



CASE STUDY

CBS Community Based Sanitation

The Changing Face of a Slum Community

Community Based Sanitation and
Slum Development Project,
East Devadhanam, Trichy,
Tamil Nadu, India



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This case study is a product of the experiences generated in the Community Based Sanitation and Slum Development Project in East Devadhanam, Trichy, Tamil Nadu, India. The project was implemented in joint collaboration with Exnora International, Chennai and CDD Society, Bangalore. The funding support extended by BMZ and the overall guidance provided by BORDA is gratefully acknowledged.

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SUMMARY

The movement of people into densely populated areas due to increasing urbanisation has resulted in increased risk to public health and hygiene. Slums in urban areas are often defined as having lack of access to safe drinking water and poor sanitation systems with almost no household hygiene. Access to good sanitation facilities is a cause for concern, especially for those living in slums. Shrinking urban spaces make defecation difficult and unhygienic. Most slum dwellers usually live without proper toilet facilities and it is women who suffer the most, as privacy is hard to come by during daylight hours.

East Devadhanam is also one such slum, located in a fringe area of Trichy in Tamil Nadu, which emerged as a result of migration and displacement of people from neighbouring areas. One of the largest challenges to public health in this slum was access to safe drinking water. The lack of toilets led to open defecation, cultivating diseases caused due to parasitic and bacterial infections. The sanitation situation in East Devadhanam was deplorable calling for an appropriate sanitation solution in order to improve the health and hygiene conditions of the inhabitants.

With this objective, the Community Based Sanitation and Slum Development (CBSSD) project was implemented by Exnora International, Chennai, with support from the German Ministry for Economic Cooperation and Development (BMZ) and Bremen Overseas Research and Development Association (BORDA). The technical assistance in the project, especially in setting up of DEWATS (Decentralised Wastewater Treatment Systems) was extended by FEDINA DEWATS Coordination Office-FDCO, now Consortium for DEWATS Dissemination (CDD) Society, Bangalore. The community played a vital role in the entire implementation process of the project. The poor sanitation situation and unhygienic environmental conditions were addressed initially through awareness building and information dissemination. The CBSSD project and DEWATS were foreseen as appropriate interventions towards holistically improving the health and hygiene status of the residents of East Devadhanam.

This publication highlights the process of implementing the CBSSD project in East Devadhanam and records the experiences generated during the course of action. This document bares the constraints faced, lessons learnt and accomplishments in the implementation of the project which will help other organisations and institutions involved in the up-scaling of such approaches and technologies.



Tiruchirapalli, often referred to as Trichy, is located in the central region of Tamil Nadu state, India. It is situated on the banks of river Cauvery and was the capital of the early Chola Kings dating back almost 2,000 years.

Being an ancient city, it is not surprising that the 21st century modern city has also become an ideal place for the existence and growth of slums.



East Devadhanam is a peri-urban slum, located about a kilometer north of Trichy. It has a population of approximately 2,000 people of different ethnic groups. It is a settlement of mainly displaced and migrant persons, comprising of small farmers, agricultural labourers or daily wage earners. East Devadhanam lies on the bank of the river Cauvery, the lifeline of large tracts of Karnataka and Tamil Nadu States. The settlement falls under the administrative jurisdiction of Trichy City Corporation (TCC).

The Settlement and its Inhabitants

East Devadhanam was accorded the status of a declared slum in the 1960s. It is one of the oldest, yet one of the most marginalised settlements of Trichy. The lack of basic amenities and employment opportunities in the surrounding rural areas has led to an exodus of rural folk to Trichy giving rise to slums such as East Devadhanam. These slums grew despite the lack of clean and safe potable water, drainage and toilet facilities. Over the years, slum dwellers have been plagued by water-borne and respiratory diseases, with children being the worst sufferers, growing up in unhygienic living conditions.

Rationale behind Selection of East Devadhanam as Project Area

The Community Based Sanitation and Slum Development (CBSSD) project aimed at improving the health and hygiene conditions of people dwelling in slum areas. In order to arrive at selection of a slum for a CBSSD intervention, an outline mapping of Trichy town was initially conducted. Based on the data





collected, a map was prepared, delineating slums and similar low income settlements in Trichy. The data collected (Trichy City Corporation, TCC statistics, 2003-04) revealed 258 declared and 400 undeclared slums in Trichy. Over 80% of the slums were situated on government Poromboke lands. More than 55% of slum households had a living area of only 50 sq ft. and about 50% used community toilets. Over 40% of women were illiterate, while general literacy was especially low among the age group of 50 year-old women. Over 65% of those employed, worked in small private enterprises as low income labourers. About 5% migrated seasonally to places like Chennai in search of employment. Male youth were unable to secure employment, which invariably increased their frustration and made them feel insecure about their future.

