

## **GOOD PRACTICES IN SANITATION INFRASTRUCTURES FOR PERIURBAN POOR COMMUNITIES: A CASE IN HANOI**

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### **Abstract**

**In the context of high urbanization in South-East Asia, peri-urban areas suffer increasingly from environmental pressure and from lack of access to environmental infrastructures. At a time when urban financial resources are not available and deteriorated environmental conditions require expensive urban drainage structures, adapted practices are greatly needed.**

**A pilot wastewater management community project by an international NGO serves as a case study for capacity-analysis at the local level. Through interviews with experts and user-oriented focus groups, the capacity of the village and households to participate in the project is analyzed.**

**Even with the absence of credit, contribution from the poorest population is much more significant than one would expect. The Lai Xà project demonstrated that the resulting participation could be highly profitable for the authorities compared to the traditional approach of government supply and maintenance. Local communities can, with proper training, manage and maintain a simple sanitation system. The sustainability of these community services however depends on specialized technical and managerial support from water and sanitation authorities. This orientation with regional agencies will be a strategic option for international cooperation to support sustainable sanitation development.**

**Keywords:** Sanitation; Capacity Building; Periurban; Low-cost; Vietnam.

### **Introduction**

Simple, low-cost technologies are available for sanitation; they represent alternatives to communities without access to proper sanitation services. In spite of high investments in most urban areas of the world, the number of inhabitants without access to sanitation is unfortunately still increasing year after year (Lenton et al, 2005). Urban governments, with the support of international aid, are mostly investing in downtown commercial districts and in “hardware” networks (i.e. main sewer collectors and treatment stations). These structures do not usually reach the poor neighbourhoods, the latter ending up with both inadequate drainage and solid-waste collection. Even where some services exist, they are often in poor condition because of bad planning, questionable design, improper operation and insufficient maintenance. Finally, sanitation problems are often resolved locally in an informal way, resulting in downstream discharges of waste that contaminate the next district of the city.

## **New approach needed**

During the 90's, an evolution towards collaborative and strategic approaches was hardly encouraged by the international agencies. (Bartone et al., 1994; Tayler et Parkinson, 2003; Wright, 1997). Change was unfortunately limited because governments and local authorities were lacking knowledge-capacities and financial resources. At the time, community initiatives and NGO-collaborations were the most successful in terms of reaching populations (Satterthwaite et al., 2005). These initiatives were, however, hard to reproduce: they were based on a particular context and on exceptional local capacities. Many community initiatives were lacking institutional support to sustain efficient management, operation, and maintenance. Since their projects were on a local scale, the pollution could only be discharged downstream to the next neighbourhood. Since these cases never adopted a community-management method, they promoted a new dominant paradigm based on demand and participation approaches (IWA, 2006; Kalbermatten et al., 1999; Lenton et al., 2005; McGranahan et al., 2001).

Since engineers now support simplified and decentralized technologies for wastewater management (Lens et al., 2001), it is now possible for households and communities to take a larger responsibility in wastewater management while enjoying a quality service. The theoretical framework of this research is based on these new organisational and demand-based approaches (IWA, 2006; SANDEC/WSSCC, 2004), and supports a more efficient distribution of sanitation responsibilities in light of local objectives and capacities.

Sanitation and drainage services are practically non-existent outside large cities in Vietnam. 68% of the urban populations have access to a hygienic latrine, compared to 11% of rural populations (World Bank, 2004). Urban drainage has improved in the last few decades but most existing drains date back to French colonisation (pre-1954) and are very damaged. All recent investments come from international aid and are focused on reducing flooding in urban areas. Compared to water supply, sanitation is clearly not a priority yet for the Vietnamese government: no national institutional framework has been adopted yet. Urban sanitation has been decentralized to provincial authorities without according proper budgets. Projects are still submitted to the central government where financing is accorded on a per-case basis. Rural sanitation has been tackled by many international donors as part of the poverty reduction strategy (Joint-Committee, 2005). However, all projects focus only on the supply of individual private latrines; drainage and communal wastewater treatment are not considered yet in rural areas.

