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**Environmental sanitation planning for cities of the South:
linking local level initiatives with city-wide action**

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This paper presents recent developments in environmental sanitation planning for cities of the global South by presenting two approaches that provide a combined response for dealing with the complexity of sanitation problems in unserved urban areas. Both approaches presented; the revamped HCES guidelines (now referred to as Community-led Urban Environmental Sanitation – CLUES) and the Sanitation 21 framework are process-oriented approaches that aim to address socio-economic and spatial diversity and seek to overcome the limitations of blueprint approaches characterised by ‘one-size-fits-all’ interventions. The paper highlights the fact that both approaches require close consideration of the ‘domain interface’ which allows for the linking of localised community solutions and city-wide interventions.

Introduction

Most of the people who lack basic sanitation services in the World’s cities live in rapidly growing urban and peri-urban areas of the global South. This is reflected in the United Nations’ Joint Monitoring Programme (JMP) report, which predicts that the number of the world’s urban population without access to improved sanitation will increase from 661 million to 898 million by 2015 (UN JMP 2010). The majority of responses to this problem are failing to address the real issues that determine the success of investments to improve sanitation services in town and cities throughout the World.

Critique of current planning approaches

Conventional approaches for the planning and design of urban sanitation services are usually based on prescribed technical standards that do not account for the diverse nature or the rapidly changing urban environment. In addition, planners frequently fail to recognize the investments that have been made and community level activities (often by NGOs) to improve household or communal latrines are generally not incorporated into plans for city-wide infrastructure. Where facilities are installed without consultation, the investment is wasted if facilities are unused or become unhygienic because they are poorly maintained. Decisions about where to invest and what type of system to install are often based on political and other vested interests. They are not based upon a real understanding of the needs of the population to be served. Different stakeholders have very different perspectives on the problem. The local authority’s primary interest tends to be focussed on keeping the city clean and to avoid outbreaks of infectious disease; whereas residents are usually concerned with their everyday needs for a convenient, safe and sanitary latrine.

The need for more responsive frameworks

There is clearly a need for more realistic and adaptive urban planning approaches that consider socio-economic, institutional, financial and capacity issues that determine the effectiveness and sustainability of environmental sanitation interventions. With this in mind, various innovative planning frameworks have been developed to address basic infrastructure planning and programming for poor urban areas. These include Community Action Planning (Hamdi and Goethert, 1996), Strategic Sanitation Planning (Wright, 1997), Urban sanitation: a guide to strategic planning (Tayler et al, 2003) or the Household-Centred

Environmental Sanitation (HCES) approach (Eawag, 2005). Several have been piloted in selected areas but only few have been evaluated systematically, especially with regard to their institutional and financial requirements and implications.

Scope and objectives

Building on the experiences from the planning approaches mentioned above, this paper lays out the rationale for an incremental approach which combines city-wide actions with community initiatives and scaled implementation for which funding may be easier to mobilise (Mara and Alabaster, 2008). Drawing on experience from piloting the HCES approach across three continents and seven pilot sites, this paper highlights some of the strengths and weaknesses of the planning framework and provides recommendations for an improved environmental sanitation planning tool. The linkages between local services and infrastructure and existing or planned municipal systems are discussed in the last part of this paper in relation to the International Water Association's (IWA) Sanitation21 planning framework.

Local-level, community-based planning – experiences from HCES

HCES – the original approach

The Household-Centred Environmental Sanitation (HCES) approach is an area-based planning approach which targets unserved or under served urban communities. At an early stage of conceptualization, it was realized that the specific needs of these communities cannot be effectively met by starting from the perspective of the traditional city master plan perspective. The approach was thus developed to concentrate on those domains closest to the residents: i.e. the household and the neighbourhood. Thus, the planning approach adopted by HCES, as the name implies, aims to solve problems where they occur rather than exporting them downstream. The planning process starts by focussing on household decisions on service needs and then moves outwards from the household to the neighbourhood, before considering the impact of the town and its hinterland. HCES adopts a flexible and neutral approach with regard to technology choice taking into account economic factors (ability and willingness to pay) and social benefits such as privacy, dignity and convenience.