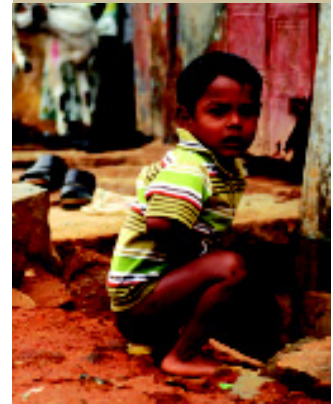
At the time of the project intervention in 2004, East Devadhanam consisted of congested houses in an unhygienic environment with an inadequate infrastructure and lack of proper sanitary facilities. TCC had subsequently constructed several integrated sanitary complexes (with bathrooms and child-friendly toilets) in the entire area. TCC had also taken a policy decision to hand



over management of all sanitary complexes to Self Help Groups (SHGs) so as to create a sense of ownership and for long-term sustainability of the complexes. There were 8 sewage pumping stations in Trichy which lifted wastewater into the Panchapur reservoir for treatment. The underground drainage system (UGD) served only parts of the old Trichy Municipal area. Areas outside municipal limits were left unconnected to the UGDs, while existing toilets were to be connected to open drains or septic tanks.

The Outline Mapping of 658 Trichy slums was conducted and 3 slums were short listed for possible project interventions. Based on the outcome of the RPA exercises in all the three slums, East Devadhanam was selected for the CBSSD project.

The sanitation situation in East Devadhanam was dismal and required a proper sanitation solution on a priority basis. The unhygienic conditions in the settlement were cause for many residents suffering from water-borne diseases. This required urgent attention. Open defecation was also rampant resulting in contamination of water sources and the neighbouring environment. In addition, the local NGO, Gramalaya, was already working with the East Devadhanam community with interventions focusing on SHG formation for micro-credit. The ongoing cooperation between ExNoRa and Gramalaya, further made the selection of East Devadhanam even more logical.



Situation of Basic Needs Services in East Devadhanam

Lack of protected water supply, unsafe drinking water, clogged drains, open defecation, and ill-ventilated hutments adversely impacted on the quality of life of the slum dwellers of East Devadhanam. The non-existence of sewage treatment facility was the cause for endemic health hazards in this slum. Appreciable improvement was not expected in the foreseeable future as most poor settlements were not officially declared as slums. Hence, public sector contributions were not forthcoming. Despite a few households having individual toilets and some using community toilets, more than 65% of the residents of East Devadhanam still resorted to open defecation creating unhygienic surroundings in the settlement, as well as polluting the river Cauvery. In addition, effluents from existing community toilets were subjected to inadequate treatment in septic tanks. The toilets built by TCC could not be properly maintained due to shortage of water supply. Further, Operation and



Maintenance (O&M) mechanisms were inadequate and desludging of septic tanks involved high recurrent costs, hence it was avoided. All these factors reinforced the practice of open defecation.

The inhabitants of East Devadhanam were not adequately aware of the importance of hygienic practices. Non-existence of adequate sewage treatment systems and consequently, disposal of effluents into open drains that flowed through the settlement into the river Cauvery made for unhealthy situations. The roads were narrow and plot sizes too small to include living space as well as a toilet with septic tank. This resulted in widespread of bacteria, contamination of surface and shallow groundwater, increase in incidence of water-borne diseases and loss of dignity particularly of women and girls due to non-availability of toilets. The 'slum character' was hence reinforced.

ExNoRa International – A Social Catalyst

In 2003, ExNoRa International, in collaboration with the FEDINA DEWATS Coordination Office, FDCO, now Consortium for DEWATS Dissemination (CDD) Society, Bangalore, and funding from Bremen Overseas Research and Development Association (BORDA), Germany, adopted East Devadhanam as a pilot initiative under the BMZ supported CBSSD project, India. The CBSSD project aimed at improving the living conditions of poor settlements in peri-urban areas through the promotion and establishment of decentralised sanitation solutions. The project initiated with the organisation of the target community, thus building the community's capacity to independently upgrade the quality of their environment.



Excellent Novel Radical (ExNoRa) International is an environmental movement founded in 1989, focusing on mobilising and empowering communities to participate in preserving nature and preventing environmental degradation, thereby improving the quality of life. ExNoRa International is a non-profit, non-political, secular, non-governmental and environmental organisation, based in Chennai, Tamil Nadu.





Community Based Sanitation and Slum Development (CBSSD) in East Devadhanam – An Integrated Approach

CBSSD is an integrated approach that builds on people's participation in planning and implementation in the self-help mode. The sanitation infrastructure development was a model that combined environment-friendly wastewater treatment (DEWATS: Decentralised Wastewater Treatment System) with Decentralised Solid Waste Management (DESWAM) and promotion of good hygiene practices. The CBSSD also targets creation of general awareness and lobbying with government to provide basic infrastructure to the poor.

The CBSSD project in East Devadhanam was envisaged as an intervention to holistically improve the environment as well as health and hygiene status of its residents. One of the main objectives of implementing the CBSSD project in this settlement was to treat the wastewater from the toilet blocks and recycle it for irrigation purposes. By-products such as sludge and biogas were also to be optimally utilised.

