pockets, used for selection of slums for further intervention. The slums are to be selected on the basis of inaccessibility to basic services and prevalence of Below Poverty Line (BPL) families;
- Base line situational analysis for benchmarking of data on access to safe water, sanitation, hygiene practices, willingness to pay, institutional situation;
- Community mobilisation and awareness on sanitation and hygiene;
- Training and capacity building of Self-help Groups (SHGs), NGOs and slum-level groups;
- Value-based Water, Sanitation and Hygiene Education component – focus on hygiene behavioural change through school and community hygiene programmes;
- Infrastructure development – individual and community toilets, solid waste management, drinking water points and roof rainwater harvesting, among others;
- School sanitation activities; and
- Documentation and learning.

Awareness building, meetings with communities to disseminate hygiene messages, motivating and mobilising communities to construct toilets, sensitising them about the ill effects of open defecation, rallies and camps, formed the hallmark of community facilitation exercise done by the partners. Simultaneous efforts were made in the project to constantly dialogue and negotiate with the Municipal Officials to take up water related works, provide dustbins in the slums, provide water points in slums and also lay drainage works. Provisions were also made in the project for pro-poor funding, in the form of revolving loan, to enable the poor to gain access to credit, to construct individual household toilets. Simultaneous efforts were made to orient the staff of Municipal Corporations and elected representatives through stakeholder consultations and workshops, on pro-poor approaches, need for integration of hygiene with water and sanitation, sustainability and importance of community consultation, role of Corporators and official staff, etc. Exposure visit of Municipal Corporation Officials and Corporators (elected public representatives) were organised to Bangalore and Tiruchirapally (Trichy) where community-managed sanitation initiatives are running successfully.

Results Achieved

A few notable outputs in the first year were:

- Six open defecation-free slums – the first initiative in Madhya Pradesh;
- 3000 families have access to safe sanitation — Household (HH) toilets;
- 6 School Sanitation Blocks constructed with rainwater harvesting structures;
- 5 new community toilets constructed and managed by communities;
- 1000 mts. of underground drainage restored/ created – by Municipal Corporations;
- 50 water sources restored;
- 100 women's groups spreading the message of safe hygiene;
- 63 Community Water and Sanitation Committees working;

- Dustbins and rickshaw vans provided in the slums – for door to door garbage collection;
- 1100 families started using compost pits, soak pits;
- Corporators and elected representatives trained and exposed to issues of Water and Sanitation; and
- A large Data and Information base/GIS Maps created for all the Slums.

Discernible impacts can be seen in the following areas:

- Increased levels of awareness regarding safe hygiene and sanitation practices amongst communities, especially women leaders and children. The emphasis on school hygiene education and the spread of hygiene messages through SHGs has contributed to enhanced awareness and knowledge amongst women and children, who will act as hygiene ambassadors.
- Inclusion of the poor and the marginalised members of the slum communities in planning process – providing them with a platform to participate in the form of SHGs and Community-based Water and Sanitation Committees (CWASCs). Participation of women in the SHGs have considerably increased, and provided them with opportunities to make decisions regarding locations for latrines, on investments for hardware structures and on interventions for slum improvement.
- Trained masons are a major human resource in the slums, who are actively engaged in the promotion of low-cost individual Household latrines.
- An overall sense of community ownership and sense of responsibility for taking up slum improvement activities is remarkably evident amongst the people. Few slum communities are in the process of declaring themselves open defecation-free, totally changing the face of the slums.
- Construction of toilet facilities in the slums have not only provided increased convenience but also dignity to women and adolescent girls, who were under constant threat of physical abuse while going out in the open for defecation.

Impact at the strategic/sector level

- Availability of sanitation fund has improved access to credit the urban poor to construct toilets. Process is on to get the guidelines for sanitation fund adopted by the local government as this will enable rapid upscaling of sanitation coverage.
- Open Defecation-free slums is a new *mantra (strategy)* in the selected slums of the project cities. Entire communities, so far unaware of the concept of HH toilets or Community Toilets, are now actively engaged in constructing pits for latrines, forming SHGs for management of the sanitation fund.
- The Poverty Mapping reports have, in terms of the issues, highlighted the interrelatedness of infrastructure issues, and as qualitative data have so forcefully brought out the need to take a holistic approach rather than providing one or the other kind of infrastructure and expecting long-term sustainable impact.
- The Poverty Mapping exercise has also been significant because it:

  - Takes into account all Poverty Pockets – notified and non-notified.
  - Has been able to identify a large number of non-notified slums in all cities.
  - Inter Poverty Pockets (PP) – WATSAN deficiency zero in the most deficient.
  - The qualitative study focused on understanding the extent of lack of access and implications of infrastructure deficiency on education, especially girls, health and livelihoods.

- Engaged Corporators and local residents in an exposure visit to best practices in urban WATSAN sector in South India, as an outcome of which, councillors have constructed Child-friendly toilets and are proposing community toilets to be managed by SHGs, on the models set up in Trichy.
- Stakeholder consultations organised in each city, which were attended by respective city Mayors, City Municipal Commissioners, city engineers, Corporators and a large number of other stakeholders have been very effective forums to share the findings of Poverty Pocket Situation Analysis (PPSA) and get these endorsed, but also to seek their commitment to the project. Government admitted that this was the first time such a massive survey has been done by anybody and these hold significant value for the ADB project.

Sustainability

The project emphasises on working through local partners and with communities, to ensure that there is full ownership of the project in planning, implementation and monitoring. WaterAid ensured that there exists a capacity within the community so that the benefits are sustained and communities are empowered to demand and receive benefits from the municipalities. Some of the concrete steps taken were:

- The CWASCs formed at the slum level for planning, coordination, monitoring of the project, have been oriented on various aspects of urban water and sanitation, their role as members of this group, and have been trained on organisational development aspects. Members of CWASCs have successfully interacted with local corporators to demand their attention and time for the project and seek their greater involvement.
- The local partner organisation has assumed greater responsibilities in interfacing with the Municipalities and Government officials, Corporators, and local leaders and they have been successful in mobilising funds for activities to be done by the Municipal Corporations.
- Involvement of SHGs in all the project activities has given greater confidence that activities will be sustained over a long time. SHGs are closely involved in decision related to constructing latrines, slum sanitation activities etc. Involvement of SHGs has resulted in improved usage of assets. Involving women and children in hygiene promotion programmes have resulted in discernible changes in water handling practices and handwashing practices, at the HH levels.

Lessons Learned and Transferability

The first year has yielded good learning opportunities, both from working in the field and from strategic relationships built over the past one year. A few lessons learnt were:

- Providing alternate financing options, in the form of sanitation loan to communities can greatly enhance the pace of adoption of toilets in the urban context. The need for toilets is well articulated by the community in many cases but lack of adequate community-based financing options has been a deterrent in taking up toilets. Majority of the communities that have chosen to work with, belong to the most deprived sections like ragpickers, those with very limited source of income and other deprived groups. It is also felt that targeting subsidies to these genuinely marginalised sections motivates them to adopt latrines.
- It is important to integrate provision of safe drinking water and improved sanitation with hygiene education in order to achieve improved health outcomes. It is essential that hygiene education is integrated right from the beginning in order to ensure greater adoption and usage of sanitation facilities.
- A significant outcome of the Poverty Mapping exercise has also been the identification of a large number of non-notified slums in all the 4 cities, underlying the need for taking services and entitlements to these areas.

4

MADHYA PRADESH, INDIA

Poverty Mapping Framework for Infrastructure Interventions

One of the main obstacles to inclusive urban planning is the lack of up-to-date, comprehensive and sufficiently detailed information about urban areas. As a result of this gap in information, many informal settlements are left out in the city-wide planning and process. In the metros as well as in many big cities in particular, large proportion of the urban population live in slums in India. The urban projects undertaken in these cities tend to ignore significant slum improvement interventions. The development plans have really not addressed the issue of the marginalisation of the poor in the cities, often leading to their spatial exclusion. They are pushed out of the city, where services are poor and investments are low.

Slum Environmental Sanitation Initiative **(SESI), a part of UN-HABITAT intervention in the four cities in Madhya Pradesh — Bhopal, Gwalior, Indore and Jabalpur, with population of over 1 million each, emphasizes in identifying slums/poverty pockets, based on the status of water and sanitation service deficiency. The initiative uses Poverty Mapping as an instrument to prioritize the slums for investments, based on poverty and environmental infrastructure deficiency matrix.**

A detailed survey titled *Poverty Pocket Situation Analysis* (PPSA) was carried out in the four project cities. PPSA aims at ranking poverty pockets in terms of availability and access to water and sanitation facilities. This is not a household survey. The data under this study has primarily been derived from key informant interviews and group discussions and reflects the multiple and overlapping perspectives of different stakeholders in all the poverty pockets of the four selected cities. This process involves spatial mapping of infrastructural deficiencies in the slums and a base line survey of the individual household for monitoring the MDG parameters for sustainable access to improved sanitation and safe drinking water. The final outcome of this mapping exercise is the selection of the most vulnerable slums for water and sanitation intervention under SESI.

Introduction

The State of Madhya Pradesh has very poor coverage of urban population through tapped water sources and sanitation facilities, in addition to its gaining momentum in the process of urbanization. Most affected by this lack of basic services are the city's poor who constitute a sizeable population and live in the slums. Official data on the slum population including basic service delivery status, status of BPL families etc. are either very old or inadequate. The rate of increase in urban poverty and poverty pockets in the large cities of Madhya Pradesh further makes the Census data and the existing municipal data irrelevant. In this context, a study was taken up to find out the status of water and sanitation in the poverty pockets of the project cities in the State.

Objectives and Strategies

- To select Poverty Pockets (PPs) in consultation with the Municipal Corporations of the four project cities covering 5,000 households for project intervention, having concentration of the poor with higher deficiency in water and sanitation; and
- Collate data on all the Poverty Pockets on the availability of environmental deficiency parameters for starting the Municipal Action Plan for Poverty Reduction (MAPP), a process initiated by the Municipal Corporations under the ADB project.

Mobilisation of Resources

This initiative is a collaborative effort between UN-HABITAT, WaterAid and the local Municipal Corporations. The mapping of the poor in the city

was done in order to monitor the impact of the intervention on targets 10 and 11 of goal 7 of the MDG on water and sanitation at the local level. The slums were selected on the basis of this mapping exercise in consultation with the corporation and the partner NGOs, viz. Advocacy for Alternative Resources, Action, Mobilisation and Brotherhood (AARAMBH) in Bhopal, SAMBHAV Social Service Organisation in Gwalior, Bhartiya Gramin Mahila Sangh (BGMS) in Indore, KSHITIJ and Association for Community Transformation (ACT) in Jabalpur. Approximately, 500 officials of the Municipal Corporations and 600 NGO staff were involved in this survey. Several rounds of consultations were conducted with the Municipal Corporation staff and local counterpart NGOs. Each questionnaire had a provision for dual signature of both the entities. The total cost involved in implementation of this initiative was US$ 11,628 in each of the project cities, which was funded by ADB.

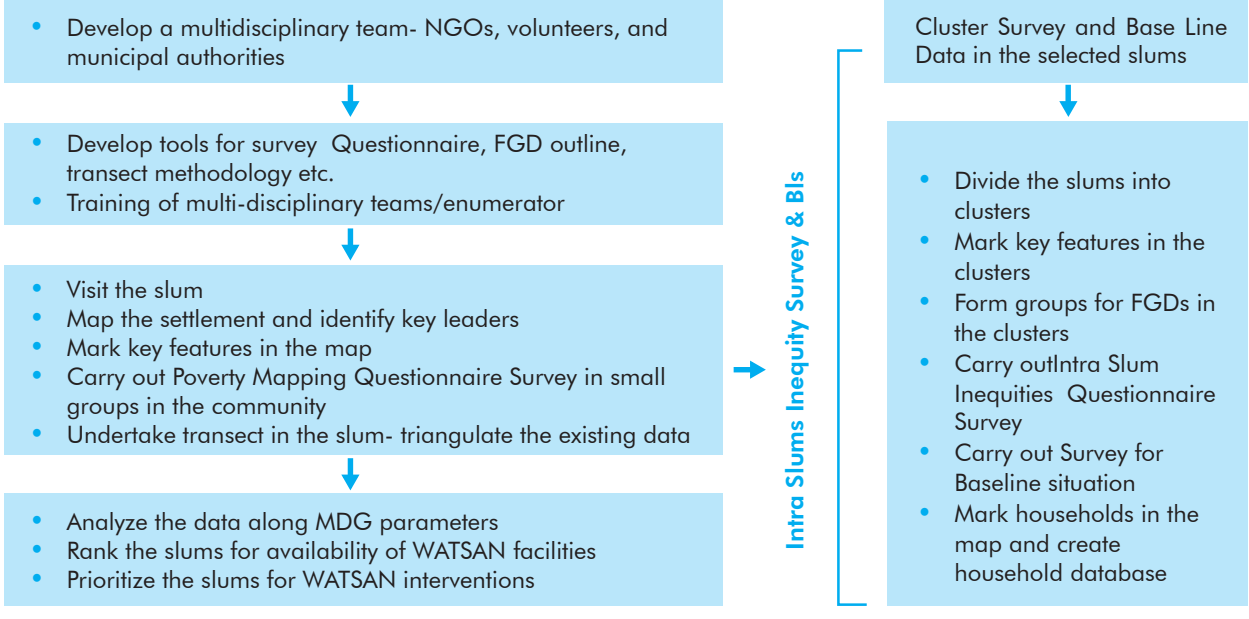
Process

This initiative started with the collection of baseline data by a physical survey which illustrates the location and condition of the poor in various localities and establishes baseline values for the MDG indicators in each of the areas, establishing programme management indicators.

The questions in the survey form were regarding population (no of households, no of families below poverty line, total population, etc.), presence of infrastructure (roads, street lights, schools, anganwadi, balwadi, health centres, etc.) access to water supply (hours of water supply, no of individual and community water connections, quality of water, etc.) and access to sanitation (individual and community toilets, open defecation practice, solid waste management, etc). The data analysis provided information on PPs with least access to water and sanitation and where the number of people living below poverty line was high apart from access to infrastructure. Based on the individual poverty pocket's information on these counts, PPs were categorised and ranked. In order to triangulate the quantitative data as well as to collect information on quality and status of available infrastructure and basic services impacting quality of life in PPs, qualitative surveys were also undertaken in few slums separately using participatory exercises for community's direct feedback from six poverty pockets in each of the cities for final analysis.

In the selected PPs for project intervention, a baseline survey at the household level was later carried out to assess the status of water and sanitation services besides the knowledge, attitude and practices (KAP) of the slum residents in their hygiene behaviour. This information was subsequently used for the development of operational plans for project interventions. Further, the baseline data was also used to define GIS layers and mapping of the status of these pockets through visual maps in GIS.

The below flow chart explains various stages involved in the process of data collection during PPSA exercise:



Results Achieved

This study finds that the number of poverty pockets (see Table below) and their population in these cities have been severely under-reported in the official records. There are 55 to 65% gaps in the estimation of number of PPs between official data and current survey. While the Census 2001 reports 8.3% (125,720) Bhopal's population in 209 slums (Census 2000), the present survey recorded 128,170 households in the 380 poverty pockets/slums. Even considering a conservative estimate of 5 members per households, it multiplies the household's number to a much higher figure of 640,850 persons, which is more than 45% of the city's population recorded in 2001, i.e., 1.43 million. The presence and identification of a large number of unnotified slums underscores the importance of formalising these and also the urgent need to take facilities and entitlements to the large concentrations of HHs in such PPs. The study revealed a high percentage of HHs having access to improved water sources, which was indicative of the presence of infrastructure but did not necessarily ensure the required availability of water to the HHs.

Survey data using participatory methodologies provide contrasting answers to the queries relating to access to water, sanitation and basic infrastructure. These are indicative of the complexity of the issues at hand. In the absence of piped water supply to households and low water tables in many areas, in summer a household may have to spend as much as 4-5 otherwise productive hours in fetching water. This takes away their time from other livelihood activities and puts a tremendous burden on women in particular. Households pay private water providers where quality of water is anyone's guess. Water scarcity has also been found to be one of the important reasons for the discontinuance of education of adolescent girls, who are generally given the responsibility of fetching water for the households. Each water source has a number of people dependent on it resulting in a tremendous amount of pressure on each source. Opportunity costs of accessing water are high, as households lose out on income contributions by one or the other productive member due to the need for someone to take responsibility to fetch water and, on the other hand, pay high amounts of money to private providers to get this basic service.

Qualitative findings reveal the seasonality of water availability, predictably the summer season being the worst for the inhabitants in the poverty pockets. Water supply through municipal taps get reduced considerably as well as through handpumps, bore wells and tube wells. Water is supplied through municipal tankers, but this also fails to fulfill the requirements. The qualitative survey also found that even where sources of water were present, the dependence of the community was gradually increasing on the same source over time due to increase in population. Therefore, lack of access is not just a function of complete absence of infrastructure but also of an increasing population dependent on available sources and interventions which need to be planned in this light.

Lower access to quality sanitation facilities and services is mainly hindered by the current status of low availability and poorly maintained sanitation and sanitary conditions. Qualitative survey noted that even the households, which have got personal toilet, prefer to go for open defecation. One important reason for this has been lack of water for cleaning and flushing the toilets. The other reason has been the lack of a proper drainage system, which result in choking of these toilets very frequently. This information of about 1,540 slums were collected, analysed and uploaded onto the GIS and later made available to the Municipal Corporations.

Details	Bhopal	Indore	Gwalior	Jabalpur
Total no of poverty pockets identified	380	604	229	324
Total households	128,170	176,545	60,787	109,866
Number of household living in the poverty pockets Below Poverty Line	63,921	19,614	10,452	26,726
% of household living Below Poverty Line	49.8	11.1	17.19	24.33
% hh living in the poverty pockets with access to improved water source (average)	95.80	66	96.11	96
% hh living in the poverty pockets with access to improved sanitation (average)	58.0	84	68.49	54
% hh living in the poverty pockets defecating in open	42	16	31.50	45.7
% hh living in the poverty pockets with piped water supply	30.8	28	65.14	34.3

Sustainability

The data generated through the survey would help in implementing other pro-poor initiatives in the project cities. This data has been used by the Government of Madhya Pradesh for implementing basic services for the urban poor in the project cities and act as a tool for monitoring the status of the slums for convergence of the resources and at the same time, would help in assessing the infrastructural deficiencies and plan interventions. The factors leading to sustainability include:

- Financial: The use and leveraging of resources, including cost recovery, indicating how loans are being paid back and their terms and conditions;
- Social and Economic: Gender equity, equality and social inclusion, economic and social mobility;
- Cultural: Respect for and consideration of attitudes, behaviour patterns and heritage; and
- Environmental: Reducing dependence on non-renewable resources (air, water, land, energy, etc.) and changing production, consumption patterns and technologies.

Lessons Learned

The Poverty Mapping Framework revealed that the number of slums in the project cities has increased considerably as compared to the Census survey conducted in 2001 by Government of India. The process was designed to provide the framework for participatory planning between Corporation and communities at the neighbourhood level and need for undertaking such surveys at frequent intervals to monitor the achievement of MDGs.

Transferability

This programme provided the framework for participatory planning between Corporation and Communities at neighbourhood level, aimed at networking slum improvements to city-wide infrastructure. The poverty mapping data and reports have been handed over to the State Government and Municipal Corporations for preparing the Municipal Action Plans for Poverty Reduction under the DFID-funded Madhya Pradesh Urban Services Project Programme. Under the MAPP process, the majority of the Project investments will be dedicated to improving major environmental infrastructure throughout the urban areas of the project cities. The Poverty Mapping Framework adopted in the four project cities is a pathfinder for pro-poor water and sanitation governance and becomes an essential and integral part of any city/town economic and social development.

5

MADHYA PRADESH, INDIA

Developing a Urban Water Demand Management Strategy

Traditionally, adding new infrastructure and tapping additional water resources is seen as the only way to tackle problems related to water supply. An effort to look at all service issues in a holistic way is missing altogether. This study on "Water demand management strategy (WDM) and implementation plan" for the cities of Bhopal, Indore, Gwalior and Jabalpur in Madhya Pradesh is aimed at proposing interventions that improve efficiency in water distribution and use in urban water supply networks. WDM itself refers to the implementation of policies and measures that control or influence the water demand. This will potentially lead to long-term sustainability of the available water resources and infrastructure and also imbibe a culture of conservation of a commodity that otherwise considered free.

The study has been successful in establishing a baseline of the current operations. In the process, issues critical to water supply in each city have been identified and the water demand management strategies have been formulated under three heads: Technical, Financial and Institutional. A systems approach has been adopted while formulating the WDM strategies and a phased implementation plan has been suggested. The baseline of operations will also help in gauging the success of any future interventions.

Rising capacities on WDM and the implementation strategies at different levels have been the built-in process within the implementation agency. An attempt has been made to motivate the participants in these programmes and feedback has been obtained on the assessment exercises, proposed strategies and pilot projects during different interactive sessions with the stakeholders. Such sessions have been successful in triggering brainstorming on different aspects of water resource management in the context of urban areas.

It is anticipated that the respective municipal corporations will use this WDM strategy document in the routine planning process to bring in reforms and in judicious identification of projects for implementation. The ADB is also using the recommendations made to select projects for future funding. The digitised GIS maps prepared using the available base maps can be used for better management of daily operations.

Introduction

Assessment studies undertaken in the project cities of Madhya Pradesh suggest that the available water supplies theoretically translate into per capita availabilities ranging between 150-170 lpcd. Yet, with the estimated non-revenue water at around 28-45%, the present water supply problems can be attributed more to the lack of governance and inadequate monitoring infrastructure rather than to any scarcity of the water resources.

The study aimed to ensure long-term sustainability of the available water resources through interventions targeted at improving efficiency in water distribution and use in urban water supply networks. UN-HABITAT commissioned this study on *Water Demand Management* (WDM) in the cities of Madhya Pradesh to The Energy and Resources Institute (TERI), New Delhi. The study is funded under the Water for Asian Cities (WAC) Programme, which is a collaborative initiative between the UN-HABITAT, the Asian Development Bank (ADB) and Governments of Asia. The study was supported by the Government of Madhya Pradesh through the Municipal Corporations and Public Health Engineering Departments in each city.

Objectives and Strategies

The specific objectives of the study, in each city, were to:

1. Assess existing water supply operations covering technical, financial and institutional aspects including water balance and establish a baseline using the data collected.
2. Formulate a detailed Water demand management (WDM) strategy and implementation plan for the cities.
3. Build capacities at different levels.
4. Prepare digitised GIS maps using the available base maps.

It is envisaged that water saved from the implementation of WDM strategies can be used to provide access to the underprivileged that are uncovered or inadequately covered by the present distribution system. This would lead to an equitable distribution and wiser use of the resource, increased consumer satisfaction and better quality of life.

Mobilisation of Resources

A partnership approach has been followed during this project study, which is supported by the UN-HABITAT with contributions from TERI. Other partners in the study include the Government of Madhya Pradesh, Shri G.S. Institute of Technology and Science (SGSITS) and Environmental Planning and Coordination Organisation (EPCO). The ADB is using the recommendations made in this study to decide projects for funding support.

Comprehending the multidisciplinary facets of this assignment, the team on the project comprised engineers, planners, economists, environmental scientists and Geographic Information Systems (GIS) experts, drawn from TERI, UN-HABITAT, industry and respective municipal corporations.

Process

There is an absolute lack of basic data sets necessary for establishing baseline of the operations covering technical, financial and institutional aspects. In cases where information is available, it is poorly recorded, unavailable readily and/or of a subjective quality. As a result, it was challenging to undertake a basic assessment of a reasonable quality. A Questionnaire-based approach has therefore been followed for collection of secondary data from each of the zones in the respective cities. Besides, flow-monitoring using portable flow meters have also been carried out at some strategic locations. The water balance is, therefore, based on the best information available, which tends to be a mixture of assumptions that have been vetted by the respective officials. Similarly, financial information has been collected from available records with respective municipal corporations. For assessment of institutional issues, a SWOT analysis has been undertaken.

The analysis of these assessments has been presented during the stakeholder consultations in each city and capacity building programmes.

Based on inputs and comments received from the stakeholders, the assessments have been refined further. Uncertainty in the results of water balance has also been assessed, presented and discussed.

WDM strategies have been formulated based on this analysis and have been broadly categorised under three heads: Technical, Financial and Institutional. A systems approach has been adopted while formulating the WDM strategies and a phased implementation plan has been suggested. It is further recommended that a Plan-Do-Check-Act (PDCA) approach should be followed during implementation for better utilisation of the scarce resources. Feedback has been obtained on the proposed strategies and pilot projects during different interactive sessions with the stakeholders.

The capacity building programmes have been meticulously designed aiming to:

- Give the stakeholders a clear perspective of the status and issues facing urban water supply in their respective cities;
- Highlight the need for having systematic management information systems through hands on exercises on water balancing;
- Discuss the proposed WDM strategies, their prioritisation and implementation plan;
- Picture good water management practices through site visits and experience-sharing; and
- Motivate the technical personnel and improve the ownership of the document on WDM strategy and so on.

Low motivation of the staff coupled with limited vision of the top level decision makers and high political interference have resulted in limited ownership of the problem and solution implementing process. The service provider and consumer interface also gets affected resulting from poor satisfaction levels. There is, therefore, a need to further stimulate all stakeholders and improve their participation in the decision-making and implementation process.

Results Achieved

Assessment of the existing water supply operations has been carried using the best available information and is available as a good baseline for all future assessments and benchmarking. A detailed WDM strategy and implementation plan document has been prepared for each of the cities and proposes the following strategies:

- Technical
  - Metering
  - Water audit and balancing
  - Geographical Information Systems (GIS) and Management Information Systems (MIS)
  - Establishment of District Metered Areas (DMA)
  - Leak detection and control
  - Energy auditing
  - Pressure management
  - Assets management program
  - Water conservation at consumer end
- Financial
  - Accounting System Reforms
  - Rationalisation of tariff structure
  - Program-linked allocation of funds
- Institutional
  - Organisational restructuring
  - Operationalising performance measurement and MIS
  - Formulation of a vision, policy and legislative framework for provision of water supply services
  - Enhancing staff capability and motivation
  - Increasing involvement of all stakeholder, especially politicians
  - IEC campaigns
  - Legislation for control on groundwater use
  - Policy guidelines for service delivery and public-private partnerships
  - Reforms in billing system

In addition, the capacity on the concept of WDM and implementation of strategies has been built at different levels within the implementation agency. An attempt to motivate the participants has also been made in these programmes and the feedback obtained on the proposed strategies has succeeded to build an ownership of the document.

It is anticipated that the respective municipal corporations will use this strategy document in the regular planning process to identify projects for implementation and their upscaling. The ADB is also using the recommendations made to select projects for funding. The digitised GIS maps prepared using the available base maps can be used for better management of daily operations.

Sustainability

The concept of WDM itself is in line with principles of sustainability and targets at a long-term sustainability of the available water resources and infrastructure through the implementation of policies and measures that control or influence the water demand.

A systems approach has been followed to formulate the WDM strategies and duly recognises the need to make the strategies and implementation plan acceptable to relevant stakeholders, so as to sustain the reforms process in the medium and long term. To ensure economic sustainability, it is further proposed that the implementation is undertaken in a phased manner using the Plan-Do-Check-Act (PDCA) approach. For increased acceptability and smoother execution, it is recommended that these strategies are implemented on a pilot scale and then replicated on a larger scale after incorporating lessons and best practices learnt in the process.

The proposed financial strategies also aim at promoting efficient utilisation of available water resources while also avoiding any tariff shocks and continuation of lifeline slab for the poorest of poor consumers.

Similarly, the institutional reforms aim to build upon the strengths of existing system and target to improve the interface between consumer and service provider so as to ensure greater public participation and cooperation. Proposed strategies like formulation of a vision and policy Statement, policy guidelines for service delivery and so on are likely to further the above cause and improve the quality of life. Organisational restructuring, capacity building and Information, Education and Communication (IEC) campaigns have also been recommended to better prepare towards the reforms process.

It is well realised that implementation of these strategies shall face different obstacles, which have been identified and an approach to address the same, involving relevant stakeholders, has also been recommended.

Lessons Learned

An important finding from the study is that the current situation of water supply results more from mismanagement rather than any scarcity of the resource. This includes:

- Inadequate knowledge and capacity;
- Inadequate monitoring infrastructure and tracking systems;
- Poor motivation and will;
- Lack of ownership and accountability; and
- Limited vision.

This State of affairs can be summed up as a case of lack of governance. There is, therefore, a need to bring in parallel institutional reforms and build capacities at all levels in the Municipal corporations. A management information system that tracks day-to-day operations is a must to begin with, not only to bring in transparency in the system and accountability but also to track performance on a regular basis. These aspects have been stressed upon during the capacity building programs and have been well received.

Transferability

TERI has worked along with the other local institutions from Madhya Pradesh – SGSITS and EPCO towards institutionalisation of training and capacity building process for WDM in all four cities and Water Resource Planning and Conservation (WRP), South Africa, on replication of the concept. Specific activities included:

- Preparation of a WDM manual relevant to local conditions in local dialect;
- Preparation of a WDM strategy document that has best incorporated comments of relevant stakeholders;
- Organising stakeholder consultations and training programs for staff from each of the cities; and
- Institutionalisation of training and development of course curriculum for mainstreaming WDM.

The training programs were delivered adopting a training methodology, which included a combination of lectures, site visits, interactive group discussions and hands-on exercises. Each training program has been followed by a refresher course.

6

SURAT, INDIA

Urban Governance in Environment and Public Health

The city of Surat in the State of Gujarat was one of the filthiest cities in India prior to 1995. On outbreak of the plague in 1994 and the poor working conditions of the local Government paralysed the city's basic services, increased the morbidity rate, and put heavy capital expenditure on the local government, the Surat Municipal Corporation (SMC). The Municipal Commissioner of the city introduced exemplary reforms in 1995 and turned the city into the second cleanest city in the country. Basic services increased to over 95 per cent of the residents, and capital expenditure increased by about 450 per cent.

This local action was looked upon as a Model Approach in addressing the problems of Environment and Public Health in the city of Surat by adopting the principles of Good Urban Governance.

The Problem

Prior to May 1995, the city of Surat was one of the filthiest cities in India and also faced with financial, administrative, socio-political and legal problems. In September of 1994, the city was traumatised by a plague outbreak. This outbreak of Plague coupled with poor working conditions and non-attendance to the grievances, further demoralised the staff of the Surat Municipal Corporation. Basic municipal services such as street cleaning, collection of solid waste, water supply and sewerage services, drains, street lights, parks and gardens, roads and schools were only covered for about 45% of the city residents. Morbidity rate due to water-borne and water-related public health diseases was high. To make matters worse, both the elected representatives (councillors) and the media had no interest in the functioning of Surat Municipal Corporation. Capital expenditure on long term assets stood at Rs. 300 million with expenditure on salaries and allowances accounting for about 47 per cent per Revenue Budget.

Process

In May 1995, a new Municipal Commissioner was posted to the city as the Chief Executive Officer (CEO). He undertook a one-week extensive tour of the city and held consultative meetings with all levels of municipal employees. He decentralised all his administrative and financial powers to 10 Commissioners (six zonal chiefs together with four functional heads of water supply, sewerage; town planning and finance divisions). A consultative decision-making process among all the 11 Commissioners was introduced. The resulting decentralisation and empowerment of work units broke the departmental barriers and lifted the morale of the staff. A micro-planning exercise based on extensive field input was carried out to lay down equitable norms for effective and efficient provision of services to the citizens with best use of the available resources.

The council entered into partnerships with the private sector, who provided street litterbins in exchange of advertising rights. Instant penalties on littering were introduced and this increased the amount of revenue collected. Community-based Organisations (CBOs), mainly women groups in the slum areas, were used to raise awareness on the need to widen the roads so as to make provision of other services easier. The media realised the positive role it played in spreading public awareness and has taken up the role of social auditing of the Municipal Corporation's operations.

The citizens were involved in the decision-making process through a grievance redressal system and feedback mechanism. A transparent system for routine works such as maintenance was worked out for contractors. During the whole process, the media was used to highlight the situation and to create public awareness.

Reforms Practiced

The exemplary reforms brought out by the Municipal Commissioner are summarised into:

- Decentralising all his administrative and financial powers;
- Adopting consultative decision-making process with the implementation officials;

- Laying down equitable norms for effective and efficient provision of services to the citizens with best use of the available resources;
- Entering partnerships with the private sector;
- Introducing instant penalties on littering;
- Using CBOs, mainly women groups in the slum areas to raise awareness;
- Involving citizens in the decision making process through a grievance redressal system and feedback mechanism;
- Developing a sense of citizenship and pride;
- Inculcating public awareness and civic participation among the citizens;
- Maintaining transparency at all levels of operation; and
- Increased support of Media.

Results Achieved and Sustainability

Within a period of 18 months, Surat had turned from the filthiest city to the second cleanest city of India. The internal revenue collection increased due to efficient tax recovery, transparency in tax assessments and plugging of loopholes in tax administration.

A sense of pride among the sanitation workers was restored through provision of proper equipment and their grievances taken into consideration. Provision of basic services increased to over 95% of the residents, while capital expenditure also increased by about 450%.

A sense of citizenship and pride was developed as the citizens were aware of their civic rights to quality services. Inculcating public awareness and civic participation among the citizens has brought transparency among the council officers and workers. Morale of the staff even from the lowest level has been sustained by an innovative system of public rewards.

Lessons Learned and Transferability

The Municipal Commissioner's initiative was looked upon as a Model Approach in addressing the problems of Environment and Public Health in the city of Surat by adopting the principles of Good Urban Governance, opened new opportunities for local economic development and can be replicated in other cities and towns.

7

GUJARAT, PAKISTAN

Sustainable Waste Management Initiatives

The main goal of the Gujarat sanitation programme is to manage waste through developing an indigenous low-cost waste management approach. The programme, initiated by Waste Busters, a private organisation, is to develop workable processes and strategies to improve the management of waste and promote recycling practices in a way that can benefit the urban poor and thereby improve the hygiene and living conditions of the communities involved. Consequently, the city of Gujarat is ranked as one of the cleanest cities in Pakistan with proper waste collection and disposal mechanisms. The unique features of the programme are financial and environmental sustainability with social equity.

Background

The city of Gujarat, in Pakistan, has an area of about six square kilometres with a population of 543,000. Data from the Tehsil Municipal Administration shows that the amount of solid waste disposed at the dump site has increased from 100 tons in 1990 to 250 tons in 2003. This has become a menace to the environment and urban management efforts. The waste disposal problem stems from many sources. Some of them are apathy and lack of public awareness, indiscriminate dumping, foul odours, deteriorating environmental quality, lack of enforcement and inefficient collection services. The sanitary and waste problems were more significant in the high density and low income urban areas (low-cost apartments or squatter settlements).

Objectives and Strategies

The Gujarat Sanitation initiative was aimed at providing sanitation services to the poor and the socially excluded groups, which was facilitated by the policy arrangements that included:

- Targeting the poor and providing them with low-cost and affordable waste management and disposal services;
- Commercialisation of waste disposal services through the introduction of user charges and use of the revenue generated for the purposes of meeting project expenses; and
- Capacity building of the municipality administration.

The project was initiated and largely implemented by the private sector, Waste Busters, through a partnership approach.

The specific objectives of the project were to:

- Create employment for unemployed young people;
- Generate income from waste;
- Clean up the entire city; and
- Establish a self-sustainable sanitation mechanism.

Mobilisation of Resources

The resources for the initial start-up cost were generated by the private sector partner, which contributed 60 per cent of the total cost. The Tehsil municipal administration provided infrastructure support such as vehicles and machinery required for the transportation of waste. A grant of $50,000 for best practices was received by Waste Busters from the United Nations Development Programme (UNDP) under its Urban Governance Initiative. This amount was also spent on capacity-building of the Tehsil municipal administration and the initial cost of the composting plant in Gujarat. The income generated from the sale of recyclable items and compost was also a source of funding. This has largely ensured the sustainability of the project.

Process

The programme was implemented through a partnership approach. The partnerships involved were:

- Tehsil Municipal Administration, Gujarat;
- Waste Busters, a private waste management contractor;
- Shahdaula Welfare Trust, a non-governmental organisation based in Gujarat; and
- The Communities.

The programme was commenced in 2002 and implemented by Tehsil Municipal Administration, with the goal of improving urban solid waste management (SWM) through community mobilisation. Later on, other community activities were initiated after the communities were mobilised and the effectiveness of this approach demonstrated. In September 2002, the SWM programme was handed over to several community-based organisations with good track records with transparent management of similar programmes. It was financed by service charges collected from the community and other programmes running simultaneously and independently of the main SWM programme.

The programme priorities were established in keeping with the needs of all the stakeholders, particularly the citizens of Gujarat, who voiced their opinions in community meetings. The project coordinators, Waste Busters, organised a round-table for the stakeholders in waste management in March 2002 and recommendations for action were made. The poor being benefited from the public-private partnership arrangements had a focus on poverty reduction for the disadvantaged groups living in urban areas. The concept entailed mobilising the community into adopting proper waste disposal practices (use of garbage bags for disposal of household waste, end of indiscriminate dumping of garbage in open areas, and individual households' payments for the services).

The non-governmental organisation, Shahdaula Welfare Trust, was mobilised to convince and motivate the people and their communities by sending social activists from door to door in the target areas and conveying the message to each household. The city was divided into units, each unit comprising 2,000 households. For each unit, 10 unemployed young people from that area were hired as social motivators.

The social motivators were given 200 households each and their job was to conduct community meetings where the project concept was discussed with the residents and their acceptance was taken down in writing through membership forms.

The residents were asked to pay 100 Pakistan rupees (PRs) per month to the local community-based organisation for waste collection services. The 100 PRs were then applied to the cost of 30 garbage bags supplied to each household, the transportation by pick-up and the salaries of the social motivators and labourers. This created a self-sustainable mechanism and employment for the social motivators. Street scavengers were hired as labourers and went from door to door collecting the garbage bags and sorting the waste into organic and non-organic categories. The scavengers not only received a salary from the waste collection fees but also earned additional income by selling recyclable waste to hawkers.

The process of door-to-door collection resulted in an 80 per cent reduction in the indiscriminate dumping of garbage and provided a clean and healthy living environment to the community. The waste collected in garbage bags was then transported to the waste recycling/landfill site where all the waste was segregated into organic and non-organic wastes. The organic waste was processed into compost and sold as organic soil conditioner while the inorganic waste was further sorted into paper, plastics, metals, Tetra Pak cartons, polythene, and so on. These items were then sold to the appropriate recycling industries. Income generated from sales was applied towards operating expenses and maintenance of the plant and machinery, and also contributed for generating profits to the private partner, Waste Busters.

Results Achieved

The city of Gujarat was ranked as one of the cleanest cities in Pakistan, with a proper waste collection and disposal mechanism. The project resulted in the creation of over 500 jobs for the unemployed in the city. It promoted clean streets. The drains were not choked with plastic bags or other materials, which used to cause major sewerage problems. In addition, the city had a waste recycling plant which recycles organic waste into compost and provides much-needed organic matter at a very low cost to farmers.

The factors that led to the success of the project included:

- The involvement of the community right from the inception of the project through to the whole project cycle. Most significantly, the establishment of the project priorities took into consideration the views and needs of the target population and all stakeholders in general through a consultative process;
- Application of the principle of complete participation of all stakeholders in the whole of the project in which each stakeholder played an unique role in the project;

- Well-coordinated and complementary partnership with clear and well-defined roles for each stakeholder;
- Integrated approach to service provision by providing income-generating opportunities and employing a poverty alleviation approach; and
- Introduction of social, economic and financial incentives particularly contributed to the self-sustaining aspect of the project.

Sustainability

The programme is self-sustainable as the income generated from service charges pays the salaries of the social motivators and other expenses. Income from sales of recycled waste was an attractive profit incentive for investment. In addition, the programme enjoyed the community support. The programme was environmentally sustainable and the construction of a waste recycling plant was a clear indication of an efficient, transparent and accountable management system.

One of the unique features of this project is the financing partnerships adopted by the project, which was an essential tool for ensuring the financial sustainability. The self-sustaining approaches through revenue generated from service user charges were fundamental in enhancing the sustainability of the project beyond external funding strategies.

Lessons Learned

- Participation of the beneficiary groups in the whole project process, including planning, decision-making and implementation: this approach enhanced a sense of ownership of the initiative among the beneficiary groups;
- A partnership approach, backed by enabling institutional frameworks, which aided in the implementation and general management of the programme; for example, Waste Busters organised a stakeholders' workshop which made recommendations for action, while the public-private partnership arrangements targeted the poor and created employment opportunities, particularly for young people;
- Social equity and affirmative action: the integration of scavengers and other poor and disadvantaged groups into the project process enabled them to earn a salary essential for living in dignity; the programme targeted low-income groups and provided low-cost and affordable sanitary services;
- The central role of the local authorities and decentralisation was illustrated by the role played by the Tehsil municipality in the whole project process and the decentralisation of sanitation services to the local levels;
- Environmental sustainability was exemplified by sound environmental management approaches adopted in a bid to achieve a clean and sanitary environment for the residents of Gujarat;
- Transparent and effective governance was largely demonstrated by the financial management systems of the project.

Transferability

The programme was designed in modules for ease of replication. In fact, the Gujarat project was a replication of the Lahore sanitation programme and the concept was initiated in eight major cities of Pakistan. The project gained national recognition as a model of a self-sustainable programme.

8

TAJIKISTAN

Institutional Framework for Improved Management

Drinking water supply systems in the rural areas of Tajikistan are managed by multiple agencies with overlapping functions, causing confusion among the service providers, regulators, and consumers. This Local Action is a Pilot and Demonstration Activity (PDA) that helps to create a new institutional framework for managing drinking water supply systems in Jomi District, Tajikistan

Introduction

There is much room for improvement in the management of Drinking Water Supply Systems (DWSS) in Tajikistan's rural areas. Several management schemes were experimented by local Governments — districts may have one district-wide agency, or several parallel agencies for the same purpose acting at the jamoat level (Local Administrative Unit below the District Government) or multiple agencies that co-exist but with no clear hierarchical structure. In most cases, these agencies' performance was hindered by lack of financial resources and the discontinuity and unreliability of revenues from water consumers. Most consumers who were willing to pay regularly for good and reliable water supply services had no trust in the management capacity of government agencies.

Creating an Institutional Framework

A pilot and demonstration activity (PDA) was initiated with an objective to create a new institutional framework for the establishment of water consumer protection committees (WCPC) in rural areas of Tajikistan for managing drinking water supply.

Process

Under this initiative, a new DWSS management scheme was created which takes into account the separation of the "service provider" and "quality controller" roles, and the active participation of the water users. The new management framework paved the way for the establishment of an independent village-level WCPCs in three villages of Jomi district, where a DWSS managing agency was created by the local Government in 2005.

Resources

The estimated cost of the project is US$45,000 to undertake rehabilitation works in the target villages, improvement in water supply services through enhanced tariff structure to cover O&M costs and eventually to move towards full cost recovery.

Expected Results:

- Formation of WCPC in 3 villages of Jomi District;
- Working meetings between WCPC and the DWSS management agency;
- Agreed Plan of Action for improvement of water supply services;
- Tariff structure to cover full O&M costs and efforts towards full cost recovery;
- Improved performance of DWSS managing agencies in terms of cost recovery, water availability and water quality;
- Progressive enhancement of the scope of services provided;
- Increased Financial Stability;
- Transparency in the decision-making process;
- Enhanced confidence of the communities;
- Rehabilitation works in target villages within a time frame for:
  - resuming 5 hours daily water supply service;
  - increased water pressure;
  - increased value of water sales from 0 to 16 cubic metres per hour;
  - increased number of water connections (additional taps installed).

9

TIMOR-LESTE

Partnerships for Reconstruction of the War-torn Nation

Timor-Leste needed support for the reconstruction of its war-torn land. The country's water challenges were the greatest in Southeast Asia with mere 73 per cent of its population having access to water supply services and with poorer sanitation coverage. This Local Action illustrates how the partnerships between various water sector stakeholders have rebuilt the country and provided water to the people.

Background

In August 1999, the people of Timor-Leste voted for their independence. A month later, mass destruction displaced three quarters of the country's population, destroying most homes and infrastructure. Looting and burning were rampant. Water supply and sanitation facilities were especially impaired. While damage to the main physical assets was limited, office buildings, records, vehicles, and tools were totally destroyed. The losses in urban areas were much higher than in rural areas where there was little water supply infrastructure. But even in rural Timor-Leste, there were several incidents involving poisoned wells, stolen hand pumps, dislodged pipes, and damaged spring intakes. In towns with public water supply and sanitation systems, vehicles, pumps and motors were looted. Water treatment plants were damaged. Pipelines, tools, and spare parts were stolen. Storage tanks were torn down, and as homes, stores, offices, and other buildings were burnt, water connections, meters, latrines, and septic tanks were either damaged or completely destroyed.

Before the crisis, the water supply system served only 40% of the population in district capitals and 29% in sub-district towns. The average access to piped water supply was 13%. In Dili, about 8,600 household connections and 270 public water stands existed. People were unwilling to pay for low-level water supply service and made extensive use of private shallow wells in other urban areas. Only 48% of Timor-Leste's total population of 0.8 million had access to potable water. When the hostilities subsided, the availability of functional water and sanitation facilities at the village household level was further reduced to about 10% and 5%, respectively.

Resources

To help rebuild the country, a Trust Fund for East Timor (TFET) was established with contributions from various funding agencies. Asian Development Bank (ADB) and the World Bank were appointed as joint administrators of the fund. A grant of $4.5 million from TFET for the rehabilitation of Timor-Leste's water supply and sanitation sector was administered by ADB. This was later supplemented with an additional $4.5 million in the second phase of the project.

Process

The Water Supply and Sanitation Rehabilitation project sought to provide the people of Timor-Leste with sustainable water supply and sanitation services using appropriate technology and solid management systems. They were assisted in restoring damaged water supply and sanitation (WS&S) infrastructure and building institutional capacity to manage, operate, and maintain the systems.

The project had three components:

- The **Water Supply and Sanitation Sector Management and Investment Programme** provided consulting services to assist project management units (PMUs) in programme implementation.
- The **Capacity Building and Institutional Development Programme** identified and implemented activities that supported physical WS&S construction from conception to post-completion. Stores, generator sheds, workshops, and other WS&S maintenance infrastructure were procured or rehabilitated.

- The Water Supply and Sanitation Implementation Programme had three subcomponents.

  – The *Quick Response Facility* repaired and rehabilitated water supply systems across 13 districts of Timor-Leste that needed immediate action.
  – The *Dili Water Supply Repair and Rehabilitation subcomponent* provided materials, equipment, and civil works to support the Dili water supply system and the project funded by the Bank of Japan. Complementary works included the repair and rehabilitation of public taps and other water points in Timor-Leste's capital. This subcomponent also administered small local contracts and construction contracts for deep well drilling.
  – The *District Water Supply Repair and Rehabilitation subcomponent* aimed to address the needs of smaller urban and rural communities by procuring and installing pipes, fittings, pumps, motors, and generators; supplying construction materials and equipment; designing services for small and medium scale water supplies; rehabilitating water bores and raw water intakes; and providing support for water quality testing and groundwater pump testing.

Results Achieved

With the Water Supply and Sanitation Rehabilitation Project and other donor assistance, emergency system repairs made significant progress in restoring these WS&S services. The public water supply systems in each of the district capitals were restored.

One of the many project achievements was the successful *Quick Response Facility,* which built four deep wells in Dili and Suai. It also undertook major repairs on the Viqueque water supply transmission main over the Cuha River and assisted with procurement process for urgent minor works during the government transition stage and for major works of other funding agencies.

Around 32,000 people in 12 districts of Timor-Leste were benefited from improved WS&S facilities through the *District Water Supply Repair and Rehabilitation Programme*. Bindau Santa Ana and Becora alone had 9,000 beneficiaries. These results were achieved with the help of local and international non-governmental organisations (NGOs), as well as the beneficiaries themselves who lent their time and effort towards the construction and ongoing operation and maintenance of the facilities. In addition, 4,000 water meters were procured to reintroduce water supply user charges in the area and about 2,000 meters were installed.

In all, around 96,000 people directly benefited from improved WS&S facilities through the first phase of the project, which was approved in July 2000 and completed in December 2001. Improved operation of facilities and enhanced human capital from the capacity-building programmes were an additional achievement. Furthermore, about 26,100 local people gained an equivalent number of employment days either directly or through contracted activities.

Sustainability

In general, the project has met its objectives. Water supply was improved to the levels that existed under the earlier Indonesian administration. Despite the marked improvement, these levels were still considered inadequate for achieving the country's reasonable public health goals. Sanitation facilities, including wastewater, solid waste, and drainage systems, were yet restore to the earlier levels, but again, these, too, require the attainment of standards significantly higher than those achieved under the Indonesian administration.

Users Viewpoint

"In many cases, having access to safe water has allowed people to resume some profitable activities. Natalia Gutierres and her husband, Augustus Suarez Medeira, were traders before the conflict. They collected corn from their neighbours and sold it in Dili, but the turmoil disrupted farming and trade. The family, like the di Silvas, also moved to Ermera. There, Ms. Gutierres opened a restaurant. "We had to find a different way to survive," she says. "We made more money before. But the restaurant is doing better now, and we make about $300 a month in profits." The restaurant is simple, furnished only with long wooden tables and benches, but the food is tasty and clean. Though she only has one tap for her home and the restaurant, the running water helps her maintain good hygiene. Without it she may not have been able to run the eatery".

The sustainability of the project's WS&S outcomes depend on the capacity of the Timor-Leste's Government and WS&S to maintain the infrastructure and systems provided by the project. The evolving political and institutional environment may have impact on sustainability.

Lessons Learned

There is still a significant need for external support to the sector. While most water supply services in urban and rural areas have generally been restored to the basic service levels provided during the previous administration, this service still does not meet generally accepted standards. Further improvements are needed to achieve public health, human dignity, and environmental protection goals.

There is an ongoing need for capacity building at all levels. Support for this effort should be provided at an appropriate pace and time to ensure that the local staff and community gain the required understanding and ownership. Some capacity-building activities may need to be repeated to orient new staff and further reinforce the learning of existing staff.

Cooperation with NGOs allows effective early access to local experience and knowledge of social and physical conditions. NGO involvement has been crucial for successful implementation because they have the human resources to undertake the work in all rural areas.

Reducing leakage in existing water systems increases their efficiency and effectiveness, resulting in improved service and reduced costs. The reintroduction of metering and user charges becomes a mechanism not only for generating revenue, but also for promoting efficient water use and reducing waste. Water user charges must be quickly introduced.

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SECTION II

Integrated Policy, Planning and Management

Integrated Policy, Planning and Management

In a rapidly growing urban conglomeration, it is essential that the stakeholders involved in providing safe water and sanitation to initiate appropriate measures in policy, planning, administration and accountability. An inclusive and coherent policy and planning would be required. It is important to adopt a differential approach with flexibility and plan the water and sanitation projects in an integrated manner to benefit all sections of the society, including the poor in the 'unrecognised slums'. For people evicted from their dwellings, rehabilitation policies must include safe water and sanitation facilities. Institutional transformation with clear roles and responsibilities for accountability are needed to achieve the MDG targets. Leadership plays a vital role in bringing radical transformation and culture of change. Transparency and participatory approaches ensure project success and its replicability. Initiatives such as water conservation/saving lower water supply investments and decrease wastewater discharge. An integrated policy, planning and management approach results in effective implementation of water and sanitation projects, benefiting the urban poor in particular.

This Section includes 14 such local actions from Afghanistan, Cambodia, China, India, Iran, Japan, Kiribati, Korea, Kuwait, Kyrgyz Republic, Nepal and Uzbekistan.

Afghanistan: the Urban Rehabilitation and Employment Programme**,** under Ogata Initiative by the Government of Japan, facilitated water supply to over 2 lakh of poor residents comprising returnees, internally displaced persons, widows, demobilised solders and vulnerable groups in rebuilding their living environment.

Cambodia: the dynamic leadership of an individual rehabilitated the ruined public utility into an exemplary institution in providing 24x7 safe drinking water to a million people of Phnom Penh.

