



Environment

Water Community



Solution Exchange for the Water Community Consolidated Reply

Query: Role of Improved Sanitation in Economic Growth - Examples; Experiences.

Compiled by Pankaj Kumar S., Resource Person and Ramya Gopalan, Research Associate
29 June 2007

From Priyam Das, University of California at Los Angeles (UCLA)/WaterAid, California, USA
Posted 9 June 2007

I am a Doctoral student in Urban Planning at the University of California at Los Angeles (UCLA) working on water and sanitation issues in developing countries.

My colleague Tom Kemeny and I are putting together two reports for WaterAid-London, focusing on the opportunities and constraints in the sanitation sector. We will share the final reports with members as soon as they are released by WaterAid, but for now, we would like to share with members the following details:

The first report will examine

- i. The contribution of improvements in sanitation to economic growth and productivity (or in some cases, the negative impact on productivity and growth)
- ii. Cost of investments (for hygiene promotion or social marketing, infrastructure such as sewer lines and treatment, etc.); and the effectiveness of investments (translation into growth, productivity, averted Disability Adjusted Life Years (DALY)).

The second report will examine

- i. Success stories in sanitation and factors for success (measured in coverage and use)
- ii. Role of governments in these success stories
- iii. Role of women in these success stories, and
- iv. Cost of successful programs; factors leading to receiving increased investment, etc.

The collation of examples and experiences in the above areas from the field and their outcomes in these reports will help us in formulating specific guidelines and recommendations for practitioners, policymakers and program managers in the water and sanitation sector.

In this context, I request SE-Water members to please share with me the following:

1. Success stories in the sanitation sector and reasons why these successes were achieved
2. Examples from the field, showing a clear economic impact on communities/households which have improved their sanitation conditions

Thanks for your support, and we will acknowledge all contributions by members in the final reports.

Responses were received with thanks from

1. [Surekha Sule](#), National Institute of Rural Management, Hyderabad
2. [Avani Mohan Singh](#), Haritika, Jhansi, Uttar Pradesh
3. [Harshad Gandhi](#), Excel Industries Ltd., Mumbai
4. [Digbijoy Bhowmik](#), Independent Consultant, New Delhi
5. [Vijay L Vadlamuri](#), Halcrow Consulting India Private Ltd., Mumbai

Further contributions are welcome!

Summary of Responses

What is the role of improved sanitation in economic growth? This is the issue which the query explored and sought success stories demonstrating such linkages. Members shared experiences which demonstrated economic benefits of investments made in sanitation services by creating livelihood opportunities and positive health outcomes, and suggested ways of making investments in sanitation sustainable.

Discussing the impact of improved water and sanitation availability on livelihoods, members mentioned that the first beneficiaries of improved sanitation would be people working in the watsan sector, such as ragpickers. Additionally, the time saved by all households from fetching water could make available person-days, which could be put to better economic use. In this context, they quoted a study from [Haryana](#), which estimated that about 80 person-days per capita would be generated per annum through savings of time required to fetch drinking water. Similar was the experience respondents related from [Uttarakhand](#), where village people spent an average of 2 to 3 hours daily, and up to 7 hours during summer, for fetching drinking water. A saving in this time could have a significant impact on women and girl children, added members.

Improved sanitation has enormous health impacts, and respondents demonstrated this by citing a sample study from [Aligarh](#), **Uttar Pradesh** which showed that piped water supply (and hence lesser contamination) decreased child morbidity ratio by 30% compared to water supply through stand-posts. If investments in safe waste disposal were made in addition to investments in water supply, it resulted in lesser incidence of infant mortality compared to those villages where investment was made only into water supply, the study concluded. Another case study respondents quoted from [Chhatarpur District](#), **Madhya Pradesh** indicated how basic access to safe water and sanitation led to an overall economic improvement by freeing up time for productive economic activity, by reducing water borne diseases, and by consequently saving both days lost to disease, as well as expenditure in curative health care. The increased water availability had also made a marked change in personal hygiene, again translating into better health – and hence economic - benefits.

Additionally, the discussion underlined importance of communications, and noted that positive health impact of improved sanitation is related to educational levels of mothers and their exposure to media, which enables faster absorption of the message, especially in low income groups. Thus, investments in Information, Education and Communication (IEC), for example under programmes like the Jawaharlal Nehru National Urban Renewal Mission ([JNNURM](#)) became crucial, and could be easily increased by drawing from budgets at various levels of the programme. The example of Gangora School in [Lalitpur District, Uttar Pradesh](#) emphasised that use of toilets and other sanitation behaviour is directly correlated to increasing community awareness on the issue. The discussion also underscored the need for a communication strategy on sanitation to incorporate the multiplier effect of outcomes from improved sanitation like savings from health care and decreased child morbidity and mortality.

