A Sanitation Journey

Principles, Approaches & Tools for Urban Sanitation

sustainable sanitation alliance

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Foreword

Sanitation and hygiene are the foundation of healthy cities. They are just as much prerequisites for economic development as they are necessary for the health of our societies. This is being made particularly clear to us by the COVID-19 pandemic. It is why Germany and Switzerland have been pushing the issue of safe and sustainable sanitation for all for many years.

Our shared goal is the achievement of the sixth Sustainable Development Goal (SDG #6) – Clean Water and Sanitation. Together, we are supporting the Sustainable Sanitation Alliance (SuSanA), which already defined what comprehensive sustainable sanitation for all means back in 2007. Since then, the network has grown to more than 14,000 members whose enthusiasm is especially crucial for advancing this cause. The Swiss Federal Institute of Aquatic Science and Technology (Eawag) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH are among the most active partners in the network and, within the framework of its "Cities" working group, have jointly produced the publication "A Sanitation Journey – Principles, Approaches and Tools for Urban Sanitation" presented here.

We therefore wish all our readers a thought-provoking read and interesting insights into the world of urban sanitation. And, at the same time, we hope that this publication will provide you with welcome orientation to help accelerate our joint efforts to reach our common goal of a world with sustainable sanitation and hygiene for all, adapted to all contexts and needs, and leaving no one behind.

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Acronyms

A	Approach
ADB	The Asian Development Bank
BMZ	Federal Ministry for Economic Cooperation and Development
BMGF	Bill and Melinda Gates Foundation
BORDA	Bremen Overseas Research and Development Association
CD	Capacity Development
CLTS	Community-Led Total Sanitation
CLUES	Community-Led Urban Environmental Sanitation
CMS	Concerted Municipal Strategies
CSDA	City Service Delivery Assessment
CSP	City Sanitation Planning
CWIS	Citywide Inclusive Sanitation
DEWATS	Decentralised Wastewater Treatment Systems
Eawag	Swiss Federal Institute of Aquatic Science and Technology
EcoSan	Ecological Sanitation
EcoSanRes	Ecological Sanitation Research Programme
EHP	Environmental Health Project
FSM	Faecal Sludge Management
GIZ	Gesellschaft für Internationale Zusammenarbeit
GTZ	Gesellschaft für Technische Zusammenarbeit
GWSP	Global Water Security and Sanitation Partnership
HCES	Household-Centred Environmental Sanitation
HRWS	Human Right to Water and Sanitation
IRC	International Water and Sanitation Centre
IWA	International Water Association
JMP	WHO/UNICEF Joint Monitoring Programme
LCC	Life-Cycle Costing
MDG	Millennium Development Goal
NGO	Non-Governmental Organisation
NIUA	National Institute of Urban Affairs (India)
NWSC	National Water and Sewage Corporation (Uganda)
OPSS	Open Planning of Sanitation Systems
PEA	Political Economy Analysis
PHAST	Participatory Hygiene and Sanitation Transformation
pS-EAU	Programme Solidarité Eau
RTTC	Reinvent the Toilet Challenge
Sandec	Department Sanitation, Water and Solid Waste for Development at Eawag
SanRes	Sanitation Research Programme
SARAR	Self-esteem, Associative strengths, Resourcefulness, Action-planning and Responsibility
SCBP	Sanitation Capacity Development Platform
SDC	Swiss Agency for Development and Cooperation
SDG	Sustainable Development Goal
SDM	Structured Decision Making
SFD	Shit Flow Diagram
Sida	The Swedish International Development Cooperation Agency
SOS	Sludges from On-Site Sanitation
SSA	Strategic Sanitation Approach
SSP	Sanitation Safety Planning
STP	Sewage Treatment Plant
SuSanA	Sustainable Sanitation Alliance
T	Tool
TAF	Technology Applicability Framework
TAG	Technical Advisory Group
TSP	Town Sanitation Planning
UCLTS	Urban Community-Led Total Sanitation
UDDTs	Urine-Diverting Dry Toilets
UN	The United Nations
UNDP	The United Nations Development Programme
VIP	Ventilated Improved Pit latrines
WASH	Water, Sanitation and Hygiene
WB	The World Bank
WHO	The World Health Organisation
WSP	The UNDP-WB Water and Sanitation Programme
WSSCC	Water Supply and Sanitation Collaborative Council
WSUP	Water and Sanitation for the Urban Poor

Extended summary

Although the number of urban dwellers in the Global South with access to improved sanitation increased significantly over the last three decades, progress has been outpaced by rapid urban growth. The number of people in urban areas lacking improved sanitation has steadily increased and today over 1.8 billion urban dwellers do not use safely managed services. Progress has not only been slow, but also uneven between different segments of the population. The focus of ministries, urban authorities and financing agencies has been mostly on incremental expansion of sewers, benefitting non-poor segments of the population, and in most places, utilities have failed to provide citywide services mainly because they have stayed within the sewer paradigm.

Since the 1960s, conventional sewerage was seen as the panacea for improving sanitation coverage for cities in industrialised, as well as low- and middle-income countries. However, the high investment and operation costs of this approach made it challenging to reach most of the urban population in the Global South. Therefore, John Kalbermatten and his colleagues at the World Bank conducted a research project into low-cost sanitation technologies in 1976–1978. This first initiative looked at viable investment alternatives for low-income areas and led to subsequent programmes, such as the UNDP – World Bank Low-cost Water Supply and Sanitation Project – Technical Advisory Group (TAG) (1978–1986), the World Bank's Water and Sanitation Programme (WSP, 1987–2017) and today's Global Water Security and Sanitation Partnership (GWSP). These World Bank (WB) managed programmes increasingly influenced the thinking and discourse in the sanitation sector and, at a later stage, the Bank's lending policy.

The TAG prepared the basis for strategic sanitation planning, implying that sanitation challenges needed to be addressed not only through a multi-technology approach, but also through a multi-disciplinary approach that included not only sanitary engineers, but also economists, social scientists and health specialists. Another important contribution was to move away from a top-down, technology-centred approach and engage with the community in an interactive planning process when selecting appropriate technologies.

The first systematic approach to citywide sanitation planning was the "Strategic Sanitation Approach (SSA)" described in 1989 and published in 1997 by the WB-UNDP WSP. This approach sought innovative solutions to Urban Sanitation coverage, including inter alia:

- unbundling sanitation services regarding different solutions for different parts of the city and regarding different management arrangements along the service chain, and
- better responding to demand by determining the willingness to pay for different solutions.

In 2000, a working group of the Water Supply and Sanitation Collaborative Council (WSSCC) conceived the "Household-Centred Environmental Sanitation (HCES)" as another approach to citywide sanitation planning, combining a bottom-up and top-down approach and introducing the concept of recycling and reuse. SSA and HCES were never adopted by external support agencies since SSA was considered too time and resource consuming and the implementation of HCES for citywide sanitation would require an enabling environment that does not exist in most places. Although SSA and HCES turned out to be rather theoretical, their underlying principles and concepts received wide attention and influenced the future discourse on Urban Sanitation, especially by introducing a systems approach, the participation of all stakeholders in the planning process, the unbundling of sanitation services and the concept of resource recovery.

The Bellagio Principles for Sustainable Sanitation, formulated in 2000, aimed at reconciling the importance of sanitation for public health with the ecological resource recovery paradigm and stated that "waste should be considered a resource, and that its management should be holistic and form part of integrated water resources, nutrient flow and waste management".

In 2007, the Sustainable Sanitation Alliance (SuSanA) was created and comprehensive sustainability criteria for sanitation were defined.

In the new Millennium, the importance of sanitation was increasingly and more widely recognised. To address the global sanitation crisis, the UN declared 2008 as the International Year of Sanitation and in 2010, the UN General Assembly adopted the declaration of the Human Right to Water and Sanitation (HRWS), acknowledging the importance of sanitation to the realisation of human rights. Probably the most important milestone in the international recognition of (urban) sanitation for human well-being and sustainable

development was the adoption of special targets on sanitation and wastewater management in 2015 by the UN member states as part of SDG #6.

The SDGs have led to a paradigm shift in how Urban Sanitation is managed.

Targets SDG #6.2 (safely managed sanitation and hygiene services) and SDG #6.3 (reducing the portion of untreated wastewater) put the focus on managing the entire sanitation service chain, encompassing containment, emptying, transport, treatment, and safe reuse or disposal. They also highlight the importance of inclusivity in terms of vulnerable groups (e.g. girls and women).

An important result of the wider recognition of the importance of alternative sanitation systems that are independent from sewers and can serve the entire population of a city, including areas with a high-degree of informality, high population density, and low income, was the decision by the Bill and Melinda Gates Foundation (BMGF) to initiate the Reinvent the Toilet Challenge in 2011 and to support initiatives related to Faecal Sludge Management (FSM). In the 2010s, more approaches to Urban Sanitation Planning, such as the City Sanitation Planning (CSP) and the Concerted Municipal Strategy (CMS), were developed and tested. In 2015, the concept of a Shit Flow Diagram (SFD) was first published. This turned out to be a powerful tool to visualise the current sanitation challenge in cities and to engage political leaders, decision makers and civil society in discussions about excreta and related investment and management priorities in their city because it makes visible the need for effective management of onsite sanitation. Recently, the Human Right to Water and Sanitation, Faecal Sludge Management (FSM) and recognition of the importance of cross-sector inter-linkages, as well as the focus given to the SDGs, prepared the ground for the development of Citywide Inclusive Sanitation (CWIS) and its corresponding principles. CWIS is based on lessons learned from past discourse in Urban Sanitation and aims at tackling the impasse many low- and middle-income country cities face in improving their Urban Sanitation services.

South Asia and Sub-Saharan Africa are regions where the lack of Urban Sanitation provision and the crisis of solid waste management has been most striking. Despite increased programme and policy advocacy and financing, improvements in Urban Sanitation remain limited. The main bottlenecks are governance and institutional muddle, with competing roles and responsibilities at state and municipal levels, financially starved municipalities, and the rapid succession of new approaches and frameworks. In South Asian cities, the priority focus has traditionally been on water provision and sanitation has been largely considered part of solid waste management. Nevertheless, several initiatives contributed in recent years to a more inclusive and sustainable Urban Sanitation agenda in this region. For instance, the Clean India Mission has prioritised sanitation in India, addressing the serious sanitation backlog and moving beyond achieving open-defecation free status by dealing with the management of the entire sanitation service chain at scale. In Sub-Saharan Africa, institutional arrangements for Urban Sanitation have historically been much more centralised compared to countries in Asia. However, in the past decade most countries have instituted several reforms in line with decentralisation and devolution policies. In addition, many approaches to Urban Sanitation have been piloted by donors and NGOs alike, but with limited success for scaling-up to a national level.

Looking ahead, there will be an increasing shift from sector-centred towards city-centred approaches.

Emerging approaches such as

- "Green Cities",
- "Water-wise Cities",
- "Resilient Cities",
- "Smart Cities" and
- "Water Sensitive Urban Design"

have high potential to consider inter-linkages and to advance Urban Sanitation in a more comprehensive manner. This will hopefully result in more integrated urban (sanitation) planning approaches that are capable of combining material and energy flow master planning. Communicative bottom-up planning will take into account the different environmental and socio-demographic conditions within each city, the different priorities of stakeholders at all levels, and match these with available technical and institutional solutions, minimising trade-offs among different SDGs.

Part A

1. Introduction

According to the latest estimates (2017), globally, over 600 million urban dwellers lack basic sanitation and 2.2 billion urban residents do not use safely managed sanitation services. By far, most of these people live in urban and peri-urban areas of the Global South. Global South refers to the UN classification "developing regions" including all regions of Latin America, Asia, Africa and Oceania (www.wssinfo.org). Inadequate sanitation not only negatively affects public health outcomes and degrades the natural environment, but also impedes economic growth and productivity. The international discourse on how to address the tremendous and complex challenges of Urban Sanitation in the Global South has evolved significantly over the last decades. Also, several approaches and tools for Urban Sanitation Planning have been developed and applied to different degrees.

What is this publication about?

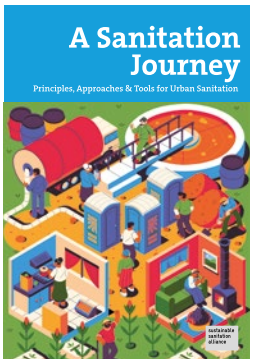
It gives a general overview of how the situation of Urban Sanitation in the Global South has developed over the past decades *(Part A, chapter 2)*. The focus is the evolution of Urban Sanitation discourse in the context of Development Cooperation *(Part A, chapter 3)*. It leads the reader on a sanitation journey from the 1960s to the present-day, delineates past and present thinking in Development Cooperation related to Urban Sanitation, and outlines how approaches and tools evolved and are built on each other. This discourse is complemented by perspectives on Urban Sanitation from the Global South *(Part A, chapter 4)*. These perspectives are from two regions where the lack of Urban Sanitation provision has been most striking – South Asia and Sub-Saharan Africa. It describes how the Urban Sanitation journey played out in South Asia and how important issues related to Urban Sanitation are perceived in Sub-Saharan Africa. The main reasons and challenges concerning the limited uptake of existing planning approaches and tools at the local level are also discussed.

Part A concludes with a reflection on current trends and emerging developments in an outlook on Urban Sanitation *(chapter 5)*.

Part B compiles factsheets of selected approaches and tools for Urban Sanitation. It provides a short description of each approach and tool, including their rationale and purpose, corresponding practical experience and lessons learnt.

What is this publication NOT about?

It is beyond the scope of this publication to give the full perspective from the Global South, as well as a complete analysis of the Urban Sanitation discourse in the context of Development Cooperation. Furthermore, the publication does not aim at a complete analysis of the main reasons and challenges for the (limited) uptake of existing planning approaches and tools. It focuses only on a selected number of approaches and tools; the selection is mainly based on the authors' experiences in and knowledge of the sector.



IN A NUTSHELL

This publication gives a general overview on how the situation of Urban Sanitation in the Global South developed over the last decades, focuses on past and present thinking in Development Cooperation as it relates to Urban Sanitation, reflects on the corresponding evolution from a South Asian and a Sub-Saharan perspective and provides an outlook on emerging developments. Its aim is to provide orientation for both sanitation professionals and people from outside the sector about where the sector stands now and where it should head to.

To facilitate reading, the definition of five key terms used in the publication is important:

1 A PRINCIPLE is defined as a fundamental proposition accepted by the international community and applying to all kind of tools. Thus, it is of overarching nature and provides basic guidance (e.g. environmental security, universal access, inclusive participation).

2 AN APPROACH is defined as a framework or methodology for Urban Sanitation that aims at putting principles into action (e.g. Household-Centred Environmental Sanitation, Sanitation 21, Open Planning of Sanitation Systems). These approaches emerged one after the other over a period of several decades, and it is assumed that the more recent approaches are based on the previous ones and the learning derived from their applications. No distinction is made whether it is a new approach or the refinement of an existing one.

3 A TOOL is defined as an instrument that supports the operationalisation of an approach. A tool can be applied in the context of one or more approaches (e.g. Life-Cycle Costing for WASH, Shit Flow Diagram). As these tools emerged following each other over a period of several decades, it is assumed that more recent tools are based on previous ones and the learning stemming from their applications.

4 THE TERM SANITATION SYSTEM is defined according to the Compendium of Sanitation Systems and Technologies (Tilley et al., 2014b): "A Sanitation System is a context-specific series of technologies and services for the management of these wastes (or resources), i.e., for their collection, containment, transport, transformation, utilisation or disposal."

5 THE TERM SUSTAINABLE SANITATION is used according to the definition of the Sustainable Sanitation Alliance (SuSanA, 2008): "In order to be sustainable a sanitation system has to be not only economically viable, socially acceptable, and technically and institutionally appropriate, it should also protect the environment and the natural resources. When improving an existing and/or designing a new sanitation system, sustainability criteria related to the following aspects should be considered:

- Health and hygiene
- Environmental and natural resources
- Technology and operations
- Financial and economic issues
- Socio-cultural and institutional aspects

The importance of principles for Urban Sanitation is evident in light of their evolution and corresponding approaches and tools. In the centre of this evolution stands the Bellagio Principles for Sustainable Sanitation, which were formulated in 2000 and officially endorsed during the 5th Global Forum of the Water Supply and Sanitation Collaborative Council (WSSCC) *(see Box 1)*. Despite the difficulty of their full operationalisation, they are still valid today. The principles put human dignity, quality of life and environmental security at household level at the centre of any sanitation approach and fostered the understanding that sanitation problems should be resolved at the lowest practical levels (household, neighbourhood, community, and city). Emphasis is given on involving all stakeholders, consumers and providers, in particular, at the start of any intervention and waste is considered as a resource. Implementation of these principles in practice, however, has been challenging as they require involving different disciplines and sectors. Besides the required trans-disciplinarity, optimising the use of resources also matters in order to provide the necessary environment which enables the development of strategic plans that can answer the questions: 'Where are we now?', 'Where do we want to be?' and 'How do we get there?'.

BOX 1

The Bellagio Principles for Sustainable Sanitation 2000

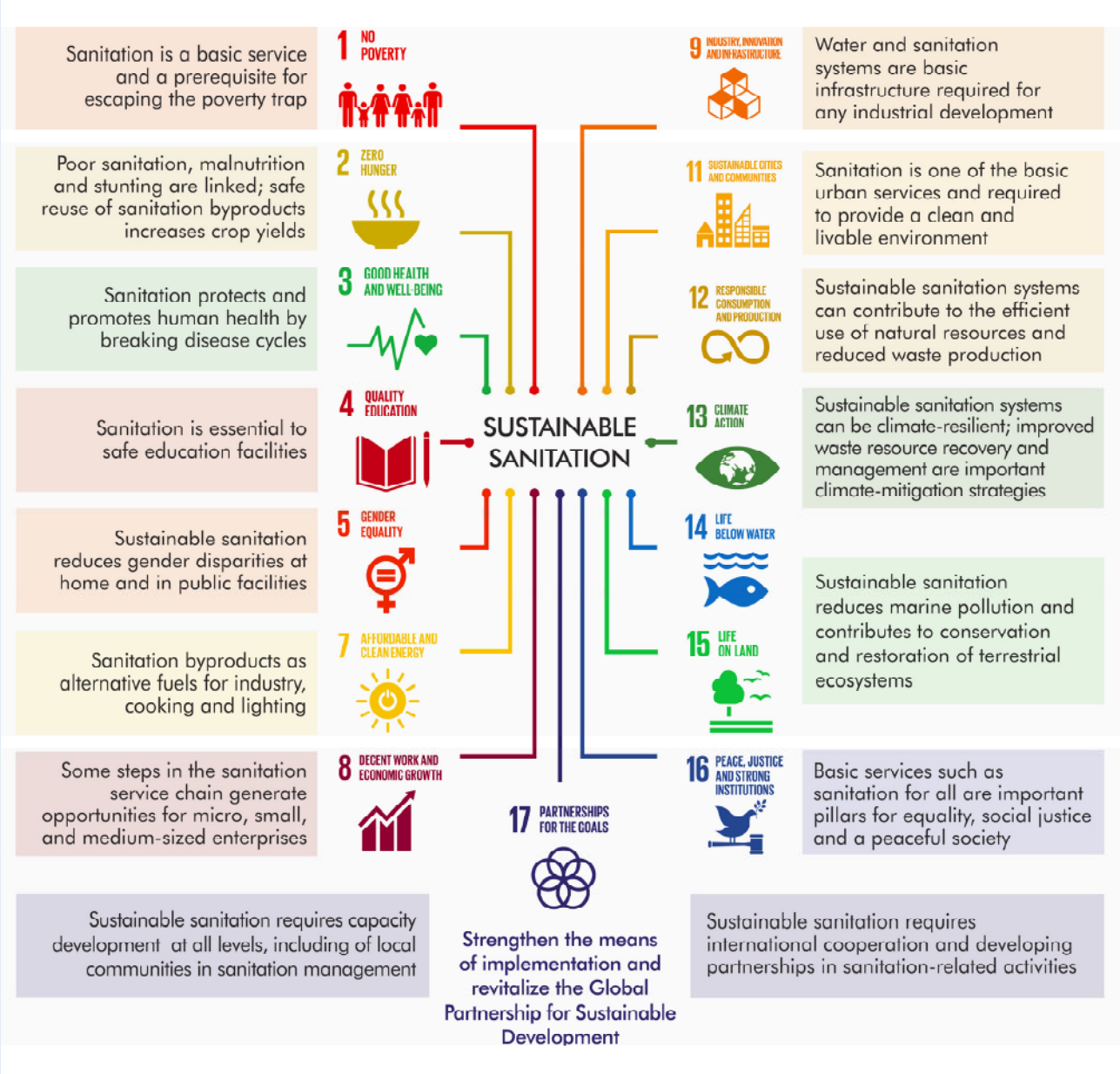
- **Human dignity, quality of life and environmental security at household level should be at the centre of the new approach, which should be responsive and accountable to needs and demands in the local and national setting.**
- **In line with good governance principles, decision making should involve participation of all stakeholders, especially the consumers and providers of services.**
- **Waste should be considered a resource, and its management should be holistic and form part of integrated water resources, nutrient flow and waste management.**
- **The domain in which environmental sanitation problems are resolved should be kept to the minimum practical size (household, community, town, district, catchment, city) and wastes diluted as little as possible.**

These principles were endorsed by the members of the WSSCC during its 5th Global Forum in November 2000 in Iguaçu, Brazil.

(Schertenleib, 2005)

FIGURE 1
The SDGs at a glance
https://sdgs.un.org/goals

FIGURE 2
The linkages of sustainable sanitation to the SDGs beyond SDG #6
SuSanA 2018 & SuSanA 2017



It was not until 2007, when the Sustainable Sanitation Alliance (SuSanA) was founded in light of the International Year of Sanitation of the United Nations (UN), that the Bellagio Principles were taken seriously. Today, these principles are fully recognised even beyond the sanitation community as they have been part of the discourse in the field since then and have been merged into the Sustainable Development Goals (SDGs), which were adopted by all UN members in 2015 *(see Figure 1, page 14)*.

The SDG #6 aims at ensuring access to water and sanitation for all by 2030. Explicitly, SDG #6.2 targets access to adequate and equitable sanitation and hygiene for all. SDG #6.3 highlights the need for improved water quality by reducing pollution and halving the proportion of untreated wastewater and emphasises the importance of recycling and reuse options. Supporting and strengthening the participation of local communities in improving water and sanitation management is emphasised by SDG #6B.

"The close links between sanitation and the many targets across all of the SDGs highlight the pivotal role that sanitation plays in the accomplishment of the SDGs" (SuSanA, 2018).

Improved sanitation in general, and the implementation of sustainable sanitation systems in particular, is of relevance beyond the specific targets of SDG #6, because they impact many of the other 16 SDGs and their targets. For example, the specific sustainable sanitation criteria related to the protection of the environment and natural resources is of obvious relevance to targets in SDGs #2, #6, #11, #14 and #15, while the positive results from implementing sustainable sanitation systems can have a broad impact on almost all the SDGs.

A summarised overview of the relevance and linkages of sustainable sanitation to the other SDGs can be seen in Figure 2 *(page 14)*. The many ways by which sustainable sanitation and wastewater management can help in meeting the SDGs are also shown in a publication by Andersson et al. (2016). The SDGs call for cross-sectoral cooperation and solutions and emphasise that the challenges of Urban Sanitation cannot be overcome by one sector alone.

BOX 2

The Manila Principles for Citywide Inclusive Sanitation 2019

- **Equitable, affordable and safe sanitation services**
- **Environmental and public health emphasising safe management of human waste considering the entire sanitation system**
- **Hybrid technologies implying the coexistence of sewered and non-sewered sanitation solutions,**
- **Comprehensive planning following an inclusive, holistic and synergetic approach**
- **Monitoring and accountability stressing appropriate governance**
- **Mix of business models stressing a variety of funding sources and financial mechanisms**

(Narayan and Lüthi, 2020)

Taking into consideration the call of the SDGs for cross-sectoral approaches, key sector players rallied around the introduction of a new Urban Sanitation approach called Citywide Inclusive Sanitation (CWIS), that brings together thinking which evolved in the sector (BMGF et al., 2016) and led to the formulation of the Manila Principles of Citywide Inclusive Sanitation (Gambrill et al., 2020; Narayan and Lüthi, 2019a; Schrecongost et al., 2020, *see Box 2*). The term 'inclusive' encompasses all city areas, including informal and peri-urban settlements, and also implies sewer and non-sewer technologies, the entire service chain, larger urban goals, and all stakeholders, i.e. all groups of society, without marginalisation based on gender, disability, or income level (Narayan and Lüthi, 2019b). CWIS does not aim at introducing a new set of principles, but rather takes up the lessons learned from the approaches defined in the past and framing them specifically to address the current sanitation challenges.

