

**34th WEDC International Conference, Addis Ababa, Ethiopia, 2009**

**WATER, SANITATION AND HYGIENE:  
SUSTAINABLE DEVELOPMENT AND MULTISECTORAL APPROACHES**

**Adaptation of existing participatory planning tools for the  
peri-urban and rural context in Africa**

*S. Jung, M. Wafler, J. McConville & E. Kvarnström, Austria*

**REFEREED PAPER 138**

---

*This paper describes a planning approach for sustainable sanitation, and is one of the outcomes of the EU-financed project NETSSAF. The proposed planning approach is geared towards improvement of decision-making in the planning process and in creating demand for sanitation through use of demonstration units and multi-criteria decision support approaches. It was felt that these issues were not emphasized sufficiently in existing planning tools. The paper describes the eight planning steps as well as the technical and non-technical requirements for the implementation of sustainable sanitation.*

---

**Background**

Historically, the sustainability of water and sanitation projects has not been satisfactory. Of the water supply and sanitation projects evaluated by the World Bank in 2001, only 50-66% was deemed to be satisfactory and less than half were rated likely to be sustainable (World Bank, 2003). Project assessments consistently report cultural constraints, behavioral change, prohibitive costs, lack of political and managerial support, or low community demand as reasons for low success rate of water and sanitation projects. This wide array of constraints needs to be overcome if sanitation is to be brought to scale in a sustainable manner.

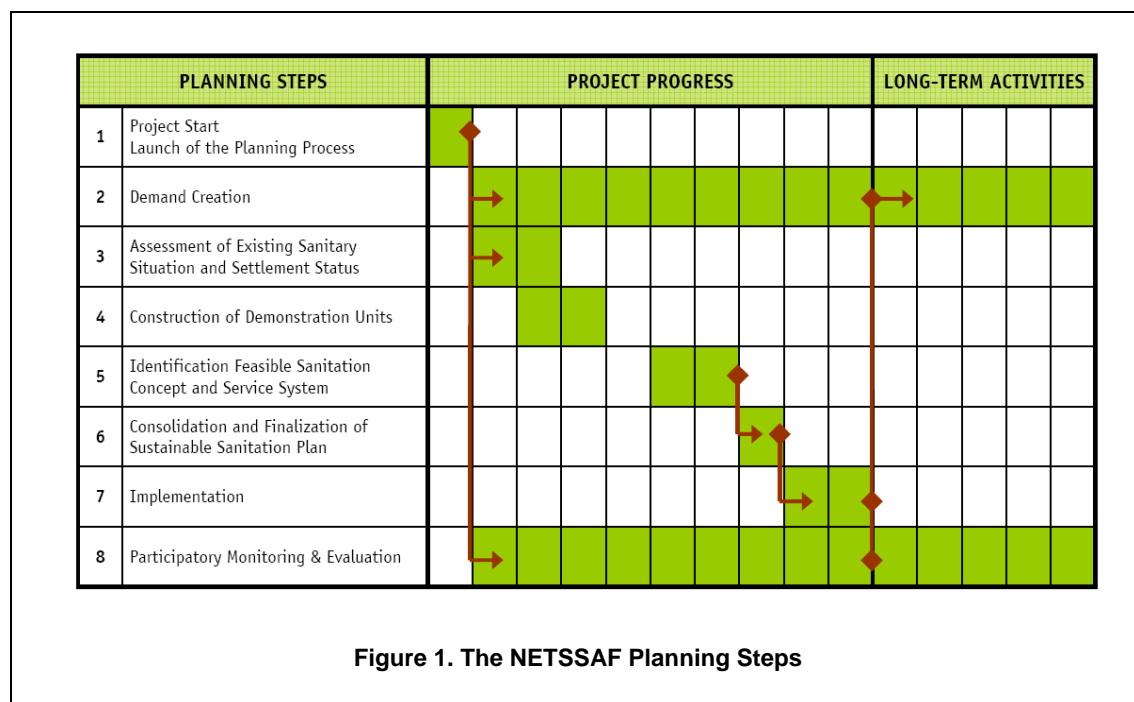
Overcoming these constraints starts with the planning phase. Participatory and holistic approaches to sanitation planning can increase the potential for a sustainable system through better management of the numerous risk-factors and capacity development within the local domains for successful operation and maintenance of the systems. In recognition of this a number of organizations have developed/are promoting planning frameworks for sanitation based on the assessment of user priorities at different levels of decision-making (Wood et al 1998; Kvarnström and af Petersens, 2004; Eawag, 2005; Kar 2005; IWA, 2006).