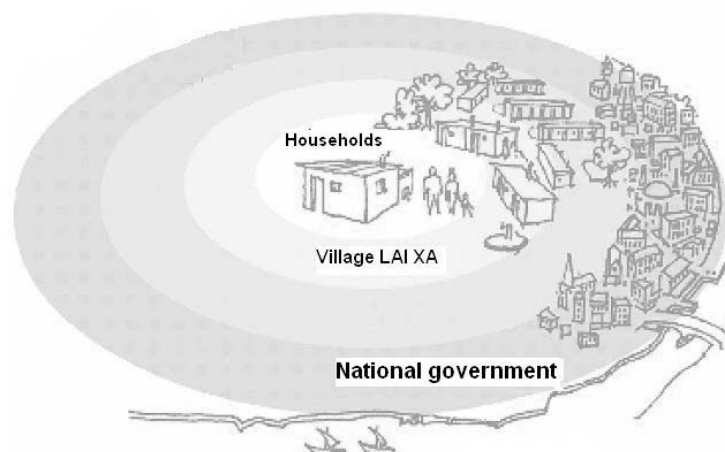
## **Research methods**

This project is part of a wider research undertaken in Vietnam for a PhD degree in the field of urban environmental management. The case study is a pilot wastewater management community project by an international NGO. We interviewed all groups of stakeholders to identify their sanitation needs and capacities. Through our analysis we identified the factors that influence their decision to participate in this project.

The stakeholders were divided in scales of analysis illustrated in figure 1: participants at the national level (government, ministries, water and sanitation agencies, etc.), participants at the village level (local authorities, traditional leaders, social organisations, project committee, etc.), and participants in households. The fieldwork in Hanoi lasted 13 months, and was conducted in partnership with the NGO YWAM, a project supporter, and a professor from the Hanoi University of Civil Engineering, who acted as the technical consultant in the community project. The research methods employed interviews with experts and focus groups conducted with users.

The case study, while not necessarily exemplary or representative, was chosen because it presented a strong demand for sanitation from a highly informed public. Furthermore, the village

typifies periurban environmental conditions; located on the outskirts of Hanoi with no access to urban services, in the context of increasing urban pollution creating pressure on local agriculture.



**Fig. 1.** Scales of analysis

**Specific research question:**

- What are the community and household capacities in wastewater management in periurban Vietnam?

**Overall thesis research questions:**

- Which government mechanisms can be better adapted to suit local capacities?
- What external support is needed in light of new local sanitation management mechanisms?

**Indicators**

All groups of stakeholders were analysed in terms of their capacities in the following sectors: institutional, human resource, technical, financial, social, and cultural. Institutional capacity refers to legal, procedural, and governmental frameworks that influence group action. Human resource capacity refers to the work of all professionals required to plan, build, maintain, and manage the sanitation system, as well as the work that goes into training other participants. Technical capacity is the material needed to support the technological system in materials, tools, vehicles, and machinery. Financial capacity refers to the means of funding the operations of a sanitation service. Social capacity refers to the community's capacity to get organized and cooperate for a mutual benefit, as per the social capital definition (Putman, 2002). Finally, cultural capacity refers to the individual and cultural preferences in terms of hygiene and sanitation, or in other words, one's willingness to adopt a new sanitation system.

**Research objectives:**

- Pilot-test low-cost sanitation technologies in periurban Vietnam.
- Identify household and village capacities in order to plan, operate, manage, and maintain the system.
- Identify characteristics of the technology that can be best harmonized with local management efforts.
- Identify needs of support in order to achieve sustainable local management.

**Case study: Lai Xà project**

Lai Xà is a village on the border of the Hanoi Metropolitan province and is facing a typical periurban environmental problem. The community is part of a rural commune and is thus not provided with urban environmental infrastructures. The water pollution from its industrialized and urbanized neighbour is increasing and affecting its agriculture.