Project Implementation

Before the implementation of the project in East Devadhanam, various studies and analysis were conducted to establish the feasibility of setting up the sanitation infrastructure. These comprised of pre-feasibility and feasibility surveys, Rapid Participatory Appraisal (RPA) and baseline survey.

Pre-feasibility and Feasibility Surveys

The pre-feasibility survey was carried out to collect preliminary data and information and confirm the suitability of a locality for DEWATS unit. Availability of land for setting up the DEWATS unit, sufficient water supply, disposal

options, re-use options and presence of community organisations for O&M were some of the parameters on which information was collected and analysed.

A more detailed feasibility survey was conducted after the pre-feasibility study. It was found that the settlement had a community toilet complex with separate blocks for men (10 seats) and women (20 seats). The toilet complex was set up in an area of 1,260m², the built-up area being 438 m².

These pre-implementation surveys and studies were conducted with the close involvement of the community and concerned authorities. A crucial advantage of the project was that Gramalaya had previously mobilised and organised the community to manage the sanitation complexes. The community was therefore open to interventions that would benefit them further by improvement of health, hygiene and living conditions.

Rapid Participatory Appraisal (RPA)

The feasibility survey was followed by a Rapid Participatory Appraisal (RPA) as an educative and information-gathering exercise. It helped to build on the existing rapport with the community. The various practical tools used for conducting the RPA were community mapping, transect walk, venn diagram, timeline analysis and problem tree. Conclusive inferences were drawn from these participatory exercises which helped in the planning of the project.

Baseline survey

ExNoRa International and Trichy District ExNoRa, its local unit, conducted a baseline survey of East Devadhanam in 2003-04. The methodology adopted was mainly through questionnaires. Focused group discussions were also conducted at a few places.



Rapid Participatory Appraisal (RPA) tools are used to visualise and assess qualitatively the status of people and resources of a particular area. The process encourages local people to get involved in the process and compile information in such a way that is easy and intelligible to them.

The baseline survey showed that there were 384 households in East Devadhanam, inhabited by 1,670 persons, mainly of Tamil origin. The survey covered 92.7% (356 households, 1,549 persons) of the population. The respondents comprised of 778 men and 771 women including 464 (about 30%) children and 78 (5%) elders. The community constituted mostly of Dalits* and Tamil was the predominant language. The major occupation of the people was in construction labor, fruit and vegetable vending, and other petty jobs fetching monthly incomes between Rs. 1,000 and Rs. 2,500. Thus, most of them fell into the below poverty line (BPL) category.

East Devadhanam survey findings with respect to health, hygiene and sanitation:

- 21% families had household toilets, 63% used community toilets and 16% resorted to open defecation.
- People resorting to open defecation had reportedly constructed houses without toilets due to lack of space and disposal mechanisms. Constructing a toilet was unaffordable apart from lack of awareness on the adverse impact of open defecation on community, personal and environmental health and hygiene.
- Almost all households were reluctant to admit that they were accustomed to open defecation and therefore preferred it in the vicinity of the community toilet complex or on the river bed.
- More than 80% children resorted to open defecation apparently due to the lack of toilet training and abhorrence for closed toilets.
- Age-wise analysis revealed that open defecation was common across all age groups.
- 80% of households had no bathrooms, consequently, women had to bath in the river.
- Incidence of waterborne diseases and respiratory ailments was reportedly high.
- 58% opted for government medical treatment facilities and others preferred privately-run facilities, while some resorted to self-medication.

* Caste system has been abolished in India, but the word Dalit is still used (Sanskrit meaning: suppressed). The term 'scheduled caste' is the official term used in Indian government documents for Dalits)

It was clear from the baseline survey that there was an urgent need for health and hygiene education to bring about a behavioural change in the practice of open defecation. The community complained of improper drainage facilities and inadequate drinking water. They also felt that there should be a compound wall around the sanitation complex as well as the land adjacent to it. There emerged a strong need for child-friendly toilets. In the social context, it was felt that ending open defecation would also lead to restoring the dignity of people, especially of women and girls.

Establishing the Need for Community Based Sanitation - Decentralised Wastewater Treatment Systems (CBS-DEWATS)

Based on the pre-implementation surveys, it was decided to set up a DEWATS project for the existing East Devadhanam sanitation complex. The complex served about 384 Economically Weaker Section (EWS) families (approx. 2,000 persons).

It was envisaged that the sewage from the public toilets could be treated through DEWATS for re-use. The biogas generated by the pre-treatment process in the biogas settler could be used for heating water and lighting, treated sludge could be used as fertiliser and treated wastewater for irrigation of a small agricultural plot adjoining the CBS complex. Treatment would also ensure better sanitary conditions in the neighborhood. Finally, the O&M cost would be relatively low in case of DEWATS and would benefit the community. Thus, it was envisaged that the CBSSD intervention in East Devadhanam would add value to the existing sanitation complex through integration of DEWATS, while also closing the energy cycle.