The HCES approach works towards the empowerment of communities to organise themselves and participate in development interventions (Roma and Jeffrey, 2010). The workshops, focus group discussions and stakeholder meetings are accompanied by exposure activities (e.g. construction of pilot facilities or sanitation bazaars) and capacity development interventions to enable community organisations or private sector service providers to absorb and utilize future infrastructure improvements. Depending on local context and community preferences, the action plans and proposed solutions vary considerably: from on-site low-cost latrines in Dodoma, Tanzania to simplified sewers with biogas and constructed wetlands in Nala, Nepal (see Figure 1).

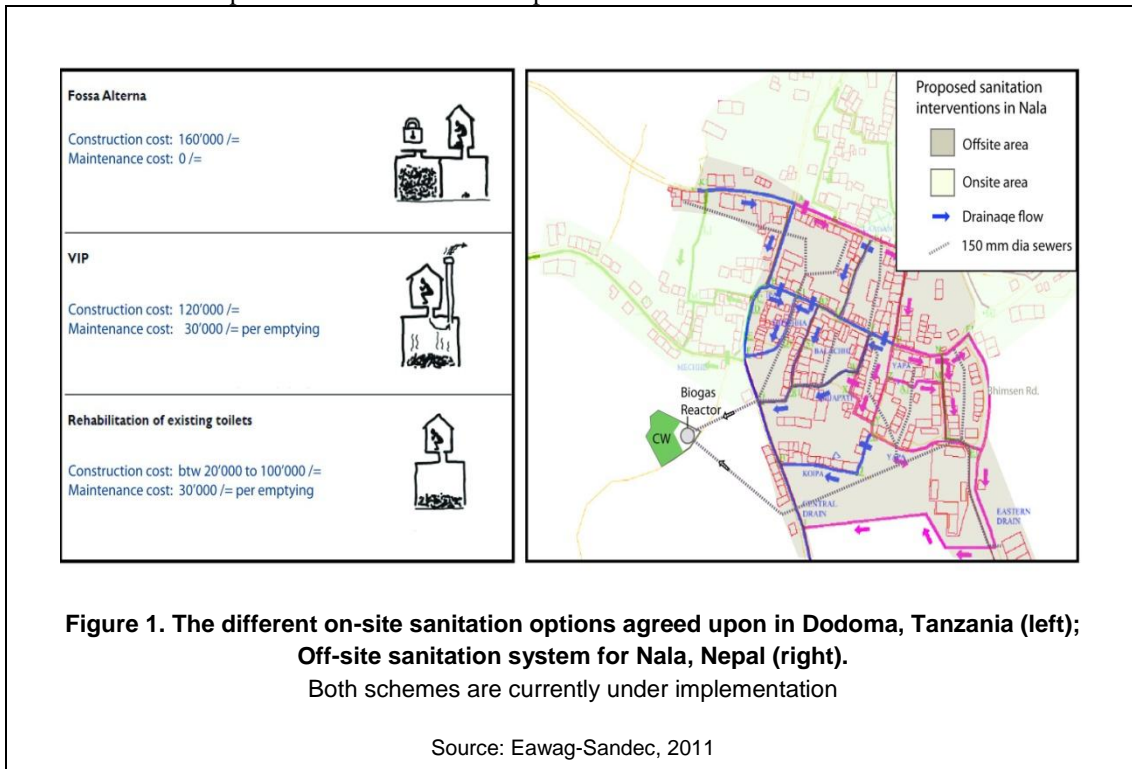
Lessons learned from HCES implementation

Eawag-Sandec in collaboration with its development and research partners have concluded an intensive piloting, experimentation and evaluation of the household-centred approach between 2006 and 2009 in Africa, Asia and Latin America. The HCES approach has been piloted in 7 different urban and peri-urban sites across Africa, Asia and Latin America. The validation sites are Tanzania (Dodoma), Kenya (Waruku, Nairobi), Burkina Faso (Fada N'Gourma), Costa Rica (Curridabat), Laos (Vientiane), Nepal (Nala) and Mongolia (Darkhan). Recent publications (Lüthi *et al*, 2008; Eawag, 2009; Lüthi *et al*, 2009) document and analyse the process, timeframe, costs implied and provide a detailed look at reasons for respective successes and failures. Experience indicated that the HCES planning approach could be achieved in 10-12 months at an average cost of around US\$ 2 per resident (this does not include the time of costs associated with implementation of the plan) (Eawag, 2009).