China: the sustainable water management initiative in Jinan City is unique for the promotion of city's safe water supply. The city has been considered as the National Water Conserving City. Similarly, Nanjing is slated as a Water Saving City.

Japan: Fukuoka was the first city to venture on Water Conservation Consciousness in partnership with the citizens and the private sector.

India: an integrated, demand-driven and need-based approach was adopted to address the issues of providing adequate water supply and sanitation to the Himalayan region. In the State of Tamil Nadu, democratising water governance led to a change in bringing adequate water supply to 752 villages through the implementation of the 'Total Community Water Management' project.

Iran: the Government of this Islamic Republic adopted aquifer management for harvesting floodwaters to control desertification, supply of irrigation water and provide employment opportunities.

Kiribati, the republic**:** an isolated country in the Central Pacific, is adopting an integrated planning and management approach to provide safe drinking water and sanitation for the thirsty Atoll.

Korea: adopted an integrated approach to transform the city of Hanam into a sustainable and environmentally self-sufficient city with a well structured urban development and growth management.

Kuwait: experienced an effective and profitable waste management system in an economic way for providing a healthy environment in Ahmadi Town.

Kyrgyz, the republic in Central Asia: has resorted to cooperation and resource-sharing for water.

Nepal: the sanitation initiative for the peri-urban communities of Siddhipur is an integrated pro-poor planning and management effort in eradicating open defecation and bringing out appropriate solid waste disposal practices in the community.

Uzbekistan: over 700,000 people, predominantly poor benefited from the efforts to mitigate the ongoing effects of drought by providing safe and easily accessible water supply, minimising water wastage, improved sanitation facilities and health conditions with better hygiene.

10

AFGHANISTAN

Urban Rehabilitation and Employment Programme

Afghanistan Urban Rehabilitation and Employment Programme was implemented by UN-HABITAT in collaboration with the beneficiaries and local authorities under the overall ownership of the Transitional Islamic State of Afghanistan. The project was implemented in the three cities of Kandahar, Jalalabad and Mazar-e-Sharif. These projects are part of the Ogata Initiative Phase II, an initiative of the Government of Japan, which was launched in 2002 to support the comprehensive regional development in Afghanistan.

UN-HABITAT has been working with urban communities in Afghanistan for more than a decade. The Community Forum is a local self-governing organisation that provides a platform for the members of a community to consult on local problems and devise ways and means to address them in an agreed priority. Community Forums are engaged in the design and implementation of wide ranging initiatives such as housing reconstruction, water supply and drainage, road construction/repair, schools, and medical centres.

The project had two distinct components, shelter and water supply. The shelter component was implemented in Kandahar and Jalalabad whereas the water supply component was limited to Mazar-e-Sharif only. A total of 3,500 shelters were built in these two cities, and a number of strategic repairs in the existing water supply system were carried out in Mazar-e- Sharif benefiting 30,500 families (213,500 people).

Ogata Initiative

The Government of Japan launched the Regional Comprehensive Development Assistance Programme (Ogata Initiative) in August 2002 to support comprehensive regional development in Afghanistan. This initiative is designed to realize modality of comprehensive development for reconstruction, and to achieve a seamless transition from humanitarian assistance to recovery and reconstruction assistance as early as possible.

The overall objective of this initiative is to design and implement tangible projects emphasising regional recovery and community empowerment through the United Nations and other agencies, under the ownership of the Transitional Islamic State of Afghanistan (TISA), with the additional aim of achieving capacity building of the TISA and enhancing cooperation between the TISA and regional authorities. The Ogata initiative's projects help communities with building materials and small labour cash wages, making shelter construction more affordable.

The Ogata Initiative were being implemented in Phases. The strategy of Phase II of the Ogata Initiative ("Ogata II") is to expand comprehensive regional development targeting local communities in addition to refugees and Internally Displaced Persons (IDPs). This includes programmes such as income generation, medical care, water supply, sanitation and capacity building for education, labour-intensive projects (rehabilitation of basic infrastructure), etc. The Afghanistan Urban Rehabilitation and Employment Programme is a part of the Ogata II package but it does not bear any direct relations with the rest of the package.

Shelter situation: Kandahar & Jalalabad

During the conflict period, cities and towns in Afghanistan were places of refuge for internally displaced families — despite the fact that the urban housing stock had been extremely damaged. With the advent of an internationally recognised government in late 2001, there had been a sudden influx of refugees returning home (the "returnees"). A large number of returnees had settled in major cities, either as temporary residents en route to their final destination or as permanent residents. Since much of the rural infrastructure had been destroyed, it is probable that many temporary residents will choose to stay in those cities.

Consequently, many of the returnees were either forced to live with relatives – often in overcrowded condition in improvised settlements. For instance, in Kandahar, an estimated 90,000 families are living in 41,529 houses, or one house for every 2.2 households. Hence, there was an urgent need to initiate a programme of assistance to the returnees so that their housing needs are met.

In Jalalabad, the major problem was the scale of the influx of the returnees. In addition, the periphery of the city of Jalalabad has been, throughout the years of conflict, a frontline of fighting and, therefore, had sustained heavy damages. This had resulted in the destruction of housing, infrastructure and public buildings, especially in the areas of Surkroad, Hada and Sumarkhel. Accordingly, the Project concentrated its support to an area defined by these roads.

Water Supply System: Mazar-e-Sharif

Mazar-e-Sharif is the regional town of northern Afghanistan. Over the past two decades, the city came under repeated siege from opposing forces. While the physical destruction was not as severe as in Kabul, the city lost the capacity to manage and maintain its critical infrastructure including water supply. Prior to the Project, the water supply systems were barely functioning:

- The intake was partly damaged;
- The main tube wells and the associated pumps were not functioning;
- Trunk lines had a number of leaks; and
- There was a widespread contamination of drinking water from free flowing sewage.

Scope of the Project

The Project was implemented in three principal cities of Afghanistan, viz. Kandahar, Jalalabad, and Mazar-e-Sharif. The Project has two distinct components — Shelter and Water Supply. The shelter component was implemented in Kandahar and Jalalabad, whereas water supply component was limited to Mazar-e-Sharif only.

Project beneficiaries

Kandahar: 2,000 families (shelter)
Jalalabad: 1,500 families (shelter)
Mazar-e-Sharif: 30,500 families (water supply)

Goals and Objectives

The objective of the Project was to assist the poor residents in the cities of Kandahar, Jalalabad and Mazar-e-Sharif, who consist of returnees, International Displaced Persons (IDPs), widows, demobilised soldiers and vulnerable groups, in rebuilding their living environment. The comprehensive programme of support assists the poor in rebuilding their lives by addressing their urgent needs of income, water, sanitation system, and shelter, in the process enhancing their sense of security while creating healthy environments for them to live in. The overall goals of the Project were:

- To assist the returnees and vulnerable families in the construction of the shelters;
- To generate employment opportunities and income for the poor in the target cities;
- To restore and expand the water supply system in the target cities with the aim of providing stable potable water to the cities' population including the returnees;
- To ensure leading participation of the target population in the design and implementation of the activities of the Project as a way of empowering them to undertake improvement measures out of their own initiative.

Process

Shelter Component: Kandahar & Jalalabad

The shelter component of the Project was designed to assist the returnees and the vulnerable groups who cannot by themselves build their shelter. Within the returnees, the Project gives priority to the most vulnerable households, such as those headed by widows, with no bread earners in the family, and the very poor.

Beneficiaries were identified with the cooperation of the local authorities and in consultation with community members. Once identified, they form their own group so that they can take care of local procurement, production of building materials like bricks in a collective manner, and labour mobilisation (including self- and mutual-help). Building materials, such as timber beams, windows, doors, are financed by the Project and procured by the groups. Distribution of building materials took place under the supervision of the ward committees (called the "Shuras") where the Project sites were located but each family was required to keep a Family Material Card where details of materials and cash grant disbursed are recorded and verified. This process enabled families to make critical decisions – such as how large the shelter should be, what kind of materials should be used, and what design would be more appropriate based on their needs and capacity.

The Project was based on the premise that people have the capacity to assist in their own recovery provided they have security and active support

from authorities. Each element of the Project was designed in consultation with the beneficiaries so that they can define their needs and identify solutions. In case of shelter construction, no layout plan of a shelter was suggested to allow designing their shelters based on their needs and their ability to invest. The Project helped to remove the obstacles that hinder people from exercising their judgment. By assisting them with building materials and small cash, shelter reconstruction was made more affordable. Beneficiaries took part directly in the construction and its management as the Project generates employment within the community.

Improvement of Water Supply System: Mazar-e-Sharif

Under the Project, a number of large-scale and minor repairs, installation of a number of hand pumps in those parts of the city that were not served by the network, shall be undertaken. This component of the Project was implemented in collaboration with the support of the municipality and in partnership with the Central Authority for Water Supply and Sewerage (CAWSS).

Implementation Strategy

The implementation strategy was based on the premise that people should be at the centre of development. This will not only make the implementation go smoothly but also contribute to their self-reliance. Under this strategy, participation assumes a central role in which people contribute to the Project by participating in the decision-making process rather than the other way round. The scale of the needs far exceeds available Project resources. It is essential that people become part of the decision-making.

Shelter Construction

- Beneficiary families and the communities was the centre of the process with local Government and UN-HABITAT playing the role of supporting them within a given framework;
- Families received recognition and had the opportunity to take decisions regarding the building of the shelter: the family was not a mere recipient of a package delivered;
- Families were given the freedom to decide on the technology, size and shape materials and how to build the shelter;
- Families were able to optimise the grant package to get more "housing space". Families were able to prioritise quality vs. space, technology vs. space, etc. Families chose the size of rooms according to their needs and traditions, as a standard plan was not imposed on them;
- With the Family Material Card, families were always aware of the amount of materials ordered, the cost and the balance. A guideline on earthquake damage mitigating building method was introduced and Technical Officer advised the families accordingly. Families were able to build on the existing foundation of their old house without having to invest in new ones; and
- Mutual help system was promoted in the form of groups of families helping each other. Procurement was devolved to the community level and system put in place to ensure transparency.

Mobilisation of Resources

The Government of Japan provided a total budget of US$ 2,603,095, of which a total of US$ 947,767 was allocated for 2,000 shelter units in Kandahar and US$ 712,601 for 1,500 shelter units in Jalalabad. Additional US$ 942,727 was allocated for Mazar-e-Sharif water supply repair and improvement.

Results Achieved

A total of 3,500 shelters were built in these two cities, and a number of strategic repairs in existing water supply system were carried out in Mazar-e-Sharif benefiting 30,500 families (213,500 people). The original Project was planned for a duration of six months. A letter of exchange between the Government of Japan and UN-HABITAT took place on 29 October, 2002. The details include:

Shelter Construction

Kandahar
Planned 2,000 shelters — Completed 2,000 shelters

Jalalabad
Planned 1,500 shelters — Completed 1,500 shelters

Water Supply Rehabilitation: Mazar-e-Sharif

- Restoration of Nahr-e-Top scheme;
- Restoration of Takhta-pul Water Supply Scheme — Activity changed to Neighbourhoods scheme;
- 24 Neighbourhoods scheme restored; and

- Inception and complete overhaul and repair of 300 handpumps in different districts of the Mazar-e-Sharif City and 46 additional hand pumps installed.

Sustainability and Programme Extension

The Project was based on the belief that people are the primary resource in the rebuilding process and they have to play a central role. People as organised communities had to take decisions on their own development and take action accordingly. Mobilisation was the key approach to make people aware of their responsibilities and to decide what needs to be done to overcome the present situation. This was the process of empowerment that enables people to take development into their own hand enabling them to rebuild their lives with dignity.

UN-HABITAT had the opportunity to observe different models of assistance in Afghanistan. A model commonly practiced in Afghanistan in shelter sector was one that prescribes the details of how a shelter should look like, how large it should be, what materials should be used, how large a window should be and at what pace the shelter should be built. In real life, homebuilders-owners make these decisions in the broader context of what is commonly known as 'priority regime'. In other words, shelter needs although an important element of the total needs of the poor, should not come at the cost of other needs such as food, health, education, etc. When shelter standards are prescribed they tend to be mismatched with the priority regime, thereby forcing people to curtail other needs.

If people are trusted to come up with their own standards within the bound of technical soundness, they would be able to meet their shelter needs more efficiently and at a lower cost. These were the reasons why the Project did not provide standard designs and plans but instead focused on helping people to define their needs by themselves and somehow fitting Project requirements to their needs.

Extension of Ogata Initiative Phase III

The output of this Project had supported the people of the three cities in Afghanistan; however, there will be more returnees and IDPs coming back to the cities. Therefore, similar type of continuous support will be required as shelter and water is essential for all people to establish their basic living environment. In the course of implementation, it became evident that toilets were necessary in order to avoid further contamination of ground water. UN-HABITAT suggests that the toilet construction for shelters built by Ogata II, and additional shelters should be included for the component of Ogata III.

Lessons Learned

All the returning families were very eager to rebuild their houses and this facilitated the mobilisation of people. Most families have the skills and capacity to build their own housing, however they may also need to hire skilled labour or to provide food for helpers. This is particularly true in the case of female-headed households. Therefore, it is optimal to supply part of the shelter package not only in cash, which was US$ 2 per day as a payment, for instance, but would also cover food as it was observed that some families find it difficult to obtain food during the construction period. Furthermore, mutual help is a traditional practice and it was useful to organise it in the form of "Mutual Help Groups". These groups can turn into savings and credit groups. The Project originally intended to do this, but due to the time frame for implementation, they could not be formalised. In terms of materials, the biggest demand from the grant was for roofing beams. The beneficiaries were able to procure other materials like planks, nails and plastic on their own.

Through the activities of the Project, families learnt how to help each other and work with other families in order to produce construction materials and construct shelters efficiently. Families learned how to discuss with wakils and shuras. Communities learnt how to work with Municipal Governments and United Nations. Municipal governments learnt how to guide and mobilise people to achieve the same objectives.

Urban Rehabilitation and Employment Programme: Ogata Initiative Phase III

The Urban Rehabilitation and Employment Programme in Afghanistan under Ogata Initiative Phase III was implemented by UN-HABITAT in collaboration with local Afghan Communities and the Municipal Authorities. The Project was implemented in three cities in Afghanistan, namely, Kandahar, Jalalabad and Mazar-e-Sharif. The project was founded under Japan's Regional Comprehensive Development Assistance to Afghanistan: Ogata Initiative Phase III, an initiative of the Government of Japan, which was launched in 2003 to support comprehensive regional development in Afghanistan. In many respects including objectives, approaches, principles, activities, target cities, beneficiary selection process, etc, the Phase III programme builds on what was initiated under Ogata Initiative Phase II programme.

Project Achievements:

City	Shelter (Units)	Toilet (Units)	Road, drainage Gravelling	Water Supply	Beneficiaries (Families)
Kandahar	1,175	2,437		13.4 km water supply network extended 15 tube wells with hand pumps completed	16,896
Jalalabad	1,250	2,234	9 km road gravelled 2 km drainage built 1 causeway (30mx6.50mx35m)	28.651 km of water supply network extended 23 tube wells with hand pumps completed 33 stand posts constructed 1 water reservoir rehabilitated 2 pump houses rehabilitated 4 submersible pump repaired 660 m electricity for network provided Leakage detection and repairs in 50 places Spare parts for water supply provided	53,484
Mazar-e-Sharif:	1,000	827			1,827
Total	3,425	5,498			72,207

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PHNOM PENH, CAMBODIA

Rehabilitation of Public Utility for Sustainable Water Supply

Cambodia's Phnom Penh Water Supply Authority (PPWSA) was unlike a typical water utility in Asia and this was not because it had service efficiency, greater water productivity or increased consumer base. Other water utilities in the region also had some of these traits at one time or another. PPWSA was different because it achieved all these by radically transforming a decrepit and war-torn water supply system with missing water and water customers, into a model public sector water utility that provided drinking water round the clock to all of the one million inhabitants of Phnom Penh with an efficient and effective pro-poor governance. The radical transformation was due to the dynamic leadership of a young engineer who initiated the culture of change within the organization by education and motivation, followed by a flurry of reforms. With the assistance of ADB and through internal reforms, PPWSA transformed itself into an efficient, self-financed, autonomous organisation in the city and an outstanding public utility in the region.

Background

Cambodia's 20-year civil war and the Khmer Rouge rule destroyed much of Phnom Penh's buildings and infrastructure. The water supply system was totally deteriorated with the century-old pipes and poor distribution network serving piped water to a quarter of the population, water losses, water theft, illegal connections, increased unaccounted-for water and inaccurate billings, etc.

Phnom Penh's water supply system capacity shrank from 55,000 m^3/day in the 1960s to 65,000 m^3/day by 1993. With century-old pipes and a poor distribution network, only a quarter of the population received piped water. The Phnom Penh Water Supply Authority (PPWSA), a Government-owned water supply utility, was having trouble in meeting the challenges. The employees were demoralised, underpaid and underqualified. Only 13% of connections had water meters, leading to inaccurate billing. Only 28% of water production was actually sold, with the collection rate not even reaching 50%. Illegal connections were prolific and unaccounted for water was at a high (72%), followed by water thefts.

Objectives

To bring reliable and safe drinking water to all the one million inhabitants of Phnom Penh for 24-hours a day.

Resources

ADB assistance and the support of the Government of Cambodia.

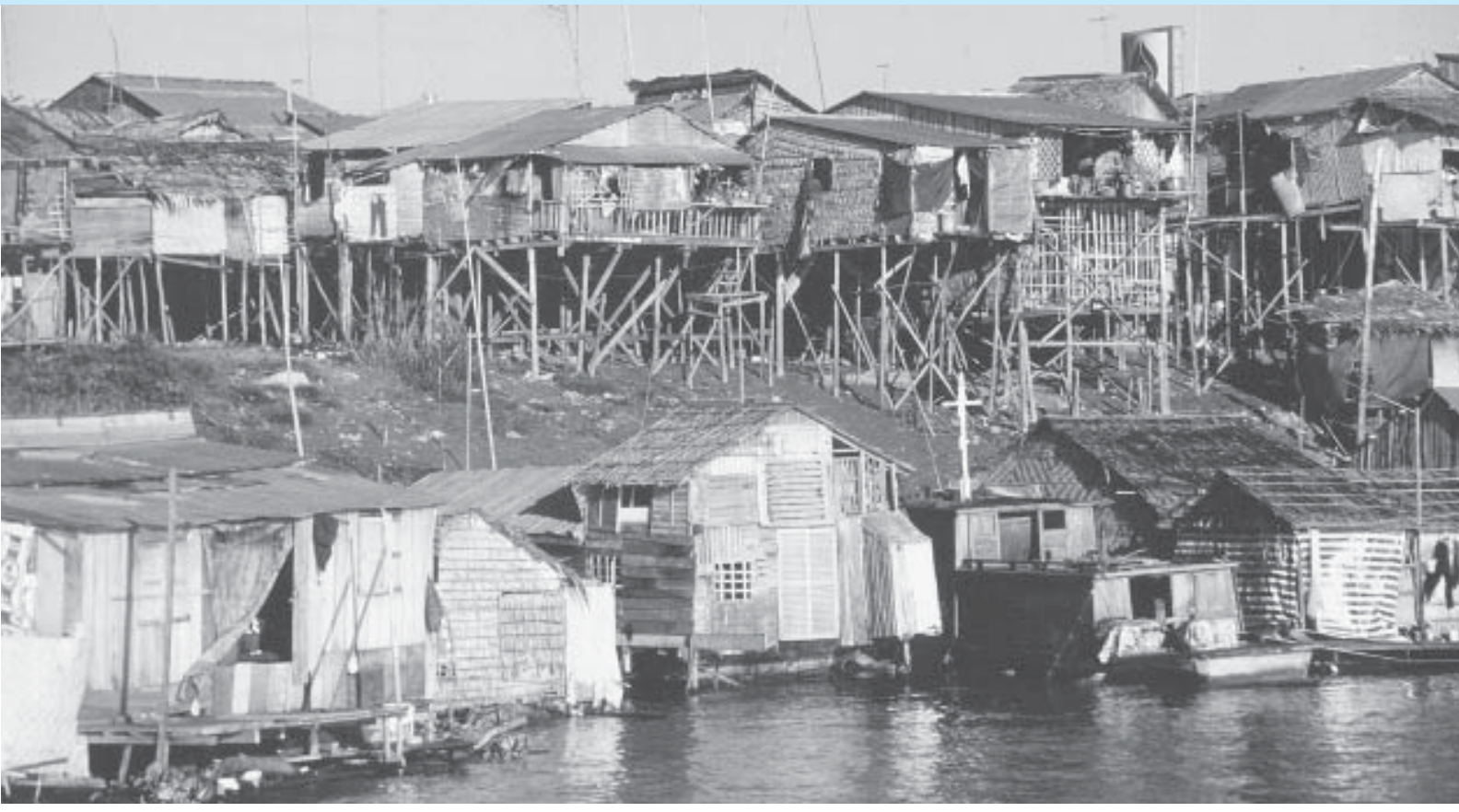
PPWSA Initiative – a culture of change

The year 1993 marked the beginning of the restoration of Phnom Penh's water infrastructure. With the assistance of external funding agencies, particularly the Asian Development Bank (ADB) and through internal reforms and dynamic leadership, PPWSA had brought out a culture of change within the organization by education and motivation.

Process

Mr. Ek Sonn Chan, a young engineer who took PPWSA's helm, initiated the "culture of change" within the organisation, starting with the education and motivation of PPWSA's staff. This was followed by a flurry of reforms, including

- **streamlining the organisation's workforce** — giving more responsibility to higher management, promoting promising staff, giving higher salary and incentives to staff, fostering the spirit of teamwork, etc.
- **improving collection levels** — installing meters for all connections, computerising the billing system, updating its consumer base, confronting high-ranking non-payers and cutting off their water supply if they refuse to pay, etc.



- ***rehabilitating the whole distribution network and treatment plants*** — hiring locals instead of international consultants for the job, manually looking for the pipes as all blueprints were destroyed during the civil war and mobilising the communities to report leaks, etc.
- ***minimising illegal connections and unaccounted-for water*** — setting up inspection teams to stop illegal connections, penalising those with illegal connections, giving incentives to the public to report illegal connections, etc.
- ***increasing water tariffs to cover maintenance and operating costs*** — proposing a 3-step increase in tariffs over 7 years, although the 3rd step did not push through anymore because revenues already covered the costs by then.

Results Achieved

Hundred percent water services to the inner city Phnom Penh was achieved and expanded to surrounding districts, with priority given to urban poor communities. PPWSA served 15,000 families in 123 urban poor communities, giving the poor extra privileges such as subsidised tariffs, connection fees, installments for connection fees, etc. Non-revenue water decreased from 72% to 8%, while bill collection was at 99.9%. Its 147,000 connections, up from 26,881 in 1993, brought reliable and safe drinking water to all of Phnom Penh's one million inhabitants 24-hours a day. Through the internal reforms, PPWSA transformed itself into an efficient, self-financed, autonomous organisation in the city and an outstanding public utility in the region.

Sustainability and Transferability

The Phnom Penh Water Supply and Drainage Project provided the opportunity for PPWSA to partner with ADB and demonstrate its capacity for catalysing water sector reforms. The project advocated the transfer of more managerial autonomy to PPWSA to enable it to use its own funds on maintenance and rehabilitation programmes. As a result, PPWSA became financially and operationally autonomous, achieved full cost recovery, and transformed into an outstanding public utility in the region.

PPWSA had established that through a transparent environment where water utilities have sufficient autonomy, where tariffs can cover costs, where services are equitable to all and where there is the active involvement of staff and civil society, clean water targets can be met. Mr. Ek Sonn Chan says, "It doesn't matter whether

PPWSA: Before and After		
Indicators	**1993**	**2006**
Staff per 1,000/Connections	22	4
Production Capacity	65,000 m^3/day	235,000 m^3/day
Non-revenue Water	72%	8%
Coverage Area	25%	90%
Total Connections	26,881	147,000
Metered Coverage	13%	100%
Supply Duration	10 hours/day	24 hours/day
Collection Ratio	48%	99.9%
Total Revenue	0.7 billion riels	34 billion riels
Financial Situation	Heavy Subsidy	Full Cost Recovery

water distribution is done by the private sector or a public agency, as long as these institutions are transparent, independent from political pressures, and accountable."

In January 2004, PPWSA was awarded ADB's Water Prize — an award conferred to exemplary project agencies that have established sound practice in implementing ADB's "Water for All" policy — for dramatically overhauling Phnom Penh's water supply system and demonstrating leadership and innovation in project financing and governance. Mr. Ek Sonn Chan received the 2006 Ramon Magsaysay Award for Government Service for his "exemplary rehabilitation of a ruined public utility, bringing safe drinking water to a million people in Cambodia's capital city."

Lessons Learned

Water doesn't have to be Free. The Local Action of Phnom Penh demonstrated that access to water does not mean that it has to be free. The urban poor were considerably better-off paying for safe, piped water than buying water of questionable quality from private vendors. For instance, Phnom Penh's unconnected residents used to pay 1,000 riels a day for water bought from private water vendors; After the transformation, they only spent about 5,000 riels per month for PPWSA-supplied water.

Cost Recovery is Vital. By developing a tariff structure where the utility fully recovers its cost of water production and transmission, the utility became financially viable and able to invest in the water infrastructure. The PPWSA reached full cost recovery in 2004 and is making modest profits.

Operator must be Autonomous. Although the PPWSA is Government-owned, it had enough autonomy to develop its own payment structure and culture with an enthusiastic and motivated staff responsive to consumer demand and efficient operations where revenues pay for infrastructure development.

Government Support is Crucial. The tariff restructuring, which paved the way for PPWSA's greater revenues, would not be possible without the support of the Government of Cambodia and its development agencies. PPWSA would also not have the freedom to innovate if the Government had not declared the utility as an autonomous body in 1986.

Civil Society must be involved. The remarkable increase in bill collection and reduction in illegal connections also highlighted the importance of involving users and civil society in a service that they want and are willing to pay for. The key was to develop a utility-customer relationship, based on long-term community building rather than short-term contractual relationships. Effective awareness campaigns also enabled PPWSA to increase tariffs with broad public support.

Investing in Staff Yields Radical Results. PPWSA takes pride in its team of people who are hardworking, responsible and self-motivated. PPWSA professionalised its workforce, building its technical capacity (each staff receives an average of 12 days of training each year) and instilling in its employees a work ethic of discipline, competence and teamwork.

Water Champion at the Helm Drives Reforms. When Mr. Ek Sonn Chan introduced the "culture of change" to PPWSA, he started the Utility on the road to recovery. With each reform that PPWSA had taken, he had been its driving force, leading his staff and the community by example.

12

JINAN, CHINA

A National Water Conserving City

The 'Sustainable Fresh Water Management' initiative in Jinan City, China was given the award of China's Best Practice in improving the living environment by UN-HABITAT in 2002. This was a unique accolade for the promotion of the city's safe water supply and preservation of water resources. This Local Action was also awarded the title of "National Water-Conserving City" to create water-conserving cities.

Background

Jinan City is located in the semi-arid plains of China. For over two decades, the people and industries of Jinan exploited the natural and abundant groundwater supply to improve their living conditions and to fuel the economic growth. Jinan's economic growth thrived on its cultural-environmental heritage as the "City of Springs" by attracting many tourists, as well as domestic and foreign investments. The overexploitation of the natural and abundant groundwater resources by people and the industries for improving the living conditions and the economic development resulted in the decline of the groundwater levels, lack of freshwater resources and reached a crisis point, by mid-1990s. Domestic and industrial water supplies became unpredictable. The water table fell dramatically, causing the natural springs to dry up intermittently. This resulted in a slowdown in tourism development and added costs for industrial production and businesses. These factors threatened the well-being of the citizens of Jinan and jeopardised prospects for long-term economic development.

Objectives and Strategies

The project and the various policy initiatives were aimed at ensuring environmental sustainability as well as sustained supply of fresh water to the residents of Jinan.

The objectives of the initiative were to:

- Ensure the treatment, recycling and reuse of wastewater;
- Manage water demand through the conservation and recycling of water resources;
- Manage water supply through the diversification of sources of water and watershed conservation;
- Enhance urban greening; and
- Improve infrastructure for reducing leakages.

In 1997, a decision to remedy this State of affairs was made in order to provide the citizens of Jinan with safe drinking water and restore the perennial flow of its springs. This was initiated with a view to preserve the unique cultural and urban environmental heritage as a 'City of Springs' which promotes tourism as well as improve the living conditions of the citizens and the economic development.

A three-pronged strategy was adopted in a participatory approach:

- Demand management through the conservation and recycling of water resources;
- Supply management through the diversification of sources of water; and
- Watershed conservation and urban greening, using new and appropriate technologies.

Mobilisation of Resources

The Project involved various stakeholders as partners including the International Bank for Reconstruction and Development (IBRD), the Australia Export Finance and Insurance Corporation, the Chinese Government and the general public in particular, and were consulted at each phase of the initiative.

The total investment required for realizing the objectives led Jinan city to embark on a multi-faceted financial package. A loan from the World Bank was used to build the Queshan reservoir, which has a capacity of 46 million cubic metres, and the Banqiao pumping station. International Bank for Reconstruction and Development contribution amounted to 17.24 per cent of the total costs during the first year. In the second year,

the figure fell to 10.86 per cent and rose again in the third year to 12.26 per cent, while there was no contribution in the fourth year. The second partner, the Export-Import Bank of China, contributed 2.84 per cent for the first year and no funding in the subsequent years. The third partner, the China Government Public Debt Section, contributed 15.69 per cent in the first year, 7.71 per cent during the second year, 30.92 per cent in the third year and 26 per cent in the final year.

A package involving a domestic loan and a loan from the Government of Australia was used to finance the building of the Yuqing Reservoir, which has a capacity of 48.5 million cubic metres and the Yuqing Water Plant, which processes 400,000 cubic metres per day. Increases in water pricing and user charges were used to service these loans, while the municipality's budget provided matching funds for water catchment improvements, urban greening and various other components of the initiative.

Process

The implementation process entailed mobilisation of all stakeholders and of the general public from the outset. Beneficiary groups were involved in all phases and stages of the project, including planning, the decision making process, and implementation; Periodical meetings, workshops and seminars were organised at each step of the design, implementation, monitoring and evaluation processes. Multi-stakeholder committees reviewed the progress made and played an active role in project supervision, quality and cost control. The Jinan Municipal Government established a solid waste management team and the Yellow River adduction project headquarters, with the Mayor as Commander-in-Chief. All Municipal Departments, including the Development Planning Bureau, the Planning Bureau, the Environmental Protection Bureau and the Water Conservancy Bureau were mobilised within this framework.

The Policies were formulated to govern and manage the supply, demand and conservation of water. These included :

- Pricing of domestic and industrial water which encouraged conservation in the uses of water and in consumption;
- Incentives for the acquisition and use of water-saving technology; and
- Strict regulation of groundwater use and the replenishment of the water table.

Results Achieved

Jinan City's water supply was augmented to 1.5 million cubic metres per day, of which 0.9 million cubic metres were derived from surface water. The springs of Jinan City were once again flowing on a regular basis. The environment was improved and the unique cultural and urban environmental heritage of the city preserved.

The initiative led to reforms in the management of utilities in the city. The new technologies, new working methods and human resources capacity building turned the Government which was earlier considered as inefficient and ineffective, into a modern, accountable and transparent operation. The adoption of new policies and legislation led to more efficient and transparent utilities management and to pricing policies, which contributed to the long-term financial sustainability of Jinan's public administration.

The partnerships with well-established institutions ensured effective management of water resources. The Policy initiatives ensured environmental sustainability as well as sustained supply of freshwater to the residents of Jinan. The establishment of institutional frameworks reinforced by the mobilisation of adequate resources in a transparent manner aided in the management of water resources and financial viability. The financing partnership adopted by the initiative assured its financial sustainability and, hence, its success.

The factors that led to the success of the project include:

- Effective legal, institutional and policy frameworks aimed at regulating the use of water, water pricing, and protection of water catchment areas;
- Public participation in all phases and aspects of the policy and decision-making process;
- The participatory process led to the adoption of a vision for a more sustainable future with social and economic advantages benefiting all;
- Extensive and well-coordinated partnership systems; and
- Meaningful involvement of the local authorities in the whole project process from the inception.

Sustainability

The factors that contributed to the sustainability of the initiative include:

- Increase in water pricing and user charges that are, in turn, used to service the loans, while the

Municipality's budget provided matching funds for water catchment improvements, urban greening and various other components of the initiative;
- The initiative's endeavour to change the pattern of water resource management in Jinan – on the water supply side, the diversification of water sources allows the City of Jinan to meet present and future demands for water without jeopardising groundwater sources, while the supply of safe water and the revival of Jinan's scenic and cultural heritage are renewing the city's economic development potential and competitiveness, especially in the tourism sector, thus contributing to long-term economic sustainability;
- The development of laws and policies regarding the regulation of the use of resources through discussions involving all stakeholders, providing a level playing field for regulating the use of resources and the application of user charges and water tariffs, and providing an enabling framework for the adoption of new technologies and production methods as well as new management systems.

Transferability

The innovative aspects of the initiative included the adoption of new technologies using geo-textiles to reduce water leakage in reservoirs. The process and principles of tackling the issue of safe and reliable freshwater by using a concerted and participatory approach to supply and demand management and watershed conservation are transferable to many cities in China, where similar problems occur.

In the formulation of the initiative, Jinan took note of other successful practices such as those implemented by the cities of Weihai and Qingdao, both of which are recognised in the UN-HABITAT Best Practices Database. In 2002, the initiative was given the award of "China's Best Practice in Improving the Living Environment". This was a unique accolade for the campaign for the city's safe water supply and preservation of its springs. It was also awarded the title of "National Water-Conserving City" in the campaign to create water-conserving cities.

These achievements drew the attention of many cities, including Kunming, Xiamen, Yantai and Weihai, which have sent delegations to learn from Jinan's experience. Jinan was invited by the China Water Supply Association and the Shandong Provincial Construction Department to share the lessons learned from its experience and to transfer the use of water leakage prevention technology.

Box 2.1: Water Conservation Conscious City, Fukuoka, Japan

Like the best practices, effective water demand management in Fukuoka was born from a crisis. Fukuoka was the first city in Japan to venture on a programme of creating Water Conservation Consciousness in partnership with the citizens and the private sector to meet the alarming water threat. The explicit and innovative measures taken to balance the supply and demand for water were an exemplary experience worthy of record.

Fukuoka is a fast developing city in Japan. Not blessed with abundant water resources and subject to serious periodic droughts, Fukuoka faced enormous challenge in securing a reliable and stable water supply for over 1.3 million citizens in the face of ever growing demand. There was a great drought in 1978, forcing the city government to curb water supply for 278 days in a year, with some parts of the city having no water supply at all – a harsh reality water situation faced in the city.

To respond to this alarming situation, the Fukuoka city, in partnership with the citizens and private sector, launched various initiatives promoting a "Water Conservation Conscious City" in 1979. Under this scheme, several innovations and measures were implemented. The need to raise water conservation consciousness among the city residents was emphasised. Water-saving apparatus were introduced and approximately 96% of users had water flow reducing devices installed in their faucets. Water savings were realised with an average family saving up to 1,000 litres per month. Water conservation consciousness amongst residents was promoted through "Save Water Campaign" held annually. Guidelines on saving water were distributed to homes and educational materials to primary schools. More than 85% of citizens were involved in some kind of efforts to conserve water.

Minimising leakage is one way of using water effectively. The Fukuoka City Water Bureau had been addressing water leakage by replacing old pipes with new ones. Through such effort, Fukuoka had the lowest water leakage rate of Japan and it was under 2.7% in 2001. The city was also actively promoting reuse of treated wastewater. Using the Wide-Area Circulation System and Individual Circulation System for large-buildings, used and treated water was utilised for flushing toilets and watering plants. The amount of water conserved by this approach was about 7,000 cubic metres a day. The City supplemented its fresh water supplies by converting seawater into freshwater, using the Reverse Permeability system, to produce 50,000 cubic metres of freshwater daily.

Other measures included an integrated water distribution monitoring system to ensure efficiency. The City had also embarked on protecting water sources through tree planting campaign. A 'Fukuoka City Forest and Water Resource Foundation' was established in 1997, financed by one yen per cubic metre surcharge shared equally by residents, business people and the city authority.

The per capita water consumption in Fukuoka City was less than what it was before in 1978, despite a 30 per cent increase in population. Fukuoka City consumes approximately 20% less water than other comparably sized cities.

13

NANJING, CHINA

A Water-saving City

With the pressure of worsening water quality and deteriorated water environment, Nanjing became a typical city lacking quality water, despite having water resources. It became necessary to choose to become a "Water-saving oriented City". Water saving not only improves the efficiency in using water resources and relieve the pressure of water supply, but it also lowers the water supply investment and decreases the wastewater discharge. The cost of water-saving is much lower compared to the cost of long-term water diversion and pollution control. Therefore, water-saving enjoys both economical and ecological benefits.

Background

Located in "abundant water" District at lower reaches of Yangtze River and surrounded by mountains, the city of Nanjing in China has an advantage of water resources. With rapid economic growth, social development, increase in population, industrialisation and urbanisation, water consumption has risen, resulting in a wider gap between water supply and demand. In April of 2006, Nanjing Municipality launched a comprehensive programme and established a Leading Group, which was responsible for organising, guiding, coordinating, supervising and examining the city-wide implementation process. The Leading Group was headed by the Deputy Mayor-in-Charge. The city Deputy Secretary-General and the Director General of Municipal Utility Bureau were appointed as the Deputy Head, and the members included the leaders of 19 Bureaus and 11 Districts. The Leading Group office is located in Municipal Utility Bureau, whose division of Water Supply and Saving Management takes care of the detailed work.

Objectives and Strategies

It is estimated that by 2010, the investments[1] by the water supply facility providers will be of the order of US$ 1/m^3 and US$ 1.3/m^3 for wastewater treatment; while it needs only US$ 0.4/m^3 for water conservation. The cost of water saving is much lower, compared to long-term water diversion and pollution control. Accordingly, it is aimed at establishing a 'Water Saving City' at provincial level in 2007, and at national level by 2008. With the application of the principles of "China Habitat Award" and "UN-HABITAT Scroll of Honor", Nanjing is expected to develop as a harmonious modern city, full of economic dynamics, cultural characteristics, quality living environment with social stability. Consequently, the city value will be elevated and the urban competitive capacity will be enhanced.

Mobilisation of Resources

The Government investment for the Programme is RMB 1 million (US$ 130,000). More than RMB 3 million (US$ 390,000) are used for the upgradation of water-saving utensils to the residents annually. The bulk users, consuming over 1 million tons, are asked to be water-saving enterprises (Entities), and regular usage rate by the industries has to be more than 75%. Water-saving technology is to be developed and popularised by joint efforts of Universities and the Scientific Research Institutions. Nearly 100 Experts and Professionals are involved from 19 Bureaus and 11 districts in Nanjing.

Focus

The Water for Asian Cities Programme was initiated by UN-HABITAT in Nanjing. The component of water conservation and demand management are being implemented and will help Nanjing to realise the objectives of building a water-saving city, which include:

- Developing the strategy of water conservation and demand management for Nanjing, and develop water-saving technology and equipment;

1. *Source: Report on the Sustainable Development Strategy of Water Resources*

- Conduct a study on policies of water protection and demand management; and
- Promoting conservation and demand management for Nanjing.

Process

A. Referring to the national as well as the provincial indicator system combining the Nanjing status quo of water-saving management, analysis has to be done to distinguish the advantages and deficiencies so that the focus on project indicators can be identified and improved. The implementation plan is to be developed and the project indicators need to be broken up to specific member Entities.

B. Different types of activities are encouraged through "Publicising Week for Water-saving", which aimed at establishing the atmosphere of building a water-saving city throughout Nanjing. Newspapers, magazines, televisions, broadcasts, websites and briefings can publicise intensively the purpose and significance of water-saving and enrich the varied approaches.

A series of activities, called "Five Once", were carried out in 2006 on the theme, "Promote water recycling and build a water-saving city" during the "Publicising Week for Water-saving", which included publicising:

- In a square once - an interactive Q & A (question and answer) was performed which was hosted jointly by Shanxi Road Square and the Life Channel of Nanjing TV;
- In a special space in Nanjing News Daily once;
- Once by dialogue between citizens and leaders of the Leading Group through live broadcast;
- Once in communities. Over 100 throwaways and surveys were dispersed and more than 30 households in communities were offered replacement of toilet fittings without any charge; and
- Once on-campus. Twenty exhibition boards and several banners were used for publicising in Nanjing University and Nanjing Normal University. Over 500 flyers and 400 surveys were dispersed.

C. The activities of "building water-saving enterprises (Entities) and Communities" are

actively promoted. Every year, the work is carried out in three stages, which include:

- Training classes for water-saving management;
- Conducting water balance test; and
- Carrying out activities for building water-saving enterprises (Entities).

Fifty-four Water-saving Enterprises (Entities) and 28 Jiangsu Provincial Water-saving Communities have been awarded.

D. Water-saving regulations are to be improved to ensure the lawful management and the virtuous development of the water-saving work. The Regulations on Water Supply and Conservation Management in Nanjing have been listed in the legislation plan in 2007 which can hopefully be issued in the second half of 2007.

E. Water conservation and demand management strategy and water-saving plan are to be developed to provide guidance and evidence for the work at different stages. "The Mid term to Long term Plan on City Water Saving in Nanjing" (2010 - 2020) (including the Plan for irregular Water Resource Use) has been worked out, which diagnoses the current situation and puts forward the objectives and the implementing measures. The Plan has passed the expert examination and the approval of the Municipality.

F. The rationing of water use is to be amended to meet the requirement of gradual transition from planned management to ration management.

G. The water-saving document related to "three simultaneities" is to be perfected to regulate the management. Integrating the practical conditions of Nanjing, "Notice on Printing and Distributing Rules of water-saving "three simultaneities in Nanjing" was issued by the Municipal Public Bureau, Construction Commission and Environmental Protection Bureau of Nanjing, which prescribes specifically the evidence, objectives, management agencies and requirements for "three simultaneities".

H. The investigation and study on reclaimed wastewater reuse and rainwater harvesting is to be conducted.

I. Water-saving management is to be enhanced and basic data and statistics are to be improved.

Results Achieved

- For Water consumption per RMB 10,000 (US$ 1,300), Gross Local Products Value was 31.71m^3 and Industrial Value-added was 39.65 m^3.
- The water volume index of 6 industrial districts has reached national standard.
- The rate of repeatedly used water by industries reached 77.40%.
- The water use proportion by water-saving enterprises (Entities) was 43%.
- The leakage rate of urban water pipelines was 10.39%.
- Household water consumption in cities was 102.76 litres per person per day.
- Water-saving utensils coverage reached 100%.
- Reclaimed wastewater reuse in the city was 24.01%.
- Urban wastewater treatment rate reached 91.39%.
- Collective treatment rate was 66.82% and 97.92% of industrial wastewater emission reached standards.

Progressive input of special water-saving fund accounted for over 0.1% of financial expenses and the Programme benefited approximately 4 million population.

Sustainability

Implementing the strategy of overall water-saving embodies the practice of adhering to the view of Scientific Development, it is an important act for effective utilisation of water in ensuring the quality of life for the people.

Through the process of " water saving" without decreasing the quality of life and the eco-social development capacity, comprehensive measures are adopted to reduce the loss, wastage and pollution during water use, improve the water efficiency and use of water resources scientifically as well as reasonably.

Under the concept of "Water-saving city", in the whole process, the citizens have the awareness on the benefits of water-saving by establishing integrated water-saving management systems, adopting legal, economic, administrative, technological and publicising measures to optimise the operational mechanism, which can save and protect water resources at every link of development so that the limited water resources can exert maximised eco-social benefits.

Lessons learned

Efforts should be increased to speed up the upgradation of the water-saving utensils in the old residential areas. The Entities using administrative water including government departments, public institutions, schools and hospitals should attach greater importance to the upgradation of water-saving utensils and facilities. The newly-built, rebuilt and expanded buildings must utilise the water-saving utensils. The water utensils washed out by the State must be stopped. The management of public water use should be highlighted. Urban reclaimed water-use projects should be developed. The irregular water resources such as reclaimed water should be used extensively in the sectors including construction, municipal environment, sanitation, landscape, greening, and vehicle cleaning. The momentum of upgrading water supply pipelines should be increased by setting up panic repairing centres, enhancing the statistics collection for fire-fighting, water consumption for landscaping, and lowering the leakage rate in pipelines.

Transferability

Nanjing Meishan Metallurgy Company decreased water consumption from 9 tons to 6 tons per ton steel by investing RMB 120 million (US$ 15,600) to the newly reclaimed wastewater reuse facilities, which reached advanced standards in China.

Nanjing Army Command College took the lead in establishing a wastewater treatment plant with capacity of 4,000 tons treatment per day among various army colleges in Nanjing. As a result, 50 thousand tons of water can be saved every month by reusing the reclaimed wastewater for toilet flushing, flower watering and landscape water use. The single middle-water consumption for toilet flushing is 800 tons, which can save RMB 1,000 (US$ 130) per day.

The Jiangning campus of Hehai University established the system of rainwater collection, storage and utilisation for beautifying the environment by developing flowers, grass and trees. Since the system was started in 2001, at least 100 thousand cubic metres and RMB 200,000 (US$ 26,000) have been saved annually.

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UTTARAKHAND, INDIA

Himalayan Water and Sanitation Programme

The Himalayan Water and Sanitation Programme, known as 'Himmothan Pariyojana' in Hindi, the Indian national language, was launched in 2001-02 in the hill State of Uttarakhand, to address the issues affecting the Himalayan region and its people through watershed management, water and sanitation interventions and livelihood enhancement. The approach is demand driven and need based. It involves community participation and integrates water supply, health, sanitation, source conservation and agricultural support.

Introduction

The challenges facing the central Himalayan region were severe environmental degradation, migration, meagre land holdings and heavy workload for women. The status of drinking water supply was very poor with 48% of habitations either partially covered or not covered. Usage of toilets was about 26% resulting in water-borne diseases.

In the 1990s, the Government initiated community-led water scheme called Swajal through Non-governmental Organisations (NGOs). With the successful experience gained through this scheme, Himalayan Institute Hospital Trust (HIHT) sought to continue this initiative incorporating further activity to strengthen areas like Natural Resource Management and livelihood option. Accordingly, HIHT approached Sir Ratan Tata Trust to carry out this Himmothan Pariyojana which was a huge success in its first phase and the second phase is going on.

Objectives and Strategies

The project 'Himmothan Pariyojana' focuses on water supply, sanitation services, livelihood enhancement, protection of catchment area, enhanced access to information and knowledge, women empowerment, sustainable local governance and achievement of "Open Defecation Free" status. The objective is to deliver sustainable health and hygiene benefits through improvement in Water Supply and Environmental Sanitation Services.

Mobilisation of Resources

The financial resources for the project's first phase were granted by a private funder. The investment for the 12 villages in first Phase was to the tune of Rs. 31.452 million. In the second phase, the same funding agency brought in additional grants from another agency to carry out the project in 20 villages. Community contributed 10% of the cost either in cash or kind.

Process

The Project was carried out in 42 months over four phases, viz, Preplanning (six months), Planning (twelve months), Implementation (twelve months) and Operation & Maintenance (twelve months). Plans were made and implemented in the areas of:

- Water Supply Scheme;
- Sanitation (Latrines, Organic Compost Pits, Grass Patch and Poly Houses);
- Catchment Area Protection (CAP);
- Hygiene and Sanitation Awareness;
- Livelihood Enhancement and Women Empowerment Interventions;
- Information and Knowledge-sharing;
- Cash and Labour Contribution;
- Community Monitoring & Evaluation; and
- Operation and Maintenance.

All technical criteria of State and Central water and sanitation (WATSAN) agencies have been followed for implementation of the schemes. A mix team of software and hardware human resources has been used including social scientists and technical staff.

Problems Encountered

- The pre-feasibility task is very critical and needs sufficient time, as resources get wasted in case of wrong selection;
- Demand-driven mobilisation consumes lot of energy, patience and time;
- Timely Collection of community contributions was a challenge;

- Demand generation of individual sanitary items, procurement of materials and motivating the community to construct as per design and technical norms was a challenge;
- Community conflicts set hurdles in the implementation of project activities, which were tackled by the User Committee/Gram Pradhan (Village Head), etc;
- Instilling ownership in the community with regard to Operation and Maintenance (O&M) was also a challenge as they have to take care of issues like tariff fixation, village maintenance worker selection and training, documentation, etc.

Results Achieved and Sustainability

The first phase of Himmothan project for 12 villages was completed in 2006 and the second phase is under way in 20 villages. The community participatory WATSAN projects were viewed with the following five aspects of sustainability. All these five aspects were pursued quantitatively as well as qualitatively.

Technical benefits:

- Time saved per family is 2.94 hours/ day;Technical benefits:
- Water availability increased from 12.75 Lpcd to 69.3 Lpcd;
- Coverage of household sanitary latrines increased from 5.5 to 59%;
- 532 compost pits, 428 garbage pits, 284 soak pits, 210 grass patch and 26 poly houses were made accessible to the communities;
- All the 829 households (population 4,921) have access to disinfected, clear water within 50 m horizontal and 15 m vertical distance from their residences;
- Regular disinfection, by adding bleaching powder solution in the chlorinator and residual chlorine, was being tested by the community; and
- All the water supply schemes are functional and the communities are satisfied with the technical efficiency of the schemes.

Financial:

The communities contributed 10% of the Direct Technical Report (DTR) cost in either cash or labour as their share of the Capital cost. Total community contribution in hardware items including individual items have come to 24%. The communities, in village level meeting, carried out tariff fixation and downtime exercise to fix tariff, which in most of the villages has come to more than that estimated in the DTR. Communities insure the schemes on a yearly basis and have deposited enough money to renew the insurance for nearly next ten years.

Institutional:
The village committees meet regularly (with almost 75% attendance), collect money and deposit in the bank (381 members have a saving of Rs. 4, 62,836 and are conducting inter loaning to the tune of Rs. 7, 84,000). Out of these, 24 members have already been linked to the bank and all of them have started income-generating (IG) activities. A total incentive of Rs. 3, 50, 000 have been provided to 26 Self-help Groups (SHGs).

A Himmothan Federation has been formed by all the twelve village committees (which meets quarterly) to act as an umbrella organization to help them carry out the Operation & Maintenance activities after the exit of HIHT.

Environmental:
The physical environment of the villages had improved drastically with the construction and proper usage of 532 compost pits, taking care of the bio-degradable waste and 428 garbage pits to dump the non-biodegradable waste. 284 soak pits were constructed for waste water disposal. 488 latrines were being used as against 12 latrines before the project. Out of the 12 communities, 5 of them have already become “Open Defecation Free”. Only 2 sources tapped out of 30, had decreased to level between Safe Yield and Design discharge. This case should be taken in the light that all the Catchment Area Protection (CAP) works will only come into effect slowly within the next 3-4 years as the sapling

planted (23,400) will mature to become plants and recharge the depleted aquifers. This is a gradual process producing discernible results over a long time unlike any other activity included in the project.

Social:

All the communities had taken ownership of the scheme. They realise the implications of water quality on their health and regularly carry out preventive maintenance, regular disinfection, and residual chlorine testing and adopting proper water management practices. Their awareness level had increased regarding all aspects of the project in particular, and life in general. Women had enhanced their position in the social hierarchy by participating in Income generation activities, earning money, demanding to participate even more in the day-to-day decision making within the family as well as among the community.

Lessons Learned and Transferability

It has been a great experience to work with so many stakeholders and implementing the project with demand-driven and community participatory approaches. This has proved beyond an iota of doubt that this HIMMOTHAN initiative is highly successful in attaining the goals, benefits visualised at the start of the project and has tremendous scope for replication and all the stakeholders are ready for scaling up.