DEWATS applications are demand-driven technological solutions aimed at reducing water pollution for communities and small and medium-scale enterprises with the following characteristics:

- Providing wastewater treatment for organic wastewater from both domestic (CBS – Community Based Sanitation) and industrial sources (SME–Small and Medium Enterprises).
- Providing treatment for highly variable organic wastewater flows from 1 to 1,000m³ per day.
- Using simple designs, minimal dependence on energy, reliable, durable and tolerant to inflow fluctuation.
- Not requiring sophisticated operation and maintenance, hence substantially reducing operational costs.

The minimal maintenance requirements and, in principle, its non-dependence on external energy sources, make DEWATS suitable especially to decentralised locations, i.e. for municipal towns and village/colony settings. The DEWATS modular approach allows for customisation so it works in locations where space is a constraint. If called for, additional units can be added to accommodate growing demand.

DEWATS systems work efficiently in reducing pollutants to the standards required for disposal into public sewer lines, natural water bodies and for reuse of the treated wastewater for agricultural or landscaping purposes.

Community Mobilisation for Setting-up CBS – DEWATS

Trichy District ExNoRa, successfully built upon the community-based operation and management structures in East Devadhanam earlier established by Gramalaya. Further, the community was mobilised to participate in social and cultural activities that promoted communal harmony and self-help. The technical concepts of the CBS–DEWATS were discussed and explained to the community. The option of reusing the by-products of the wastewater treatment process were presented to the community and the benefits explained in detail. Initially, the community was apprehensive of including a biogas settler as the use of biogas generated from human waste was commonly perceived to be in conflict with the cultural beliefs prevalent in Indian society. The stigma attached to using human waste and its by-products for cooking purposes made the very concept of biogas socially unacceptable. However, through sustained efforts, awareness programmes and opportunities to perceive visible rewards, it gradually gained a foothold.

Thus, a biogas settler was included as a treatment module. The other treatment modules – anaerobic baffle reactor and planted gravel filter were also included as the community realised that the treated wastewater could be applied for irrigation. They were assured that the water would be odourless and colourless as well as a good fertiliser because of its nutrient content. Many SHG members being from agricultural backgrounds welcomed the idea of reusing the treated wastewater for crop irrigation. They were even successful in lobbying with the TCC and acquiring the plot adjacent to the sanitation complex for farming as an income generation activity. Sludge generated during the treatment was proposed to be applied as fertiliser (the latter with some more treatment to render it compatible to agricultural practices and safe for handling).



Unity is Strength

The Social and Health Education (SHE) team members set a visible example of 'unity is strength' by uniting for a good cause. The 10,000 sq ft. area of land, adjacent to the sanitation complex was illegally encroached by one of the settlement's resident though the land was under the jurisdiction of TCC. When the idea of setting up the DEWATS unit was mooted, the SHE team members filed a petition against the encroachment with TCC requesting it to reclaim the land and allot it for setting up the DEWATS structure. After several discussions, follow-ups and visits to the TCC Commissioner's office and other Government Departments, the lobbying efforts of the SHE team members was successful. They acquired the land which is now used for urban farming. Today, an appreciable income is generated from the harvest of vegetables grown on this plot.



Foreseeing such benefits, the community accepted the integration of the proposed DEWATS configuration with the existing sanitation infrastructure. FDCO was therefore able to incorporate the feedback and insights gained into the final technical design (e.g. inclusion/exclusion of biogas settler).

Role of Community in Setting up CBS-DEWATS Unit

Community contribution to the project was significant right from the selection of the technical options for wastewater treatment, providing labor for the construction of DEWATS unit, contributing in kind to the temporary fencing of the sanitation complex, spreading the word in the community about the benefits of wastewater treatment on health and hygiene as well as organising the community for the formation of the O&M team. The members of the SHGs pooled in funds and contributed to the setting up of DEWATS integrated with DESWAM. For instance, six SHGs contributed Rs. 500 each (total Rs.3,000) towards the cost of bins for the collection of wastes already segregated at the household level as part of the SWM effort initiated by Trichy District ExNoRa. An information board was put up providing daily news, information on health and hygiene aspects and conveying messages on the ill-effects of open defecation.

The DESWAM concept was introduced in the East Devadhanam community as part of a holistic community based sanitation approach with options for recycling and re-use. Selected community members along with SHG members were taken on an exposure visit to the Vellore Institute of Technology and the Gandhi Nagar Town Panchayats where different DESWAM practices were being implemented. The exposures helped the members understand the need and benefits of DESWAM. TCC provided two push carts for collection and disposal of non-degradable and recyclable wastes.

