

# sustainable sanitation alliance

SuSanA - fact sheet

## Planning for sustainable sanitation

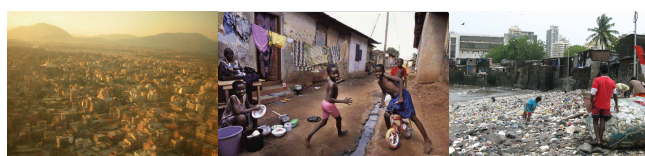
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### Summary

This factsheet deals with the planning of sustainable sanitation for urban and peri-urban areas of the developing world and its importance for accelerated sanitation coverage by 2015. The United Nation's International Year of Sanitation has highlighted the enormous increase in the number and use of sanitation facilities implied by the MDG target on basic sanitation. According to recent estimates, around 400'000 people will have to be provided with adequate sanitation daily during the period 2001 and 2015 to meet target 10 of Goal 7, to *'halve by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation'* (UN, September 2001). We urgently need new creativity for better planning and implementation to achieve this target. The daunting task of improving global access to sanitation is complicated by a growing consensus that conventional approaches - flush toilets connected to centralized wastewater treatment plants that dispose into local waterways - are economically and environmentally unsustainable (SuSanA, 2007).

We first address shortcomings of past approaches with their supply-driven focus. Then, new planning approaches for improving sanitation conditions in the rapidly growing cities of the 'South' and guiding principles for successful sanitation planning are presented. A full overview of urban sanitation problems is not discussed here, as this is the focus of the first thematic paper "Sustainable Sanitation for Cities" (SuSanA, 2008).

- Top-down, supply-driven planning epitomized by the "Master Plan" continues to dominate much of sectoral planning in the developing world. The resulting capital-intensive solutions tend to be costly, energy-intensive and inflexible, failing to reach large proportions of the new slum poor.
- Experience has shown that importing sanitation planning models from the industrialized world and to implement centralized 'one-size-fits-all' solutions is in many cases neither appropriate nor sustainable. Thus, planning approaches must be adapted to better allow for the planning and implementation of context-specific sanitation systems.
- Recent innovations in sanitation planning include a more integrated planning approach (strategic sanitation planning), a greater emphasis on the actual needs and means of the users encompassing close consultation with all stakeholders (household-centred approach) and a systems approach to sanitation, integrating all domains of the city (Sanitation 21).
- There is a lack of integration between the various components of environmental sanitation; excreta, domestic and industrial wastewater, solid waste and storm water are managed by means of separate systems, often run by different agencies or institutions. Better use of synergies can lead to more sustainable and cost effective solutions.
- Issues of political economy: improving sanitation coverage especially for the urban poor means tackling vested interests and often corrupt practices. Planning must openly deal with these issues and seek to increase incentives for anti-corrupt behaviors and achieve greater transparency at community and city-wide levels.
- Convince local authorities, utilities and donors that commitment and effective participation from all stakeholders are needed to achieve 100% adequate sanitation



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## Why past approaches have failed to deliver

Planning in its most general sense is about decision making and can be defined as “a process of making choices among the options that appear open for the future and then securing their implementation” (Roberts, 1974).

Ever since the beginning of urban civilization 5000 years ago, humans have to some extent been planning urban environments and their corresponding services and infrastructure. Since the 19<sup>th</sup> century, urbanism and urban planning has developed into a field of knowledge and practice that views the city as an object for study, intervention and control under the responsibility of specialists and experts capable of streamlining interventions through policies, plans and projects.

The principles of planning that continue to dominate the thinking of urban and infrastructure planners and political decision-makers in the South are based on the concept of ‘manageable towns’ - often replicating the principles of colonial urban planning. Today, however, large parts of the cities of the developing world are completely neglected by mainstream planning. The majority of urban populations live in informal, unplanned settlements which are often considered ‘illegal’ or ‘unauthorized’ and tolerated at best. The combination of the pace and scale of urban population growth in developing countries is undermining the efforts of city and municipal administrations to plan and guide urban development.