Few learning events and achievements are summarised below:

- Sense of ownership has been evolved in the Community which ensures proper O&M and sustainability of the schemes.
- Awareness on health & hygiene aspect has been increased in all spheres of life whether personal, domestic or environmental.
- Village level Institutions are sustainable. Institutional structure of the project provides more attention to user community and ultimately project benefits are being better realised by the Community. It has found that this system provides better workmanship and quality of construction due to work management by Community.
- Community is ready to pay if they are involved in decision making which also helped in local hurdle resolving.
- Women involvement in decision-making process improves the quality of decision.
- Private Trust – NGO – Community partnership works.
- Demand-driven approach is the sustainable approach rather than top-down approach.
- Ensuring maximisation of health benefits on a sustainable basis, integrated approach towards Water Supply, Sanitation, Health & Hygiene awareness, Catchment Area Protection and Agricultural Support activities.
- Partnership with the Government is essential and there is need for a learning alliance (all stakeholders come to a common platform and share their skills and experiences).
- Trust can help in innovations, action research and knowledge development on which Government can scale-up. The objective is to complement Government systems rather than to duplicate efforts.

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TAMIL NADU, INDIA

Democratisation of Water Governance

In response to the acute water crisis in Tamil Nadu (a State in South India), the Tamil Nadu Water Supply and Drainage Board (TWAD Board) embarked upon a change process in the year 2003, based on serious introspection of the nature of its governance, its roles and relations with the community along with the willingness of individual engineers in the organisation to critically re-examine their perspectives, attitudes and values.

A 'Democratisation-led' change process was initiated to bring about attitudinal transformation among individuals and in the organization, how it relates to the citizen and stakeholders. The first transformation was in the form of the "Maraimalai Nagar Declaration". The principles set therein led to the optimum usage of resources and responsive governance leading to improved and better service delivery. The consequent internal dialogue within the organisation around the declaration led to the formulation of a bottom up vision of *"Secure Water for all, forever"* and to implement it "Change Management Group" (CMG) comprising volunteer engineers, who were formed at the State and District levels. This vision was implemented across the State in 752 villages and hamlets as a project called Total Community Water Management (TCWM), voluntarily, undertaken by the engineers with the concept of conservation and community management to *Reach the Unreached*. The success of this change process now finds echoes in the formation of the National Change Management Forum, the first Water Operators Partnership in India.

Background

Overexploitation and droughts have reduced the annual per capita availability of fresh water in Tamil Nadu to 840m^3. Out of the 385 Blocks in the State, only 288 were declared overexploited. The technocratic approach of seeking higher technologies and investment failed to tackle the challenge of providing sustainable water systems. This situation warranted deep introspection. The grim situation led the State Public water utility TWAD Board and its Engineers to review their existing perspectives, roles and approaches in a self-critical and open process and the following priorities emerged:

i) Attitudinal Change and Institutional transformation,
ii) Conservation of resource and revival of traditional water bodies, and
iii) Sustainable and Equitable water supply in partnership with the community

Objectives and Strategies

The major objectives of the initiative are:
(i) Community Water Governance,
(ii) Reach the Unreached, and
(iii) Transform the Organisation into a public responsive one.

Strategically, the change process was structured around interventions at three levels:

1) *Workshop: Space for exploration:-* Where engineers could honestly and critically examine, explore and debate on issues.
2) *Village/Community: Site for experimenting with learning:-* Where engineers forge new relationships based on democratic functioning and dignity.
3) *Workplace: Sphere for internalising learning into formal systems:-* The work area where changed values, norms and visions of functioning can be mainstreamed.

Mobilisation of Resources

The native wisdom and social capital *of* the community were important resources for the mission played a large part in the success *of* the mission. The financial support for organising the workshops was provided by UNICEF with the State Government providing the capital investment *of* US$ *5* million for schemes. The most important dimension was the Human Resource *of* about *300* TWAD Engineers (CMG) from all cadres who were involved as the technical and social engineers.

Process

At the end of 2003, the TWAD Officials decided that the only way forward was not to regurgitate old solutions but to start afresh: by going back to ask fundamental questions about the need and relevance *of* the public utilities, the values and vision it should embody, distortions and omissions in practice, and the shape *of* future direction *of* efforts *to* achieve it's true role and mandate.

Challenges: The critical challenge was to achieve development with dignity through a transparent and accountable organization, which could provide sustainable and equitable service.

Change processes: Intervention design

This challenge *could* be met only by bringing about significant change through intervention in three broad areas:

i) **Attitudinal Transformation** amongst individuals, Organisation & Stakeholders,
ii) **Perspective Changes** *to* differentiate between efficiency and effectiveness, provision and partnership
iii) **Institutional Transformation** *to* create an organization culture *of* democracy and sensitivity.

Results Achieved

The Democratisation of Water Management Project was taken up in over 143 Village local-self governments comprising around 752 villages involving about a million people. This voluntary project was able to transform the utilities and create new Paradigm of governance.

Institutional Transformation:-
Maraimalai Nagar Declaration: In August *2004,* the first major breakthrough was the evolution and adoption *of* the Maraimalainagar Declaration, exhorting all *to* adopt traditional wisdom and cost-effective solutions across the organization.

Formation of Change Management Group (CMG) as a Voluntary forum: The CMG was initiated by its 43 core members voluntarily, as the conscience keepers *of* the change process, coming from a cross-section of the engineering community which then got to evolving a collaborative vision.

Evolving a new Vision: The seven-point vision **"Secure water for all, forever"** clearly went beyond the realms *of* what a water engineer would generally be engaged in. For the first time, the Engineers saw their role as guardians *of* not just water resources, but of nature itself.

A New Paradigm of Water Governance:- The endeavour of the Project was to establish a new paradigm in how institutions and governance systems should go about tackling the water crisis and the task *of* achieving the MDGs. The 3-year journey as evaluated by UNICEF has recorded many shifts from the traditional ossified technocratic approaches.

Shift I: Transforming the Core Principle of Functioning:- The adoption of the 'Maraimalai Nagar Declaration' led engineers to move away from the unquenched thirst for investment. Instead, they relied on rehabilitation of existing water assets in 47% of villages, revival of traditional sources and aimed to increase coverage by 10% within the same budget. This innovative step forward resulted in savings up to 33% *of* the annual budget allocation.

Shift 2: Finding more cost-effective solutions:- One of the significant impacts is the reduction in the capital cost per household by 60% (from US$100 to US$40) in the project villages. The cost per household is less than US$25 in 41% of schemes.

Shift 3: Community Partnerships:- Around 500 Village Water and Sanitation Committees (VWSC) were formed involving citizens from all strata of society. The VWSC made water plans and took decisions on the management of water resources. As a measure of its involvement, over 56,000

households have contributed $0.4 million to implement water supply or recharge schemes in 143 local self-governments (Village Panchayats). There was better targeting with about 65% of the schemes implemented in villages with more than 50% of the population below the poverty line.

Sustainability

Sustainability of the approach was based on the tripod of Resource Conservation, Financial Prudence and Social Justice. Under **Resource Conservation,** micro level Water balance was carried out in all the 143 village panchayats and shared with the community. The new understanding enthused the community to participate in the physical implementation of the ***Total Community Water Management (TCWM)*** voluntary programme wherein 45 ground water recharge schemes and mass afforestation by planting 20,000 trees were taken up. In all the project villages, special Grama Sabhas were convened for community action to take up cleaning and revival of traditional water bodies and tanks with safe wastewater disposal and solid waste segregation. The enlightened desire of preserving nature became the new mantra (strategy).

On the **Financial sustainability** front, there was focus on adoption of appropriate technology, pumping regulation and wastage reduction and had a major impact in reducing expenditure and preserving the source. In monetary terms, the 0&M expenditure in Project Villages fell by 46% (to US$270 per month) and the Revenue improved by 54% (to US$105).

On the **Social Justice (Reaching the Unreached) -plank,** a UNICEF Evaluation Study "Impact of Change Management in TWAD" found a 200% improvement in the satisfaction level of the community in comparison to the Control group of villages.

The most important finding of the Impact Assessment study relates to 'Reaching the Unreached'. 76 percent of women respondents reported that the water engineers visited the village regularly, met and interacted with them. 84 percent reported that the engineer behaved as a community member; and 61 percent reported that all this led to joint identification

and actual implementation of solutions. About 78 percent of the Dalits (Disadvantaged) in the project villages reported that the water engineer was regularly visiting the Dalit habitations; 80 per cent said that the engineer provided them the space and encouraged them to talk and participate in village meetings; and 57 per cent reported that action was initiated on solutions jointly identified by them for problems of water supply.

Lessons Learned

At the end of three years several issues are clear. Future interventions seeking to address the water crisis cannot and should not follow the time worn, stereotyped way of seeking and pumping in new

investments of money and technology while continuing to ignore the more pressing issue of reforming water governance. Greater transparency, openness and democratic functioning has the potential of providing a voice to the voiceless and involving them in the development gains. The work in Tamil Nadu shows that investing in governance reform is so productive. Then again, when solutions are sought to be found from within — be it within the culture and practice of the water utility, or from within the traditional and cultural practices of communities, new bonds of relating are forged.

Expanding Horizons

Water Operators Partnership

The full importance of the *TWAD* Democratisation experiment can be gauged by the transferability of the concept. In fact, that TWAD-CMG engineers worked on invitation with two other Indian State Government level water utilities, viz. the Maharashtra Jeevan Prathikaran and the Jharkhand State Water Department to initiate similar change interventions in their States. In August 2006, the Government of India and UNICEF adopted the TWAD experience at the National level This resulted in the formation of a **National Level Change Management Forum** to pioneer such water reforms in other State utilities.

The Democratisation of Water Management concept has found resonance in other sectors as in the World Bank-assisted Tamil Nadu Water Resources Management Project. It has been adopted as part of the project design and as a first step, a workshop was conducted by the *TWAD* CMG for the minor irrigation Departments in 2007.

There have also been interests from water utilities of other countries in South America and Egypt seeking to collaborate with the Change Management Group of the *TWAD* Board.

It is only through such attempts at transformation through Democratisation one can ensure that ‘there is water for the future generations’.

16

IRAN

Aquifer Management: A Green Path to Sustainable Development of Marginal Dry Lands

The Government of the Islamic Republic of Iran adopted Aquifer Management as a programme for harvesting the flood waters to control desertification, supply of irrigation water and provide employment opportunities.

Introduction

Iran, with a population of 68.9 million and per capita income of US$ 1,720, covers an area of 636,296 sq. miles. Oil exports account for around 80% of foreign exchange earnings as well as non-oil exports such as carpets. The Gareh Bygone Plain, a 6,000-hectare sandy desert in southern Iran, annually receives 150 mm of rain as opposed to 2,860 mm of pan evaporation. Freshwater scarcity, poor rangeland, and dust storms had caused migration of some nomads-turned-farmers from the Gareh Bygone Plain. Women and children had to walk up to 6 km a day to fetch water resulting in back pain, miscarriages for the women and lower school attendance for the children.

The politically expedient and economically disastrous sedentarisation of nomads in the Gareh Bygone Plain had wreaked havoc on the environment. Application of inappropriate technologies, mainly moldboard plows and pumps, in an area facing recurrent droughts, had desertified a scrubland, and made refugees out of the once prosperous nomads.

Objectives and Strategies

The initiative addresses the vicious cycle of poverty–ignorance — desertification, and drought/flood affecting the nomads in the Gareh Bygone Plains by breaking the interfacing. The main objective of the initiative was desertification control through floodwater spreading for the artificial recharge of groundwater. Other objectives include planting of shade trees and fodder bushes as live windbreaks; deposition of the suspended load onto the moving sand; and provision of fuelwood which would discourage people from cutting trees and removing bushes on the watersheds, thus helping soil and water conservation. All of these activities, along with hiring of labourers and watchmen, would reverse the tide of migration.

Process

The programmes of reforestation, community education and mobilisation were introduced. A collaboration of the central government, local authority, parastatals, non-governmental organisations, community-based organisations and academic institutions provided knowledge, resources and technology.

Results Achieved

The artificial recharge of groundwater (ARG) rehabilitated 1365-ha of the plain and increased the irrigated farm field area 8-fold to 1193-ha during the 1983-1987 period. The recharged water provided 250 occupations for the owner-operators and 95 positions for the hired labourers. Moreover, extra employment has been provided due to the annual production of 10 tons of honey.

The average annual forage yield increased 5-fold to 445 kg/ha. Deposition of fine-grained sediments in the systems converted a loamy sand into sandy loam-loam, suitable for growing small grains. The establishment of 89-ha of river red gum forest and erection of 30-km of windbreaks of eucalyptus and acacias, stabilised the moving sands and ameliorated the climate. The stem and fuel wood yield of river red gum at the age of 18 was 4,701 and 813 kg/ha/yr, respectively. The above ground carbon sequestration of the same trees was 2221 kg/ha/yr and, therefore, the trees annually filter 220 tons of carbon out of the atmosphere. The flooding caused damages and fatalities were eliminated. Disregarding the intangible benefits, and assuming the beneficial life of the systems to be 20 years, the cost-benefit ratio for this project has been 1:22. Capacity building was achieved through holding seminars and field trips for students, professors, teachers, technicians, policy makers, and publishing in scientific journals.

Sustainability

Floodwater spreading transformed the desert into verdant scenery. Some of the tangible benefits were instrumental in reversing the migration towards the Gareh Bygone Plain. Results showed that 8 million cubic metres of floodwater provided ample freshwater, fuel wood, and employment opportunities, and reduced work burden on women and children. The success led to a government policy adopting aquifer management as a programme and allocated annual budget. It demonstrated the potential of annually harvesting 50 cubic kms of floodwaters could control desertification on 14 million hectares, supply irrigation water for 6 million hectares and provide jobs for 4 million people.

17

KIRIBATI

Integrated Sanitation, Public Health and Environment Improvement

The Integrated Sanitation, Public Health and Environment Improvement Project was initiated for the thirsty Atoll of Kiribati to strengthen the health and well being of the people. The Project provided a sustained programme of improvements in water supply, sanitation services, solid waste disposal, and environmental conservation.

Background

The Republic of Kiribati is one of the most isolated countries in the Central Pacific. Located mostly along the dry belt of the equatorial climate zone, the island chain has exceedingly limited sources of freshwater, which are extremely vulnerable to contamination and are served by highly deficient infrastructure. The country is no more than a series of low-lying coral islands and atolls, which form a narrow strip of habitable land consisting of mostly infertile coral sand soils.

The habitable land is seldom more than a few metres above the high water mark and is bound on the outside by fringing reefs and on the inside by lagoons. Consequently, Kiribati is vulnerable to severe weather, and even high waves can cause damage, as many of the atolls do not exceed 4-5 metres above sea level.

As demand for adequate water supply and sanitation services has increased along with the population, the capacity of the existing systems was unduly stretched, causing significant degradation of the environment. Water supply for atolls consist of fragile freshwater "lenses", pockets of freshwater that float on the underlying seawater that permeates through the coral structure. Atolls also typically suffer from prolonged dry periods, especially during the El Nino and La Nina climatic events. The rate of water extraction from the lenses and the rate of natural replenishment from rainfall were, therefore, finely balanced.

The lenses provide the main source of freshwater, and collected rainwater provides the rest. When population pressures mount, as in South Tarawa, the stability and sustainability of the lens was threatened and water became a scarce resource. In areas of high population density, the lenses were also susceptible to pollution from sewage and other contaminants. The management of Kiribati's freshwater resources was poor, both on the supply and demand side. What was delivered to consumers was substandard in both quantity and quality. Water-borne and water-related diseases were a major public health hazard, with diarrhoeal diseases ranked as the third highest cause of illness.

A centralised water system pumps water from the remaining uncontaminated lenses at the northern end of South Tarawa. Increasing population pressure created a serious threat to even these remaining water supply sources, and consequently to the basic health of the population and its social stability. The government-run piped water supply system only served about 70% of South Tarawa's total population in 1997/98. No system of regular maintenance existed, allowing unmeasured amounts of water to be lost through leaky pipes in the transmission system. The sewerage system only served about 38% of the 3,520 households. Sewerage drainage ditches were shallow, generally in disrepair, and ineffective in preventing discharge from returning to the coast. Sewer pipes were 90% blocked by sand and sediment because of neglect and poor maintenance.

The Project

An integrated Sanitation, Public Health, and Environment Improvement Project was initiated for thirsty Atoll with the technical assistance (TA) grants, designed by the Asian Development Bank (ADB) to improve the water and sanitation sector, with focus on health and environmental issues.

Objectives

The objective of the Project was to improve the health and well-being of the people of Kiribati by providing a sustained programme of improvements in water supply, sanitation services, solid waste disposal and environmental conservation.

Scope

Approved in December 1998, the project was implemented through 2003. It was concentrated in the most populated areas of Kiribati, primarily South Tarawa and selected areas of North Tarawa for improving the quality and availability of safe drinking water; rehabilitating and expanding the sewerage and sanitation systems; implementation of institutional reforms throughout the Public Utilities Board (PUB), and promote hygiene and sanitation through better solid waste management.

Resources

ADB provided a loan of US$10.2 million for the project for:

- Upgrading the water supply system;
- Solid waste management landfills and environmental conservation;
- Institutional development, consulting services, and project implementation support;
- Upgrading sanitation and sewerage systems;
- Housing loans and the supply of plant and equipment for solid waste management refills; and
- A water pilot study.

Process

The Ministry of Finance and Economic Planning was the executing agency for the Project. A committee was established on the islands of Bonriki and Buota to create a cooperative partnership arrangement between the Government and community groups to address land issues involved in the maintenance of reserve areas around each of the islands' water lenses. Population density was so high (2,300/km^2) in South Tarawa that the urban development had begun to encroach upon protected water reserves, where the water lenses were replenished. Some of the lenses that previously supplied public needs in South Tarawa were so polluted that they were no longer safe.

To protect the lenses, the management of the Water Reserves Committee established 50-metre "setback zones" around each of the water reserves, marked by the construction of a boundary road. These zones were designated as protected, and informal dwellers living inside the 50-metre area were asked to relocate voluntarily. While most of them did so, a few were unable to find alternative vacant land. In addition, new migrants arriving from the outer islands were also putting pressure on available open land areas within the protected zones.

TA grants were provided for training and educating the community to improve its long-term ownership and participation in the sector. Non-governmental organisations (NGOs) and community-based organisations (CBOs) such as women's and church groups and cooperatives were included in sanitation and conservation activities to promote hygiene and public sanitation. Community development and training programmes include topics such as the water cycle, water and wastewater management, gardening with wastewater products, do-it-yourself well and latrine construction. These workshops were held for community groups, schools, women's groups, and local governments.

The staff of government agencies and NGOs, teachers, and community leaders were trained in better water handling, sanitation, and waste management practices. Community members were benefited from educational and promotional materials such as posters, flip charts, manuals, calendars, stamps, videos, and theatre plays.

This assistance was designed to maximise the benefits of the project by ensuring that:

- Water users understand the water cycle and its importance;
- Providing environmentally sound assistance to anyone wishing to make improvements in wells, rainwater tanks, water purification systems, waste management systems, or latrines; and
- Creating the necessary institutional arrangements to sustain these community development and participation initiatives.

Another TA grant was given to the PUB to improve their efficiency through institutional restructuring. A programme for restructuring the PUB was carried out and advisory support was provided to improve the administration, management, operation,

finance, accounting, and maintenance work of the PUB. A human resource development programme was prepared and implemented for PUB management and staff, including training in the use of a computerised accounting and financial management system. Reviews and restructuring were carried out on organisational, training, and salary matters. Consequently, the collection of outstanding debts was improved — in some cases resulting from cutting off power to non-paying consumers — and the number of permanent staff appointments to the board were increased, while temporary board positions declined.

Cultural issues were among the more challenging obstacles to project implementation, mainly because of the extremely cautious nature of Kiribati society, which promotes equality, expects people to be modest and humble, and frowns on self-promotion. This created some difficulty for the restructuring of the PUB and the resettlement of squatter communities living within the water reserve areas. Government employees in charge of resettlement and restructuring issues feared of being viewed as standing out by acting too aggressively or placing themselves above others.

Reform of the PUB was slow, partly because of past inefficiencies. The poor quality of the water supplied earlier led many people to refuse to pay for service, even to the extent of damaging or destroying their water metres. Such actions did not result in interruption of water supply to those households, because of the same culture of caution and equality that led to the PUB's reputation for not following up accounts in arrears. In addition, the confirmation of staffing positions was slow because of the reluctance to make anyone redundant or move staff among departments. New tariffs on water and sewerage were approved, but slow in implementation.

Results Achieved

Although community awareness about environmental issues was thought to have increased as a result of the programme, it took longer than expected for people to incorporate the lessons into their way of life. By mid-2003, the Bonriki water reserve cleared all settlers, except a few households awaiting vacant land nearby, and in the Buota reserve area many people vacated the 50-meter setback zone. However, the stream of migrants from outer islands moving to Tarawa continued to pressure the available land at the cleared reserves. The government committee that was established to manage the water reserves was reasonably effective in resettling the squatters, but progress remained slow, as there was little available land elsewhere.

While there were some delays in the initial recruitment and approval of consultants, the physical construction side of the project (the rehabilitation and expansion of water supply, sewerage, sanitation systems, the construction of rainwater tanks and latrines) was progressed as planned.

The public awareness increased and there was a positive community response to the project. The pilot water project that involved three villages was very well received when it provided the people with a constant 24-hour water supply. The project as a whole achieved the positive outcome.

Lessons Learned

The project experience provided the following lessons learned:

Loan conditions and understandings need to be compatible with the local culture and its values. Cultural sensitivities were not always fully understood. Allowing more time for personal discussions, negotiations, restructuring at the beginning of the project may have minimised delays.

Demographic patterns must be carefully observed. Tarawa's high migrant population made it difficult to keep water reserves clear of informal dwellers although a relocation site was identified, as new migrants from outer islands continue to arrive daily and tend to occupy vacant areas. This migrant population was to be taken into account and a programme of formal resettlement needed to be investigated.

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AHMADI, KUWAIT

Environmental Waste Management System

The Local Action presents an effective and profitable waste management system in an economic way for providing a healthy environment in Ahmadi Town, situated near Kuwait Oil Company.

Background

Kuwait, with a population of 2.5 million and a per capita income of US$ 18,000, produces approximately 2,200 tons of waste per day — an average of 1.3 kg. per person. This was initially dealt with by burying the waste into an abandoned quarry, causing land and air pollution. The amount of waste produced was on rise as a result of population growth in Ahmadi Town (about 25,000 population) located near the Kuwait Oil Company.

Waste Management Initiative

In response to this prevailing situation, in 1995 the Oil Company entered into a contract at the cost of US$ 5 million for a period of 4 years to collect and transport approximately 35–40 tons of daily waste from various locations including plantations, restaurants, residential areas, offices and roads.

Objectives

The main objective of the initiative was to have an effective and profitable waste management operation by raising awareness on environment issues and the impact of domestic waste on the environment, and establishing a system to increase the amount of raw material produced from recycling.

Resources and Process

The main source of funding came from Kuwait Oil Company and human resources were mobilised at the household level. One of the challenges of the initiative was collecting and sorting all kinds of waste dumped together as the concept of waste separation was unknown. Through aggressive campaigns, advertisements, training, and development of alternative collection methods, residents were made to understand the importance of waste management.

Results Achieved

Since the start of the initiative, the amount of waste reduced by 80% in Ahmadi Township. Introducing the concept of waste recycling and separation of waste in the garbage collection, the contract saved a total of US$ 1 million. Pollution was reduced as a result of recycling a total of 19,048 tons of waste. Recycling also provided raw materials such as paper, plastic, metal, carton and glass for local and foreign industries. The compost from recycling organic waste was used to enhance and upgrade the soil quality in Kuwait in support of the company's policy to plant 1 million trees in the oil field to reduce air pollution.

Sustainability and Transferability

The initiative had taken into consideration the social, economic, environmental and cultural conditions and developed methods accepted by the Society. It educated the company staff, their families and society in general on the dangers of domestic waste pollution and the need to reduce waste. Various schools participated in recycling and clean-up projects. Their efforts were recognised and received awards from the Kuwaiti Government. The concept of recycling the waste for the healthy environment for the present as well as the future generation was emphasised and had been the key instrument in the success of the initiative.

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KYRGYZ REPUBLIC

Water - A Cooperation Tool for Resource-sharing

The Kyrgyz Republic has abundant water resources, which it shares free of charge with Uzbekistan, Kazakhstan and Tajikistan for the irrigation of agricultural land. Uzbekistan is one of the world's largest natural gas producers and a major oil source for many countries. The Kyrgyz Republic does not have oil and gas reserves. It is one of Uzbekistan's biggest customers, with an annual average gas consumption of 850 million cubic metres. The Kyrgyz Republic pays cash for 50 per cent of the gas it imports. The rest is paid "in kind" with the Republic's abundant commodity, Water.

The Government of Uzbekistan announced plans to increase gas prices. This had a direct impact on the Kyrgyz Republic's energy sector. The impending price hike prompted Kyrgyz Parliamentarians to debate the issue of water taxation for their neighbour.

To tax or not to tax — this is the question that Kyrgyz Republic parliamentarians are mulling over about Uzbekistan's use of their country's water resources. Kyrgyz officials are divided about the plans to turn water into an income-generating resource. Kyrgyz farmers who pay for water consumption are of the view of that they should not have to pay since the Uzbek neighbours do not pay for the water they take from them. Water has been a tool of cooperation for resource sharing between the Kyrgyz Republic and Uzbekistan. The Governments and the communities can therefore join hands in addressing the water challenges.

Background

The young Kyrgyz Republic in Central Asia has a vibrant water resource that provides safe drinking water to 98% of its urban population and 66% of rural areas. Two major Central Asian rivers, Amu-Darya and Syr-Darya, flow from Kyrgyz Republic to Uzbekistan.

Uzbekistan sources more than 70 percent of its water supply from the rivers of its Central Asian neighbour for its power-generating stations and agriculture fields. Experts and scientists believe that the available water will not be sufficient for the hydroelectric power stations and for the agricultural needs of Uzbekistan. There is a need to collect more water in the reservoirs.

Water-sharing arrangements

Kazakhstan, the Kyrgyz Republic, and Uzbekistan have several agreements to regulate water use. In broad terms, the Kyrgyz Republic assures water supply and electric power to Kazakhstan and Uzbekistan in the summer for irrigation purposes, while Kazakhstan and Uzbekistan provide fuel to the Kyrgyz Republic to generate hydroelectricity during the winter months. But the implementation of these agreements has not always been in order.

Implications of water-sharing

The Kyrgyz Republic makes payment to Uzbekistan for importing natural gas partly in kind with its abundant commodity, namely, Water. When the Government of Uzbekistan announced plans to increase gas prices from US$ 55 to US$ 100 per 1,000 cubic meters, the water and energy issue began brewing in Central Asia. The rise in fuel prices has direct impact on Kyrgyz energy sector and has felt the blow as the price increase to take effect from 2007. The price hike prompted Kyrgyz parliamentarians to debate on the issue of water taxation for their neighbour.

The head of the Kyrgyz Republic's Power, Mining, and Natural Resources Department is open to the idea of taxing Uzbekistan's water supply. The Institute of Water Problems and Water-Power Engineering of the Kyrgyz National Academy of Sciences determined the cost generated by the use of water in the country. Results show that water consumption amounted to about US$ 83.7 million in 2001, and is estimated to increase dramatically.

Water as a cooperation tool

Government, private lawyers and even scientists are not keen on the idea of selling water as water is nature's gift and cannot be a subject of bargaining. But, all parliamentarians of Kyrgyz agree to the fact that the country has to find funds to pay for the imported natural gas. The Deputy of Parliament suggests that "we should make payment not for water, but for the delivery of water". Kyrgyz farmers urge the Government to demand for payment of water from Uzbekistan for meeting the repairs and maintenance of water infrastructure, building water treatment facilities and water pipes in the villages. Professionals and intellectuals are keen to resolve the water-and-gas issue.

Initiatives under way

In December 2005, ADB started facilitating the project for regional water policy discussions. The new draft agreement on Syr Darya and Amudarya Basins, and on database and information exchange were developed and circulated to Central Asian countries for review by national working groups. A number of meetings of water and energy experts were held (in October 2006 in Bishkek; December 2006 in Tashkent; March 2007 in Ashgabat, and April 2007 in Tashkent), to agree on formulation of water/energy exchange under the draft agreement. As a result, revisions were made in the draft agreement and are being reviewed by the concerned Governments.

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SIDDHIPUR, NEPAL

Integrated Pro-poor WATSAN Systems

The Water for Asian Cities Programme of UN-HABITAT in Nepal in partnership with Environment and Public Health Organization (ENPHO) is providing technical and financial assistance to the Siddhipur Water and Sanitation Users Committee (WSUC) in implementing a community-based integrated water and sanitation programme, which aims to demonstrate pro-poor and sustainable water and sanitation systems by adopting a fast-track approach.

Background

Siddhipur is a traditional Newar settlement located approximately 6 km south-east of Kathmandu. It has a population of 6,046 with 1,308 households. Water, sanitation and hygiene were one of the most serious problems of this community.

The drinking water in the village was brought-in directly from the Godawari River and distributed free of cost through 52 public stand posts without any form of treatment. This water is not fit for drinking purpose because of faecal and chemical contamination. This 30 year old system did not have any water tariff and management system. Most of the water taps and the distribution network were in dire need of rehabilitation and repair.

The sanitation condition in Siddhipur was also in a very poor state of affairs. More than 60 % of the households did not have access to sanitation facilities, thus open defecation was rampant in the village. Women of the village were most affected. They were compelled to openly defecate in areas far away from the house. Women, children and adult women face severe difficulties, especially during the night, due to lack of access to sanitation. Likewise, due to haphazard disposal practices of solid waste like plastics and straw waste from traditional straw weaving business community, hygiene situation was in a bad state.

Objectives and Strategies

The main goal of the programme was to demonstrate a fast track approach to implement a community-based integrated programme on water and sanitation in Siddhipur through a pro-poor and gender-sensitive approach. The strategies and initiatives were drawn out by ENPHO under the technical and financial support of UN-HABITAT in partnership with the community.

During the initial phase of the programme, a socio-technical survey including poverty mapping of the households of Siddhipur was carried out by ENPHO in association with the local community. The findings of these results were shared in the community and the feedback was collected and incorporated in the project. To empower women in the programme, ENPHO made it mandatory to include more than 33% women members in Water and Sanitation Users Committee (WSUC) team.

Mobilisation of Resources

Out of the total budget (US$ 485,000) UN-HABITAT, WaterAid Nepal (WAN) and ENPHO mobilised 60% of the financial resources while the remaining 40% of the resources was contributed by the local community themselves. UN-HABITAT contributed US$ 250,000 while ENPHO pooled in additional US$ 37,000 through support received from WAN. Apart from the unskilled work contribution of the local community, they were also able to pool in and mobilise local government funds for different construction activities. For example, the water supply intake system was constructed by the community (US$ 6,000) by mobilising the Village Development Committee (VDC) funds. Likewise, the Overhead Tank for the water supply system was constructed through support (US$ 30,000) received from the District Development Committee (DDC) by the community.

As part of programme implementation, ENPHO, UN-HABITAT and WAN provided technical as well as financial support while the entire programme was implemented through a community-based approach using Siddhipur WSUC as the focal point of the community.

Process

To carry out the different interventions in the community, the programme facilitated and established a local Water and Sanitation Users Committee (WSUC) comprising people from different sectors. The WSUC was established through consensus of the community through several rounds of community meetings and interactions between the villagers. The WSUC consists of leaders of different political groups, representatives of traditional institutions such as *Guthis,* women representatives, local leaders and representatives of the village development committee (VDC). Out of the 11-member WSUC, more than 33% (3 persons) of the members are represented by women with one in the key post as a Vice Chairperson.

After the establishment of the WSUC, different small sub-committees were created to handle specific components of the programme. These sub-committees were headed by member of the main WSUC where specific roles and responsibilities were assigned. The responsibilities for sanitation improvement activities were especially assigned to women as they were directly associated with cleanliness and hygiene at the household level. Under the umbrella of the women representatives from the WSUC, a 15-women group also known as Sanitation and Hygiene Education (SHE) Team was established during the programme mainly to implement sanitation and solid waste management activities in Siddhipur and were provided training of trainers (TOT) on sanitation, hygiene and solid waste management (SWM) issues. Similarly to implement the Community-led Total Sanitation (CLTS) campaign, 14 sub-committees led by a SHE team member was established in different clusters of Siddhipur. Each of these CLTS sub-committees is represented by equal number of male and female members from the clusters.

Both the water supply and sanitation component were given equal footing during intervention. The traditional institutions or *Guthis* were mobilised by the WSUC to gather community support for the water supply construction activities.

The decision-making process for different interventions conducted was mainly done by the community. ENPHO's role was to facilitate and make the decision-making process easy by carrying out analysis of the problem. The main decision-making body from the community is the WSUC. In addition, the different sub-committees also assist the WSUC in the decision-making process.

The following tools were used for decision-making and planning:

- *Weekly meetings and planning*: These meetings were conducted between WSUC and ENPHO for monitoring, planning and implementation of activities. Short-term and long-term action plans were prepared in a participatory manner and implemented.
- *Focus group discussions (FGDs):* These types of discussions were done while decisions had to be made involving specific groups of people. For example, to shut down the open defecation areas used by women in Siddhipur, FGDs were carried out with only women members who were using these toilets.
- *Social Audits:* This tool was used mainly to update the community on the programme activities as well as to receive their feedbacks on programme activities.

Results Achieved

One of the major problems faced during programme implementation was to bring a rapid change in the poor sanitation practices in the community. The main challenge was to stop open defecation and haphazard solid disposal practices in the community. However, through the active involvement and mobilisation of various community groups, the problem was solved to a larger extent. By targeting the women members, the status of solid waste management was improved at the household level. The integrated programme on water and sanitation has given a new facelift to the village. There has been enormous success in Siddhipur in terms of implementing the integrated water and sanitation programme.

The villagers of Siddhipur now have the privilege of drinking WHO standard drinking water at their door step which, otherwise, was not possible. The water quality and quantity has improved after

construction of the new water supply intake, treatment and distribution system. All the construction activities were conducted under the leadership of the community. Similarly, community contribution for the water supply was overwhelming. More than 50% of the overall cost in the water supply was contributed by the community both through cash and kind. The community was successful in mobilising more than 2.4 million rupees of the local development funds from the VDC and the District Development Committee (DDC) for the programme.

The sanitation situation of Siddhipur has also improved remarkably in a short period of time through various initiatives including CLTS implemented in 14 different clusters covering more than 80% of the total population of Siddhipur through partial subsidies provided by the programme as well as through self-initiatives taken up by individual households. The members of the sub-committees established in each clusters have been mobilising locals of their clusters to clean up the lanes and alleys of the village every Saturday of the week. Storm water drains were improved and lanes were paved. Promotion of Ecosan toilets, demonstration of community level septic tanks and improved pit latrines have helped in increasing sanitation coverage in the community. Women now feel dignified to use private toilets at home. Despite the enormous success achieved in sanitation improvement, some of the open defecating areas specially designated for women, have not yet been removed from the village. Therefore, in order to completely remove these open defecation areas, the programme is still using the CLTS tool to create peer pressure among the households in Siddhipur and motivating them to construct individual toilets in homes.

Similarly, more than 800 households have been directly benefited through training programmes on household solid waste composting techniques. These households then adopted composting practices at the household level which was constantly monitored by the SHE team.

In addition, the water and sanitation education activities adopted in Schools through establishment of 5 Nature Clubs. More than 250 school children from these Nature Clubs were instrumental in creating awareness at the community level by conducting street dramas, rallies and exhibitions. Also, more than 4,000 men and women have been directly benefited through various capacity building and awareness programmes implemented in the community.

The people of Siddhipur are now in the process of declaring Siddhipur as an open defecation-free and 100% sanitation coverage community. This will be one of the landmark achievements of the programme.

Sustainability

Financial: The use and leveraging of resources, including cost recovery, indicating how loans, if any, are being paid back and their terms and conditions;

Social and Economic: Gender equity, equality and social inclusion, economic and social mobility;

Cultural: Respect for and consideration of attitudes, behaviour patterns and heritage;

Environmental: Reducing dependence on non-renewable resources (air, water, land, energy, etc.), and hanging on production, consumption patterns and technology.

In all the water and sanitation interventions, the programme sought co-funding from the community mainly to make it sustainable and develop a sense of ownership among the households and communities. For example, in the water supply component, more than 50% of the total budget was contributed by the community through contribution of land, kind and cash.

In addition, a pro-poor water tariff system has also been developed and adopted by the community for future sustainability of the water supply system. The programme has provided two types of drinking water connection provision i.e. Private and Community Taps. Households who opt for private taps have to pay a minimum of Rs. 75 per month while households connected to community taps pay a minimum of Rs. 50 per month. The community taps are specially targeted for those households who cannot afford a private tap and it is shared by 5-10 households. The water tariff increases progressively with additional consumption of water, mainly to check the misuse or over consumption of water. Since the overall water supply system has been designed for a 20-year period and considered water demand for double the current population, it is estimated that there will be surplus water during the initial years. Therefore, the community has decided and is planning to sell the surplus water by establishing its own low- cost water bottling scheme to generate revenue for the future sustainability of the system.

Likewise, in the sanitation interventions in case of household composting options, 40% of the total cost was borne by individual households. Similarly, the superstructure of the Ecosan toilets was constructed by individual households. In case of improved pit latrines, the programme provided material worth NRs. 2,200 and the remaining cost of toilet construction was borne by the individual household.

The programme tried to include all segments of the society including men, women and children. The traditional institutions such as *Guthis* were mobilised to provide contribution in kind in the water supply component. Similarly, most of the sanitation interventions were carried out through active involvement of women members. For example: as women are directly involved in daily household cleanliness activities, they were targeted and trained on solid waste composting as well as other sanitation improvement activities. Similarly, considering the fact that most of the people in Siddhipur are farmers and accept the use of human urine as fertilisers socially as well as culturally, Ecosan Toilets were promoted in Siddhipur realising the nutrient value of human urine and faeces and its application in agriculture on one hand, while on the other hand, use of Ecosan toilets saves water, recycles nutrient, avoids cross-contamination of groundwater and is a environmental-friendly and sustainable option.

Lessons Learned

- **Community Mobilisation**
  Community mobilisation is an integral part of programme implementation process. It helps to prepare the community and to seek their support in different programme intervention processes. Mobilising the community adopting a fast track approach to meet the programme objectives was quite challenging and difficult to achieve simultaneously. Therefore, it is felt that prior to programme implementation, considerable time should be allocated for community mobilisation process.

- **CLTS Campaign and Sanitation**
  The CLTS tool is a useful tool mainly to create awareness among the community members on proper sanitation practices and helps to create pressure for self-toilet construction and as well as to remove open defecation practices. In Siddhipur, the CLTS tool was only used during the later stages of the programme. Thus, it is learnt that in other programme areas, CLTS should be adopted as early as possible.

- **Capacity Building of Community**
  Capacity building of the community members on different water and sanitation activities and giving them the opportunity to be involved directly is very fruitful for the programme. Through their involvement, work load of the implementing agency can be shared by the community and further involving them on specific activities helps to empower them.

- **Involvement of Community**
  Community involvement is required from the initial stage of programme planning till the implementation stage to develop the feeling of ownership in them. In addition, the community should be involved to use the poverty mapping tool more effectively. Men should also be involved while implementing the sanitation improvement programmes.

Transferability

- *Poverty Mapping:* Adopting the Poverty Mapping tool to identify the poor segments of the society and developing intervention programme accordingly is a useful approach. This tool can be applied elsewhere as well.
- *Mobilising local funds:* Motivating the community members to pool local-level funds will provide additional funds for the programme. Collaborating with the local government and implementing the programme will foster government partnership and also develop government ownership in the programme. Such an initiative can be adopted in other areas as well.
- *Sanitation options:* Different sanitation options adopted in Siddhipur such as community septic tanks, household options for solid waste composting, Ecosan toilets have been successfully demonstrated and used in Siddhipur which can be adopted elsewhere as well.
- *Using CLTS campaign and Women for improving sanitation:* The CLTS approach adopted in Siddhipur and involving women in sanitation improvement activities was very successful which can be replicated elsewhere as well.

This community has become a learning centre for national and international communities where professionals and general people alike visit to witness the water and sanitation options adopted here.

Box 2.2: Integrated Approach for Eco-city, Hanam, Korea

'Green City Hanam'" was an initiative to transform the city of Hanam from a rural and unplanned city into a sustainable and environmentally sound self-sufficient city with a well-structured urban development and growth management.

Background

Since 1971, 98.4% of Hanam's total area was designated as green belt zone and local residents were complaining about the legal restrictions in most areas.

Strategies

In addition to guidelines for sustainable city development, four strategies were formulated based on:

- Green belt deregulation policy;
- Landscape ecology;
- Development axis for Hanam city Master Plan, 2016; and
- Expanded town concept.

Process and Resources

Hanam generated a comprehensive and long-term framework to achieve this goal. The city sought the assistance of UN-HABITAT and United Nations Environment Programme (UNEP) to define the basic direction of an Eco-city and to introduce environmental technologies and international support programmes. Four main considerations were used: (1) energy saving, (2) water circulation, (3) land use and transportation, and (4) biodiversity and urban space structure.

Results Achieved

As a result of a partnership between UN-HABITAT/UNEP, United Nations Development Programme (UNDP), the Environment Promotion Foundation, SNU, Korean and foreign experts of various fields, citizens and NGOs, Hanam was able to realize most of its goals. Among them was the development of a local agenda 21 to realise an Eco-city plan and creation of a database, based on an ecological survey conducted by experts.

In leading the Eco-city plan to actual implementation, another unique feature was the use of pilot projects. A trust was established for pilot projects to facilitate Eco-city development focusing on the development of Agenda 21 and investment. Having achieved more environmentally sound and globally sustainable development, Hanam then embarked on the Hanam Sustainable City Programme (SCP). Forging of partnerships proved that planning can only be effective through a local community base.

Sustainability and Transferability

The 'Hanam's Biodiversity Strategy' was presented at the 'Urban Environment Forum' in Cape Town, in September 2000, and the city of Hanam won the '2001 Asia Green City Award' in Singapore in September 2001. This is an ongoing project and its impact on other cities in Korea is noticeable and the Hanam initiative is being replicated as an Eco-city model all over Northeast Asia.

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UZBEKISTAN

Mitigating the Effects of Drought

The Western Uzbekistan Rural Water Supply Project has tried to mitigate the ongoing effects of drought by providing safe and easily accessible water supply, by minimising water wastage, by improving sanitation facilities and health conditions and encouraging better hygiene. About 700,000 people, of whom 60 per cent are poor, benefit from the project. The project also strengthens the institutional capacity to manage potable water resources and ensure long-term sustainability of the Government's water supply programme in the Aral Sea area.

Background

The province of Karakalpakstan, adjacent to the Aral Sea, and the province of Khorezm, are located in the driest part of Uzbekistan with an annual rainfall ranging from 70 to 110 millimeters. The water shortage in Western Uzbekistan has worsened over the last 3 decades with the drying up of the Aral Sea. The Aral Sea began to recede in the early 1960s after the former Soviet Union began a drive to expand agriculture, particularly the growing of cotton crops, in the area. The dry climate made it necessary to divert water from the contributory rivers, Amudarya and Syrdarya. As a result, their inflow into the Aral Sea decreased. The Aral Sea had shrunk to less than half its original size and only 20% of its former volume. The desiccation of the Aral Sea resulted in the loss of its fishing, tourism, and shipping industries, and the destruction of the eco-system of the sea and its deltas. The salty desert that has been formed produces up to 100 million tons of windblown salt dust contaminating the surrounding regions of Uzbekistan and Kazakhstan, and further inhibiting agricultural production. Since the mid-1990s, a decline in snow and glacier melt from the surrounding mountains, combined with a reduction in rainfall, has significantly reduced the water resources in the two major watersheds. The Amudarya River in particular has been the main source of fluvial and shallow aquifer abstraction for human consumption and agricultural use in Karakalpakstan and Khorezm, and the reduced volume of flow has resulted in the drought, the worst in 100 years.

Shortage of irrigation water from the Amudarya River has led to the loss of most of the rice, cotton, and wheat crops. Irrigation canals, which used to be a main source of raw water for household use, have dried up, depriving many rural households of direct access to safe drinking water, and means of employment, income, and food from agriculture. Families, particularly women and children, fetch water from distant alternative sources. Drinking water, where available, is often contaminated or of poor quality. Consequently, for the population in the drought-affected areas there is high risk of water-borne diseases and the carcinogenic and immunological conditions brought about by the long-term consumption of high levels of water-borne minerals.

Drought Relief Programme and Resources

Recognising the urgency of the problem, the Government of Uzbekistan embarked on a programme for immediate relief (Aral Sea Drought Relief Programme) that is receiving extensive support from the international community. In 2001, the Government requested emergency assistance from the Asian Development Bank (ADB) to mitigate the effects of the drought. A loan for US$ 38 million was approved in May 2002 for Western Uzbekistan Rural Water Supply Project.

Objectives

The main objective of the Project was to improve the living and health conditions of rural communities in Karakalpakstan and Khorezm. The aim was to expand the supply of potable water in districts from a minimum of 12% to 85%, reduce losses from unaccounted-for water from over 50% to 30%, increase the supply efficiency of bulk water and service delivery, and lower the production costs.

Process and Results Achieved

The project comprised of three components:

- Potable water supply,
- Water conservation and health improvement, and
- Capacity building.

The potable water supply component involved the development of new systems, rehabilitation and upgrading of existing facilities. Bulk water pumping and transmission were strengthened, new deep boreholes and treatment plants provided, and water distribution centres were rehabilitated or built.

The water conservation and health improvement component involved the introduction of water conservation measures, improvements in the sanitation facilities of schools and clinics, and promotion of health awareness related to water and sanitation. The capacity building component involves support for project management and institutional strengthening in water supply management.

About 700,000, people of whom 60% were poor, were benefited from the Project.

Lessons Learned and Sustainability

Learning from the experience of other water supply projects in Uzbekistan and ADB water supply projects in other countries, the project has incorporated the following features in its design:

- A flexible menu of sub-projects including both strategic and locally focused works that can be completed within the required time and can be constructed, operated, and maintained by local agencies;
- Participation of stakeholders, such as rural assemblies, women's committees or similar community organisations, in sub-project development, and possibly in operation and maintenance;
- Information, education, and communication campaigns;
- Coordination of project activities with the central and local governments and international funding agencies under the Government's Aral Sea Drought Relief Programme; and
- Training to strengthen institutional procedures and to ensure efficient and speedy procurement.

A participatory approach to the selection, planning, and implementation of sub-projects was expected to increase a sense of ownership among beneficiaries, which, in turn, will improve the operation and maintenance (O&M) of equipment, as well as voluntary water conservation and health measures.

Top-down approaches were embedded at all administrative levels of Government. The project was structured to increase local responsibility for water supply services by decentralising implementation and operation and maintenance, and actively involving both local governments and community-based stakeholders.

To recover O&M costs, metered charging will be introduced under the project. A tariff structure will be prepared for the sub-project districts using a stepped tariff by volume, and a lifeline tariff for minimum consumption to increase affordability by the rural poor. However, since affordability of tariffs is a critical issue in the drought-stricken areas in Karakalpakstan and Khorezm, the Government will continue to subsidise rural water supply until the rural water and sewerage agencies can fully recover the cost of O&M from users.

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SECTION III

Appropriate Technologies

Appropriate Technologies

The demographic trends and the rapid and chaotic growth of urban centres in many countries of the Asia-Pacific region, together with the growing demands on existing water and sanitation services, make the search for innovative, affordable, indigenous and culturally acceptable 'Appropriate Technologies' very imperative. Such techniques and technologies contribute greatly to the water and sanitation sector and may primarily focus on:

- Point-of-use drinking water treatment systems at household level;
- Water purification systems;
- Wastewater treatment systems;
- Recycling and reuse of wastewater;
- Desalination systems;
- Systems to track leakages and unaccounted-for water;
- Rainwater harvesting and groundwater recharging;
- Onsite safe disposal systems for safe sanitation; and
- Use of GIS for improved infrastructure services.

There is a wealth of experience in Asia for these measures, where all stakeholders including governments, private sector and civil society organisations have played a notable part. The 10 Local Actions presented under this Section illustrate these measures through proven practices in India, Indonesia, Nepal, the Philippines, Singapore and Qatar, as detailed below:

India: the case of Byrraju Foundation is a notable illustration of pro-poor water purification and bottling system to generate WHO standard drinking water by purifying water at available sources in a small treatment plant and deliver at affordable costs.

Sulabh International Social Service Organisation, a pioneering NGO in Sanitation in India, developed cost-effective sanitation technologies for household and community use with onsite safe disposal system, which not only promotes safe sanitation but also prevents environmental degradation. The NGO also developed technologies for water-effluent treatment from biogas digester and wastewater management.

Indonesia and Nepal: initiated different cost-effective household drinking water treatment technologies at the household level. Indonesia initiated 'Air Rahmat', a solution that purifies water for drinking. Nepal promoted 'Piyush – a 0.5 per cent chlorine solution', 'Solar Water Disinfection (SODIS)' which are simple to use, reliable and easily accessible. 'Kanchan Arsenic Filter' is another innovative household drinking water treatment device for removing arsenic and microbiological contamination, popularly used in Nepal.

Rainwater harvesting has become a viable option in Nepal for collecting and storing rainwater to augment water supplies as well as groundwater recharging. The wastewater treatment plant at Sunga in Madhyapur Thimi Municipality in Nepal illustrated an approach towards achieving sustainable management of wastewater.

The Philippines: the decentralized waste water treatment using local technology in the coastal town of Liloan cleared water pollution due to poor sanitation and contributed to the town's economy.

Singapore: achieved self-sufficiency in providing daily potable water to millions of its citizens by adopting technologies for recycling of used water, desalination of seawater and keeping the unaccounted-for water low.

Qatar: is the first country to implement a comprehensive and integrated nationwide Geographic Information System (GIS) for improved infrastructure services and waste disposal systems.

The above interventions and approaches are of significant importance as they can help in the rapid and focused spread of water and sanitation services, particularly among poor communities.

22

INDIA

Cost-effective and Appropriate Sanitation Systems

Sulabh International Social Service Organisation is an NGO and a pioneer in promoting Environmental Sanitation since over three decades within India and abroad. Dr. Bindeshwar Pathak, a great Humanist, Social Reformer of contemporary India and Founder of this organisation, is of the opinion that the solution to the problem of sanitation for the developing world lies in, "Technological Development with Social Transformation" and the key instrument for this purpose is a toilet. The toilet should be affordable, appropriate, indigenous and culturally acceptable with mechanism of onsite safe disposable. It has combated the problem of manual scavenging in countries like India.

Sulabh's pioneering work has shown that human waste can be disposed off affordably and in a socially acceptable way. The Sulabh solution is a low-cost, pour-flush water-seal toilet with leach pits for onsite safe disposal of human waste. The technology is affordable for poor people because the designs suit different income levels. The system is never out of commission, and can be built with locally available materials, is easy to maintain and has the potential for upgradation. The technology has brought about major changes in the attitudes and personal habits of the urban poor. Sulabh's pay-and-use approach for public toilets reflects good commercialisation of services and the private-sector involvement in the initiative.

Another unique initiative of Sulabh is the *Nai Disha* (meaning New Direction) programme to change the course of life of the manual scavengers through education, skill upgradation and empowerment so that they are gainfully employed in other trades and professions. Further, Sulabh's approach to capacity building, training and awareness, particularly for women who are the worst sufferers due to the lack of toilets and the children and youth through school sanitation, facilitates not only in transforming the quality of their lives, but also strengthens the ingenuity and expertise towards achieving the goal of safe sanitation to all.

Sulabh has demonstrated how a partnership between a local Government, NGO and the community can make a substantial impact on improving the environment quality, particularly in the areas inhabited by the poorest segment of society, both in the urban and rural settlements. Indeed, this has been a partnership between Central, State and local government, the private-sector, NGO, the Community-based Organisation (CBO) and ex-scavengers.