2. Development of Urban Sanitation in the Global South
A general overview

This chapter gives a general overview of how the situation of Urban Sanitation in the Global South developed over the last decades. In chapter 4, the perspectives are given from two regions where the lack of Urban Sanitation provision has been most striking – South Asia and Sub-Saharan Africa.

Sewerage as a standard model for Urban Sanitation

During the colonial period and for many years afterwards, engineers and planners considered conventional sewerage, which has been the technology of choice for Urban Sanitation in cities in Europe and the United States, as a standard model for cities in the Global South. However, since sewer systems were constructed only for privileged settlements, only very small segments of the urban population in the Global South were connected to them. Apart from this, a slightly higher number of people had access to mostly unimproved latrines, while a large proportion of the urban population lived in insanitary conditions without access to any kind of sanitation services, leading to poor public health conditions and environmental degradation, both undermining social and economic development (Greenberg, 2012; Van Zile Hyde, 1951).

Progress in sanitation outpaced by urban growth

The United Nations addressed the imminent crisis in water supply and sanitation services by declaring the 1980s the International Drinking Water Supply and Sanitation Decade in an effort to encourage its member states to improve these services. Despite the Decade having called for "service for all" by 1990, data collected by the World Health Organization (WHO) indicated that the progress was extremely limited (Kalbermatten and Middleton, 1990). Between 1980 and 1990, an estimated additional 314 million urban dwellers received "sanitation service". However, this did not keep pace with the rapid growth in urban population of 400 million people and, therefore, the "unserved" urban population in fact increased during the Decade from an estimated 290 to 380 million.

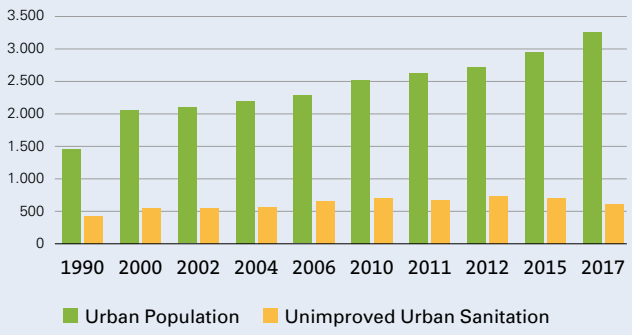
The Graph 1 shows how the urban population in the Global South grew since 1990 and what proportion of the urban population had access to "improved sanitation", according to the WHO/UNICEF Joint Monitoring Programme (JMP). JMP was established in 1990 to monitor progress in water supply and sanitation at national, regional and global levels. The terms "improved sanitation" and "unimproved sanitation" were coined by the JMP in 2002 to help monitor the progress towards Goal #7 of the Millennium Development Goals (MDGs) *(see Box 3, page 17)*. The eight MDGs where approved in 2000 by the UN General Assembly and signed by 189 heads of state *(www.un.org/millenniumgoals)*.

According to JMP data/estimates, from 1990 to 2015, the number of urban dwellers with access to improved sanitation increased by an estimated 1,270 million people. However, progress was once again outpaced by rapid urban growth and the number of people in urban areas without access to improved sanitation increased from 450 to 680 million. This trend reversed only in 2017. It should be noted that there is an ongoing discussion as to whether a shared facility can/should also be considered as "improved" sanitation; if this were the case, the JMP data for 2017 suggest that the number of urban dwellers without improved sanitation is "only" approximately 300 and not 680 million.

GRAPH 1

Urban Sanitation in the Global South (in Millions)

JMP; www.wssinfo.org



Improved vs. "adequate" sanitation

Furthermore, in 2003 UN-HABITAT challenged JMP's definition of "improved" sanitation, questioning if it is fully adequate from a health perspective (UN-HABITAT, 2003). While recognising that JMP had to choose a definition that allowed for easy data collection in order to facilitate international comparability, a definition of "adequate" sanitation was suggested by UN-HABITAT that included not only access to an improved sanitation facility, but also the provision for handwashing and the "safe removal and disposal of toilet waste". Using this definition, UN-HABITAT estimated that in the year 2000, 850–1,130 million urban dwellers in Africa, Asia and Latin America were without "adequate" provision to sanitation. Since 2015, JMP is using a similar indicator to monitor progress towards Sustainable Development Goal #6 (Indicator 6.2.1): "Proportion of population using a) safely managed sanitation services and b) a handwashing facility with soap and water".

Therefore, the latest JMP reports also report on "safely managed" services. Although no numbers are given on Central and Southern Asia, the latest JMP report indicates that in the year 2000, approximately 1.6 billion urban dwellers in the Global South did not use safely managed sanitation services and that the respective number for the year 2017 is 1.8 billion.

Sanitation development slow and uneven

Although the MDGs galvanised countries all over the world to improve their ratings and to undertake the monitoring of progress toward the provision of urban and rural sanitation, the MDG target to "halve the proportion of the population without sustainable access to drinking water and basic sanitation" did not foster/encourage planning for citywide sanitation that would reach all segments of the population. Consequently, an analysis of the progress between 2000 and 2017 has shown that Urban Sanitation development has not only been slow, but also uneven (UNICEF & WHO, 2019). In 36 low-income countries, Urban Sanitation coverage has been decreasing (8 countries), becoming more unequal (22 countries), or both (6 countries). An important reason for this is that utilities simply could not keep pace with rapid population growth, which mainly took place in informal poor areas of cities. In these areas, conventional sewer-based systems are often not viable because sewers have high upfront costs and require long planning horizons and significant amounts of water and energy requirements for operation.

The focus of ministries, urban authorities and development finance institutions remained mostly on incremental expansion of centralised sewers, benefitting non-poor segments of the population. Engineering universities course curricula also focused on centralised sewage systems. As a result, with only a few laudable exceptions:

> Utilities in the Global South have stayed within the sewer paradigm and failed to provide citywide services for the urban poor.

Commonly, the by-laws and acts of utilities may even explicitly stipulate that they are only to work with sewers; therefore, when they cannot provide conventional sewers in peri-urban areas and informal settlements, they often fail to consider these areas for sanitation services, even if they are within their official jurisdiction. Experience in the field has shown that to provide citywide services, a mix of different technologies and system configurations are necessary, and that the context of each urban area will determine which technologies and configurations are applied. It is essential that utilities adopt a technology neutral approach and that the responsibility for sanitation services fall under one administrative entity.

BOX 3

Improved sanitation
Use of:

- Flush or pour-flush to:
  - piped sewer system
  - septic tank
  - pit latrine
- Ventilated improved pit (VIP) latrine
- Pit latrine with slab
- Composting toilet

Unimproved sanitation
Use of:

- Flush or pour-flush to elsewhere
- Pit latrine without slab or open pit
- Bucket latrine
- Hanging toilet/latrine
- Shared or public facilities
- No facilities or bush or field

JMP; www.wssinfo.org

3. Evolution of Urban Sanitation discourse in the context of Development Cooperation

This chapter describes how the discourse on Urban Sanitation evolved from the 1960s till today in the context of Development Cooperation and presents the approaches and tools developed over this time. It leads the reader on a sanitation journey from the past to the present *(see Figure 3)* and outlines how approaches and tools evolved and complement each other. At the end of the chapter, an overview is provided on approaches and tools, summarising their salient features, main contributions or innovations, and their important challenges and limitations. Factsheets on these approaches and tools are provided in Part B.

1960s & early 70s: The post-colonial period

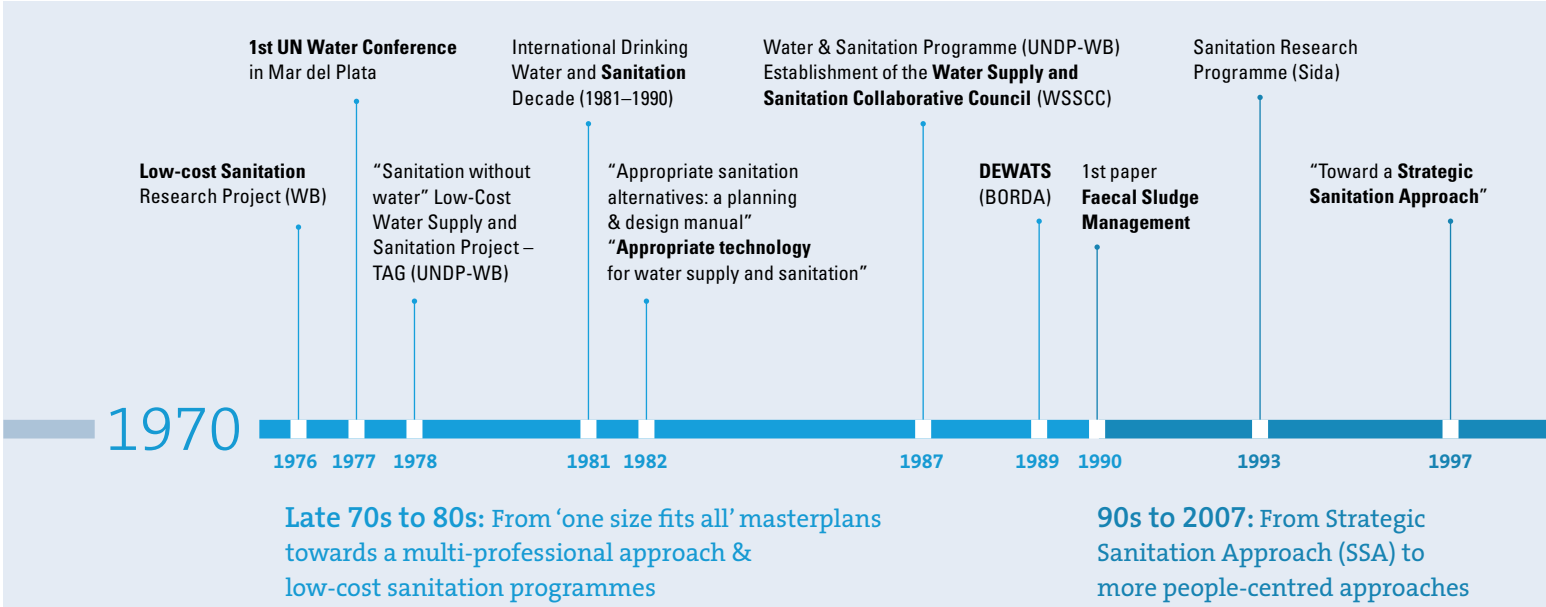
Conventional sewerage was the technology of choice for the disposal of human excreta in cities in Europe and the United States, and was considered by engineers and planners as a model for cities in less-developed countries. There was a clear dominance of technologies from the Global North being brought to the Global South. This was also due to colonial structures. Already during colonial times, sewer systems were constructed only for privileged settlement areas.

The focus of external agencies, especially bilateral corporations, was on water supply, first in urban and later in rural areas, as part of a general attempt to slow down rural-urban migration and to address areas with a poor population.

Little to no attention was given to sanitation.

In cities in low-income countries, only a few people were connected to sewer systems, a few had unimproved latrines and most people lived in very insanitary conditions without access to any kind of sanitation service (Greenberg, 2012; Van Zile Hyde, 1951).

FIGURE 3
Timeline on the evolution of Urban Sanitation



Late 70s to 80s:
From 'one size fits all' master plans for sewered systems towards a multi-professional approach and low-cost sanitation programmes

Sewer master plans for major cities in the Global South were developed by big conventional engineering firms in Europe and the United States and submitted for funding to the World Bank (WB) and other big funding agencies. At the time, John Kalbermatten was the Senior Water and Waste Advisor at the WB and he was convinced that the investment and operational costs of conventional sanitation solutions was making it difficult to reach most of the population in developing countries and that, therefore, lower-cost technologies had to be considered *(Figure 4)*. Likewise, Duncan Mara addressed the shortcomings of conventional treatments and the advantages of pond systems (Mara, 1976). To address these issues and in preparation of the first United Nations 'Water Conference' in 1977 in Mar del Plata, Kalbermatten launched in 1976 a two-year WB research project into low-cost technologies. Its conclusions (Kalbermatten et al., 1982 a, b) were that there were many viable alternative (on-site) solutions, offering equal service (from a public health perspective) at lower cost than traditional sewerage systems. He believed that the focus should rather be on achieving maximum health benefits, than on maximum convenience.

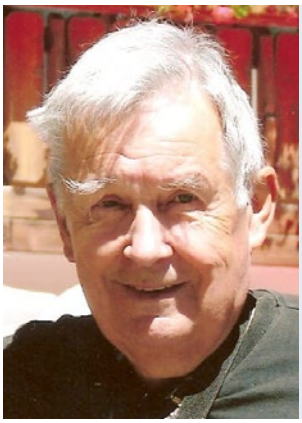


FIGURE 4
John Kalbermatten
Schertenleib (private picture)

Kalbermatten argued that there should be a multi-technology approach to Urban Sanitation Planning in order to provide a mixture of sanitation solutions that would be implemented according to the actual physical and socio-economic conditions and ensuring that everyone has proper service.

In 1978, Uno Winblad published the first edition of "Sanitation without water", which also contributed to the discussions around alternative approaches to water-based solutions (Winblad and Kilama, 1985). Meanwhile, at the 1977 UN Conference of Mar del Plata, the member countries of the UN declared the 1980s to be the International Water Supply and Sanitation Decade (1981–1990).

In preparation for this Decade, Kalbermatten set up the UNDP-World Bank Low-cost Water Supply and Sanitation Project – Technical Advisory Group (TAG), the precursor of the well-known World Bank Water and Sanitation Programme (WSP). The TAG prepared the basis for strategic sanitation planning.

2007 to the present: The UN' International Year of Sanitation & the foundation of SuSanA, advocating for a systemic approach & sustainability

Sanitation challenges need to be addressed not only through a multi-technology approach, but also through a multi-disciplinary approach.

This approach would include not only sanitary engineers, but also economists, behavioural scientists, and health specialists. Moreover, it should consider multiple criteria that go beyond technical, health and cost aspects and include socio-economic, socio-cultural, institutional and environmental aspects (*see Figures 5 and 6*). Such an approach would allow for flexible solutions and phase-wise incremental improvements.

Another important contribution was the emphasis to move away from a top-down, technology-centred approach and to engage with the community in an interactive planning process when selecting appropriate technologies. At that time, community participation was primarily seen as a generic rural development issue and was little known or acknowledged in the field of urban development. Kalbermatten fostered its acceptance in the Urban Sanitation context: the aim of community participation was to ensure that technologies are acceptable, materials are available, and that they can be operated and maintained locally with minimal external assistance.

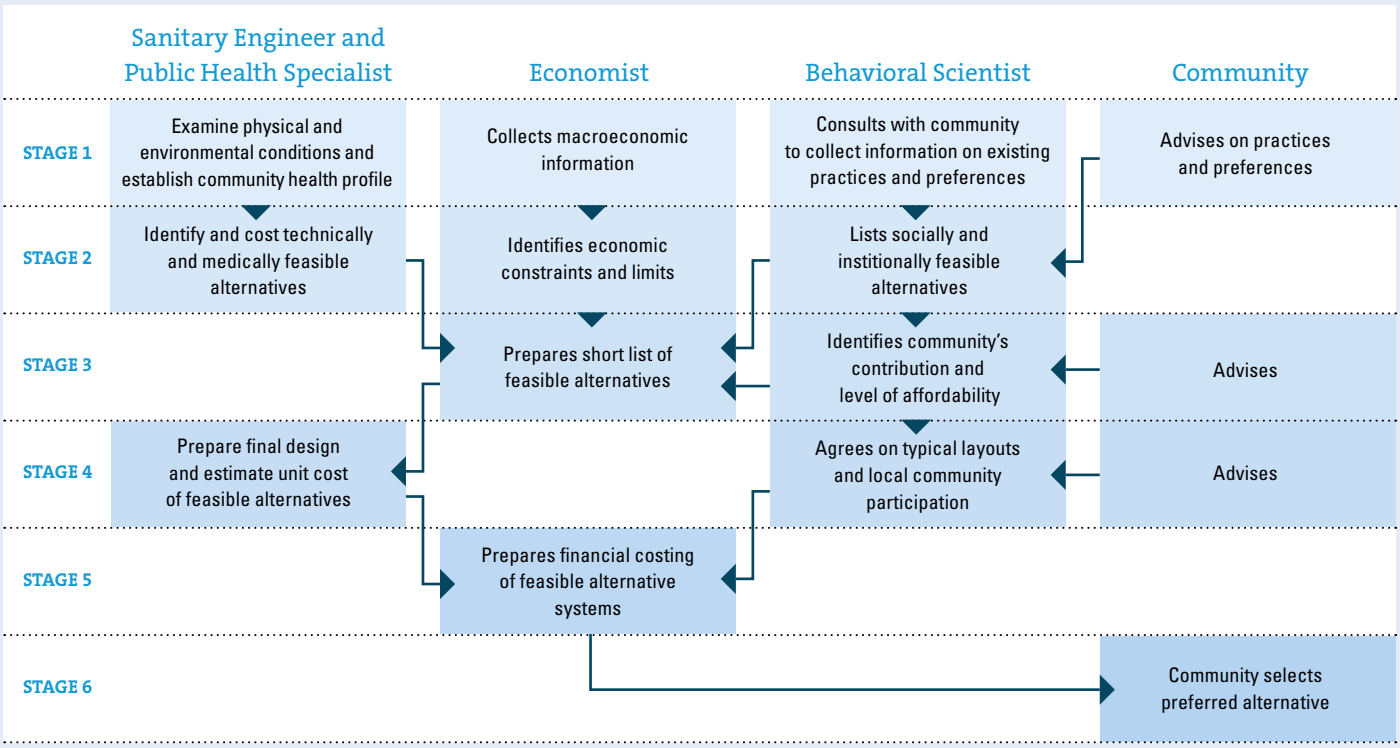


FIGURE 6

Consideration of socio-cultural aspects

The socio-cultural dimension of sanitation project design: contributions of the social sciences, Kalbermatten, 1982b

FIGURE 5

Consideration of multiple criteria and phase-wise incremental improvement

Recommended structure of feasibility studies for sanitation programme planning, Kalbermatten, 1982a

Initially, Kalbermatten's ideas reached only a few interested experts as it was very difficult to convince conventional engineers of non-conventional technologies/approaches. However, the tools **SARAR (Self-esteem, Associative strengths, Resourcefulness, Action Planning & Responsibility)** and **PHAST (Participatory Hygiene and Sanitation Transformation)** were developed in the 70s to empower communities to engage in participatory planning and take ownership of the decision-making process *(see Tool T1 in Part B,* e.g. Grupo SARAR, 2012). Originally designed for rural use, these methods have proven to be extremely flexible and could easily be adapted to urban settings, e.g. in Mexico, Bolivia and Colombia. They have been used in various countries in Asia, Africa and Latin America and are still in use today.

The conclusions of the research project and the resulting recommendations from the TAG were compiled in several WB publications, including "Appropriate sanitation alternatives: a planning and design manual" (Kalbermatten et al., 1982a), "Appropriate technology for water supply and sanitation; a summary of technical and economic options"; (Kalbermatten et al., 1982b) and "Meeting the Needs of the Poor for Water Supply and Waste Disposal" (Golladay, 1983). Kalbermatten structured the identification of appropriate technologies by considering a fixed set of the technical options available and used a decision tree as illustrated in a figure taken from the original document *(see Figure 7)*.

Under the guidance of Kalbermatten, the TAG brought together sector experts, such as Richard Middleton, Richard Feachem, Duncan Mara, Albert Wright and Mike McGarry, to implement low-cost sanitation programmes in low-income urban areas. Focus was given on the construction of Ventilated Improved Pit latrines (VIP) and pour flush toilets, and the TAG published technical papers and guidance notes on these technologies. Only a few of these programmes, however, made a significant impact upon the sanitation needs of cities as a whole. Furthermore, the proper management of the sludges from the low-cost sanitation options, i.e. emptying, treatment and safe disposal/reuse, was largely neglected. The issues related to Faecal Sludge Management (FSM) in cities of the Global South were not introduced or addressed until being taken up by Eawag-Sandec in 1990 as part of its research project "Sludges from On-Site Sanitation" (SOS).

In 1987, as the successor of TAG, the influential "UNDP-WB Water and Sanitation Programme" was formed with the support of UNDP and bilateral agencies, and managed by the World Bank (Black, 1998).

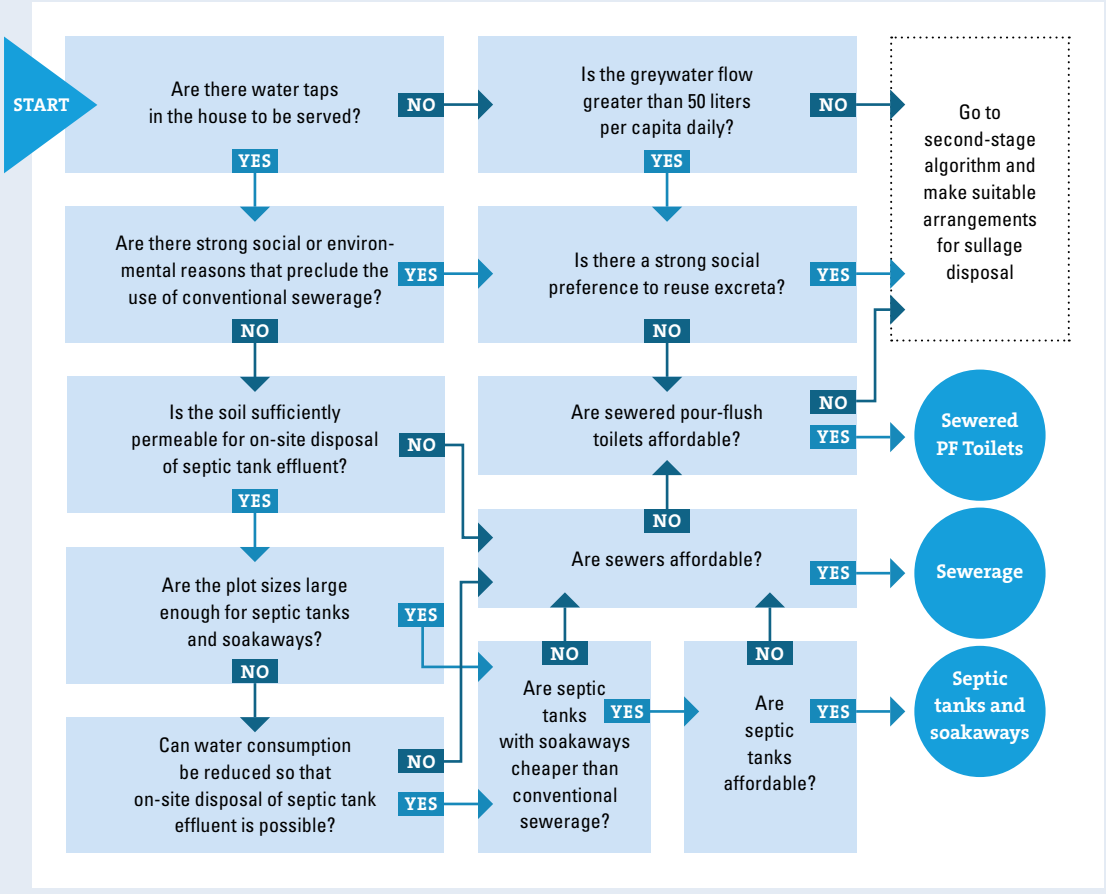


FIGURE 7
Identification of appropriate technologies
First stage algorithm for selection of technology, Kalbermatten, 1982a

90s to 2007:
From Strategic Sanitation Approach (SSA) to more people-centred approaches

Albert Wright's publication "Toward a Strategic Sanitation Approach", published in 1997, was originally elaborated as a working paper by the UNDP-WB WSP *(see Figure 8)*. The SSA *(see Approach A1 in Part B)* operationalised much of Kalbermatten's thinking by:

- paying attention to the preferences of users and providing users with the services that they want and for which they are willing to pay;
- unbundling sanitation services into separate parts (such as household services and trunk services) and providing these components in the sequence that the users prefer; and
- involving the creative use of both non-formal institutions and formal institutions in co-producing services (Wright, 1997).

The focus on user preferences was based on the understanding that sanitation planning needs to recognise local values and preferences in order to provide solutions acceptable to the users and which they are willing to pay for (Keeney, 1992; Lüthi, 2012).