Technical Planning and Implementation of CBS-DEWATS

The CBS-DEWATS concept was shared with the community and their acceptance was sought. Detail designs and cost estimates were then prepared. Trichy District ExNoRa/ExNoRa International with the assistance of FDCO hired an architect and a contractor for the construction of the DEWATS unit. This process involved more time than expected and was attributed to a 'first time' experience for most of the collaborating partners. Being a pilot initiative, it took time and effort to attain clarity and a basic understanding by all involved stakeholders as DEWATS was still a new concept requiring a new approach.

The DEWATS construction commenced on 8th November 2004. The TCC provided finance for the repair and renovation of 30 existing toilets and the community contributed through their labor for the construction. As the DEWATS unit construction was new to the architect and the contractor, they were provided with an exposure visit to a unit under construction at the Beedi Workers Colony in Kengeri, a satellite town of Bangalore and Ullalu Uppanagara, a low income peri-urban slum rehabilitation settlement in Bangalore South. This facilitated the architect and contractor with a better





understanding of the planning and construction methodology for a DEWATS unit for application at East Devadhanam. However, a few modifications were incorporated during construction prompted by technical constraints such as high water table.

The DEWATS at East Devadhanam has a treatment capacity of 9m^3 and occupies an area of 126m^2 . The concept proposed for the treatment was a configuration of Biogas Settler, Anaerobic Baffle Reactor (ABR) and Planted Gravel Filter (PGF) in place of the then existing septic tank which provided only partial treatment. DEWATS ensures a more efficient treatment. It constitutes of the following modules:

- **Biogas Settler:** A primary-level treatment module consisting of a sedimentation tank for retaining particles settling in a specific time frame. Biogas is formed due to digestion of settled organic particles under anaerobic conditions. Dissolved and suspended particles pass untreated to the next stage. The retention time ranges between 12-24 hours.
- **Anaerobic Baffle Reactor:** The secondary-level and main treatment module ensures anaerobic degradation of suspended and dissolved solids by subjecting fresh wastewater to action of an active sludge blanket. The baffle reactor is suitable for all kinds of organic wastewater and its efficiency increases with higher organic loads. The retention time ranges between 1-2 days.
- **Planted Gravel Filter:** A tertiary-level treatment unit where aerobic and facultative degradation of dissolved organic matter accompanied by pathogen removal occurs. They work on a combination of biological degradation, chemical adsorption and physical filtration. The filter media are

usually graded gravels of three different sizes, i.e. 90-120mm, 8-12mm and 6-8mm. Plants commonly used are canas indica, reed juncas, typha angustifolia, papyrus and phragmites australis which supply oxygen through their roots. Retention time ranges between 2-4 days.

- **Collection Sump:** A collection tank where the water is collected and pumped for irrigation purposes or cleaning toilets.

The DEWATS construction was completed in seven months in May 2005. The system was commissioned in July 2005 after testing for gas and water tightness. The DEWATS unit along with the renovated toilet complex was inaugurated by the Commissioner for Municipal Administration, Government of Tamil Nadu.

The DEWATS unit cost was estimated at Rs. 7,00,000. It treats effluent from 20 toilets in 2 sanitation blocks, serving about 460 persons.

Wastewater Monitoring and Treatment Indicators

The effluents indicated a BOD level of 179 mg/l and a COD level of 896 mg/l prior to treatment in the first year of the project in May 2005. Post treatment, the BOD and COD levels were expected to conform to statutory requirements of 100 mg/l and 250 mg/l respectively as it was proposed to be used for irrigation. A year later in March 2006, water monitoring data indicated an acceptable BOD level of 82 mg/l but the COD level of 400 mg/l was on the higher side. The latter was due to the inherently high Total Dissolved Solids (TDS) in ground water from a borewell used in the toilets. The monitoring data of May 2007 indicated that the BOD and COD concentrations were 26 mg/l and 184 mg/l, respectively, well within the statutory requirements set by the Pollution Control Board for treated wastewater which is to be reused for irrigation.



Chemical Oxygen Demand (COD): It is the most general parameter to measure organic pollution of water bodies. It indicates the amount of oxygen required to oxidise all organic and inorganic matter.

Biochemical Oxygen Demand (BOD): The BOD is the fraction of COD that is oxidised biologically through bacterial action.



Management, Operation and Maintenance of CBS-DEWATS

The CBS-DEWATS complex is operated and managed by the local SHE team, also called the O&M team. The SHE team comprises of two members from each of the six SHGs who take responsibility for the O&M of the DEWATS unit. The membership of the O&M team is on a rotation basis, thus giving an opportunity to all SHG members to assume responsibility. However, at times, the membership in the O&M team and sharing of responsibilities poses challenges as some members are reluctant to give up their responsibility as well as the status gained as a result of this membership.

A regular schedule is followed for maintenance, e.g. periodic checks of sewer lines, removal of scum and other floating particles from anaerobic baffle reactor and regular harvesting of plants in the PGF. The filter material is to be washed periodically, every 3-5 years. The compound wall around the site was constructed by TCC through the Namaku Naamae (Self Sufficiency Scheme) while BORDA/BMZ and TCC contributed Rs. 50,000/- each. This would prevent intrusion by cattle and outsiders.