The factors that have led to the success of Sulabh initiative include:

- **an innovative and task-oriented partnership**
- **effective community participation in the design and implementation process**
- **use of locally available and environmentally-friendly technology**
- **bringing change and transformation in the quality of life of the underprivileged**
- **an integrated approach to providing service with income-generating opportunities to the marginalised.**

Background

Two-thirds of the Indian population goes out for defecation in the open areas and over 120 million homes do not have toilet facilities. Worldwide, around 100 million urban dwellers defecate in open areas due to non-availability of toilets at homes, or at public places or because they are too distant or too expensive to build. Open defecation is a source of infection for various diseases. Lack of access to safe sanitation not only contributes to a cycle of diseases but also has impact on health, education, productivity, further leading to poverty. Most people, specially the poor, are not aware of the health and environmental benefits of improved sanitation. Their priorities were different and the toilet was not a felt need. General awareness and Community's involvement in sanitation promotion was inadequate. There has been another dimension to the problem of sanitation in countries like India, called Scavenging, wherein human excreta is cleaned and carried away manually. Scavenging was and has been associated with untouchability in the Indian society and the scavengers face social discrimination.

Goals and Objectives

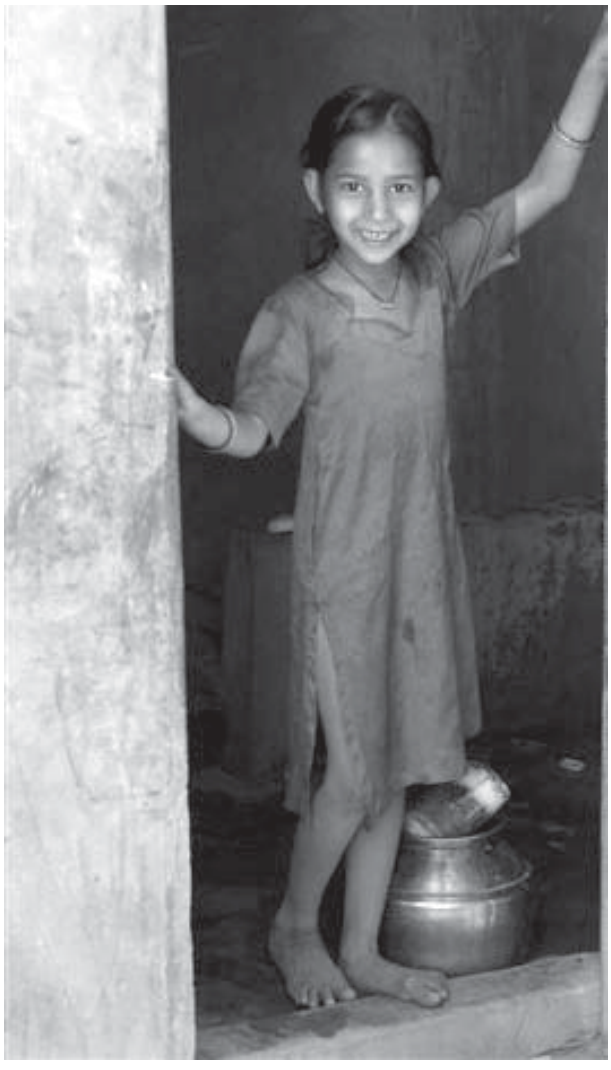
Sulabh's short-term goals include the provision of accessible, affordable and easily available latrines and the means to maintain them. Its long-term goal involves bringing about major change in the attitudes and personal habits of the urban poor.

The specific objectives of the Sulabh Initiative include:

- Providing basic amenities to a large portion of the population which are cut off from formal municipal services;
- Instilling social responsibility for city-wide good environmental conditions through creation of awareness;
- Providing the opportunity for low-cost, self-help development for megacities where public agencies are financially unable to provide critical services;
- Providing affordable services in the most effective way;
- Applying the fundamental principles of partnership and community participation;
- *Partnerships:* Demonstrating how a partnership between a local government agency and a non-governmental organisation, backed by community participation, can be very effective;
- *Community involvement:* Involving the community, with a special emphasis on women – indeed, community participation has been central to Sulabh's success with its education programmes aimed at creating awareness as to how sanitation affects the lives of slum dwellers, and by providing toilets to communities – Sulabh has motivated and reinforced community-level involvement in the initiative;
- *Affirmative action in favour of women scavengers:* The initiative places special emphasis on the transformation of the scavenging women to bring them to the mainstream of the society through education, skill upgradation and empowerment and, thereby, enhancing the principle of social equity;
- *Environmental sustainability:* Sulabh's innovative approach provides sustainable environmental sanitation, and advocates and enhances access to low-cost sanitation services, particularly for the poor.

Resources

Sulabh initiative receives financial support from its self–financing strategies through the pay-as-you-use model of public toilets and consultancy services.



Process

Sulabh technology involved the development of a twin-pit pour-flush toilet which uses only two litres of water for flushing. The excreta fall into a leach pit and the two pits are used alternately. Gas and liquid is slowly dispersed into the soil through holes in the lining of the pit, and waste is rendered odourless and almost dry after a two-year rest period, so that it may later be used as manure and soil conditioner.

For in-house toilets, the implementation process entails door-to-door campaigns by Sulabh volunteers who talk to people and persuade them to convert their bucket latrines into Sulabh Shauchalayas (twin-pit pour-flush latrines). Once the beneficiaries agree, Sulabh undertakes the full responsibility to construct the toilets to the entire satisfaction of the householders involving them fully in the process. A guarantee card is issued to each household so that any construction defect can be rectified free of charge. Follow-up services are

also provided to assist and guide the householders in toilet use and maintenance. Sulabh has set up a special cell to monitor the quality and satisfaction of the users who get a Sulabh toilet system installed in their houses.

Under the scheme of the Government of India and several state governments, there is a provision of subsidy and loan to the beneficiaries with balance amount being paid by the beneficiaries. Many a times it becomes too difficult for the Government to recover loans from beneficiaries. Sulabh helps the government body in recovering such loans. It also helps beneficiaries to get subsidies/loans from the Government.

For the construction and maintenance of public toilets, Sulabh's strategy is to play the role of a catalyst between official agencies and the users of Sulabh complexes. The land and finances for the construction of public toilets are made available by local bodies. Sulabh undertakes the construction of these complexes and maintains them on a pay-and-use basis for 30 years.

Sulabh technology has further been extended to creation of biogas from human excreta, and the gas can be used as a cooking medium and electricity generation.

Results Achieved

Sanitation facilities have been provided in 1.2 million individual households and nearly 6,000 public toilets for communities and are used by over 10 million people daily. An individual toilet can be constructed at a cost as low as US$ 10 with the cost varying as per the specifications and materials utilised. The dumping of fresh, pathogenic night soil has stopped and has led to improvement in the physical environment. These toilet complexes have restored human dignity by providing facilities for defecation and bathing in privacy and eradicating social discrimination against scavengers. Some of these complexes have become social centres because of the provision of communication services (telephones), medical care, family welfare services, clean water (for drinking) and cloakroom facilities.

Over 60,000 scavengers have been liberated from the demeaning and unhygienic task of manual scavenging and rehabilitated in other skills. Over 6,000 wards and family members of these liberated scavengers have been given vocational training.

'Solution': Sulabh Twin pit pour-flush toilet

Sulabh Public Toilet Complex at Shirdi, Maharashtra

Around 1,100 towns have been covered by Sulabh toilet systems. There has been a dramatic positive change in the physical environment of the towns where Sulabh has worked.

General awareness, sanitation, health, education and the community's involvement in the social infrastructural programme have instilled self-reliance and confidence in the people. Sulabh's Literacy programme among women and children with education on sanitation and personal hygiene in slums and squatter settlements has resulted in the improvement of the environment, ecology and health. These women have become the forerunners of social change by creating awareness in the community about the importance of sanitation and personal hygiene. This has brought about a positive impact on the health standards of all members of the households concerned, especially among the underprivileged women and children.

Sulabh programme of Nai Disha (New Direction) has created new avenues for the scavenging families to emerge into the mainstream of the society with income-generating opportunities for self-reliance. The cost-effective sanitation advocated by Sulabh also formed part of the prestigious project for the prevention of pollution of the river Ganga and Yamuna, undertaken by the Government of India. The efforts of Sulabh are now being treated as an integral part of the National River Conservation Project. Through partnership with Sulabh, the local government has played a major role in the provision of affordable sanitation services and technical support to the initiative.

Sustainability

Sulabh has developed its own methodology to ensure sustainability in the provision of sanitation facilities to the communities in urban areas. It is based on the following premises:

- General awareness of self-reliance and confidence without much dependence on the Government;

- Structuring decentralized programmes and gradually handing them over to the target groups;
- Adoption of sustainable, replicable, acceptable and most appropriate cost-effective technologies;
- Creation of awareness about sanitation;
- Involvement of the community, especially of women, at every stage of implementation; and
- The training, rehabilitation and removal of social discrimination against scavengers engaged in the manual handling of human excreta so that they do not become unemployed, once the bucket and dry privies they clean are converted to pour-flush toilets.

The technology developed by Sulabh is cost-effective, sustainable, replicable and most appropriate. It can be built using indigenously available materials and is easy to maintain. It has a high potential for being upgraded, i.e., it can be connected to sewers easily when they are introduced into a new area. It does not need the services of scavengers.

The organisation works to turn the development process into a people's movement with the people themselves becoming agents of change. Sulabh's innovative approach provides sustainable environmental sanitation development to bring about lasting change in the habits and attitudes of the community. This approach has assisted in building the capacities of the communities with the objective of helping them to learn and believe in their own ability to help themselves, their communities and others.

Lessons Learned

An important lesson in Sulabh's initiative is that in order to improve the living environment and accessibility to basic services for all, appropriate technology, social marketing and delivery systems have important roles to play. However, this should be backed by strong community participation strategies along the lines developed by the organisation to make delivery systems effective and sustainable. In this sense, Sulabh's initiative is more of a social innovation than a technological one.

Sulabh technology has enabled households which previously possessed single-pit latrines or had no latrine at all, to have access to a decent and affordable sanitation option.

Transferability

International and bilateral agencies have advocated for the adoption of Sulabh technology and its model in developing countries. Sulabh International has been working closely with UN-HABITAT and has made significant contribution to bridge the sanitation gap. It has been working in South Asia and Africa and has sent its experts to several countries as part of UN-HABITAT Missions.

At the request of UN-HABITAT, Sulabh International prepared a publication on "Social Marketing of Sanitation" which seeks to serve as a link between UN-HABITAT and the other agencies engaged in promoting socially and environmentally sustainable cities and towns. Another publication on "Sanitation and Energy" is under preparation. In collaboration with UN-HABITAT, Sulabh has promoted capacity building to the professionals of 14 African countries on "Sanitation Technologies", who, in turn, implement these technologies in their respective countries.

Sulabh has spread the message and awareness on Environmental Sanitation in the Asian countries of Nepal, Sri Lanka, Bhutan, Afghanistan, and Africa. At the request of the Government of Afghanistan, Sulabh has constructed public toilet complexes with digester in the city of Kabul and trained locals in their operation and maintenance. Sulabh also extended consultancy services for provision of social and technical guidelines on health, hygiene and sanitation to the Republic of Mozambique. Developed counties like France also derive benefits from the efforts of Sulabh Sanitation.

Within the country, the success of Sulabh efforts led the Government of India and State Governments to initiate and implement the low-cost sanitation programme all over India with the following objectives to:

- Convert the dry or bucket latrines in urban areas to pour-flush sanitary latrines designed by Sulabh;
- Provide such latrines where no latrines existed;
- Make more pay-and-use public toilets available; and
- Eliminate manual scavenging and make these scavengers free from the demeaning work and strengthen their capacities for alternative gainful employment.

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ANDHRA PRADESH, INDIA

Pro-poor Water Purification and Bottling

The Byrraju Foundation (BF), a non-profit organization dedicated to rural transformation, has embarked upon providing safe drinking water, conforming to WHO standards, in the villages of the State of Andhra Pradesh. BF came up with a viable option to separate 'safe drinking water for everyone' from the rest of the water supplied through Rural Water Supply (RWS) Scheme in the villages. They treat the water in a small plant with effective technology, which produces 1000-2000 litres of pure drinking water in one hour. This programme is supported jointly by the community, the local body (the Gram Panchayat), and the Byrraju Foundation. This water is free from harmful bacteria and other impurities and is delivered in 12-litre food-grade HDPE cans at a user charge of Indian rupees 1.50 (approximately US$ 0.04) with which the unit can function on a sustainable basis and is affordable by a common man.

Introduction

The aim of BF is to create a world-class platform for sustainable transformation of villages. BF believes that the transformation is sustainable if the processes are disaggregated, institutionalized and participatory with community owning, managing and leading the initiatives. BF is working in the areas of Healthcare, Education, Literacy, Water, Environment, Sanitation, Agricultural Advisory Services, Livelihoods and Disability Rehabilitation in 180 villages across East Godavari, Guntur, Krishna, Ranga Reddy, Visakhapatnam and West Godavari Districts of Andhra Pradesh, impacting a million lives.

Most of the villages in Godavari and Krishna delta, where BF has major presence, 63% of villages are dependent on irrigation canals and the remaining 37% of villages use groundwater. Survey along irrigation canals in this region revealed that water sources have been polluted due to various contaminants. Tests conducted on water, supplied through Rural Water Supply (RWS) scheme, showed that 138 out of 159 villages i.e., 79%, with surface water as the main source, did not conform to the safe water norms on account of Coliform, Turbidity, Chlorides, Total Dissolved Solids (TDS), etc. If the need for maintaining residual chlorine of 0.2 parts per million (ppm) (mg/l) is also considered, 143 of them, viz. 90%, failed. In upland areas, mostly dependent on groundwater, 17 out of 21 villages have TDS in excess of permissible limit of 500 ppm. Ten of these villages also have fluorides beyond the norm of 1 ppm. It is observed that out of 40 litres per capita daily (LPCD) water supplied by RWS, about 2 litres is used for drinking purpose, which is about 5% of total quantity to be supplied in villages. It is much easier to treat 5% of water supplied to drinking water standards rather than the entire quantity. BF developed a strategy to address the situation and established community-based water plants, jointly supported by village local body, community and BF, for meeting the requirement of drinking water in villages.

Objectives and Scope

To mitigate people's sufferings due to consumption of unsafe water, BF has conceived the idea of providing safe drinking water to 100% people in all the adopted villages at a cost that the poorest of the poor can also afford. In providing solution, the key factors considered are output quality meeting the prescribed norms of WHO, scalable technology, sustainable processes, and participation of community. The solution involves setting up of community-based water treatment system at the village level. Accordingly, the Foundation came up with the idea of setting up of a Plant, initially one for every 3 villages, using appropriate technology to be operated by trained youth from the village.

Process

The treatment undergoes purification process, viz. coagulation for settling suspended matter, chlorine dosing for killing the bacteria, pressure sand filtration

for screening fine particles, activated carbon filtration for removal of smell and odour, micron filtration for removal of extra fine particles and ultraviolet sterilization for inactivating the residual bacteria. In case the raw water has TDS beyond 500 ppm, the outlet from micron filters is passed through Reverse Osmosis(RO) membrane at high pressure for removing dissolved solids, including bacteria. This water is sent through an ozonator to maintain oxygen level and improve shelf life. The processed water, before filling in the cans, is subjected to another stage of ultraviolet radiation to arrest bacteria, if any, that may generate in the storage tank. The system, effectively eliminating impurities and harmful bacteria, produces water at 1,000-2,000 litres per hour.

Operation and Maintenance of plants

Based on the level of impurities in raw water, the process parameters are set for effective removal of the same. To overcome the power cuts, the Plant is operated on single-phase, as it is available for 12-16 hours a day in villages, on flexible timings, using voltage stabilisers for maintaining the quality of power. Hundred percent stand by for all the critical components like Pumps, Motors, UV Lamps, Voltage Stabilisers, Multi-port Valves and adequate stocks of consumables are ensured. In some villages, which distribute higher quantity of water, a Diesel Generator has been installed to meet the requirement of power. Annual maintenance contract is entered into, initially for 5 years, with the suppliers of the Plant to ensure trouble-free operation of plants. For every 5 plants, a maintenance team is deployed within close vicinity of a cluster of villages by the Supplier, so as to attend to preventive and breakdown maintenance. Layout and components have been standardised so that the plants, operating in similar conditions, can effectively share inventories for proper operation.

In order to ensure 100% satisfactory performance of the Plants, quality of the product water is monitored strictly. While product water is tested for key parameters like bacteria, TDS, pH, residual chlorine, etc., at the Plant on a daily basis, local Science Colleges are involved in testing of samples for various biological, physical and chemical parameters on weekly/fortnightly basis.

Social Impact

To place health at the centre of the broader development agenda is a conscious strategy adopted by BF, as it has high receptiveness from beneficiaries. Credibility established through the success of health activities translated into goodwill for BF's other initiatives, including water. When the water plants were conceptualised, *Gram Vikas Samithi* (GVS), a 9-member body of volunteers representing all sections of community, including women, constituted to oversee implementation of various activities of BF, is involved in the decision-making process. GVS plays a key role in mobilising community support and take up regulatory issues with the local authorities. The project, involving *Gram Panchayat* (village local body), GVS and BF, has role clarity on the aspects as stated at Table-1:

Capacity building of community in identification and solving of problem by participation in a systematic manner to enhance their operational capabilities is an important step for achieving sustainability. To facilitate this, BF imparts skills to the GVS for proper implementation of schemes, self-reliance in setting up and running services through user charges and/or mobilisation of funds. For operation of water plant, unemployed youth are trained on various aspects. Though BF, through its field staff, oversees running of plant till its stabilization and ironing out any deficiencies in operational matters, it is ultimately handed over to GVS or a self-help group (SHG). So far, 7 plants were handed over to GVS or Self-help Groups (SHGs) under close supervision of GVS, and more are in the pipeline.

Table-1: Role clarity

Gram Panchayat	Gram Vikas Samithi	Byrraju Foundation
*Allotment of land (free) *Permission to draw raw water from main source *Obtain power connection at concessional tariff	*Collect contribution from community and supervise construction of building *Identification of youth from village for operation of plant *Oversee operation of plant and distribution of water *Offer creative solutions to increase utilisation of water	*Awareness creation, resource mobilisation, develop criteria and identification for eligibility *Identify suppliers of equipment, procurement and train operators *Process framework for sustenance of project; assess, document and disseminate the impact *Quality monitoring and assurance

Financial Sustainability

Water Plant is a financially sustainable model, with community and BF investing in the plant costing Rs. 7.50 lakh for conventional process and Rs. 8.75 lakh for RO system (including Rs. 3.50 lakh for building in both cases). The economics of plant operation, due to better knowledge management and process improvements, thus resulting in reduction of both fixed and variable costs, is shown at Table-2:

The Plant's break-even point for distribution is 4,000-4,500 litres a day. Even though Byrraju Foundation is able to raise the required resources, a few financial institutions came forward offering loan at an interest rate of 9% a year to meet the capital expenditure. Government of India, under Swajaldhara scheme, grants subsidy to the extent of 30% of capital costs for setting up of community-based plant by a team of individuals or a self-help group in villages. The financial aspects will undergo a minor change which can be offset with increased levels of distribution of water to ensure sustainability of the plant.

Results Achieved

The product 'water' is delivered in a 12-litre HDPE food-grade Can at Indian Rupees 1.50 (US$ 0.04) at plant. Additional amount of Rs. 0.50-2.00, depending on distance of travel, is charged for its delivery by a rickshaw/van at the doorstep within as well as neighbouring villages. Access to clean drinking water has transformed the village landscape in many ways. The impact is quite perceptible among the children, with reduction in absenteeism in attending school (due to sickness) and improved learning, as water from these plants is supplied free of cost to the schools and health centre in the villages adopted by BF. The initiative benefited the community in the following aspects:

- Access to safe drinking water provided to nearly 800,000 people in about 155 villages.

- Patient visits to BF's Health Clinics in villages with access to BF water dropped by 15-30% and expenditure on medicines declined by 10-22%, attributed mainly due to relief from water-borne diseases.
- Provided livelihood to nearly 270 village youth for operation of plant and distribution of water (by rickshaw within village and by auto/van in nearby villages).
- The surplus generated from the plant is used for common good of the village.

Lessons Learned

Initially, the pilot plant at Gollalakoderu did not foresee high levels of suspended matter, which increased more so during the monsoon period — a small scale coagulation unit to reduce turbidity thereby sand filter and micron filters. Ozonation was also introduced to maintain shelf life, quality of product water and increase of oxygen level, which usually drops down in raw water during colder days (peak winter period). Appropriate treatment processes have been put in place to suit different situations and characteristics of raw water. Based on the experiences gained, the Foundation is confident of setting up small community-based water purification systems for a cluster of 2-3 villages,

Table-2: Economics of operation

No	Item	Non-RO	RO
1	Production of water per day in litres (average-minimum)	5,500	5,500
2	Distribution of water per day in litres (average-minimum)	5,000	5,000
3	User Charges @ Rs. 0.125 a litre for 360 days in Rs.	**225,000**	**225,000**
4	Annual Recurring costs in Rs. – Manpower: 2 persons @ Rs. 2,500/month – Power, Consumables, Maintenance and other expenses – Depreciation @ 10% of the cost of equipment	 60,000 64,200 30,000	 60,000 92,600 40,000
	TOTAL expenditure per year in Rs.	**154,200**	**192,600**
5	**SURPLUS** per year in Rs.	**70,800**	**33,500**

having a total population of 8,000-10,000, as a sustainable rural enterprise. The concept and technology have been established which helps the villagers to operate the water Plant on their own.

Though it is the desire of the Foundation that poorest of the poor in the village is able to afford consumption of the product water, the challenge is to reach them and ensure higher levels of consumption. Although BF is creating awareness and educating the villagers by demonstrating the contamination levels in present water systems, the mindset of villagers is something which is very difficult to change in a short span of time. Added to it is the cost element, as vast majority of villagers want drinking water at no cost that too at or very near to their doorstep. Despite realising the importance of consuming safe drinking water, the common practice of drinking from available sources for years hinders them from paying for other water, however safe it may be. But the reality that the naturally available water resource is polluted, does not strike them immediately and continuous and constant persuasion can only motivate them to switch over to drinking safe water. However, the realisation and need for safe options is increasingly felt and the trend is towards searching for better sources, which is making the Government also to improve/install water purification systems.

Distribution of product water to individual is another constraint. While those in close vicinity of the plant collect the water, people living little far or in neighbouring villages need to put in extra effort or spend for transport. The bad condition of roads, more so in monsoon time, distracts transporter to carry the water to far off places and adjoining villages. To improve distribution system, mobile units to process water at different locations, including hamlets, which are far from main water source, is another option for greater levels of reach.

Transferability

This project has great potential for replication because:

(a) Design of the plant, the process and the choice of equipment are sound;
(b) Recurring cost of plant is not a burden on the donor/sponsor; and
(c) Participation of the community is possible.

Seeing the success of the pilot plant and based on the response from other villages, 50 more plants have been set as on September 2007.

The model, which can be run as an income-generating enterprise, is replicable across other regions and BF guided/is guiding a few agencies in the establishment of such plants as listed below:

a. Dow Chemical International Ltd, Dasiagudem (Nalgonda Dist, Andhra Pradesh (AP))
b. Gavarasana Foundation, Gollaprolu (East Godavari Dist, AP)
c. Nayudamma Foundation, Chimidithapadu (Prakasam Dist, AP)
d. Centre for Water& Sanitation, Hyderabad: Gajula Malkapaur (Nalgonda Dist), Railapur and Medchal (Ranga Reddy Dist, AP)
e. UN-HABITAT, Nairobi: Signed a cooperation agreement with BF to set up four plants, one each in Indore, Jabalpur (both in Madhya Pradesh), Laos PDR and Uganda.
f. CCF India, Raichur: 3 plants, one each at Kollegal (Hassan Dist), Chittapur (Gulbarga Dist) and outskirts of Bangalore (all in Karnataka)
g. Helpage India, Chennai: One plant in Cuddalore (Tamil Nadu)

Byrraju Foundation has been rated as 'Best Water NGO-Water Quality' in India by *Water Digest* (A global magazine for water solutions) and UNESCO for the year 2006-07. Global Development Network, short listed the scheme (within top 6 out of 184 proposals received in various fields across the world) for 'Most Innovative Development Project' Award for the years 2006 and 2007.

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INDONESIA

Simple Solution for Drinking Water Makes a Big Difference

The people in Jakarta, Indonesia no longer have to boil water for drinking. A new and easy-to-use water treatment solution, "Air Rahmat" or "Gift Water," gave the breakthrough in water purification technology. This system decontaminates water for drinking, and reduces health risks. A common 19-litre bottled water costs one U.S. dollar while a 100-millilitre bottle of Air Rahmat, which is enough to treat approximately 660 litres of water — the average amount used in a household of four in one month — costs less than 50 cents.

The Problem

Over 100 million people in Indonesia lack access to safe water and more than 70 percent of the country's 220 million population relies on water obtained from potentially contaminated sources. Unsafe drinking water is a major cause of diarrhoea, which is the second leading killer of children under five years of age in the country and accounts for about 20 percent of child deaths each year. According to the Ministry of Health, at least 300 out of 1,000 Indonesians suffer from water-borne diseases every year, including cholera, dysentery, and typhoid fever. Around 30 percent of the water distributed by water companies in the country is contaminated with E.coli or faecal coliform and other pathogens. The tap water stored in a container for one day will turn yellow. Many water reservoirs are located close to septic tanks and, added to this, 30 percent of the country's water pipes leak due to poor maintenance. The country's local water companies, which get water mainly from the country's polluted rivers, can hardly handle the dirty raw water due to lack of advanced technical treatment.

Air Rahmat- the "Gift Water"

To reduce the high incidence of diarrhoea among the children, the United States Agency for International Development (USAID) introduced Air Rahmat. Air Rahmat is produced through private-public partnership called Aman Tirta, which believes that all Indonesians may have easy access to safe drinking water. Members of Aman Tirta include the Johns Hopkins Centre for Communication Programmes and CARE International, Indonesia. Literally, Air Rahmat means Gift Water, but the brand name refers to a liquid, 1.25 percent sodium hypochlorite solution, which is effective in deactivating micro-organisms such as E.coli in water. Rahmat itself stands for economical, easy to use and healthy.

Process

The solution is originally developed as part of the Safe Water Systems programme of the U.S.A. based Center for Disease Control and Prevention and has the same type of treatment that large scale municipal water treatment systems use worldwide.

Boiling Water Out - Air Rahmat In

"The ten year old Milvan has been waking up at 5 am to boil water for his consumption throughout the day in school as his parents cannot afford to buy bottled water. Milvan will no longer have to wake up early in the morning just to boil water for drinking. 'I will just use Air Rahmat' says Milvan, referring to a new water treatment additive introduced by the Government of Indonesia to get safe and drinking water at low cost".

In Indonesia, Air Rahmat is made to be used at the household level. The solution is easy to use. Just add three millilitres of Air Rahmat for every 20 litres of water, shake or stir for 30 seconds, wait for at least 30 minutes and the water is ready to drink. Endorsed by the Coordinating Ministry for People's Welfare and the Ministry of Health, Air Rahmat will be widely available in sidewalk eateries, kiosks, small stores, and traditional markets in the districts of Banten and North Sumatra provinces, where the incidence of diarrhoea is high.

Results Achieved

When used correctly in conjunction with proper storage, the water treatment solution has been shown to reduce the risk of diarrhoea up to 85 percent. Air Rahmat is also able to protect water for two to three days from recontamination. Indonesian women report saving of more than 100,000 rupees or 11 dollars a month by using Air Rahmat. They no longer have to buy kerosene for boiling water. The solution has also been introduced in tsunami-struck Aceh province. From the first day after the tsunami, Air Rahmat, has been registered as a consumer product by the Ministry of Health and has been distributed throughout Aceh. More than 1.5 million bottles have been distributed in Aceh, where lack of clean water is still a major problem. Reported use of chlorine solution in stored water in Aceh Besar was associated with a 47 percent decreased risk of having contaminated drinking

water. Air Rahmat is extensively available in Jakarta and in the provinces of West, Central and East Java.

Sustainability

According to the Ministry of Health and USAID, Air Rahmat is safe to use. The product is used in more than 25 countries. Worldwide, more than 2 million households use products similar to Air Rahmat. "By introducing Air Rahmat", says Soetodjo Yuwono, Secretary, Coordinating Ministry for People's Welfare, "we are offering a simple and sustainable solution to lack of access to safe water."

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KATHMANDU VALLEY, NEPAL

Rainwater Harvesting - A Viable Option

UN-HABITAT's Water for Asian Cities (WAC) Programme in partnership with the Ministry of Physical Planning and Works (MPPW), NGO Forum for Urban Water and Sanitation (NGO Forum/ NGOFUWS), and the Water Aid Nepal has initiated a programme to build capacity on Rain Water Harvesting (RWH) system and to disseminate, demonstrate and promote RWH technology in Nepal. A Rainwater Harvesting Promotion Programme (RWHPP) was launched in five municipalities of Kathmandu Valley and Banepa Municipality in January 2006. The aim was to familiarise people with this simple technology of tapping nature's gift and popularise its use at the household, community and municipal levels and thereby provide a supplementary water source to the people. The effort has been to set up the RWH plants in several government institutions, private enterprises, and housing projects and to create a growing demand for the RWH plant at the household level.

Introduction

The country of Nepal is blessed with highest level of water resources in Asia with five river basins contributing 71 percent of the annual flow during the monsoon season and 40 percent in the dry season (80 percent of the total rainfall). Ironically, the water scarcity is at an increasing trend with growing dependence on groundwater aquifers.

The overextraction of groundwater has led to depletion of water table beyond its recharging capacity in many areas, leading to water quality degradation, land subsidence, receding of rivers and drying up of ponds. Further, rapid urbanisation and industrialization, especially in the urban areas, has converted the rivers into sewers, unfit for downstream consumers, resulting in numerous environmental and ecological calamities. In most parts of the Terai region where the only source of water is groundwater, arsenic problem has added to the grievances of the poor. The Kathmandu Valley is facing acute crisis of water — the traditional stone spouts, wells, ponds and springs have been neglected and groundwater mining has not been regulated.

Rainwater, the primary source of water, has been greatly neglected. The average rainfall in Nepal is about 1,500 mm. The total annual precipitation is 869 million m^3/yr, of which 476 million m^3/yr is lost to evapo-transpiration and 358 million m^3/yr is drained off by Bagmati River. The potential to harvest rainwater is very promising in Nepal. Even if just one-fourth of Kathmandu Valley (50.76 square km) starts harvesting rainwater, 44.5 MLD of water can be harvested which can quench the thirst of 600,000 people. In a study conducted on a 90 square metre rooftop at a residence in Dallu, it was observed that the total rainfall received per year was 66 days and rainwater harvested was 154 cubic metre.

Looking at the potential and the water scarcity of the country and the Valley's dependence on groundwater in particular, the RWH has been visualised as the best option and an immediate alternative water resource.

Objectives and Strategies

The Rainwater Harvesting Promotion Programme (RWHPP) promoted by UN-HABITAT's Water for Asian Cities Programme in collaboration with NGO Forum in five municipalities of Kathmandu Valley and Banepa Municipality, sought to familiarise people with RWH technology and popularise it at the household, community and municipal levels by setting up examples of RWH systems and disseminating information on its effectiveness.

The long-term vision was to ensure successful adoption of RWH as a supplementary source of water for sustainable water supply services in urban centres. The programme adopted the following strategies:

- Policy advocacy to lobby for mandatory requirement of RWH system in building by-laws;
- Capacity building of plumbers, civil engineers and architects on RWH and also to train probable clients like housewives;

- Establishment of help-desks, which functions as a matchmaker between clients willing to have RWH facility and plumbers trained for the purpose; and
- Establishment of demonstration sites.

Resources

NGO Forum received a total financial support of US $84,000, of which UN-HABITAT contributed US$ 47,500 and WaterAid Nepal and NGOFUWS contributed US $36,500.

Process

RWHPP has conceived a multi-pronged approach with maximum spread effect which include:

- Policy advocacy and implementation to create favourable environment that mandates and promotes rainwater harvesting in all new built structures;
- Tailor-made RWH training programmes for all target groups at various levels;
- Preparation and distribution of RWH standard manual and guidebook;
- Installation of RWH components at popular historical/public structures to serve as demonstration sites;
- Promotion of private sectors for easy accessibility of RWH components and materials at a competitive price;
- Production and distribution of promotional items for mass communication and advocacy; and
- Counselling the prospective clients on RWH and help to generate employment opportunities.

Results Achieved

Within a year of its initiation, the RWHPP has made its presence felt in the deliberations of policy making and equally in the decision making of commoners. With the effort of the programme, a RWH Club has been set up where plumbers interact and discuss issues of RWH.

Kathmandu Metropolitan City (KMC) has installed a RWH system in the Multi-purpose Martial Arts Centre in the city. Nepal Water Supply Corporation installed a RWH system in one of its branches. The corporation has also started raising awareness among consumers about the system. Similarly, the World Wildlife Fund has installed a system in its office building. Altogether, some 200 buildings have installed the system till date.

Four demonstration sites were selected and the rainwater harvesting system was designed and installed in Tri Chandra College, Kirtipur Housing, for squatter rehabilitation, Scheer memorial hospital, and Department of Urban Development and Building Construction. The historic pond Ranipokhari, at the heart of the city, has been recharged through the rainwater harvested from the rooftop of Tri-Chandra campus buildings. At Tri-Chandra campus, Youth Red Cross circle is running a help-desk that provides counselling and demonstration services on RWH.

Publication of mass awareness materials and promotional materials including a manual on RWH in local language were published. Technical support was given to the construction of demonstration sites, individual households and various institutions interested in installation of RWH.

Various technical trainings were organised for the practicing technicians like plumbers and engineers. Training of Trainers programmes were conducted for the community members, students and technical manpower who, in-turn, organise and conduct trainings on RWH. Those trained technical manpower were absorbed in job placement for the design and installation of RWH system. Many volunteers are mobilised for RWH promotional activities.

RWHPP has been using a variety of tools to promote and disseminate information about this system. A hoarding board was placed in Kupondole locality in central Kathmandu for the purpose. An audio-visual medium has been employed. *Jalpari* (Water Fairy in Nepali), a telefilm was extremely popular in Nepal and was even nominated for the World Water Forum 2006 Film Festival in Mexico. *Jalpari* was also showcased in the World Urban Forum, Vancouver, and in the Himalaya Film Festival in the Netherlands.

The role of the media in promoting the technology and disseminating information has been encouraging. National newspapers in the country have highlighted the successful implementation of the technology in various buildings and have repeatedly presented the RWH technology as the readily available option to solve Kathmandu's water woes.

The effort of RWHPP has seen in the formation of a government-level RWH Steering Committee. The Committee initiated work to prepare RWH guidelines for urban and rural areas. The newly

drafted Urban Water Sanitation Policy has a RWH chapter in it. Following a workshop, the housing colony sector has also committed to install plants in new housing projects.

The Bank of Kathmandu, a leading private sector bank, has agreed to provide priority and facilities to loan proposals for building houses that will have RWH system.

Nepal Red Cross Society (NRCS) Kathmandu District and Lalitpur District, as well as Guthi Youth Network, after participating in a training programme on RWH system, signed an agreement for dissemination of the technology and have been promoting the technology with their door-to-door campaigns. After an orientation workshop, Rotary Club of Lalitpur Municipality has also planned to install RWH systems in 1,000 houses in Lalitpur.

On the cultural front, the ancient *Sithi Nakha* festival, which is celebrated at the beginning of monsoon every year with farmers feasting and cleaning up water sources, is being promoted as a national festival in order to spread the practice of cleaning and preserving water sources. Also, the Stone Spout Users' Association has initiated efforts to recharge groundwater. Experts also say that the Valley's geology is capable of shallow groundwater recharge through RWH and, thus, ponds that have dried up and long forgotten can be revived again.

Sustainability

If RWH is incorporated in a building design right at the beginning of construction, there is very minimal cost involved for this component. Further, RWH reduces people's reliance on groundwater and, hence, reduces risks associated with high groundwater extraction and also ensures recharge of groundwater.

Lessons Learned

These initiatives have generated several lessons as to how RWH can be popularised and replicated, and are outlined below:

- Aggressive media campaign and trained human resource is required for promotion of RWH.
- Educating consumers, housewives, teachers, children and other stakeholders is necessary for acceptance of the system.
- Necessary to establish database of RWH users.
- Networking, Collaboration and partnerships need to be strengthened to promote RWH.

Similarly, it was learnt that rainwater utilisation should be advocated at three levels:

Household Level

- Encourage citizens to harvest rainwater.

Municipal Level

- Install RWH systems in municipal and public buildings.
- Utilise rainwater in public parks and ponds.
- Mandate and promote RWH in all newly built structures through building by-laws.
- Discourage discharge of rainwater through storm-water drain where recharge is possible.
- Preserve traditional water supply systems and sources.

National Level

- Prepare land use map and conserve recharge zone.
- Introduce Differential Tariff System and promote RWH.
- Construct Infiltration dam to increase groundwater table.
- Provide subsidy or no-interest loans to install RWH systems.

Transferability

The experience in Nepal proved that the technology is quite transferable. It has become extremely popular in rural areas by virtue of its easy transferability.

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SUNGA, NEPAL

Reed-bed Wastewater Treatment System: Sunga Wastewater Treatment Plant

The Sunga Wastewater Treatment Plant Project illustrated an approach towards achieving sustainable management of wastewater and inspired the people to adopt such decentralized technology which could be managed by the community itself for the solving the ill-managed wastewater in the city. The Sunga reed-bed wastewater treatment system (RBTS) is an effective community-based wastewater management system that provides increased awareness by addressing the issue at the local level. The project has many advantages:

- **easy operation and maintenance**
- **adaptability in small areas compared to conventional system**
- **working efficiency**
- **water optimisation**
- **recycle & reuse of treated wastewater**
- **income and livelihood opportunities.**

Introduction

Part of the Madhyapur Thimi Municipality was sewered in 1995 and the collected wastewater was planned to be treated in oxidation ponds. However, due to the failure of establishment of the treatment facility, wastewater is discharged into the Hanumante River which has become highly polluted. As the river is used for irrigation, discharge of untreated wastewater has created public health risks, especially for the farmers using the polluted water for irrigation and to the consumers of the products. Rivers have vibrant eco-system and are the lifeline for humanity. The growing trends of urbanisation have significant influence on the levels of pollution in the rivers that flow through and near the urban centres. If the open draining of solid and untreated liquid wastes continues to increase, the pollution will impact the rivers' ability of self-treatment and make it unfit for any form of life and for use for any purpose.

Sunga, the project area for demonstrating the RBTS in a community-based approach, is a small settlement in the Municipality. As the local community and the Municipality had shown interest in establishing a demonstration system of managing the wastewater, Environment and Public Health Organisation (ENPHO), with the techno-financial support from Asian Development Bank (ADB), UN-HABITAT's Water for Asian Cities (WAC) Programme and WaterAid Nepal (WAN), established the system in Sunga. The Municipality provided the required land for constructing the RBTS along with the financial assistance for its Operation and Maintenance (O&M). The local community people of Sunga actively participated in the successful establishment and operation of the system.

Objectives and Strategies

The main objective of this project was to promote a simple but effective community-based wastewater treatment technology to improve the sanitation situation of Sunga and, at the same time, to demonstrate the system for treating wastewater at the community level.

In order to establish the demonstration system, community consultations were done to inform them about the system and to get their consent. Numerous community consultation meetings were conducted after which a 17-member management committee was formed for implementation of the project. A tripartite Memorandum of Understanding for the construction and operation of the RBTS was signed between the management committee, Madhyapur Thimi Municipality and ENPHO. The management committee was taken on a field visit for better understanding of the structure, operation and maintenance of the system.

Mobilisation of Resources

WAC Programme and WAN provided financial support in addition to the fund provided from ADB. As per the tripartite agreement made between ENPHO, the management committee and the Municipality, the Municipality committed to provide Rs. 50,000 annually for the O&M of the plant including remuneration (around Rs. 3,000/month) for the caretaker recruited by the committee.

Process

The community provided labour for construction while ENPHO provided technical support. On completion, the management committee took complete responsibility of O&M of the plant. The community showed great enthusiasm for the project, well demonstrated through their positive responses and willingness to support the project in all the workshops, interaction meetings. The participatory manner in which this project was implemented has led to considerable support from the community and their ownership and pride towards the project. This has been a significant reason behind the success of the treatment plant.

The treatment plant being operational, the management committee has not received any complaints from the local community. Views of the teachers and students of the local school situated close to the treatment plant also indicated that the treatment system is well accepted. Although during the very initial stages of the operation, students complained of foul odour from the plant, later such smell subsided gradually and no complaints were received from the students.

The treatment plant is now under the direct supervision of local community users and they are responsible for its continued O&M. ENPHO provided technical training to the management committee members and caretaker of the plant. In addition, a technical handbook on the O&M for the plant was also provided for the committee's operational guidance.

Results Achieved

- Area surrounding the RBTS has been transformed from a dumping site to a recreational place.
- RBTS has been established as a demonstration site to others who have been enthusiastic to build similar kind of wastewater treatment plants.
- It has been demonstrated that community can own and run a wastewater treatment plant.
- Thimi Municipality has started to develop a plan to replicate this system to other parts of the municipality owing to success of this RBTS.
- The management committee developed partnership for implementation and has fully grown into a well known institution in Kathmandu Valley.

Sustainability

The RBTS is a sustainable technology since it requires minimal O&M and the costs associated is also not high. The management committee is strong and fully committed towards managing the RBTS. Further, the community has a feeling of ownership towards the RBTS. The management committee is planning to collect connection fees from individual households for connecting the sewer line to this treatment plant.

Discussion within the committee, community beneficiaries and with other stakeholders is under way for fixing an appropriate tariff. The collected tariff from households will be deposited in the O&M fund as a reserve fund. The influence of Madhyapur Thimi Municipality is also vital in making local people pay the sewer system connection tariff.

There are multiple uses of the treated water. The treated water is helping to augment the flow with relatively clean water in the nearby river where it is being discharged at present. The committee is using some portion of treated wastewater for gardening and cleaning. Similarly, the neighbourhoods of the RBTS and the committee are holding discussions for diverting the treated water to the farmland for irrigation as well as for other agricultural purposes.

Lessons Learned

- Need of in-depth and successive consultation with the community for successful implementation of any project.
- Assurance to the community to solve future problems.
- Inclusion of all stakeholders of the community necessary to make the project successful.
- Proper understanding on O&M by the community is necessary for future success of technologies like RBTS.

Transferability

Since the RBTS has been put into operation at Sunga, it has received attention from different national and international visitors, policy makers, researchers, professionals, students and journalists, who have visited this site to observe and share experiences on community-based RBTS for replication, research and learning. The management committee and ENPHO have received positive feedback from all the visitors who have observed the Plant. Besides, these visits have helped in raising awareness of this simple technology and the role of Communities in municipal wastewater management. This system has also been able to establish itself as a demonstration site for the ADB-funded Urban and Environmental Improvement Project which is planning to establish similar treatment plants in eight Municipalities in Nepal.

Similarly, the surrounding communities have also been given an opportunity to understand the functions and benefits of the treatment plant by being able to visually observe its operation and treatment efficiency. During the handing over ceremony, there were requests from many other local communities to support the construction of additional treatment plants of a similar kind in other parts of the Municipality. These opinions and demands from the local community clearly indicated that the treatment plant is well accepted and the people have taken it positively.

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NEPAL

Kanchan Arsenic Filter: Removable Technology for Arsenic and Microbiological Contamination

The Kanchan Arsenic Filter (KAF), a household water filter, is a modest attempt by a team of researchers from Environment & Public Health Organisation (ENPHO), Massachusetts Institute of Technology (MIT) and Rural Water Supply and Sanitation Support Programme (RWSSSP) for effectively removing arsenic and pathogens and to provide a sustainable solution to the arsenic- and microbial-contamination of drinking water in Nepal. The design of KAF is optimised based on the socio-economic conditions in the southern or Terai region of Nepal where arsenic has been detected. Studies have revealed high user acceptance, financial sustainability, and excellent technical performance. Users and prominent NGOs in Nepal consider the KAF the best among all the available household arsenic filters.

Introduction

Access to safe drinking water is a basic human right. In the rural Terai region of southern Nepal, where population density is highest, safe drinking water and health services are often unavailable. It is estimated that 90% of the rural Terai population receive their drinking water supply from tube wells and these water sources are mostly arsenic and/or microbiologically contaminated. Often children are most vulnerable to these preventable water-borne diseases like diarrhoea, cholera, stunting and other ill effects. In addition, arsenic in the groundwater can cause skin diseases and cancer which exacerbate the problem of unsafe water. It is estimated that over 0.7 million people drink arsenic-contaminated water daily, apart from regular problems of pathogens. Lack of adequate awareness on water quality, water-borne diseases, health, hygiene and sanitation is a big challenge.

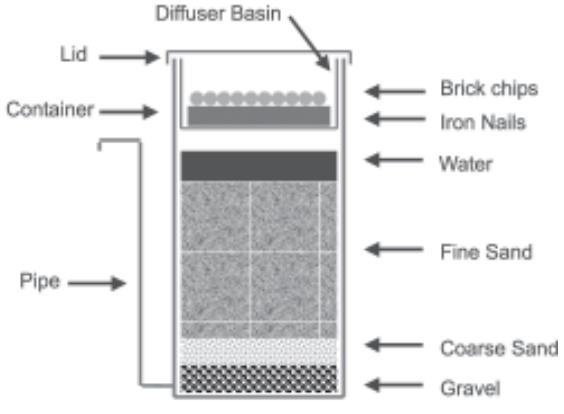
Developing Solutions

In order to provide safe drinking water and improvement in health for the people affected by arsenic and/or microbiologically contaminated drinking water in the Terai region, Environment & Public Health Organisation (ENPHO), Massachusetts Institute of Technology (MIT) and Rural Water Supply and Sanitation Support Programme (RWSSSP), conducted collaborative research to develop several arsenic mitigation options. During this period, various technologies, including Kanchan Arsenic Filters (KAF), were tested at the field level and modified to see its maximum potential. Based on several technical and social research performed on these arsenic removal technologies at the national and international level, KAF was identified and proven to be the most reliable and acceptable technology to remove arsenic together with iron, turbidity and bacteria. The team intensively worked to develop an effective implementation model based on demand-driven approach, user participatory and partnership among various stakeholders.

Kanchan™ Arsenic Filter

Kanchan™ Arsenic Filter is built on the platform of a slow sand filter, modified to include arsenic removal capability. KAF is constructed with simple materials available in the local markets of Nepal. These materials include plastic containers, PVC pipes, iron nails, brick, sand, and gravel. The construction of the filter can be done by locally trained technicians using simple tools.

Cross-Section of the Kanchan™ Arsenic Filter (KAF) Showing Major Components



In KAF, arsenic is removed by adsorption onto the surface of rusted iron nails (i.e. ferric hydroxide). Pathogens such as bacteria are removed mostly by physical straining provided by the fine sand layer, by attachment to previously removed particles, and by biological predation occurring in the top few centimetres of the sand. Over the course of the

project, four different versions of the KAF have been designed. The latest Gem505 KAF was designed in March 2004 with a design flow rate of 15 L/hr and at a cost of around US$ 20.

Objectives and Strategies

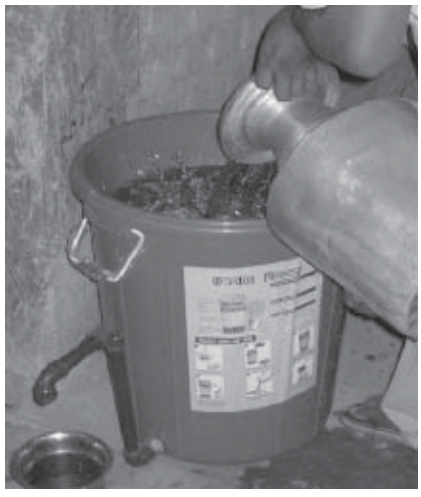
The main objective of KAF implementation project is to promote KAF as a sustainable technology in the arsenic-affected communities of Terai. The specific objectives were to:

- Transfer the technology at local level by building capacity of local entrepreneurs and local stakeholders.
- Formulate effective implementation model for quick and sustainable promotion of KAF.
- Raise awareness among the villagers on arsenic and KAF.
- Conduct monitoring and evaluation of filter performance and user acceptance to improve the design.

Mobilisation of Resources

The team secured funding to support the implementation efforts from:

- World Bank Development Marketplace, 2003 (US$115,000 grant),
- Global Water Trust, 2004 (US$ 8,700),
- World Bank/Poverty Alleviation Fund (PAF) Nepal Development Marketplace, 2005 (US$ 20,000 grant),
- Simavi Foundation, 2005 (US$ 70,000 grant),
- US Environment Protection Agency P3 Competition, 2005 (US$ 10,000 award) ,
- UN-HABITAT, Water for Asian Cities Programme, 2006 (US$ 6,000 grant),

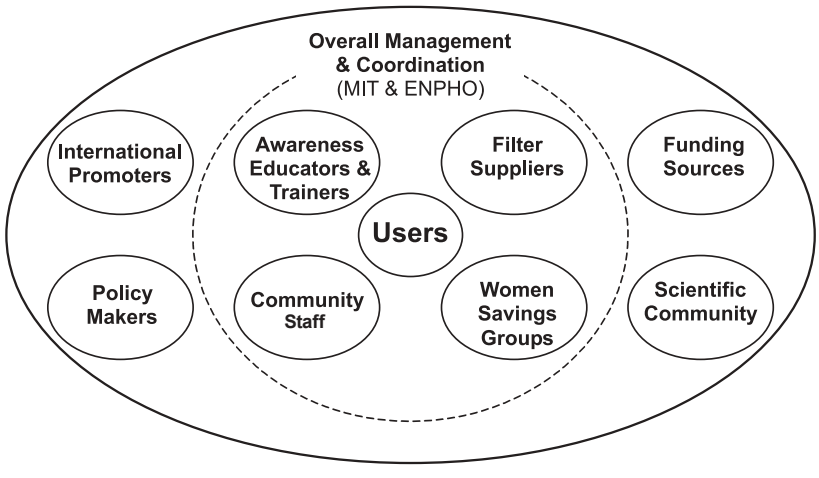


- St. Andrews Prize for the Environment, 2006 (US$ 10,000 award),
- Department of Water Supply and Sewerage/ UNICEF and Nepal Red Cross Society (Distribution of 4,000 KAF).

Users were located at the centre of the implementation model. Four key factors directly effect the adoption and sustained use of the KAF among the users. First, users gained awareness of the water contamination problems through education and training activities conducted by Community-based Organisations (CBOs), and local government authorities. The education and awareness activities included village-level small group discussions, school education programmes, street dramas, woman-to-woman household-level trainings, as well as mass media campaigns such as radio and distribution of IEC materials. Then the users will make a decision whether to purchase KAF or not.

Process

KAF Implementation Model



Once the users are informed and motivated, then they can visit their local KAF entrepreneurs to purchase filters. Twenty entrepreneurs across the country have been trained yearly (2004, 2005, and 2006) by the team on filter construction, installation, promotion, sales, distribution, and general business management. The team also coordinates with parts suppliers such as the Gem factory and pipes & iron nails depots to optimise the supply chain and pricing.

In the initial stages of the implementation activities (2003 and 2004), a 75% cash subsidy on the cost of the filters was given by donors in order to quickly spread the filter among the communities. As awareness increased and demand grew (2005 and 2006), this subsidy was reduced and changed to 50% materials subsidy. To reach those who cannot pay in cash at once, the team partnered with village women savings groups to develop a micro-financing scheme. The team also coordinated with regional and local governments to provide additional subsidy to the poorest people.

To ensure proper KAF O&M in the users' households, field staff and village women leaders regularly visit KAF households to discuss with the users, reinforce health messages and proper O&M procedures, and to record users' feedback. In addition to the above activities, the team coordinates other supportive functions. The team actively collaborates with the National Arsenic Steering Committee (NASC), Department of Water Supply and Sewerage, local universities, and other key stakeholders to plan and guide Nepal's policy in Arsenic Mitigation Initiative. NASC has endorsed KAF as only household-level arsenic mitigation options in Nepal. A KAF reference centre is established at ENPHO to provide the general public information related to the KAF technology and implementation. Project information is also disseminated to the international development community through conferences, website, seminars, and through the WHO Household Drinking Water Treatment and Safe Storage Network.

Results Achieved

As of September 2006, over 4,700 KAFs are in operation across Nepal, serving approximately 30,000 to 35,000 people.

KAF showed a high arsenic, iron and bacterial removal capacity.