The following are identified to be the key learnings highlighted from the extensive field testing:

- i) *Participation* - People-centred planning evidently takes more time and effort than top-down planning and programming. Several ex-post evaluations were carried out in 2009 to assess overall satisfaction by the process stakeholders (local NGOs) and residents. Results show that there is a direct relationship between the level of participation and overall satisfaction with the participatory process and its outcomes

(Kraemer *et al*, 2010). This finding supports the argument that shared decision-making ensures a greater sense of ownership and an increase in social capital.



- ii) *Informed choice* – Residents need to be informed about the range of options available to them to be able consider the relative merits of their choices. They were provided with a menu of sanitation options to choose from, taking into account socio-cultural preferences, ability to pay and operations and maintenance. To support this process, the use of Eawag’s Compendium on Sanitation Technology Options proved to be beneficial in all pilot sites (Tilley *et al*, 2008).
- iii) *Enabling environment* - The importance of the local socio-political and institutional environment that enables change was confirmed in all pilot sites. If a planning exercise does not lead to the intended result, this is usually due to ‘disabling’ environments that undermine well intentioned initiatives such as insecure tenure (threat of evictions in informal settlements) or unrealistic regulations and standards which prevent more appropriate, decentralised solutions as exemplified in the two following case studies.

The institutional and regulatory barriers of community-based planning are exemplified in two cases from Costa Rica and Tanzania, where the HCES planning approach was piloted in 2007-2009. In the formalized settlement of La Europa (population: 750) on the outskirts of San José, the local neighbour’s association in cooperation with local research institutions was able to mobilize the entire community through a series of community workshops. Various environmental sanitation solutions were discussed and analysed, including stormwater drainage, solid waste management and improved sanitation. Problems arose when the national utility AyA (*Aqueductos y Alcantarillado*), which is responsible for urban water and sewerage, refused to consider alternatives to centralized sewage system.

AyA plays an ambiguous role: on the one hand it is the sectoral regulatory body; on the other hand it is also the dominant service provider in the San José metropolitan area. Independent service provider arrangements are possible, but AyA refuses to consider any technology that will not result in connection to the planned centralised sewage system, even though the topographic situation does not favour a centralised solution in a hilly settlement like La Europa. Consequently, although involved from the beginning of the planning process, AyA and its parent Ministry of Public Health started blocking the bottom-up planning process.

In Dodoma, Tanzania the household-centred approach faced similar challenges. The unplanned but regularised low-income settlement of Chang’ombe to the north of Dodoma (population: 35,000) featured very poor sanitary conditions (over 90% of the population used unimproved or traditional latrines (Lüthi *et*

al, 2008) with a high incidence of cholera during the rainy season. The planning process was piloted by a local NGO which managed to build up momentum within the community, involving schools, women and youth groups. Inflexibility and institutional inertia on the part of the local utility DUWASA (“*We deal with sewerage, not with sanitation*”) and a general disinterest in community-based processes led to project delays. Because the urban poor will not be part of DUWASA’s customer base for the foreseeable future, they showed little interest in low-cost on-site sanitation options. Despite these institutional barriers, social marketing campaigns and revolving fund sanitation schemes were set up to improve sanitation coverage in Chang’ombe in 2010.

Community-led Urban Environmental Sanitation (CLUES)

The results generated from the piloting of the HCES approach have fed into a set of updated planning guidelines termed ‘Community-led Urban Environmental Sanitation’ (CLUES) which are targeted more directly at the neighbourhood and community level. The revamped guidelines feature several improvements to the existing provisional guidelines including a streamlined planning process (see Figure 2) with 7 steps (as oppose to ten steps in the HCES approach) to guide users from process ignition (Step 1) to the action plan (Step 6) and final implementation (Step 7).

Based upon the experiences from piloting the HCES approach in Costa Rica and Tanzania, the revised guidelines place increased emphasis on the enabling environment dealing with socio-economic, institutional, financial and human resources issues that determine the quality and sustainability of environmental sanitation interventions. Steps 6 and 7 also highlight the needed linkages between area-based community initiatives and city-wide planning and programming efforts.