SSA was applied only in a few cities, including Kumasi in Ghana, Ouagadougou in Burkina Faso and Bharatpur in India. One of the main challenges in implementing the SSA was the significant technical and financial support required, due to the multi-sectoral complexity and scope. Moreover, the emphasis on willingness to pay was not successful, because people were not sufficiently informed about the pros and cons of the different available technologies.

The SSA was critically revisited and reviewed in the publication "Urban Sanitation: A Guide to Strategic Sanitation Planning" by Kevin Tayler, Jonathan Parkinson and Jeremy Colin, published in 2003 *(see Figure 9)*. It entailed a description of the strengths and weaknesses of the 'planning model', 'market model' and the ground-driven 'local collective action model'. The SSA framework was very time and resource consuming; therefore, it was never adopted by multi-lateral agencies. Another criticism of it was the viewpoint that sustainable sanitation would have never worked in the Global North if it had solely relied on a market-based approach. Historically, Urban Sanitation as a public good always included subsidies, especially related to the building of sanitation infrastructure.

To provide an alternative technical solution supporting SSA, Bremen Overseas Research and Development Association (BORDA e.V.) started in 1989 to foster **Decentralised Wastewater Treatment Systems (DEWATS)**. DEWATS are small-scale systems used to manage the wastewater from a small community or from service areas. The aim was to provide affordable alternatives to centralised systems in order to reduce the water, electricity and operation and maintenance requirements. These alternatives could be managed at the community level and reduce environmental contamination, while producing reusable by-products for agriculture and energy. DEWATS systems are based on a well-researched combination of technologies, which allowed for the approach to be standardised and disseminated all over the world (Sasse, 1998).

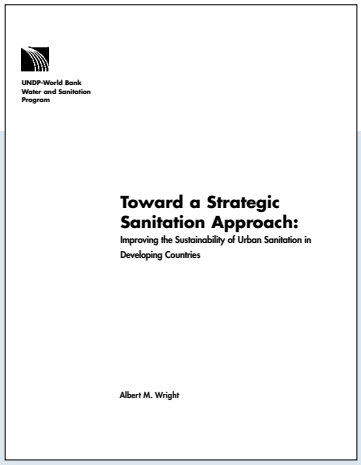


FIGURE 8
"Toward a Strategic Sanitation Approach"
Wright, 1997

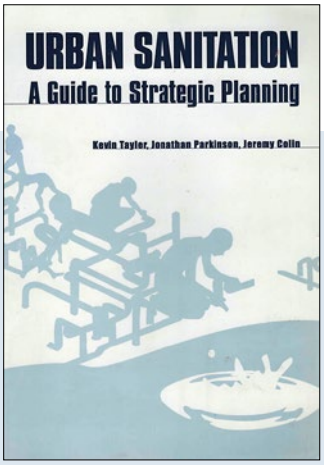


FIGURE 9
"Urban Sanitation: A Guide to Strategic Planning"
Tayler et al., 2003

The alternative concept of unbundling the centralised system into smaller units that are more flexible for different management approaches and to respond to future socio-demographic and environmental changes is gaining recognition and importance, also in industrialised countries. Many researchers see these more modular sanitation systems as one required element to achieve SDG #6 at a global scale (e.g. Hoffmann et al., 2020).

In 1999, the **Household-Centred Environmental Sanitation (HCES)** approach *(see Approach A2 in Part B)* was conceived by the Environmental Sanitation Working Group of the WSSCC. In the following year, it was synthesised by a representative group of experts into the Bellagio Principles for Environmental Sanitation *(see Box 1 on page 13)*. In 2005, the HCES approach was published as guidelines for implementing the Bellagio Principles in Urban Environmental Sanitation Planning (Schertenleib, 2005; Eawag/WSSCC, 2005). It fosters the understanding that:

- households should be at the core of the planning process,
- a combination of bottom-up and top-down approach is necessary;
- it follows a model of "city-zones" with circular systems within the zones; and
- focuses on the enabling environment *(see Figures 10 and 11)*.

Similar to the Bellagio Principles, the HCES approach was officially endorsed during the 5th Global Forum of the WSSCC at Foz do Iguaçu.

However, the HCES approach was never tested in its integrity for citywide sanitation planning since no appropriate pilot site could be found with the required enabling environment. In fact, many of the theoretically well-planned participatory approaches were rarely put into practice, as illustrated in the publication "Unpacking sanitation planning. Comparing theory and practice" by Jennifer R. McConville (McConville, 2010). However, the HCES approach was piloted and evaluated for area-based planning, focusing solely on community involvement within one area (community), without considering all 'zones' in a systematic manner. These pilot and evaluation projects took place between 2006 and 2010 in Africa, Asia and Latin America, in seven different urban and peri-urban settings. The experiences and lessons learned from these pilot projects were compiled in the publication "People's choice first" (Lüthi et al., 2009) and used to develop a revised and simplified set of guidelines for area-based sanitation planning. These guidelines were published in 2011 as **"Community-Led Urban Environmental Sanitation" (CLUES)** (Lüthi et al., 2011a).

The principle of considering waste as a resource and of closing material cycles at the lowest possible level was implemented in the **Ecological Sanitation (EcoSan)** approach, which was fostered by various programmes funded by the Swedish International Development Cooperation Agency (Sida) and the German Ministry for Economic Cooperation and Development (BMZ). The Swedish SanRes (Sanitation Research) and EcoSanRes (Ecological Sanitation Research) Programmes reflected the long-lasting

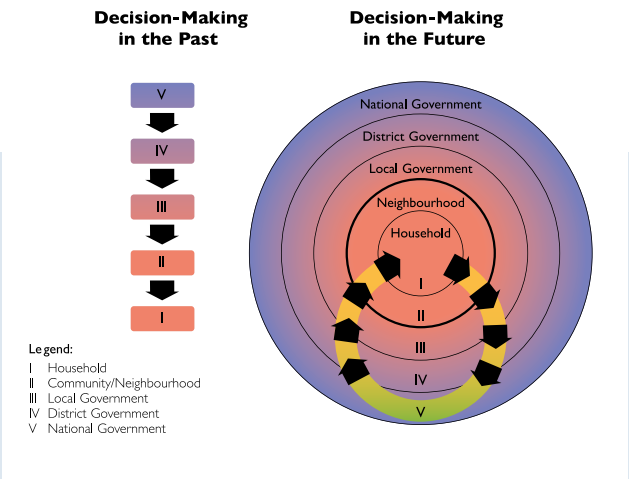


FIGURE 10
HCES – household at the centre of planning
Eawag/WSSCC, 2005

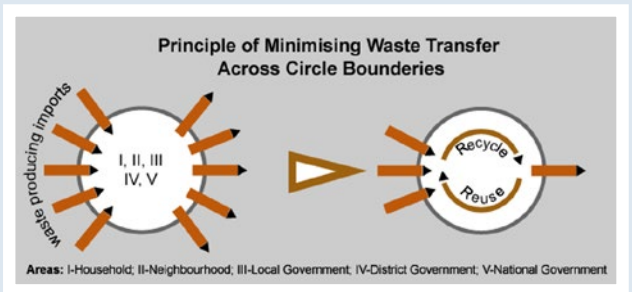


FIGURE 11
HCES – circular system
Eawag/WSSCC, 2005

research that was already conducted in Sweden in the 90s (i.e. looking at centralised collection and reuse of urine and its fertilising capacity), and evolved from the ideas of Winblad in the early 90s, recognising human excreta as a resource. Between 1997 and 2001, the Swedish EcoSan approach led to the discussions driven by Winblad, promoting urine-separation technology (e.g. Urine-Diverting Dry Toilets, UDDTs) as the option to recover nutrients from human faeces and urine. The EcoSanRes Programme was initiated by the Stockholm Environment Institute in 2001. It started to pilot the approach together with accompanying local capacity development at various locations in Asia, Africa and Latin America. These pilots mostly implemented the technology with the intention of reusing the "product" onsite (e.g. as soil conditioner, fertiliser or biogas). At the same time, an EU funded urban pilot project in Ouagadougou explored the possibility of a centralised collection, treatment, and reselling system.

An independent discussion platform with roughly 500 members, the EcoSanRes Discussion Group, was initiated at that time. It allowed for peer exchange among practitioners around the world interested in the approach and built the foundation for today's highly visited and influential open discussion forum of the Sustainable Sanitation Alliance *(forum.susana.org)*.

The EcoSan approach of the German Gesellschaft für Technische Zusammenarbeit (GTZ) was developed in the early 2000s. It emphasised that EcoSan is not synonymous with a certain technology (such as UDDTs), but puts forward an approach for planning, preparing and implementing EcoSan projects that is community-oriented and HCES-based (Werner et.al., 2003). Nowadays, the "old" EcoSan approach is discussed under the term "Productive Sanitation Systems" (e.g. Rosemarin et al., 2008), which avoids the narrow perception of limited technologies and the strict avoidance of sewered systems, but includes a range of reuse-oriented systems and technologies.

Based on recommendations from the Bonn Water Conference in 2001, at the UN World Summit on Sustainable Development in 2002 in Johannesburg, a sanitation target was added to that of drinking water in Target 7c of the Millennium Development Goals (MDGs): "Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation". This significantly increased the importance given to sanitation in the international development agenda. However, although the MDG sanitation target was not very ambitious, focusing only on 'access to basic sanitation' and neglecting the safe management of the entire sanitation system, it was still far from being achieved by 2015.

An ambitious and more comprehensive sanitation target is included in the SDGs, which succeeded the MDGs in 2015.

Since national sanitation policies are critical to creating an enabling environment for increased access to (urban) sanitation services, the Environmental Health Project (EHP) published in 2002 the Guidelines for the Assessment of National Sanitation Policies (Elledge et al.,2002). These guidelines provided a practical tool to assess the effectiveness of sanitation policies in order to improve and expand sanitation services, especially for the underserved. The assessment looks at the adequacy of national sanitation policies, focusing on four core questions:

1. What are the national sanitation policies?
2. How adequate are these policies?
3. How are these policies translated into programmes?
4. How effective are these programmes in improving services?

2007 to the present: The UN' International Year of Sanitation and the founding of SuSanA, advocating for a systemic approach and sustainability

The UN declared 2008 as the International Year of Sanitation. A small group of experts shared the concern that the International Year of Sanitation might be technology-centred and that there could be a lack of coordination with regard to the planned activities of various organisations active in the sanitation sector. Thus, this group of experts founded the Sustainable Sanitation Alliance (SuSanA) in 2007, aiming at furthering the efforts made towards sustainable Urban Sanitation in the 80s and 90s.

In 2008, SuSanA laid out its vision, in which five criteria for sustainable sanitation were defined (SuSanA, 2008):

1. health and hygiene,
2. environment and natural resources,
3. technology and operation,
4. financial and economic issues, and
5. social and institutional aspects.

These five criteria, which were largely based on the sustainability criteria developed earlier in the Swedish research context (Kvarnström et al., 2004), allowed for conducting a multi-criteria analysis in sanitation planning (Bracken et al., 2005). Such analysis is used in the **Open Planning of Sanitation Systems (OPSS)** approach (Kvarnström & Petersens, 2004) *(see Figure 12)*.

In line with an increasing awareness that building latrines alone does not improve public health conditions, and could even be a cause of environmental deterioration, SuSanA has firmly advocated a systemic approach that takes into consideration all sustainability criteria. At the same time, SuSanA acknowledges that complete sustainability is meant to be an orientation for action rather than a stage to be fully reached. SuSanA's systems approach to sanitation recognises that toilet infrastructure alone, without improving the management of sanitation services downstream, would not solve the problem (Tilley et al., 2014a). Through its publication "Sustainable Sanitation in Cities", the SuSanA Working Group on Cities highlighted the need for sanitation systems to be integrated parts of the urban environment. Furthermore, it called for the integrated planning and design of urban infrastructure in which sustainable sanitation systems contribute to the overall sustainability of cities (Lüthi et al., 2011b). At the same time, E. Kvarnström et al. (2011) suggested the concept of a functional sanitation ladder, based on the sustainability criteria and the functions of a system, as an alternative to the largely technology-based sanitation ladder used by the WHO/UNICEF Joint Monitoring Programme for benchmarking and comparing service levels across countries.

The declaration of the **Human Right to Water and Sanitation (HRWS)** by the UN General Assembly on 28 July 2010 was a remarkable moment for the sanitation sector, acknowledging the importance of sanitation with regard to human well-being and the realisation of human rights *(see Figure 13)*. Although ten years after the HRWS has shown that context matters and that no clear-cut solution exists, HRWS

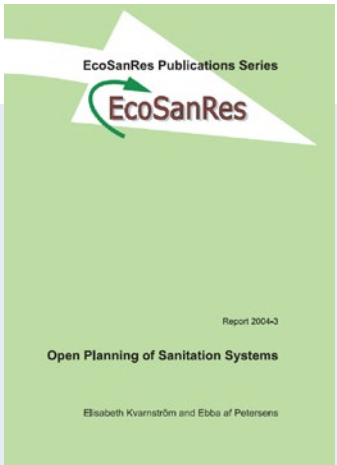


FIGURE 12
"Open Planning of Sanitation Systems"
Kvarnström & Petersens, 2004

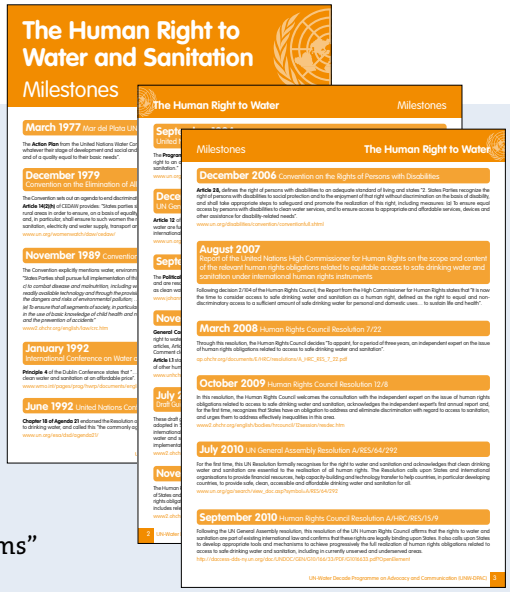


FIGURE 13
"Human Right to Water and Sanitation HRWS – Resolution 64/292"
www.un.org/waterforlifedecade/pdf human_right_to_water_and_ sanitation_milestones.pdf

does provide a framework for compliance and guidance for countries, practitioners and civil society to improve and expand Water, Sanitation and Hygiene (WASH) services and decrease inequalities in its access. Thus, a progressive understanding of HRWS is promoted nowadays that also furthers the importance of recognising specific national and local contexts. Hereby, the appropriateness of WASH services, reducing gaps in access to WASH services, maximising the availability of resources and fulfilling minimum core obligations are stressed (UN Human Rights Council, 2020).

City Sanitation Planning (CSP) emerged from strategic planning processes for citywide sanitation sector development in India and Indonesia (e.g. WSP, 2010; Walther, 2016; Govt. of India, 2008) *(see Approach A3 in Part B)*. It is a widely used approach for urban sanitation planning, with CSPs being made for several cities across India, Nepal, Tanzania, and Indonesia. Although the overarching aims of a CSP are common across the board, there are considerable differences in the steps taken and the aspects to be considered in each of these countries and even in each of the cases where it is implemented. Overall, CSP follows a holistic, citywide planning and decision-making approach, aiming at designing and implementing locally appropriate sanitation systems, including solid waste. Such a holistic process includes the technical and non-technical aspects related to sanitation, and considers wastewater, stormwater, water supply and solid waste management as an integral part of sanitation. It is not a completely novel approach as it builds on the lessons learned from previous approaches.

The **Concerted Municipal Strategy (CMS)** (LeJallé et al., 2012) is very similar to the CSP approach, but focuses mainly on francophone regions. The CMS programme was implemented by the Programme Solidarité Eau (pS-EAU) between 2007 and 2010, fostering the inclusion of local actors in the formulation of municipal strategies *(see Approach A4 in Part B)*.

In 2011, Eawag published the **Community-Led Urban Environmental Sanitation (CLUES)** guidelines based on the experiences and lessons learned from pilot projects implementing the HCES approach for area-based sanitation planning *(see Approach A5 in Part B)*. These guidelines make the HCES approach more actionable (e.g. reducing the 10 steps to 7 steps). They also focus on the community and not on the household level (Lüthi et al., 2011a). Prominence was given to the importance of the enabling environment *(see Figure 14)*. Furthermore, a set of tools was provided to operationalise each planning step. Up to now, many reports indicate a comparatively broader uptake of this approach when compared to past ones. Several agencies and Non-Governmental Organisations (NGOs) have implemented the CSP and CLUES approaches or adapted them to their context, i.e. WaterAid, GIZ, the Asian Development Bank (ADB), Helvetas, and Water and Sanitation for the Urban Poor (WSUP).

The importance of the enabling environment also triggered the development cooperation community to promote approaches, such as the "Scaling-up concept" developed by GIZ and "The Whole System Approach" developed by IRC (Galli et al., 2014). These approaches focus on capacity development and a long-time horizon to make sure that appropriate strategies to reaching the last mile are embedded in national institutions. The scaling-up approach is applied by GIZ worldwide and draws upon GIZ's experience in about 25 different countries. The concept highlights that scaling-up works best if embedded in national water sector reform and if implemented through national structures. It needs to be accompanied by a pro-poor sector policy.

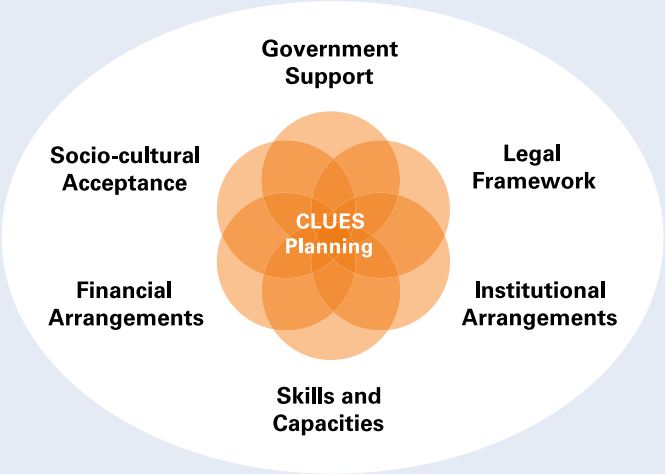


FIGURE 14
CLUES – the six dimensions of the enabling environment
Lüthi et al., 2011a

The challenge most Urban Sanitation approaches and frameworks face is the effective representation and voice of the highly non homogenous urban community (with a disparity in economic and social status) in matters pertaining to urban water, sanitation and solid waste management. This is a political and governance challenge that cannot be addressed by administrative tinkering (of existing or new institutions and utilities).

In 2011, the Bill and Melinda Gates Foundation (BMGF) initiated the **Reinvent the Toilet Challenge (RTTC)**. This initiative aimed to generate and support new toilet technologies as alternatives to sewer systems to serve people lacking sanitation. Emphasis was given on an innovative design of the toilets based on the following:

- functioning self-contained,
- consuming zero-energy,
- running independent from conventional (sewer) infrastructure, and
- being cost-wise affordable.

The innovations are, thus, not only designed to be more appropriate for developing urban areas, but also meant to enhance the sustainability and climate resilience of Urban Sanitation due to:

- reduced water demand,
- higher adaptability to demographic and environmental changes, and
- improved recovery of resource (e.g. nutrients and energy).

The RTTC has influenced the sanitation sector, resulting in a global agreement that corresponding technologies need to be put into practice. However, to date, no next generation "re-invented" technologies, resulting from the pure technological focus of the RTTC, have achieved industrial scale, nor has any technology been proven through successful operations at scale.

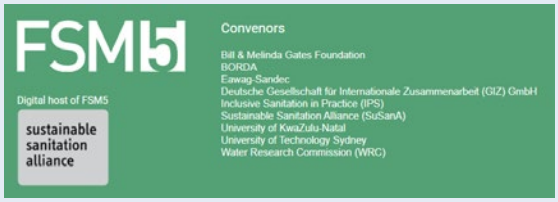


FIGURE 15
FSM5 – 5th International FSM Conference
www.susana.org, 2019

To support the diffusion of technology innovations into practice, the **Technology Applicability Framework (TAF)** was developed by the Rural Water Supply Network and a range of actors, among them GIZ. TAF is a decision support tool that is meant to be applied to the analysis of sanitation system elements. It helps to evaluate how the applicability, scalability and sustainability of a specific WASH technology can provide lasting services in a specific context, as well as the readiness for its introduction *(see Tool T2 in Part B,* e.g. Olschewski, A., Casey, V., 2015).

As a contribution to long-term sustainable service provision, the BMGF also invested in the development of a range of tools to support the implementation of **Life-Cycle Costing for WASH (LCC)** implemented by IRC. LCC *(see Tool T3 in Part B,* e.g. Fonseca, C. et al., 2011) provides the framework and guidance for the comparison of costs at district level in order to contribute to long-term sustainable service provision. The approach was tested in Burkina Faso, Ghana, Mozambique, Andhra Pradesh (India), and Bangladesh, as well as in refugee camps and emergency settlements, and is still being further developed.

Another important contribution of the RTTC is the further acknowledgment and recognition of the importance of **Faecal Sludge Management (FSM).**

FSM and the logistics behind it are crucial for an Urban Sanitation system that is not based on sewers.

The increased interest in FSM triggered many research and application projects, as well as the organisation of a steadily growing bi-annual international conference *(see Figure 15)*. This has resulted in the development of safe and affordable technical solutions to treat the products from on-site sanitation (preferably by transforming them into marketable fertiliser or fuel products, e.g. compost or pellets). Moreover, the critical role of on-site and non-sewered sanitation to reach the growing urban population was also emphasised. This meant that onsite systems, often the only solutions in low-income, high-density urban areas, were no longer seen as a "temporary" stop-gap solution for the poor, but as an option to achieve sustainable sanitation in the longer term, contributing to a more holistic view on sanitation systems. Structuring the whole sanitation system along 'containment – emptying – conveyance/transport – treatment – reuse/disposal' allowed for the visualisation of how the sanitation sector in a certain city or project location works, and of what works and what does not. Subsequently, various assessment

tools, such as the **Shit Flow Diagrams (SFDs)** and the **Citywide Service Delivery Assessment (CSDA)** *(see Tools T4 and T5 in Part B)*, have used the whole sanitation system logic to describe the management of excreta and wastewater in cities, to identify corresponding options for improvement, and to consider these options in urban planning, and, thus, as part of the enabling environment for citywide service delivery. In this regard, FSM potentially contributed to the fostering of the citywide inclusive sanitation approach (Peal et al. 2014a and 2014b).

"Sanitation 21" published in 2014 *(see Figure 16 and Approach A7 in Part B)* explicitly addresses the challenge of a citywide approach for sanitation (Parkinson et al., 2014). Unlike other guidelines that were more process-centred, Sanitation 21 highlights that there is no uniform, standardised planning procedure, ensuring sustainable planning outcomes at city level. The publication addresses such key areas for sanitation as stakeholder engagement, institutional partnerships, the sanitation systems, enabling environment and incremental improvement. Although very much promoted by the IWA, outreach of the publication was limited due to its abstract nature.

In 2015, the World Health Organisation (WHO) published new guidelines for **Sanitation Safety Planning (SSP)** (WHO, 2015). They provide guidance on applying a step-by-step risk-based approach that assists in the implementation of health risk assessments at local level and support the management of the entire sanitation system *(see Tool T6 in Part B)*. Starting from the aim that all sanitation systems should protect human health, the planning process focuses on the identification of hazardous events and risks exposure, as well as the assessment and prioritisation of control measures. Putting a focus on human health, however, SSP considers environmental pollutions only to a limited extent. The SaniPath Rapid Assessment Tool developed by the Center for Global Safe Water at Emory University is a related example, which aims to assess exposure to faecal contamination in low-income urban settings. Applying this exposure assessment tool, however, requires substantial expertise and good lab facilities (Raj et al., 2020; Robb et al., 2017).

During the 2010s, in particular, in the second half of the decade, Urban Sanitation programmes have gained in prominence. Many development agencies and research institutes have started to give higher importance to the urban environment and respective work domains (e.g. WaterAid, WSP and WSUP). In addition, the HRWS, FSM and cross-sector interlinkages, resulting from the SDGs (i.e. SDG #6 and SDG #11), built the ground for the development of the concept of **Citywide Inclusive Sanitation (CWIS)** and its corresponding principles.

CWIS is based on the understanding that previous attempts at solving the Urban Sanitation challenge through the existing approaches have not been fully successful, and that new approaches are needed to reach the goal of 100% safely managed sanitation for all as stated in the SDG #6. CWIS is not a radically new approach, rather it brings various strands of thought on Urban Sanitation under one umbrella. The concrete definition of CWIS is still in progress as it continues to evolve.