The Lai Xà project is supported by Youth-With-A-Mission, an NGO from New Zealand. Working in Lai Xa and its commune administration since 1999, YWAM accepted to support an ambitious environmental management project that comprised three phases: solid waste management, liquid waste treatment, and clean water supply. The NGO contributed 50% of the financing while the commune and village contributed the remaining half.

The solid waste management phase of the project was completed in 2003. All domestic solid waste is now being collected and sorted for organic composting, and non-organic waste disposal is sent to the local landfill. The second phase of the project started in 2004 using the same participatory approach. The first step was an educational and communication campaign on sanitation, hygiene, and the environment. The educational campaign was conducted by training a team of local ambassadors, who would later teach their own group about the project and the sanitation service. The ambassadors were representatives from all social organizations and groups of residents in the village. The group of 40 ambassadors, who received an exhaustive training on the sanitation system over 6 weekends by the technical consultant, could reach more than 94% of the population through direct contact. The objective of this method was to create a core of trusted leaders in the village that would support the project after the NGO leaves.

The technology was going to be low-cost and made simple for easy local operation and maintenance. The households were taught how to build their own drain and connect it to the secondary lane drainage. All new water toilets were to be completed with septic tanks that were designed properly. Another committee, formed by the Lai Xà residents, was to closely monitor the construction in the village. Their mandate was to report to the village assembly about the quality of the work while supervising all household connections and secondary drainage construction.

**Research results**

There were many stakeholders involved in the Lai Xà project. The social and political groups as well as formal and traditional authorities were categorized as representing interests from the “village level”. Any other individuals who were involved in tasks that would benefit the entire village were also categorized as part of the “village stakeholders”. The analysis was separated in two categories of participants: village stakeholders and household users. Both groups of people have specific capacities that allow them to take on certain responsibilities to create a more sustainable alternative management mechanism.

## **Village capacities and interests**

The stakeholders from this level included social and political organisations such as the Women's Union, Youth Union, Farmers Association and Veteran's Association. The community workers (healthcare and teaching professionals) and the private sector (craftsmen, farmers, mechanics) also had capacities and a great interest in being involved in the project. Also present were the committees formed especially for the project: a local management committee, ambassadors, a construction supervision committee, and employees of an environmental group.

The analysis shows that the typical agricultural village was far from having the capacities to implement and manage an independent and sustainable sanitation service. Specialized management and human resources were missing and would remain necessary even after service implementation. Even with the NGO having been present in the village for six years, the local management committee, with a certified accountant as part of its team, was still overwhelmed with work. Despite having been sufficiently trained to oversee the routine cash-flow generated by the service, managing the finances remained challenging when both new constructions and repairs to existing infrastructures were being planned. The committee felt the need to be mentored on this kind of financial and technical planning and management.

Technical workforce and tools were also limited in the village. The planning, engineering, and technical training had to be executed by an external consultant who was hired by the NGO. Sanitation technologies are not widespread in Vietnam; adapting these to the needs of a poor village required advanced expertise. The village, however, was home to a large and inexpensive manual work-force and the sanitation system itself was fairly simple to operate, maintain, and repair; it was made of material that could be found locally (bricks, concrete) and needed no chemical for operation and maintenance. A group of agricultural workers had been adequately trained and could regularly maintain the system manually.

For a village where the average income is less than half the national average, the participation and financial contribution from users was very important. This involvement could be mostly related to the mobilisation of social groups inside the village network. Local participation and financial contribution is increased when a project is orchestrated with the local authorities. The traditional social organisations are still very powerful in Vietnamese rural communities; they are used to organise and pass on Government endeavours. This efficiency in communications and social mobilisation results in a very high social capacity.

Ultimately, it appears that the choices of technology and design are the most important factors in mobilizing local village capacities. The Lai Xà system has a simple design that allows gradual financing and construction. The treatment is decentralized to avoid total interruptions of service thus requiring further user-contribution. The capital and construction costs are low, with operation and maintenance being conducted locally by non-specialized workers.