Social evaluation of KAF showed high user acceptance, satisfaction and sustained use. Of the 1,074 respondents who have first started using the filter at least one year ago, 83% reported that they continue to use the filter everyday. Most of the users liked the taste and appearance of filtered water and considered KAF simple to use and maintain.

Sustainability

This KAF project is sustainable in two ways:

- The technology (simple, low-cost, constructed by local materials), and
- Implementation model (demand-driven approach, based on social entrepreneur business model and partnerships among various stakeholders).

Sustainable Technology

- As opposed to many technologies designed in first-world laboratories far removed from the users, the KAF was designed onsite in arsenic and pathogen-affected villages. Technological design was placed within social, economical, and political constraints of Nepal.
- It is manufactured by local labour using materials available in rural Nepal.
- The filter operation and maintenance is easy, suitable for the often uneducated rural villagers.
- The filtered water tastes and looks significantly better than untreated water (according to many users), so users will continue to use the filter.

Sustainable Implementation

- Local entrepreneurs were trained to manufacture KAF and provide services (installation, maintenance, testing, etc) at business locations that are easily accessible to most arsenic-affected villages.
- Information about water contamination, treatment options, KAF, and the cost were provided to villagers/users through workshops so that they can be individually informed to protect health.
- The capacity of existing local authorities like Village Development Committee (VDC) and health posts to support strengthening of safe water initiatives, rather than relying on the often ineffective remote central authority and/or top-down distribution.

- The implementation scheme focused on the use of existing and functioning distribution networks and infrastructure rather than creating new networks/infrastructure.
- For entrepreneurs to be financially sustainable, their monthly profit (calculated by multiplying unit sales by margin per unit) must be greater than their monthly fixed cost. In this case, their fixed cost is minimal because these entrepreneurs are well-established local NGOs and community clubs that have their own financial support for their premises and staff. Depending on the KAF demand, they can easily hire temporary staff to increase their filter manufacturing capacity on the need basis.

Lessons Learned during the implementation of KAF

- Difficulty in quality control of the filter when people/ organisations build the filter without informing to or receiving proper training from the team.
- Many of the KAF entrepreneurs like CBOs traditionally depend on donor funding to run any activities. These entrepreneurs do not comprehend that KAF promotion and sales can be a financially sound and sustainable business idea.
- There is no government approval mechanism in Nepal to certify KAF. As a result, local users are often confused and unconvinced, leading to slow technology dissemination.
- Need to demonstrate the long-term sustainability of this approach when external funding dries up, and to develop a long-term scheme so that the poor can have easy access to the KAF.
- The KAF dissemination model to equip local entrepreneurs with skills, and the users with knowledge and tools to solve their own problems, may also be a solution for other arsenic-affected countries.

Transferability

The success of the project is recognised by various awards, including the 2005 Wall Street Journal Technology Innovation Award — Environment Category, 2006 St. Andrews Prize for the Environment — 2nd Prize, and the 2006 World Water Forum Kyoto World Water Grand Prize — Top 10 finalists.

UN-HABITAT/UNICEF/WHO has, recently, collaborated with the Government of Nepal to commence National-level arsenic mitigation programme. During this programme, about 15,000 KAF will be distributed to provide safe drinking water for the households using arsenic-contaminated water. KAF distribution will be done following the implementation model presented above. This is a big achievement and example of transferability of such approaches.

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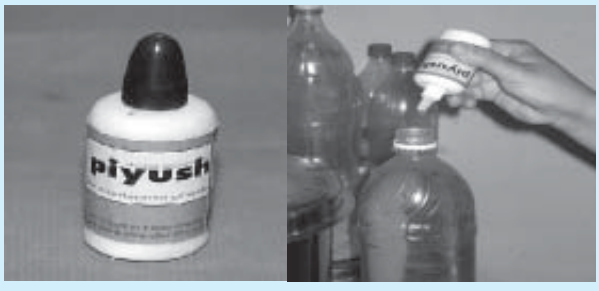
Box 3.1: Household Level Water Treatment Systems, Nepal

The Municipal water supplies in Nepal are rarely chlorinated to an adequate level and bacterial contamination in tap water is common, resulting in a high incidence of water-borne diseases. Common practices are simply to cover the water vessels to protect the water from contamination. Boiling, filtering and using chemical disinfectant are the commonly used techniques in the households. These treatment systems have limitations and only a small percentage of the population are using them. Raising awareness of the issues and promoting household water treatment options or point-of-use drinking water treatment (POU) can play a vital role in ensuring access to safe and clean water.

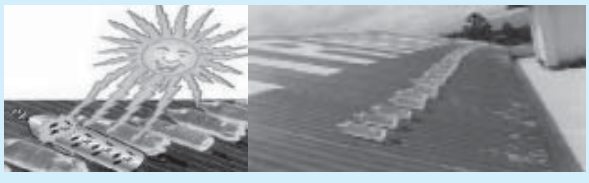
The Environment and Public Health Organisation (ENPHO), a Non-governmental and Non-profit-making Research organisation, one of UN-HABITAT's partners, has been promoting, over a decade, three different kinds of point-of-use drinking water treatment (POU) options, namely,

- 0.5 % chlorine solution, with brand name of 'Piyush';
- Solar water disinfection (SODIS); and
- Kanchan Arsenic Filter (KAF), an innovative drinking water device for household water treatment.

Piyush is a 0.5% chlorine solution, (a small-scale chlorination), specially packed in locally made 60 millilitre dropper bottles. Only three drops are required to add to a litre of water which, after shaking and allowing to stand for 30 minutes, brings the FRC content between 0.2 and 0.5 milligram per litre which is within the recommended WHO drinking water guidelines. Piyush is simple to use at the household level; costs little (only US$ 0.2 per bottle), reliable; easily accessible; no adverse effect on human health and saves energy.



Solar water disinfection (SODIS), another water treatment system at the household level, is a simple, low-cost and effective technology for disinfecting small quantities of drinking water by using solar energy to destroy pathogenic microorganisms. Clear PET bottles filled with water are exposed to sunlight for improving the quality of drinking water.



Kanchan Arsenic Filter (KAF), an innovative household drinking water treatment device, is discussed in detail as above.

All three of these water treatment options have great potential, widely used, socially acceptable and more so locally available. These applications can be replicable for promotion and dissemination in other regions since problems with quality of water is almost similar in the developing world. There is also opportunity for job creation at local level by producing and marketing the product locally, especially 0.5 % chlorine solution and Kanchan Arsenic Filter.

UN-HABITAT has entered into a partnership with Centre for Affordable Water and Sanitation Technology (CAWST) for promotion of these technologies in Mekong Region. Similarly, Water for Asian Cities Programme, UN-HABITAT Nepal, developed partnership with Coca Cola Company to build local capacity and nation-wide promotion of POU in Nepal. UN-HABITAT has also collaborated with the Government of Nepal, UNICEF, and WHO to commence National Level Arsenic Mitigation programme to support in building local capacity.

28

LILOAN, THE PHILIPPINES

Decentralised Wastewater Management: Big Results from Small Solutions

Liloan, a costal town in The Philippines is essentially an agricultural Municipality in the province of Cebu. Tourism contributes significantly to the town's economy. When water pollution due to poor sanitation threatened the tourism industry, the Mayor of the town and the municipal council sought the assistance of ADB and the Department of Environment and Natural Resources (DENR) to help the town in eradicating the problem. Through a pilot and demonstration activity and a grant from ADB's Cooperation Fund for the Water Sector, the Municipality established a decentralised wastewater treatment facility (WTF) using local technology. The results were outstanding and financially promising. The coastal waters have become clearer and contamination has completely receded. The success of the project has drawn the attention of the neighbouring towns.

Problem, Process and Resources

The Liloan Municipality has been facing the challenges related to sanitation such as overflowing of septic tanks, creating water contamination, unsanitary conditions and health risk. This situation worsened in 2004 when waste from public market's septic tank directly discharged into Liloan's coastal waters. The water contamination caused sharp decline in the tourism industry and increase in water-borne diseases among tourists and locals. The Municipality adopted a decentralised Wastewater Treatment Facility (WTF) that uses a locally-made technology called "Rotating Biological Contactor", which was the first of its kind implemented in Northern Cebu. It treats 60-100 cubic metres of wastewater a day, has radical impact on health, sanitation, and tourism situation and facilitate as a cost-effective solution to address the sanitation problem.

The facility was located in the middle of the town centre. Setting up adequate power supply for such a technical facility in such location was a constraint. Another major barrier was the town's negative attitude towards pollution control. In the implementation of the project, Communities were involved at every step. As they understood their gains, there has been a dramatic shift among the people from "I don't care attitude" to "I care and I pay" attitude.

Asian Development Bank (ADB) provided funding to construct the WTF and the DENR — the technical assistance. Consumers were assured of reliable quality water supply at their doorstep for which they were willing to pay. A differential water tariff was provided – a lower tariff for subsistence living needs and rates are higher as the consumption increases. The Municipality identified cost-recovery schemes such as recycling, selling treated wastewater for use in flushing toilets or for gardening. The financial results are promising.

A Cooperative was established with the Liloan market vendors and provided training to them in the operation and maintenance (O&M) of the WTF, and handed over the management of the facility to them. They were also encouraged to operate the communal toilets at the public market. Measures were taken to build consensus among local officials, residents and other stakeholders as they were immensely involved in the project. Feasibility studies were carried out and right technical experts identified as specialists and facilitators throughout the entire process.

Results Achieved and Sustainability

The results were exemplary. User charges for the WTF, the public toilets and other cost-recovery mechanisms generated revenue more than enough to cover the O&M costs of the WTF, and a considerable amount was saved by the Cooperative. The community was enthusiastic about the WTF project. Just a few months after its operation, the coastal waters have become clearer and contamination has completely receded.

Lessons Learned and Transferability

Value of awareness and understanding:

On the political side, it is important to convince the local council about the validity of the project strategy. The people, too, should understand how sanitation improves their health, livelihood, and overall quality of life; and, thereby, can rely on their cooperation during project implementation.

Decentralised WTF work wonders:

It is important to conduct clean-up drives as well as to prompt the industries, subdivisions, and the commercial establishments to have their own sanitation facilities if they are located too far away from the decentralised WTF.

Keep ends to sustain the means:

It is necessary to keep WTF in full operation and its working order with perfect cost-recovery.

The success of the project drew attention of several community representatives from neighbouring towns. This local action which is cost-effective and sustainable can be replicated in other towns under similar circumstances.

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SINGAPORE

Technology Turns Water Weakness into Strength

Prior to its independence in 1965, Singapore was water-dependent on Malaysia. Singapore's heavy investments in the water sector with innovative interventions, after it became an independent nation, have made the country self-sufficient. Singapore is no longer importing its water from Malaysia. The internationally acclaimed Public Utilities Board, Singapore's Water Authority, has been highly successful in combining frontline technology with demand management. The NE Water, produced from the recycling of the used-water and supplied as drinking water in bottles, has not only gained wide support and acceptance of the Singaporeans, but it has also kept the unaccounted-for water low. A desalination plant is capable of producing daily potable water at 46 U.S. cents a litre to Singapore's four million citizens. The Prime Minister of Singapore believes that the island country's initial water dependency on mainland Malaysia was a blessing in disguise that it helped to turn the "vulnerability into strength."

Background

Singapore, the tiny island nation of 700 square kilometres, imports nearly half of its daily consumption of 1.14 billion litres of water a day from reservoirs and rivers in Malaysia's Johor State, under agreements signed in 1961 and 1962 when Singapore was still a part of the Malay Federation. Under the agreements, Singapore is allowed to draw 1,277 million litres daily from rivers in Johor for a price of less than 1 cent per 1,000 gallons (3,800 litres) until 2011. Two other agreements signed during this period allow Singapore to use up to 461 acres of land in Johor as catchment areas for 99 years. All this water is pumped into Singapore through three huge pipelines across the two-kilometre causeway that separates the two countries.

After Singapore became an independent nation in August 1965, the island Republic felt vulnerable enough to register the agreements at the United Nations Charter Secretariat Office in June 1966. Acrimonious debates between the neighbours on the renegotiation of these agreements continued — while Malaysians demanded for increased prices for their water, Singaporeans wanted guaranteed access to the water for an indefinite period.

The country also lacks land area for more reservoirs. It has separate drainage and sewerage systems that safely drain water into existing local reservoirs in catchment areas that already cover half the island.

Objectives and Strategies

To achieve self-sufficiency in drinking water for the citizens of Singapore by adopting appropriate measures to turn the weakness into strength.

Keeping in view the limitations and the weakness that persisted in respect of drinking water for millions of its population, Singapore made innovative interventions to promote drinking water by recycling the used water and, thereby, keeping the unaccounted-for water low, desalination of the seawater and efforts to use and manage water wisely. Singapore's Water Authority, viz. Public Utilities Board, combined the front line technology with demand management.

Process

The drinking water, called NE Water, was produced from recycling of the used water. The NE Water had been consistently distributed as bottled water to the public for sampling, especially at major public events. The NE Water became a popular brand with people's acceptance.

The desalination plant was designed and built by a local water treatment company, Hyflux, and features 'reverse osmosis' technology in which dissolved salts in seawater are extracted by forcing the water through membranes with microscopic pores. The "Desal H2O", produced by the plant, was a dynamic and vibrant part of Singapore's water industry.

Resources

Singapore has invested heavily on water facilities in making the country as self-sufficient as possible. US$ 119 million was invested for the desalination plant which is capable of producing 114 million litres of potable water a day. The Government has outsourced 2.7 billion dollars worth of water infrastructure projects and another 900 hundred million dollars to improve the water services. The experience gained from these projects gave Singapore companies a competitive edge in the global market.

Results Achieved

Singapore announced a breakthrough when the country's water authority, the Public Utilities Board (PUB), was able to collect all used water (in a country which is 100 percent sewered) to produce NE Water – a popular brand of bottled drinking water. There are three plants producing 76 million litres of NE Water. The country rolled out its five millionth bottle, a testimony to the cleanliness with which the country's drains are maintained since they flow back into the reservoirs — the main source of drinking water. The NE Water has gained the wide support and acceptance of the citizens of Singapore. The desalination plant produces daily 114 million litres of potable water to serve 4 millions of Singapore population at 46 US cents a litre. The water industry in Singapore is a dynamic and vibrant part of its economy.

Sustainability and Transferability

Singapore showcased its expertise in water management and purification technologies to 600 delegates from different parts of the world, where Hyflux has already built five water recycling plants. Valuable praise came the Minister for Water and Electricity from the desert country of Saudi Arabia, who said that Singapore's achievements lay in combining frontline technology with demand management. The secret behind Singapore's successful water policy included "keeping unaccounted-for water low, water pricing to reflect its scarcity value and encouraging everyone, be it households, communities or the industries, to use and manage water wisely."

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QATAR

Geographic Information Systems for Improved Infrastructure Services

Qatar, a country of 522,000 people located in the west coast of the Arabian Gulf, is the first country to implement a comprehensive and integrated nationwide Geographic Information System (GIS) for improved infrastructure services and waste disposal mechanism.

Background

Qatar is an independent country situated halfway along the west coast of the Arabian Gulf. The territory includes a peninsula covering an area of approximately 11,500 sq.km. and a number of islands around it.

Qatar, which was a desert country with a small pearl fishing industry, experienced rapid and unprecedented growth during the past three decades after the discovery of oil. Several hundred kilometres of roads, drainage networks, telephone lines, power and water networks, etc. have been built accompanied by an explosion in new real estate developments. The Government agencies in the country were unable to keep up-to-date records of this rapid and large-scale development. The lack of information together with inadequate inter-agency coordination led to inefficient management of resources. Nineteen Government agencies involved in specialised tasks produced and maintained their own paper-based maps at different scales to store and display information relevant to them. In the face of growing demands and shrinking budgets, the Government could not afford such large-scale duplication efforts and wastage of resources.

The Environment Department of the State of Qatar is endeavouring not just in keeping the environment clean and healthy but also for its sustainability. Amongst various environmental issues that the Department is tackling and monitoring, the management of waste disposal sites in the country is one of the prime concerns. More important still is the task of locating an ideal site for waste disposal. Selecting an ideal site for waste disposal, particularly the hazardous waste, is a cumbersome task. Many factors — like the geology and the structure of the bedrock, groundwater regime, development and settlements, agricultural farms and fields, fragile geographical features etc., have to be taken into consideration.

Innovative Interventions and the Process

The Government realised the need for an innovative means of tapping and managing vast information resources that facilitate more efficient decision-making required to sustain the developments and to maintain the newly built infrastructure. This aspect, together with the consideration that eighty percent of this vast information was geographically related, prompted the Government to opt for implementation of a fully integrated Geographic Information System (GIS) programme for the country. To realise this aim, the National GIS Steering Committee and the Center for GIS (CGIS) were established in the year 1990 for this purpose.

The National GIS Steering Committee was entrusted with authority as well as power to implement GIS policies among Government agencies for fostering inter-agency coordination and ensuring common national standards on data/information, software and hardware. The primary tasks of the CGIS were the maintenance of online and up-to-date high resolution Digital Topographic Database, training, support in GIS implementation and development of associated standards and applications.

The CGIS's state-of-the-art high-resolution, online and up-to-date Digital Topographic Database provides a common base map for all the GIS user agencies in Qatar through a high speed, fibre optic network named GISNet. Through common data standards and inter-agency coordination, it

has been ensured that there is only one source agency for any given type of information, thus eliminating data redundancy.

Results Achieved

The benefits of GIS implementation have gone far beyond the set goals and objectives. The GIS provided analytical and modelling capabilities to various agencies. To illustrate, the sewer modelling which required an outside consultant, is done in-house with the help of custom applications utilising digital elevation model. The citizens now reap the rewards of having street names and numbers for the first time in the country's history, so that emergency services can easily get to the right location using Electronic Place Finder. The ability to view superimposed thematic layers at desktop has greatly enhanced physical and infrastructure planning capability. The Master Plan for the country for the year 2020 has been completely prepared using GIS, thus making it dynamic, flexible and easy to update, monitor and implement. The transportation planning model that predicts the impact of land use changes on road traffic has a GIS interface, a unique feature, which is probably one of its kind in the world.

The Environment Department has turned to GIS to construct a "Hydro-Geo Environmental Map" depicting and categorising the suitability of areas by taking into consideration the factors relating to environmental degradation and waste disposal systems. Such a map is generated by taking into account all the possible constraints, creating thematic maps of these constraints and then superposing these thematic maps to evolve respective synoptic maps; and finally integrating all the synoptic maps into the final Hydro-Geo Environmental Map. It shall be in best of the practices to adopt this resultant map in deciding the location and appropriate site selection for waste disposal in the country.

With the online and up-to-date data from various agencies through GISNet and with the help of customised GIS applications developed by the CGIS, the right information at the right time is available for the decision makers at their finger tips.

These are but a few of numerous benefits the country has been enjoying with GIS implementation.

Sustainability and Transferability

Qatar is the first country to implement a comprehensive and integrated nationwide GIS, internationally recognised as one of the finest GIS implementations in the world. Many agencies are presently updating spatial features directly into the digital database thus completely eliminating the need for cumbersome paper map updating. Using GIS tools, consistency and uniformity in policies, standards and regulations for the whole of Qatar has been achieved. The Government saves money in delivering services like sewerage, electricity and water through linked up-to-date databases.

SECTION IV

Community-managed Initiatives and Awareness

Community-managed Initiatives and Awareness

The present reformative perspective advocates that water is a scarce resource and must be managed locally as a socio-economic good. The present target-based supply-driven approach pays little attention to the realities. Implementation of a participatory and demand-driven approach is expected to ensure the desired level of service to the people and can recover the capital and O&M costs. Full recovery of these costs is expected to generate a sense of ownership and ensure financial viability and sustainability.

Community Managed Water Supply and Sanitation initiatives (CMWSS) play a vital role in facilitating pro-poor water and sanitation governance. CMWSS enables a demand-responsive approach based on community empowerment. This would ensure community's full participation in the project — in planning, design, implementation, control of finances and taking up total responsibility of Operations and Maintenance (O&M). This Section presents 12 such proven practices from Bangladesh, India, Iraq, Japan, Lao PDR, Nepal, Pakistan, Papua New Guinea, the Philippines and Ukraine.

Bangladesh: water was successfully supplied to the urban poor of the city of Dhaka with the involvement of the user groups in the planning and implementation of the project. The user groups were made responsible for managing the water points and to secure payments of water bills, which generated a sense of community ownership and thereby ensured sustainability.

India: the community-managed water supply initiative of UN-HABITAT supported by ADB in the cities of Indore, Gwalior and Jabalpur helped in providing water connections to the slums at affordable costs. In Orissa, Gram Vikas, an NGO, provided hundred per cent pro-poor water supply and sanitation coverage to over 200 villages by adopting a social inclusion approach which empowered the marginalised groups, especially the women. In Pune, Maharashtra, community participation together with the changed role of the Pune Municipal Corporation towards service delivery as a facilitator instead of a provider, resulted in providing community sanitation blocks to all the slums of the city.

Japan: the water utility management practices adopted in Yokohama with customer awareness resulted in access to city water for every citizen and also contributed reduction in unaccounted-for water.

Iraq: the community-based neighbourhood rehabilitation programme augmented municipal water supply, sewage network and other infrastructure through a participatory process.

Lao PDR: a community-based fast-track water supply and sanitation project demonstrated the impact of a 'Community-Water Utility' partnership in improving the water and sanitation services as well as enhancing the community, utility and local authorities capacities.

Nepal: the Samriddha Aawas, a first of its kind project is a unique example of adopting community-based water resource management for promoting the eco-friendly community with the provisions of eco-friendly technologies for sustainable water supply, sanitation, waste and wastewater management.

Pakistan: the Orangi Pilot Project for small urban centres in Karachi is unique in many ways. This model acknowledged the faith in the abilty of people to address their own problems.

Papua New Guinea: a pro-poor partnership initiative among the stakeholders raised awareness among the community and improved the water and sanitation services.

The Philippines: institutions that provide technical and financial support for the effective management of water supply and sanitation systems along with community-managed approaches promote the safe drinking water supply to the southern province of Agusan Del Sur.

Ukraine: campaigning and creating awareness among the people, especially the women, promoted effective water use and management as well as facilitated in bringing changes in the national water policy.

Community-managed Water Supply and Sanitation initiatives, thus, improve the lives of the urban poor and the disadvantaged by connecting them to safe drinking water and sanitation services through affordable and appropriate means and ensure users' comfort with the desired level of satisfaction.

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DHAKA, BANGLADESH

Community Interventions Ensuring Sustainability

Water supply for the urban poor of Dhaka City, especially the slum dwellers, has been inadequate and very poor. A pilot project was initiated by Dushtha Shasthya Kendra (DSK), an NGO in partnership with the Dhaka Water Supply and Sewerage Authority (DWASA) to establish two water points in select communities, in 1992 and 1994. Community groups were organised to manage the water points and secure payments of water bills. The community was satisfied with the service and the DSK recovered its investment cost. The success was attributed to organising the user groups involved in the planning and implementation of the project and responsible for managing the water points. This generated a sense of community ownership and thereby ensured sustainability.

Background

Water supply for the urban poor of Dhaka City, especially the slum dwellers, is problematic. The obstacles are both institutional and technical. At the institutional level, the Dhaka Water Supply and Sewerage Authority (DWASA), the agency that provides water supply and sewerage services in the city, only provides connections to landowners. Slum dwellers are, therefore, automatically outside of the service coverage. At the technical level, Dhaka does not have continuous water supply. Households must therefore construct storage tanks to store collected water when it is available (often at night). Slum dwellers cannot afford this infrastructure.

Process

As a pilot project, Dushtha Shasthya Kendra (DSK), a Non-governmental Organisation (NGO) approached DWASA for connections to the piped water system and served as guarantor for the security deposit and regular payment of bills on behalf of the community, for which DWASA has agreed. The pilot project involved establishing two water points in selected communities, the first in 1992 and the second in 1994. Community groups were organised to manage the water points and secure payment of water bills.

Results Achieved

The second water point succeeded tremendously. The community was satisfied with the service. DWASA bills were paid regularly, and DSK recovered its investment cost.

Sustainability

DSK attributes the success of the second water point to the fact that the user groups were organised, oriented to assume the responsibility of managing the water point, and involved in the planning and implementation stages of the project. This generated a sense of community ownership, thereby ensuring sustainability.

Transferability

Encouraged by this success, several development institutions collaborated to further test the approach and develop a replicable model of sustainable water supply for the urban poor. Among these were UNDP-World Bank Water and Sanitation Programme, WaterAid, UNICEF and the Swiss Agency for Development Cooperation. The project has been replicated and, approximately, 150 water points have been constructed servicing 17,500 families covering 110,000 people.

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MADHYA PRADESH, INDIA

Community-managed Pro-poor Demand-Responsive Initiatives

The Community-managed Water Supply Scheme (CMWSS) was initiated with a vision to demonstrate that it is possible to quickly improve the lives of the urban poor and the disadvantaged by connecting them to safe drinking water. The end-users would not have to travel long distances or waste time in queuing for water. This initiative had a pro-poor approach and the cost of construction of the system was met upfront from the revolving fund especially created for the project implementation.

The project was taken up in the cities of Gwalior, Jabalpur and Indore of Madhya Pradesh targeting 1,200, 800 and 1,200 households respectively. The projects were implemented in partnership with UN-HABITAT, the Municipal Corporation (MC) and the community represented by Community Water and Sanitation Committee (CWASC) in Gwalior and Jabalpur, whereas it was implemented in Indore in partnership with UN-HABITAT, the District Urban Development Agency (DUDA) and CWASC.

The approach waived the upfront payment of connection charges and instead facilitated easy installments. The schemes were commissioned in all the three cities. The community's financial management improved remarkably through the capacity building. The initiative also enhanced the capacity of the MC, the local community and other stakeholders to take up the projects on community participation. This project has proven prospects for managing sustainable drinking water supply at affordable costs.

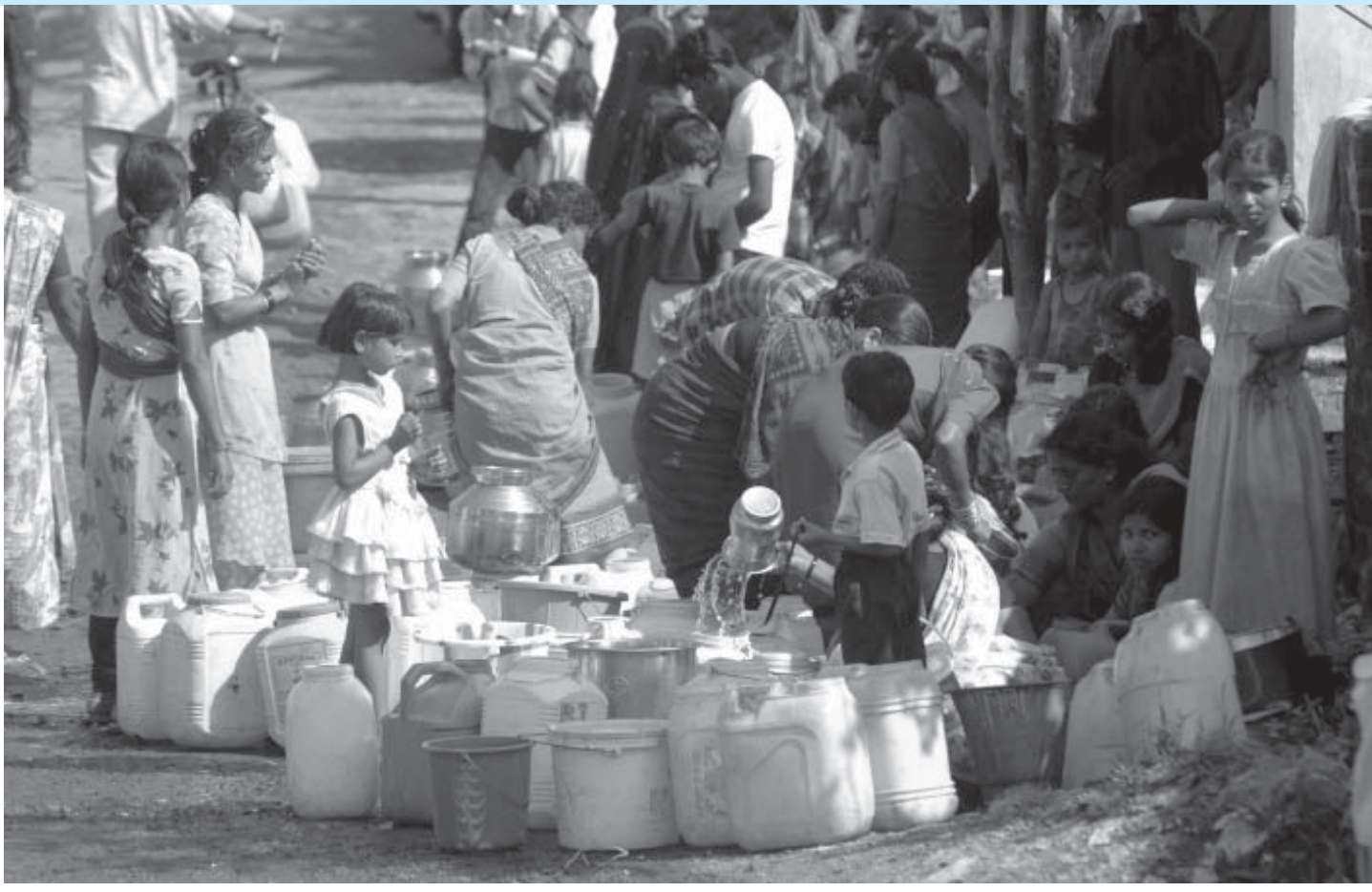
Situation before the initiative began

With rapid urban development, the gap between demand and supply of water in urban areas is widening, imposing stress on the basic infrastructure facilities of the local bodies, which often fails to address the growing demand. The poverty pockets in the cities usually do not have sustainable water supply, and augmentation of water supply for the poor usually do not figure in the priority list of the urban civic bodies.

The notified slum of Ramaji Ka Pura, Islampura and Subhash Nagar are situated in a hilly terrain of Ward No. 1 of Gwalior city having 6,000 households almost totally below the poverty line. Water was supplied by MC through direct pumping with the time schedule for supply to this area during the night between 2 am to 4 am. These odd hours of water supply kept the people awake almost the whole night round. Besides this, around 1,500 households located at relatively higher reaches of the hilly terrain did not get water at all. They, therefore, purchased water from the households located in the lower reaches approximately @ Rs. 100/- per month.

The notified slum of Bagra Dafai, located in Guarighat Ward of Municipal Corporation of Jabalpur, is having more than 1,200 households almost totally below the poverty line. The locality is being supplied water free from three tube wells of the municipal corporation which are supplying water to public stand posts. There is no piped water supply system in this locality. People queue up for substantial period in the morning, when the tube wells are operated, fill up water in buckets for their houses. On account of disputes regarding water allocation amongst the residents, around 30 to 40 First Information Reports (FIRs) have been filed in the police station in the past. The electricity billing for each tube well is approximately Rs. 25,000 per month (US$ 556) which is borne by the Municipal Corporation of Jabalpur (MCJ). To make matters worse the underground water supply in the area is having excessive fluoride and does not conform to the standards for safe drinking water. The households are, however, drinking this water due to lack of any other alternative source.

The notified slum of Shiv Nagar, Shahin Nagar, Pawan Putra Nagar, Kamal Nagar and Chowdhary Park Colony are situated in Ward No. 64 of Indore city having 1,200 households almost below poverty line. Presently, there are no dug wells or handpumps available in the locality and the households are dependent on private tube well owners for their water requirements. The poor also



fetch water from nearby Lakhani factory, which is located at a distance of 3 kms from the colony. During summer, people get water from the tankers of Indore Municipal Corporation and in other months they buy it from private tube wells.

Objectives and Strategies

The objective was to initiate a demand-responsive approach, full ownership of the assets by the community, responsibility of O&M and loan recovery from the community.

The scheme was undertaken in the participatory mode involving the MC/ DUDA and the community. The community was converted into a legal entity to carry out the responsibilities of planning, design, implementation, operation, maintenance and management of the CMWSS. The MC/DUDA entered into a MoU with CWASC for institutionalisation of arrangements.

The priority of CMWSS was to provide water quickly to improve the lives of the urban poor and the disadvantaged by connecting them to safe drinking water. It is expected that the users do not have to travel long distances or waste time in queuing up for water. The consumers will also be assured of continuous service or, if not continuous, on a regular basis (same time everyday) and provided with enough water to cover their daily needs, which would facilitate proper housekeeping. Providing water to those living on upper reaches of the hilly area was the immediate task.

Mobilisation of Resources

A Revolving Water Fund (RWF) has been created with the fund provided by UN-HABITAT under the Water for Asian Cities programme to facilitate implementation of this initiative. The Revolving Fund is being managed by the MCs /DUDA. The community was provided a loan equal to the capital cost of the scheme from the fund to meet the infrastructure development cost, which is being paid back by the community to the MC/ DUDA in installments.

The poverty pockets were selected after series of stakeholder consultation. The body of CWASC has adequate representation of women. The planning and design of scheme was done based on affordability and technical feasibility by the CWASC.

Process

In Gwalior, the scheme involved supply of treated water through construction of a ground level sump, pumping water from the sump to a ground level reservoir constructed at higher level in the area and supplying water to the consumers through gravity by a network of pipelines.

In Jabalpur, the water is being supplied from an overhead of the existing water supply scheme of MCJ. Under this project, only the distribution line has been laid. In Indore, this project involved construction of the elevated reservoir and laying of pipeline.

The training activities on record-keeping, procurement & contracting procedures, and O&M were conducted for the CWASC.

Results Achieved

Addressing all the concerns and unheard voices by consultative process with community proved an effective tool for participation of community. The CWASC could work as a participatory institutional device for target-oriented association of community.

The implementation of scheme in the participatory mode is proving that, even the poor in the community are willing to pay for the basic service. Another outcome is the demonstration of workable partnership among local government and community, setting the ground for scaling up/ ensuring provision of other civic facilities. Such partnerships are capable of recognising and addressing local opportunities and constraints.

The involvement of community in O&M of the scheme will relieve the human resources of MC of this work and they will be available for other works. The participatory decision making in the CWASC could resolve the conflicting views and synergise the opinions in forming a common approach in addressing the common problems.

With the implementation of CMWSS, the health conditions of people including women and children, are improving as they started getting quality water. The initiative in the process of project implementation was able to establish better coordination and integration between community members, CWASC, and MC/DUDA. In a way, the initiative improved the capacity of MC/DUDA in taking up community-based projects. It has brought visible changes in people's attitudes, behavior and in the respective roles of women and men in meeting their water needs.

Sustainability

As it is evident, the poor are unable to get the piped water supply in their homes on account of high connection charges which have to be paid at the start to the MC. Under CMWSS, a pro-poor approach has been adopted for the residents of slums for ensuring economic sustainability of the scheme. After extensive consultation with the community, it has been agreed in Gwalior that each member of the community would pay the connection charges at easy installments of Rs. 100 per month for seven and a half months. User charges of Rs. 80 per month would be charged as per the normal prevailing rate in the municipal area. In Jabalpur, the connection charges and user charges are being paid in the form of lump sum payment of Rs. 100 per month (for 36 months) and monthly user charges afterwards as per MCs prevailing rates. In Indore, the connection charges will be paid in 5 installments of Rs. 200 each. User charges of Rs. 60 per month will be paid in addition to the monthly connection charges.

The residents will also have the flexibility of weekly or fortnightly payments. Fixed installments have been proposed as it does not appear to be practically feasible to meter the consumption of each household in this below poverty line area. The entire capital investment would be recovered in 32 months in Gwalior, 46 months in Indore and 36 months in Jabalpur for executing a similar piped water supply scheme.

On completion of the payback period, the CWASC may resolve to hand over the scheme to the MC for operation and maintenance leading to ultimate integration with Municipal supply with the residents only paying MC for the water charges as per the prevailing rate. The initiative was successful in leveraging of resources from community including cost recovery through pro-poor user charges and pay back of loans taken up from revolving fund to meet cost of capital works upfront. It is sustainable as the men and women are equally involved and due consideration was given to community's attitudes, behaviour patterns and heritage.

Lessons Learned

The CMWSS approach established that if the communities are empowered with informed choices and mobilised substantially, they can execute and manage drinking water supply scheme as per their needs and affordability. A remarkable improvement in community's financial management can be achieved through their capacity building with the result that the CWASC opened bank account and carried out all the transaction relating to project execution and operation and maintenance. The participation of women is crucial for the success of CMWSS, since women are the main collectors and users of water, as well as the main sufferers if the system does not function. The implementation of the initiative enhanced the capacity of the MC, local community and other stakeholders on taking up the projects based on community participation.

Transferability

The Government of Madhya Pradesh (GoMP) issued guidelines for the implementation of CMWSS in Urban Areas in partnership with community, CBOs and ULBs. Since Community-managed Water Supply Scheme is a process project designed to enable the community to have access to acceptable, adaptable, sustainable and affordable safe drinking water system, the reform process does not end with the physical completion of water supply schemes. In several ways, it marks the beginning of a new and more challenging phase in the process where the local community has to shoulder the responsibility of operation and maintenance of the system. This entails putting into operation the decisions taken by the community with regard to tariff structure, collection of monthly water charges from the users, ensuring proper maintenance of the system so as to ensure reliable

and regular supply of safe drinking water. Towards this end, the community will have to arrange for periodic quality checks of water being supplied as well as ensure sustainability of sources. All these activities would require high degree of community mobilisation and awareness. The local action through CMWSS has proven prospects for managing sustainable drinking water supply at affordable costs through empowerment of the communities and their capacity building, which can be replicable and adoptable in the other cities and towns.

Box 4.1: Orangi Pilot Project for Small Urban Centres, Karachi, Pakistan

The Orangi Pilot Project (OPP) model is unique in many ways. The model acknowledges the community's ability to help itself. The main feature of the model is its simplicity, based primarily on the notion that people and/or the community have been dealing with problems from time immemorial and they always come up with solutions. The spirit of OPP is that people can and do help themselves and it endorses the faith in the ability of people to address their own problems.

Orangi is a low-income settlement extending over 10,000 acres (or 4,160 hectares) with some 1.2 million inhabitants. The informal settlement began in 1965, and now most of the 113 settlements within Orangi have been accepted by the Government, and land titles have been granted. Most inhabitants built their own houses and none received official help in doing so. There was no public provision for sanitation as the settlement developed; most people used bucket latrines, which were emptied every few days, usually onto the unpaved lanes running between the houses. More affluent households constructed toilets connected to soakpits, but these soakpits filled up after a few years. Some households living near creeks constructed sewerage lines which emptied into the creeks. The effort of getting local government agencies to lay sewerage lines in Orangi was too much for local residents, who felt that these should be provided free. Believing that Government should provide, they had little incentive to improve their situation.

Project Initiatives

A local organisation called the Orangi Pilot Project (OPP), established in 1980 by Dr Akhtar Hameed Khan, was sure that if local residents were fully involved, a cheaper, more appropriate sanitation system could be installed. Research undertaken by OPP staff showed that the inhabitants were aware of the consequences of poor sanitation for their health and their property, but they could not afford conventional systems, and they did not have the technical or organisational skills to use alternative options. OPP organised meetings in lanes that comprised 20-25 adjacent houses, explained the benefits of improved sanitation and offered technical assistance. Where agreement was reached among the households in a lane, they elected their own leader who formally applied for technical help. Their site was surveyed, plans drawn up and cost estimates prepared. Local leaders kept their groups informed and collected money to pay for the work. The laying of sewers then proceeded, and the maintenance was also organised by local groups. OPP's research concentrated whether the cost of sanitary latrines and sewerage lines could be lowered to the point at which poor households could afford to pay for them. Simplified designs and standardised steel moulds reduced the cost of sanitary latrines and manholes to less than one-quarter of the contractors' rates. The cost of the sewerage line was also greatly reduced by eliminating the profits of the contractor. The average cost of the small-bore sewer system is no more than US$30 per house.

Process

Technological and financial innovations were the easy part. The difficult part was convincing residents that they could and should invest in their own infrastructure, and changing the nature of local organisations so that they responded to these needs. OPP staff had to wait for six months before the inhabitants of one lane were prepared to organise themselves to develop their own sewerage system. Gradually, the residents of other lanes, after seeing the results achieved, also sought OPP's assistance. There were problems in some lanes, and money sometimes went missing or proved to be insufficient. In general, OPP staff stood back from these issues (once they had persuaded the first communities to begin). Once a lane had ensured that the finance was available, they would provide technical assistance only. The first challenge was one that the communities had to realise by themselves.

Results Achieved

The scope of the sewer construction programme grew as more local groups approached OPP for technical assistance and the local authorities began to develop the mains into which the sewers could be integrated. The concept of component-sharing between people and government evolved. The inhabitants could finance, manage and maintain the construction of latrines, lane sewers and small secondary sewers (known as internal development), and the government could take responsibility for financing, managing and maintaining the large secondary sewers, trunk sewers and treatment plants. As a result, nearly 6000 lanes have developed their own sewer systems linked to sanitary pour-flush latrines serving over 90,000 housing units, using their own funds (the equivalent of around US$1.4 million) and under their own management. One indication of the appropriateness of the model developed by OPP is the fact that many lanes have organised and undertaken lane sewerage investments independent of OPP; another is the households' willingness to make the investments needed in maintenance. The main reason why low-income households could afford this is that the work cost one-sixth of what it would have cost if it had been undertaken by the State. Women were very active in local groups; many were elected group leaders and it was often women who found the funds to pay for the sewers out of household budgets.

Lessons Learned

OPP understood the need to simultaneously improve technical, financial and organisational options. At the beginning, it was established to provide a pilot scheme for the Government. Its experience taught it that the Government generally had little interest in what it was trying to do. But as local residents became more interested and involved, so too did their elected representatives, who now found that they were dealing with people who had a good understanding of infrastructure investments. There are now many project-level agreements between OPP, local communities and State agencies. In all of these settlements, the State is doing much more than it was before, although it is working within a model of sanitation that has reduced its responsibilities.

Transferability

The programme is being replicated in eight cities in Pakistan by local NGOs, CBOs and local governments, and in 49 other settlements in Karachi by local governments and the government agencies responsible for upgrading the informal settlements, the Sindh Katchi Abadi Authority.

Source: Hasan. Arif (l997), Working with Government: The Story of OPP's Collaboration with State Agencies for Replicating its Low Cost Sanitation Programme. City Press. Karachi, 269 pages; Orangi Pilot Project-Research and Training Institute (2002), Katchi Abadis of Karachi: Documentation of Sewerage, Water Supply Lines, Clinics. Schools and Thallas, Volume of The First Hundred Katchi Abadis Surveyed. Orangi pilot project, Karachi, 507 pages.

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ORISSA, INDIA

Social Inclusion and Empowering the Marginalised: The Gram Vikas Way

Gram Vikas, an NGO working with the rural poor provided 100 per cent water supply and sanitation coverage to 211 villages in the State of Orissa. A family-oriented approach and a socialised community fund-raising are the organisation's hallmark strategies for encouraging total village participation. Gram Vikas' Rural Health and Environment Program (RHEP), an integrated rural development intervention, has helped over 200 villages to acquire good quality toilets and bathrooms, coupled with at least 3 taps per household and 24 hour water supply. Providing water and sanitation is RHEP's core rallying element that brings communities together, and serves as a springboard for collective action in Gram Vikas' other programmes.

Gram Vikas' interventions in Orissa are directed at energising the villages, and are driven by the involvement of the entire community in planning, implementation and monitoring. The uniqueness of Gram Vikas is the adoption of the social inclusion approach wherein all families, irrespective of their economic, social and caste considerations, build the same type of toilet and bathrooms.

Gram Vikas's integrated approach culminates in a process of empowering marginalised groups, especially women who are traditionally excluded from meaningful participation and decision making.

Process and Resources

An initial subsidy of Rs. 3000 for toilet construction was granted per household in the community through its own funds sourced from its pool of donors, including the Government. This was considered as a social cost and was spent for materials like cement, steel, pan, and doors. The villages co-financed projects through a "corpus fund" in amounts of Rs.1,000 which the community must raise. The family's contribution to the corpus fund was determined by their economic capacity, with the poor giving lesser contributions. Income from pisciculture and vegetable farming was used for operation and maintenance expenses. If the income was not enough, the villagers contributed another 0.5% or 1% of the gross product at harvest time. These contributions were also socialised. The maintenance of infrastructure was the responsibility of the villagers. Local youth were trained to undertake minor repairs and maintenance of the pumps, motors and pipelines.

Results Achieved

Gram Vikas has helped in acquiring good quality toilets and bathrooms to over 200 villages coupled with at least 3 taps per household and 24-hour water supply, besides putting up 64 common units in schools and community halls.

Sustainability

Over the years, Gram Vikas has pioneered mechanisms that ensure building sustainability in water and sanitation. The corpus fund is put into an interest-earning deposit and the interest is used for operations and management as well as for extending support to new families in the village for building toilets and bathrooms with piped water supply. Through the villages' corpus funds, Gram Vikas is able to leverage for additional resources. It has successfully leveraged for Government funds for rural water supply or from local area development funds from Members of the Parliament and members of the Legislative Assembly. In addition, the corpus fund has also been used as collateral to source more funds from financing institutions.

Transferability

Gram Vikas's integrated approach not only provided piped water supply, toilets and bathrooms but also culminated in a process of empowering marginalised groups, especially women who are traditionally excluded from meaningful participation and decision-making. The organisation is hopeful that by 2010, they would serve 120,000 families in 1,000 villages. Networking with like-minded civil society groups operating in Orissa is a primary consideration to replicate Gram Vikas' water and sanitation projects in other parts of India — especially in Jharkhand, Chhattisgarh, Madhya Pradesh and Andhra Pradesh — in partnership with other NGOs who have expressed interest in the approach.

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PUNE, INDIA

Community-Municipal Partnerships for Improved Sanitation

The main thrust of the local action was to provide community sanitation blocks for all the slums in Pune by the Pune Municipal Corporation (PMC) in the State of Maharashtra. The uniqueness of this initiative was community participation. The significant feature was the changed role of PMC in relation to the service delivery — Instead of being a provider, the PMC became a facilitator. Though the communities had never been involved in the past, NGOs and CBOs came to the fore front and took a proactive role in the design, construction and maintenance. Around 500,000 slum dwellers were benefited from this initiative. The Pune experiment was recognised as a Model by the State Government. The Government of India launched the National Programme for Universal Sanitation, based on the Pune experience.

Introduction

The construction of community toilet blocks in slums had been undertaken by the Pune Municipal Corporation (PMC) for more than 30 years. Considering the magnitude of the problem, the number of blocks built was miniscule. There were around 2,500 toilet blocks in slum areas in the city of Pune, Maharashtra State, mostly built 25-30 years ago. The costs were very high due to involvement of contractors. In the absence of community involvement at any stage, existing toilet blocks fell into disuse, became dilapidated and municipal conservancy staff could not maintain them. As a result, people had to, perforce, suffer the indignity of defecating in open areas. The incidence of diseases like diarrhoea were highly prevalent in the slum areas which are polluted, leading to the spread of diseases and the threat of epidemics.

For the first time in 1999, the Municipal Commissioner of PMC took a stand to tackle the issues frontally by taking up the sanitation programme at the city level scale and managed to reach the benefits to 500,000 people out of the slum population of 600,000.

Objectives and Strategies

The main objective of the initiative of Pune Municipal Corporation was to provide community sanitation blocks for all slums in the city through NGOs and people's participation. NGOs were entrusted with the design, construction and maintenance of the blocks and a partnership was established with the Corporation. The capital costs of construction and the provision of water and electricity were the responsibility of the Corporation, while the NGOs/CBOs were to prepare the design, construct the toilets and maintain them by collecting monthly family contributions.

Mobilisation of Resources

The annual budget of the Municipal Corporation gets approved by the House. For this initiative, the entire project cost was made in the budgetary provisions of the Corporation. In two-year period, the money spent on toilet blocks was more than the amount altogether spent in the previous 20 or 25 years. The programme was kept on high priority and all the technical and human resources available with the Corporation were pressed into service. NGOs contracted qualified engineers and architects who were to dialogue with local communities while finalising the design. Wherever there were strong community-based organisations, construction was taken up by them as well as the maintenance.

Process and Project Management

Bids were invited only from Non-governmental organisations (NGOs) so that community participation in construction, design and maintenance would be ensured. The costs were brought down significantly by laying the condition that NGOs would not bid higher than the estimated cost. This was done in view of the non-profit approach of NGOs as compared to the

contractors. Personal review by the Commissioner on weekly basis strengthened the implementation of the programme and energised all the PMC staff in removing the obstacles.

Demand assessment was the key factor in determining the requirements. A survey of all slums in the city by the PMC staff was carried out by categorising the slums – Category 'A' referred to those areas where there were no toilet blocks and people had no choice but open squatting; Category 'B' covered those existing blocks which were in unusable and dilapidated condition and required either major repair or demolition and reconstruction, and category 'C' covered areas where there were functioning toilet blocks but they were inadequate in relation to the user population. 67 slums in the 'A' category were given top priority and 452 slums in the 'B' category second priority.

What was unique about the initiative was its stress upon Community Participation. The PMC's normal practice was to float tenders, invite bids from contractors and get the blocks constructed by them. The conservancy staff of the Corporation was expected to maintain them, at no stage does the community get involved and the blocks become unusable very soon.

The Project had undergone various problems and hindrances. One of the problems faced was that the Corporation staff were not used to dealing with NGOs/CBOs because their experience had always been limited to dealing with contractors. By holding weekly review meetings, the concept and understanding of NGO/CBO partnership was augmented. Another problem was that initially some of the elected Municipal Councillors opposed the initiative, at least partly, because they felt that they had lost control and patronage. However, as the toilet blocks started coming up in some areas, these Councillors were pressurised by their own constituents to get the programme implemented and soon visualised its value. The third problem was the low level of technical skills in the Community to design and construct the blocks. Where there were committed NGOs, Communities — particularly women — were encouraged to interact with qualified engineers and architects and bring in their inputs into the process. Progressively, these slum women became familiar with RCC drawings and other technicalities as their experience and knowledge was progressing.

The operation and maintenance was the main problem. At some locations, there were not enough users to cover costs through contributions but at others, income from user charges exceeded the costs.

The significant feature of this initiative was the changed role of the Corporation in relation to Service Delivery. Instead of being a Provider, it became a Facilitator. Though communities had never been involved in the past, NGOs and CBOs came to the forefront with a proactive role in the design, construction and maintenance.

Results Achieved

The results achieved were impressive. 418 toilet blocks with 6,958 toilet seats were constructed for Pune slums through people's participation. People in most areas do not have to suffer the indignity of open defecation. Children's toilets have also been provided at many locations. Health and hygiene were better with this environmentally sound approach of waste disposal. It is the poor slum dwellers who were primarily benefited. The provision of a caretaker's room is an incentive to any family to look the after cleanliness. 500,000 slum population of the city were benefited under this initiative.

Sustainability and Transferability

The Corporation became familiar with NGOs and CBOs and the latter had learnt how to deal with the officialdom. This newly formed confidence of the communities extended to other areas of the State. The Pune experiment was recognised as a model by the State Government and other Corporations were encouraged to follow it. Visitors from other cities also tried to incorporate the main principles into their programmes. The Government of India launched a National Sanitation Programme (Nirmal Bharat Abhiyan) for Universal Sanitation on the basis of the Pune model and offered State Governments/Local Bodies 50% subsidy on cost of construction. The new attention to urban sanitation meant a greater focus on the needs of the poor. The National Programme launch meant greater resources being pumped into the sector and, in turn, resulted in better physical coverage in slums and impact on people's health.

In this initiative, the Municipal Corporation of Pune funded the entire sanitation programme through its budgetary resources. The maintenance of toilet blocks was rested with the community. During the course of time, the Corporation is saving money on the conservancy staff appointed and the user fees to fund for the maintenance.

Some of the NGOs gave pride of place to slum women in the implementation of the programme. These women were in a position to take up other construction programmes, visit government offices to negotiate their entitlements and were treated with greater respect in the family and the community. The construction of toilet blocks in slums contributed to preserving the modesty of women and preventing sexual abuse.