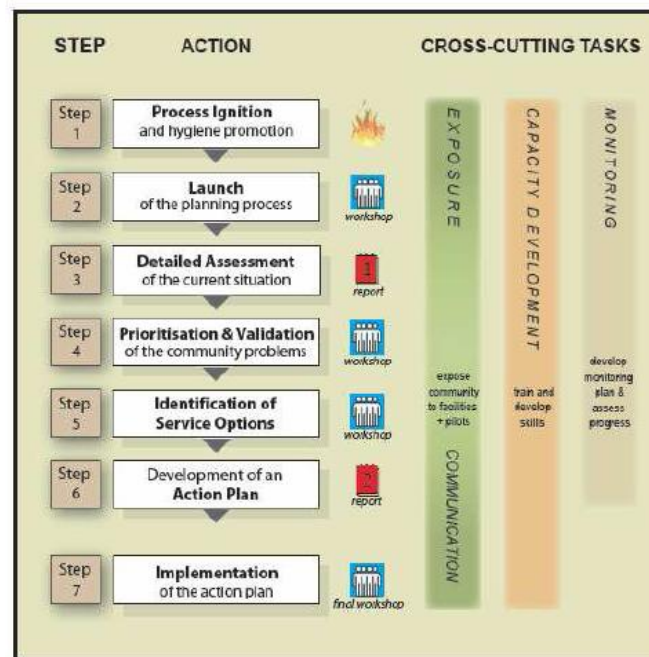


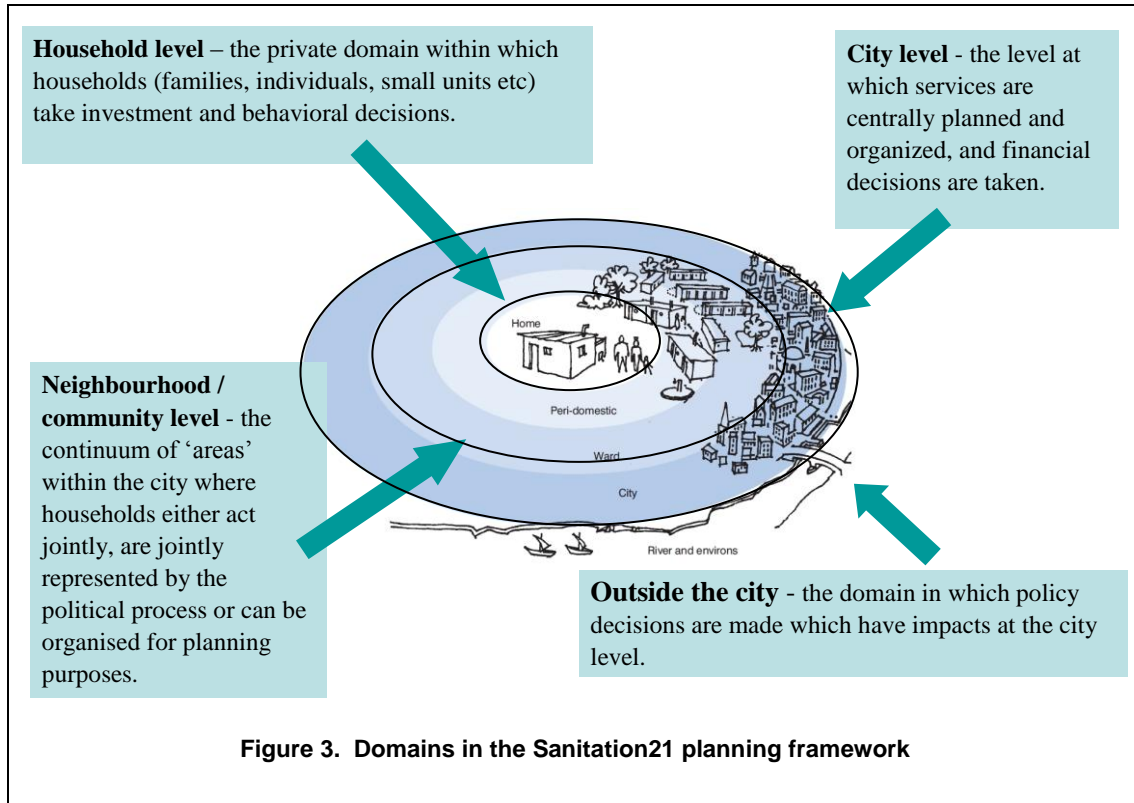
Figure 1. The 7 CLUES planning steps

Source: Eawag-Sandec, 2011

Sanitation 21 – a framework for city-wide planning

To help define the respective roles and responsibilities between those actors working at the city level and those working at the community level, the Sanitation21 framework divides the city into different domains for decision-making and intervention from household to city level (see Figure 3). Each domain is

characterized by a distinct set of factors that influence the most appropriate sanitation system (including both technology and management arrangement) which are used as the basis for analysis of stakeholder interests and sanitation system options. In each domain, there is a need to identify and consider those factors that influence and incentivise the behaviours of different stakeholders in each domain.