The operational costs of the DEWATS unit are covered by the income generated from user charges fixed at Rs.0.50 per use. Through the pay-and-use system, a monthly income of Rs.6,450/- accrued, while the monthly expenditure for maintenance amounted to approximately Rs.4,500/-. The surplus was spent to meet electricity charges for lighting and running the pump for irrigation. While the income levels seemed to be adequate, the costs of periodic maintenance, repairs and replacements could call for a revision of user charges. Alternatively, TCC could be approached to allocate funds or take on the responsibility of periodic maintenance or contribute when additional finance

is required for repair and maintenance as this would be beyond the capacity of the community.

Outcomes and Achievements

The CBSSD project implemented in East Devadhanam is the first of its kind in Tamil Nadu and has proved to be an exceptional example of private-public cooperation. The pilot project was conceptualised, designed and implemented with the active participation of all stakeholders - the community, TCC, Gramalaya, ExNoRa International, CDD Society, BORDA and other Government departments.

The project had a strong community focus. The community-based SHGs were actively involved from its very inception to daily operation and maintenance. The self-help organisation of the target community has successfully ensured the community's capacity to independently upgrade the quality of their living environment.

One of the major achievements of the project has been ensuring sustainability of the system as it is fully owned and managed by the community themselves.

The sanitation facilities have put an emphatic end to health hazards and the practice of open defecation and will go a long way in encouraging the use of the available toilets and inculcating good health and hygiene practices.

Child Friendly Toilet ends open defecation

The Child Friendly Toilet (CFT) built as part of the CBSSD intervention has brought about a remarkable change in the habits of children who used to defecate in the open surroundings. With the establishment of CFT, children are using the toilets every day, enjoying the colourful drawings on the walls and the clean surroundings. Initially, the children were accompanied by their mothers who taught them the basic ideas of toilet use and hygiene including practices like washing hands with soap after using the toilets. Children also learnt by observing each other and now, they are happily using the CFT. A wash basin with soap is provided at one corner of the CFT for hand washing. The CFT have been successful in inciting interest among children for using toilets and have massively contributed to the cleanliness of the slum surroundings.





The treated wastewater is put to appropriate use for irrigating the vegetable garden adjoining the CBS complex. It has ensured a bountiful produce of greens and vegetables that grow in abundance and are supplied to neighborhood stores. Income has increased through these activities. Moreover, the biogas generated is used as a fuel for cooking, heating water and lighting biogas lamps in the toilet complex. The sludge residue is not dispensed with but serves as an effective compost to enrich garden soil.

The closing of the energy and water resource cycles were also a strategic achievement of the project. The residents of East Devadhanam are more enlightened than other marginalised communities.

Certain observations in the behavioural change of people were noted. The notice board was visible to all and read regularly, cleaning of the neighbourhood

became a regular activity, awareness on health and hygiene had a positive impact and open defecation was reduced appreciably.

The project has thus improved the social, economic and environmental conditions of the people of East Devadhanam.

Spreading the Message

The achievements and lessons learnt from the East Devadhanam project were up-scaled in many ways. The concept of DEWATS and its success story in this project was disseminated at various platforms in seminars and workshops. The message spread to other NGOs and international agencies who became interested in the concept. Visitors from different parts of the country and overseas began to observe the decentralised functioning of a sanitation structure.

The SHE team members voluntarily visited the temporary settlements of Nagapattinam after the Tsunami of 2004. They also shared their experiences especially the importance of hygiene and DEWATS as an exemplary sanitation solution. During the post-tsunami rehabilitation and reconstruction phase, 72 permanent settlements out of 205 were short listed for setting up appropriate sanitation systems. Various NGOs and agencies proposed different types of sanitation solutions of which three systems were preferred, DEWATS being one of them. A Government of Tamil Nadu Order was issued prescribing DEWATS as one of the appropriate technologies for sanitation solutions. Thus, DEWATS units were finally to be set up in 23 permanent settlements of tsunami affected communities.



Demand increased for including DEWATS in the Chennai City River Conservation Project (CCRCP) of the Chennai Water Supply and Sewerage Board (CWSSB). Other municipal bodies such as Erode and Musiri also evinced interest and set up DEWATS in their municipal areas. Further, exposure visits for the Commissionerate of Municipal Administration (CMA), Tamil Nadu Slum Clearance Board (TNSCB) and others to DEWATS units at the Friends of Camphill (Institute for mentally challenged persons) and Ullalu Upanagara (a peri-urban settlement for slum evictees), both in Bangalore, facilitated dissemination of awareness on DEWATS. This proved to be an invaluable lesson in public-private partnership initiatives.

Constraints and Lessons Learnt

The implementation of the CBSSD project at East Devadhanam threw up learnings which could be addressed when replicating or up-scaling such a project.