The environmental impact of this initiative is salutary — open defecation was a thing of the past in the areas where these blocks were constructed and the spread of disease contained.

As the work in Pune proceeded, it attracted a number of visitors from Governments in India, NGOs and Community Representatives from other cities. Several international visitors from UN agencies, Municipal Councils and NGOs visited Pune, studied the experiment and interacted with municipal officials and slum dwellers in Pune. They carried back this experience with them to their organisations, cities and countries. When the municipal Councillors of Mumbai were reluctant to approve a similar programme in their city, a visit to Pune convinced them of the value of the effort and they gave the green signal. When the Slums Board Secretary of Bangalore visited, a decision was taken to implement the programme on the same lines in that city. A toilet model was put up in the UN building in New York in 2001 to inform international delegates about the potential of this initiative.

Lessons Learned

The most important lesson that emerged from this initiative was the importance of partnership between State Functionaries, NGOs, CBOs and the Community. Experience revealed that the administrative machinery of the State cannot by itself reach the poor while NGOs and CBOs cannot go to scale without partnering with the State. The initiative brought out the synergy achieved when the roles and relationships between these entities underwent change and the State limited itself to being an Enabler and Facilitator while the communities acquired a proactive role in the provision and maintenance of such infrastructure. The lessons learned moved from Pune to Mumbai to Bangalore and to the all-India level through the National Sanitation Programme.

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YOKOHAMA, JAPAN

Water Utility Management by Customer Awareness

Water is a precious resource in Yokohama, Japan, as elsewhere in the world. Reducing unaccounted-for water (UFW) remained an important challenge for the Yokohama Waterworks Bureau (YWW). This Local Action is about the water utility management practices in Japan and in particular, some of the practices followed by YWW with customer awareness for the conservation of water and reduction of UFW. The measures adopted resulted in 100 per cent access to the city water by the Yokohama population.

Background

Yokohama Waterworks Bureau (YWW) is the first organisation of its kind in Japan, commenced operations in 1887, and since then has been practicing appropriate systems to cope up with the water demand on priority.

Water Utility Management

Water utility management can be considered in 3 components — management of quantity, quality and economic aspects of supply. The operations of Yokohama Water Works Bureau (YWW) are structured around these broad components. However, there is a need to raise customer awareness on minimising water leakages and ensuring their participation in the process of water conservation. Set out below are three of the ways in which water conservation and reduction of unaccounted-for water (UFW) is accomplished by YWW.

a) Role of Water Metre Readers (WMRs)

The role of WMRs is summarised in the following seven functions:

- *Proper reading of meters:* This includes not only checking correctly the consumption volumes of customers accurately but also examining each time whether the meter itself is working well. The service areas for each WMR comprise of two zones — an odd month zone and an even month zone. An average of 2,900 metres is read each month by a WMR;
- *Transmitting data to and from the computer centre:* Before visiting customers, the WMRs receive a statement setting out customer data such as previous consumption records and other related information. After reading the meters, WMRs update the records and transmit the same to the centralised computer centre;
- *Examination of metre reading records:* By comparing with previous records and taking into account other factors such as seasonal variations, a reality check of the WMRs' work is undertaken;
- *Data updating:* Based on the visits of WMRs, records are updated to provide the latest information on customers (eg., names of customers who have newly moved in, etc);
- *Estimation of consumption volumes:* While keeping meters in good working order is the responsibility of customers (hence, the costs of leakage are also borne by them), in practice, whenever the meter is faulty, the WMR would need to make estimates of the consumption;
- *Handling customer complaints:* Since WMRs are YWW's points of contact with customers, they have an important public relation role to play — listening/communicating to customers and providing feedback to the water utility; and
- *Communicating important messages:* Messages from the Urban Local Government (ULG) are communicated six times a year, printed on the reverse side of the consumption slip. Since YWW is the only service managed by the ULG, it is an important point of contact with citizens.

b) Dealing with customer claims

When current consumption volume shows a sharp increase over the previous records, the WMR would need to consider the following:

i. Whether the customer has fulfilled his/her duty to report or get the leakage (where applicable) fixed at the earliest possible instance;
ii. Whether the leakage is easy to detect; and
iii. Quantum of leakage.

A 6-point scale (with 2 points for each of the aforesaid categories) is used to compute the charge (penalty) to be borne by the customer for the leakage. The same is illustrated by the following example:

Step 1: Determination of leakage volume

A. Current consumption volume (as indicated by the water meter): 100

B. Previous consumption volume (indicated in previous record): 7
C. Assumed leakage volume (A-B): 30

Step 2: Award of points to customer

D. Whether customer performed duty in time or not (Not performed=0): 2
E. Whether leakage was easy to detect (most difficult=2): 1
F. Assumed leakage volume (Less than double): 0
G. Total customer points (D+E+F): 3

Step 3 : Leakage volume to be charged to customer

H. H = C/G = 30/3 = 10

Step 4 : Consumption volume to be charged to customer

I. I = B+H = 70+10 = 80

Step 5 : Leakage volume loss to be borne by YWW

J. J = C-H = 30-10= 20

In FY 2002, there were 1,673 cases of customer claims for leakages which have been analysed as follows:

Easy to detect	: 710 cases
Difficult to detect	: 963 cases
Detected by WMRs	: 80%
Detected by customer	: 20%

This clearly indicates a need for more proactive customer behaviour in leak detection and reporting. For this, YWW promotes customer awareness programmes for conservation of water.

c) Raising awareness among customers and children

YWW conducts general "people awareness" campaigns, promotes study visits for school students and citizens to the water museum, purification plants and a conservation forest, and organises summer classes. A standard videotape presentation on the theme has also been prepared. Some of these efforts are detailed below:

- Water museum: The water museum was opened in 1987 to commemorate the 100th anniversary of YWW. Since then, over 430,000 people visited the museum with school children accounting for 35% of the total. The museum is managed by the retired staff of YWW, well experienced in water supply operations;
- The Kosuzume water purification plant plays host to elementary school students in Yokohama. Between 1999 and 2003, over 12,000 students (from 173 schools) visited the plant;
- A conservation forest situated in Dohsi village, Yamanashi, which houses one of the water sources for Yokohama — the Dohsi river (originating from the foot of Mount Fuji) is the site for study tours every summer. Every year, around 800 people participate in this tour; and
- Summer classes are organised for parents and children in a "Water Quality Examination" seminar. This includes experiments to check water quality, through which children understand and appreciate the need for water conservation. This is considered as an effective long-term strategy to promote better citizenship.

Water Tariffs and Social/Welfare Policies

The ULG manages the water utility and does not provide any funds from general revenues to YWW. YWW, therefore, operated on commercial principles with its main revenues being water charges. Since water supply has a public health dimension, underprivileged customers can apply for government support/exemption from payment of water supply charges and sewage fees. The categories exempted include:

- handicapped persons : physical handicaps (Class 1 and 2), mental handicaps (IQ lower than or equal to 35), multiple handicaps (Class 3 together with IQ lower than or equal to 50) and elderly persons — bedridden or those suffering from senile dementia; and
- households receiving welfare benefits/medical care assistance, including single parent households.

For such customers, YWW exempts the payment of water and sewerage charges and the charges are directly borne by the welfare bureau of the ULG.

International Cooperation

On the occasion of the centenary year of YWW, a scholarship programme was commenced by the city of Yokohama, under which water experts from Asian countries were invited to join the training programmes conducted in Yokohama.

Other Initiatives

YWW adopted commercial accounting systems, as used by the private companies, which enabled efficient operations of the water system. An environmental policy including water conservation was started under the initiative of the National Government.

Results Achieved

All the population of Yokohama have access to city water.

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XIENG NGEUN, LUANG PRABANG, LAO PDR

Community-based Pro-poor Governance

A fast-track Community-based Water Supply and Sanitation project is being implemented under the Mekong Region Water and Sanitation (MEK-WATSAN) initiative in Xieng Ngeun, a secondary urban town in Lao PDR. This project aims to address the problems of water and sanitation of the rapidly expanding urban poor. The project is implemented by the Water Supply State Owned Enterprise of the Province of Luang Prabang in cooperation with UN-HABITAT and demonstrates how a community can work together with a utility to provide improved water and sanitation, and also in the process, enhance the capacity of the community, utility and local authorities.

Introduction

The Government of Lao PDR has been facing the challenges of relatively high unit capital costs and the problems of the poor. With the exception of the capital city, Vientiane, and other provincial capitals, water supply and sanitation coverage in secondary and district towns remain a major concern for the Government of Lao PDR. Before the initiative, access to improved water supply and sanitation was at zero percent in Xieng Ngeun with a population of 6,500, the women and children being most affected.

The National Growth and Poverty Eradication Strategy (NGPES) has identified water supply and sanitation as one of the four high priority sectors to be developed in order to meet the Government's economic growth and poverty eradication objectives. The two most fundamental criteria for selection priority were 'Needs' (level of service coverage) and the incidence of 'Poverty'. The town appraisals included stakeholder consultations and workshops, as well as key informant interviews.

Objectives and Strategies

The main objectives of the initiative are to:

- Demonstrate how a community can work with a water supply entity to acquire safe water and adequate sanitation that meets its needs within a short time frame of around eighteen months;
- Demonstrate pro-poor water connection charges and tariffs;
- Improve community awareness of environmental sanitation and enhance the capacity of water supply entity and local artisans.

The provincial and district authorities of Xieng Ngeun worked together with the State-Owned Water Supply Enterprise of Luang Prabang Province and the local community in order to address the problem of water supply by jointly undertaking the construction of a piped water supply project using the spring located on the slope of the mountain, about 6 kilometres from Xieng Ngeun.

Mobilisation of Resources

UN-HABITAT entered into a cooperation agreement in August 2005 with the water utility to collaborate within the framework of the MEK-WATSAN initiative. UN-HABITAT provided US$ 250,000. The counterpart contribution from the local community of Xieng Ngeun and the Utility was US$ 200,000. Key actors in this process have been the community and the Lao Women's Union.

Process

The Xieng Ngeun project was designed by the Water utility and validated by UN-HABITAT and its consultants. In terms of activities, the process included an initial rapid assessment to address any ethnic or gender issues, as well as assist in the development of a participatory framework.

In conjunction with surveys and designs, work plans were developed for all stakeholders, including implementation arrangements and procurement packages. In parallel with the implementation of the facilities, pricing policies and structures were developed and implemented. Revolving funds were pilot tested for water connections and latrines, billing and collection systems were established. Operation and maintenance systems were implemented. Community awareness programmes were established. A simple system was evolved to monitor the sustainability. In essence, a framework of sustainability was developed.
Monthly progress reports were generated, as well as a final report to be produced within 28 days of commissioning. Project performance monitoring and evaluation tool was used to monitor and evaluate the project outputs, outcomes and

impacts. Several steering committees were formed to handle different activities, such as procurement, community activities, to name a few. These committees involved the members of the Xieng Ngeun community, as well as officials from the utility and the District Authority, with women representation. Problems faced during the implementation process were amicably mitigated with local efforts.

Results Achieved

Xieng Ngeun is the first community-managed fast-track water and sanitation project in Lao PDR. Pricing policies developed supported the pro-poor connection charges and tariffs. The introduction of revolving fund enabled the poor to gain access to both water and improved sanitation facilities. The community awareness programmes covered all aspects of the project. Capacity building of the water service entity was provided to sustain the project investments, as well as training of local artisans in the construction of latrines. Apart from providing labour, the community was willing to be a active partner in all aspects of the project from the planning to the implementation phase.

Achievements of the Project

- From zero percent at the beginning of the project, the coverage in water supply will be around 80% and for sanitation 100% by the end of the project;
- 11 community standpipes for poor households were installed; and
- 20 schools and public infrastructures had access to safe drinking water.

Sustainability

UN-HABITAT developed a guidebook, "Guidelines on Revolving Funds for Constructing Latrines and Water Connections in Luang Prabang, Lao PDR". Currently there are 239 households that have signed up for the revolving fund scheme. Funds have been transferred from the UN-HABITAT fund to the water service entity account, which, in turn, transferred to the Nam Papa Xieng Ngeun Branch. Each household, interested in taking loan, will fill-in a request form to be guaranteed by the Chief of the Village concerned. A loan contract between the household and Nam Papa Xieng Ngeun Branch will be signed, with the loan ceiling being 800,000 kips per household and repayment period will be 18 months. The loan will be a combination of cash and materials in order to guarantee that the loan will be used for the construction of latrine and to reduce the cost of materials when bigger quantities are procured.

Another aspect of the revolving fund is community preparation and mobilisation. The community was oriented on the importance of sanitation and

hygiene as well as access to the revolving funds. Each family borrowing loan will receive hygiene education to ensure behaviour change and the proper use of hygienic latrines.

Since the project is using a Gravity-fed system, it becomes economical to provide water while the operation and maintenance costs are kept to minimum. The community has also taken up the responsibility to cooperate on the operation and maintenance activities with the water utility.

The project, in a nutshell, has endeavoured to ensure that the set objectives are sustainable through active involvement of the community and pro-poor financing mechanism.

Lessons Learned

The project has been able to prove that it is possible:

- For the community, government authorities and water supply entity to work together to provide safe water and improved sanitation to meet the community's needs, including the poor households and act as a driving force for change and development and not as mere project beneficiaries; and
- To have effective pro-poor connection charges and tariffs, with appropriate tariff policy and pro-poor micro-financing tools like the revolving fund.

Transferability

UN-HABITAT, on request by the Government of Lao PDR, is undertaking a similar project in Sayabouly town to cater to about 4,700 citizens located on the left bank of the Nam Houng River. It is in the formative stages and District Authority officials as well as the water utility officials from Sayabouly have already visited the Xieng Ngeun project.

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KATHMANDU, NEPAL

Samriddha Aawas: Promoting Eco-community through Resource Management

***Samriddha Aawas* or Kirtipur Housing Development Project was initiated when the squatters along the Vishnumati River were evicted under Vishnumati Link Road project in 2001, for providing shelter to 44 displaced urban poor families with their participation, right from the project preparation, implementation and maintenance. The project was the first of its kind in Nepal. It provided environmentally sustainable and affordable housing to the urban poor by promoting an eco-friendly community with provisions of eco-friendly technologies for sustainable water supply, sanitation, waste and wastewater management. The project adopted the principles of Community-based Water Resources Management (CWRM), involving the community with equal participation of women in the decision-making process. This project can be viewed as an acceptable local action to help the displaced communities who dwell in the informal settlements, for transforming into a sustainable eco-friendly community as well as improving the environmental infrastructure of the city.**

Background

Over the years, Kathmandu has been experiencing rapid urbanisation and its infrastructure facilities are deteriorating due to the growth of slums and squatters, which needed to be addressed. For the past 50 years, migrant populations of various ethnic groups were living on the banks of the Vishnumati River. The living conditions of these people were dismal. They lived without basic sanitation. There was no sewage or drainage system. They did not have access to basic necessities of life like shelter, clean water, sanitation facilities, etc. The women were the most affected with no privacy of using latrines. There was no provision of drinking water in the community. The environment of the slum was polluted affecting every individual across gender and age.

Objectives and Strategies

The main objective of this project was to improve the living conditions of the urban poor by providing basic services in a sustainable manner. Since its beginning, the strategy was to develop a pro-poor implementation plan which aimed at providing better quality of life to otherwise disenfranchised community, by involving them in the decision-making process from the beginning of the project. The policies and guidelines for the design of the project were prepared by Lumanti, an NGO.

The priority was to address the needs of these people and to improve their living conditions. Since the communities were economically weak, the challenge was to provide affordable and environmentally sustainable housing for 44 displaced families with basic amenities.

Mobilisation of Resources

Urban Community Support Fund (UCSF) is a collaborative effort between Kathmandu Metropolitan City (KMC), Lumanti, and several other national and international development agencies committed to the urban poor. The fund supports community development initiatives for the urban poor settlements through low-interest loans.

The Kirtipur Housing Project is the first initiative to receive funds from UCSF. Lumanti has played an active role from the starting of the project, by encouraging an understanding between the donors for resource generation and mobilisation for the successful completion of the project.

This project was also supported by organisations like Department of Urban Development and Building Construction, Slum Dwellers International, UN-HABITAT's Water for Asian Cities Programme, Action-Aid Nepal, WaterAid Nepal, Asian Coalition for Housing Rights and other urban partner organisations like Centre for Integrated Urban Development and NGO Forum for Urban Water and Sanitation. Lumanti also supported as a Secretariat with a transparent working approach.

Process

Lumanti developed policies, regulations and guidelines for this project with the help of different organisations working in the field of urban development. It involved the community people while designing and formulating the plan. It collected funds from the donors and mobilised it.

Through the entire planning process, the people have demonstrated their capacity to develop viable solutions. They prepared to fight for housing rights and security of tenure by organising themselves, saving money, planning, developing management skills and remaining committed to build better lives for their families and communities.

The unstable political and security situation affected the communities' ability to generate income and protest for their rights. They were required to balance their long-term needs to secure housing with short-term commitments to pay for living expenses and debts.

This housing project is designed to be an eco-friendly community by introducing eco-friendly technologies. One of the major challenges was to bring change in the attitude and behaviour of the people towards preserving the eco-community.

The community members were made to feel anchored at their housing site and were involved in the setting up of the eco-friendly technologies. They were trained for the optimum usage and maintenance of these technologies. For its smooth operation, a maintenance fund was created. Each household contributes Rs. 10 (approx. US$ 0.15) per month in this fund.

A Housing Management committee was formed. In order to ensure that the eco-technologies are well maintained and operated, the responsibility was placed in the hands of this committee. They monitor the project and also ensure that money is contributed to the maintenance fund. The community has given the responsibility to manage the fund to the management committee. In order to maintain transparency, the committee shares the financial status of the maintenance fund every month.

Results Achieved

This project was successfully completed by providing shelter to 250 people from the 44 evicted families. Their living condition has improved significantly. People have access to latrines with proper drainage system. There is an adequate supply of water in the community. Various awareness campaigns and training programmes have been conducted for the community people on rainwater harvesting, environmental sanitation, waste and wastewater management, water education and promotion of health and hygiene. There is a sense of ownership among the people of the community and their dreams to own a house has been fulfilled.

Sustainability

The houses are owned by the people of the community at zero interest rate loans provided by UCSF. The loan can be repaid within 15 years. This project has gained prominence in the society as affordable, pro-poor, eco-friendly and cost-effective. The buildings are earthquake-resistant. There is hardly any water crisis in this eco-friendly community as rainwater harvesting techniques have been used to ensure water supply facilities. It also incorporated solid and liquid waste recycling, recovering and reusing techniques for environmental sustainability. Women equally participated in the decision-making process. They run a cooperative in the community which has empowered them. The cooperative has provided financial help to the people of the community. The community people are engaged in various income-generating activities like selling vegetables, small businesses and shops.

Lessons Learned

The lessons learned during the formulation and implementation of this project include:

Community involvement

It is imperative for the success of such relocation projects that the community members feel anchored at their housing site. The project is about relocating the squatters as much as constructing a eco-friendly community. This is hard to achieve if the people feel that they have no power over decisions concerning the community.

Communication and information dissemination

In a collaborative project such as the Kirtipur Housing Project, it is very important that the communication between all the related stakeholders is sustained throughout the project. Transparency in communication and information distribution is crucial.

Persistence is required to keep issues alive in the public eye. It was important to keep encouraging the communities even when their situation seemed hopeless, and to continue raising the issues.

Multiple stakeholders and media should be used to build pressure — Lumanti supported the federations to advocate directly for the communities and worked together with them to pressure the KMC for secured housing. This community level participation added legitimacy to Lumanti's arguments and gave a focus on the communities' concerns.

Transferability

Samriddha Aawas has successfully established itself as an eco-community. It has significantly contributed in improving the living conditions of the poor in eco-friendly housing at an affordable cost. This project is an obvious example of how one can help the homeless without hampering the environment. This knowledge must be shared between the organisations working in the field of urban development nationally and internationally.

Box 4.2: Participatory Process for Neighbourhood Rehabilitation, Baghdad, Iraq

The Baghdad Neighbourhood Rehabilitation programme is a community-based initiative with the support of international and national NGOs. The programme was established to counter problems such as poor communication networks, poor sewage disposal, inadequate water supply (for both potable water and for irrigation), poor or non-existent garbage collection, lack of green areas and lack of playgrounds for children through the participatory process.

After more than 10 years of sanctions, local governments of Iraq have no longer been able to meet the shelter needs (housing, water supply, sanitation, solid waste collection, etc.) of their people. In addition, schools and buildings were in a deplorable state stemming from the aftermath of the Gulf War and effects of the sanctions imposed on the country.

To put the concept of community participation into practice, pilot schemes of essential remedial measures have been undertaken with the support of NGOs and the inhabitants in four low-income neighbourhoods in Baghdad, which were affected with dilapidated living environment, infrastructure services and, thereby, reducing the burden on the municipalities.

UNOHCI and UNDP supported the project with additional funds to promote this pilot concept and to train the residents on self-management and local leadership, improve and maintain the quality of services provided to them with the help of the newly established service cooperatives.

In addition to institutionalising this concept within the municipalities, Information and Awareness section was established at each municipality. The project also provided some elements as income-generating tools for the coops, thus providing job opportunities for the residents of the target areas.

ECHO-Humanitarian Aid Office allocated further funds to the project for rehabilitation of water and sanitation services to:

- Serve the target neighbourhoods and adjacent areas,
- Support and increase the capacity of the Baghdad Municipality,
- Upgrade and improve the environmental conditions in which the people are living,
- Address the immediate living conditions of the targeted communities, and
- Reduce health hazards, partly with new supplies from the oil-for-food programme.

Through a participatory process, the municipality water supply, sewage network, roads, public buildings and utilities have been repaired and restored. Household waste management has been improved. The Al-Shu'lla region of the town is now green through drilling an artesian well to irrigate green areas which were once dumping grounds for solid waste.

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PAPUA NEW GUINEA

Software Enhances Hardware: Pro-poor Partnerships and Community Awareness

Papua New Guinea (PNG) is the poorest among the ADB's developing member countries in the Pacific. This Local Action is intended to be a model of pro-poor partnership building involving the provincial Government, urban authorities, community-based organisations, for improving water and sanitation services by raising awareness and health education initiatives among community.

Background

About 37% of Papua New Guinea (PNG) population lives below the poverty level of $350 per year. Most of its 4.5 million inhabitants live a subsistence lifestyle in the rural areas without access to basic services like potable water or adequate sanitation.

In the towns, about 16% of the population is poor, urban water supply reaches only 43% of the population, and sewerage only 20%. As in most developing countries, it is the poor who suffer the most from the lack of safe water and good sanitation.

Although communities rank safe drinking water as their number one priority, lack of water during the dry season is a very serious and universal problem in PNG. Those without safe water often resort to polluted supplies, thus exposing themselves to the risk of water-borne intestinal diseases like diarrhoea and typhoid fever. Sanitation is also generally inadequate, and the sewerage systems that do exist mostly serve the developed sections of town. Many residents have a low awareness of good sanitation and hygiene and its efforts on health. In many towns, inadequate sanitation is a source of major health hazard. For many poor communities living in the urban fringes, defecating in open areas is the only option. Human waste often pollutes water sources used for all purposes, while raw or poorly treated sewage flows into watercourses and pollutes beaches and coastlines.

Initiatives for Improved WATSAN

In November 2000, ADB approved a $15.3 million loan to the Government of PNG for a project that would provide water supply and sewerage to six selected provincial towns. The Provincial Towns Water Supply and Sanitation Project would create or extend water supply facilities in Kerema, Mendi, and Wabag, and rehabilitate sewerage services and sewage treatment in Alotau, Madang, and Mt. Hagen.

Objectives

The project was intended to increase coverage and improve the quality of basic water supply and sanitation services, with the ultimate goal of improving public health and overall social indicators for the population, especially the poor communities of the selected towns. Another objective was to improve the management and coordination of the water supply and sanitation sector by strengthening the capacity of the PNG Water Board.

Pro-poor, Community Awareness and Health Education Initiatives

When the project was designed, it became increasingly clear that an infrastructure project alone would not be enough to improve the living conditions of the urban poor in the project area. To increase the benefits from the loan, and to make it more pro-poor oriented, a Low Cost Sanitation and Community Awareness and Health Education (LCS-CAHE) programme financed by the Japan Fund for Poverty Reduction (JFPR) was added as a complementary support.

The long-term goal of the LCS-CAHE programme is to improve the health of the poorer residents of the project towns, and ultimately their standard of living, by lowering health expenditure, increasing labour productivity, and generating more income-earning opportunities. The immediate objective is to provide poor urban dwellers with affordable, environment-friendly, and appropriate sanitation

facilities and to bring positive changes in the sanitation behaviour.

The LCS component involved building of low-cost sanitation facilities such as ventilated, improved pit latrines for 4,200 needy households in the project towns. The LCS project provides funds for construction of the toilets and the beneficiary households contribute materials and labour to produce a sense of beneficiary ownership. Field visits during the planning period have confirmed that households are prepared to contribute 5%-10% of the construction costs. The LCS is implemented over a period of 3 years, including an initial pilot-testing period in two poor settlements of the project. During the pilot phase, workable, socially sensitive, and cost-effective approaches are developed to provide a model and build a sense of ownership and involvement of the community.

Before the toilets are installed, CAHE activities are carried out in the beneficiary communities. The objective of this programme is to teach poor households the basic hygiene, safe methods of collecting and storing water, environmental health, and the operation and maintenance of various toilet systems. The awareness and education programme entail production of printed materials (e.g., cartoons), focus group meetings, and the use of popular theatre and the mass media. About 80% of the beneficiaries of the programme are women, as they have the primary role in collecting water, controlling its use, and looking after sanitation facilities.

Domestic consultants act as facilitators of the programme and, together with the community development officer of the urban settlement, the programme activities are planned and implemented. Community groups (Women's groups, Traditional landowner organisations, Church networks, Non-governmental organisations (NGOs), Neighbourhood associations, etc). help plan, design, and implement LCS-CAHE activities. During the project preparation, Civic Society Groups, NGOs, and Local Communities expressed their firm willingness to take part in project implementation.

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AGUSAN DEL SUR, THE PHILIPPINES

Institutionalised and Community-based Approaches

Residents of Barangay Doña Flavia in San Luis, Agusan del Sur, The Philippines, used to dream of safe water supply and improved sanitation. The efforts of the Philippine Center for Water and Sanitation (PCWS), an NGO, resulted in round-the-clock water supply and the community now manages its own water supply and sanitation facilities.

The PCWS brought safe drinking water supply to the southern province of Agusan del Sur by helping to create institutions that provide technical and financial support for the effective management of water supply and sanitation systems and adopting a community-managed approach – a consolidation of local government support, community participation and partnership, and civil society organisation initiatives. The initiative now serves as a model for future rural water and sanitation projects in the Philippines.

Introduction

The province of Agusan del Sur in Mindanao is one of the poorest in the Philippines, and is one of the top 19 priority provinces for national government assistance. Barangay Doña Flavia in San Luis used to get water from 24 wells that dotted the community. Of these, only eight wells supplied potable drinking water. Ensuring adequate supply of safe water for Doña Flavia's growing population became a major concern of various water sector stakeholders, as it is fast becoming the commercial centre of San Luis. In 1998, the water supply and sanitation system was put on priority through the concerted efforts of the local community, municipal and provincial government units, and the Philippine-Canadian Local Government Support Programme (LGSP).

Resources and Process

PCWS is a Non-governmental organisation providing public information, research, community organising, advocacy, and training for the awareness, appreciation, protection, and conservation of Philippine water resources. With assistance from the local and provincial Governments and funding from the LGSP, the PCWS organised a Provincial Water and Sanitation Center (PWSC) in Agusan del Sur. The PWSC took the task of building the capacity of municipal-level project implementers in providing sustained support for community water and sanitation associations. The project's hardware — communal standpipes, individual house connections, and water wells — was provided by the local Government. PCWS took care of the software — managing the water supply and sanitation system.

PCWS initiated and conducted a series of capacity-building activities to help facilitate the water supply and sanitation project in Doña Flavia. An orientation seminar for the community organisers and facilitators was conducted during the initial stages of the project to identify the community's immediate needs, drafted the framework for all project activities, and prepared a community action plan. A trainers' training for members of the municipal and provincial water and sanitation team was also conducted to prepare them for facilitating the training programme for community implementers. The training introduced concepts and aspects of sound and sustainable water and sanitation management systems, and developed strategies for transferring knowledge to the community.

Doña Flavia community members, who were to become the caretakers and members of the Doña Flavia Water and Supply and Sanitation Association, were also trained on the technical aspects of managing water facilities, computing tariffs to cover operations and maintenance costs, and sanitation and hygiene promotion. PCWS continues to provide technical advice to maintain communications and periodically visit Doña Flavia even after the project was completed.

Results Achieved

Doña Flavia Water Supply and Sanitation Association now manages the entire water system. Their efforts have expanded the water coverage, and the system now serves 2,687 people or 429 households — 100% of Barangay Doña Flavia's population — 24-hours a day.

Sustainability and Transferability

The Municipal Government of San Luis has utilised the concept of community management in Doña Flavia in pursuing other development projects, while thirty-three other Municipalities in Mindanao have adopted the community-managed approach in pursuing their own water supply and sanitation services. PCWS's community-managed approach — a consolidation of local government support, community participation and partnership, and civil society organisation initiatives — now serves as a model for future rural water and sanitation projects in the Philippines.

Lessons Learned

The PCWS's project in Doña Flavia showed that community-managed water and sanitation systems can work as long as it is built on:

- An effectively sustained and functioning system or service with effective financing mechanisms.
- Adequate support and investments for capacity building of community members and local governments to effectively manage water supply and sanitation facilities.

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UKRAINE

Campaigning and Awareness Initiatives

This Local Action highlights the work of 'MAMA-86', a national level Environmental NGO in Ukraine. MAMA-86 focuses on the environmental challenges of water contamination, air pollution, women and children's ill health, environmental policy making, by campaigning and creating awareness among the people, especially women, to bring in action on water use and management as well as bring in change in Ukraine Water Policy.

Background

Ukrainian nationals are confronted with the problems of daily drinking water. About 75% of the population is supplied by surface water, but most of which is not fit for consumption. In urban areas, the problems of low water quality, limited water supply and rapid increase in tariffs are common. In rural areas, where wells provide a significant source of water, the problems are water shortages and water contamination containing manganese, iron, hydrogen sulphide and nitrates.

Drinking Water Campaign

The Drinking Water Campaign was started by four NGOs. The campaigning expanded to 10 organisations and worked towards:

- Monitoring the drinking water quality in the Ukraine;
- Raising public awareness and provide information about critical water issues;
- Stimulating the cooperation and debates between different sectors;
- Conducting pilot projects aimed at improving drinking water quality and rational water use;
- Building pressure for a change in Ukraine's water policy.

Campaign Successes

The campaign was successful in mobilising people, especially women, to action. Among its successes were:

- In Tararbunary, a small town in the southern part of Ukraine, the campaign movers helped to determine the viability of small-scale water purification systems and installed a water treatment system that benefits the school children.
- In the cities of Kiev, Odessa and Kharviv, pilot projects promoting water use reduction and educating people on economic instruments as tools for water sector reform, were successful.
- In Artemivsk, an industrial town, the campaign interventions helped to improve the capacity and quality of existing wells, install water meters, enabled the water utility to run profitably, established good relations with residents and ensured payment of water bills.

Lessons Learned

Among the valuable insights highlighted by the campaign are:

- Water is a critical resource and a common good. Water may not be a means for profit.
- A watershed/water basin approach is essential to water management solutions.
- More focus on water treatment and a holistic management of the water cycle.
- Women's actions for change are setting new parameters for democratic governance.
- Transparency in all water utilities and local authorities and an open process of consultation with the public.
- Arrival of multinationals and the push for privatisation requires to be approached with caution as it may lead to an increase in poverty and inaccessibility of water to a significant part of the population.

SECTION V

Gender Mainstreaming and Empowerment

Gender Mainstreaming and Empowerment

Water and sanitation projects undertaken over the decades suggested a positive linkage between the focus on gender, women participation in particular and the degree of project success for its management and sustainability. Gender focus leads to the benefits that go beyond the project performance such as better procurement, operation and maintenance, cost recovery, hygiene awareness, more time for women for income generating activities, benefits to school-going children particularly for girls, and women empowerment. Gender needs to be addressed with a participatory and responsive approach. The role of women in water and sanitation resources for sustainable water resource management has been internationally recognised.

Developing gender mainstreaming strategies and empowering the community has been the new *mantra (strategy)* in promoting sustainable development in water and sanitation services. To elucidate, five pioneering practices from India, Nepal and Pakistan are presented.

India: to bring the required focus on gender concerns and remove inequities, a Gender Mainstreaming Strategy (GMS) and Action Plan was developed for four cities - Bhopal, Indore, Gwalior and Jabalpur, in the State of Madhya Pradesh under the Water for Asian Cities Programme by UN-HABITAT in collaboration with a locally-based NGO, 'Mahila Chetna Manch'. It emphasised pro-poor gender responsive governance with the participation of women in the decision-making, operation and maintenance, monitoring, evaluation of water and sanitation services, and forms a basis and model framework not only for the Asian countries but also to other parts of the world.

The integrated water supply and sanitation project in Tiruchirapalli district in the State of Tamil Nadu, India is a unique example of an urban sanitation project where the gender mainstreaming approach contributed to the project success.

Nepal: Nepal Water for Health (NEWAH), a national-level NGO has been providing safe water, improved sanitation, and better hygiene to the rural areas by intensifying the gender and poverty mainstreaming strategies in its water, sanitation, and health education programmes through the institutionalisation of a 'Gender and Poverty Approach' (GAP), which addresses the existing social inequities by increasing the gender equality and social justice among the rural communities.

Pakistan: the initiative and leadership of one single woman in the village of Banda Golra benefited the whole community of the village with clean water, reduced the women's burden in collecting water and improved the family and community health. This is a classic example of women empowerment and leadership in bringing out adequate water supply with the dedicated effort of women's community-based approach. Another sustained example is the effort of the Government of Pakistan with the help of ADB-funded Punjab Rural Water Supply and Sanitation Sector Project, wherein the women of Punjab gained easy access to clean drinking water through a community-based demand-driven approach involving local people from planning to construction and made responsible for O&M. Women, the primary beneficiaries, were involved in carrying out sub-projects, operate and maintain them, collect tariffs and evaluate projects as active participants in CBOs and community development units.

Gender Mainstreaming in water and sanitation has been recognised as an instrument for sustainable pro-poor and gender-responsive governance. Adopting an appropriate strategy ensures systematic mainstreaming of gender towards pro-poor upscaling of water and sanitation services. The Gender Mainstreaming Strategy also envisages faster, equitable and sustainable achievement of the Millennium Development Goal 7, Targets 10 and 11 with the participatory approach of both women and men particularly those from socially excluded and marginalised sections.

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MADHYA PRADESH, INDIA

Developing a Gender Mainstreaming Strategy for Equity and Sustainability

Policies, programmes and services for water and sanitation are mainly conceived as engineering solutions and overlook the needs, concerns and perspectives of both women and men. They strongly reflect gender role stereotypes. It is the men who participate in planning and decision-making as women have no say in the public domain. This inequity also affects efficiency and sustainability of the services.

In order to bring required focus on gender concerns and remove inequities, a Gender Mainstreaming Strategy (GMS) and action plan was developed for four cities in Madhya Pradesh - Bhopal, Indore, Gwalior and Jabalpur under the Water for Asian Cities Programme by UN-HABITAT in collaboration with a locally based NGO, Mahila Chetna Manch.

GMS envisages faster, equitable and sustainable achievement of the Millennium Development Goal 7, Target 10 and 11 and 100 per cent coverage for both women and men particularly those from socially excluded, marginalised sections with adequate water and sanitation services in the project cities by 2009.

It emphasises pro-poor gender responsive governance with the participation of women in decision-making, operation and maintenance, monitoring, evaluation of water and sanitation services.

Introduction

The Rapid Gender Assessment (RGA) of four project cities –Bhopal, Gwalior, Indore and Jabalpur confirmed that women are burdened with responsibility of collecting, transporting and storing water for the need of their families and also for waste disposal. Erratic and inadequate water supply, inappropriate toilet facilities further compounded the problems related to water and sanitation particularly for women. Slums littered with garbage for want of proper arrangement for waste disposal added to their woes. Women suffered in silence and gender ideology prompted men not to bother about women's sufferings. Women having internalised the gender roles never tried to voice their concerns.

Despite narrowing gender gap in education, health, skills and opportunities for participation in decision making at various levels, the inequalities for women in water and sanitation services were reinforced by the patriarchal values and norms that persisted in the local self governance and the gender role stereo types that were embedded in perceptions of decision makers.

Though the legal framework of India provides for equal opportunities for women and the State policy provides for visibility of women in public domain, yet women suffer inequalities and remain invisible in processes and decisions. Policies and programmes for water and sanitation too reflect gender role stereotypes as they are mainly conceived and looked upon as engineering solutions and overlook the gender concerns. There was virtually no representation or participation of women in water and sanitation committees or projects.

Objectives and Strategies

The objective of GMS is to promote gender equity, efficiency and sustainability of water supply and sanitation facilities according to need, convenience and suitability and in furtherance of the Millennium Development Goal 7 and target 10 & 11.

Specific objectives include:

- Time bound reduction in number of people without access to adequate water and sanitation.
- Improving life of all slum population in project cities by March 2009 with provision of appropriate, adequate and sustainable water and sanitation services.
- Ensuring all schools have full time water supply, separate and appropriate toilets for boys and girls.
- Establishing open defecation free cities by 2009.
- All institutions, offices, shopping complexes to have sustained and functioning water supply and toilet facilities.

- Management of water distribution and community sanitation facilities at local level particularly slums by local women and their groups.

GMS aims at adopting pro poor governance at the Municipal level, through incorporation of gender concerns in policy, planning and implementation of water and sanitation services. It envisages support to organisations, departments and other partners in water and sanitation sector by advocacy, training, institutional capacity strengthening in gender mainstreaming, resource mobilisation and operations including appropriate norms, procedures for equitable access and participation of men and women in management and decision-making processes. GMS emphasises the role of women and men as active participants and agents of change. The action plan outlines the responsibility of Municipal Corporation, Project Directorate, UN-HABITAT, NGOs and Self Help Groups (SHG) within a stipulated time frame.

The non-inclusion of women's views and perspectives adversely affect the equity, efficiency and sustainability of water and sanitation services. For delivery of fair and equitable water and sanitation services, following priorities were set taking into account the voices of women captured during the Rapid Gender Assessment and focus group discussions with men folk in the project cities:

- Introduction of gender issues in programme framework, reviews, monitoring, evaluation and all other activities.
- Inclusion of staff with gender expertise in project design, selection, implementation and monitoring teams of the project.
- Framing and inclusion of gender related guidelines in programmes and undertaking gender analysis in designing projects.
- Enabling women and men from all sections, especially those from the socially excluded, marginalised, deprived sections to participate at all levels of water and sanitation sector projects and services through organising groups, building their capacities and entrusting responsibilities.
- Advocacy, awareness, sensitisation for all levels of policymaking and implementation.

Mobilisation of Resources

GMS stipulates gender budgeting to reflect resource allocation for women's needs and priorities. Gender-disaggregated data collection and continuous gender analysis in monitoring and evaluation using gender indicators are also emphasised.

For operationalisation and compliance of GMS, a Gender Nodal Unit at the project directorate supported by an Advisory Committee and Gender Focal Unit at each Municipal Corporation is envisaged. In addition, inclusion of a gender expert on project teams, strengthening the ability of staff to integrate a gender perspective through training in gender orientation, tools for gender analysis and gender planning. To ensure participation of women in decision-making and delivery of equitable water and sanitation services, reservation and nomination of women in all committees of Municipal Corporations and promotion of women groups are envisaged.

Process

RGA and Video films, viz. 'Voices from the Margins' and 'Silences no more' capturing the voices of women, brought out issues for Gender Mainstreaming Strategy and action highlighting inequalities and inequities faced by women in the water and sanitation sector.

Inappropriate, inconvenient timings of water supply, failure in maintenance of pipelines and water taps, non-availability or inappropriate location of public toilets with no water and electrical connection and no regard for security and privacy of women, shows complete neglect of women's needs in planning water and sanitation arrangements in the slums.

A proactive approach was needed to integrate women's and men's needs, concerns and perspectives into policy, planning and management of water and sanitation services. Thus a Gender Mainstreaming Strategy and action plan was developed after consultation with stakeholders to bring the required focus on gender equality and equity.

Implementation of GMS was simultaneously taken at policy level and community level. Advocacy and awareness workshops for Municipal Councillors and officials was organised in each project city to make policymakers aware of gender, equity and mainstreaming in water and sanitation sector and also appropriate processes and tools for implementing GMS. These workshops provided a platform for developing capacity, commitment and a sense of ownership of the strategy.

As a pilot to implement GMS at community level, Mahila Chetna Manch in partnership with UN-HABITAT mobilised women in five slums in each project city to form their self-help groups for management of water and sanitation services in their locality. Skill building training sessions

empowered these women leaders to participate in demand and delivery of water and sanitation services. The men in the locality were also sensitised towards gender issues in water and sanitation.

Equipped with the know-how, women groups presented their demand to respective municipal corporations for repairing the community toilet and handing over to them for its operation and maintenance. The Municipal Corporation of project cities Gwalior, Indore and Jabalpur initiated the action on their demand. Meanwhile, waiting for action on part of Bhopal Municipal Corporation, Self Help Group (SHG) members in Ankur Nagar slum went ahead with managing the toilet themselves.

Obstacles: Initially there was resistance to women's involvement in managing community toilet. Some women also opposed levying user fee. Despite the opposition, the SHG members decided to manage the toilets. The local people came forward to help these groups. The issue of imposition of fee on toilet use was resolved by the agreement of community to contribute money for regular cleaning and maintenance of the old community toilets and payment of regular monthly fee of Rs.30 per household for new toilet complexes with adequate number of seats for men, women and children. Some SHG members and men volunteered to safeguard the sanitary fittings.

Results Achieved

Involving women self-help groups in implementation of GMS is effective. The women started voicing concerns for better water and sanitation services, and undertook to change the situation themselves. Municipal Corporations acknowledged demand of SHGs for repair, provision of electricity and water connection at community toilet. The gender orientation of men in the locality prompted them to see the deficit in these services as burdensome on women. They helped women to discuss and participate in managing water and sanitation services.

Sustainability

Gender Mainstreaming in water and sanitation is not only an issue of equity but also of efficiency and sustainability. Pro-poor and gender responsive governance is the base for sustainability. Integrating gender perspective into policies, programmes, projects, capacity building activities; adopting gender tools, use of gender disaggregated data, gender analysis in implementing, monitoring and reporting mechanism; support of gender responsive budgeting; dialogue and consultation with men and women at local levels as envisaged in GMS, are effective in making services affordable and sustainable.

Moreover inclusion of women as chairpersons, secretaries and treasurers in committees of local self- government and management of delivery of services by local women groups who are trained leadership, operation and maintenance of the services, ensures efficiency of water and sanitation services and thus leading to sustainability of efforts.

Lessons Learned

Trained women groups can take the initiative to manage these services on their own. This was seen in Bhopal where SHG members collected contributions for getting toilets cleaned and white-washed when the Municipal Corporation took no action on their demand for repair and provision of water and electricity connection in community toilet. Women leaders requested Mahila Chetna Manch (MCM) to provide overhead water tank for the toilet. MCM utilised an earlier received donation for investing in a water tank for slum locality. Water connection was provided from nearby bore well. Water taps were provided in each toilet. Local councillors supported the move.

Request to keep the toilet and locality clean by the group members led to change in sanitation behaviour of the community. Now women, men and children, especially adolescent girls are happy to use toilet; the children have stopped defecating in open. Some families who have toilets built in their houses now use the community toilet as it has sufficient water availability. This reduced the burden on women to fetch water for cleaning the toilets in their houses.

The community contributes for cleaning of toilet and the group has taken the responsibility of safeguarding and filling overhead water tank. Now group members take pride in sharing their effort with women of other locality.

Transferability

The handing over O&M after building capacities for participation of women and mainstreaming gender in water and sanitation services provides the base for its transferability.

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TIRUCHIRAPALU, TAMIL NADU, INDIA

From Alienation to An Empowered Community: Gender Mainstreaming Approach to a Sanitation Project

This Local Action is an excellent example of an urban sanitation project where the use of a gender mainstreaming approach contributed significantly to the project's success. It documents a community sanitation project implemented by the NGO, Gramalaya, in eight slums in the Tiruchirapalli district of Tamil Nadu State, in South India. The project involved the formation of women's self-help groups, the construction and rehabilitation of community sanitation complexes and the establishment of a community sanitation facility management system by the women.

Background

Lack of adequate water and drainage facilities for the community in the Tiruchirapalli district of Tamil Nadu, India caused disuse and apathy among the residents. For decades they had used the broken toilets or pavement area, or open drains in front of houses for defecation. It was a way of life they generally accepted, despite its harshness. The eight slums in Tiruchirapalli district had six community dry latrines and the human wastes are dumped in an open pit. There were also two latrines with septic tanks constructed by the Municipal Corporation. These latrines had become unserviceable due to poor maintenance of infrastructures created before April 1999. Women hold their noses covered with the end of their saris to escape the stench, but they had no choice but to continue to use the pits. To overcome embarrassment, the women covered their faces while defecating or waited-till dawn or dusk to prevent being noticed. They find it preferable to locate a tiny bit of land for defecation and use this small space repeatedly.

Men and women sanitary workers from the lower castes collected the human waste from the pits, and swept them to the side, creating a huge mound of human waste that was a hazard to community health. The city did not have underground drainage, so rains would dislodge the waste and float it around the community. This wastewater often entered the households, waste accumulation caused also blockages in the latrine complexes which government bodies were expected to clear, but did not do so.

Water tankers supplied the community with drinking water, but there was considerable wastage as well as fights to collect water. Male community leaders did not take any steps to provide improved facilities. Requests to the Government for better services were of no avail until the people joined forces with Gramalaya, a Non-governmental Organisation (NGO) that works with communities on water and sanitation projects.

Objectives and Strategies

The Project emphasised on formulation of women Self-help Groups (SHGs) for community mobilisation, sanitation management, establishment of micro-credit, conversion/ construction of water seal latrines, underground drainage system, garbage bins to dispose solid waste, capacity building of women groups.

Mobilisation of Resources

To address this situation, in 2000, the State Authorities for Urban Affairs in the Tiruchirapalli district proposed involving NGOs to encourage people's participation and empower women under the Namakku Name Thittam (We for Ourselves) programme. Gramalaya and two other NGOs

The women in Viragupettai reported that "the non-maintenance of the latrines caused faecal worms to generate and reproduce, and they could be found nearby the water taps, and even inside the walls of their houses." Poor sanitation and contaminated water affected all families with disease, increasing their medical expenses.

formulated the project with funding from Water Aid. The funding enabled the project to serve a total of 25 local slums in various communities, with guidance from the District Collector and the Commissioner of the City Corporation. In Gramalaya, eight slums in total benefited from the project. Water Aid covered the equipment and installation costs, while Gramalaya was responsible for the capacity building and community mobilisation components. The Government provided the land sites, electricity, water supply, and loans to community members.

Process

Gramalaya had prior experience in water, sanitation and hygiene projects in rural areas and has been working with women's groups as the focal point for dissemination and change.

The project design called for the installation of drinking water facilities and individual toilets, as well as community mobilisation with a focus on gender mainstreaming as detailed below:

- Forming women's self-help groups as the primary community mobilisation and sanitation management mechanism;
- Using the self-help groups to establish a savings and credit scheme related to the project;
- Converting dry earth communal pits to water seal latrines;
- Installing low cost individual toilets;
- Installing underground drainage systems and garbage bins to dispose of solid wastes;
- Installing drinking water facilities;
- Providing related training for local mechanics and masons;
- Providing training for the women's groups in accounting and assessing finances and services from the Government; and
- Providing Family Counselling.

There was hesitancy within the community regarding the project. The project staff's initial work was slow and difficult. As a result of having been let down in the past, community members were reluctant to trust the efforts of Government, politicians and the NGOs. Garamalaya worked with the community to change this situation by forming women's self-help groups, convincing men to support the women in their new roles and cleaning up garbage and waste.

The usual Government practice was to contract companies to do waste and sanitation-related construction work without any consultations with community members. Lack of supervision led to unfinished work and, in one instance, the contractors simply locked the new toilets and did not open them for two years. For Gramalaya's project the Government gave land, electricity, water supply and loans to the community but was not expected to provide the services themselves. Gramalaya followed the project design as illustrated above, as well as by:

- Demolishing old structures, cleaning up garbage and human waste so that the community started to believe again;
- Forming the first self-help group of 20 women. These women contributed to a savings account to support the project, which gave them increased confidence as they were able to access credit and determine their own interest rate;
- Convincing men to support women in their new roles following their initial resistance;
- Providing daily support to and interaction with the women to strengthen their new confidence;
- Assigning the full responsibility for collecting and distributing savings to the women after each group's formation; and
- Encouraging new start-up group activities in savings and social interaction.

The introduction of a 'pay and use' system was discussed and agreed upon by the women's groups and was critical to facility maintenance. It was agreed that each person would pay half a rupee (US$ 0.01) per usage and that each group member would take turns to serve as a caretaker so that the sites would be staffed day and night. The women's husbands accompany them for the night shifts. Tokens are issued before usage, which help to keep accounts and monitor the number of users. The women also set up a maintenance system in which both men and women take turns cleaning the complexes twice a day. The system greatly improved the hygiene levels in the complexes.

Results Achieved

The project achieved remarkable results at multiple levels.

Women's empowerment

- Women learnt vocational skills, including how to repair hand pumps;
- Women now look after family and community budgets and are able to maintain me self-help

group's accounts with both transparency and accuracy;
- Women are now also able to make decisions related to water and sanitation;
- Women have increased privacy and access to clean facilities;
- Men now look up to their women with respect and admiration;
- Women have a new sense of self-esteem;
- The women's groups increased in such numbers that they formed a city-wide federation, 'Ezhil Iyakkam', to work towards improving the quality of life in the slums;
- The project's success has attracted visitors from all over and has given the women considerable recognition; and
- As a result of the gains made by the women in the project area, women from the slums in Orissa State have now begun a similar initiative.

Men's involvement

Initially men were against the women becoming more empowered. They asked the Gramalaya staff why women were given so much importance and demanded assistance in forming men's groups. This problem was aggravated by the fact that local politicians would foment conflicts among men's and women's groups in order to get votes in future elections. They reasoned that when community members gained awareness and skills resulting from the capacity building and empowerment activities provided by the NGOs, it would be more difficult to get their votes. However, with the intervention of Gramalaya staff, the men gradually changed their attitude towards cooperation. The meetings Gramalaya held with the men served to increase their understanding that this programme gave importance to women's roles and improved their status, and that this was of benefit to none other than their own wives, mothers and sisters. The men also came around when they started to see the benefits the women's groups generated. In the end, they began to participate as volunteers to clear debris and for other works, to realise that women could tackle many problems and even to encourage their wives and female relatives to participate.

Income from 'pay and use' toilets

The 2002 Expenditure statement showed that one public sanitation complex with 20-seat capacity generated an income of about Rs. 3,65,000 (US$ 8,000 approx in 2000) in one year with a total close to 730,000 paid usages at Rs. 0.5 per usage. From this revenue 39 per cent was utilised for complex maintenance and 61 per cent for community development activities.

Community Development by women

The income from the sanitation complexes was used for a variety of works, including:

- Bore-well hand pump renovation and street tap repairs;
- Construction of a community hall, well and drainage facility;
- Toilet renovation works;
- Sanitary complex maintenance;
- Loans to nearby slums for toilet construction;
- Running a computer centre;
- Social welfare activities such as the celebration of water day and women's day;
- Special units for adolescent girls, cottage industries, and small shops; and
- Loans for education and other purposes.

Vermi- composting - sanitation and income generation

The Ezhil Iyakkam Federation concerned about the wet and decayed vegetables generated by the nearby market and thrown near the community latrines. In response, Gramalaya sought external training and then converted this waste into a resource by providing composting expertise to the women. Now women can generate compost and are able to sell for a good price.