This has led to a practice of town planning that is heavily dominated by top-down, technocratic approaches which are excessively restrictive, divorced from reality and oblivious to the present and future needs of poor citizens. This type of planning is epitomized in the so-called Master Plan or Comprehensive Development Plan approach. Experience from the past decades has shown that implementation of Master Plans rarely keeps pace with the development of new areas - the practice of planning always lags behind of what happens on the ground: first there is occupancy or squatting; second, construction; third, “informal” planning of basic infrastructure; fourth, normative regularization.

There are other problems with this planning practice:

- Top-down, technocratic planning is dominated by vested interests and powerful elites and influential figures at national and local level that tend to promote expensive “supply-driven” approaches. Little attempt is made to include the views of users when large schemes and new neighbourhoods are planned and implemented.
- A major criticism of master plans is their inflexibility in form and content. This inflexibility stems from the burdensome procedure to produce and later amend the official plans. If a plan requires modification after formal adoption, Councils must repeat all of the procedures required prior to adoption.

- The restrictive nature of city master plans is also problematic. Current urban planning departments are heavily biased towards development control, covering only a fraction of the built city.
- National legislation and regulations tend to favour planning of centralized sewer-based solutions - neglecting household interests and their ability to pay for these systems.
- Centralized sewer-based solutions carry with them a technology lock-in, have high capital, operation and maintenance costs, and are energy intensive to run.

## Supply driven planning

The traditional planning approach to urban infrastructure has been one in which planners and engineers assess the needs of a given planning area, and then decide what type of service will be provided. The most common failing of planning and implementation in the past, was the failure to take into account the expressed needs and conditions of the users of the sanitation facilities as well as of other important stakeholders (landowners, politicians, financial institutions, users of wastewater or other products generated from sanitation systems).

Government and donor agencies continue to rely on supply-driven approaches that have distinct drawbacks (Wright, 1997):

- The main beneficiaries are the richer neighbourhoods that can afford higher levels of services (sewers, septic tanks, household water connections, etc) which are often also subsidized. Poorer neighborhoods tend to be excluded for both cost and technical reasons;
- Investment and O&M costs are often not recovered, with the result being that neither proper operation and maintenance nor service extensions are possible;
- Because the costs for these capital-intensive solutions are so high, public investment to improve sanitation coverage as well in poor urban areas is not available;
- If solutions are sought for low-income neighborhoods, they tend to be ‘one-size-fits-all’ solutions without taking into account negative effects like ensuing environmental pollution;
- The high initial cost of such large-scale projects restricts competition for construction contracts to large-scale operators, excluding smaller and medium-size local contractors.





▶ figure 1: defunct sewage treatment system, Kumasi, Ghana from the 1970s



▶ figure 2: incomplete donor-funded latrine programme, Mauritania, 2004

Another example for supply-driven sanitation is the Centrally Sponsored Rural Sanitation Programme (CRSP) which was launched in 1985 in India to improve sanitation coverage in rural areas. The planning approach adopted by the Government of India was to provide free or heavily subsidized services in the form of twin-pit pour-flush toilets. The only potential customers were upper-income land owners living in large permanent dwellings and only a handful of influential local figures had these toilets built for them at the state's expense. (Black & Fawcett, 2008) Fortunately, the Indian Government has drawn its lessons from failed attempts like these and is now heavily supporting more demand-led initiatives such as the Total Sanitation Campaign.

Unfortunately, most infrastructure planning and service delivery up to this day continues to be supply-driven with a high degree of centralized control, little local accountability, and little involvement of the end users. Only slowly are utilities and service providers waking up to the fact that 'more of the same will not suffice. In the past decade, several new approaches have been tested, based on multi-stakeholder, partnership approaches. This will be the focus of the next chapter.