However, most sanitation planning tools are either geared towards urban environments (e.g. HCES, Sanitation 21) or more rural settings (e.g. CLTS, PHAST). However, in a peri-urban/small town context where sanitation systems are non-existent or of a decentralized character, it can be difficult to fully implement either the top-down urban planning approaches or the participatory methods adapted for rural settings. Urban-oriented planning tools, such as the HCES (EAWAG, 2005), Sanitation 21 (IWA, 2006) and the Municipal Guidelines for Wastewater Management (UNEP/WHO/HABITAT/WSSCC, 2004) all underline the necessity of stakeholder involvement in the planning process but are not as explicit in steps creating sanitation demand and stimulating the necessary behaviour change which is necessary when planning for sanitation in areas where open defecation is highly prevalent. On the other hand, participatory, rural development tools are designed to work in areas where centralized regulations for health and the environment are weak, which makes them more difficult to use in peri-urban areas affected by urban planning codes. Planning in the peri-urban area must adapt to sanitation and environmental regulations, space and cultural constraints which might not be completely compatible with community-driven methods, such as Community-Led Total Sanitation (CLTS).

The planning approach presented in this paper is trying to overcome these identified difficulties within existing planning approaches, and are an outcome of the EU-financed project NETSSAF which brought together European and West African partners to develop locally based roadmaps for sustainable sanitation ([www.netssaf.net](http://www.netssaf.net)).

## NETSSAF planning steps

The NETSSAF planning approach (Figure 1) is based on combining Household-Centred Environmental Sanitation (HCES), the sanitation awareness tools of PHAST/SARAR, and the methodology of the multi-criteria decision support systems (MCDSS). The NETSSAF planning approach highlights the necessity of sanitation demand creation as well as the use of demonstration units, once the preferences of the future users is identified. This tool has been adapted from existing frameworks in order to better fit the needs of peri-urban areas; however, it is still a theoretical concept and has not been tested in the field. Note also that this tool is laid out in linear steps for the ease of explanation, while in reality the process is highly iterative.



### STEP 1: Project start and launch of the planning process

This is the official project start and launch of activities related to the planning process. The main purpose of Step 1 is to bring together various key stakeholders and unite them under a common goal. The initiator of the project (preferably the local entity with the sanitation mandate, generally the local municipality) will open a dialogue and persuade key stakeholders, such as selected members of the community, of the need to plan and take action; at the same time involving end-users as their involvement will ensure the success of the participatory planning approach.

### Expected outcomes and products of Step 1

#### Outcomes

- Definition of the general problem and formulation of the overall goal of the project
- Definition of affected stakeholder groups and clarification of project area
- Consensus regarding the sanitation project, planning and implementation principles
- Consensus on stakeholder involvement, partnerships, roles and responsibilities
- Agreement on the planning approach, further tasks and activities with focus on Steps 2,3 and 8

#### Products

- Workshop
- Memorandum of understanding (MoU) representing an official consensus between the stakeholders
- Project document including
  - local problem definition, overall goal and main objectives
  - officially and generally accepted decisions about the planning area and its boundaries
  - concept on how to achieve behavioural change and increased demand for sanitation
  - work plan, financial plan and time schedule
  - communication strategy

### STEP 2: Creation of demand for sustainable sanitation

Demand for sanitation is created when end-users have motivation, opportunity and ability to purchase sanitation technologies, which suit their needs. The promotion of sanitation and hygiene is most effective if seen and designed from a holistic point of view. This implies creating and exchanging knowledge in three areas: (1) technology and hardware (e.g. different types of sanitation systems, operation and maintenance procedures, resource reuse opportunities); (2) social attitudes and software (e.g. hygiene education, behavioural change); and (3) an enabling environment. The joint promotion of all three areas of sanitation is needed to obtain the maximum health and socio-economic benefits.

Demand creation is placed as Step 2 in this framework since sensitization efforts are needed in the very beginning of the project, but in reality these activities are ongoing and highly linked to subsequent steps throughout the entire project. It is important to understand that the demand creation activities will look different over time. Activities in the first phases of the project will be more geared towards social attitudes and an enabling environment whereas latter stages of the project can be a focused on technology and hardware.