Emergence of innovative child friendly toilet (CFT) complex

The women's groups realised that, if children do not use toilets, the slum would never be clean. One of the women observed that, "as our children are habituated to using the drainage system for defecation, something similar to squatting on a 'drain type model was needed." This led to the invention of a child-friendly toilet. About 230 children use a child-friendly complex that the community built with walls separating boys and girls. Children's toilet usage was a big step forward for achieving total sanitation in the community. There is no payment required for the children's toilets and the women's groups clean them.

Improved sanitation facilities

There are a total of 201 new pour-flush toilets with 104 for men and 97 for women. Formerly, there

had been only 90 toilets with broken seats, which served 5817 people. Now there is no need for the emptying of septic tanks, as the new toilets are all connected to the newly created and expanded Government underground drainage system. The new sanitation complex has about 900 users on average per day.

Changes in hygiene behaviour

The changes in people's hygiene behaviour confirmed from the comparison of baseline data at the start and midpoint of the project (1999 and 2001 respectively) are given at Table-1.

Reasons for Project Success

- The project's focus on women's empowerment, including the formation of women's self-help groups and the related savings and credit scheme run by the women;
- Open discussions with male community members regarding the benefits of increased women's empowerment to themselves, their families and the community;
- Capacity-building of the women's groups in the areas of accounting and accessing government services;
- Provision of family counselling on domestic violence and communal problems;
- Daily contact with and support of the women's groups by Gramalaya;
- Development of community sanitation facilities managed by the community;
- Adoption of a 'pay by use' system that supported both facility maintenance and community development activities; and
- Collaboration between the Government, NGOs and the community.

Sustainability and Transferability

- **Success of gender mainstreaming in development programmes:** The development of water and sanitation facilities using a model-based on women's empowerment will bring success to a country where 70% of the population currently still defecate in the open. This project's impact clearly demonstrated that a gender mainstreaming approach should be included in all development programmes to address major concerns more effectively and obtain the maximum benefits.
- **Respect for women spreads from the community to the Government:** In Tiruchirapalli, not only is the community benefiting from improved water and sanitation facilities, improved health and increased resources to support community development initiatives, but the women have also gained enormous self-confidence. Women who were once treated shabbily by officials are now given respect and invited to sit on chairs when they visit government offices. Not only their men, but the world also now admire them, and they receive a stream of visitors from all over. Their life has a new meaning filled with hope.

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Table-1: Changes in hygiene behaviour

Hygiene Behaviour	Before (%)	Midpoint (%)
Dipping hands in container	70	26
Hand washing without any washing agent after defecation	75	2
Ownership and use of household toilets	8 (also with unsafe disposal)	22 (with safe disposal)
Percentage using community toilet	40 - damaged facility	64 -using new or renovated facilities
Children affected by diarrhea	73	10
Children's use of toilets	0 (100 per cent practiced open defecation)	90
Percentage of monthly family income spent on medical expenses	36	4

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NEPAL

Making Rural Water, Sanitation and Hygiene Gender Sensitive and Pro-poor

Nepal Water for Health (NEWAH), a national-level NGO has been providing safe water, improved sanitation, and better hygiene to rural areas in Nepal. NEWAH's main thrust is on Gender and Poverty Approach (GAP), which aimed at dissolving the disparities between women and men, and between the rich and the poor in the rural communities. To intensify the gender and poverty mainstreaming strategies of its water, sanitation and health education programmes, NEWAH institutionalised GAP approach in its interventions in Nepal's rural communities. The GAP approach addresses existing social inequities by increasing gender equality and social justice in rural water supply, sanitation, and hygiene projects.

The Situation

NEWAH's experience showed that the rich and the higher caste men dominated all aspects of the water and sanitation delivery projects. This situation often excluded women, poor Dalit (low-caste), and the local people from every form of decision-making, training and other benefits related to improved water and sanitation systems. Water systems predominantly controlled by male elites in Nepal often cause unequal access to safe drinking water between the better-off and the poorest socio-economic groups. More often, these male-led water projects prove to be unsustainable. NEWAH recognised that unless efforts are made to correct the situation at the organisational and programme levels, poor women and men will continue to be deprived of the benefits of their water and sanitation projects.

Strategy and Process

One of the GAP approach's most important strategy was the conduct of a "well-being" ranking of all households in GAP project sites to determine the socio-economic status of each household. The ranking results were used to identify which household gets greater subsidies and more paid employment opportunities. The ranking also helped to identify households and community members, particularly poor women, who need to be given better chances of participating in decision-making activities, especially when it comes to water supply and sanitation services delivery.

The GAP approach also provided equal division of paid and unpaid labour, and skill training to women and men in project-related work. Women workers reported that their family and community status was enhanced, and their self-confidence increased. The men were also trained in health and sanitation promotion. The increasing roles that poor women in GAP projects allowed them to get more involved in decisions over the location and orientation of water points in their communities. Consultations with women through the GAP approach have also directed the design of faucets and platform walls, pipe railings for women to hang clothes, and bathing units to meet women's practical needs. Child-and girl-friendly school latrines were also installed.

Another feature of the GAP approach was a flexible water points policy that allows the construction of water points even to communities with a small number of households. The policy ensured the provision of water and sanitation facilities to more distant households, who are often poor and socially excluded. A socialised graded rate system for operations and maintenance payments were also put in place, benefiting the poorest households. By providing 50% of necessary labour to help install the water and sanitation system, poor households were provided with free latrines and pay less for the services. Livelihood training programmes were also provided to add to the households' income. The GAP approach also paved the way for the creation of a gender sensitive savings and credit organisation.

Results Achieved and Sustainability

Five project sites in Nepal were used to pilot-test the GAP approach. As of July 2005, NEWAH has provided these project sites a total of 12,508

community tap stands, around 42,000 domestic latrines, 181 school latrines, and 7 public latrines. NEWAH also trained about 15,000 members of NGOs, women credit groups, and other community organisations. NEWAH's GAP approach was instrumental in increasing women and the poor:

- Access to water supply and sanitation services,
- Awareness on health issues and hygiene education,
- Participation in decision making processes and skill training, particularly in relation to the design, implementation, and operation of the water supply, sanitation and hygiene projects.

Lessons Learned

While NEWAH's GAP approach was successful in narrowing the gender and poverty gap, much still needs to be done to achieve gender and social equality in rural Nepal. NEWAH's projects provide a few lessons and suggestions in undertaking similar water supply, sanitation, and hygiene promotion projects:

- First, disaggregating community data by gender, socio-economic groups and caste/ethnicity is necessary to help identify the extent of the projects' benefits, that is, whether women, the poor and socially excluded groups are being reached. Female headed households or those with elderly or handicapped members should be prioritised in the provision of latrines, subsidies, suitable and affordable alternatives;
- Second, innovative approaches for health and hygiene promotion should be used such as considering children as change agents in the promotion of good hygiene behaviour, and training males to become community health workers to foster change in men's attitudes when female community health workers cannot make headway; and
- Third, monitoring the sustainability of an intervention, however crucial and challenging, must be considered an essential component of the projects. Future projects should be designed with greater emphasis of social inclusiveness so that no women, the poor, and other disadvantage groups will be left out from water, sanitation and hygiene services.

References

Serving the Rural Poor: A Review of Civil Society-led Initiatives in Rural Water and Sanitation by Umesh Pandey, Director, NEWAH, Nepal
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BANDA GOLRA VILLAGE, PAKISTAN

Initiative of One and Relief for All: Women's Leadership

This Local Action documents how the women's group brought water to their village; the strategies the women used to gain acceptance for the scheme and the leadership role in the village. The project is a unique model of women empowerment in bringing out adequate water supply services through community management, and is self-reliant and sustainable with the dedicated effort of a women's community-based approach with dynamic leadership.

Background

Banda Golra is a small village in Pakistan located 10 km from Abbottabad, with about 120 households scattered over the hill-side. Most men work as day labourers, while women have traditional roles in the household and take little part in decision making. Most of the families are large, as women are usually not allowed to use family planning methods. The average household has eight members. The majority of women are illiterate, while most men have primary education.

The primary school is at a distance of 4 km from the village. The girls only attend until fifth grade up to they reach puberty as using purdha is strictly observed. Women work at home, manage livestock and do other household work. Diarrhoea is a major health problem among the children. There are only five latrines in the village and these are located in the homes of influential villagers, as such most of the villagers have to use open fields.

Access to water in this area has been a problem for decades. The only water sources for the village were two natural springs, located on a mountain top and in a deep valley, which are used by the people as well as by village livestock and wild animals. Collecting drinking water is the women's responsibility and they spend three to four hours daily just completing that task. Obtaining water for livestock and other household purposes required another full day every week. During dry season women would have to sit all night at springs to get two buckets of water.

A government pipeline also supports, but there are only four connections to the village – one for the Mosque, two were installed privately and only one for the communal. The pipeline water runs twice a week and is not sufficient to meet local water demands.

Main Obstacles

The men own and control most of the village resources, including houses and land. According to the State and Islamic law, women can inherit property, but in most cases they do not receive their inherited property or are pressurised to waive their inheritance rights in favour of their male relatives. The men in the village exercise greater decision-making power than women although the majority of women involved in the water and credit schemes. Thus, the need for improved access to water and sanitation was urgent.

Objectives and Strategies

- Increased community access to clean water
- Develop an appropriate water supply scheme to the village
- Reduce the burden of water collection placed on women
- Improve family and community health.

Though, the men in the village exercise greater decision making power, one village woman, Nasim Bibi, took the initiative to motivate the villagers to formulate a water supply scheme to the village and formed a community-based women's organisation for its implementation

Mobilisation of Resources

The water supply scheme involved installing seven new handpumps in different locations in the village. The community had to contribute 20 per cent of the costs and the regional NGO, Sarhad Rural Support Programme (SRSP) 80 per cent. Each participating household had to contribute Rs. 1000 (US$ 16), and each hand pump was financed by a group of seven households. The CBO members mobilised their households and worked to get the support of their male relatives.

The village women also contributed to the scheme implementation. Every participating household had to take turns providing food and accommodation for the labourers engaged in drilling boreholes and installing handpumps. Village women also collected enough water to help soften the ground for drilling and to support construction of the handpump platforms.

Woman's Leadership

The village water supply scheme was initiated by Nasim Bibi, who needed money to help construct her house. She had heard about Sarhad Rural Support Programme (SRSP), a regional NGO that provided credit in the area. Nasim Bibi contacted SRSP to apply for a loan, but was informed that the organisation only lends money to community-based groups.

Undaunted by the refusal, Nasim Bibi mobilised the women of the community and formed a Women's Community-based Organisation (CBO) in 2002. CBO members started a saving scheme with each member depositing Rs. 10 (US$ 0.16) every month. Over two years period, 21 women members received loans from SRSP for household, construction, weddings, purchase of livestock and these loans were successfully repaid. This has motivated many other women to become members of the CBO and sustained faith in the leadership of Nasim Bibi.

During their monthly CBO meetings the women identified increased access to water as a priority for action and decided to develop a village water supply scheme. SRSP though initially rejected, with the advocacy efforts of Nasim Bibi and other CBO members to take full responsibility for the project's management and loan repayment, SRSP finally agreed.

Nasim Bibi in her work as an activist and social worker sending their daughters to school and she had the support of her husband who had liberal views on gender mainstreaming. He strongly criticised the behaviour and attitudes of other village men in restricting girls' educational opportunities and women's right to work independently. His support of his wife's leadership helped her considerably in the organisation of both the credit and water schemes.

Nasim Bibi's leadership helped other women become involved, as community leaders. The women's CBO formed three committees to manage the project. These included:

- *Project Committee* - responsible for the purchase and actual installation of the handpumps: two women and three Men;
- *Audit Committee* - responsible for financial auditing and bill payment: two women and three men; and
- *Maintenance Committee* - responsible for providing regular handpump maintenance: two women and two men.

The work the women did on these committees took them out of their traditional reproduction-focused gender roles. It involved them both in public leadership and in taking on non-traditional tasks such as pump maintenance. Nasim Bibi herself was on the Project Committee and purchased all the equipment, hired the labourers and monitored the project's implementation to avoid cost and time over-runs. In essence, serving as the water scheme project manager.

Households that did not participate initially had thought the scheme was a fraud, and that Nasim Bibi would keep the money collected for herself. They were also concerned that drilling a well for a handpump would be difficult because of the area's rocky terrain. However, after the successful installation of new handpumps, these households regretted for not having joined. They have committed themselves to contribute to any new village water schemes, as well as to the maintenance costs for the recently installed pumps. Despite the fact that some households did not contribute to the initial water scheme, they are allowed to use the handpumps.

Results Achieved

The women's water supply scheme has led to the following changes and impact on the village:

Decision-making power

- Increased decision-making power at the household level for the majority of women involved in the water and credit schemes, and the value of participation in public activities is increasingly recognised;
- Recognition of the value of women participating in public activities and how this could benefit their husbands and families directly through gaining increased access to new services such as credit and water;

- Increased recognition of the ways in which women contribute to bettering their family's economic situation; and
- Open discussion of health issues related to frequent pregnancies; many women upto 35 years old report that they are now able to decide to keep their family small.

Time saving

- Significant increase in time available for other activities as the time needed for collection of water has greatly decreased, with most women indicating that they use this extra time for family and group meetings; girls use it for embroidery and sewing for themselves and their families;
- Decreased pressure and stress for women;
- Improved women's social relations outside their homes; and
- Increased sense of independence due to greater social mobility.

Health, hygiene and sanitation

- Increased frequency of clothes washing from a weekly to an almost daily basis;
- Increased frequency, convenience and privacy of bathing for families almost on daily basis, particularly women and girls, as they no longer have to walk to the spring to bathe;
- Increased sense of security regarding the cleanliness of their new water sources;
- Decreased contamination of the new water sources due to animal waste; and
- Increased understanding of the importance of sanitation in the village by planning a village sanitation scheme.

Education

- Girls' access to education has improved. A non-formal school has been established in the village that offers both primary and secondary classes, mainly to girls. The high number of girls enrolled is a result of the special efforts of Nasim Bibi and her daughter. It was because they have confidence in Nasim Bibi and her daughter due to the successes of credit and water supply schemes and because of the fact that parents prefer to send their daughters to a school that is close by.

Increased CBO membership

There is a significant increase in the number of new CBO members, with new members now finding that they are receiving support for this activity from the male family members, unlike before, when they met with considerable resistance.

Changing attitudes

The attitudes of men and women who did not participate in the scheme have changed significantly from the project's beginning. They now perceive this type of activity as something that is being done on behalf of the entire community, and are no longer suspicious of it. They also see women's participation in the CBO as something positive that could benefit their entire family, particularly in terms of gaining increased access to credit.

Creation of role models

The project also made role models out of participating women by:

- Increase in the respect of male community members for active women members of the CBO and for Nasim Bibi in particular,
- Increasing acceptance by men that women can be effective community leaders. It was of the view that if Nasim Bibi competes in the local elections for Councillor, she would definitely win. This would have been unthinkable, prior to the water scheme.

Nasim Bibi has acquired the respect and confidence of the community through her hard work on their behalf. Through this process she has become an informal community leader, especially for the women who come to her for advice, moral and financial support. Village men also come to her for advice and help. After the successful completion of the credit and water supply schemes, they see her as a person with strong linkages with NGOs and often come to her for help, seeking jobs and credit.

Community involvement and higher rate of participation

Villagers who did not participate in the scheme now perceive it as something that is being done on behalf of the entire community.

Sustainability

After the successful completion of the credit and water supply schemes, the community members now see Nasim Bibi as an informal leader and a person with strong linkages with NGOs. Increased understanding of the importance of sanitation in the village is a long-term result of this project.

Lessons Learned and Transferability

This Local Action demonstrates how strong personal leadership, when supported in strategic ways and at strategic times, can lead to significant positive results for increased gender equality as well as improvements in water and sanitation. Nasim Bibi had the courage to step outside traditional gender roles in her village, even though she is poor and had no real power base or influence in the village. Yet the support of an external NGO stimulated her to organise a women's community-based organisation. This CBO, because it was able to address the women's immediate financial needs and because the women were able to provide additional financial support for their families through the SRSP micro-credit scheme, helped the women gain increased respect from male family members as well as increased decision-making power at the household and community levels.

The CBO members provided support for Nasim Bibi's leadership when she had to advocate on behalf of the village first with SRSP, and then with the village men to get them on her side for the water supply scheme. SRSP's condition that the CBO take on the project management also had the impact of empowering the women, as it gave their new leadership role validation and credibility from an external organisation.

The women's CBO was able to gain men's support for the water scheme because it started with a base of people who trusted each other due to their familiar relationships and because the members' male relatives realised that the women's participation was benefiting the entire family and helping support the men in their role as household heads. This helped the women gain male support for the water supply scheme, as did the fact that the women consciously involved the village men in a shared management model in the water scheme.

All these factors came together to increase community access to clean water, lessen women's burden, and improve family and community health. They have also empowered the women of Banda Golra and confirmed them in a new leadership and decision-making role.

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PAKISTAN

Ladies First: Accessible Water for Entrepreneurial Women

Imagine living in a village in Pakistan and getting water — for drinking, bathing, and washing clothes — from a stagnant rainwater pond, or a muddy irrigation and drainage canal contaminated with pesticides. This is what villagers in rural Punjab faced every day.

But what a difference clean water made to the lives of the beneficiaries of the Punjab Rural Water Supply and Sanitation Sector Project, especially the women and children, whose job was to fetch water each day for the family's needs.

The project provided safe drinking water and drainage facilities to about 800,000 people through simple, low-cost sub-projects that used the community-based approach. The primary beneficiaries were the women and children from 335 mostly poor and remote villages in the Punjab's seven priority districts.

The results are impressive, including more than 90 per cent reduction in reported water-related diseases; increased household income of 24 per cent on an average; 80 per cent increase in the school enrollment of children; considerable improvement in the local environment (decreased odours and insects); and fewer sick days reported throughout the community.

It was the first project in the Punjab to employ a community-based, demand-driven approach, wherein the local people participated from the planning through the construction stage and eventually became fully responsible for operation and maintenance (O&M).

Background

Punjab, the largest province in Pakistan, is home to 62% of the country's total population of 135 million. About 60% of Punjab's 84 million residents live in some 27,000 rural settlements, where only about half of the population has an adequate supply of water. Until recently, the remainder of rural Punjab relied on often-distant sources of unsafe water, such as uncovered wells, rivers and canal or rainfed ponds. Regarding sanitation, only a little more than 25% of the rural population has access to household latrines. The remainder of the population defecates in open areas, a situation that is particularly difficult for women, as by custom, they can only use the fields either before sunrise or after sunset. Drainage is also very poor in rural areas, and maintenance of drains is commonly neglected. In addition to the obvious unpleasant odours, this results in infestations of disease-bearing insects such as flies and cockroaches—a source of health problems for adults and children alike.

It can be said that poverty in Pakistan has a woman's face. Among Pakistan's poorer households, the incidence of chronic malnutrition in female members of a family is considerably higher than in other members. These are the same women and children who have to walk considerable distances daily, carrying heavy water pots on their heads to fetch water from ponds—water from which cows and water buffalos sometimes bathe. This task becomes especially difficult in bad weather. As this responsibility and other culture-specific restrictions deprive girls from schooling and other opportunities to advance themselves. Many Pakistani girls when they grow up, get trapped in the web of dependency and subordination because of their low social, economic and political status in society.

Objectives and Strategies

The Government of Pakistan has been concerned about the inadequate provision of social services, especially in rural areas for it believes that greater investments in such projects will stimulate productivity; reduce poverty; and promote smaller, healthier, and better-educated families. Nationally, the government has identified low water supply and sanitation coverage as one of the major issues confronting the water supply and sanitation sector. With the help of the Punjab Rural Water Supply and Sanitation Sector Project, the government sought to bring safe drinking water and sanitation facilities to poor rural communities in Punjab province.

The overall goal was to build community water supply and drainage facilities to reduce poverty and improve quality of life as well as the living conditions of rural communities in Punjab province, where water is scarce and groundwater, brackish.

Resources

Through the Punjab Rural Water Supply and Sanitation Sector Project funded by the Asian Development Bank (ADB), the women of Punjab gained easy access to clean drinking water—a radical change that will continue to uplift their lives for generations.

Process and Community Participation

Men and women formed community-based organisations (CBOs) to maintain the water supply distribution system, drains, and oxidation ponds, as well as to promote social development work and livelihood activities. They solicited community donations of land—for the construction of pump houses and oxidation ponds—and earthwork—for paving streets and constructing drains. CBO members also successfully facilitated the collection of tariffs.

Community involvement in project planning, design, and implementation was a key feature of the project. This set the stage for the CBOs' proper O&M of the water supply and sanitation schemes. They were trained to supervise the construction before the subprojects were implemented. They were trained in efficient O&M, including financial management, technical operations, and water quality monitoring, before the subprojects were handed over to CBOs.

As the primary beneficiaries of the project, women were encouraged to carry out sub-projects, operate and maintain them, collect tariffs, and evaluate projects as active participants in CBOs and community development units. Community development unit staff and CBOs were mainly responsible for community benefit monitoring and evaluation, another key feature of the project. This involved the collection of baseline data and information on performance indicators, data analysis and evaluation, and the preparation of biannual benefit monitoring and evaluation reports.

A Hygiene Education Programme was also held (4-day seminars) in each village using video and audio clips as well as flip charts to teach men, women, and school children about proper sanitation and cleanliness. As part of this programme, latrines were also sold for about US$12 to be paid in installments under the supervision of CBOs.

Monthly user fees ranged from Rs. 50 to Rs. 150 for piped water and up to Rs. 20 for gravity-based systems. Community pressure and prompt disconnection of services for non-payment of accounts generally made tariff collection easy.

Following the provision of clean water, the number of children enrolled in schools increased and community members donated their labour to expand schools.

Results Achieved and Sustainability

The project provided safe drinking water and drainage facilities to about 800,000 people through simple, low-cost subprojects that used the

"Farzina, a college student from Punjab, recounts: "Girls wanted to go to school, but there was no time. Mothers would say, 'first you must fetch the water, then you can study.'" In Farzina's village, children often spent 5–6 hours a day fetching water.

The children of Sughran Bibi also used to spend much of their day fetching water. Their story is typical in Punjab.

"We used to get our water from a pond used by animals. It was so dirty. Then, they dug a well, but we had to line up all day under the sun, to get a little water. The water wasn't good. It was brackish. We didn't have clean water, even for funerals. Many children would get sick with diarrhoea. There was cholera in the rainy season and malaria because of the mosquitoes breeding in the stagnant water. We have no money to go to the doctor. Life was so bad. Some families left the village and moved to the nearby a town, Bahawalpur.

But now that we have clean water, they have come back. Now I have time for sewing and embroidery. I make clothes that I sell. Moreover, my children are now going to school".

community-based approach. The primary beneficiaries were women and children from 335 mostly poor and remote villages in Punjab's seven priority districts out of a total of 34 districts.

Since the project was completed, the availability of water has significantly transformed the lives of women and girls in these communities. They previously spent 2–6 hours a day gathering water, and an additional 5–8 hours a week washing clothes at sources far from their homes and villages.

A survey of the project revealed that when relieved of water collection, women become increasingly involved in income generation activities—about 45% of their time saved is used for income-generating activities. Knowing this, some CBOs have started programmes such as needlecraft and handicraft. One women's CBO in the north set up a school for girls, employing two female teachers; another provided financial support for women to establish a small flour mill. Still another helped to set up a grocery store in the village.

Women in Punjab now command an average wage of Rs. 5 an hour. The monetary value of the time saved could add about Rs. 135 to Rs. 337 monthly to household income in the project area. Relief from the heavy labour of carrying water home also gives the women more energy. In many villages, households saved money on medicines as a result of improved health.

Monitoring of the project has shown impressive results—more than 90% reduction in reported water-related diseases, increased household income of 24%, on an average, 80% increase in the school enrollment of children. The monitoring report also notes a considerable improvement in the local environment (e.g., decreased odours and insects) and fewer sick days reported throughout the community.

Lessons learned

- To ensure the sustainability of community-based projects, both men's and women's community groups should be involved in planning, design, implementation, and O&M, and CBOs should be trained at an early stage of project implementation.
- Subproject selection criteria should be widely disseminated to ensure transparency and proper interpretation.
- The community is often more willing to pay for services than expected.
- The local private sector usually responds well to small rural water supply and sanitation schemes, and these are generally efficient and cost-effective.
- Construction activities should be properly packaged to capture economies of scale.
- More attention must be given to gender considerations as well as to sanitation and hygiene education to achieve lasting results.
- Delays in implementation can be avoided by requesting proforma approval from the planning commission establishing the project management unit, appointing the project director and staff, recruiting consultants, and prequalifying contractors, before the loan takes effect.
- Electrifying the pumping wells in advance would have avoided delays in operationalising several subprojects.
- To ensure good quality construction and timely completion, payments to contractors should be linked to consultants' verification of the quality of the work.
- Low salaries can result in a high turnover of community development unit staff, which can adversely affect the progress of implementation and the quality of the unit's activities.

Transferability

There are positive indicators of substantial transformation and social upliftment, as well as considerable increases in household income.

Note: *Rs. 1 (Pakistan Rupee) = US$0.0317524, US$1 = Rs. 31.4937 (1995) ADB. 2002.*

SECTION VI

Innovative Financing

Innovative Financing

There is a need to intensify the mobilisation of adequate financial resources to facilitate the improvement of basic services for the urban poor, particularly in the small urban centres. These centres vary widely both in terms of the economic base and the service delivery. They serve a variety of purposes and represent a significant proportion of the population to be reached.

Access to the basic services of water and sanitation to the low-income and the needy population and the widening demand-supply gap remains a challenge, despite substantial investments by the country governments over the years. The problem also lies in the approach as most governments suffer from the tendency to invest in new assets and facilities and paying less attention to conserve and manage the existing resources. Traditional sources of external finance are often inadequate. Most governments are increasingly aware of the significance of the internal mobilisation of funds and the gains of potentially significant economic development and poverty reduction impacts through sustainable access to safe water and sanitation.

Financing water and sanitation services demands creative thinking. The innovative financing mechanisms that focus on filling the critical financial gap considers alternatives both in terms of expanding the notion of who can provide finance as well as how finance can be supplied and demanded. While traditional finance flows were used for capital investments, innovative finance can be applied to issues such as utility's operational efficiency, developing skills and long-term sustainability of services. It involves a wide range of stakeholders including the users, informal providers, utilities, NGOs, CBOs, banks or financial intermediaries, donors and International Financial Institutions (IFIs) and moves well beyond the development agencies and the country governments.

This Section highlights some of the creative ideas and innovative mechanisms that emerge to address the financial constraints for effective service delivery, particularly benefiting the small urban centres. Six such Local Actions from Cambodia, India, Nepal and Vietnam are presented.

Cambodia: the experience demonstrates the possibility of structuring innovative financing practices suitable to the needs of the small urban centres by using guarantees to support local utilities to strengthen their sources of finance.

India: UN-HABITAT used the approach of Revolving Fund for financing water and sanitation infrastructure for the poor through micro-financing measures, involving community-managed initiatives for water supply and construction of household toilets in select cities in the State of Madhya Pradesh. Various innovations that increased access to water and sanitation to the poorest of the poor are also illustrated, which can be used for designing micro-financing mechanisms utilising revolving funds. Other innovative initiatives include implementing financial reforms including Municipal Bonds and developing public-private-people's partnerships for the delivery of services. The local action in Ananthapur District, Andhra Pradesh is a unique example of such partnership to finance pro-poor investment for drinking water supply through voluntary contributions received from individuals from all over the world in the true spirit of a global partnership for a worthy cause.

Nepal: the capital cost recovery approach for the urban poor communities, an initiative of first of its kind in Nepal, is based on 80 per cent capital cost contribution by the communities in installments with immediate gain to access water supply services, as well as mobilising the funds thus recovered for the benefit of other poor communities.

Vietnam: adopted an innovative financing practice appropriate to the requirements of the small urban centres by developing locally focused design-build-operate contracts for water supply and sanitation projects.

The above practices emphasise on domestic sources of finance for both hardware and software investments and would help support for efficient and effective service delivery in the sector.

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MADHYA PRADESH, INDIA

Revolving Funds for Financing Water and Sanitation Infrastructure

The levels of investments in the water and sanitation sector within the Asian region are quite inadequate to bridge the widening demand-supply gap and to extend services to the low income and needy population. External investments into the sector are inadequate. Most governments are increasingly aware of the significance of internal mobilization of funds. There is need for more intensified funds for ensuring the urban poor to obtain improved services. This requires devising innovative financial mechanisms that focus on filling the critical financial gap by involving NGOs and CBOs and providing loans to initiate the development of water and sanitation facilities. Thus efficient use of existing resources as well as community participation is imperative to make increased water and sanitation coverage.

Creating 'Revolving Fund' would be an appropriate solution to finance the community initiatives in the water and sanitation sector, in particular for managing the drinking water supply as well as the construction of individual household toilets for safe sanitation.

UN-HABITAT under its Water for Asian Cities (WAC) Programme has used the approach of revolving fund for financing the water and sanitation infrastructure for the poor. The WAC programme has initiated a Revolving Water Fund (RWF) for implementing the Community Managed Water Supply Scheme (CMWSS) as a pilot demonstration project in Gwalior, Jabalpur and Indore in the State of Madhya Pradesh. A Revolving Sanitation Fund (RSF) has also been created to facilitate the construction of household toilets under the Slums Environmental Sanitation Initiative (SESI) which is being implemented as a demonstration project in the four project cities.

This approach involves micro-financing measures for providing loans to the Community-based Water and Sanitation Committee (CWASC)/ Self Help Groups (SHG) from the fund and then uses the repayments from the CWASC/SHG to provide loans to other CWASC or members of the SHGs, thus "revolving" or reusing the capital. The recovery of the cost is expected to generate a sense of ownership, ensure financial viability, sustainability and alternative means of financing water and sanitation infrastructures.

Revolving Water Fund (RWF)

Background

Many slums in the cities of Madhya Pradesh have the problem of water supply in requisite quantity and at normally required timing. The notified slum of Ramaji Ka Pura, Islampura and Subhash Nagar are situated in a hilly terrain of ward No. 1 of Gwalior city having 6,000 households almost totally below the poverty line used to face such problems. The water was supplied by the Municipal Corporation through direct pumping with the time schedule for supply to this area being 2.00 am to 4.00 am. These odd hours of water supply kept the people awake almost the whole night round. Besides this, around 1,500 households located at relatively higher reaches of the hilly terrain did not get water at all. They, therefore, purchased water from the households located in the lower reaches approximately @ Rs. 100/- per month.

Similarly, in the notified slum of Bagra Dafai, located in Guarighat Ward of Municipal Corporation of Jabalpur, having more than 1,200 households are almost totally below the poverty line; people used to queue up for substantial period in the morning, when the tube wells are operated, fill up water in buckets for their houses. On account of disputes regarding water allocation amongst the residents around 30 to 40 First Information Reports (FIR) have been filed in the police station in the past. To make matters worse the underground water supply in the area is having excessive fluoride and does not conform to the standards for safe drinking water. The households were however drinking this water due to lack of any other alternative.

In the notified slums of Shiv Nagar, Shahin Nagar, Pawan Putra Nagar, Kamal Nagar and Chowdhary Park Colony, situated in ward No. 64 of Indore city have 1,200 households, almost below poverty line; the households were dependent on private

tubewell owners for their water requirements. The poor also used to fetch water from nearby Lakhani factory, which is located at a distance of 3 kms from slum cluster. During summer people get water from the tankers of Indore Municipal Corporation and in other months they used to buy it from private tubewells.

In all the three cases, the community expressed their willingness to develop the water supply facilities if the finances are available to meet the upfront cost of construction of capital works. Consequently, a revolving water fund has been setup for initiating Community Managed Water Supply Scheme (CMWSS) with a view to demonstrate that it is possible to quickly improve the lives of the urban poor and the disadvantaged by connecting them to safe drinking water which would result in users not having to travel long distances or waste time in queuing for water. CMWSS has a pro-poor governance approach in which, the cost of construction and the water connection charges are met upfront from the revolving fund.

Objectives and Strategies

CMWSS was implemented in partnership with Municipal Corporation (MC) and the community represented by Community Water and Sanitation Committee (CWASC) in Gwalior and Jabalpur, whereas in Indore it was implemented in partnership with District Urban Development Agency (DUDA) and CWASC. UN-HABITAT has entered into an agreement with MC/DUDA for creating a "Revolving Water Fund" (RWF) in the city for implementation of the CMWSS and further scaling-up later on. Funds were provided from the RWF to CWASC for the implementation of CMWSS, which will be returned to the RWF by the CWASC in installments in due course of time depending on their paying capacity. The CWASC has planned, designed and executed the scheme of their choice and collecting the user charges, while the MC has provided the technical assistance and guidance. The schemes have been completed in all the three cities.

Mobilization of Resources

The CMWSS at Gwalior involved in the supply of treated water through construction of a ground level sump, pumping water from the sump to a ground level reservoir constructed at higher level in the area and supplying water to the consumers through gravity by a network of pipelines. Out of the total capital investment of Rs. 3 million (US$ 67,000) the MC, Gwalior had contributed Rs. 1 million (US$ 22,300) from the resources at its disposal and the balance was provided by the UN-HABITAT to meet the cost upfront. In Jabalpur the distribution system has been commissioned in January 2007 covering 4.6 km length. The total capital cost of the project was Rs. 2.2 million (US$ 50,000) and this was executed by CWASC. In Indore the total capital investment for executing this system was estimated at Rs. 3.024 million (US$ 68,000). The construction of 420 kl overhead service reservoir and laying of pipeline have been completed and the system has been commissioned. The DUDA, Indore has contributed Rs. 1 million (US$ 22,300) from its own resources. The balance amount (US$ 45000) was, funded by UN-HABITAT.

Process

The Municipal Corporation/ DUDA in consultation with UN-HABITAT had first identified the poverty pockets having preparedness, entrepreneurial ability and willingness to undertake and implement the project. Consultations with the community were initiated by Municipal Corporation/ DUDA officials. The Officials of the Corporation as well as those of the UN-HABITAT briefed the community about the required approach of the community managed water supply scheme and explained the mechanism of cooperation, participation and management of such schemes. The issues raised by the residents on various operational aspects of the scheme, were explained and clarified by the team. An informal committee was formed which started the process of registration. The Community unanimously supported the necessity of such a scheme and agreed to form a Committee and submitted a proposal on such lines to the Municipal Corporation/ DUDA. Finally a CWASC having one third of the Executive Body consisted of women representatives was constituted. The planning and design of scheme based on the community choice and consensus on the most appropriate scheme based on affordability and technical feasibility was undertaken by the CWASC with the technical assistance from MC/ DUDA.

The CWASC decided on the method of execution of work and invited the offers for execution of CMWSS from various construction agencies and with the technical assistance from MC/DUDA, finalised and issued the work order. Before the commencement of work training activities to equip the community in the record keeping, maintenance

of minutes of proceedings of community meetings; technical matters like installation & specification of various components, procurement and contracting procedures, and matters related to O&M were undertaken by MC/DUDA. The CWASC has implemented the scheme and the scheme is in operation in all the three cities.

Results Achieved

At present the revolving fund is in operation in Gwalior, Indore and Jabalpur. From the CMWSS financed fund, water is being supplied to 200 households in Gwalior which will be increased to 1200 households; to 600 households in Jabalpur which will be increased to 800 households; and to 850 households in Indore which will be increased to 1,200 households within three to four months. An amount of Rs. 30,000 has been recovered by CWASC in Gwalior, Rs. 75,000 in Jabalpur and Rs. 800,000 in Indore.

Sustainability

The Revolving Fund is setup in partnership with local governmental agency involving community from inception of the water supply scheme through construction to operation and maintenance. The community will operate and maintain the schemes and will pay back the cost of the capital works, which will be revolved for financing such scheme elsewhere in the city.

After extensive consultation with the community, it has been agreed in Gwalior that each member of the community would pay the connection charges in easy installments of Rs. 100/- per month for seven and half months. User charges of Rs. 80/- per month would be charged as per the normal prevailing rate in the municipal area. In Jabalpur, the connection charges and user charges are being paid in the form of lump sum payment of Rs. 100/- per month, for 36 months, and afterwards monthly user charges as per MC's prevailing rates. In Indore, the connection charges will be paid in 5 installments of Rs. 200/- each. User charges of Rs. 60/- per month will be paid in addition to the monthly connection charges. The residents will also have the flexibility of weekly or fortnight payments. Fixed installments have been proposed as it does not appear to be practically feasible to meter the consumption of each household in this below poverty line area. The entire capital investment would be recovered in 32 months in Gwalior, 46 months in Indore and 36 months in Jabalpur for executing a similar piped water supply scheme elsewhere. Thus, the Revolving Water Fund has been structured on the principles of pro-poor water governance with affordable recovery framework.

Revolving Sanitation Fund (RSF)

Background

Consumption of unsafe drinking water, improper environmental sanitation and lack of personal and food hygiene have been major causes of many diseases. Madhya Pradesh is no exception to this. Prevailing high infant mortality rate is also largely attributed to poor sanitation. UN-HABITAT on the request of Government of Madhya Pradesh has taken up the exercise of "Poverty Pocket Situation Analysis (PPSA)" in Bhopal, Indore, Jabalpur and Gwalior. The PPSA revealed that there are 1,537 Poverty Pockets in these cities wherein 4,75,368 households reside, out of which 1,51,626 households defecate in the open.

The PPSA also revealed that communities have passive demand for the creation of sanitation facilities. Accordingly, it was felt that if the communities are made aware of the importance of sanitation and at the same time supported with a mechanism to meet the upfront cost of construction of toilet, they will construct the household toilets. Under this backdrop a revolving fund for sanitation was setup.

The PPSA exercise mapped all the Poverty Pockets (PPs) of the 4 cities on the important parameters including accessibility of water and sanitation facilities and ranked the PPs on this basis of sanitation needs. UN-HABITAT with Water Aid and the Municipal Corporation of these cities, in a tripartite partnership model, launched a Slum Environmental Sanitation Initiative (SESI) covering 5000 households in each city for making the slums open defecation free by setting up a revolving fund.

Objectives and Strategies

A revolving fund for sanitation is setup for the implementation of SESI. This demonstrates how communities can be empowered to acquire adequate sanitation that meets their needs by generating demand for sanitation facilities in slums. This can be done by awareness creation, health education, capacity building, encouraging cost effective and appropriate technologies and setting up the appropriate financing mechanism

for sanitation. It seeks to ensure total open defecation-free slums through low cost individual household toilets, community managed sanitation complexes wherever required, underground drainage and school sanitation complexes. SESI has a pro-poor governance approach aims to demonstrate that, it is possible to quickly improve the lives of the urban poor and the disadvantaged by ensuring provision of individual household toilets facilities through the mechanism of a Revolving Sanitation Fund (RSF).

Mobilisation of Resources

RSF is created for construction of individual sanitary toilets at a pro rata of Rs. 2,000/- per toilet and is managed by a local NGO on behalf of the ULB/UN-HABITAT. The NGO creates Self-help Groups (SHGs) in each slum consisting of members from households needing assistance for constructing individual toilets. The SHG gets mobilised over a period of time as a cohesive group carrying normal intra-group activities of depositing monthly contribution from the savings of its members and lending to members as per their need. The needy SHG members request the SHG for providing assistance for construction of their household toilets.

Process

Homogeneous communities organize themselves into groups, i.e. CWASCs/SHGs and improve their financial and managerial capacity to execute and manage the funds. This loan is made available to individual members of the CWASC/SHGs, for construction of individual household toilets and meeting the upfront cost of construction of super structures as well. Individual households will have the choice in deciding the design/ technological option in meeting their sanitation need with the facilitation of the NGO/ULB. SHG provides loans to individuals and recover through monthly installments. If necessary the peer group pressure of the SHG assists in the recovery of loan. On receipt of demand/ application for loan from the individuals, NGO provides technical support to individuals to help them to finalize the design and estimation of the sanitation unit taking into consideration their preferences, technical feasibility and affordability. NGO/SHG releases loans to the individuals only after assessing the readiness of the Individual's contribution in the form of cash or kind. The NGO may constantly advise the beneficiary for ensuring construction quality. After the completion of the toilet, the individual will intimate the CWASC/SHG, which in turn inspects the site and records its assessment of the construction.

Results Achieved

The SHG has the responsibility of ensuring the recipients of the fund to return the loan amount for further disbursement to the newly motivated households. The individual household toilets have been constructed by about 600 households in Bhopal, 400 households in Jabalpur, 450 households each in Indore and Gwalior, which will be increased to 1,000 households within a span of 12 months.

Sustainability

The RSF mechanism has been developed on the principles of community-managed pro-poor governance. The SHG from the community ensures that the interested individual has arranged his contribution of Rs. 1,000/- (50% of the cost of the toilet) and recommends the case to the NGO. The NGO, after ascertaining that the SHG has been mobilised and the intra-group activities of contribution and lending is taking place satisfactorily, provides loan from the RSF to the SHGs which in turn lends it (based on locally agreed principles for lending and recovery) to individual applicants, as per their need up to a maximum of Rs. 2,000/- for constructing latrines including the superstructure of their choice. The SHG has the responsibility of ensuring that the loan amount is returned for further disbursement to newly motivated households. The CWASC/SHG will collect monthly installments from each household and maintain beneficiary-wise records relating to the revolving fund and in case of default in payments, intimate the guarantors for assisting in the recovery of the loan. The CWASC/SHG will itself decide the penalty in consultation with its members in case of non-repayment of loan installments.

Lessons Learned from Revolving Fund Initiatives

The setting up of revolving funds for water and sanitation initiated the leveraging of funds within the city and within the community establishing the premises that if the communities are empowered with informed choices and mobilised substantially, they can meet finances for executing and managing drinking water supply and creation of sanitation facilities as per their needs and affordability. A remarkable improvement in

community's financial management can be achieved through their capacity building with the result of opening bank account and carry out all the transactions relating to project execution and operation and maintenance.

The participation of women is most crucial for the success of revolving fund, since women are the main:

- Collectors and users of water as well as the main sufferers if the system does not function; and
- Victims due to the non-availability of sanitation facilities.

The implementation of these initiatives enhanced the capacity of the local governments (Municipal Corporations/DUDAs), local NGOs, community and other stakeholders in initiating the projects with community participation.

Transferability of the initiatives

The GoMP issued guidelines for the setting up of revolving funds for water and sanitation to augment the coverage of water supply, sanitation facilities and creating open defecation free slums in Urban Areas in partnership with community, CBOs and ULBs. Since maintenance of revolving funds is a process designed to enable the community to have access to acceptable, adaptable, sustainable and affordable finance for meeting their safe drinking water and sanitation needs, its setting up and operation does not just end with physical creation of facilities but for their sustainable use. In several ways, it marks the beginning of a new and more challenging phase, wherein the local community has to shoulder the responsibility of operation and maintenance of these funds and the facilities created.

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INDIA

Micro-financing Mechanisms through Revolving Funds: Comparative Experiences

This Local Action presents various experiences in India that can be used as the basis for designing micro-financing mechanisms for promoting pro-poor water and sanitation, utilizing Revolving Funds. These experiences include the kind of models being used for financing household water and sanitation facilities for weaker sections and the innovations that have increased access to water and sanitation by the poorest of the poor. The presentation provides suggestions on do's and don'ts and learnings about the possible pitfalls that such programmes should avoid to ensure greater success. The institutions, organisations and programmes that have adopted a similar approach and that can support in designing and capacity building are also identified.

Introduction

UN-HABITAT has been supporting water and sanitation related projects at household level through revolving funds in four cities, viz. Bhopal, Gwalior, Indore and Jabalpur in the State of Madhya Pradesh, India and is keen to upscale at the national level. The revolving fund has been set up for financing small community managed water and sanitation initiatives. The guidelines for the revolving fund for water and sanitation have been developed and are duly endorsed by the State Government of Madhya Pradesh.

UN-HABITAT has facilitated piped water connections for individual households, where the capital investment was done by UN-HABITAT and the amount is being recovered from households through a monthly charge for the connection and the water charges. The recovered money is put in a revolving fund for use by another neighbourhood. Similarly, a Sanitation Fund has also been developed. The Sanitation Fund gives loan to households for construction of individual household toilets. The money is recovered in installments and the fund utilised in a revolving manner so that more and more households can benefit.

Financing Models

The following are some of the experiences in financing water and sanitation facilities to benefit the poor with suggestions on how such programmes can be designed and scaled up. The water and sanitation community have stressed that notwithstanding hidden subsidies for the affluent, revolving funds could be an appropriate mechanism to make water and sanitation (WATSAN) facilities accessible to the poorest at a large scale.

1. Small Grants Scheme in Urban Water Supply and Sanitation: Gangtok - Shillong

The Gangtok-Shillong Water and Sanitation Programme funded by AusAID aims to improve water supply, sanitation and solid waste services in two cities in the north-eastern region of India. The AusAID funded project 'Gangtok-Shillong Urban Water Supply and Sanitation' had a component of micro-finance. The fund is called 'Small Grants Scheme' and it provides 70% capital cost as a one-time grant and 30% community contribution — not a loan. The whole process of planning, implementation and future management lies with community groups or CBOs. This method is used successfully in almost 30 projects in Gangtok by Ecotourism and Conservation Society of Sikkim (ECOSS).

2. Water Credit Provided by Banks as part of Economic Activities, Usilampatti, Madurai, Tamil Nadu

Indian Bank's Special Unit for Microfinance (IBSUM), Usilampatti branch in Madurai, Tamil Nadu State gave loans in the range of Rs. 2,000/- to Rs.3,000/- to 50 members for constructing rain water harvesting structures in their homes. These loans were sanctioned to SHG members and disbursed as a combined loan along with the enterprise loan. This type of water credit is combined with loans for economic activities and thus fulfils the Reserve Bank of India (RBI) permits to lend to SHGs for both consumption and production purposes. Under the RBI permit, Banks, while lending for economic activities can also add

the water credit and lend as a combined limit, like the Indian Bank did in the Usilampatti branch. Also, subsidy is still an attractive option to the target groups. When bank loans for toilet construction were given with subsidy under the Central Sanitation Programme, many poor SHG women availed loans and constructed the toilets.

Organisations including commercial banks are keen for micro-financing water and sanitation facilities. They can design individual loan for WATSAN purposes which can be marketed to the target groups through SHGs. For instance, Indian Bank has developed an exclusive individual loan product for financing Sakthi dealers under the Sakthi Project of Hindustan Unilever Limited (HUL).

3. Water Credit through Self-help Groups for Toilets and Water Connections, Tiruchirapalli District, Tamil Nadu

Gramalaya, an NGO, with "Water Partners International" provided loans amounting to Rs. 4.5 million to 490 borrowers through Tiruchirappalli City Corporation for household water connections and toilet facilities. Loans are provided through women SHGs ranging from Rs. 3,000 to Rs.10,000 at 18% rate of interest on diminishing returns to be repaid in 18 - 24 months with Under Ground Drainage (UGD) facilities. The cost of UGD is Rs. 6,000/- to be deposited with the Tiruchirappalli City Corporation. There is 100% repayment of loans from the borrowers with more demands from other interested SHGs. This has led Gramalya to form a separate Micro Finance Institution (MFI) for this Water Credit project funded by Water Partners International. Water Partners International is supporting NGOs and Miss in India and Bangladesh through Water-credit in providing access to household latrines and water connections for the slum dwellers and rural families through women Self-help Groups.

The newly constituted GUARDIAN - (Gramalaya Urban and Rural Development Initiatives and Network) will lend money for water and sanitation facilities in Trichi and suburban areas. BASIX, an another leading MFI for building inclusive financial system for the poor, is implementing pilot research projects in Hyderabad, Delhi, Ganjam and Indore. BASIX is commissioned by the International Fund for Agriculture Development (IAFI) which is actively involved in the field of Poverty Alleviation in India.

In addition, the Commercial Banks and the Primary Agricultural Cooperative Banks (PACBs) supported Gramalaya, have mobilised Rs. 7.5 million for construction of low-cost latrines, where loans are provided to women self-help groups directly on the facilitation from Gramalaya. Gramalaya has also planned to mobilize Rs. 100 million through local commercial banks and PACBs for construction of 30,000 household toilets in Thottiyam, Thathaiengarpet and Thuraiyur Blocks of Tiruchirappalli District under its 'War against Open Defecation Campaign Project' jointly supported by Water Partners International, USA, WaterAid, UK and Arghyam, Bangalore.

4. Revolving Loans to promote Sanitation in Villages, Hooghly District, West Bengal

All India Institute of Hygiene and Public Health (AIIHPH) introduced in one of its projects, a revolving fund to promote sanitation in the villages. AIIHPH worked for the Research and Development (R&D) on integrated and ecologically balanced water and environmental sanitation in Singur and Dhaniakhali Blocks in Hooghly District of West Bengal. The project was funded by UNICEF. Through a demand-driven approach, people were made aware and motivated to have household toilets and constructed at affordable costs. The minimum cost of household toilet construction (single leach pit with pour flush arrangement) was Rs. 500/-.

Various types of household toilets were developed. The cost of these toilets vary between Rs. 500/- and Rs. 3,000/-. Most of the families opted toilets costing Rs. 500/-. The revolving loan was Rs. 500/ - per family and to be paid back in 25 months without interest. Experience showed that repayment rate was satisfactory in first year but irregular in subsequent years. This was the experience of AIIHPH during 1993 and 1995.

5. Innovation towards ensuring social inclusion, Orissa

When poor families find it difficult, women as "inclusion ambassadors" persuade their better-off to contribute more. The money is invested and the interest earned thereof funds, the water and sanitation schemes which permits the communities to manage resources. Communities bear a third of the capital cost, Government bears half the

amount and Gram Vikas provides the rest at an average amount of Rs. 4,000/- per family. The community also attempts to tap local development funds of local elected representatives (MPLAD/ MLALAD Funds)*.

6. Community Participation Fund

The slum dwellers that migrate from nearby districts and villages for their livelihoods, mostly do not have their own houses (80% of the urban poor live in rented and leased houses). They may not go for upgradation without permission of their house owner. Secondly, those who live in own houses, they may not have ownership of the land due to encroachment.

In order to promote effective sanitation and water facilities, there is a need to have a community survey and slum profile because these two areas are closely related, with its main functions taken up by the Urban Local Bodies (ULBs). The Ministry of Urban Development, Government of India, has initiated the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in which 63 cities were selected for entire city development at international standards.

To tackle the water and sanitation problems of the slums, the Ministry has come up with a Community Participation Fund (CPF) in order to enrich the people's participation. The concept of CPF falls under housing upgradation fund, which is a very viable product in urban areas. The CPF will be given to the local NGOs and Community Based Organizations (CBOs) based on the issues of the individual slum. The proposals are prepared by the CBOs and routed through the local municipal corporation to the Ministry. The project cost for each of the proposal is around Rs.1 – Rs. 1.5 million and the community contributes 5 to 10% in addition. The project will be implemented and maintained by the community with or without the help of local civil society organizations.

Analysis of experiences in Micro-financing, Credit and Revolving Funds

Many efforts are being made in innovative financing of water and sanitation (WATSAN) projects in India. The results are mixed and are facing serious scaling up challenges. Most of the innovative financing options are incentivised with capital investment subsidies of varying levels. The revolving fund options are largely targeted at improved private services, like the household sanitation or household piped water supply. As there exists very high willingness to pay for WATSAN services, such schemes are apparently regressive in the sense that the poor tend to pay more as usual while the rich are covered by subsidized service delivery. A major reason that put a priori ceiling on loan financing is the existing policy regime that promises (seldom delivers) basic essential service level through subsidized public investments. Though this could be a laudable objective, after 5 decades of planning, the poor are still the worst affected and are paying disproportionately high for WATSAN services. This is again compounded by the inefficiency of service delivery in terms of quality, quantity and reliability, compelling the users to adopt various coping strategies. According to studies, in a State like Kerala more than 55% of the investments in drinking water had come from private-household sector and a significant share of the urban households are spending as high as Rs. 18,000 – Rs. 25000, as capital investments (connection charges and facility up gradation) alone for assured supply.

Why then high benchmark willingness to pay coexists with many non starter revolving /loan funds? The answer is the dichotomy of WATSAN financing policies by national and State governments — the promise of free provision kept private investments shied away. As the people gradually realize that promise do not deliver, the circle is getting completed by crowding in the household capital investments as coping strategies.