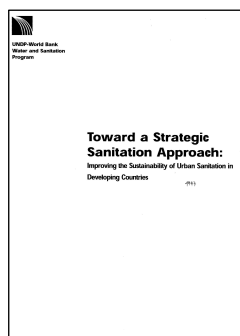
## Innovations in sanitation planning

This chapter presents three novel approaches to sanitation planning for urban and peri-urban areas of the developing world which seek to overcome the poor performance of past top-down, supply-driven planning paradigms. The three approaches have a lot in common as they highlight the developmental role of planning and recognize that stakeholder involvement is a prerequisite to effective planning.

The three planning approaches discussed here are:

- The Strategic Sanitation Approach, 1994 (WSP);
- Household-Centred Environmental Sanitation, 2005 (WSSCC/Eawag)
- Sanitation 21, 2005 (IWA)

## The Strategic Sanitation Approach (SSA)



Strategic planning is an integrated, comprehensive approach that emphasizes not only the technical and economic aspects, but also the challenges of institutional capacity and public participation. Central to the approach is the comprehensive systems analysis of the strategic options selected. The strategic planning process differs from sectoral planning in its global approach and

from the classical master planning approach in its methodology and its orientation - more flexible and responsive and less static and overly complex.

The SSA approach was developed in the 1990s by the UNDP-World Bank 'Water and Sanitation Program' (WSP) and tested in pilot projects in Kumasi, Ghana and Ouagadougou, Burkina Faso (Saidi-Sharouze, 1994). The most comprehensive review of the strategic sanitation approach was produced by Albert Wright in 1997 (Wright, 1997).

### Box 1: Kumasi Sanitation Project (1989 - 1994)

Still the best referenced and published project to date, the Kumasi Sanitation Project in Ghana has applied SSA to develop a flexible strategy for urban sanitation in Kumasi, a city of 770'000 inhabitants in which 75% lack adequate sanitation services. A demand-oriented approach was adopted that differs from previous agency-led initiatives by:

- tailoring recommendations on technical options to each type of housing in the city;
- considering user preferences and willingness to pay;
- using a short term planning horizon (10-15 years), emphasizing actions that can be taken now;
- breaking the strategic plan into projects that can be implemented separately (unbundling);

The project partners were the Kumasi Metropolitan Assembly (KMA), the UNDP-World Bank Regional Water & Sanitation Group for West Africa for technical assistance and the Kumasi University (KUST) as the partner institute.

By the end of the 5 year pilot project, 160 KVIPs (with 240 individual units) serving a population of 4'000 in the low-income pilot areas were built and a simplified sewerage system cum septic tanks was built in the Asafo area serving around 20'000 persons. Overall, there was a strong bias towards technology choice, neglecting health and hygiene promotion. source: WELL, 1999

Central to SSA are the twin principles of *demand* and the attention paid to *incentives*. The former is seen first and foremost in economic terms and strongly linked to the concept of *willingness to pay*. This has raised a debate on appropriateness of limiting demand to economic aspects only. While urban poor may indicate a high willingness to pay for services such as water and electricity, they may indicate a low willingness to pay for other services such as sanitation or drainage which have just as important impacts on environment and health (Cotton & Tayler, 2000). Demand is a multi-faceted





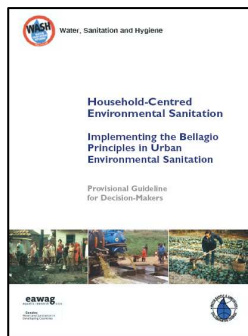
issue which must also include cultural norms, individual behavioral aspects as well as economic aspects.

Preconditions for adopting a strategic sanitation planning approach include the formulation of demand-based policy (as opposed to supply-driven approaches described above) and the development of an institutional framework to provide the right incentive structure. Programme management is done by a 'core group' of experts from the City Engineers Department, the Planning Department and selected short-term consultants.