The Sanitation21 framework also prompts the planner to ask questions about whether a technology is fit for the purpose in relation to local needs and demand and whether it will work in relation to the local capacities to manage the system. Specific focus is made on the linkages between localized systems and city-wide systems for waste management. These may be physical connections in the form of sewerage or desludging services or managerial/technical support to local level operators. The aim is to ensure that decisions about technologies are embedded in the local context and to support municipal and local authorities prepare rational and realistic citywide sanitation plans that form the basis for future focus of activity and investment. The updated framework is a development of the draft planning framework published by IWA in 2006 which was launched at the IWA Congress in Beijing (IWA, 2006). The conceptual framework for planning is essentially the same but the process is defined more explicitly and consists of the following steps:

- Step 1: Ensuring commitment** – As good planning requires a commitment to cooperate between different institutional stakeholders, there is a need to ensure that the local authority and the main organisations responsible for service delivery are in overall agreement about their roles and responsibilities related to urban sanitation. These stakeholders should be encouraged to sign a ‘Sanitation Charter’ to avoid potential future disagreements about overall policy towards sanitation services in the city and to demonstrate the commitment to citizens to improve sanitation in the city,
- Step 2: Collation and sharing of information** – an essential part of the planning process is the collation and sharing of information; including spatial maps, demographic and socio-economic data, details of existing service coverage at the household level, communal and public sanitation facilities, extent of waste collection systems (sewerage and desludging services) and waste treatment infrastructure. Any previous documents and planning documents related to urban sanitation should also be collected at this stage to provide a basis of reviewing the degree of success of previous initiatives (Step 4).

- Step 3: Define objectives of improved sanitation and service levels* – Based on the interests of the stakeholder groups, expectations for improvements in sanitation facilities and services are likely to be different. In order to develop a consensus about the focus of the planning activity and objectives of investments, it is necessary for stakeholders to understand each others' interests. This is a process of consultation and reconciliation of stakeholder interests in order to agree upon the level of service level in relation to the capacity and willingness to pay for improved services.
- Step 4: Understand the existing context* – The objective of this step is to obtain a detailed understanding of the existing context in terms of the physical, environmental, social and institutional parameters in each domain (as shown in Figure 3). The capacities of the key actors that will influence the implementation and long term management should be assessed. In addition, the power relationship between different groups that may influence decisions and actions should be analysed and understood. This knowledge should be used as the basis for assessing the relative degree of success (or failure) of previous initiatives to identify the key constraints that may also influence future initiatives.
- Step 5: Identify viable sanitation technologies in relation to the physical environment* – The aim of this step is to identify feasible sanitation technologies that are considered appropriate within the context of the physical environment. Specific attention is required for those areas that are hard to serve and different technologies are likely to be more appropriate for different parts of the city. Factors that need to be taken into consideration include operational performance and expected levels of service, construction and operational costs and flexibility for adaptation to future urban development.
- Step 6: Costing options* – This step involves a robust financial analysis to identify the most cost-effective solution. All options should be costed in terms of their capital (CAPEX), capital maintenance (CapManEx), and operational and routine maintenance (OPEX) costs. These costs are used as the basis for whole life-cycle assessment to calculate the Net Present Value (NPV) and identify the most cost-effective option in the long term.
- Step 7: Assess alternative management and financing arrangements* – All facilities in different domains need to be managed effectively for the system as a whole to work. This step in the planning process looks at the various management arrangements and the alternative approaches for financing sanitation improvements. Neighbourhood and city-level infrastructure may require a different type of management arrangement. For example, contracting out operation and maintenance to private sector operators may result in a better quality of service delivery.
- Step 8: Preparation of plan and gaining ratification for implementation* - the final stage in the planning process involves pulling together the various components of the plan into one coherent document and using this as the basis for consultation with the various actors and stakeholders. This step should require further consultation to ensure that the proposed solution(s) meet local expectations for service level improvements as defined in the initial stages of the planning process.