Investments into appropriate technology for wastewater or sewage treatment also result in savings in capital expenses, suggested participants, and quoted the example of [Nagpur, Maharashtra](#). Here, use of partially treated wastewater for a power plant has reduced its water budget, thus allowing the State to divert this expenditure to other critical sectors. Other decentralized solutions members mentioned for solid waste management were [Organic Waste Converters](#) by Excel Industries and [Biogas Plant](#) by Bhabha Atomic Research Centre. Members also highlighted that the importance of treating Municipal wastes, that pollute water sources and is detrimental to health and hygiene.

In addition to above experiences enumerated, members suggested the following measures to ensure sustainability of investments in water and sanitation services:

- Integrate sewage and solid waste department under one agency, which could support community initiatives for integrated waste resource management at source & convert waste into useful products.
- Ensure organic solid waste treatment and composting at source of waste generation to reduce organic waste flowing into water bodies.
- Evolve a financial support scheme to make voluntary initiatives affordable, and to promote voluntary initiatives such as organic waste treatment, decentralized or at-source composting etc.
- Provide financial incentives to support /subsidize capital costs and operating costs for voluntary initiatives rather than impose fines through legislation, since gaps in enforcement makes this path ineffective.
- Reinforce policies which price the extraction/ use of virgin water more than use of recycled wastewater (as in Nagpur). This would encourage new township projects to integrate measures for procuring treated water into their plans, and would discourage use of virgin groundwater or surface water.

The discussion outlined the multiple impacts that improvements in sanitation have on economic growth, and generated suggestions for ensuring sustainability of investments in the same. It also highlighted that investments into increasing people's awareness about sanitation could multiply into varied economic benefits for the poorest populations.

Comparative Experiences

From [Digbijoy Bhowmik](#), Independent Consultant, New Delhi

Haryana

Improved Watsan Availability Impacts Livelihoods, Satyameopuram District

A rural drinking water supply project covering 503 villages estimates that a total of 80 man-days per capita would be generated per annum. The Investment in water and sanitation services generates savings in the time and labour required to fetch/procure water. This savings thus allows for the generated man-days to be employed in more productive livelihoods, including coverage by existing programmes on livelihoods, such as NREGA etc.

Maharashtra

Wastewater Treatment Technology Saves Capital Expenses, Nagpur

A wastewater treatment plant provides partially treated wastewater to a power plant, reducing its water budget by 20%, thus allowing the State to divert revenue expenditure to other sectors. A pricing policy that prices virgin water extraction/abstraction well over twice as much as wastewater usage additionally reinforces the savings thus forcing new township projects to consider procuring water from treatment sources instead of abstracting ground/surface water.

Uttar Pradesh

Improved Watsan Services Impacts Health Outcomes, Aligarh

Investment in safe water and sanitation resulted in healthcare outcomes like cost savings of treating enteric/water-borne diseases or other epidemiological factors. A study conducted in 1997 places a benefit of over 30% in child morbidity ratio in the case of piped water supply compared to stand-posts. In case of settlements with infants, investment in safe waste disposal and sewage, showed lesser infant mortality incidences compared to investment only in water supply.

From [Avani Mohan Singh](#), Haritika, Jhansi, Uttar Pradesh

Creating Sanitation Awareness Impacts Health Status, Lalitpur District

Although government achieved latrine construction targets, health status saw no improvements as the education part of the sanitation campaign failed. Instead of large-scale community wide education programmes WaterAid/Sambhav pioneered an economic solution in Gangora School, training pupils to teach others. Now, all 40 latrines are being used, additionally teaching children leadership, financial skills and confidence, creating an impact through outreach. Read [more](#).

Madhya Pradesh

Access to Watsan Services Improves Economic Status, Chhatarppur District

Haritika and WaterAid set-up the Community based Rural Water Supply & Environmental Sanitation Project in Singaawan Khurd Village enabling community action via sustainable community owned and managed systems to overcome deprivation of rural communities. They thus built latrines, set-up mini pumping water supply schemes, undertook IWRM and income generation activities facilitating significant health and economic improvements. Read [more](#).