### Expected outcomes and products of Step 2

#### Outcomes

- Increased awareness of the linkages between sanitation, hygiene, personal health, fertilizing, crop production and living conditions
- Improved standard of knowledge of the social, ecological and economical advantages of sustainable sanitation systems in the local area
- Increased demand for sanitary infrastructure and services amongst the local population

#### Products

- Strategic plan of awareness raising/behavioural change/demand creation program
- Different awareness-raising/behavioural change/demand creation activities
- Establishment of learning alliances for sharing and spreading sanitation information
- Well-defined supply chain to meet increased demand for sanitation and reuse

### STEP 3: Assessment of existing sanitation situation and user priorities

The aim of Step 3 is not only to facilitate participatory decision-making in the planning process, but also to collect background information required for system design by identifying user needs and priorities related to water and sanitation, operation and maintenance, and other challenges of a day-to-day service delivery. This step is performed through a comprehensive, participatory assessment of the current level of services and user attitudes towards sanitation across the domains of the project area.

The information collected in this step feeds into the design of demonstration units (Step 4) and is a reference point for the selection of feasible sanitation systems through MCDSS (Step 5).

### Expected outcomes and products of Step 3

#### Outcomes

- Detailed information about the sanitation situation and the settlement status of the project area
- Knowledge about the population's priority concerns, perspectives on sanitation and expectations
- Preliminary list of terms of requirements for a sanitation system which will be used in designing demonstration units and in Step 5 for the MCDSS process.

#### Products

- Detailed and valuable information about the area's current sanitation systems, service providers, possible linkages to fertilization/crop production, technical and environmental constraints
- Detailed data about the technical, economic, health and environmental conditions in the project
- Documentation of the desired functions of the sanitation system and services, as identified by the users, authorities and service providers

### STEP 4: Construction of demonstration units:

To complement the awareness-raising and demand creation process and to overcome the possible lack of local references for large-scale sustainable sanitation projects, it is necessary to set up good-practice demonstration units. The goal of Step 4 is to enable stakeholders to make an informed choice on their sanitation system components, by building on their own experience with various sanitation schemes.

The benefits of constructing demonstration units/projects are amongst others:

- Demonstrate and showcase a wide range of socially and culturally acceptable, sustainable and hygienically safe sanitation and reuse schemes to potential future users and political decision-makers;
- Optimize the design of sanitation facilities according to user feedback;
- Identification of the users' desires and their real drivers for improved sanitation;
- Allow potential users to gain confidence and trust in the system being advocated;
- Demonstrate the reuse and application of recyclates (i.e. urine and finished compost/desiccated faeces) and treated water in agricultural and/or aqua-cultural production;
- Provide scientific background for the amendment to existing codes and regulations regarding effluent standards and/or reuse of treated waste products;

### Expected outcomes and products of Step 4

#### Outcomes

- Awareness of stakeholders of the variety of possible sanitation concepts and possibility to test/use some of the optimal system components
- Enable the user community to conduct an informed choice
- Gathering information for required design modifications related to local site specific conditions

#### Products

- Construction, operation and maintenance of various demonstration units
- Revised designs for the various sanitation schemes
- First set of updated user priorities concerning sanitation schemes in the project areas

### STEP 5: Identification of Feasible Sanitation Concepts and Service Systems

The overall objective of Step 5 is to reach a decision about the most suitable sanitation system(s), considering technical and non-technical issues of sanitation systems and technologies. The process leading towards that decision comprises the identification of sanitation alternatives and a MCDSS process, which results in the agreement on the option(s), considered most appropriate for the project area; a process that starts in the earlier steps and is finalized after the implementation of the demonstration units. .

First, planners and consultants of the stakeholder group gather information regarding the various sanitation system options, which can be presented and discussed in a workshop. A participatory decision-making process is then structured around a well-arranged comparison based on the desired functions/criteria,

as defined in step 3. The various stakeholders will get the opportunity to ask questions, discuss, propose modifications and give feedback to the options. Based on that, it should be envisaged to rank the various sanitation options, reflecting the decision-makers' priorities for each criteria (or group of criteria). This ranking process will identify one system option, or group of systems, which has to be considered most appropriate for the project area.