The UNDP-World Bank funded strategic sanitation approach was a great step forward in adopting more realistic and appropriate sanitation planning strategies for cities of the developing world. There are however, three lessons worth mentioning:

- Despite the rather high amounts invested by the project (1 million US\$ for Phase 1), coverage rates remained very low, due to the high construction cost and the amount of subsidy of the strongly promoted KVIP (~200 US\$); households did not have a choice of lower-cost options;
- A rather technical planning and promotion approach which was biased towards technology choice rather than health or hygiene promotion;
- SSA doesn't deal with all processes of the sanitation system and failed to plan for the wider aspects of faecal sludge management (transport-treatment-application)

### Household-centred Environmental Sanitation Approach (HCES)



HCES is a demand-led planning approach for urban environmental sanitation which places the household and neighbourhood at the core of planning and implementation. HCES was developed in the year 2000 by a representative expert group under the auspices of the Water Supply and Sanitation Collaborative Council (WSSCC) in Geneva. HCES is based on the Bellagio Principles which focus

on human dignity and quality of life, involvement of all stakeholders in decision-making and waste considered as a resource with maximum use of recycling and reuse potential. The HCES planning approach deals with the most immediate social priorities of rapidly urbanising areas of the developing world - sanitation, water and waste. It is a radical departure from the centralized planning approaches of the past and recalibrates decision-making to include those who count most: the users.

Decisions on determining the type of basic services to be implemented is heavily based on the actual needs and means of the users and is done in close consultation with all

stakeholders, including the private sector as a potential service provider.

More than the other two planning methods presented in this paper, the household-centred approach is a process where planning is done *with* the end users, not *for* them. This is carried out in a 10-step planning process outlined in the provisional guidelines (WSSCC/Eawag, 2005). The planning steps are organised in three main groups: Appraisal (Steps 1 - 4); Engagement (Steps 5 - 9) and Action & Implementation (Step 10).

#### Box 2: HCES in Chang'ombe, Dodoma (2007 - 2009)

Together with local partners, Sandec is currently implementing the household-centred approach in the unplanned settlement of Chang'ombe on the outskirts of Dodoma, Tanzania's capital. The 10-step planning approach aims to prepare an urban environmental sanitation service plan for the 35'000 inhabitants. The multi-stakeholder process involves the service utility, the municipality, NGOs as well as neighborhood committees who are involved in the water and sanitation sector. The demand-oriented approach involves:

- a participatory assessment of the status-quo utilizing household interviews, focus-group discussions and key informants;
- assessing user priorities and preferences, behavior and willingness to pay;
- a participatory discussion and assessment of viable system and technology options: technical, institutional and financial;
- construction of three innovative pilot sanitation facilities to test user acceptance before replication;

The planning process is organised by a three-member task force including a facilitating local NGO, the municipality and a representative of the Chang'ombe community but it manages to fully integrate the end-users in all planning stages and achieve more sustainable solutions agreed upon by all stakeholders.

source: Sandec, 2008

A precondition for adopting the HCES approach includes understanding and working towards a so-called enabling environment. An enabling environment can be seen as "the set of inter-related conditions that impact the potential to bring about sustained and effective change" (*ibid*). This includes the political, legal, institutional, financial and social conditions that are created to encourage and support certain activities. An enabling environment is important for the success of any development investment; without it, the resources committed to bringing about change will be ineffective.

Program management is usually assured by local NGOs or locally-based research institutions and backstopping is provided by Eawag-Sandec. In most cases municipal officers are also involved but not as process drivers.

The HCES approach is currently being field-tested in several towns in Africa, Asia and Latin America, with a focus on un-serviced or under-serviced areas in urban and peri-urban settings.

The HCES approach was developed to address the deficiencies identified with previous planning methodologies and to build on new developments tested by the strategic sanitation approach.

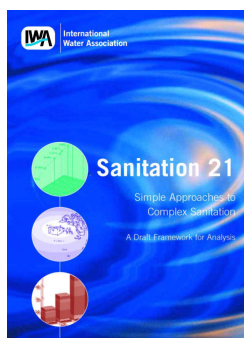




Preliminary field results suggest:

- Multi-stakeholder planning processes take time. HCES is slower than expert-driven planning processes. Slow progress with the planning and implementation of sanitation systems can result in frustrations at the community level.
- Although the HCES planning approach is a flexible method which enables (but does not prescribe) a fixed solution or technology, stakeholders are conservative and often prefer to choose known solutions even if they are disposal-oriented rather than re-use oriented.
- Further simplification of HCES is required to be valid as a non-expert-driven process that can be applied in a multi-stakeholder environment.