Uttarakhand

Drinking Water Supply Impacts Socio-Economic Conditions, Tehri Town and Villages

(from [Vijay L Vadlamuri](#), Halcrow Consulting India Private Ltd., Mumbai)

A survey conducted by [IIT Roorkee](#) observes that while fetching drinking water is a core function in rural households, water is supplied mainly via household connections and public stand posts, in the town. Further, since villages are on hill tops there is no natural storage of water and water borne diseases resulted from the lack of safe drinking water. Comparatively the people relocated to the well planned and developed Tehri town due to Tehri Dam face no water problems.

International

South Africa

Sanitation Project Impacts Local Economic Development, Ozwathini, KwaZulu-Natal

(from [Ramya Gopalan](#), Research Associate)

The Mvula Trust runs the Ozwathini Sanitation Project in five sub-villages where 19 builders are operational, trained to deliver 2,408 toilets in 24 months, including hand-washing facilities, and imparting hygiene education. Mvula and the municipality keep track of achievements vs. expenditure and community entrepreneurs benefited by R2 million from this people-centred, local economic development approach, thus increasing the community's responsibility. Read [more](#).

Related Resources

Recommended Documentation

Compendium of Best Practices in Municipal Waste Management (from [Surekha Sule](#), National Institute of Rural Management, Hyderabad)

Volume II, City Managers' Association of Maharashtra, 2004 - 2005

http://jnnurm.nic.in/best_prctices/English/Vol-II/01_CMAM_Cover.pdf (Size: 178 KB)

Provides details of best practices in solid waste management across cities and the contributions made towards improving socio- economic development

From [Avani Mohan Singh](#), Haritika, Jhansi, Uttar Pradesh

Water Brings Mobile Phone Prosperity to Village

Dan Clayton, What, where and why? India and WaterAid, Singaawan Khurd village, Chhatarppur, Madhya Pradesh, 02 March 2007

<http://realtravel.com/lalitpur-journals-j4086658.html>

Indicates how basic access to safe watsan led to an overall economic improvement by freeing up time for productive economic activity, reducing water borne diseases, etc.

Gangora School, Lalitpur Block, Uttar Pradesh

Dan Clayton, What, where and why? India and WaterAid, 01 March 2007

http://realtravel.com/lalitpur-uttar_pradesh-travel-blogs-d3937424-3.html

Emphasises that use of toilets and other sanitation behaviour is directly correlated to increasing community awareness on the issue to ensure improvements in health status

From [Ramya Gopalan](#), Research Associate

The Link between Investment in Water and Sanitation and Economic Development

<http://www.cin.gov.cn/Habitat/en/zt/slt-05.htm>

Using case studies, demonstrates links between economic development and improved supply of watsan services, also indicating that improved provision is not the only factor

Making Water a Part of Economic Development – The Economic Benefits of Improved Water Management and Services

Commissioned by Government of Norway and Sweden

http://www.who.int/water_sanitation_health/waterandmacroecon.pdf (Size: 2.80 MB)

Focuses on the economic benefits of actions that address the insufficient supply of water and sanitation services and inadequate water resource management

Driving Development by Investing in Water and Sanitation – Five Facts Support the Argument

WHO and Stockholm International Water Institute (SIWI)

http://www.siwi.org/downloads/Reports/Driving_Development.pdf (Size: 478 KB)

Provides five facts for why Investments in water can be an engine for accelerated economic growth, sustainable development, improved health and reduced poverty

Using Sanitation to Promote Local Economic Development in Ozwathini, Kwazulu-Natal

Dick de Jong and Jabu Masondo, IRC, 26 July 2005

<http://www.irc.nl/page/25063>

Recounts the achievement of the Ozwathini Sanitation Project implemented as an outputs based contract and its contribution to local economic development

Optimized Management of Watsan Services in Small Towns

http://wedc.lboro.ac.uk/projects/new_projects3.php?id=46

The research examines how to improve and optimise sustainable Water and Sanitation services in small towns in developing countries.