## **Households capacities and interests**

In rural areas without any available public service, households are solely responsible for meeting their sanitation needs and constructing any individual latrines. In Lai Xà, increasing flooding and contamination result in new needs for urban infrastructures. The household's capacities and interest to contribute to that kind of commune infrastructure were analyzed. The technological system chosen in Lai Xà needed a high contribution from users, mainly due to financial reasons. They had to build secondary drains and connect them to the sewer as well as build a septic tank for pre-treatment and, understandably, utilize and maintain all these structures properly. All households definitely had the capacity to look after such a simple system. This high social capacity combined with an important educational campaign, created openness to such a new

technology and, in turn, strengthened cultural capacity. Despite requiring technical expertise from external sources, the households still committed to constructing their individual connection as well as to a monthly maintenance fee. It goes without saying that the household's financial capacities also proved to be much higher than expected for such a poor community.

The recognition of these existing capacities is, however, not a proof that the households *will* participate at the full extent of their capacities. Many sanitation projects in developing countries result in low sustainability due to a low willingness-to-pay from beneficiaries. Factors that encourage household participation are still missing from international literature.

Degrading environmental conditions and basic sanitation needs alone were far from sufficient to convince households to pay for this system in Lai Xà. Most households did not know much about the benefits of extensive sanitation. The educational campaign and technical trainings were popular and well received in the village. The most convincing claims, however, were those regarding the economic benefits for agriculture, increased modernity, and cleanliness in the village. Furthermore, most households said they would not invest without a unified mobilisation from both local authorities and social organisations to demonstrate the project's importance in the village. Competent technical consultants persuaded households of the quality and the appropriateness of the proposed technology. The presence of technical support in the village convinced households to invest in construction since they could benefit from cheap consulting and improved overall quality.

The analysis later demonstrated that willingness-to-pay for connection is not sufficient to maintain a sustainable service. Once the project activities ended in Lai Xà, many poor considered that their contribution was done and sufficient, and questioned the need to pay for maintenance. Government recognition, strict regulation, and financial support are mentioned as good incentives to pursue maintenance contribution.

## **Discussion and conclusions**

The factors that emerged from this analysis are directions to develop good incentives in service planning. The Lai Xà project demonstrated that the resulting participation could be highly profitable for the authorities compared to the traditional approach of government supply and maintenance.

The studied community, similar to many small Vietnamese towns, presents local capacities to undertake small-scale environmental services. Simple accounting and management can be done locally, as well as low-tech operation and maintenance. Local farmers and users can participate either financially or manually. The best choices of technology for poor communities are those that are simple to operate and low-cost. They must be built from materials that can be founded locally and require few specialized machinery. Decentralized wastewater treatment can use simpler treatment, can be built gradually, and are simpler to maintain (Lens et al., 2001).

A sustainable service, however, needs specific consultant-support in engineering and management to support the work undertaken locally. The Lai Xà case showed that local training in basic management and sanitation technologies, combined with an educational campaign, can create capacities to manage and maintain a low-tech community service without important input from the authorities. To be sustainable, the drainage and wastewater treatment system will need specific expertise on specific phases of projects: design, construction, and repairs. These are the phases where water and sanitation agencies can focus their active role while downloading routine management tasks to the communities. The Lai Xà case also showed that no district or provincial agency could provide this sanitation expertise to support the community in this periurban area. The expertise is relatively non-existent outside of the urban drainage companies located in the bigger cities. Reorienting and reinforcing the capacities of such government

agencies will be a strategic project that can be accomplished by international cooperation. While the role of international firms is not limited to construction anymore, capacity-building for supporting community initiatives will be an efficient option to avoid the repetitive wasting of international capital investment.

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## Author's Biography



**Julie Beauséjour** has an Agricultural and Biosystems engineering degree from McGill University. Her main interest is urban environmental management in developing countries. Her master thesis in Civil Engineering from École Polytechnique de Montréal was about solar technology for treatment of industrial liquid waste in Mexico. During her doctoral studies, she specialized in sanitation management, capacity-building in environment, and low-cost sanitation alternatives. She will be defending her PhD thesis in urban planning during the fall 2008.