### Expected outcomes and products of Step 5

#### Outcomes

- Suitable service combinations are developed and evaluated based on the information gained in Steps 3-4
- Revised matrix of criteria and adjusted priorities that can be used in an MCDSS process
- Conduction of a participatory decision making process integrating all stakeholder groups and targeting an agreement on the most appropriate sanitation option
- Final decision on the sanitation system and service concepts

#### Products

- Description of sanitation options
- Tailor-made assessment criteria to evaluate the options given conditions
- Evaluation matrix of sanitation options by experts, based on earlier steps
- Community workshop to discuss pre-selected sanitation systems, based on results from earlier steps
- Community workshop to reach an agreement on chosen sanitation system(s)
- Document outlining the final decision of sanitation system and service concept

### STEP 6: Consolidation and finalization of implementation plans for sustainable sanitation

Having identified the feasible sanitation system(s), the stage is set to prepare a master action plan for implementing the systems. The master plan will take into consideration the financial, technical, institutional and human resources needed to achieve the interventions. Therefore, the objective of this step is to describe how to organise and deliver these four areas in an integrated way. It will also have to be integrated in the overall planning process of the municipality. The master plan should lay out clearly defined activities and specific calendars. It must be developed in close cooperation with the entity/body responsible for the sanitation implementation, with strong support from the stakeholders. In addition, the master plan should suggest a management system for directing the implementation process and procedure for monitoring and evaluation of the process.

### Expected outcomes and products of Step 6

#### Outcomes

- Planners and stakeholders have a clear understanding of the requirements for implementation;
- The technical capacities of members of the community are defined as well as the training needs;
- The roles of the different stakeholders during the implementation stage are defined;
- A financing model is developed;
- Technical, financial, human resources and institutional aspects are clearly defined

#### Products

- Technical design of the project including drawings and specifications;
- Workshop to identify the technical capability of the community;
- Institutional framework and financial approach;
- Master plan of the sanitation program including technical, financial, institutional and human resources issues, as well as elements related to operation and maintenance and sustainability of the project

## STEP 7: Implementation

The logical conclusion to adopting the aforementioned planning framework is to arrive at the point of implementation and service delivery. Step 7 is therefore designed to govern this process and the key conditions, which need to be observed during this stage of the project/programme.

### Expected outcomes and products of Step 7

#### Outcomes

- Sustainable sanitation becomes commonplace in national sanitation campaign planning;
- Small and medium enterprises (SME) are able to install, maintain and repair as well as commercialise recyclates (i.e. compost and urine) as natural fertilizer to the agricultural sector;
- New markets have been created promoting income and job generation;
- Local enterprises will provide required sanitary wares and sell them to SME for installation purposes;
- The construction sector has become more professionalized through new products in sanitation;

#### Products

- Films, posters, brochures, kits for workshops for information and awareness raising;
- Manual and modules for capacity development;
- Guideline for construction of sustainable sanitation systems;
- Alignment of support systems for O&M and M&E;
- Document on the standardization of the sanitation facilities including user's manuals;
- Guidelines/posters for the use of the sanitation facilities and re-use of sanitation by-products;
- Map of the locality with installed sanitation facilities;
- Monograph of the locality, including national politics and policies;
- Survey/questionnaire for assessing impact of the project implemented

## STEP 8: Participatory monitoring and evaluation

Participatory Monitoring and Evaluation (PM&E) is an established, well-tested participatory methodology that seeks to engage participants (citizens, communities, social groups, etc.) in M&E, and creates ownership over evaluation results and of development project interventions.

The use of PM&E can increase learning, skills and confidence in the local groups responsible for sanitation management, and encourage them to add local knowledge to the process. Activities related to PM&E should be carried out during the whole planning process and have to be continued after the implementation.

### Expected outcomes and products of Step 8

#### Outcomes

- Consensus building and creation of a sense of project ownership in the local community;
- Course correction of project objectives through consultation process and learning through doing;

#### Products

- PM&E indicator set;
- Periodic M&E reports on outcomes in relation to objectives

## Technical and non-technical requirements

In addition to the planning process, a number of technical and non-technical requirements for implementing sustainable sanitation were identified. These requirements are aspects to consider at each step in the process.

The technical requirement can be summarized as follows:

**Sourcing:** Identification of all types of sources of supply. This refers not only to sourcing of (building) materials (e.g. local, national or international suppliers of required sanitary wares), but also of human resources.

**Designing:** Assessment of “good practice” examples and adaptation of existing technologies to local needs and habits.

**Management and logistics:** Refers to the management and logistic aspects of collection, treatment and reuse/disposal concept processes, and also the collection and transport of flow-streams and/or sanitized end products.

**Installation:** The hardware of the sanitation system used for collection, treatment, distribution and reuse/disposal concepts.

**Operation & maintenance:** O&M aspects of the whole sanitation system, including collection, treatment and reuse/disposal concepts.

**Treatment:** Transformation (processing) and sanitation of flow streams.

**Logistics:** Logistical aspects of distribution and application of sanitized flow-stream(s) (applicable only if flow-streams are recovered for crop production or aqua cultural activities after sanitization).