Compatibility between CLUES and the Sanitation21 approach

Clearly CLUES and Sanitation21 planning approaches are mutually compatible and there are many inherent similarities in relation to their consideration of technologies within the context of the socio-economic and institutional environment. However, their starting points are quite different. Whereas CLUES is primarily focused on solving sanitation problems in informal settlements and aims to derive solutions that require the minimum of external support (or potentially none), the Sanitation21 approach aims to encourage sanitation planners think more holistically about sanitation from a citywide perspective taking into account the needs of all communities. This approach therefore starts from a local authority and utility perspective aiming to find ways in which the official service provider can embrace local level activities – often those in the informal sector – and thus solve sanitation problems in areas which are by nature hard to serve.

There are two main groups of actors involved in sanitation service provision; those that operate at the household/community level and those that operate at the municipal level (or potentially a part of the city). Whereas the CLUES planning approach starts at the community level, the S21 approach starts at the city level. The two approaches are compatible as they both recognise the relevance of the other. As incorporated into CLUES, planning starts at the local level and is therefore embedded with communities and is specific to the local context. However, it recognizes the need for the local initiatives to be supported by city-level services. The main types of support can be identified as follows:

1. Provision of managerial and technical expertise.
2. Physical connection to municipal sewerage or waste collection services.
3. Support for operation and maintenance support and link to spare part supply chain.
4. Financing (micro-financing, access to loans etc).

City level planning as incorporated by Sanitation21 aims to address these support needs from the onset and is therefore a way in which city authorities and the utilities responsible for service provision can capitalise on the resources (human and financial) available at the community level. The types of resources that can be mobilized through NGO activity can result in the following benefits:

1. Interventions and resultant sanitation services are sustainable and meet the expectations of local communities.
2. Finances are used as efficiently as possible and services are financially sustainable.
3. Links between community-based organization, the local authorities and service providers are established to ensure that roles and responsibilities and lines of accountability are recognised.

Therefore, there is often a need to link activities at this level (i.e. CLUES) with higher level strategic city-wide planning initiatives that make the connections with the official service providers and seek to resolve problems of service provision that cannot be solved at the community level. There are already some good examples which demonstrate that challenges can be overcome. Some examples where this has been successfully achieved include the community managed public toilets in Nairobi which are connected to the city sewerage network, the desludging services in Dhaka managed by DSK which are permitted to discharge septage into the Water and Sewerage Authority's sewers, and the condominial sewerage model which has resulted in wide scale sanitation improvements in unplanned settlements in Brazil.

Thus, community level activities to improve household or communal latrines need to be incorporated into plans for city-wide infrastructure and there is a need to engage with city authorities and utilities in a way that enables them to see the benefit of working with NGOs and other organisations working at the grass-roots. In this respect, it is the definition of the 'management interface' between community-led solutions and the city-level service provider that is one of the most challenging dimensions of sanitation planning in the urban context. However, according to Evans (2011), the domain interface between Sanitation21 city-wide strategic programming and CLUES ward-level (neighbourhood) participatory planning and interventions must be addressed so that community initiatives can become less dependent on city-wide actions, and finance for small elements of the system becomes easier to mobilise. This approach may also be beneficial for the service provider as the solutions can be less capital-intensive and more cost-effective in the long term. However, as argued in the paper, the relative balance of responsibility requires a carefully managed planning process involving activity and interaction at the community and municipal level.

Support for sanitation planning processes

The first task will often be to develop a planning culture and planning capacity within organisations operating at the municipal level. This will usually require action at a higher level to develop the systems and procedures that provide incentives for planning and support for organizations that wish to develop their planning capacity. (Tayler and Parkinson 2005) The answer lies in an applied planning process which is linked to a capacity development at the higher municipal level. In response, there is increasing commitment from various organisations to support institutional and NGO stakeholders in low and middle income countries engage with the inherent complexities of urban sanitation and to develop plans that aim to provide sustainable and cost effective solutions. Towards this objective, both Sandec-Eawag and the International Water Association are involved with the SuSanA Working Group on 'Cities and Planning' (see <http://susana.org/index.php/lang-en/working-groups/wg06>) and are working closely with funding and implementing agencies including UN-Habitat, the Asian Development Bank and the Water and Sanitation for the Urban Poor (WSUP).

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