### Sanitation 21-Simple approaches to complex sanitation



Sanitation 21 is a comprehensive approach for the assessment of planned or existing sanitation situations. However, unlike the previous examples, since it is a planning framework, it does not provide in-depth guidance for planners and operators. The Sanitation 21 task force argues that technical planners and designers have to develop more sophisticated planning systems that

respond to the needs of rapidly growing cities. As regards the human and political context, this will require a change in the manner of making technical decisions. Sanitation 21 draws on well-established principles of good planning and design practice from within the technical world and also from a lot of inputs by the developing world contexts (IWA, 2005).

The Sanitation 21 planning framework includes three parts:

- Part 1: The Context - understanding the context and environment;
- Part 2: Technical Options - the sanitation system and its components;
- Part 3: Fit for Purpose - how well does the system fit with the context?

Sanitation 21 was conceived with the same vision as the household-centred approach presented above. Communalities include the concept of dividing the city into different domains of intervention (household to city level), the system options analysis and the importance of analysing stakeholders interests or 'drivers' at each level. Unlike the two previous approaches, Sanitation 21 has not yet been tested on the ground.

Sanitation 21 identifies eight generalised system typologies depending on the different flow streams. The systems range from on-site dry with (semi-)centralised treatment to

conventional waterborne sewerage with centralised treatment. (IWA, 2005, p. 20)

Sanitation 21 includes further planning innovations such as in Part 3 of the framework, where the likelihood of success at each level should be assessed. The beauty of the level approach is that it allows an assessment of the proposed or existing system across all urban levels, thus revealing why a system, which appears to meet the city's objectives, may not result in better services for households, or why a system selected by households may have resulted in worsening the situation in 'downstream' levels.

#### Box 3: Sanitation 21 - the 9 Planning Steps

##### Part 1 "Defining the context"

1. Identify key actors at each level. Carefully assess the range of interest groups.
2. Identify interests of key groups - what do they want from a sanitation system?
3. Understand what external factors drive decisions at each level. Are they fixed or can/should they be changed?
4. Identify capacities at each level for implementation and long-term management of any system. Include interests, skills, resources, and time.

##### Part 2 "Sanitation systems/options"

5. Analysis of existing systems. Where there is an existing system, 'map' this against the identified levels. Segregate the system to make it clear what elements exist and/or function at each level.
6. Identify in detail the management requirements for the systems segregated across each level. These requirements include skills, manpower, time, tools etc.

##### Part 3 "Fit for Purpose"

7. Does the proposed/existing system meet the objectives at each level? Does it provide the service households expect? Will it address environmental concerns at the city level?
8. Can the system be managed the way it needs to be managed at each level? If not, what are the alternative system arrangements (institutionally or technically) making it more likely for management to be carried out in the long term?
9. By taking all the previous steps and technical considerations into account, will (or does) the system work? If a number of workable options are thus identified, these (and only these) may be suitable for an economic and financial assessment to identify the long-term cost solution.

source IWA, 2005

Whilst the Sanitation 21 planning framework is not a new planning approach (its principles are collected from the corpus of planning work that precedes it), it does motivate a new mind set amongst technical planners and those with responsibility for urban sanitation. In particular, it seeks to open a debate and encourage the technical professional community to think beyond 'business as usual' approaches, appealing to strong business arguments of efficiency and effectiveness in design as the way to bring about positive change.





The following table provides an overview of the specific features and strengths of each approach presented earlier. The three examples illustrate that there is no 'silver bullet' for planning for sustainable sanitation - each approach has specific advantages and disadvantages depending on context

and available skills and capacity. Future research efforts must focus on how these approaches can be further improved and institutionalized and taken to scale. This is the planning challenge for urban areas facing us in the follow up to the International Year of Sanitation.