Recommended Organizations

Stree Mukti Sanghatana, Mumbai (from [Surekha Sule](#), National Institute of Rural Management, Hyderabad)

Contact: Jyoti Mhapsekar; 31, Shramik (Royal Crest), 1st Floor, Lokmanya Tilak Vasahat, Road No: 3, Dadar (E), Mumbai – 400014; Tel.: +91 22 5574 5848; Fax: 91 22 2417 4381; smsmum@vsnl.com, sms@streemuktisanghatana.org

Addresses the problems of waste management and women rag pickers by organizing and training them in environmental entrepreneurship programmes to improve their livelihoods

Jawaharlal Nehru National Urban Renewal Mission (JNNURM), New Delhi (from [Digbijoy Bhowmik](#), Independent Consultant, New Delhi)

Ministry of Urban Development (MoUD) and Ministry of Housing and Poverty Alleviation

<http://jnnurm.nic.in>

For utilising its program budgets to increase investments in IEC aspects of watsan services which enable better adoption and hence contribute to economic development

Architecture & Planning Department, IIT Roorkee, Uttarakhand (from [Vijay L Vadlamuri](#), Halcrow Consulting India Private Ltd., Mumbai)

Indian Institute of Technology Roorkee, Roorkee - 247667, Uttaranchal; Tel.: +91-1332-272349/274860; Fax: +91-1332-273560

<http://www.iitr.ernet.in/departments/AR/index.htm>

Conducted a survey in parts of Tehri District, Uttarakhand in 2004 with regard to drinking water supply problems and socio economic conditions of the Tehri villages and town

Recommended Tools and Technologies

From [Harshad Gandhi](#), Excel Industries Ltd., Mumbai

Organic Waste Converter

Environ-Biotech Division, Excel Industries Ltd., 184-87, S.V. Road, Jogeshwari (West), Mumbai - 400 102; Tel.: +91 22 56464200; Fax: +91 22 26783657; excelmumbai@excelind.com;

<http://www.excelind.co.in/cat.htm>

Details Organic Solid Waste Treatment/Composting at source, technology can enable governments to allocate financial resources in alternate sectors crucial for development

Kitchen Waste Based Biogas Plant

S. P. Kale and S. T. Mehetre, Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre (BARC); Trombay, Mumbai - 400 085; Tel.: +91 22 25505050/25505010; Fax: +91-22-25505151/25519613

<http://www.dae.gov.in/ni/ninov02/biogas.htm>

Provides information on the plant producing biogas from kitchen waste, technology enabling governments to allocate resources in alternate sectors crucial for development

Responses in Full

[Surekha Sule](#), National Institute of Rural Management, Hyderabad

An agency called Stree Mukti Sanghatana in Mumbai works with women ragpickers and has organised over 2000 rag-pickers, whose lives have changed through better sanitation practices. You may contact Jyoti Mhapsekar on smsmum@vsnl.com for further details.

Another person to contact is Sanjay Gupta, who was in Alliance for Waste Management (AWM). Ask Jyoti for his contact details.

Also, I wrote a manual on Best Practices in Solid Waste Management for city managers, which was commissioned by Directorate of Municipal Administration, Maharashtra. It contains case studies of many cities. I can share this with interested members.

[Avani Mohan Singh](#), Haritika, Jhansi, Uttar Pradesh

Please visit the following website for a case study on how increase in sanitation led to improved economic productivity.

<http://realtravel.com/lalitpur-journals-j4086658.html>

There are other interesting case studies on the same travel Blog related to Drinking water and sanitation in villages in Lalitpur district in Uttar Pradesh, which you may also like to see at:

http://realtravel.com/lalitpur-uttar_pradesh-travel-blogs-d3937424-3.html

[Harshad Gandhi](#), Excel Industries Ltd., Mumbai

Sanitation issue & related policy support / funding largely focus on water supply & sewage. About 40 millions ton of Municipal Solid Waste generated in 5161 cities & towns often lands into open storm water drain which finally flows into water bodies causing serious water pollution issues.

It is financially prudent & sustainable on long run if govt budget / funding agencies equitably allocate financial resources for prevention of problem at source of generation. It is desired to integrate sewage & solid waste dept under one agency to support community initiatives with integrated waste resource management at source & convert waste resource into useful products.

Ensuring Organic Solid waste treatment / composting at source of generation can reduce the organic waste flowing into water bodies. In order to promote voluntary initiatives for organic waste treatment / composting decentralized or at source, it is necessary to evolve a financial support scheme which would make such voluntary initiative affordable for the masses. Such decentralized solutions for solid waste management are available, examples Organic Waste Converter developed by Excel Industries Ltd., Biogas Plant developed by BARC etc but currently there are no incentives from ULB / State Govt / Central Govt to make it a mass movement under community initiative program.

It is desirable to provide back-ended financial incentives to support / subsidized capital as well as operating cost for voluntary initiatives rather than imposing fines through legislation as it normally loses impact when it is not supported with adequate enforcement mechanism & even if enforcement mechanism is put in place, few black sheep take short cut & corruption proliferate.