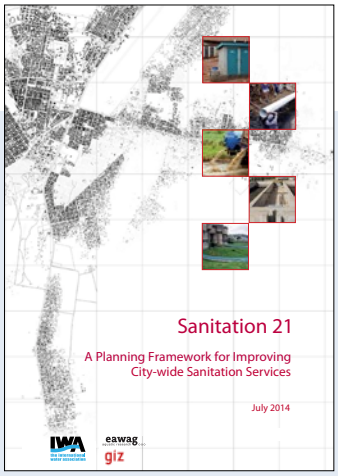


FIGURE 16
"Sanitation 21"
Parkinson et al., 2014

However, there is a broad agreement on the following framing: "CWIS is an approach to Urban Sanitation, where all members of the city have equitable access to adequate and affordable improved sanitation services through appropriate systems (sewered and non-sewered) of all scales, without any contamination to the environment along the entire sanitation value chain." (Narayan and Lüthi, 2020).

The first document mentioning CWIS is the "CWIS Call to Action" published in 2016 (BMGF et al., 2016) that puts together four fundamental pillars (World Bank, 2016) *(see Figure 17)*. Since then, the CWIS approach has received great traction in both research and practice. A recent special issue on CWIS has been put together and several peer-reviewed articles on the topic have been published in the open source online journal Frontiers in Environmental Science (Lüthi, Hoffmann and Willets, 2020).

FIGURE 17
CWIS – inter-locking pillars
World Bank, 2016

Overview: Approaches & Tools

The following table provides an overview of the approaches and tools highlighted in this chapter. This section summarises the salient features of each approach and tool, including its main contributions or innovations, as well as most important challenges and limitations.

APPROACHES SALIENT FEATURES	Main innovations and contributions	Main limitations and challenges
A1 SSA Strategic Sanitation Approach	· Multi-professional and multi-criteria (not only technical). · Considers user preferences and provides appropriate technologies. · Unbundles services and allows for incremental improvements. · Combines non-formal and formal institutions (co-creation).	· Significant technical and financial support is required and an "enabling environment" needs to be in place or be created. · Defines relevant principles for planning, but not guidance on their implementation. · Despite the effort of introducing alternatives to conventional sewer-based sanitation, little attention was drawn to the management of non-sewered sanitation.
A2 HCES Household-Centred Environmental Sanitation (HCES)	· Combination of bottom-up and top-down strategies. · Prioritisation of circular systems within different city-zones, considering waste as a resource. · Focus on the enabling environment. · Planning framework that also considers solid waste management and drainage.	· Managing the interfaces between area-based to citywide planning requires an (political, legal and institutional) enabling environment. · Requires close collaboration and coordination between multiple agencies that often have overlapping jurisdictions and little commitment towards working together.
A3 CSP City Sanitation Planning	· Comprehensive planning framework that also considers water supply, solid waste management and drainage. · Encourages stakeholder participation in decision-making.	· Needs leadership, stakeholder commitment and adequate support from the city government for human and financial resources. · Despite many CSPs being developed in South Asia, many have scarcely been used for making decisions related to sanitation investment, due to lack of ownership by the city governments.
A4 CMS Concerted Municipal Strategies	· Inclusion of local actors. · Focus on the francophone regions.	· Development of the strategy is a process that needs to be locally led and promoted. · Should be used by urban planning departments and integrated in city budgets to allow for a holistic approach to city and sanitation planning.
A5 CLUES Community-Led Urban Environmental Sanitation	· Empowering communities. · Further fostering enabling environment. · Provides concrete guidelines and a choice of tools to help in the operationalisation of the approach.	· Requires that the community or neighbourhood is well organised to achieve participation. · More time consuming than expert-led planning approaches. · Requires skilled facilitation and expert support. · Requires strong project leadership to ensure that joint decisions are followed by action. · Managing the interface between the area-based and citywide planning remains a challenge.
A6 San21 Sanitation 21	· Pulls together the key elements of citywide sanitation planning seen across the range of other planning tools/frameworks. · Mentions specifically the importance of institutional partnerships.	· Conceptual framework rather than a detailed technical guide for Urban Sanitation Planning. · Requires institutional backing and support to be taken up locally.
A7 OPSS Open Planning of Sanitation Systems	· The process makes decision-making transparent and helps to make trade-offs regarding stakeholder-defined objectives visible to support discussion and informed choices.	· Process-oriented tool with extensive stakeholder involvement, which entails higher front-end costs. · Only covers technology selection and not detailed planning.

Part B of this publication provides a detailed description of the approaches and tools, including their rationale and purpose, practical experience and lessons learnt. This compilation allows the reader to learn key information at a glance, and to compare it while selecting the tools. Despite this conceptual evolution, most approaches and tools have been predominantly supply-led with their proponents providing the financial and technical support necessary for their use in implementation. The uptake of the presented approaches and tools has been less than satisfactory, with the notable exception of the CSP and SFD *(see also section 3 in chapter 4)*.

TOOLS SALIENT FEATURES	Main innovations and contributions	Main limitations and challenges
T1 SARAR/PHAST Self-esteem, Associative strengths, Resourcefulness, Action-planning and Responsibility / Participatory Hygiene and Sanitation Transformation	· Widely used compilation of specific methods and exercises to empower communities to engage in participatory planning and take ownership of the process.	· Requires expert skills and (external) human and financial resources for facilitation. · Requires time and full engagement of participants. · More feasible in smaller projects and challenging for urban centres.
T2 TAF Technology Applicibility Framework	· Systematic evaluation of technology appropriateness, considering the perspectives from users, regulators, and producers and all sustainability dimensions.	· Strong facilitation is required. · The TAF is limited to assessing technologies or to selecting among several technologies in the same setting.
T3 LCC WASH Life-Cycle Costing	· Quantification of life-cycle costs of WASH services to support the comparison of costs at district level as a contribution to long-term sustainable service provision.	· Cost data is often considered as sensitive information, resulting in the reluctance of some information holders to release data. · There is a discrepancy between obtaining a statistically sound sample and keeping data collection feasible. · A generic approach that needs to be adapted to local conditions.
T4 SFDs Shit Flow Diagrams	· Fosters a more holistic approach to the entire sanitation system. · Highlights the opportunities and challenges related to the current sanitation situation at the scale of an entire city, thereby providing a great advocacy tool.	· Requires that data is available or can be collected. · Interpretation of poor data is often subjective and leads to approximate results at best.
T5 CSDA Citywide Service Delivery Assessment	· Complementary to SFD to assess the enabling environment and why the situation is as it is.	· Requires skilled facilitation of the process. · Scoring system needs to be well understood by all stakeholders. · Most suitable where decision makers are motivated to prioritise actions and where no more specifically relevant local tools exist.
T6 SSP Sanitation Safety Planning	· Links risk assessment at local level, considering the entire sanitation cycle with citywide hygiene conditions.	· Applicable to safely manage and improve existing sanitation systems, but not for planning new systems. · Requirement for cross-sectoral cooperation of multiple actors in often siloed institutions and agencies (health, agriculture, environment, urban planning, etc.). · Has to complement existing control measures and requires site-specific and reliable data from many stakeholders.

4. Evolution from a Global South perspective

This chapter first describes how the Urban Sanitation journey played out in South Asia and then gives an African perspective on important issues related to Urban Sanitation. South Asia and Sub-Saharan Africa are regions where the lack of Urban Sanitation provision has been most striking. Although there are distinct differences in how Urban Sanitation developed in different regions, such as Latin America, South-East Asia and Northern Africa, the general tendencies and issues involved have been quite similar. It is beyond the scope of this publication to give the full perspective from the Global South.

In the third section, the main reasons/ challenges are listed for the limited uptake of existing planning approaches and tools at the local level *(see Part B)*.

4.1 A South Asian perspective

4.2 An African perspective

4.3 Challenges to the uptake of existing planning approaches and tools at the local level

4.1 A South Asian perspective

The urbanisation trend in South Asia, from the mid twentieth century onwards, witnessed a lag in making Urban Sanitation a priority owing perhaps to the newly independent countries priorities of food security, infrastructure and industrial development. This is reflected in the relatively low investment in infrastructure, weak institutional systems and lack of treatment and safe disposal of waste and wastewater. Most South Asian countries have fared poorly in terms of prioritising Urban Sanitation as an inclusive and sustainable service. India, Pakistan, Bangladesh and Nepal have witnessed different levels of urbanisation and of sanitation infrastructure development. Sri Lanka, however, stands out for its higher rate of urbanisation, as well as better indicators of social development and relatively better Urban Sanitation outcomes.

Emerging from British colonial rule as independent states in 1947, India, Pakistan, and later Bangladesh, share a common history of colonial urban infrastructure and institutional legacy. Nepal, with its relatively slower process of urbanisation, has experienced more donor funded programmes and project-based approaches to urban water and sanitation. In these countries, it is observed that institutional systems of Urban Sanitation are legacies of colonial priorities of the mid twentieth century and that the following was in place:

- The colonial administrative system was geared for managing provinces, forests, and natural resources, and not for urban or rural development. Urban governance systems (city administrators) of the few cities of that time, remained under the administrators of states/provinces. This remains so even today in most cases.
- The emergence of three types of settlements took place within a city:
  1. the old city (unplanned old settlement often with inadequate land title records),
  2. a new city called the civil lines that was planned as an administrative hub of colonial rule, and
  3. cantonment areas for housing the military.

  Not all cities had cantonments and civil lines. These settlements were provisioned with dry latrines, and central sewerage systems were only installed in a few instances.
- Urban Sanitation relied on dry toilets and caste-based manual cleaning of toilets and sewerage lines.

As urbanisation gathered pace from the mid-1970s onward, rural migration to cities led to the expansion of urban settlements. Land development authorities were set up in several towns of India to acquire land from peri-urban areas for housing and industrial/commercial use. City master plans and regional plans in India tried to provide for spatial land use and development planning. However, the pace of urbanisation outstripped planned development, leading to unplanned habitations and slum settlements cropping up within and at the outskirts of cities across South Asia. This pattern of urban expansion continues till now in most South Asian cities, resulting in the city authorities and water-sanitation utilities merely trying to catch up with this expansion.

Centralised sewerage systems are unable to expand to cater to the needs of growing mega cities or even mid-size and smaller cities, owing to financial constraints.

Karachi, Delhi, Mumbai and Dhaka are such mega cities. For instance, Dhaka has only 20% sewerage coverage for a population of close to 20 million. Karachi does not have a single functional sewerage treatment plant. Although nine cities of Bangladesh have Water and Sanitation Associations (WASAs) for water and sanitation provision, they only focus within their formal municipal limits. The regular operations and maintenance of sewage treatment plants and solid waste management plants remain the biggest challenge to India. While the absence of any type of sanitation infrastructure remains a challenge to Pakistan, Nepal and Bangladesh.

Evolution of institutional arrangements for Urban Sanitation

The provision of drinking water and some form of basic sanitation services in South Asian countries has been considered the role of government agencies. Public Health in a broad sense covered aspects of water supply and sanitation in the mid twentieth century when Ministries of Urban Development were not yet in place. It became the mandate of the Health Ministry in India after independence. A Central Public Health and Environment Engineering Organisation (CPHEEO) that defined standards and technologies for sewerage and water supply in India, operated under the Health Ministry until the mid-1970s. The Department of Public Health Engineering (DPHE) performs a similar function in Bangladesh.

The priority focus of South Asian cities has traditionally been water provision. The priority in environmental sanitation has been mainly on solid waste management to ensure that streets are cleaned daily. As stated before, dry toilets and the caste-based manual cleaning of human faeces was a common practice in South Asian cities and has only recently been curtailed through activism and judicial recourse. Drainage has been a priority for Nepali and Bangladeshi cities where high rainfall and waterlogging is an issue and remains one of the first Urban Sanitation priorities that people demand to be taken care of. Solid waste management (mostly removal of solid waste), street sweeping, and cleaning and drainage of waterlogged areas are all visible Urban Sanitation problems to which municipalities have devoted maximum efforts since the beginning. Dealing with faecal waste management through on-site or off-site sanitation systems has always been a secondary priority because it is not a visible problem, nor does it disrupt daily life.

The separation of Utilities/Boards/WASAs from the Municipalities started in the late 1960s under the influence of bilateral and donor supported urban water and sanitation projects. A trifurcation of institutional roles and responsibilities can be observed at that time and is still the case today:

- Municipal authorities traditionally took up the responsibilities of solid waste management, cleaning of streets and storm water drainage.
- Utilities/Associations/Boards. Water supply, sewerage systems and sewage treatment plants came under Water and Sanitation Boards/Utilities in India or Associations in Pakistan and Bangladesh, called Water and Sanitation Agencies (WASAs).
- The Department of Public Health Engineering (DPHE) in Bangladesh was entrusted with setting up faecal sludge treatment plants as they operate in smaller towns and outside the municipal city limits. In India, some states authorised their state para technical institutions to handle the construction of water and sanitation infrastructure in all the towns.

The division of roles and responsibilities often led and still leads to institutional conflicts due to unclear mandates and overlapping jurisdiction. At the city level, for instance, solid waste and street dust are commonly dumped into storm water drains. Each of these wastes are, however, under the responsibility of a different agency, making their removal a challenge. The separation of roles also impacts overall city sanitation planning and coordination between agencies (Narayan et al., 2020). At the state or province level, the municipality might have no say in the selection of technology or the construction of a waste-water treatment facility, but has to manage it once it is handed over and becomes operational.

Weak financial health of most cities

Urban local bodies in most South Asian cities depend on central and provincial/state level financial tax devolutions. In India, this dependence varies from 20% to 80% of the annual budgets of most urban local bodies (town authorities). As a result, financially starved urban local bodies are unable to even operate and maintain sewage treatment plants or solid waste management plants.

Access to Urban Sanitation services: impact of Millennium Development Goals

While the International Decade on Water and Sanitation (1980–90) did not have much impact on promoting Urban Sanitation in South Asia, the Millennium Development Goals initiative did galvanise countries all over the world and in South Asia to improve their ratings and undertake the monitoring of progress towards the establishment of urban and rural sanitation.

Initiatives contributing to an inclusive and sustainable Urban Sanitation agenda

Funding for centralised sanitation systems has increased significantly in South Asia from the 1980s, mostly through loans provided by the World Bank, the Asian Development Bank and bilateral agencies, including the Japanese International Cooperation Agency.

Several initiatives have been contributing to the promotion and development of an inclusive and sustainable sanitation agenda:

Slum upgrading

Slum upgrading and relocation has been a priority in India. This included the provision of basic water and sanitation services, often community toilets and public taps. International development agencies have supported several projects in India on urban poverty and slum improvement, including basic services of water and sanitation.

Water and Sanitation Programme South Asia

The World Bank increased the focus on urban and rural sanitation in South Asia through its advocacy initiatives.

National Plans and Programmes for Sanitation

Bangladesh embarked on a National Water Supply and Sanitation Policy (1998). GIZ supported the implementation of the first Urban Sanitation Policy for India (1998) that introduced the concept of City Sanitation Planning *(see A3, Part B)*.

Urban Missions

India embarked on an urban development Mission (Jawaharlal Nehru National Urban Renewal Mission – JNNURM) in 2006 that included a focus on Urban Sanitation and the development of City Development Plans and projects that were funded by central government. This was followed by the development of City Sanitation Plans. Since 2014–2015 India embarked on Swachh Bharat Mission, the Smart Cities Mission and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT Mission). All geared towards addressing urban water supply and sanitation. In 2017, India issued Guidelines for Faecal Sludge Management to make it part of the Urban Sanitation missions.

Sustainable sanitation with focus on nature-based solutions

It was popularised by BORDA, SuSanA and GIZ.

Market-led smaller sewage and wastewater treatment plants

Market-led smaller sewage and wastewater treatment plants and package solutions for housing colonies and institutions are now popular in many Indian cities.

Faecal sludge management (FSM) or septage management

FSM or septage management was initiated in Bangladesh in 2009–2010 when 11 towns invested in basic sludge drying beds-based faecal sludge treatment plants. The Gates Foundation identified faecal sludge management as a priority in South Asia and has invested significantly in national level policy advocacy, capacity development and exposure visits and setting up demonstration plants in some cities of Bangladesh and India.

Capacity Development for Urban Sanitation

It is an area increasingly gaining attention in South Asia from both donors and Government agencies (Kapur, 2020). In India, the Sanitation Capacity Building Platform (SCBP) *(www.niua.org/scbp)* has produced a normative framework for capacity development and a digital dissemination strategy (Dash, 1999), and has shown the potential for capacity development as a sustainable learning strategy with the help of academia and national nodal training institutions.

However, despite these initiatives, increased financing, and programme and policy advocacy, improvements in Urban Sanitation remained limited at best: Pakistan, Bangladesh and Nepal, for example, did not see much expansion in sewerage connectivity and sewerage treatment plants. While sewerage systems and plants were built at a rapid pace in India during the 1980–2015 period, these still did not reach more than 33% of the households by 2011 (National Census) and did not translate into treatment of sewage beyond 37% of the sewage generated by 2015.

Due to increasing water scarcity and water conflicts, the treatment and reuse of wastewater is an urgent priority for many South Asian cities; this is a governance and political challenge that must transcend institutional and administrative domains.

4.2 An African perspective

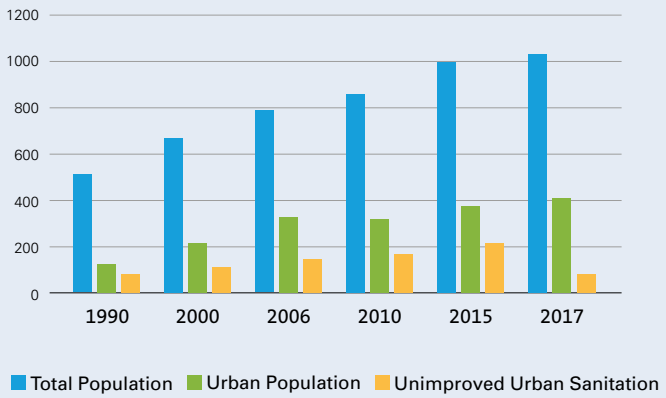
Sub-Saharan Africa is the region where the lack of Urban Sanitation provision has been the most striking. Graph 2 shows urban population growth since 1990 and indicates that the number of urban dwellers without access to improved sanitation has been increasing. Here again it should be mentioned that this number of urban dwellers without access to improved sanitation would be significantly lower (in 2017 by more than 50%), if a shared facility were also to be considered as "improved" sanitation *(see page 16)*.

Historically, the evolution of institutional arrangements for Urban Sanitation in Sub-Saharan Africa has been much more centralised compared to countries in Asia. After independence, many countries in Sub-Saharan Africa created national utilities or parastatals owned by the government and initially only responsible for service provision in the capital city or larger urban areas. Their mandate included the treatment and provision of drinking water and later the development of waste-water collection and treatment, and was initially based on conventional sewers and wastewater treatment plants.

GRAPH 2

Urban Sanitation in Sub-Saharan Africa (in Millions)

JMP; www.wssinfo.org



In the past decade, however, most countries have instituted a number of reforms in line with decentralisation and devolution policies:

Delineation of key mandates and decentralisation

Kenya and Zambia have reformed their Urban Sanitation institutional models to accommodate delineation and separation of key mandates for water supply and sanitation, namely: policy formulation, regulation, financing, and service provision to separate agencies. This delineation was targeted at improving governance, monitoring and accountability, access to sanitation, and service delivery at the local, regional, and national levels. The effects of the reform process are not noticeable yet since the institutional straightening has been slow, but the foundations for well-balanced institutional frameworks seem to be in place.

Dedicated financing mechanism for Urban Sanitation

Kenya and Zambia have formed dedicated institutions for financing water and sanitation infrastructure. The Water Sector Trust Fund in Kenya under its Urban Investment Programme is mandated to provide conditional and unconditional grants to the counties and to assist in financing the development and management of water and sanitation infrastructure and services in the marginalised and under-served areas. The Devolution Trust Fund in Zambia has been a basket fund for financing water and sanitation infrastructure in urban and peri-urban areas, targeting the marginalised.

In both cases, access to funding is based on an open call for project proposals by the service providers or utilities and pro-poor subsidies for standardised toilets are provided to the marginalised population by a results-based financing scheme via the funding mechanism. Both funding mechanisms are donor funded, and relatively lower investments in sanitation as compared to investments in water supply and conventional wastewater management have been observed. Water supply is commonly defined as a national priority.

Formation of successful utility models and regional agencies for infrastructure and improved service delivery

The last decade has seen the evolution of a handful of well-managed national utilities in Africa. A few of the prominent ones are the National Water and Sewerage Corporation (NWSC) in Uganda, the National Office of Sanitation in Senegal (ONAS), the National Office of Sanitation and Drainage in Ivory Coast (ONAD) and the National Office of Water and Sanitation in Burkina Faso (ONEA). NWSC is a parastatal organisation owned 100% by the Government of Uganda and was established under the National Water and Sewerage Corporation Act (2000). The organisation has the mandate to provide water supply and sewerage/ sanitation services in larger cities and towns via performance contracts with the Ministry of Water and Environment. Currently, NWSC operates in 254 towns, up from 74 towns in 2015. The key factors attributed to the success of NWSC are:

- improved performance efficiency,
- a high rate of cost recovery,
- increased accountability down to the lowest operational level and
- a sustained growth for improving access to services.

Although much of its success is based on its work to improve water supply there has been a limited, but steadily increasing performance reported on improved sanitation services. However, attempts to introduce effective regulation of NWSC did not materialise to date.

Approaches and frameworks as experienced in practice

The last decades have seen many approaches to Urban Sanitation that have been piloted in Sub-Saharan Africa by donor agencies and NGOs alike. However, they have mostly had limited success in terms of scale up to a national level.

Some of the approaches that have shown promise are:

Town Sanitation Planning (TSP) in Uganda

Initiated by GIZ and piloted by the Ministry of Water and Environment in six Ugandan small towns, the TSP approach draws from the many planning approaches developed earlier, notably: City Sanitation Planning, Concerted Municipal Strategies, Strategic Sanitation Approach and Sanitation 21. It was modified for the specific needs of small-towns and relied on participatory approaches to develop strategic sanitation/FSM plans. TSP follows a clustered approach to FSM, i.e. developing an FSM system for a cluster of three to four towns by providing a common FS collection and treatment option to increase economies of scale. The system also caters to the FSM requirements of rural areas in the vicinity and, thus, closing the loop of the rural-urban continuum. The TSP approach is now a standard methodology that the Ministry uses for all future investments in sanitation infrastructure for small and medium towns in Uganda. Although the TSP approach is currently being rolled out nationally, the financing of these plans remains a challenge to be addressed.

Upscaling Basic Sanitation for the Urban Poor in Kenya

The Up-scaling Basic Sanitation for the Urban Poor (UBSUP) programme was piloted by three water utilities with support from GIZ. The programme aimed to improve sanitation at the household and plot levels by providing subsidies and commercial loans for household and sanitation marketing of standardised toilets, called SafiSan. Additionally, the programme also funded improvements along the sanitation chain and the establishment of treatments systems. The programme is being upscaled to 20 water utilities with an aim to provide up to 400,000 people with adequate sanitation in Kenya. The investments are funded by the Kreditanstalt für Wiederaufbau (KfW) and supported by BMGF.

Citywide Inclusive Sanitation

Although this approach is in its infancy, it is gathering interest, mainly due to support from the World Bank and BMGF. There are currently only a few existing examples to showcase it, namely the "Countywide Inclusive Sanitation" initiative in Nakuru, Kenya, and the Citywide Inclusive Sanitation Improvement and Financing Strategy for Kampala, Uganda. Both provide a road map for sanitation improvements in cities, but with limited scope for financing the improvements.

On-site sanitation mandate

Many national and local utilities have introduced FSM policies for the vast un-sewered urban areas in the past decade. This includes delegating responsibilities to the private sector and implementing new treatment infrastructure in the form of faecal sludge treatment plants. FSM is now an integral part of strategic sanitation plans across West Africa, which clearly delineate utility's, private service providers' and household's responsibilities. As a case in point, Ouagadougou in Burkina Faso today has over 100 formalised companies providing sludge emptying services to the city's non-sewered areas. Especially the insights from Burkina Faso and Kenia are good practice examples for scaling up sanitation services.

4.3 Challenges to the uptake of existing planning approaches and tools at the local level

Despite the existence of several planning approaches and tools that suit a wide variety of needs and contexts, their uptake at scale is lacking behind. With the notable exception of SFDs and CLUES, most approaches and tools have been predominantly supply-led with their proponents providing financial and technical support for their use in implementation.