**Monitoring & evaluation:** control of the functioning of the “whole” system (project) and its assessment for corrective actions.

The non-technical requirement can be summarized as follows:

**Stakeholder aspects:** Focus is on all involved stakeholder groups and their awareness, needs and priorities in terms of sanitation.

**Financial aspects:** Requirements referring to the financing of large-scale implementation of sustainable sanitation systems/projects.

**Economic aspects:** Focusing on the collection, treatment, distribution and application of all relevant flow streams, including reuse aspects for energy and food production.

**Environmental and health aspects:** Refer to environmental and health issues of the sustainable sanitation project.

**Legal & institutional aspects:** Aspects that help in establishing an enabling legal and institutional environment.

**Training, education & dissemination:** Requirements relating to training, educational and dissemination aspects of sustainable sanitation projects.

## Conclusions

The NETSSAF planning approach is an attempt to integrate the best existing theory on sanitation planning and practice, which highlights key features for achieving sustainable sanitation, especially in peri-urban areas. Participatory and holistic approaches to sanitation planning can increase the potential for a sustainable system through better management of the numerous risk-factors and capacity development within the local domains for successful O&M of the systems. When planning for sanitation in non-served peri-urban areas, with low sanitation demand, it is also necessary to employ awareness-raising, behavioural change and demand creation activities throughout the process. The introduction of previously unknown sanitation solutions will be facilitated if demonstration units are constructed as part of the planning process, followed by facilitated discussion of options using MCDSS tools. It is the hope of the NETSSAF network that future sanitation projects will pick up this tool, improve it, and benefit from its approach.

---

## Acknowledgements

The author/s would like to extend thanks to EU for financing of the project NETSSAF and to all partners in WP4 (ESCA, IEES, SEI, CREPA, TUT, BOATA, TTZ, TUHH, EAWAG, BioAzul, IWA, UAA, SLU, ULeeds, GTZ, Ville de Sya) of the NETSSAF project, which all contributed to the conception of the NETSSAF Planning Approach.

---

## References

- Eawag: Swiss Federal Institute of Aquatic Science and Technology. (2005). Household-Centred Environmental Sanitation: Implementing the Bellagio Principles in Urban Environmental Sanitation. Duebendorf, Switzerland: Eawag.
- International Water Association (IWA). (2006). *Sanitation 21: Simple Approaches to Complex Sanitation, a Draft Framework for Analysis*. London: International Water Association.
- Kar, Kamal. (2005). Practical Guide to Triggering Community-Led Total Sanitation (CLTS). Institute of Development Studies, University of Sussex, Brighton, UK.

- Kvarnström, Elisabeth and af Petersens, Ebba. (2004). Open Planning of Sanitation Systems, Report 2004-3. EcoSanRes Program, Stockholm Environment Institute: Stockholm, Sweden.
- UNEP/WHO/HABITAT/WSSCC. (2004). Guidelines on Municipal Wastewater Management. UNEP/GPA Coordination Office. The Hague, The Netherlands.
- Wood, S., Sawyer, R., Simpson-Herbert, M. (1998). PHAST step-by-step guide: a participatory approach for the control of diarrhoeal disease. Geneva, World Health Organization (unpublished documents WHO/EOS/98.3).
- World Bank (2003). *Efficient, Sustainable Service for All? An OED Review of the World Bank's Assistance to Water Supply and Sanitation*. Operations Evaluation Department, The World Bank, Report No. 26443.

---

### Note/s

A sanitation system that is sustainable protects and promotes human health, minimizes environmental degradation and depletion of the resource base, is technically and institutionally appropriate, socially acceptable and economically viable in the long term.

---

### Keywords

Participatory, Peri-urban, Planning, Sanitation, West Africa

---

### Contact details

Stefan Jung  
Neulerchenfelderstrasse 9/32,  
1160 Vienna, Austria  
Tel: +43-1-4053817  
Email: [Stefan.jung@ecosan.at](mailto:Stefan.jung@ecosan.at)  
www: [www.ecosan.at](http://www.ecosan.at)

Martin Wafler  
IEES and seecon gmbh c/o Architekten Wafler,  
Löwengasse 47, 1030 Vienna, Austria  
Tel: +43-1-9619450  
Fax: +43-1-7130605  
Email: [martin.wafler@seecon.ch](mailto:martin.wafler@seecon.ch)  
www: [www.iees.ch](http://www.iees.ch) or [www.seecon.ch](http://www.seecon.ch)

---