Digbijoy Bhowmik, Independent Consultant, New Delhi

There are considerable examples that exhibit that investment into safe water supply and sanitation result into products and/or input elements that go into economic development.

In the case of the district of Satyameopuram, Haryana, a rural drinking water supply project covering 503 villages estimated (as per the project report as audited by the financiers) that a total of 80 man-days per capita would be generated per annum through savings of time and labour required to fetch/ procure water. Putting the generated man-days into productive livelihoods is of course, another issue, and this needs coverage by other programmes on livelihoods, such as NREGA et al.

[For the uninitiated, Satyameopuram is also known as Mewat and has been notified as the 20th district of Haryana by carving out four blocks of Gurgaon and two blocks of Faridabad districts.]

Of other outcomes, there exist numerous examples wherein investment into safe water, and more so, has resulted in healthcare outcomes that include inter-alia, savings in costs of treating enteric/ water-borne diseases or other epidemiological factors caused about by inadequate investments into sanitation. A sample study conducted in 1997 in Aligarh places a benefit of over 30% in child morbidity ratio in the case of piped water supply as compared to stand-posts. Also, in case of settlements with infants, investment into safe waste disposal, including sewage, shows lesser incidences of infant mortality as compared to those with investment into only water supply.

In other cases, it has been so propounded that the impact of mother's education on child mortality is stronger among low-income households as compared to middle income and high-income households. Likewise, media exposure to health impacts of water and sanitation have also contributed in reducing child mortality and savings on curative healthcare that can be channeled to other productive sectors. This last point has been found to be even more effective if women are the recipients of media exposure, as studies reveal faster dissemination and permeation rates prevalent amongst women, especially in low income areas.

Under the Jawaharlal Nehru National Urban Renewal Mission (see jnnurm.nic.in), investments into information, education and communication at the level of the beneficiaries has normally ranged between 1% to 5% of the project cost. However, given the fact that IEC funds can be pooled from multiple levels of projects, i.e. both from trunk level as well as last-mile levels, and also leverage Civil Society external assistance or CSR contributions, raising the quantum of investment required is usually not a problem. However, what is usually missing is a persuasive, but subliminal mode of communications, which is usually on account of lack of understanding of

service providers on multiplier outcomes, such as savings on healthcare or decrease in child/ infant morbidity. This in turn, does not translate into the expected results from a communication strategy, and hence results in partially palatable communications.

There are also some examples that exhibit how investment into appropriate technology results in savings in capital expenses. In Nagpur, Maharashtra, a wastewater treatment plant provides partially treated wastewater to a power plant, reducing its water budget by about 20%, allowing the State to divert revenue expenditure to other critical sectors. This is further reinforced by a policy that prices virgin water extraction/ abstraction well over twice as much as wastewater usage. This has forced new township projects to adopt, right at the plan conception stage, measures for procuring water from internal treatment sources rather than abstract ground/ surface water.

Vijay L Vadlamuri, Halcrow Consulting India Private Ltd., Mumbai

As a part of the research team of Architecture & Planning Department in IITRoorkee, I along with my colleagues conducted a survey in parts of Tehri District in Uttaranchal during 2004 with regard to drinking water supply problems and socio economic conditions of the people living in villages and Tehri town. Our observations were as follows:

Villages in Tehri District: Jhadipaani, etc

- Fetching drinking water is one the first daily chores of a family member.
- People spend 2-3 hours daily and up to 7 hours during summer season for fetching drinking water.
- Women and school going children taking the burden. Even unemployed youth join them.
- Most of these villages are on hill tops and the problem is even worse, since there is no natural storage of water.
- Due to lack of protected drinking water supply people depend on well water and other alternate sources like springs, often falling sick with water born diseases.
- Personal sanitation and hygiene are compromised for lack of water for daily uses.
- Most of the houses are in a scattered manner because of mountainous / hilly region and household supply is expensive. Supply can be economical through public stand posts located strategically and through water tankers for very sparsely populated villages.

Tehri Town

- There is no water problem as on that date due to well planned and developed new township of Tehri for the people relocated due to Tehri Dam.
- Water supply is absolutely free (as an incentive for relocation) and two times a day for 1-2 hours. But this trend is likely to end soon and people will be asked to pay for their usage.
- Most of the people are middle class business people, petty shop owners, vendors, etc.
- Time spent for fetching drinking water is comparatively less with their rural counterparts due to household connections and a number of public stand posts.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to the Water Community at se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-watr] Role of Improved Sanitation in Economic Growth - Examples; Experiences. Additional Reply."

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