It poses the question, if the approaches and tools are reflecting and supporting the actual implementation needs in the countries and if they are appropriate in bridging the gap between piloting and implementation at scale. There is an urgent need to test them in large scaling up processes and to strengthen the appropriate institution to steer these kind of processes.

Especially the experiences in South Asia have shown that there are some key reasons for the lack of uptake:

Resource challenges

- The availability of significant front-end financial and human resources, as well as the commitment and engagement of stakeholders to carry out the process and develop ownership.
- Time constraints affect the uptake, since most of the listed tools and approaches, despite their significance, take up more time than conventional top-down utility led planning.

Capacity challenges

- The availability of expert skills for facilitation to make sure that all stakeholders understand the process and its results and that the stakeholder demands are well understood and effectively translated into the final plan.
- The availability of an enabling environment where structured, comprehensive, and inclusive planning by itself is valued as a necessity.
- The degree of organisation of the community for its effective engagement in the planning project.
- Training of local planners to make sure that the use of strategic planning approaches and tools are well understood as integrated approaches are often not part of the normal curricula of civil and public health engineers.
- The availability of reliable site-specific data.
- The stability of the institutional setting and staff.
- The constant transfer of trained staff creates the lack of availability of skilled planners.

Institutional challenges / need for contextualisation

- Contextualisation of guiding principles to local conditions and embedment of them in the existing institutional framework. This will require:
  1. setting the ground for integrated planning in coordination with other sectors;
  2. multi-stakeholder engagement
  3. managing the interface between area-based and citywide planning; and
  5. linking decisions to investments.
- Confusion resulting from the existence of many similar tools for the same purpose, which are often promoted by the same international agencies.
- The lack of tools to holistically understand and select the effective combination of appropriate technologies and viable institutional options and governance systems.

Leadership challenges

- Strong project leadership to ensure that joint decisions are followed by action.
- Political will of elected officials to prioritise sanitation and its planning processes is necessary to gain stakeholder trust and access to data.

5. Outlook

From sector-focused to cross-sectoral approaches

The evolution of Urban Sanitation thinking, corresponding approaches and tools demonstrate the shift from sector-focused to cross-sectoral city-centred approaches. Cross-sector thinking and cooperation are also inherent to the SDGs. The publication "Navigating the Structure of Research on Sustainable Development Goals" (Nakamura et al., 2019) highlights that water supply and sanitation are inter-linking health, the environment, agriculture and sustainability sciences *(see Figure 18)*. Bearing the overarching nature of the SDGs in mind, their inter-linking character emphasises that sustainable Urban Sanitation cannot be achieved by the sanitation sector alone.

Cross-sectoral city-centred approaches are holistic and have the potential to address the challenges related to climate change and urbanisation more comprehensively than sector-focused approaches because they involve various actors and align interventions at the city level. However, they are a challenge per se as aligning interventions at the city level call for:

- national policies, allowing for the integration of a variety of different sector priorities,
- a mutually accepted goal, balancing the interests of the actors, and
- structural changes in the enabling environment so that the alignment of interventions are not limited only to the integration of technical solutions.

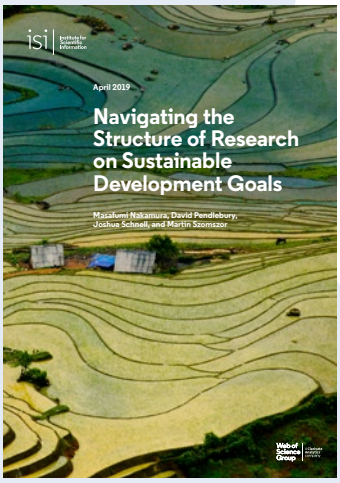


FIGURE 18
Water supply and sanitation inter-linking health & environment
Nakamura et al., 2019

Application of modular systems

For sanitation, this also means the necessity to consider non-grid, small-grid and hybrid sanitation systems along with conventional sewerage systems. Modular systems (e.g. modular anaerobic systems implemented in South Asia by BORDA and the Consortium for DEWATS Dissemination Society) are independent from water, energy, and sewer infrastructure *(see Figure 19)*. This makes them more flexible to changing environmental and socio-demographic conditions and helps to address the effects of climate change, i.e. increasing migration and urbanisation (Hoffmann et al., 2020). Modular systems, however, not only require different engineering capacities, such as those required for the optimisation of the logistics of vehicular-based transport, but also different institutional frameworks that are designed for the unbundled services required for non-sewered sanitation. Like any system, modular systems come with their own set of operational challenges, regulations, financing mechanisms, etc., and easily might result in being additional burdens for the implementers if no integrated, well-coordinated and enabling planning environment is in place.
A practical tool to assess the effectiveness and adequacy of sanitation policies can be found in the Practical Guidelines for the Assessment of National Sanitation Policies (Elledge et al., 2002).

Leaving no one behind

Aiming at equitable access to sanitation, SDG #6 stresses the importance of good governance at the levels of local government and national authorities and highlights the necessity to consider equity as an integral part of comprehensive Urban Sanitation approaches. The call for equity, in particular the consideration of women's and girl's needs, and, more recently, of people living with disabilities, has also been reflected in the evolution of Urban Sanitation thinking. However, this must be further expanded to cover the needs of other marginalised communities, including those discriminated by caste, ethnicity, religion and income levels among others, to make sanitation universally equitable. Because modular systems are often the only feasible option for high-density, low-income, (informal) urban areas, they also provide the structure for a more citywide inclusive approach, "leaving no one behind". However, equity in sanitation cannot be achieved without being coordinated and synergised with all basic urban services since neglecting these services could compromise any gains made from sanitation due to their interdependence (Scott et al., 2019).

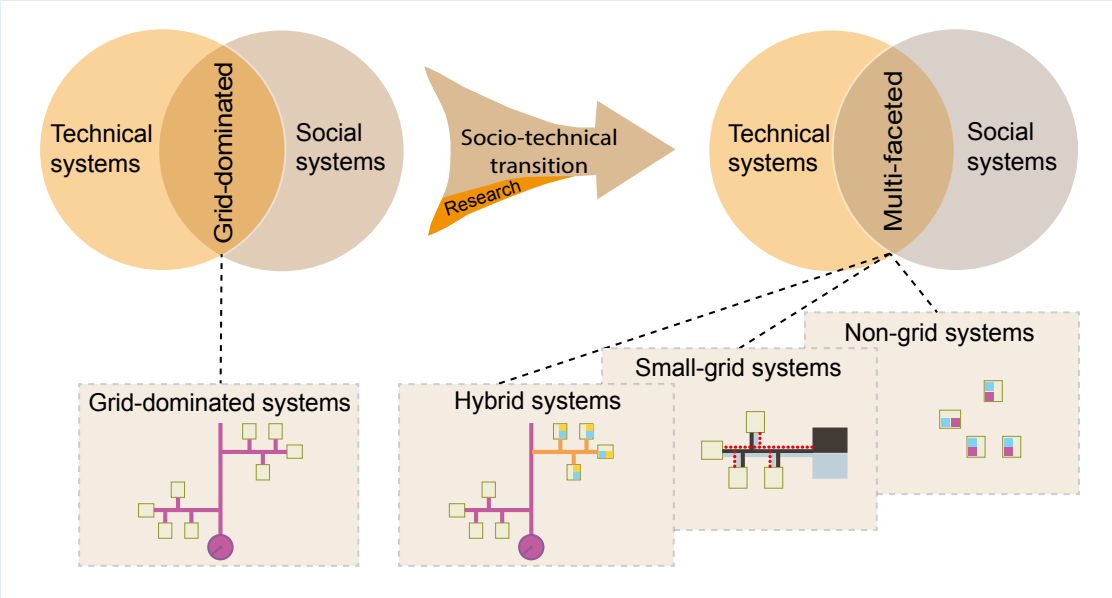


FIGURE 19
Modular Systems
Hoffmann et al., 2020

Emerging
city-centred approaches

Currently, there exists a few such cross-sectoral city-centred approaches worldwide that have a high potential to consider inter-linkages and advance the Urban Sanitation agenda in a comprehensive manner.

- Green Cities / Eco-Cities
- Water-wise Cities
- Resilient Cities
- Smart Cities
- Water Sensitive Urban Design

Green Cities (or Eco-Cities)

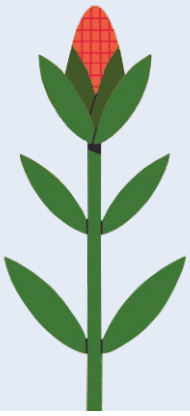
A Green City or Eco-City is a city designed with consideration of its social, economic, environmental impact and resilient habitat for existing populations, without compromising the ability of future generations to experience the same. The ambiguity within this idea leads to a great deal of variation in terms of how cities carry out their attempts to become sustainable. The central focus is that cities should create the smallest conceivable ecological footprint, while also producing the lowest quantity of pollution.

Typically, Green Cities attempt to reconfigure the resource flows, technologies and aspects of the social organisation of network infrastructures with a focus on energy, food, water and waste. By reusing wastes (solid waste, organic waste and human waste) as resources and reducing reliance on external infrastructure, Green Cities attempt to respond to climate change and resource constraints (Hodson & Marvin, 2010).

Exemplary Green Cities aim for:

- water neutrality – new developments that do not increase overall water use,
- zero energy, i.e. settlements that are energy self-sufficient or even produce excess energy, and
- waste reuse, where locally generated waste becomes a fuel or nutrient source or the waste is recycled.

In this regard, reuse-oriented sanitation systems can play an important role as they are able to provide energy, and recover nutrients and water.



Water-Wise Cities

The Principles for Water-Wise Cities were launched by the IWA in 2016, with the aim to support cities to develop and implement their visions for sustainable urban water management (IWA, 2016). Against the background of climate change and population growth, the principles encourage resilient planning for and design of more liveable cities.

Sustainable urban water management – which makes a city "water-wise" – is defined as management of all water within a city in a way "that recognises the connection between services, urban design and the basin, with an approach that maximises the achievement of urban liveability outcomes, and resilience to unexpected social, economic or bio-physical shocks, while replenishing the environment".

The 17 Principles for Water-Wise Cities embrace aspects of "reduce, recycle and recover", as well as a systemic approach that connects water and sanitation to other services, such as health, transport, food production, waste or energy. It seeks the integration of urban planning with the management of the urban water cycle, encourages transdisciplinary planning and acknowledges the capacities of "water-wise" citizens. Since its launch, 30 metropolitan areas worldwide have endorsed the IWA Principles for Water-Wise Cities.

Resilient Cities

The origin of the concept of resilience in the context of ecology dates back to the 70s where it was used to describe the ability of an ecological system to continue functioning when disturbed even though it might not remain unchanged anymore. Since then, the concept has been gradually taken up for use in cities by looking at the analogies between living organisms and urban areas (Meerow et.al., 2016).

Resilience was initially tied to the concept of equilibrium, focusing on the time a city takes to return to its equilibrium after experiencing a shock or disorder (mainly in relation to climate change/natural disasters). However, in recent years the focus has shifted towards the adaptive and transformative capacity of cities, emphasizing their dynamic characteristics, such as flexibility and redundancy, to meet emerging challenges (Mierzejewska & Wdolwcka, 2018).

Several approaches have been developed to analyse and measure the resilience of cities. As part of the 100 Resilient Cities (100RC) project pioneered by the Rockefeller Foundation, the City Resilience Index was developed – a comprehensive tool that helps the administrators in cities understand and measure their resilience (Rockefeller Foundation, 2014). 100RC, together with SIWI, ARUP and the Resilience Shift, focused on the urban water sector and launched the City Water Resilience Approach, which aims to help cities build water resilience (Rockefeller Foundation et al., 2019). UN Habitat has recently published the City Resilience Profiling Tool, which provides process steps to diagnose the level of resiliency within a city and to develop an action plan to increase it (UN Habitat, 2018).

Whereas the absence of functioning sanitation systems and services has negative impacts on public health and the environment of urban settlements, sustainable sanitation systems that provide nutrients, energy and water can play an important role to increase the resilience of cities.

Smart Cities

"Smart cities" is a term used to describe the future of cities and has become popular since 2009. In contrast to "green/eco cities" and "digital cities", that focus rather on environmental or technological aspects, smart cities tend to combine the elements of sustainability, social inclusion and information and communication technology.

In general, the use of information and communication technology is seen as an enabling factor that allows for improvements in the use of public services, living quality of people and reduction in social inequality and unemployment (Eremia et al., 2017).

While in many contexts, the technological aspects tend to be crucial for creating "smart cities" (e.g. smart grids, smart meters, sensing technology, smartphones, etc.), others pointed out that a city cannot become smart because of technology only. Technology, thus, is seen as the means to serve the interest of the residents, whose abilities and interactions form the basis of the future city (Winkowska et al., 2019). The smart city approach is especially popular in Europe (and Northern America) and cities, such as Barcelona and Rome, have started to implement different technologies and processes to turn themselves into smart cities.

In 2015, the Indian Government launched the Smart Cities mission. It is an innovative initiative to drive economic growth and improve quality of life by enabling local development and valorising technology as a means to create smart outcomes for citizens. Hereby, the Smart Cities mission fosters the provision of core infrastructure (e.g. water supply, sanitation, solid waste management, electricity and mobility) to improve the quality of life of its citizens. The provision of safe sanitation services is seen as key to healthy and lively cities. Initially, 100 cities were selected to be upgraded under this mission. "Smart" solutions that use technology, data and information are seen as an important tool to improve services and infrastructure (Govt. of India, 2020).

Water Sensitive Urban Design

Another emerging approach that needs consideration is the Water Sensitive Urban Design, which originated and is widely accepted in cities across Australia (Wong, 2006). The primary aim of Water Sensitive Urban Design is to design urban environments that allow the water cycle to function as closely as it would naturally. This, thereby, reduces the impact of urban development on the water cycle (Sharma et al., 2018).

Water Sensitive Urban Design is a comprehensive water management system that includes Low-Impact Design concepts, water conservation principles along with management of water quality and urban ecology. It offers an integrated framework for sustainable design of the built environment and water cycle management, including supply, flood resilience and wastewater treatment.

The key principles of Water Sensitive Urban Design are to:

- protect natural systems,
- protect water quality,
- restore water balance,
- minimise potable water demand,
- integrate storm water treatment into the landscape,
- reduce hydromodification,
- create landscape amenities and
- minimise cost while adding value

(Donofrio et al., 2009).

This presents a scope for designing sanitation systems that are water sensitive with minimal water footprints and emphasizes the recycling and reuse of used water. Therefore, sanitation is strongly included in the narrative of Water Sensitive Urban Design.

Catchment-scale approaches

In addition to cross-sectoral citywide approaches, looking beyond the city to the catchment level is another beneficial option to create a circular economy and explore opportunities in the water-energy-food nexus. This takes into consideration interactions between the urban and rural environments and their different usages of water resources. It also stresses the need for a more holistic and integrated approach towards sustainable and inclusive Urban Sanitation. Two such catchment-based approaches from which Urban Sanitation could find synergies are given below.

Source-to-Sea management

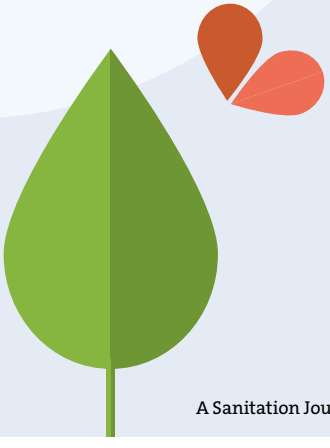
Source-to-Sea management is a governance paradigm to support joint action for the improved management of land, water, coastal and marine linkages. A Source-to-Sea system is the land area that is drained by a river system, its lakes and tributaries (the river basin), connected aquifers and downstream recipients, including deltas and estuaries, coastlines and near-shore waters, the adjoining sea and continental shelf, as well as the open ocean (Mathews et al., 2019).

The inter-sectoral Source-to-Sea approach aims to establish governance, operations, practices and finances that increase collaboration and coherence across the land and water systems and foster cross-sectoral and in many cases transboundary coordination, including land management, water management, marine management, solid waste management and wastewater management. The approach, thus, offers an interdisciplinary way of thinking by linking sanitation and wastewater specialists with experts from other disciplines to allow for more holistic approaches to address the pollution of the sea.

Integrated Water Resources Management (IWRM)

Integrated Water Resources Management (IWRM) is a process that promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment (Global Water Partnership, 2000). It is a conceptual framework that aims to unpack the complexity of water management and the importance of accounting multiple stakeholder interests.

IWRM is based on the principles of ecological sustainability, social equity and economic efficiency of a finite resource that different users are dependent upon. Although the concept is argued to be amorphous, and not a universal solution to water management (Biswas, 2008), the opportunities it poses for the comprehensive inclusion of sanitation and for considering wastewater as a resource for peri-urban and agricultural needs is worth exploring.



Outlook on sanitation as a key element in an urban system

The emerging approaches described above underline that SDG #6.2 cannot be achieved by solely addressing the Urban Sanitation sector. On the other hand, many of the SDGs cannot be achieved without achieving SDG #6.2. Sanitation has the potential to be a key element in a larger urban system and contribute to urban sustainability in a range of dimensions (e.g. health, education, food security, access to energy, etc.). Linking the Urban Sanitation sector to a range of other sectors and, in turn, other SDGs is crucial to make Urban Sanitation work (SuSanA, 2018). For instance, sanitation systems can be designed in a way that they not only minimise resource abstraction (freshwater for flushing and energy for transport and pumping), but also produce additional resources. Organic matter contained in faecal sludge can be transformed to biogas that can be used as an energy source for treatment facilities, households and industries. Or, effluent can be used for landscaping, and the recovery of nutrients both from effluents or sludge, for instance in the form of compost, can contribute to sustainable urban horticulture, closing the material cycles at local or regional levels. However, cities also need to consider the material and substance flows of water, organic material, and nutrients through the urban system beyond sanitation in order to understand and regulate them. This can be possible, for example, through the fostering of symbioses between different industries or sanitation and industry/agriculture to achieve an industrial ecology (e.g. Erkmann, 2001) and healthy urban metabolism (Baccini and Brunner, 2012).

Additional insights could be gained by identifying the highest market value for the product(s) from sanitation systems in any given context. Where feasible, planning of sanitation system components could then take place in such a manner that it becomes easier, as well as more time-, resource- and cost-efficient to produce these products from organic waste streams. Finding overarching solutions that go beyond sectors and that can take into account a broader set of social, economic and environmental parameters could be supported by an integrated urban master plan for material flows (water, organic waste nutrients, inorganic waste, electronic waste, etc.), energy, and food production (Panesar et al., 2018).

The knowledge base on urban sustainability has significantly improved as recent developments show. However, focus is commonly still solely given to the water cycle and tends to ignore sanitation. Although there exist some emerging good practice examples to implement these recent developments, action is often again split into sectors and, thus, fails to break the silos and promote integrated urban master planning. Hence, cross-sectoral action is often not yet provoked on the ground, resulting in missed opportunities to seize sanitation as a game changer for urban sustainability.

The Journey on Urban Sanitation shows that the discourse around sustainable sanitation has made significant progress to become more holistic and to address a more and more complex set of environmental and economic conditions on a theoretical, intellectual level, while still promoting the consideration of the local conditions in different city areas, as well as the preferences of communities. However, also here, action on the ground is lagging behind and, for instance, development banks so far have failed to apply citywide approaches to sanitation at scale. The simple reason for this is that cities need well-resourced institutions and enough personnel with the capacities to understand and steer such a process, plus a local government that gives such activities the required priority. This is usually not the case either in the Global North or the Global South.

The fundamental tasks for cities and those who want to support them is to build the right institutions and the related capacity to handle Urban Sanitation in a broader sense.

There is better understanding today of the importance of resources, such as water, nutrients and energy, and of the need to protect and efficiently use them in the face of increased pressures, e.g. from population growth and climate change. Therefore, supporting the development of municipal policies and city institutions should be geared to enable them to address the challenges in a different way. For instance, the "integrated urban master plan" approach described above can be taken as an example of how things need to be addressed differently.

Implementing integrated urban master plans in practice requires approaches that are cross-sectoral and transdisciplinary. Such planning approaches should be designed in order to facilitate agreement on a joint vision in line with the SDGs among various stakeholders from different sectors and levels and to balance trade-offs when comparing different planning options. Communicative planning (Lüthi, 2012) and Structured Decision Making (SDM) approaches (Gregory et al. 2012) have the potential to put this into practice, by combining empirical knowledge with

different stakeholder preferences (Keeney, 1992). This allows for the provision of transparent and systematic instructions on how to plan, without over-rationalising the problem. Moreover, the often-differing priorities of different sectors and actor levels can be aligned by generating a common vision for development at local, regional and national levels.

Although an integrated urban master plan is no silver bullet, it could contribute to the way in which well-resourced urban institutions – that have the capacities needed and broader policies in place – address today's more complex and intermingled challenges. Not only context-specific communicative planning is required, socio-technical transitions also need to take place that align the availability of new technical configurations (e.g. modular systems allowing for resource recovery) with suitable institutional arrangements (Hoffmann et al., 2020). On this upcoming journey, one can learn from implementing technical and institutional innovations in protected niches (such as applied research projects, and projects of the public sector or light-house projects). Lessons learned from such experiences should be well documented and the following questions addressed:

Are we doing things right?
Are we doing the right things?
How do we decide what is right?

Contribution to pandemic preparedness and response

The Covid-19 outbreak has demonstrated the need and potential of coordinating Urban Sanitation with various sectors, especially in low-income settings, during a pandemic (Wilkinson, 2020). Building strong institutions around sanitation and making considerable investments to protect public health through better sanitation was a game changer in a set of cities at the beginning of the 20th century. A real opportunity presents itself now to bring various sectors and related expertise together and to develop urban strategies that foster integrated planning of resilient urban infrastructure. These could also contribute to pandemic preparedness and response by merging multiple dimensions of urban planning and Urban Sanitation in a more systematic manner – such as the environment, public health, water, organic waste, stormwater management and faecal sludge management, as well as the potential for energy, fertiliser and water reclamation for urban greenery and beyond.

To conclude, it is worth emphasising once more the close inter-linkages between all 17 SDGs and the vital role sanitation plays in achieving several of them (SuSanA, 2018). Ultimately, the journey of Urban Sanitation must continue, in order to make lives of the billions who will populate the cities safer, healthier and more liveable.

Part B

Factsheets on Approaches & Tools for Urban Sanitation

Part B compiles the factsheets on:
A seven approaches and
T six tools for Urban Sanitation.

It has to be noted that the selection of approaches and tools is of a rather subjective nature and reflects the authors' own experiences in approaches and tools for Urban Sanitation. Furthermore, criteria for the selection entail available reports on their:

- practical use,
- contribution to paradigm shifts in Urban Sanitation and
- relevance for today's work in the Urban Sanitation sector.

For instance, the Community-Led Total Sanitation (CLTS) approach has not been included in this compilation since it has been used predominantly for rural sanitation, although there are examples of towns and cities in Africa, South Asia and South-East Asia, which have also more recently adapted an Urban Community-Led Total Sanitation (UCLTS) approach (Myers et al., 2018). Wherever there is open defecation, there is a need to consider mixes of rural and urban tools, in which CLTS (as well as PHAST/SARAR) has its appropriate use.

The elaboration of each approach and tool follows the same key aspects:

- basic data,
- an overview of the approach or tool,
- important points and lessons learned,
- its rationale,
- purpose of the approach or tool,
- corresponding practical experience derived from its use,
- current discussion about it, and
- important references and links.

The compilation allows the reader to learn key information at a glance, and to easily make comparisons.

Within each approach and tool, some basic information referring to the planning phase to which the approach and tool are applicable is provided as well. For this purpose, the planning phases were defined as follows:

PLANNING PHASES	DEFINITION
1) Diagnostic phase	· Understanding of the current situation
2) Strategy phase	· Definition of planning objectives · Identification of non-technical and technical options
3) Evaluation phase	· Detailed evaluation of options, finetuning, comparison
4) Planning phase	· Selection of preferred option · Action planning
5) Action phase	· Implementation · Ensuring sustainable operation and maintenance

Strategic Sanitation Approach

An approach towards an adaptive incremental sanitation planning framework

The SSA Approach, sometimes also referred to as Strategic Sanitation Planning (SSP) was first described in 1989 by the UNDP-World Bank 'Water and Sanitation Program' (WSP) and published as an internal working document in 1997 [2,6]. Key principles include demand orientation, attention to incentives, a wider choice of technological options, including decentralised and onsite solutions, affordability, innovative financing and management mechanism, capacity building, and a focus on a neighbourhood-centred approach and community participation to sanitation for aggregation of household demand [6].