The success of the project could be largely attributed to the active participation and synergy of efforts of all stakeholders involved in improving the sanitation situation in East Devadhanam. To ensure achievement of the expected results and intended impacts, the various stakeholders had to be enabled to play their respective roles. This called for the development of an appropriate framework which also entailed initial investment in a learning-by-doing phase. This necessitated capacity building of project partners for the implementation of the project. Building partnerships required time for the stakeholders to get to know and trust each other and learn to work together. It was a pilot initiative calling for a new approach - a 'first time' experience for most of the collaborators. Therefore, the preparatory phase was prolonged with frequent learning loops and reviews taking place from time to time.



Ensuring that local communities take charge of managing and maintaining the initiated efforts was a prerequisite for the sustainability of the CBSSD project. This implied that communities were involved in every step of the project from the beginning as equal partners and relevant details of the project were communicated regularly. Their involvement meant more than merely attending meetings and assisting in the construction process. They were expected to contribute in cash or kind towards the management of the sanitation facilities and hence gain a sense of ownership of the project. This process of mobilising the slum community where the tradition of community participation (social capital) was non-existent, enabling it to develop a sense of ownership, proved to be an uphill task. The successful mobilisation through generation of demand and a participatory approach worked as a catalyst in creating active groups for the provision of decentralised basic needs services.

In a nutshell, the implementation of the CBSSD project was not a flawless journey. In any such social process where diverse groups are involved, conflicts are inevitable and need to be strategically resolved. The SHG members were often involved in group dynamics discussing cases of conflict and dissent which involved much time to sort out.

The project experience clearly demonstrated that the issue of sanitation quickly turned into an entry point activity for a more integrated approach to the provision of a wider set of decentralised services like solid waste disposal, improved drainage systems, education and awareness on hygienic aspects. This stresses the importance of adopting an integrated approach to improve the sanitation holistically in



slum areas and not merely addressing hardware component, *i.e.* toilets and treatment plants.

Establishing a sound mechanism for initial assessment, procedures, periodic monitoring and reflection was another important aspect that supported the implementation process and helped evaluate the real impact on the ground. This particularly held true for the project which was developed through iterative phases where every change in the implementation built on the experience of previous phases. This called for an in-built monitoring system which could influence decisions. Since this was a pilot project, the procedures were loosely structured and responsibilities were not clearly defined. Standard Operating Procedures (SOPs) had not yet been evolved and consequently affected the progress of the implementation. This experience has now converted into well-defined SOPs which are available for future project implementation.

Regarding the technical aspects, the design of the project proved to be feasible but it emerged that more research work could have been done on the quality of water in the PGF as high concentrations of chlorides and sulphates were found in ground water.

The construction of the DEWATS unit began during the monsoon season and the area was water logged posing hurdles to the construction process. Besides, civil structures corroded rapidly and required repair often.

The exposure visits to operational DEWATS and biogas units and DESWAM practices proved to be strategic in clinching issues with communities. Through the visit to an ongoing DEWATS construction, the architect and the contractor learnt significant construction steps.



Conclusion

The DEWATS system at East Devadhanam has shown a way to improve hygiene in marginalised settlements. The area which was once in a deplorable state, has secured a clean environment with vegetables growing in the garden. People have comprehended the importance of sanitation and are slowly emerging as torch-bearers in spreading the message of hygiene and sanitation.

Involvement of civil society organisations is the crux in implementation of a community based project. The strategic advantage is that different entities pool in and synergise so that the whole is significantly more than the sum of its parts. Such processes are also welcomed and supported by the Government as mentioned in the 74th Amendment to the Indian Constitution which envisages the involvement of NGOs and other civil society organisations in developmental activities.

The importance of cultural and social aspects cannot be discounted while mobilising poor and marginalised communities in such a project. Rather, addressing these aspects becomes more challenging than merely setting up physical infrastructure. In the cultural context of East Devadhanam, even though addressing the social stigmas involved in handling faeces and biogas was crucial, the project was successful in resolving these issues and has proved to be sustainable. Exposure visits and awareness building played a vital role in solving such kinds of sensitive issues.

This project has set a visible example of DEWATS technology as an appropriate model for treatment of blackwater from toilets



and re-use of treated water and by-products for other purposes. This case study is a tool for showcasing the effective implementation of sanitation solutions in a slum area, especially for practitioners who could replicate these technologies in other areas. Civil society organisations should continue to lobby for this cause to ensure that the existing schemes and policies include sustainable technologies such as DEWATS. This experience also draws inferences on enhancing the roles and opportunities for NGOs by the Government to involve them in community-led sanitation projects, make allocations and provide financial support to them. Provision of basic needs services should be addressed through the collective efforts of the Government, civil society organisations and other institutions as a priority, especially in a country like India with a rapidly growing slum population.

