

Small Towns: Research on Solutions for the Sanitation (Planning) Gap

Sandec is conducting cross-sectional applied research on small town sanitation planning in Nepal, Malawi and Bolivia. This is providing insight into various aspects of sustainable sanitation planning, and is helping to define the tools and steps needed for City Sanitation Plans. C. Lüthi¹, P. Reymond¹, S. Renggli¹, E. Reynaert¹, M. Klinger¹, A. Sherpa², M. Sherpa², W. Mtika³

Introduction

Small and medium-sized towns, here considered as towns with less than 100 000 inhabitants, carry the brunt of urbanisation; most future urban growth is expected to occur in these towns [1]. Sanitation coverage in small towns will, thus, be key to the achievement of the Sustainable Development Goals (SDGs). Although the challenges are similar to big cities, small towns suffer from a weaker institutional base, lack economies of scale and fewer funding opportunities are available. In many countries, the high level of centralisation of the State hinders access to national budget transfers, or the existing decentralisation processes has delegated responsibilities to municipalities, but without the necessary financial transfers. These limitations are most apparent in the delivery of basic services, such as water, sanitation and solid waste management.

Research on small town sanitation services

With the aim to provide tools and solutions to facilitate sanitation planning and service delivery in these contexts, Sandec is conducting field research in Nepal, Malawi and Bolivia. The three projects are testing, adapting and validating sanitation planning tools, and providing insight into appropriate sanitation systems and service delivery mechanisms, while supporting local stakeholders in planning. The objective is to develop state-of-the-art guidance for small town urban environmental sanitation planning and programming.

Tikapur, Nepal

An important bottleneck to realistic infrastructure and basic services planning in Nepal's rapidly growing small- and medium-sized towns is the lack of reliable and up-to-date data. Within the framework of the "Small Towns Water Supply and Sanitation Sector Project" in Tikapur Municipality (estimated population: 65 000), the need was identified for simplified, contextualised planning tools which: (i) are easy to utilise and (ii) add value to an integrated planning approach, i.e. cov-



Photo 1: Peri-urban areas of Cochabamba, Bolivia.

ers the entire sanitation value chain from toilet to re-use options. The first step was validating the assessment of the current situation and service delivery options. This included analysing technical, institutional, regulatory and socio-economic aspects (Figure 1). A situational analysis was conducted (the cornerstone of any successful planning), which consisted of a structured household survey with 400 households, three focus group discussions and the production of a Geographical Information System (GIS) database, featuring toilet coverage, storm water drainage and water provision. These assessments formed the basis for prioritising what needs improvement and what needs to be newly developed in terms of basic urban sanitation services and infrastructure.

A Shit Flow Diagram (SFD) was also developed for Tikapur, Nepal, a powerful tool to communicate and visualise how excreta physically flows through a city or town, which clearly differentiates between safe (green) and unsafe (red) disposal (Figure 1). SFDs are helpful advocacy and assessment

tools because they are easily understood by non-experts and decision-makers.

One of the main challenges in Tikapur is the total absence of formalised faecal sludge management (emptying, conveyance and treatment). Like many other small towns in Nepal, there is high toilet coverage, due to successful campaigns against open defecation in the past decade. However, the faecal sludge is commonly not emptied or is directly disposed of into the environment, resulting in unhygienic urban environmental conditions. Tikapur's SFD shows that only 30 % of the sludge is currently safely managed.

Luchenza, Malawi

In Malawi, Sandec's Community-Led Urban Environmental Sanitation (CLUES) planning approach is being validated in the small town of Luchenza (approximately 20 000 inhabitants) in partnership with the University of Malawi, The Polytechnic. The project was launched with a sanitation planning workshop in Luchenza that had more than 50 participants from the Municipality, the community and the private sector. A second, re-

gional workshop was held in May 2017 at which various stakeholders, such as vacuum truck operators, municipal officials and NGO representatives from different areas of the country, came to talk about sanitation service delivery solutions for urban contexts.

Through community mobilisation, household surveys and water quality testing, an action plan for water, sanitation and hygiene (WASH) service delivery improvements in the town is being developed. As services and funds are very limited, the priority is to develop recommendations that can be executed within the community. Because data on municipal WASH services in Malawi is scarce, the project is creating a database for the town and methodologies that the Municipality can use as a baseline for work and as a metric against which future progress can be measured.

Arbieto, Valle Alto de Cochabamba, Bolivia

The peri-urban area of the city of Cochabamba (Photo 1) has recently experienced strong population growth due to rapid development, attracting migrants from all over the country. In 2014, an international NGO built 500 single-vault urine-diverting dry toilets (UDDTs) in seven peri-urban neighbourhoods and a composting facility for the faeces. Due to poor planning, however, the NGO abandoned the project before a collection service for the faeces and urine was implemented. Two main questions were asked: (i) which sanitation systems and services are appropriate for peri-urban areas that cannot be connected to the main sewer network, and (ii) under which conditions is a large-scale UDDT-based system with col-

lection and treatment service feasible and sustainable?