ORIGIN:
based on the outcomes of the World Bank (Low-cost Water Supply and Sanitation Project – Technical Advisory Group, the precursor of the Water and Sanitation Programme (WSP) advocating Strategic Sanitation Planning (SSP)

FORMAT:
Working paper [2]
Guidance report [3]
Research paper [4]

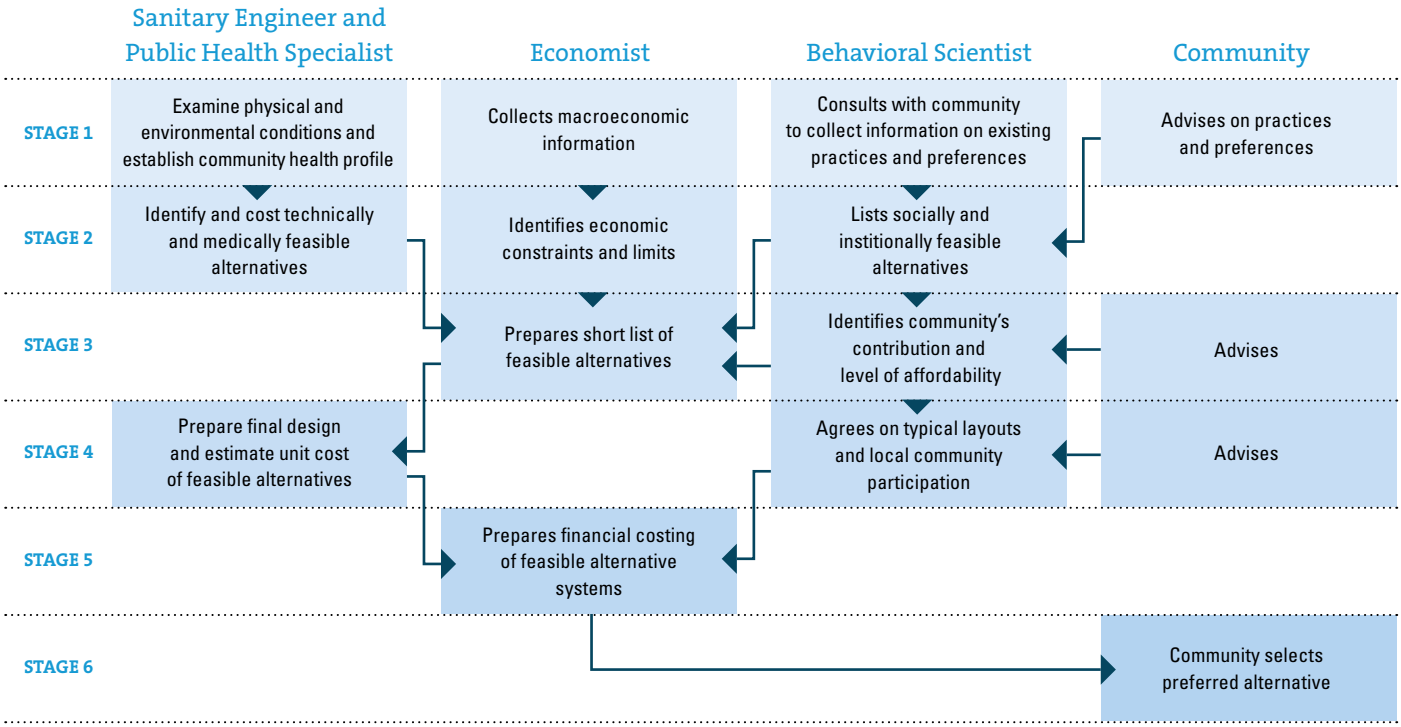
FIRST PUBLISHED:
1997

SUPPORTED BY:
United Nations Development Program, World Bank WSP

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
2) Strategy

Appropriate sanitation alternatives: a planning and design manual[1]



WHY IT WAS DEVELOPED?

The approach was developed in response to a focus on conventional sewerage as the only method considered for the disposal of wastewater in urban areas until the late 1970s. Research at that time identified viable alternatives, which were already well understood, but an approach to planning and implementing Urban Sanitation programmes with active user community participation did not yet exist. The approach recognises the importance of users' willingness to pay for perceived benefits and proposes innovative financing mechanisms and institutional frameworks. Attention is given to capacity-building initiatives that enable all levels of government and other stakeholders to implement responsive and sustainable programmes[2,5].

WHAT PURPOSE DOES IT SERVE?

The purpose of the approach is to bring attention to the social feasibility of sanitation solutions. The approach highlights the need to draw from the social sciences to develop promotional activities, and to implement pilot and demonstration projects. Further, the approach entirely rethinks the traditional master planning approach, as shown by direct comparison between the two: single technology vs. multi-technology; rate of extension vs. rate of adequacy; engineering studies vs. inter-disciplinary studies with community participation; public utility model vs. involvement of various public and private service providers inflexibility vs. flexibility; and one-time exercises vs. semi-continuous processes[5].

CURRENT STATUS / PRACTICAL EXPERIENCES

The approach was used to guide significant World Bank supported Urban Sanitation investment and two pilot projects in Kumasi, Ghana, and Ouagadougou, Burkina Faso. Since then, it has formed the basis for a number of projects in India, Indonesia, Thailand, Brazil and Pakistan[5]. Key problems encountered during these activities include a lack of a planning culture among local stakeholders and the consequent tendency to respond to problems in ad hoc ways. Moreover, the experiences suggest that there is a need for institutionalisation and to develop a more integrated approach to capacity building, with a strong emphasis on the way in which individual activities fit into overall planning and development processes[4].

WHERE IT HAS BEEN USED?

One example of a strong influence of SSA is Urban Sanitation planning in Indonesia. The World Bank supported the Indonesia Sanitation Sector Development Program (2006–2010) and its successor, the Urban Sanitation Development Program (USDP), which had led to more than 200 City Sanitation Strategies (Strategi Sanitasi Kota; SSK) by 2012.

DISCUSSION

The goals and objectives of the SSA retain formative elements of sanitation planning to date; its underlying principles are at the core of the approaches developed in the following decades, including: Household-centred Environmental Sanitation, Sanitation 21 and Community-Led Urban Environmental Sanitation. For the first time, the SSA has drawn attention to the sustainability of interventions with regard to long-term operation and maintenance of sanitation facilities (i.e. toilets). However, despite the effort of introducing alternatives to conventional sewer-based sanitation, little attention was drawn to the management of non-sewered sanitation technologies that need to be emptied when full. The prevailing idea was that demand in urban centres would continue to respond to conventional and/or condominial sewer-based sanitation and that non-sewered technologies in peri-urban and rural areas would be managed onsite, either by building a new facility or by reusing the emptied content locally. Emptying of non-sewered technologies was mostly considered as a municipal service for communal or public toilets with little attention to the capital and operational costs for emptying, transport and treatment.

REFERENCES / LINKS

[1] Kalbermatten, J.M. (1982a).
[2] Wright, A. M. (1997).
[3] Tayler, K., et al. (2000) .
[4] Tayler & Parkinson (2005) .
[5] Middleton & Kalbermatten (1990).
[6] Peal et al. (2010).

IMPORTANT POINTS & LESSONS LEARNED

Long-term, citywide, integrated sanitation programme approach with responsiveness to demand at the community level as a core principle.	Programmes are considered successful when users and the service agency have common goals developed through a consultative process involving all stakeholders.	Works well in places with significant technical and financial support, but shows challenges in cities with low planning and programming capacity.
Meant to be flexible and adaptive so that it can incorporate lessons from new experiences and innovations.	A broad-brush approach defining relevant principles, but does not provide detailed and structured planning guidance for their implementation.	For the approach to work, an "enabling environment" needs to be available or created.

Household-Centred Environmental Sanitation

An approach to implement the Bellagio Principles in Urban Environmental Sanitation

The HCES approach is a radical departure from the past central planning approaches as it places the household and its neighbourhood or the community at the core of the planning process. HCES is a multi-sector and multi-actor approach accounting for sanitation, water supply, solid waste management and stormwater drainage, and emphasizing the participation of all stakeholders in planning and implementing Urban Sanitation. HCES responds directly to the needs and demands of the people, but attempts to avoid problems resulting from purely 'bottom-up' or 'top-down' approaches.

ORIGIN:
Environmental Sanitation Working Group of WSSCC; Eawag-Sandec

FORMAT:
Provisional Guideline for decision-makers

FIRST PUBLISHED:
1999

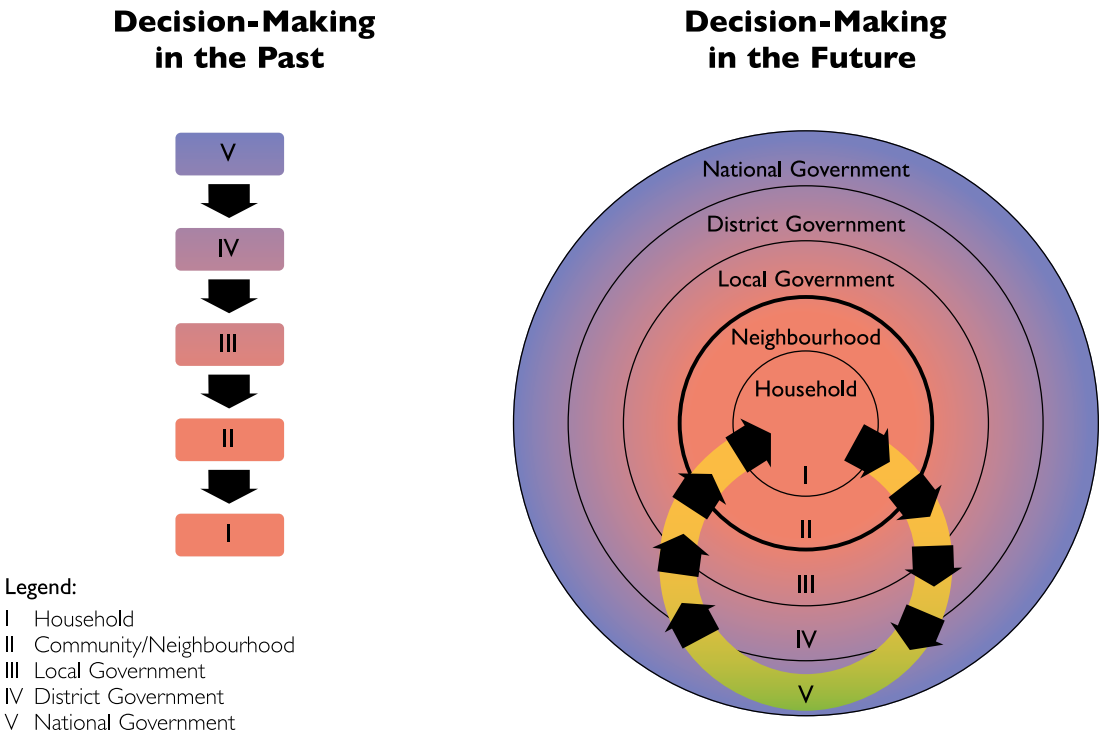
SUPPORTED BY:
SDC, GIZ, WEDC, WSP

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning

After conceived by a working group of the WSSCC, the HCES approach was synthesised by a representative group of experts into the Bellagio Principles for Environmental Sanitation.[1]

HCES – household at the centre of combined bottom-up and top-down planning [1,2,3]



WHY IT WAS DEVELOPED?

The HCES approach was a response to one of the key lessons learned from the International Drinking Water and Sanitation Decade (1980–1990): the need to respond to consumer demand and priorities to achieve sustainable progress. For a long time, planning of water and sanitation service provision consisted of what came to be known as a 'Top-Down' approach. Needs were determined by well-meaning officials at central, regional, district or municipal levels, based on their own perceptions. Those to be provided with services were 'Target Beneficiaries' without much say, if any, in matters of service level or determination of priorities. Beneficiaries are seen as consumers of services and, therefore, active participants in the decision-making process. The HCES approach was also an attempt to remedy the defects of conventional planning of urban environmental sanitation services, where problems are not addressed close enough to the point at which they originate.

WHAT PURPOSE DOES IT SERVE?

HCES is a multi-sector, multi-actor approach to delivering integrated urban environmental services. It is designed to respond to household needs and priorities. The HCES approach attempts to avoid the problems resulting from either 'top-down' or 'bottom-up' approaches and tries to combine the benefits and reduce the negative aspects of both by focusing planning on household demand and by including all stakeholders in the process, from planning to implementation. An important principle is also to solve the sanitation and solid waste problems as near as possible to where they occur, to save/recover resources, and to reduce the production/transfer of waste by maximising recycling and reuse.[1]

CURRENT STATUS / PRACTICAL EXPERIENCES

A Provisional Guideline for decision-makers was developed to provide first guidance on how to implement the Bellagio Principles by applying the HCES approach. However, HCES was never tested in its integrity as an approach for citywide sanitation planning since no appropriate pilot site was found. Instead, the HCES approach could only be piloted and evaluated for area-based planning, focusing on community involvement within one area (community), without considering all 'zones' in a systematic manner. Such piloting and evaluations took place between 2006 and 2010 in Africa, Asia and Latin America, in seven different urban and peri-urban settings. The experiences and lessons learned from these pilot projects were used to develop a revised and simplified set of guidelines for area-based sanitation planning. These guidelines were published as "Community-Led Urban Environmental Sanitation" (CLUES).

WHERE IT HAS BEEN USED?

As mentioned earlier, the HCES approach has never been used in its integrity for citywide sanitation planning. However, the Community-Led Urban Environmental Sanitation approach (CLUES), which is largely based on the HCES approach, has been implemented in nine countries in Africa, Asia and Latin America for area-based sanitation planning.

DISCUSSION

The management of interfaces between the different zones is key. Thus, a successful application of the HCES approach in full is only possible with the commitment and support of the municipal leadership, and its willingness to take the steps necessary to support such an enabling environment.

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[3] www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SESP/Household-Centred/HCES_guidelines_en.pdf

IMPORTANT POINTS & LESSONS LEARNED

The HCES approach was designed for citywide sanitation planning by

- dividing the city into the 'zones' Household, Neighbourhood, Local Government, etc., and solving the problems within the 'zone' nearest to where the problems arise; and
- using a 'circular model', which emphasizes reuse and recycling to conserve resources and reduce waste transfer between different 'zones' in place of the traditional linear model of unrestricted supply and subsequent disposal.[1]

Managing the interface between area-based planning for one zone to citywide planning turned out to be the major challenge since it requires collaboration and coordination between multiple agencies which often have different capabilities and little commitment to working together.

The HCES approach requires a political, legal and institutional environment, which enables the management of interfaces between the different zones.

City Sanitation Planning

A concept guiding city managers in sector planning

CSP is a comprehensive citywide planning and decision-making framework that consequently includes stakeholders to plan citywide sanitation by prioritising investments and selecting the most viable projects. The CSP process is technology agnostic and aims to arrive at locally appropriate sanitation systems. CSP's framework is broadly defined and includes a comprehensive list of factors to consider. Therefore, the framework can be adapted to the particular city's needs and aspirations. The technical aspects often include water supply, wastewater, solid waste and drainage. There is no uniform definition of a CSP. Several organisations have developed different concepts. This factsheet is based on the concept applied in India.

ORIGIN:
Various sources. The version from the National Urban Sanitation Policy (NUSP) by the Government of India (GoI) is used here.

FORMAT:
Policy document, guides, manuals and toolkit

FIRST PUBLISHED:
2008

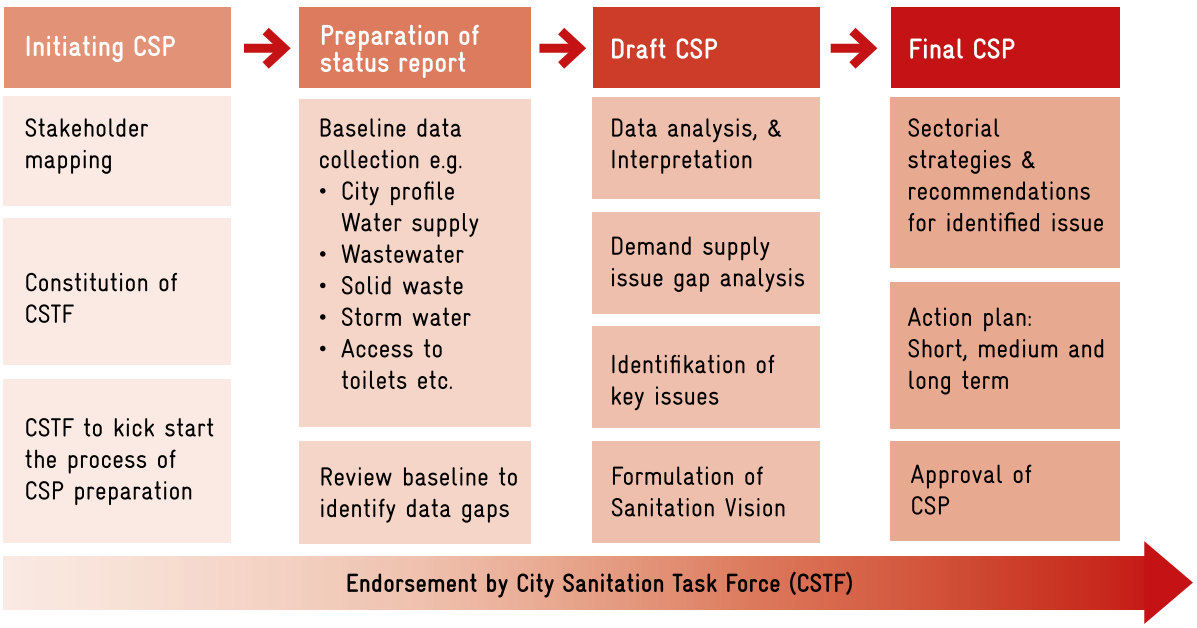
SUPPORTED BY:
GIZ, World Bank, CSE etc.

IMPLEMENTATION:
India, Indonesia, Nepal and Tanzania

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning
5) Action

Steps of CSP Preparation [2]

Figure 2: Steps of CSP Preparation



WHY IT WAS DEVELOPED?

Although Urban Sanitation has always been recognised as an important aspect of public and environmental health, there were no clear national policies regarding its implementation in India until the launch of the NUSP. The two main instruments for achieving the policy's goals are the State Sanitation Strategy (SSS) and the City Sanitation Plan (CSP) that translates the national policy into structured implementation plans for sustainable sanitation at the state and city levels. Since the CSP framework in the NUSP is comprehensive, yet broadly defined, the corresponding support program (SNUSP) by GIZ published a series of toolkits, training manuals and practical user guides that have been widely taken up. Likewise, with impetus from the national governments of Indonesia and Nepal, CSP frameworks with similar fundamental steps were created, in accordance with the respective country's policies and vision.

WHAT PURPOSE DOES IT SERVE?

The CSP aims to be cross-sectoral, citywide, inclusive, incremental, and holistic. The City Sanitation Task Force acts as the focal stakeholder group that ensures that the preparation of CSP is inclusive, consultative and iterative. The plans have short, medium and long-term actionable steps, ensuring that an incremental approach is adopted. Understanding the current sanitation situation and projecting future scenarios in the city is emphasized through three stages of baseline data collection for:

1. preparatory action,
2. vision setting and information campaign, and
3. planning and implementing institutional changes, social mobilisation, and investments.

CSPs could potentially catalyse change in the institutional, financial, technical aspects of sanitation, while improving general awareness, capacity development and long-term monitoring agenda.

CURRENT STATUS / PRACTICAL EXPERIENCES

As part of the NUSP, several CSPs for cities across India were commissioned and developed to obtain funding from former national schemes. With the introduction of newer national programmes, such as 'AMRUT' and 'Swachh Barat Mission', CSPs have been replaced with Service Level Improvement Plans, Citywide Concept Plans, and Swactha City Plans. However, a few states, such as Kerala and Telangana, have institutionalised CSPs through legislative and state level policies. There have been no reports that CSPs in Indonesia and Tanzania have gained any traction once projects, focusing on city sanitation planning, ended in these locations.

WHERE IT HAS BEEN USED?

Over 200 CSPs are reported to have been drafted across India. However, far fewer have been formally approved and actively used in making decisions related to sanitation investments. Prominent CSPs in India include Raipur, Kochi, Hoshangabad, and Shimla. Denpasar, Indonesia, Tikapur, Nepal, and Dar as Salam, Tanzania, are other notable international examples.

DISCUSSION

CSPs were aimed as living documents to be used by cities to make informed decisions about sanitation investments. Such blueprint documents require city governments to have adequate technical capacity and to take ownership of the preparation. Due to the lack of both, in many cases the preparation was outsourced to consultants with little or no ownership of city government; hence, the CSP was developed only for checklist purposes limiting the intended benefits of the process itself to catalyse change, capacity development and awareness. A comprehensive CSP needs leadership and adequate funding, time, effort, and expertise for preparation, which are often limiting factors. Some of the successful CSPs have been developed only with external support from international development agencies. In order for the CSP to be useful, it needs to be followed by funding (e.g. from national schemes) for implementation, otherwise it risks being only a reference document.

REFERENCES / LINKS

[1] NUSP Document: Government of India, Ministry of Urban Development. 2008. National Urban Sanitation Policy, Delhi.
[2] CSP Tool Kit: GIZ 2016, 'CSP Toolkit' Support to National Urban Sanitation Policy II, New Delhi.
[3] SNUSP website: www.urbansanitation.org
[4] CSP based on Indonesia experience: WSP (2010) Marching Together with a Citywide Sanitation Strategy. www.wsp.org/library/marching-together-citywide-sanitation-strategy

IMPORTANT POINTS & LESSONS LEARNED

The CSP provides a single-point document for the city government to make informed decisions about achieving sustainable sanitation in the city.

The technical components of a CSP are not restricted to access to toilets and wastewater and faecal sludge management only, but also include water supply, storm water drainage, and solid waste management.

Stakeholder involvement via a City Sanitation Task Force (CSTF) is key. For an effective CSTF, the members have to be carefully chosen, considering their stakeholder group, local and technical knowledge, and, importantly, their commitment towards the process.

A comprehensive CSP needs adequate support from the city government for human and financial resources allocated to its preparation and implementation.

Concerted Municipal Strategies

An approach that includes local actors in developing strategies for large towns and regions with small towns

The CMS program was developed and piloted by pS-Eau and the MDP between 2007 and 2010 in in order to enhance inclusion of local actors in the formulation of a municipal strategies. The program consisted in the development of four components:

1. strategies for large towns;
2. regional strategies for small towns;
3. methodological guides and
4. training needs assessment.

Six guides were produced and disseminated to share the main lessons learned. Recently, a 7th guide about small-bore sewer systems was also produced.

ORIGIN:
Programme Solidarité Eau (pS-Eau) and the Municipal Development Partnership (MDP)

FORMAT:
7 Guidebooks [1,2]

FIRST PUBLISHED:
2010

SUPPORTED BY:
ACP-EU Water Facility, French Development Agency – AfD

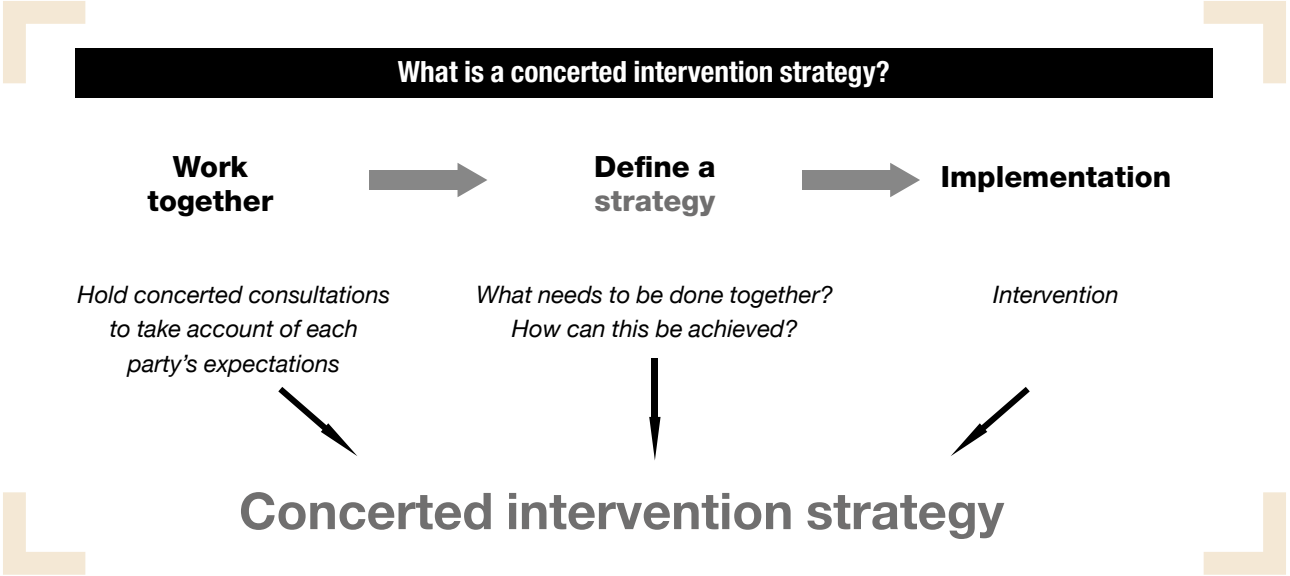
IMPLEMENTATION:
West, Central and East Africa

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning

WHY IT WAS DEVELOPED?