References

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5. Management survey data on O&M system collected by Trichy District ExNoRa
6. Technical data compiled by CDD Society
7. Monitoring data collected by CDD Society in November 2006



ANNEXURE

Project Partners and Responsibilities

The project in East Devadhanam was a collaborative effort between public, private and overseas organisations. The collaborating partners and the varied responsibilities were as follows:

Bremen Overseas Research and Development Association (BORDA):

Founded as a not-for-profit organisation in 1977 based in Bremen, Germany. It works towards poverty alleviation in Asia and Africa. Its mission is to improve the livelihoods of disadvantaged groups and to help sustain eco-systems through the dissemination of demand-oriented, basic needs services in the fields of decentralised sanitation, water and energy supply, solid waste management and wastewater management. BORDA has been working with partners in India since 1979. Through the integration of appropriate eco-friendly technology into a holistic framework of technical, social, economic and environmental components, BORDA facilitates the provision of Decentralised Basic Needs Services (DBNS) to urban, peri-urban and rural areas and technical support to small and medium scale enterprises, institutions and communities.

German Ministry for Economic Cooperation and Development, Berlin

(BMZ): BMZ provided the major funding for the project measures to BORDA and its primary partner in India, CDD Society. BORDA was responsible for the project and undertook overall monitoring, review, evaluation and management of the project and for reporting to BMZ.



Consortium for DEWATS Dissemination (CDD) Society (formerly FEDINA DEWATS Coordination Office, FDCO): A non-governmental organisation which was founded in 2002 and registered formally as CDD Society in 2005. The organisation aims to promote and improve social, economic and environmental conditions of less privileged, disadvantaged and marginalised sections of society in South Asia through the provision of DBNS. CDD Society is based in Bangalore with Regional Coordination Offices in Nagpur and Chennai. It works through a network of like-minded partners across South Asia. The partners implement DBNS projects in close cooperation with CDD Society. The Society functions as the network's Secretariat and provides technical, research and development, financial, capacity building as well as marketing support to the partners. The approach towards the implementation of the various decentralised services is to work with partners from the concept stage to the execution and completion of a project.

ExNoRa International, Chennai and Trichy District ExNoRa: The project holder and implementing organisation respectively, played significant roles in mobilising, motivating and organising the community to participate in the project and were hence, the key players who also ensured that infrastructure was set up efficiently.

Gramalaya: Collaborated with TCC to organise and mobilise communities in Trichy slums, including East Devadhanam, to receive basic needs services and infrastructure. It also mobilised communities to assume responsibility for its management, all prior to the CBSSD project. It collaborated with ExNoRa International and Trichy District ExNoRa to add value to these earlier interventions.

Trichy City Corporation (TCC): The authority responsible for the land and project assets, accorded clearance for modifying the existing sanitation block and accorded approval for the East Devadhanam community to use the land adjoining the sanitation complex for productive purposes (growing vegetables and/or fruits). It also financed the repair and renovation of the existing sanitation facilities and built a wall enclosing the CBS complex.

East Devadhanam Community: The primary partner and beneficiary of the BORDA-BMZ supported project participated at all stages of the project. Community-based groups took over responsibility for operation, management and routine maintenance of the infrastructure.



ACRONYMS

ABR	Anaerobic Baffle Reactor	EWS	Economically Weaker Section
BMZ	German Ministry for Economic Cooperation and Development	ExNoRa	Excellent Novel Radical
BOD	Biochemical Oxygen Demand	FDCO	FEDINA DEWATS Coordination Office
BORDA	Bremen Overseas Research and Development Association	FEDINA	Foundation for Educational Innovations in Asia
BPL	Below Poverty Line	NGO	Non-Government Organisation
CBS	Community Based Sanitation	O&M	Operation and Maintenance
CBSSD	Community Based Sanitation and Slum Development	PGF	Planted Gravel Filter
CCRCP	Chennai City River Conservation Project	Poromboke	Government land which has no value on the day it is allocated for any miscellaneous purposes
CDD Society	Consortium for DEWATS Dissemination Society	RPA	Rural Participatory Appraisal
CMA	Commissionerate of Municipal Administration	SHE	Social and Health Education
COD	Chemical Oxygen Demand	SHG	Self Help Group
CWSSB	Chennai Water Supply and Sewerage Board	SME	Small and Medium Enterprises
DBNS	Decentralised Basic Needs Services	SOP	Standard Operating Procedure
DESWAM	Decentralised Solid Waste Management	TCC	Trichy City Corporation
DEWATS	Decentralised Wastewater Treatment Systems	TDS	Total Dissolved Solids
		TNSCB	Tamil Nadu Slum Clearance Board
		UGD	Under-ground Drainage





This publication is a case study which showcases an appropriate example of a Community Based Sanitation and Slum Development project in India. The role played by the beneficiary community in their initiatives for maintaining hygiene and sanitation in their slums through DEWATS and ending open defecation, has set a visible model of community based initiatives.

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