► table 1: Overview of main characteristics of the three sanitation planning approaches

	Strategic Sanitation Approach (SSA)	Household-centred Environmental Sanitation (HCES)	Sanitation 21 - Simple approaches to complex sanitation
Comprehensive approach	- socio-economic - technical - institutional set-up	- socio-economic - technical - environmental aspects	- socio-economic - technical - environmental aspects
Stakeholder involvement & methods used	- community consultation - core group of experts	- all stakeholders should participate - include community in all planning steps	- focus on planners & experts - institutional mapping, understand the drivers at each level
Technology choice	- unbundle solutions by zone or neighborhood - mostly disposal oriented	- open to all system options - waste seen as a resource	- open to all system options - integrated solutions across boundaries
Special features	- cost-recovery important - contingent valuation survey – willingness to pay	- waste diluted as little as possible - integrated solutions: environmental sanitation	- holistic: From households to downstream domains

### Guiding principles for better sanitation planning

When planning for the complex realities of the one billion people currently living in informal urban settlements worldwide, some radical rethinking is required. While it is certainly true that *"..there is little evidence that any overarching approach has had any significant impact in the complex situations faced by the urban poor and those charged with delivering sanitation services to them"* (Tayler, 2008, p. 30), this paper does map out the key issues that need to be addressed if there is to be progress in replicating good practice and moving to scale. Some key issues and pointers for adopting successful planning approaches are summarized below:

✓ **Understand power relations**

Stakeholder assessment, institutional mapping or regulatory review tools of analysis are effective for analysing existing power relationships and vested interests in an urban context. This must include formal and informal institutional arrangements, public, private, civil society institutions and focus on groups/individuals whose interests are likely to diverge. Understanding the dynamics and the regulatory environment of an urban setting is a prerequisite for producing informed

planning solutions. This means being aware and trying to work against corrupt practices by promoting greatest possible transparency of planning decisions.

✓ **Ensure effective participation**

All of the above planning approaches underline the importance of stakeholder participation. It is of great importance to empower local people through raising their skills and capacities. The key issue here is information-sharing from the outset of any project or programme. There are three capacity components useful for improving participation and action. These are (adapted from Goethert & Hamdi, 1997):

- **Individual** (particular skills individual people in the community have)
- **Collective** (a community's capacity to organise, mobilize and support collective actions)
- **Institutional capacity** (the institutional framework having an influence on communities and their longer-term sustainable development)





✓ **Build partnerships - reach consensus**

Good partnerships and participatory programmes begin when actors come together to achieve a common goal based on agreed priorities. Of great importance is developing local champions at community and/or municipal level which can drive forward the process. Wherever possible, one should utilise participatory action planning methods to converge the interests of stakeholders and pool resources. It should be noted however, that partnerships are not always easy and it takes considerable effort and time to maintain them and to keep them going over time.

✓ **Aim for closed-loop solutions**

Waste should be considered as a resource and its re-use should be encouraged from the very start of any planning process; e.g. greywater re-use and production of biogas, liquid fertiliser or soil conditioner, urine separation or composting as well as other options that minimize the export of waste flows, are less energy intensive and entail lower capital and operation costs. Experience shows that the testing of pilot technologies can be the first step in convincing users about safety, advantages and convenience.

✓ **Be realistic about the complexity of sanitation interventions**

Unresponsive institutions and the technical challenge of providing affordable and manageable sanitation solutions for dense, informal habitats have been the main reasons for low coverage so far. To move forward, initiatives should go for the 'unbundling of interventions': breaking the plan into projects that can be implemented separately and incrementally. There is a trade-off to make between short term 'quick fix' solutions versus long term closed-loop infrastructure improvements.

✓ **Drivers of sanitation**

We should recognize that sanitation improvement has many drivers and sources of motivation - not only the existing sector institutions and their agendas, but also individual aspects such as customs/habits, context specific practices and status, those in need of potential products from sanitation systems, etc. To bring urban sanitation coverage to scale, new innovative tools must be adopted and applied in a context-specific way, for example social marketing, total sanitation campaigns and public-private partnerships.

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