The CMS approach was developed to enhance the inclusion of local actors in the formulation of a municipal strategies. This should be achieved by, assisting local authorities in the process of diagnostic, communication and strategy development. The approach comprises a series of six methodological guides:
Guide 1 is intended for elected and municipal officials of larger towns (from 50,000 to 300,000 inhabitants) with a step-by-step methodology, from conducting the diagnostic to formulating the strategy.
Guide 2 is intended for developing regional strategies of small towns (from 3,000 to 30,000 inhabitants).
Guide 3 provides the key concepts and tools of interventions required to carry out robust and usable demand analyses.
Guide 4 supports the selection of locally appropriate technologies for three possible sanitation chains: onsite, small-bore and conventional sewerage.
Guide 5 sets out the management models available for shared toilets and showers in schools, commercial public places, health centres and neighbourhoods.

CMS Concerted intervention strategy [1]



Guide 6 aims at increasing awareness and understanding of the means of financing available for the sanitation chain.
Guide 7 was added to support the decision-making process in identifying if small-bore sewerage could be considered as an appropriate solution in a given context.

WHAT PURPOSE DOES IT SERVE?

The CMS was developed to bring inclusion of all local actors (public/private sector, civil society and NGOs) together to develop water and sanitation strategies. The approach applies to the entire local authority area and results in immediate feasible actions documented in a shared strategy document that sets out a vision tailored to an identified demand and to local financial and management capacities.

CURRENT STATUS / PRACTICAL EXPERIENCES

Implementation in the town of Dschang, Cameroon, in 2006 demonstrated how CMS can work successfully. Following the three steps of detailed diagnostic, discussion of findings and definition of interventions, the strategy led to the establishment of a municipal agency that was able to mobilise resources for investments to improve access to water and sanitation within the municipal area. Although this could not be achieved in other towns during the pilot phase until 2010, it increased awareness about the wide range of needs and forms of sanitation services that should be considered when developing local public policy[4].

WHERE IT HAS BEEN USED?

In total, the CMS approach for large towns was piloted by pS-Eau and the MDP in 15 towns (from 30,000 to 300,000 inhabitants) in West, Central and East Africa. The regional small-town approach was piloted in three regions in Ghana, Burkina Faso and Mali. Documented evidence of practical experiences beyond these projects, which were implemented between 2007 and 2010, is lacking. However, according to personal communication with pS-Eau staff, the approach is still applied within projects of pS-Eau.

DISCUSSION

CMS belongs to the family of urban planning approaches also known as City Sanitation Planning (CSP). When used in urban planning departments, these plans and strategies are embedded in city budgets and allow for a holistic approach to city and sanitation planning. In some countries, the preparation of plans is required by the state and central governments and linked to financial incentives or funding pots. The technical and non-technical aspects for delivering sanitation are taken into consideration and it draws upon the fundamentals of planning models and approaches that have evolved in the 90s and early 2000s, such as those outlined by John Kalbermatten, the Strategic Sanitation Approach and the Household-centred Environmental Sanitation approach[3]. The CMS approach and other CSP approaches aim to develop a shared vision of challenges; define current and aspirational service levels and their quality standards; assess viable resources to reach higher service levels and help identify financial resources needed to achieve them.[4]

REFERENCES / LINKS

[1] Concerted Municipal Strategies. Component 3: Six methodological guides. www.pseau.org/en/cms/guides. Accessed 2020-04-16.
[2] Service d'assainissement par mini-égout. www.pseau.org/mini-egouts. Accessed 2020-04-16.
[3] Kennedy-Walker et al. (2014).
[4] Programme Solidarité Eau newsletter, Number 71, December 2012. www.pseau.org/outils/ouvrages/ps_eau_lettre_du_ps_eau_71_en_2012.pdf. Accessed 2020-04-16.
[5] Guide pS-Eau n°7, Service d'assainissement par mini-égout. Dans quels contextes choisir cette option, comment la mettre en œuvre?, J.M. Ily, C. Le Jallé, J. Gabert, D. Désille, pS-Eau, 2014. www.pseau.org/mini-egouts
[6] www.pseau.org
[7] http://mdpafrica.org.zw

IMPORTANT POINTS & LESSONS LEARNED

The process of developing the strategy involves three main steps:
1. preparing a detailed concerted diagnostic, including socio-economic and technical components;
2. sharing and discussing diagnostic findings with all stakeholders; and
3. defining an intervention strategy.

The main challenges include the recommendation that the process needs to be locally led and promoted, while relying on a neutral external facilitator with proven skills, expert knowledge and legitimacy from the national government.

Not a fixed, overly detailed framework, but one that provides guidance and clarification built upon a multi-stakeholder consensus reached through consultation.

Applicable to water supply, excreta and faecal sludge management and simplified sewerage interventions in large towns and regions with small towns.

The guides are intended for elected and municipal officials and their development partners in order to guide the process of the development of a strategy.

Aimed at matching offers and demand by bringing together different actors.

Community-Led Urban Environmental Sanitation

A structured, area-based sanitation planning approach

CLUES is a field-tested multi-actor approach accounting for water supply, sanitation, solid waste management and storm water drainage with a focus on under-served urban neighbourhoods. The participatory approach includes seven planning steps. It facilitates stakeholder engagement from an early stage and emphasizes inclusive establishment of planning objectives. The seven steps are accompanied by three cross cutting actions:

1. awareness raising and communication;
2. capacity development; and
3. process monitoring and evaluation.

Part 1 of the guidelines explains the steps.
Part 2 describes the "enabling environment" (see icon).

ORIGIN:
Eawag-Sandec, based on the Household-Centred Environmental Sanitation (HCES), implementing some of the positive experiences learned at local level.

FORMAT:
PDF manual and 30 downloadable "how-to-do-it" tools and checklists

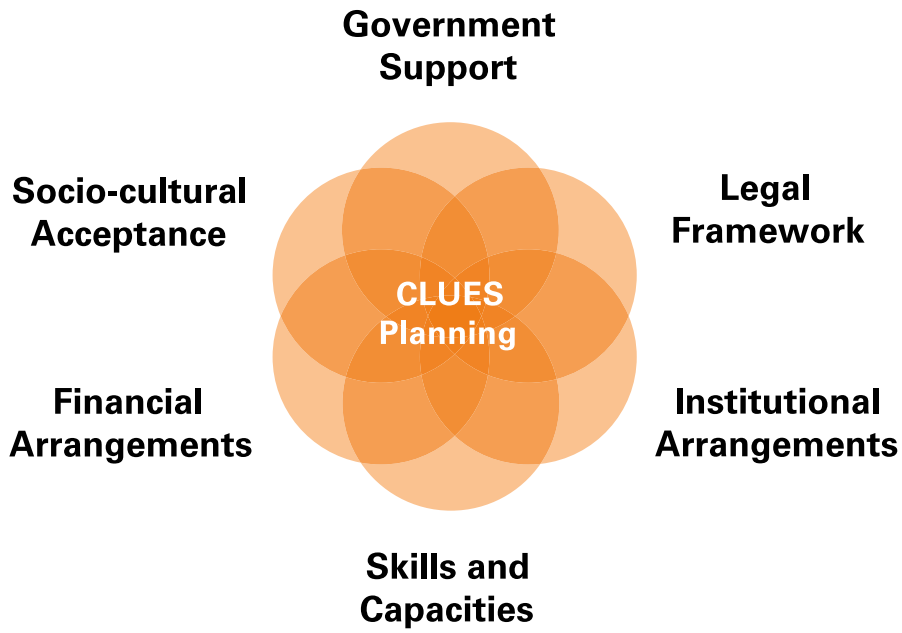
FIRST PUBLISHED:
2011

SUPPORTED BY:
SDC, WSSCC and UN-Habitat

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning
5) Action

Community-Led Urban Environmental Sanitation [1]



WHY IT WAS DEVELOPED?

CLUES was developed to overcome the limitations of planning culture and capacity, which is dominated by supply-led, heavily engineered solutions. Past experience shows that if plans are not suited to the local technical and managerial capacities, implementation is unlikely. Like HCES, CLUES also attempts to involve and mobilise all stakeholders, particularly the targeted community, giving the beneficiaries a stronger voice in decision-making about basic urban services. The experiences from piloting and testing of the HCES approach were used to develop a simplified set of guidelines for area-based and community-centred sanitation planning.

WHAT PURPOSE DOES IT SERVE?

The CLUES approach aims to provide more safely managed sanitation in unserved and under-served urban neighbourhoods. It helps to overcome the poor design and implementation of community-based sector development projects by providing a seven-step structured planning itinerary from project initiation to implementation. CLUES belongs to the growing body of area-based (i.e. not citywide) and demand-responsive planning approaches that combines expert knowledge (rational comprehensive planning) and community/stakeholder knowledge (collaborative planning). The goal is to achieve an implementable environmental sanitation plan with buy-in and commitment at the local level. The integral toolbox with 30 generic tools aims to provide better guidance for the implementation of the seven planning steps.

CURRENT STATUS / PRACTICAL EXPERIENCES

CLUES guidelines are available in three languages (English, Spanish and Arabic) and have been widely implemented in the past decade. Practical experience shows that CLUES implementation is most promising if:

- the community or neighbourhood is already organised and not too heterogeneous,
- sanitation (or the lack of) is perceived as a priority, and
- a capable facilitator keeps the planning on track and provides timely communication to all involved stakeholders.

WHERE IT HAS BEEN USED?

CLUES has been implemented in Africa (Uganda, Kenya, Tanzania and Zambia), Asia (Nepal, India and Laos) and Latin America (Ecuador and Costa Rica). Implementing agencies include UN-Habitat, GIZ, SDC and various international and local NGOs. A number of these projects have been documented and published (see references below). Not all examples have followed all seven planning steps, but have, at least, adopted and incorporated CLUES features on a case-by-case basis (e.g. step 3: Detailed Assessment or step 6: Development of an Action Plan). The most widely used section of the guidelines has been the mapping of six key elements of the enabling environment (see icon on previous page).

DISCUSSION

CLUES is the only environmental sanitation planning approach that provides a comprehensive tool set and guidance on "how-to" implement each step of the planning process. This is especially important in contexts with a lack of planning culture as this can seriously constrain efforts at strategic planning. However, people-centred planning takes time, more than conventional expert-led planning approaches; yet, it offers a higher level of process flexibility. Successful implementation requires the consideration of the three cross-cutting activities and the enabling environment. The informed choice approach in step 5 requires skilled facilitation and expert participation during the sanitation system selection process. Since the focus is at neighbourhood level, it does not cover more strategic citywide sanitation planning concerns.

REFERENCES / LINKS

[1] CLUES Guidelines: Lüthi et al. (2011a).
[2] CLUES website: www.sandec.ch/clues
[3] Susana website: www.susana.org/en/knowledge-hub/resources-and-publications/library/details/1300

IMPORTANT POINTS & LESSONS LEARNED

CLUES can lead to better sanitation intervention outcomes with higher community ownership.

Special attention needs to be given to including minorities and less out-spoken segments of the community (e.g. through focus group discussions, gender-based prioritisation).

Experience from implementation shows that decision-making in multi-stakeholder settings requires strong project leadership to ensure that joint decisions are followed by action.

Managing the interface between area-based planning and more strategic citywide planning remains a challenge.

Sanitation 21

An integrated, multi-stakeholder citywide planning framework

Sanitation 21 (San21) is a new generation planning framework based upon international best practices where good planning has formed an integral part of achieving improvements in Urban Sanitation. Unlike Community-Led Urban Environmental Sanitation (CLUES), San21 has a citywide perspective, and provides a holistic planning framework rather than detailed technical guidance. San21 is founded upon five planning stages:

1. build institutional commitment and partnership;
2. understand the existing context and define priorities;
3. develop systems for sanitation improvement;
4. develop models for service delivery; and
5. prepare for implementation.

ORIGIN:
The joint IWA, Eawag, and GIZ, document Sanitation 21: "A Planning Framework for Improving City-wide Sanitation Service" is a further development of IWA's "Sanitation 21 – Simple Approaches to Complex Sanitation" (2005).

FORMAT:
PDF manual with 38 pages

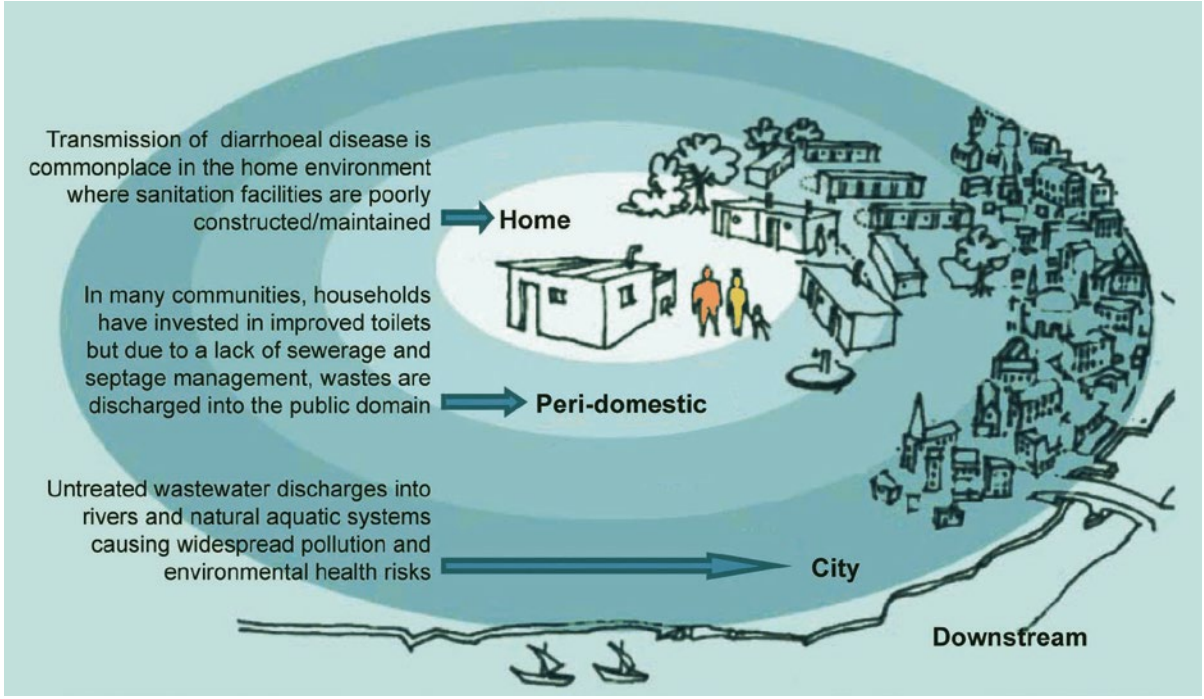
FIRST PUBLISHED:
2014

SUPPORTED BY:
IWA and GIZ

IMPLEMENTATION:
n.a.

SANITATION PLANNING PHASE:
From project initiation to design

Public health risks at different levels related to poor sanitation[1]



WHY IT WAS DEVELOPED?

The need to adopt a new approach towards planning for improving Urban Sanitation services in low- and middle-income countries emerged in response to the unsatisfactory performance of past master planning approaches, which paid insufficient attention to:

- equitable service delivery for low-income and informal areas,
- the role of the private sector in service provision,
- the potential benefits of alternative, non-sewer systems,
- the need to ensure demand to pay for services and
- capacity development.

San21 is based on a more realistic perspective of the need to secure the necessary finances for implementation that are less dependent on external funding and, even more importantly, ensure cost-recovery for long-term sustainability.

WHAT PURPOSE DOES IT SERVE?

It encourages stakeholders to envision and work towards clear and realistic targets that correspond to users' demands and to the different physical and socio-economic conditions within a city.

CURRENT STATUS / PRACTICAL EXPERIENCES

The San21 framework was launched at the IWA Development Congress in Nairobi in 2013 and published by the International Water Association (IWA) with a foreword by Glen Daigger, then President of the IWA. Always intended as a conceptual framework, rather than detailed guidelines, San21 never 'hit the ground', but it can be seen as a precursor to the Citywide Inclusive Sanitation approach as it promotes much of the same thinking: multi-stakeholder, strategic vision, incremental and multi-optional, etc.

WHERE IT HAS BEEN USED?

San21 was never intended as a detailed technical guide for planning and programming Urban Sanitation. Its strength lies in its strong conceptual framework. Practitioners in a number of countries and in various development partner agencies reported that this aspect influenced the city sanitation plans they were responsible for.

DISCUSSION

San21 did not gain significant traction among those responsible for the preparation of city sanitation plans, mainly because it was not designed as a detailed technical guide. It was endorsed and promoted by the International Water Association, which added clout to its concepts, but it lacked stronger institutional backing with funding for dissemination and to promote uptake.

However, the approach gained widespread sector visibility and helped efforts to move away from the traditional, physically focused master plans to today's more contemporary thinking on inclusive sanitation. Thus, San21's main contribution to the sanitation sector has been to systematise an inclusive citywide approach.

REFERENCES / LINKS

[1] San21 (pdf) can be downloaded from the Susana website: www.susana.org
[2] Lüthi, C. and Parkinson, J. 2011. Environmental sanitation planning for cities of the South: linking local level initiatives with city-wide action, Loughborough, UK. http://wedc.lboro.ac.uk/resources/conference/35/Luthi-C-1195.pdf

IMPORTANT POINTS & LESSONS LEARNED

San21 sets out key principles and process guidelines to help city stakeholders develop appropriate and affordable solutions to sanitation problems, while considering appropriate technologies, management arrangements, institutional challenges, and user demands.

It highlights the need to build institutional commitments and partnerships and to develop a collective vision of the current needs based on current infrastructure.

A supportive enabling environment with respect to policy and governance is key to the success of implementation of the plan. Capacity building actions required for ensuring that facilities and infrastructure are managed and well maintained are just as important as the proposed improvements themselves.

San21 does not reinvent sanitation planning, but aims to distil down the experiences from various planning methodologies that look at implementing the principles of strategic sanitation planning (e.g. City Sanitation Plans).

Open Planning of Sanitation Systems

A process-oriented and open approach for selection of sanitation system in a given setting. It is also known as Open Wastewater Planning.

OPSS is a five-step process that enables choosing the most appropriate sanitation solution in a given setting. It has a technology-neutral starting point, initially focusing on criteria the system should meet, before addressing which sanitation technologies and systems can meet those criteria. There is stakeholder involvement in several of the steps, including in the final decision-making step. The process, with its transparent approach, has proven useful in situations where conflicts exist/may happen. It is not a full sanitation planning process in and of itself, since its focus is to be a transparent approach that enables only the choice of a technology/system. It is, therefore, useful as an add-on in other, more encompassing planning approaches in combination with other tools.

ORIGIN:
Peter Ridderstolpe, Water Revival Systems, Uppsala, Sweden

FORMAT:
Process-oriented planning tool for choosing sanitation technologies and systems

FIRST PUBLISHED:
1999, in English

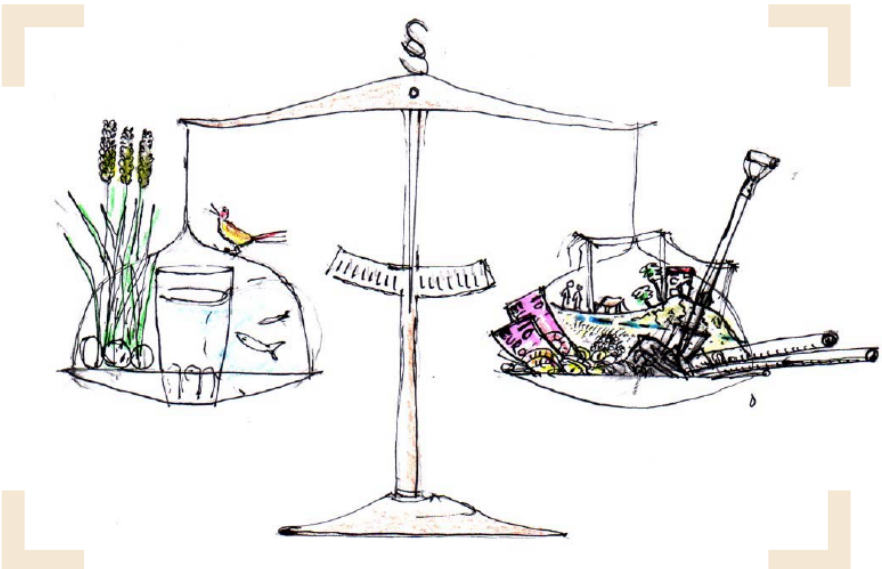
SUPPORTED BY:
Global Water Partnership (GWP) and Coalition Clean Baltic

IMPLEMENTATION:
Mainly Sweden and Eastern Europe

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning

WHY IT WAS DEVELOPED?

OPSS was developed to improve the decision-making process in sanitation projects, make decision-makers and stakeholders look at the consequences of different systems along the entire service chain, and to take into account both primary and regulatory (health and environment) and practical (social, costs etc.) considerations.



Water Revival Systems [5]

WHAT PURPOSE DOES IT SERVE?

It recognises that the desired primary outcomes of a sanitation system (protection of human health and the environment in a sustainable manner) can be met by many different technology and system options. The starting points are technology neutrality and stakeholder involvement, which can help create a constructive and objective dialogue around the merits and shortcomings of different technologies, using stakeholder-identified criteria. This can be particularly useful in settings where there might be a risk of conflicting interests between stakeholder groups and strong voices regarding certain technologies. The process makes decision-making transparent, showing the pros and cons of a number of chosen sanitation systems. It helps to unveil conflicting interests and allows for a discussion of the trade-offs between different systems.

CURRENT STATUS / PRACTICAL EXPERIENCES

The method is currently used in different manners and in different scales in decision-making: from guidance and direction at national levels, down to picking a specific technology for a specific situation. Stakeholder involvement varies depending on the contextual conditions.

WHERE IT HAS BEEN USED?

The process has been extensively used in Sweden since the 1990s, especially in planning situations where an extension of the wastewater jurisdiction had been planned, and where additional investments in sanitation solutions could be demanded from house owners.
It has also been used in planning situations in Botswana, Estonia, Latvia, Lithuania and Poland. And it has been adopted by the GWP Central & Eastern Europe Sanitation Task Force and is recommended for all their 13 countries. In addition, elements of the process have been included in projects in other settings, such as Botswana, Lima, Peru, and Bolivia.

DISCUSSION

OPSS is a transparent process where professionals work closely with relevant stakeholders in the process of choosing a sanitation system. It is not a full sanitation planning process in and of itself, but it is a suitable method for making technology and system choices that can be embedded in larger planning processes, such as Sanitation 21 or Community-Led Urban Environmental Sanitation (CLUES). It is a process-oriented tool with extensive stakeholder involvement; this entails higher front-end costs. However, the costs spent on the process of planning may lead to easier implementation in the long run. The process itself creates better stakeholder understanding of decision objectives and available decision options, and helps in the setting of common goals. This can increase ownership in the best of cases and it will help reveal conflicts that need to be resolved to make systems function in the long term. The approach can also be used for technical situations, which may not necessarily demand extensive stakeholder involvement. Technology neutrality and a criteria approach also function well in purely technical decision-making.