An evaluation of the present situation was conducted based on a household survey, which collected information about the current use of the UDDTs and people's perceptions of the water and sanitation situation, and through direct observations of the toilets. The assessment showed that since their construction, the number of UDDT users has constantly decreased. At present, only a third of the population uses them; many residents have turned their UDDTs into pit latrines.

Different service scenarios were investigated to determine if implementing a collection service and starting the faeces composting plant is financially feasible. The two main scenarios considered were: (i) collecting and treating only the faeces or (ii) collecting all solid waste (including the faeces) and treating the faeces and organic waste at the composting plant. The collection would be handled by either door-to-door collection or through collection points. In general, services that collect all solid waste have larger numbers of customers and, thus, more potential revenue to run a system. Collection points also decrease service costs, by reducing transport times and facilitating access.

This case study provided good insight into the feasibility and replicability of single-vault UDDT-based sanitation systems in peri-urban areas. It showed, however, that these are not financially sustainable in the short term and require long-term government and/or third party assistance. The systems that currently operate relatively successfully in Bolivia, for instance, receive permanent financial support.

The way forward

This research project is testing and validating the toolbox needed to produce City Sanitation Plans (CSPs), i.e. realistic and implementable sanitation solutions for small towns. Diagnostic tools were applied and validated in Tikapur, while work on participatory planning of bottom-up action took place in Malawi and service options for a specific sanitation system in Bolivia were analysed. We believe the tools applied in Tikapur, could be useful and add significant value for similar planning processes in other small towns looking to improve their urban environments. The project has already attracted the attention of stakeholders at the national level in Nepal and several tools used during the project will be applied in other small towns to further develop the CSPs.

The research findings will assist small towns worldwide in the development of plans to improve their urban sanitation environments. Hundreds of cities around the world, especially in India, are undertaking city sanitation planning exercises, with mixed results, as they are often not properly prepared to do this work and/or receive weak initial assessments. CSPs provide an approach to address environmental sanitation challenges from a systems perspective and facilitate selection of the best alternatives for a given context. Through the development of sound CSPs, this project will provide a proper framework for small towns to solve their sanitation problems, implement sanitation systems and strengthen the work done on the local level to achieve the SDGs.

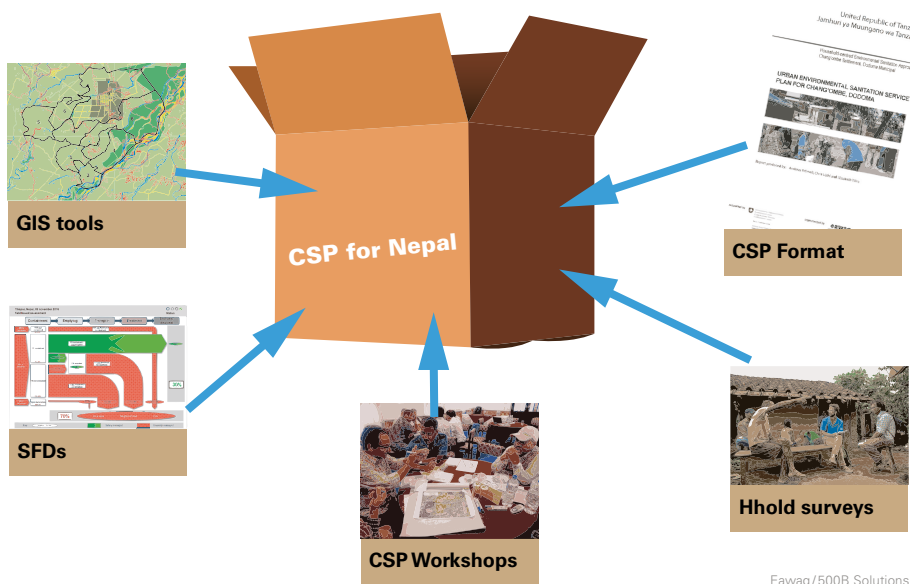


Figure 1: City Sanitation Planning Toolbox validated in Tikapur.

- [1] UN-Habitat (2013): Small Town Development Approaches. Nairobi, Kenya
- [2] Sherpa, M., Sherpa, A., Klinger, M. and Lüthi, C. (2017): Tikapur Municipality Environmental Sanitation Situational Analysis Report. Kathmandu, Nepal.
- [3] Reynaert, E. (2016): Assessment and further development of a management scheme for a UDDT based sanitation system in Arbieto (Valle Alto de Cochabamba, Bolivia). Internship Report. Eawag-Sandec, Switzerland. (Also available in Spanish)

¹ Eawag/Sandec, Switzerland

² 500B Solutions, Nepal

³ University of Malawi, Malawi

All outputs of this research can be found at www.sandec.ch/seep.

Funding: SDC WESSP Programme.

Project partners: Helvetas, AGUATUYA, 500B Solutions, Asian Development Bank and University of Malawi.

Contacts: samuel.renggli@eawag.ch, philippe.reymond@eawag.ch or christoph.luethi@eawag.ch

Eawag/500B Solutions