Ideally, the revolving/loan fund should target the rich/better off sections to leverage greater financial resources to the poor. However, policy and implementation distortions are making the task onerous. Despite the imitations, the funds would serve a great purpose and could be scaled up:

(i) if public policy in unequivocal terms spell out its stand on free provision;
(ii) the thrust of the funds is more on community assets; and
(iii) major Government/ donor funded programmes have embedded venture fund window of optimum size, with options for community bidding for counter part contribution levels administered on normative and transparent mechanisms.

* *MPLAD: Member of Parliament Local Area Development Fund*
MLALAD: Member of Legislative Assembly Local Area Development Fund.

There is an initiative by Hindustan Lever Ltd. (HLL) called "PROJECT SHAKTI" in India. During its implementation phase and it was actively involved with SHGs/NGOs/Government Agencies across 14 States in promoting the concept of Micro Enterprise /Health & Hygiene. Now the project has more than 15000 Shakti Dealers across the country and HLL has been keen in promoting Health and Hygiene programmes through the rural communicators called 'Shakti Vahinis' and on the whole the entire channel is getting stronger day by day with the active participation of rural women in this programme. Utilising this channel will be a great help in speeding up the implementation of the programme.

These types of programmes especially Water and Sanitation programmes should be tried more through public private partnerships and we should take the help of companies like HLL/Procter & Gamble/Wipro/ ITC etc. Recently HLL also launched its new product 'Pureit' water filters, which can be procured easily by SHG members through their internal loan options. Alternatively, even any local bank can extend a loan of Rs. 2,000/- to acquire the filters and thereby encourage them to have purified water for the families.

More than providing access for the communities to these facilities there is a great need for bringing awareness on the importance of the hygienic living to rural women, who can in turn bring change in to their families. All the Primary schools and High Schools in rural India must exclusively deal on the subject on a consistent basis to bring an over all understanding of water and sanitation problems and how they can be addressed by the involvement of the community members/ corporates and the Government Agencies.

Even taking the help of Nehru Yuva Kendras of the rural youth programme can be tried involving rural youth and developing them into Water and Sanitation Clubs. They could be trained as advisors and technicians to deal with minor repairs and other works in the community. By this way, good employment to them can also be generated simultaneously.

Constraints in Revolving Funds

Constraints in Adoption

The adoption of revolving funds by the poor for WATSAN facilities saves time for the poor households, increases time availability for economic activities and thereby increased ability to pay installments. Slum-dwellers living in rented accommodation or prone to frequent migration, may be reluctant to invest in toilets. Insecurity of tenure is another constraint. Poor people who lack ownership over the land on which their houses were built, may not be interested in taking such loans. Absence of a steady revenue stream for repayment of loans from revolving funds is another major constraint for the poorest.

Constraints to scale up

There are many systemic constraints **in** scaling up WATSAN revolving funds. In general, hidden subsidies are built into large-scale water and sanitation programmes, which benefit the rich and the affluent, while the revolving funds are designed for the poorer sections. The Government's promise to deliver such municipal infrastructure at no cost hampers flow of private investment in building water and sanitation infrastructure, which by nature is a high demand area, and could easily attract such viable infrastructure. As this low cost and efficient infrastructure delivery is plagued with poor quality, quantity and reliability, the citizens ultimately end up with investing private capital to meet the gaps. In this process, the poor pay more than the rich pay for water and sanitation services.

Suggestions

A system of revolving funds for financing water and sanitation infrastructure needs to be evolved for affluent sections, and the money saved may be utilized in providing subsidised access to the services for the poorer sections. In case if this can not be done, the revolving funds should be scaled up, provided the thrust of the fund was kept on community assets and if major Government and donor funded programmes have a window to encourage venture funds. In addition, the following are suggested to promote revolving funds:

- Designing customized individual loan products for the WATSAN programmes by UN-HABITAT and other organisations in this business, such as the special product that Indian Bank designed for the Shakti project.
- Undertaking community survey and preparing slum profiles to understand factors for reluctance against use of loans for sanitation.
- Using public-private models for promoting revolving funds, as done by a company promoting water filters through SHGs.
- Increasing awareness of women and schoolchildren about sanitation and involving youth as advisors and technicians.

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ANANTHAPUR DISTRICT, INDIA

A New Approach to Financing Pro-poor Investment for Drinking Water Supply

Responding to the request of the people, a unique public-private partnership was forged in 1995 to provide safe drinking water to Ananthapur district at the initiative of Sri Sathya Sai Central Trust – a private non-profit-charitable Trust. The district of Ananthapur (Population: 3.6 million) in the State of Andhra Pradesh is the second-most arid district in India and has been experiencing drought continuously for the past 15 years. Getting safe drinking water has been a daily drudgery for millions in Ananthapur. Another major threat is the excessive fluoride in the ground water. The poor are the worst-affected by the fluorosis (a disease of fluorine poisoning), which further restricts their income-earning opportunities. The Trust committed the fund required for implementing this massive project by people's participation.

The project was completed in a record time of 18 months at a cost of Rs. 3000 million (US$ 69 million), which included the construction of:

- **huge reservoirs in the river beds of Pennar and Chitravatty and Hagari,**
- **Infiltration wells,**
- **Borewells,**
- **Summer Storage tanks,**
- **Water treatment plants for treating the river and canal waters, and**
- **a 2500 km pipeline for distributing drinking water throughout the length and breadth of the district.**

About 40 litres of safe drinking water per capita per day reaches 731 villages in the district covering a population of about one million, out of a total of around 1,000 villages in the district.

Background

Prior to the implementation of the project, the availability of drinking water was meagre and quality of water was not appropriate. The whole district was deprived of ground water due to frequent failure of monsoon and continuous drought. The contamination of drinking water by excess fluoride along with bacteria persisted. The villagers suffered severe health problems due to the water borne diseases and bone deformation. Chronic water scarcity in Ananthapur had adversely affected food security and income earning opportunities of the people, particularly the rural poor. Of the 14 occurrences of famine between 1900 and 1959 in India, Ananthapur was affected as many as 11 times. Poverty continues to be widespread in the district. Nearly 60 per cent of rural households in the district survive on an income of US$1 per day.

Salient Features of the Project

The project presented an innovative model of public, private and people's partnership for the delivery of drinking water supply services to the rural and urban poor. Key to this partnership was the rare motivation generated by the Trust among the key partners. The State Government agencies took the lead at the project formulation, planning and design phase. The contractor, Larsen and Toubro Ltd., worked in close partnership with the communities and the State Government agencies during the implementation phase. The Trust funded the entire project through voluntary contributions received from individuals of the civil society from all over the world, in the true spirit of a global partnership for a worthy cause. After completion, the project was handed over by the Trust to the State Government which has assumed responsibility for its maintenance, operation and management in partnership with grass root level democratic institutions (Panchayat Raj).

The significant features of the Project are summarised as:

1. Population provided with safe drinking water - 1.25 Million (Design); 900,000 (current) in 731 villages and the Ananthapur Town.
2. Source of supply - 60 per cent surface water from three rivers and 40 per cent ground water from deep aquifers, fully treated.
3. Mode of supply at user end - 1,700 public stand posts and 1,000 concrete Cisterns with 4 taps in each.

4. Project cost - Rs. 3,000 million (US$ 69 million approx.).
5. Project duration - 18 months (February 1995 to July 1996).

Objectives and Strategies

The Project's main objective was to improve the quality of life of the people through safe drinking water. For this purpose, the Project adopted the following strategies:

- Adopting an innovative approach which crossed several thresholds of excellence and set new frontiers by demonstrating creation of a public service facility to serve the felt needs of the people despite Government's initiative through inspired leadership to "Love all and Serve all" and bringing out a basic desire to participate and contribute to the common good by members of all communities.
- Demonstrating an alternative mode of financing (compared to traditional institutional financing) for large-scale drinking water supply projects for the rural and urban poor, which could significantly contribute to achieving the Millennium Development Goal.
- Adopting new approaches to build a broad-based partnership involving public, private and the community by forging and succeeding in a collaborative endeavour between a non governmental organisation, a governmental agency and a private contractor.
- Utilising situation specific and localised technologies, systems and practices, and a well-designed Management Information System (MIS) facilitating continuous monitoring and evaluation for timely completion without cost overrun.
- Creating abilities to achieve super-ordinate goals by effectively combining Staff, Systems, Strategy, Structure, Skills and Style for effective functioning of both sets of Organisational dynamics 'transactional as well as the transformational'. The former, through the centralised Sri Sathya Saibaba Water Supply Board, Municipality and the Local Self Government provided role and responsibility, standard and commitment, direction and execution and the latter, because of the outstanding and evangelical leadership produced the right mission, strategy and culture.
- Generating right combination of professionalism, compassion, credibility, leadership and inspiration for successful execution of the project with fruition of good performance and a sense of mission.

Mobilisation of Resources

The initial cost of the Project was estimated at Rs. 700 million mainly for construction of borewells and De-fluoridation plants. However, the Trust revised the project concept and decided in favour of a Permanent Source Framework for the project, adhering to all the normal Government procedures in the formulation and implementation of the project. Accordingly the detailed working of the project resulted in an outlay of about Rs. 1750 million. However, the scope of the project was further extended keeping in view the ground realities and the project was completed at a cost of Rs. 3,000 million (US$ 69 million) totally funded by the civil society organisations through funds subscribed by the global community to the Sri Sathya Sai Central Trust.

The operation and maintenance cost of the project including staff, plant and machinery is being borne by the Government of Andhra Pradesh through a board specially constituted for the operation and maintenance of the comprehensive protected water supply schemes and Gram Panchayats (Rural Local Self-government) in the ratio of 70:30, pending creation of corpus fund. The government releases every year 70 per cent of the maintenance cost and the Board raises 30 per cent costs from the water users by prescribing appropriate rates. The cost of O&M has been worked out by the Board to the tune of Rs. 90 million (US$ 2 million). The operation and maintenance costs mainly relate to the costs of men and machinery, maintenance of DG sets, electricity charges, cost of chemicals, other maintenance charges like spares or pump set repairs etc. and the 2 per cent overheads of the Board office establishment.

The cost of the water is calculated based on the capacity of the storage facility in the overhead reservoirs in each village; generally devised at 40,000 litres capacity for 1000 (approximately) population and 60,000 litres capacity for 1500 population coverage. The water provision in terms of the users requirements is 40 lpcd, collected through stand post. However, in terms of the water delivered the O&M cost works out at an average of Rs.15/- per kilo litre (US$ 0.33/kl) of which the government contribution has been 2/3rd at Rs.10/-, and 1/3rd at Rs.5/- is generated from the water users.

Process

Sri Sathya Sai Drinking Water Supply Project was implemented through a partnership of (a) Sri Sathya Sai Central Trust, a civil society organisation, as the funding and co-ordinating agency of the project (b) Government of Andhra Pradesh as the facilitator through administrative and technical support of the project, (c) M/s. Larsen and Toubro Ltd., a private sector professional organisation for actual implementation and (d) the community and the people themselves who were beneficiaries of the project for their involvement in project planning

as well as its implementation with their overall positive support and physical/in kind contributions.

Sri Sathya Sai Central Trust established as a public charitable trust for serving the society in the area of education, health and drinking water. The Trust adhered to all the procedures and practices followed under the local and national laws. The provision of safe drinking water is the sole responsibility of the Government. The Trust through its Founder made several requests to the Government for provision of drinking water supply to the millions of downtrodden in Rayalaseema and Telengana districts of Andhra Pradesh. As the Government could not fulfill its commitment for want of funds for providing safe drinking water, the Trust decided to launch the Sri Sathya Sai Drinking Water Supply Project by mobilising the community funds through its global network.

The Trust requested for technical and administrative assistance from the Departments of State Government including preparation of detailed project report with all technical data. The State Government agreed to be the partner of the Trust and entrusted the job of providing designs and specifications by its Panchayat Raj Department of the Government of Andhra Pradesh.

M/s Larsen and Toubro Ltd. (L&T) executed the project as per designs and specifications provided by the Department of the State Government. L&T also helped the Trust in designing all the Overhead service reservoirs. Concurrent engineering, quick field responses to critical problems, flexibility in decision making and institutionalisation of key decision making powers led to its successful completion. L&T's construction machinery resounded through step terrain, barren land, unapproachable territory; and L&T's high-powered team worked round the clock to implement the project without time and cost overruns.

At the time of project planning, the community leaders and select persons from the respective settlements were involved. The major areas of involvement of the community comprising of both women and men were meeting project goals, location of overhead tank and public taps. At the time of the project survey and construction of water supply facilities, the community was made aware about the purpose of the Project and nature of facilities to be provided. The community, therefore, fully involved itself as a partner of the Project and played a very positive role.

During the execution of the project, the teams of the three major partners, viz. the Trust, the Panchayat Raj Department and the L&T worked day and night tirelessly under the constant supervision, monitoring and inspiration of the Founder of the Trust.

Results Achieved

The Sri Sathya Sai Water Supply Project (SSSWSP) was launched with a noble purpose by the Sri Sathya Sai Central Trust, a Charitable Trust (a non-governmental organisation), founded by Sri Sathya Sai Baba, regarded as the Spiritual Leader by many people in India and elsewhere in the world.

The Trust supplied safe drinking water to 731 villages, covering 70 per cent of all the villages in the Ananthapur District. Apart from making safe drinking water available and accessible with great efficiency and effectiveness, the project stands as a high-water mark in the parched lives of the drought hit villagers, for it has not only fulfilled their dreams but also holds a great promise of improved health and overall quality of life in future. The provision of safe drinking water was taken up by the Trust under the following two categories:

Protected Water Supply Scheme (PWS) uses groundwater facility through Borewells covering 279 villages, wherever surface water not available. It was also called Individual Scheme as each village is provided with one Borewell connection with a Cistern from where the villagers pickup the drinking water. These were mostly maintained by the individual Gram Panchayats and the Sri Sathya Sai Central Trust itself with respect to some villages closer to the Puttaparthi region, the seat of the Trust. Regarding maintenance by the Gram Panchayats, there is, so far, no centralised system at the district level responsible for monitoring the role of these Gram Panchayats. All Gram Panchayats in the district were required to report to the District Panchayat Officer at Ananthapur for its activities.

Comprehensive Protected Water Supply (CPWS), uses surface water facilities through Balancing Reservoirs, Infiltration Wells and Summer Storage Tanks (SS Tank) covering 452 villages. Of these villages, 264 villages were covered by **major** CPWS scheme, under which water was being supplied to several villages either through more than one Infiltration Well or SS Tanks or Balancing Reservoirs. For the remaining 288 villages, the water was being provided through **minor** CPWS wherein one Infiltration Well provides drinking water to a number of villages. However, under this scheme, some villages also do get water supply from SS Tanks or Balancing Reservoirs directly depending upon its location.

The water was provided to the villagers through public stand posts. There were as many as 1,700 stand posts that were erected in these villages.

After the completion of the Project, the Government of Andhra Pradesh constituted a Sri Sathya Sai Water Supply Project Board for operation and maintenance of the water supply to 438 villages covered under CPWS. Of the remaining, 11 villages were maintained by the Panchayat Raj Department under its Rural Water Scheme and 3 centres in the Ananthapur town by the Ananthapur Municipality, wherein the water provided through Sri Sathya Sai scheme through HLC as well as through Borewells constructed by the Municipality were mixed up and distributed to the beneficiaries. However, the 438 villages maintained by the Board also include the Institutions, viz. the Jawaharlal Nehru Technical University (JNTU) and the Sri Krishnadevaraya University (SK University) at Ananthapur, one center in Dharmavaram Municipality and 5 centres of Kadiri Municipality, which were not in operation as these centres possess alternate source of water supply and hence stopped paying the O&M costs to the Board, as a result the Board disconnected supply of water to these centres. Thus, the Board extended the O&M services to 430 villages.

Sustainability and Lessons Learned

The key to sustainability is the continuing commitment of all partners after the completion of the project. The impact evaluation study revealed a rare sense of commitment on the part of all partners even after six years of operation of the water supply scheme. The strong sense of ownership of the beneficiary communities with the project remains a central factor of sustainability. The State Government ensured sustainability of the scheme through the creation of a Statutory Board (Sri Sathya Sai Water Supply Project Board) for operation and maintenance of the water supply. The Board was entrusted with the responsibility of collecting O&M costs from institutional users while the cost of supplying drinking water to poor village communities were supported through budgetary allocation.

It was a unique experience by a non-governmental organisation, which implemented the project through public-private-people-participation with a unity of purpose and harmony of thought. The Trust characterised the uniqueness of the project by:

- taking up this challenging task of vast magnitude and completing it within a stringent time frame at a minimal time and cost; which could not be possible by the Government in the next 30 years at the cost of which the project was executed by the Trust; the project, if completed by the Government with the normal procedures would have costed 200% excess than the actual expenditure made in the project and would have taken 4 to 5 years for its completion;
- conceiving and concluding the Project and handing it over to the State Government and the community to own and maintain;
- implementing the project with excellent specifications and quality materials for providing sustainable and safe drinking water supply;
- creating an environment of assurance and encouragement with comprehensive funding arrangements, contingencies for meeting uncertainties in terms of time, cost and physical requirements of the project;
- bringing up remarkable professional discipline right from the stage of formulation of the project till its completion;
- the people's total involvement for the spirit of the cause in providing all possible cooperation, even bearing the losses on their part (with minimal compensation, donating the land etc);
- creation of unique institutional mechanism by constituting an autonomous Board, for the operation and maintenance of the Project, and the engagement of a private organisation for the execution of O&M for the system;
- replicating the project in the other districts in the State of Andhra Pradesh with similar conditions.

The Uniqueness of the Project lies in every aspect of the Project Management starting from its Design, Planning, Engineering, Implementation, Cost effectiveness, Service delivery, Operation & Maintenance, Time & Cost management, its replicability and finally achieving the end goal of supplying fluoride free safe drinking water to a million inhabitants of the district and thereby improving their health conditions and ensure better quality of life. A non-governmental organisation, led the way in showing that the success of the entire endeavour depends on Unity, Purity and Divinity.

Transferability

The Sri Sathya Sai Central Trust conceived and concluded the project and after its completion, handed over to the State Government to own and maintain. The replicability of this approach was clearly demonstrated by the fact that since the completion of the Ananthapur project, Sri Sathya Sai Central Trust had undertaken and implemented drinking water supply projects in two other arid districts in Andhra Pradesh, viz. Medak and Mahboobnagar and initiated similar process in Chennai, Tamil Nadu and East and West Godavari districts of Andhra Pradesh. Similar projects are under way in El Salvador and Mali.

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AHMEDABAD, INDIA

Infrastructure Financing Reforms to Shape Up Public Sector

In India, as well as in many other countries, the urban infrastructure financing is the remit of public agencies, which often lack the skill, capacity, or funding to implement projects effectively. The Ahmedabad Municipal Corporation (AMC), and other public corporations in other Indian cities that followed (including Bangalore, Ludhiana, Nasik, Nagpur, Madurai, Tamil Nadu, and Indore) — their switching towards modernised accounting and financial systems, reviewing sources of revenues to increase collections, and focusing on recruiting trained and motivated staff — helped to increase investments in the water supply and sanitation sector using domestic funds. In case of AMC, targeted and strategic support from USAID helped to catalyse finance, and create an infrastructure for further domestic finance in the future. Ahmedabad was the first city to launch the Municipal Bonds. In 2002, Ahmedabad launched its second tax-exempt bond issue, to complete its water and sewerage infrastructure plan.

Background

Ahmedabad is the largest city in the State of Gujarat, India, as well as the commercial capital of the State. Despite economic growth in the city, it has a high rate of poverty - in 2000, 41% of the city's population lived in slums and low-income housing.

The Ahmedabad Municipal Corporation (AMC) was created to provide infrastructure services in the city, including water supply, sewerage, storm water drainage, road construction and maintenance, street lighting, and management of parks and gardens. By the mid-1990s, the AMC faced considerable financial deficits of the order of US$ 9.2 million and major improvements to services, particularly for water supply and sanitation, were highly needed.

Infrastructure Reforms

In 1994, the AMC embarked on a reform programme that included improving accounting and financial management systems, revenue collection, and its staff. For example, the AMC's main revenue source (70-75%) was an octroi tax, levied on imports into the city. As part of reform, the AMC updated the tax rates to reflect current market prices, worked with the police to identify and catch defaulters, developed a wireless network for all check posts, and organised several teams of inspectors to conduct spot checks of vehicles. Strict accountability measures were implemented to limit corruption. In essence, public sector staff members were provided the means to do their jobs properly. These activities increased revenues by 60%. The second major source of revenue (about 30%), property taxes, was also not performing - to address this, the AMC developed a computerised database of property owners, fined owners who did not pay their taxes on time, published defaulters names, disconnected water and sewerage services, and issued notices and warrants to get defaulters to pay their tax arrears. The AMC also strengthened the collections and enforcement staff. As a result, property tax collection increased by 55%.

Efforts to complement the Reforms

Complementing these reforms, AMC upgraded its accounting system from a cash-based single-entry system to a computerised double-entry system, and hired chartered accountants to introduce the system to the corporation, as well as assist with the first round of financial reports (in 1998). In 1997, 40 chartered accountants and business management graduates were recruited to key operational and administrative positions, along with further recruitment of professional middle-level managers. This human resource reform was meant to change the work ethic that had stagnated within the AMC, as well as upgrade its image as a responsible organisation.

Mobilisation of Resources and Launch of Municipal Bonds

In 1996, AMC developed US$150 million five-year capital investment programme, of which US$110 million was allocated for water supply and sewerage infrastructure. Using its revenue stream - from octroi and property taxes - as a starting point of about 30% of the capital investment programme's cost, AMC sought to raise the remaining 70% of funds through loans and a municipal bond. The AMC received support through this process from USAID, particularly with the financial analysis and preparation of the investment plan. USAID also helped to develop a methodology for assessing municipal credit ratings for the Credit Rating and Information Services of India (CRISIL), an independent agency. In 1998, Ahmedabad became India's first city to launch a municipal bond. It had a credit rating of A+ from CRISIL. The bond issue was supported through private placement (75%) to institutional investment, as well as sale to the public (25%).

Raksha Project – an Emergency Bulk Water Supply Programme

Using some of the cash raised through the bond issue, the AMC was able to develop an emergency bulk water supply scheme, the 'Raksha Project'. Raksha supplies water to 60% of the city's population, and provides treated water to residents in the mornings and evenings. AMC has noted that because of its financial standing, it was able to procure private contractors to complete the project under very competitive terms. The Raksha project was also completed in record time of 130 days.

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BUTWAL, NEPAL

Capital Cost Recovery Approach for Urban Poor

This Local Action explains the water supply project implementation in the urban poor communities of Butwal Municipality based on 80 per cent capital cost contribution by the communities. Poor communities are unable to benefit from the existing Municipality approach of 50 : 50 cost sharing, as they are unable to pay upfront cash contribution of 50 per cent. In a 80 : 20 approach, the beneficiary will pay the upfront capital cost on an installment basis and immediately gain access to water supply services. This approach is the first of its kind in Nepal, which constitutes loan for the poor to improve basic services in their own community and the recovered fund is mobilised to replicate a similar programme in other poor communities.

Introduction

The price of water is composed of many components that include production (financial) costs, economic costs, the economic value of the commodity, and the clients willingness to pay which is the economic value for the water user. The financial cost of water for an individual includes operational costs and capital costs. The operational cost and capital cost of water supply are recovered from users in different proportions. In a Small Town Water Supply Project, 50% of the capital cost is recovered from the users. The urban poor are unable to pay and cannot gain water facilities.

The Concept

The main concept of the 80:20 capital cost recovery approach is that the users pay 80% of the total capital cost of the project and only 20% is provided as grant to the users. Initially total amount required for the project is borne by the supporting agency/local government. The community has to pay back 80% of the total cost on installment basis, over a certain period of time, fixed by the users themselves.

Salient Features of 80:20 Capital Cost Recovery Approach

- Eighty percent of the total cost of the project is recovered from the community over a certain period.
- Twenty percent is provided as a subsidy by the Municipality.
- Creation of a revolving fund to replicate the programme in other needy communities.
- Making the Municipality policy pro-poor with respect to providing basic services by helping them to create an Urban Housing and Infrastructure Fund (UHIF) at the Municipality level where poor people have access to credit facilities to fund basic infrastructure such as water and sanitation.

Community's acceptance for Implementation Process

The 80:20 cost recovery approach was first implemented in Ward no.4 of Danda Tole in Butwal Municipality covering 116 households with 640 population, who are mainly occupied as daily wage earners, blacksmiths, masons and few service providers.

Cost Recovery Calculation

	Amount (Nepali Currency - NRs)	Amount (US$)
* Total Construction/Capital Cost	428,466	6,121
* 20% grant on capital cost	85,693	1,244
* 80% cost recovery	342,773	4,877
* Loan repayment per month (to be repaid in 49 months)	60	0.86

Exchange rate - US$ 1 = NRs 70

Initially, the approach faced lots of skepticism. Though Butwal Municipality was sensitive towards providing basic services including water and sanitation to the poor, they were doubtful about the 80:20 approach. The main concern of the Municipality was that this approach would increase the debt burden on the poor and will make them even poorer. But to their disbelief when the idea was proposed to the community of Danda Tole, the people were not only convinced but supported the idea wholeheartedly. They were really surprised to discover that the people of Danda Tole were not only positive but seemed totally committed to do something by themselves to improve their own community.

Thus, this informal settlement of Danda Tole was selected to pilot a Gravity Flow Water Supply System. The Municipality joined hands with Lumanti, a local NGO, to implement the drinking water supply project based on the 80:20 cost recovery principle.

From Concept to Action

Once the community agreed the concept, following steps were undertaken to translate the concept into action.

- **Creation:** "Drinking Water Management Fund" was created at Municipality in which the loan recovered from the community is deposited.
- **Operation:** A 'Fund Management Committee' was set up comprising representatives from Butwal Municipality, Danda Tole community and Lumanti for its operation.
- **Management:** The main responsibility of the Fund Management Committee is to initiate, manage and monitor the collection of loan payments on a monthly installment basis. A separate account was opened in the name of Butwal Municipality where the recovered amount was deposited. Then the Municipality decides in consultation with the community for the reinvestment in the needy communities for implementation of water and sanitation projects.
- **Transparency:** For transparent accounting each household was provided a "card" to record the monthly installment paid as the proof of the payment.

This approach has successfully managed to give the conventional trend a new dimension.

Results Achieved

The loan payback per month is NRs. 60/- at 80% cost recovery, to be repaid in 49 months. Loan recovery was relatively good in the beginning, at 60% in the first year. However, it gradually went down over the next few years. The real cause to this downfall was surprisingly not because the inhabitants could not afford to pay but due to lack of transparency in fund management and lack of capacity to manage fund.

Key to Success and Sustainability of the Approach

- Community Acceptance
- Proper accounting system
- Transparency in all activities
- Rotation of leadership of management committee every two years
- Follow-up support from Municipality for capacity building
- Periodic fund monitoring by the Municipality
- Reward for compliance and punishment for defaulters
- Active community participation and preparation

Communities Views

*** "We have committed to pay and will pay, but there should be transparency on fund management" - said Rina Bishwakarma of moderate income household. Her husband works in an office and earns NRs. 2,000 (US$ 29) per month".**
*** "Paying the amount is not difficult for me. I have bought this house months back but I am asked to pay the default of the previous house owner" said Shanti Sharma, wife of a teacher earning NRs. 3,000 (US$ 43) per month. Therefore there should be clear policy on these issues".**

Lessons Learned

The 80:20 concept is a creative approach in reaching to the needy people particularly the poor. However, as reported by the community, the programme needs continuous refinement in the following areas:

- **Level of transparency to be increased:** The community members are very concerned about the money they have paid back. Their regular payment depends upon maintenance of a clear book of accounts. Periodic disclosure of the accounts in the meetings increases trust in the management committee, and thereby increasing the payback by the consumers.
- **Capacity of the community:** A skilled person within the community to keep records of payments is vital for the success of the scheme. Many issues that arise need to be clarified. There should be a clear policy on how much a new household should pay as tariff. Should the new household be responsible for the default made by his previous house-owner in case of sale of property? A lack of clear policy in this regard causes confusion and hampers the payback.
- **Follow-up support from Municipality:** Support of the Municipality and supporting organisations are vital as a part of capacity building of community organisations, especially in accounting management.
- **Equitable cost recovery approach:** The community comprises of different economic groups have different abilities to pay. Therefore, the cost recovery should be customised according to their ability to pay. This can be done by a different proportion of capital cost recovery mechanism for different economic groups.

Transferability

Based on the lessons learned from Danda Tole project, this approach has further implemented in Chisapani Water Supply Project to serve 541 households of Shikhar Deurali squatter community located in Ward no.1 and Narsingh Tole, Paakhapani Tole, Manakamana Tole and Bhimsen Tole situated in Ward no. 4 of Butwal Municipality. The community not only agreed to pay back 80% of the capital cost at a monthly installment of NRs. 68/- to be recovered in 68 months, but also set up a fund for the maintenance of the project through household contribution of NRs. 500/- upfront fee to the fund. By learning lessons of cost recovery approach from Danda Tole, the Users Committee have passed a rule that if a household fails to pay the loan, then they will have to pay double the amount in the following month as a penalty. Butwal Municipality has also decided to assign a staff member to build the capacity of Committee to keep the accounting system properly.

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CAMBODIA AND VIETNAM

Financing Practices for Service Delivery in Small Urban Centres

Despite possible challenges, it is possible to structure innovative financing practices suitable to the needs of the small urban centres for promoting an efficient service delivery in the water and sanitation sector. This Local Action illustrates the practices adopted in Cambodia and Vietnam.

For small urban centres, the concept of using guarantees to support local utilities is quite useful as they develop and strengthen local sources of finance. Nevertheless, the practical application of guarantees in these centres may prove challenging. In Cambodia, the use of guarantees to local banks to support community-based water supply services has been proved successful.

More recently, innovations in the use of equity, combined with other finance mechanisms, may be applicable for development in small urban centres. For example, locally focused design, build and operate contracts for water supply and sanitation projects, which are funded with equity investments from a larger utility, have been demonstrated to be viable as illustrated in the experience of Vietnam.

Use of a Guarantee for small urban centres in Cambodia

In Cambodia, credit is provided only on a short-term basis. An international NGO (INGO) and a professional solidarity and international cooperation association, viz. Group Research Exchanges Technologies (GRET) has put in place a Rural Infrastructure Fund (RIF) in a public development bank with the following two-fold objectives:

- To provide medium-term (3-5 years) loans to local commercial banks who wish to finance investors involved in financing piped water systems; and
- To provide a guarantee (30%) on loans for those commercial banks in case of default of the investor.

Due to this guarantee, the commercial bank can ask less collateral and accept lower credit rate to the concerned investors.

The programme run by this international NGO (INGO) supports rural private sector to invest and build piped-water-systems with technical and financial assistance. The investor connects the people with water-meters and collects the bills every month. The INGO has helped the installation of 10 systems, with rate of coverage reaching more than 85% in certain areas.

Use of Design-Build-Lease Contracts in Vietnam

In Vietnam, small urban centres are differentiated from "townlets". Small urban centres' population range from about 4,000 to 30,000, while townlets have a minimum population of 2,000 (1,000 in mountain areas). Only 30% of small urban centres and 15% of townlets have piped water systems, with a range of connection rates, from 20-80%. The coverage of population, with 7% of the country's total population (5 million) living in small urban centres, and 15% (10 million) living in townlets, represents a considerable portion of the country's gap in meeting the Millennium Development Goals on water and sanitation.

To address this service gap, the World Bank is supporting a design-build-lease project in two towns, each with a population of about 10,000. Under the scheme, private contractors design, build, and operate the water system, borrowing funds drawn from the water utility, which the utility offers as an equity investment. After a grace period, which allows the contractor to generate cash reserves in case of cash shortfall during the design and construction period, the contractor repays the utility, including the debt service fees, out of its revenues.

In order to avoid delays, a stakeholder engagement is used to determine the feasibility of

design and cost estimates, as well as agree on tariffs. Importantly for the contractor, while the tariff does not reflect full cost recovery, the local authority (and users) must agree to a minimum consumption of 5 m^3 of water per billing period for the scheme to be viable. To cover connection costs, users preferred a higher monthly tariff rather than an upfront charge; likewise, they agreed to small, more frequent tariff increases over time rather than larger, infrequent increases. After addressing issues such as these, the local authority must vote on whether the plans are viable, and whether the utility is allowed to assume the loan which kick-starts the investment.

The benefits of this approach are that the contractor must operate the system it builds, which counters the inclination for design. As the revenues are directly tied to tariffs, the operator has an incentive to connect customers and provide good customer service, which includes billing and collections. For the utility, the risk of fronting an equity investment under the scheme (15%) is managed because the assets - which will grow in value through the scheme - belong to the utility, providing an additional incentive to provide oversight over the private contractor. Likewise, the contractor is bound by a performance bond in case the contractor does not meet its obligations. Importantly, there is a competitive market for operators in Vietnam, which increases the likelihood of success to the utility and local government.

For small urban centres, there may be options for provincial or regional utilities - or even a local utility in a nearby large town or urban center - to provide equity investments to support piped connections while supporting local economic development. Preliminary findings from the scheme suggested that capacity building to understand the contractual implications may be needed. However, small urban centres water supply can be profitable for smaller operators, provided enough work is done upstream to get the incentives right, and address different risks.

SECTION VII

Human Values-based Water, Sanitation and Hygiene Education

Human Values-based Water, Sanitation and Hygiene Education

There has been growing recognition that improvement in water and sanitation management cannot be accomplished only by technical and regulatory measures. It needs to be complemented by advocacy, awareness and educational initiatives. Education on water, sanitation and hygiene is a strategic point in bringing out positive attitudinal changes among the utility service providers and the users, and in the long run develop new ethics in the society. Women have a significant role to play. A educated woman means that the family is educated and therefore the community. Children being the future citizens, shall become the ambassadors and 'Agents of Change' in bringing such reform.

Human Values-based Water, Sanitation and Hygiene Education (HVWSHE) is an innovative approach that not only imparts education on water, sanitation and hygiene but also inspires and motivates learners to change their behaviour and promote wise and sustainable use of water and sanitation facilities. WATSAN classrooms in schools is an innovative concept to educate children about the values of water and sanitation in day-to-day life as well as promoting universal values of honesty, integrity, responsibility, etc, which would further facilitate changes in attitude and behaviour within the community towards water, sanitation and hygiene issues. This needs developing capacities in schools, teacher training colleges and communities to optimise the human potential and empowerment.

This Section shares this new and innovative initiative and the experiences of the values-based water and sanitation education in Madhya Pradesh, India and Southeast Asia.

UN-HABITAT is implementing the HVWSHE project under the Water for Asian Cities Programme in Madhya Pradesh, which is aimed at formulating strategies for introducing HVWSHE in the schools of the project cities of Bhopal, Indore, Gwalior and Jabalpur and in Savarkundla, Gujarat by putting up WATSAN classrooms as well as build the capacity of the concerned schools and other educational institutions on water and sanitation. The programme focuses on educating the children about the importance of water, sanitation and hygiene as well as motivates children to change their behaviour towards water and sanitation services. WATSAN classrooms are developed in one of the important government schools/water utilities in each of the project cities. The WATSAN classrooms are equipped with the exhibits, materials, equipments, interactive panels, models and small water testing-kits, highlighting the importance of water in life, water conservation, safe sanitary practices, disposal of domestic waste etc. They are aimed to promote listening and learning as well as learning-by-doing in a child-friendly environment and facilitate changes in attitudes and behaviour among the community towards water, sanitation and hygiene issues.

Southeast Asian Ministers of Education Organization (SEAMEO) in cooperation with UN-HABITAT initiated a project, that aims at promoting a new water use ethics among the southeast Asians. The project seeks to achieve its goal by developing the capacities of the Ministries of Education in SEAMEO to integrate HVWSHE in curricular and co-curricular activities and sensitise school officials, teachers, students, community leaders and parents to the value of water. HVWSHE is expected to become part of the various learning activities in the classrooms and in the teacher sharing and mentoring activities in schools.

These experiences not only benefit the countries in the Asia-Pacific Region but also the other parts of the world. They encourage the spirit to excel and the quest to make the world more humane and practicable in achieving the MDG on water and sanitation, by deriving benefits from such practices leading to create a new water use and sanitation friendly ethic amongst water and sanitation service providers and consumers and thereby scaling up water and sanitation services to the society.

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MADHYA PRADESH, INDIA

Initiatives for Human Values-based Water, Sanitation and Hygiene Education

UN-HABITAT facilitated establishment of HVWSHE classrooms in one of the important government schools in the cities of Bhopal, Indore, Jabalpur and Gwalior in Madhya Pradesh in India through the partnership of the State Government and the Centre for Environment Education. The basic objective of this initiative is to create a new water-use ethic through value-based water education by imparting knowledge and information on water, sanitation and hygiene, and also inspiring and motivating learners to change their behaviour with a view to promote wise and sustainable use of water and sanitation practices. Resource teachers in these schools have been especially trained to make the students learn about the values of water, sanitation and hygiene in their daily life through various innovative exercises. The Government of Madhya Pradesh facilitates visit of students from other schools of the cities to the HVWSHE classrooms.

The importance of the initiative has been recognised by the State Government as well as other institutions. In view of the vast number of the students of each city to be exposed to the HVWSHE, the State Government under its ADB supported Urban Water Supply and Environmental Improvement Project has decided to create a mobile replica of the HVWSHE classroom for exhibiting it to the various schools. The Environmental Planning and Coordination Organisation have included the HVWSHE classroom programme in their environment educational promotion programme.

Situation before the initiative began

Rapid urbanization has put enormous pressure on the urban basic service delivery system in India. Consequently while the urban local bodies find it difficult to provide safe drinking water for the growing population, the waste goes on piling up due to inadequacy of waste disposal facilities, resulting in unhygienic living conditions. Irrespective of the disparity of access to water supply and sanitation facilities, the misuse and wastage of water due to profligate use, leakages from pipes during distribution, malpractices to access water continues. But the concerted effort in bringing changes in the attitude and behaviour and cultivate values towards sustainable use of water and better sanitation facilities and practices were lacking.

Objectives and Strategies

There has been a growing recognition that improvements in water and sanitation management cannot be accomplished alone by technical and regulatory measures and need to be complemented by advocacy, awareness and education initiatives. Education on water, sanitation and hygiene is a strategic point in bringing out positive attitudinal changes among the utility service providers and the users, and in long run develop new ethics in the society.

The priority was to take initiative for the promotion of Human Values-based Water, Sanitation and Hygiene Education (HVWSHE) in school curriculum through orientation of the teachers on HVWSHE to bring or strengthen the values within each child and change the perspective of each child on water usage, sanitation and hygiene and then establish HVWSHE classrooms in selected schools to facilitate the resource teachers to make the students understand the values of HVWSHE through innovative and interactive programmes.

UN-HABITAT's strategy for implementing the HVWSHE as part of the Water for Asian Cities Programme was to build capacities in the local institutions to conduct human values-based water, sanitation and hygiene education in the formal and non-formal education sector.

Specific objectives of the programme were:

- To optimize human potential by introducing partnership with water and sanitation service providers, value-based water, sanitation and hygiene education in schools.
- To facilitate changes in attitudes and behaviour among community members towards water, sanitation and hygiene issues.
- Promote better understanding of the environment in the context of water, sanitation and hygiene.

- Develop a guide book for the imparting HVWSHE in school curriculum.

Mobilisation of Resources

UN-HABITAT facilitated establishment of HVWSHE classrooms in one of the important government schools in the cities of Bhopal, Indore, Jabalpur and Gwalior in Madhya Pradesh in India through partnership of the State Government and the Centre for Environment Education (CEE).

Funds for the programme were mobilized from various sources, with UN-HABITAT contributing US$ 84,000. The contribution of CEE was US$ 70, 000. District Administration of Indore and Jabalpur contributed from the Parent Teacher Association (PTA) fund, whereas Municipal Corporations of Bhopal and Gwalior contributed from their own resources for the renovations of the classrooms in the project cities. The combined contribution of the District Administration and the urban local bodies were approximately US$ 30, 000. Besides, the recurring cost for the maintenance of the HVWSHE class rooms and conducting the regular programme and transportation of the students from various schools to the HVWSHE classrooms are being borne by the Education Department of the State Government/ respective school authorities.

Process

Primarily, identification of hosts for classrooms in the four cities, and identification of motivated teachers in these schools for running the classroom was one of the important activities conducted for implementation of the programme. One of the criteria for identifying teachers during this programme was by their commitment to educating students on Water, Sanitation and Hygiene (WASH) issues. A pre-training meeting with teachers was conducted for discussions for their approach and understanding of the issues, giving inputs in setting up and management of the classrooms, etc. The selections of schools in the four cities were also carried out. A guidebook was prepared for this programme in local language. Orientation programme on HVWSHE for the teachers was conducted which involved information-sharing, discussing local water and sanitation issues, and their impact on overall health of the society, and the precautions that can be taken to avoid the same. An exposure visit of the teachers to Anand Shala in Gujarat was conducted to orient them in conducting the programme in HVWSHE classrooms.

CEE helped the schools in developing local-specific education material for both teachers and children. The programme offered by the host school to other schools in the city is on a cost-sharing basis. The programme could be a full-day one for a batch of students of any one class and school. A rotational system is followed, with the batches being exposed to different activities, concepts and modules in each visit.

Results Achieved

HVWSHE classrooms at Hamidia Boy's School in Bhopal, Government Padma Vidyalaya in Gwalior, Bal Vinay Mandir in Indore and Model School in Jabalpur have been established. Besides the training of resource teachers, Orientation Workshops for teachers of other schools of the 4 cities were organized. About 200 teachers from various schools of the 4 project cities participated in these programmes.

After the establishment of HVWSHE classrooms, a continuous activity for the students of other schools are also being conducted regularly in the project cities. Students of more than 50 schools have visited the HVWSHE classrooms in each city during 2006-07.

HVWSHE classrooms

Children visiting HVWSHE Classroom Bhopal

In the Bal Mela (Children's Fair) organized in Bhopal, a replica of HVWSHE classrooms was displayed, which was visited by about 2000 students.

Sustainability

Sustainability of the initiative largely depends on the popularization of HVWSHE programmes and mobilisation of adequate resources for running the programme. Realizing the importance of HVWSHE classroom programmes, the Government of Madhya Pradesh has developed a programme for training of teachers to facilitate imparting HVWSHE in schools. A guidebook on HVWSHE has been developed, which would further help teachers to make the students understand the values of water, sanitation and hygiene in their daily life. The efforts are on to sustain the programme through developing linkages with other existing programmes like that of National Green Corp. (NGC) programme and National Environment Awareness Campaign of the Ministry of Environment & Forests, and Education for All Campaign of Government of India.

Lessons Learned

- Importance of Water, Sanitation and Hygiene education must be disseminated at large. But is it is difficult to reach to vast number of students in a city through activities in a HVWSHE classrooms. Various awareness generation activities are also to be conducted simultaneously. Taking the HVWSHE classroom programmes to the other schools would enable the students to be exposed to the learning programme.
- A sustained source of fund is required for operation and maintenance of the HVWSHE classroom facility as well as organizing regular innovative programmes.
- There is need for identification of dedicated teachers as well as volunteers to run the programme in a sustained manner.

Transferability

The importance of the initiative has been recognized by the State Government as well as other institutions. In view of the vast number of the students of each city to be exposed to the HVWSHE, the State Government under its ADB supported Urban Water Supply and Environmental Improvement Project has decided to create a mobile replica of the HVWSHE classroom for exhibiting it to the various schools. The Environmental Planning and Coordination organization, under the Housing & Environment Department, Government of Madhya Pradesh has included the HVWSHE classroom programme in their environment educational promotion programme. These activities would hopefully help create greater awareness among the students as well as in the community.

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SOUTHEAST ASIA

Thrust for Value-based Water, Sanitation and Hygiene Education

Human values-based water, sanitation and hygiene education (HVWSHE) is an innovative approach that not only imparts knowledge and information on water, sanitation and hygiene but also inspires and motivates learners to change their behaviour towards wise and sustainable use of water. A Consultative Workshop on value-based water education in December 2003 introduced HVWSHE among educators in the region, leading to the adoption of the SEAMEO Declaration on HVWSHE during the 39th SEAMEO Council Conference in March 2004. The SEAMEO Council of Ministers recognised that improvements in water management cannot be accomplished by technical and regulatory measures alone, and developing awareness, advocacy and education can help sustain these measures. SEAMEO (Southeast Asian Ministers of Education Organization) in cooperation with UN-HABITAT aims to initiate a new water-use ethic among Southeast Asians. The project seeks to achieve its goal by developing the capacities of the Ministries of Education in SEAMEO to integrate HVWSHE in curricular and co-curricular activities and sensitize school officials, teachers, students, community leaders and parents to the value of water.

Introduction

Southeast Asia is blessed with abundant water resources. Water is one of the many factors that spur economic growth in the region. Agriculture, industry, commerce and trade are all linked to water and communities. To nearly half a billion Southeast Asians living in one of the most dynamic economic blocks, rapid economic growth, urbanization and changing consumption patterns put enormous pressure on water and other natural resources. Increasing urbanization also puts greater health risks among the urban poor due to lack of safe water, sanitation and hygiene. There is growing recognition that improvements in water management cannot be accomplished by technical or regulatory measures alone. Water, sanitation and hygiene education can play a strategic role for fundamental change in behaviour, personal attitudes and the underlying values. Children and youth could be the best change agents towards a sustainable water use ethic.

Objectives and Strategies

The Project focuses efforts on:

- Advocacy among policy makers and education planners to put a high priority to provision of safe water supply and improved sanitation in schools.
- Developing a common assessment protocol on the state of water and sanitation facilities in schools.
- Developing a regional database on water and sanitation facilities in schools.
- Establishing knowledge resource centres in selected schools throughout the region.
- Packaging knowledge/information on integrating HVWSHE for use by teachers in Southeast Asia.
- Developing teachers' capabilities in integrating HVWSHE in lessons lead innovations for effective learning.
- Documenting and packaging the experiences, lessons learned, key success factors on promoting HVWSHE in Southeast Asia.
- Developing a toolkit on Southeast Asian experiences in HVWSHE.

The project seeks to develop the capacity among the Ministries of Education of SEAMEO to promote HVWSHE in Southeast Asian schools and ensure proper management of water and sanitation (WATSAN) facilities in schools.

Expected Accomplishments

- Developing competencies of teachers in selected Southeast Asian schools in integrating HVWSHE in their lessons, effective use of resource materials and in assessing knowledge, skills, attitude and behaviour change among students;
- Developing prototype teaching/learning materials, lesson plans, activity guides, among others, on HVWSHE appropriate in the SEA context;

- Documenting experiences, lessons learned on effective practices in introducing HVWSHE in schools;
- Developing a common WATSAN facilities assessment protocol for use by the MOEs;
- Developing a resource package/toolkit on HVWSHE.

Resources

The project brings together the technical and logistic resources of several organisations throughout Southeast Asia.

- UN-HABITAT and SEAMEO, through the SEAMEO Secretariat, provide the technical, financial and management inputs for the project.
- SEAMEO regional centres and network provide the technical expertise and organisational support to the various project activities. All SEAMEO units engage in training, materials development, research and technical assistance services in their fields of expertise.
- The project activities will be done and field-tested through a regional network of cooperating schools, which will serve as the knowledge resource centres on HVWSHE. Teachers, principals and students of the selected schools, including the communities they serve, will be developed as knowledge resource centres on HVWSHE.
- The SEAMEO Ministries of Education are the primary beneficiaries of the project activities; the in-country project activities, however, are undertaken with the cooperation and support of the MOEs.

Process

The project addresses core concerns dealing with water and sanitation in Southeast Asian schools. On the supply side, there is limited information on the state of water and sanitation in the schools. Often, investment programmes overlook such basic needs as water and sanitation amidst many competing needs.

On one track, the Development of an Assessment Protocol on Water and Sanitation Facilities in Schools supports supply of safe water and improvement of sanitation facilities. The assessment is done to know the state of water and sanitation facilities in schools and highlight the need for safe water supply and sanitation facilities. The other major concern in the project is to build capacity in the Ministries of Education of SEAMEO Countries to effectively integrate HVWSHE in lessons, demonstrate practices and bringing attitudinal changes among learners. Amongst many strategies and approaches of HVWSHE, integration offers a viable solution addressing the diversity of the curricula, the different needs and priorities of the countries in the region and the diversity in their capabilities. Through integration, the human values and water lessons can be effectively moved to the learners through the different subject areas.

Selected schools in the 10 SEAMEO countries are being developed to serve as knowledge resource centres on HVWSHE. A resource package for Southeast Asian teachers brings together the concepts of HVWSHE, techniques of integrating human values in various lessons and model lesson plans and materials were developed (in English) for dissemination in schools.

The knowledge resources and lessons will be initially tried out in schools that are part of the SEAMEO Regional Coalition of Quality and Equity in Education (QEE) Schools. The Regional Coalition, launched in 2002, comprises some 30 primary and secondary schools all over Southeast Asia that embrace continuing improvement learning quality and promoting equity of access among learners in the communities they serve. Having adopted a broader concept of quality in education, the schools will be strengthened to serve as the knowledge resource for HVWSHE and help promote the concept and practice in their respective countries.

The experiences gained, problems encountered and the practices that worked in various contexts will be complied into a toolkit for promoting HVWSHE in Asia. This is meant to enrich the growing knowledge base on HVWSHE as applied in various regions.

Results Achieved

Four regional activities have been organised involving education workers at various levels of operation. The three-day regional planning workshop reacquainted education officials with the concept of HVWSHE, identified strategies for effective dissemination and planned the succeeding project activities.

Another regional workshop reviewed existing materials and developed exemplars integrating HVWSHE in core learning areas. This was followed by a review meeting that improved on the initial

draft. Around 30 trainers representing 8 of the Southeast Asian countries were trained on the concept of HVWSHE, the techniques and processes for integrating HVWSHE in lessons and assessment, during the **Regional Training of Trainers on Integration of Human Values in Water, Sanitation and Hygiene Education,** organized by the SEAMEO Regional Centre for Education in Science and Mathematics. These teacher-trainers will, in turn conduct national training courses in their respective schools and jurisdictions. A **national training** on integrating HVWSHE was done in Philippines and further activities in Malaysia, Cambodia and Brunei Darussalam are due to follow.

The **Assessment Protocol on School Water and Sanitation Facilities** had been field tested in 8 of the SEAMEO member countries. The SEAMEO Ministers of Education will be expected to adopt the Assessment Protocol and encourage schools in their respective countries to update information in the regional database.

The **Regional Database on Water and Sanitation Facilities in Schools** was developed from the initial field test data of the Assessment Protocol. An online version of the Assessment Protocol will be used for updating school data in national and regional databases.

Sustainability

By focusing on the development of the capabilities of the key players in education, HVWSHE is expected to become part of the various learning activities in the classrooms, and in the teacher sharing and mentoring activities in schools. The material developed not only provides timely information and knowledge on various interesting topics dealing with water. It is also being used as a resource in teaching cultures of other Southeast Asian countries, appreciation of religious and cultural diversity, health, hygiene, sanitation in addition to the common learning areas.

Further work on the project will seek to spread HVWSHE among parents, leaders of communities and institutionalization into the teacher training/ education programmes.

Lessons learned

The SEAMEO-UN-HABITAT cooperation to promote HVWSHE in Southeast Asia has gone a long way since its introduction in 2003. The advocacy reached out to practically several levels of audiences – the policy makers, those who make investment decisions, the schools and their leaders, teachers, students and young people and the communities served by the schools.

The project highlights several following facets:

- As an education project, it highlights knowledge and changing attitudes on water as a resource and as an essential part of our environment.
- As a project that relates to water supply and sanitation in schools, it highlights the needs, policies and investment decisions that leaders need to make to reach the goal of providing safe water supply and improved sanitation for all. The project also helps focus the community's effort in securing safe water supply and improved sanitation.
- As a water project, it underlines the relationship between the water utilities companies, the communities they serve and how they can work together towards efficiently using scarce water resources and preserving the environment.
- As an effort involving human values, it reaches into the human heart and mind in making better choices on using water and enhancing human dignity.

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