REFERENCES / LINKS

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[2] Kvarnström, E. and af Petersens, E. 2004. Open Planning of Sanitation Systems. EcoSanRes series, Report 2004-3. www.susana.org/en/knowledge-hub/resources-and-publications/library/details/193

[3] Ridderstolpe, P. 2004. Sustainable Sanitation for a new housing Area – how to find the right solution. WRS Uppsala AB, Sweden. https://bit.ly/3pLg6ya

[4] Kirk, B., C. Etnier, E. Kärrman, and S. Johnstone. 2005 Methods for Comparison of Wastewater Treatment Options. Project No. WU-HT-03-33. Prepared for the National Decentralized Water Resources Capacity Development Project. Washington University, St. Louis, MO, by Ocean Arks International, Burlington, VT. https://decentralizedwater.waterrf.org/documents/WU-HT-03-33/WU-HT-03-33.pdf

[5] Bodik, I and Ridderstolpe, P. (eds). 2007. Sustainable Sanitation in Central and Eastern Europe – Addressing the Needs of Small and Medium-sized Settlements. GWP Central and Eastern Europe. https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/649

[6] Kvarnström, E. and McConville, J. 2007. Sanitation Planning – a Tool to Achieve Sustainable Sanitation? Huber International Symposium, Sept 27-28, 2007. "Water and Sanitation for All". https://bit.ly/3rgE1pw

IMPORTANT POINTS & LESSONS LEARNED

This procedure uses a multi-criteria decision-making approach to support more strategic and transparent sanitation technology and system selection during the planning procedure.

One major strength of this approach is its provision of a transparent evaluation process of how different technologies meet criteria identified by relevant stakeholders.

Moreover, trade-offs between different technologies and stakeholder preferences are made visible in the process.

The five steps are:
1. problem identification;
2. boundary identification;
3. criteria identification;
4. analysis of possible solutions;
5. choice of most appropriate solution.

The first three steps require strong stakeholder involvement. This results in higher front-end costs, but also enhances ownership.

Criteria should include both regulatory (e.g. public health requirements, discharge standards and reuse demands), and practical requirements (e.g. user preferences, costs and robustness).

The co-development of the criteria along with the transparency of the process increase the understanding of the results and, therefore, the acceptance of the selected technical options.

Self-esteem, Associative strengths, Resourcefulness, Action Planning & Responsibility / Participatory Hygiene and Sanitation Transformation

A tool to engage communities and facilitate participatory planning processes

SARAR is an approach to capacity development and community empowerment that uses a weaving of participatory methods and exercises to stimulate creative problem-solving, building on local experience and knowledge. Throughout the training, individuals and groups from different contexts carry out a situational analysis, identify opportunities and plan solutions to their problems, taking ownership of the process. PHAST is a structured programme application of the SARAR methodology that is specifically focused on hygiene behaviour change and sustainable sanitation improvement. PHAST consists of seven-steps:

1. problem identification,
2. problem analysis,
3. planning for solutions,
4. selecting options,
5. planning for new facilities and behaviour change,
6. planning for monitoring and evaluation, and
7. participatory evaluation.

ORIGIN:
Lyra Srinivasan and key associates, Ron Sawyer, Jacob Pfohl and Chris Srinivasan*

FORMAT:
Participatory facilitation and training; visual and dramatic materials

FIRST PUBLISHED:
SARAR in 1990 (developed in late1970s); PHAST in 1997

SUPPORTED BY:
Sarar Transformación, World Bank/WSP, WHO, PROWWESS/UNDP, Habitat for Humanity, Uno Winblad, SEI EcoSanRes)

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning
5) Action

SARAR – Tools for Community Participation[2]

S	SELF-ESTEEM	The self-esteem of groups and individuals is acknowledged and enhanced by recognizing that they have the creative and analytic capacity to identify and solve their own problems.
A	ASSOCIATIVE STRENGTHS	The methodology recognizes that when people form groups, they become stronger and develop the capacity to act together.
R	RESOURCEFULNESS	Each individual is a potential resource to the community. The method seeks to develop the resourcefulness and creativity of groups and individuals in seeking solutions to problems.
A	ACTION PLANNING	Planning for action to solve problems is central to the method. Change can be achieved only if groups plan and carry out appropriate actions.
R	RESPONSIBILITY	The responsibility for follow-through is taken over by the group. Actions that are planned must be carried out. Only through such responsible participation do results become meaningful.

WHY IT WAS DEVELOPED?

The SARAR methodology was developed so that the people who are the most affected by any given problem can actively engage in the search for alternatives and solutions. The techniques and activities described in the SARAR methodology encourage and stimulate user's creativity and innovation, placing a strong focus on its underlying principles rather than on the technique itself. SARAR's basic principle is the recognition and affirmation of people's innate abilities. It is based on the idea that people will solve their own problems best in a participatory group process and that they collectively have sufficient knowledge and experience to address these problems and to identify and assimilate appropriate external support. Building on these principles, the more structured PHAST approach was developed to encourage hygiene behaviour change and management of water and sanitation services to control diarrheal disease.

WHAT PURPOSE DOES IT SERVE?

The purpose of the SARAR/PHAST approach is to enable community members to work out what they want to do, how it should be implemented and paid for, and how the community can sustain and replicate the resulting positive effects in the future. SARAR/PHAST seeks to help communities to improve their overall water, sanitation and hygiene situation by:

- demonstrating the relationship between sanitation, water quality and health status,
- increasing the self-esteem of community members
- empowering the community to plan environmental improvements and to own and operate water and sanitation facilities.

CURRENT STATUS / PRACTICAL EXPERIENCES

In the early 80's, the SARAR methodology was incorporated by the "Promotion of the Role of Women in Water and Environmental Sanitation Services" (PROWWESS) programme, led by UNDP and implemented in over 20 countries in Asia, Africa and Latin America. Although originally designed for rural use, the SARAR methodology has proven to be extremely flexible in adapting to urban settings. In 1993, PHAST was first piloted in four African countries (Botswana, Kenya, Uganda, and Zimbabwe) with encouraging results regarding improvements of hygiene behaviour in communities. Since then, PHAST has been incorporated into a range of sanitation and health programmes throughout Africa, Latin America, and Asia.

WHERE IT HAS BEEN USED?

The SARAR methodology and tools have been extensively applied and adapted in a variety of sectors and countries in Latin America, e.g. Central America (Mexico), South America (primarily Bolivia, Peru, Columbia, Ecuador and Brazil) and the Caribbean. It was also applied in Africa (Kenya, Uganda, Ethiopia, Tanzania, Mozambique, Zimbabwe, Zambia, Swaziland Botswana, Lesotho, South Africa, Nigeria, Ghana, Burkina Faso, Mali and Cabo Verde), and Asia (Bangladesh, Nepal, Pakistan, Afghanistan, Thailand, Myanmar, Indonesia, Kyrgyzstan and Mongolia).

DISCUSSION

SARAR/PHAST can be very rewarding to both community members and community workers, by effectively involving them in project planning, implementation, monitoring and evaluation through participatory techniques. Yet, it requires experienced community workers and in-depth training (on average two weeks and regular refresher courses) in order to succeed. This might be more feasible in smaller projects, but can be challenging for big urban centres. The application of SARAR/PHAST tools requires time and full engagement from participants, as the quality of participation in the community, and therefore, the results of it, improve through the cumulative effect. If not properly discussed in advance, the time demand might be seen as a burden by participants in the face of other competing needs (i.e. paid work, child-care, etc.).

SARAR and PHAST have served as a basis for the development of numerous other approaches and programmes, e.g. Methodology for Participatory Assessments (MPA) developed by WSP; Children's Hygiene and Sanitation Training (CHAST) developed by Caritas; Community Health Clubs (CHC) promoted by AfricaAhead; Participatory Approach to Safe Shelter Awareness (PASSA) developed by International Federation of the Red Cross (IFRC); CLTS, developed at the Village Education Resource Center (VERC) in Bangladesh with the core team that had pioneered SARAR in Asia during the 1980s and 90s; DesCom, developed by the Ministry of Water in Bolivia; and Centro para Promoción y Desarrollo Andina – ProAnde – Peru; and Entornos Saludables (Healthy Environments), a programme of the Ministry of Health in Colombia.

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IMPORTANT POINTS & LESSONS LEARNED

Fieldworkers or trainers provide the simple structure of the problem-solving activity or task. The content comes mainly from the participants, drawn from their own rich life experience. The tasks require open peer discussion and teamwork.

The major strength of the approach is its apparent simplicity. It is easy to understand and adapt to collectively resolve complex challenges.

The SARAR practical activities increase the relevance of the learning by the participants, enabling them to develop their self-assurance, new forms of self-expression and problem-solving skills.

Usually, introductory training lasts from 6 to 12 days, with follow-up facilitation for up to six months, depending on the time available in the community.

T2 TAF

Technology Applicability Framework

A tool to assess the sustainable application and scalability of WASH technologies

The TAF is a participatory decision support tool to assess the applicability and scalability of a certain WASH technology. It analyses the financial, social, institutional, legal, environmental, technical and capacity conditions from the perspective of three stakeholder groups (users/buyers, producers/providers and regulators/investors/facilitators). Its results show the suitability of a technology for the given contextual conditions and the key requirements (risks and opportunities) for its successful introduction or scaling-up.[1]

ORIGIN:
WASHTech action research project (2011–2013), SKAT was the lead organisation (other organisations involved include IRC, WaterAid, Cranfield University, WSA Burkina Faso, KNUST Ghana, NETWAS Uganda)

FORMAT:
Manual, templates and workshop materials

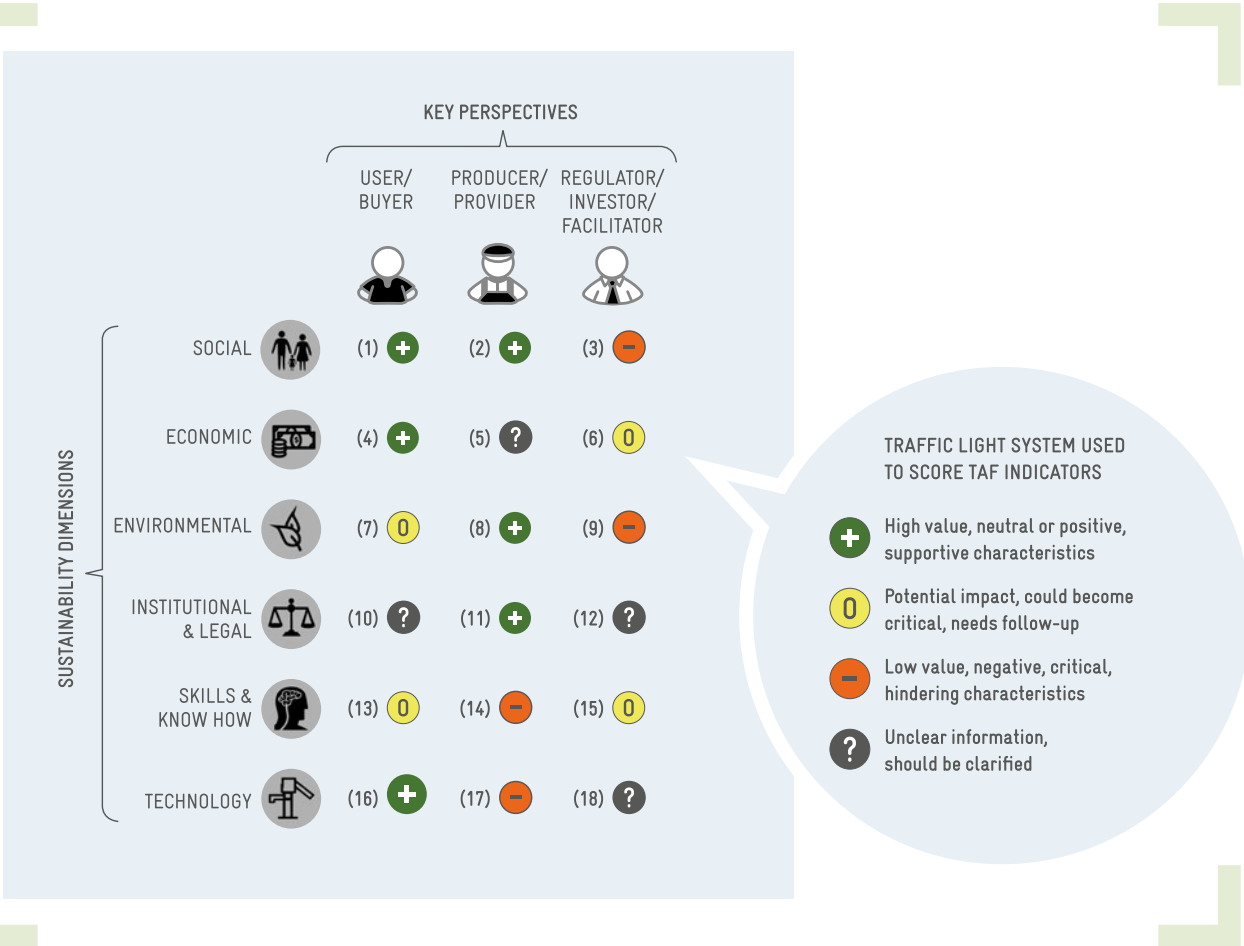
FIRST PUBLISHED:
2013

SUPPORTED BY:
EU FP7 framework [1]

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
4) Planning

Sustainability Dimensions [1]



WHY IT WAS DEVELOPED?

When delivering WASH services, decision makers have to choose from an increasing variety of technology alternatives, including novel options, for which little practical experiences are available. At the same time, the challenge to sustain operation with consistent service levels remains. Many countries lack policies and standards for the assessment of a variety of WASH technologies. The lack of systematic and transparent methods to assess the suitability of a variety of technologies for the purpose or local context can lead to arbitrary implementation. Moreover, lessons learnt in pilots are often not widely transferred and there is usually little or no feedback loop between communities, producers and implementers.[2]

WHAT PURPOSE DOES IT SERVE?

The purpose of the TAF is to assess the applicability, scalability and sustainability of the service provision of a specific WASH technology in a given context. It is not intended to provide one single best option. The results allow for a better understanding of the performance of a technology, regarding different sustainability dimensions and the requirements for its introduction. The final selection still remains with the decision actors.[2] The TAF is a participatory approach, thereby, also inspiring and motivating dialogue between stakeholders.[3]

CURRENT STATUS / PRACTICAL EXPERIENCES

In the course of the WASHTech action research project, the TAF was field tested in three countries (Ghana, Burkina Faso and Uganda). Host organisations at the national level were appointed in each country, to provide an institutional memory and national resource base.[2]

WHERE IT HAS BEEN USED?

The TAF has been applied in various countries worldwide. Besides Ghana, Burkina Faso and Uganda, it was also used in Tanzania, South Sudan and Nicaragua.[1] GIZ, for example, implemented the TAF to assess the scaling-up potential of technical innovations (e.g. the handwashing station WASHaLOT, faecal sludge transfer stations, a sanitary pad machine or DEWATS) in the Philippines, Uganda, Nepal, Afghanistan and Zambia.[3]

DISCUSSION

During the TAF testing phase it became clear that the success of a technology highly depends on the introduction process after a certain technology has been selected. Hence, alongside the TAF, the Technology Introduction Process (TIP) was developed. The TIP is a guidance document to coordinate the introduction of a new WASH technology. It supports actors in the scale-up of promising technologies, that passed the TAF assessment. The TIP describes the roles and tasks of the main actors for two different cost models and highlights critical factors of all three introduction phases (Invention, Tipping Point, and Uptake & Use).

The TAF methodology can also be applied as a decision support tool for technologies in other sectors (e.g. irrigation systems, waste management, renewable energy or transportation).[3]

The TAF is limited to assessing technologies, and is not useful for selecting technologies. It can only support the selection process, when it is conducted for several technologies in the same setting.

REFERENCES / LINKS

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IMPORTANT POINTS & LESSONS LEARNED

The TAF comprises of four subsequent steps:
1. screening;
2. assessment;
3. presentation; and
4. interpretation.

The perspective of each actor is considered in two ways. Firstly, all stakeholders are involved in the data collection. Secondly, their views are reflected in the scoring of 18 indicators.

The results of the scoring are visualised in a matrix graphic profile, facilitating their transparent presentation and the comprehensive interpretation of results through identifying strengths, risks and uncertainties.[3]

All relevant actors must be included in the process through field visits and workshops.[2]

Strong facilitation during the scoring workshop is required, to ensure that every actor group can articulate its view and that vested interests do not determine the process.[1]

This allows for a higher level of understanding of the enabling environment for a certain WASH technology among all stakeholders.

Life-Cycle Costing for WASH

A tool to analyse cost data from water, sanitation and hygiene services

IRC popularised life-cycle costing for water, sanitation and hygiene (WASH) services. The life-cycle costs (LCC) tool by IRC provides the framework and guidance for the analysis of cost data from WASH services. The tool was developed for water services in rural and peri-urban areas to support the comparison of costs at the district level consistent with common accounting and financing practices (e.g. asset management, cash flow analysis, etc.).
An important objective of implementing LCC is to develop an understanding of different cost components, leading to long-term sustainable service provision[1]. IRC developed a range of tools to support the implementation of a LCC framework for WASH.

ORIGIN:
IRC Netherlands

FORMAT:
PDF documents, web-based tool, MS Excel tools

FIRST PUBLISHED:
2011

SUPPORTED BY:
Bill & Melinda Gates Foundation, Netherlands Ministry of Foreign Affairs

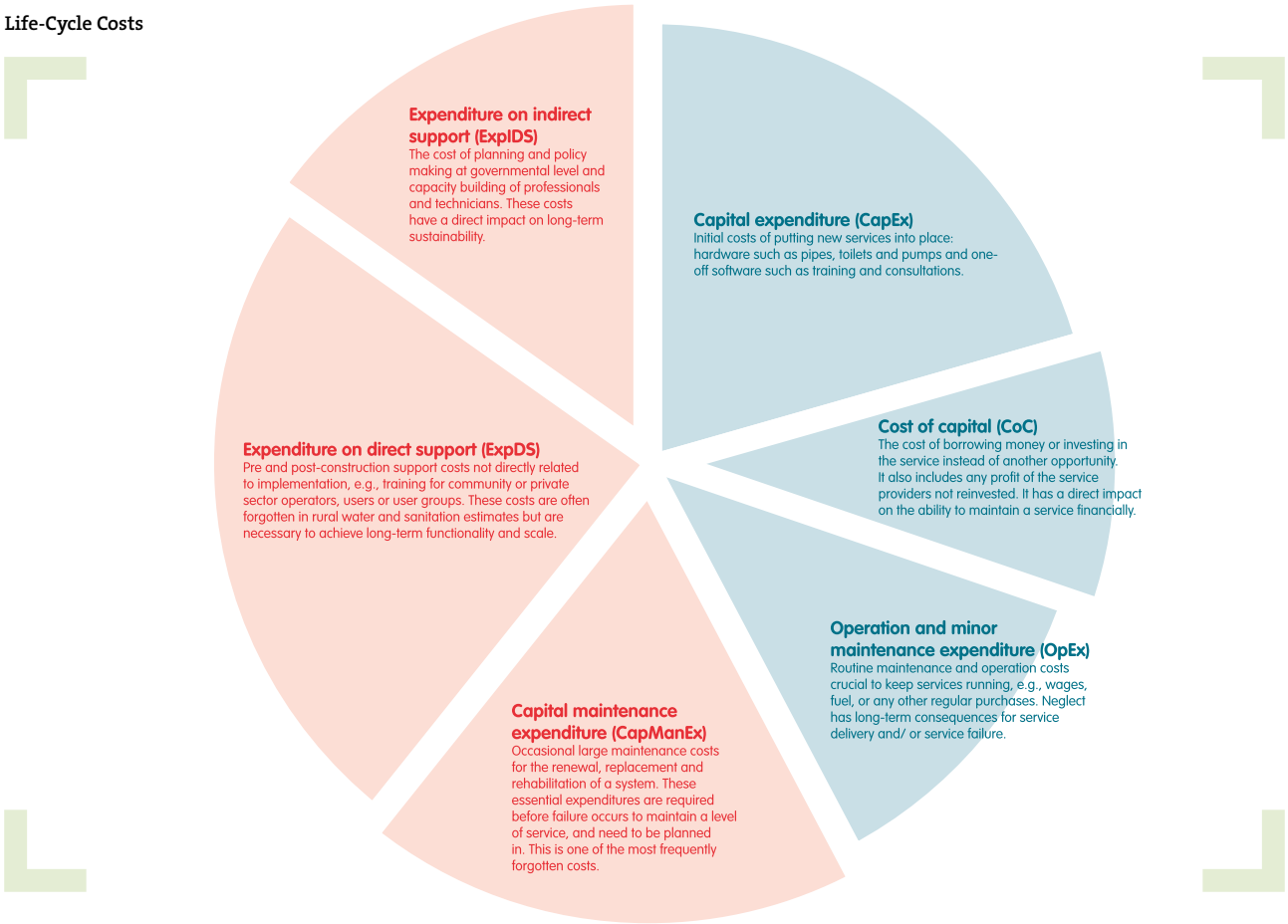
IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
4) Planning
5) Action

WHY IT WAS DEVELOPED?

LCC is an outcome of the WASHCost project, which was implemented by IRC Netherlands with country partners between 2008 and 2013. The goal of the project was to fill the gap in information about the costs of WASH services in rural and peri-urban areas not served by utilities.

Life-Cycle Costs



The core objectives of LCC is to catalyse learning and raise awareness of the importance of life-cycle costing to improve the quality, targeting and cost effectiveness of WASH service delivery. It was developed to increase the ability of decision-makers and users to make informed and relevant choices between different types, levels and models of WASH services. A 'building block' approach is used that provides a consistent accounting framework to identify six cost components.[1]

WHAT PURPOSE DOES IT SERVE?

The purpose of LCC is to provide governments and donors with the ability to combine the different cost components of WASH services in a way that indicates how much is required to be budgeted or charged for each year to ensure sustainable services. The goal is to understand the relative magnitude of different costs to allow for setting policy and policy-informed planning and budgets. The six cost components as described in the iconography are:

1. capital expenditure;
2. operating and minor maintenance expenditure;
3. capital maintenance expenditure;
4. cost of capital;
5. expenditure on direct support; and
6. expenditure on indirect support.[1]

CURRENT STATUS / PRACTICAL EXPERIENCES

As part of the WASHCost project, the approach was tested in Burkina Faso, Ghana, Andhra Pradesh (India) and Mozambique. In collaboration with UNHCR, it has been extended to refugee camps and emergency settlements.[3] Further, the tools have also been applied in WASH Programmes in Bangladesh in collaboration with BRAC.[4] The approach and tools are being developed further and in February 2020 IRC published a detailed costing and financing study report for Asutifi North District Assembly in Ghana.[5]

WHERE IT HAS BEEN USED?

Elements of the life-cycle costs approach have been adopted by more than 100 of IRC's partners, including private sector organisations, universities, and national governments, such as those of Sierra Leone, Uganda, Tanzania, Democratic Republic of the Congo, South Sudan and Honduras. Among many international NGOs and national NGOs, BRAC (Bangladesh), WaterAid, Catholic Relief Services, Water for People and UNHCR are also using LCC elements to track costs and value for money[6].

DISCUSSION

IRC has developed and tested the LCC in many different contexts and countries since 2007 and the approach is being used in IRC's partner countries. A set of updated "Costing and Budgeting Tools" is available that has been developed in collaboration with Water for People and Aguaconsult. Together with the tools, a guide was developed that provides step-by-step guidance to practitioners for collecting data for a LCC to water service delivery at district level[8]. These are relevant to provide the financial backbone of District Master Plans. Guidance is provided on data collection, conducting surveys and interviews, and contextualising the information. The guide addresses water services in Ethiopia, but is equally applicable to other countries and for assessing sanitation services.[8]
For Urban Sanitation services, costing tools are developed by the Climate and Costs in Urban Sanitation (CACTUS)[9] project and the approach to Citywide Inclusive Sanitation (CWIS).[10]

REFERENCES / LINKS

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IMPORTANT POINTS & LESSONS LEARNED

The first step in understanding life-cycle costs is determining the status of existing infrastructure by creating an asset inventory.

Cost data is often considered as sensitive information, resulting in the reluctance of some information holders to release data.[2]

There is a discrepancy between obtaining a statistically sound sample and keeping data collection doable; this depends on resources and expectations.[2] Evaluating service quality from the perspective of the users can reveal great differences between official coverage data and actual service levels.[2]

The second step is to collect the cost data of the current service delivery and determine the gap between existing services and full coverage at the desired service level.

Data collection takes more time and effort than expected, as information is often scattered across many sources or due to the absence of financial records.[2]

T4 SFD

Shit Flow Diagram

A tool to visualise the current sanitation situation in cities and towns

The SFD tool uses data, specific definitions and terminology to create a graphic of excreta flows in urban areas, along with a systematic description of the enabling environment, and an overview of all data sources. The SFD helps to engage political leaders, decision makers and civil society in discussions about excreta and related investment and management priorities in their city.

ORIGIN:
World Bank-WSP, further developed by SFD Promotion Initiative (SFD PI[1])

FORMAT:
Manual, web-based tool

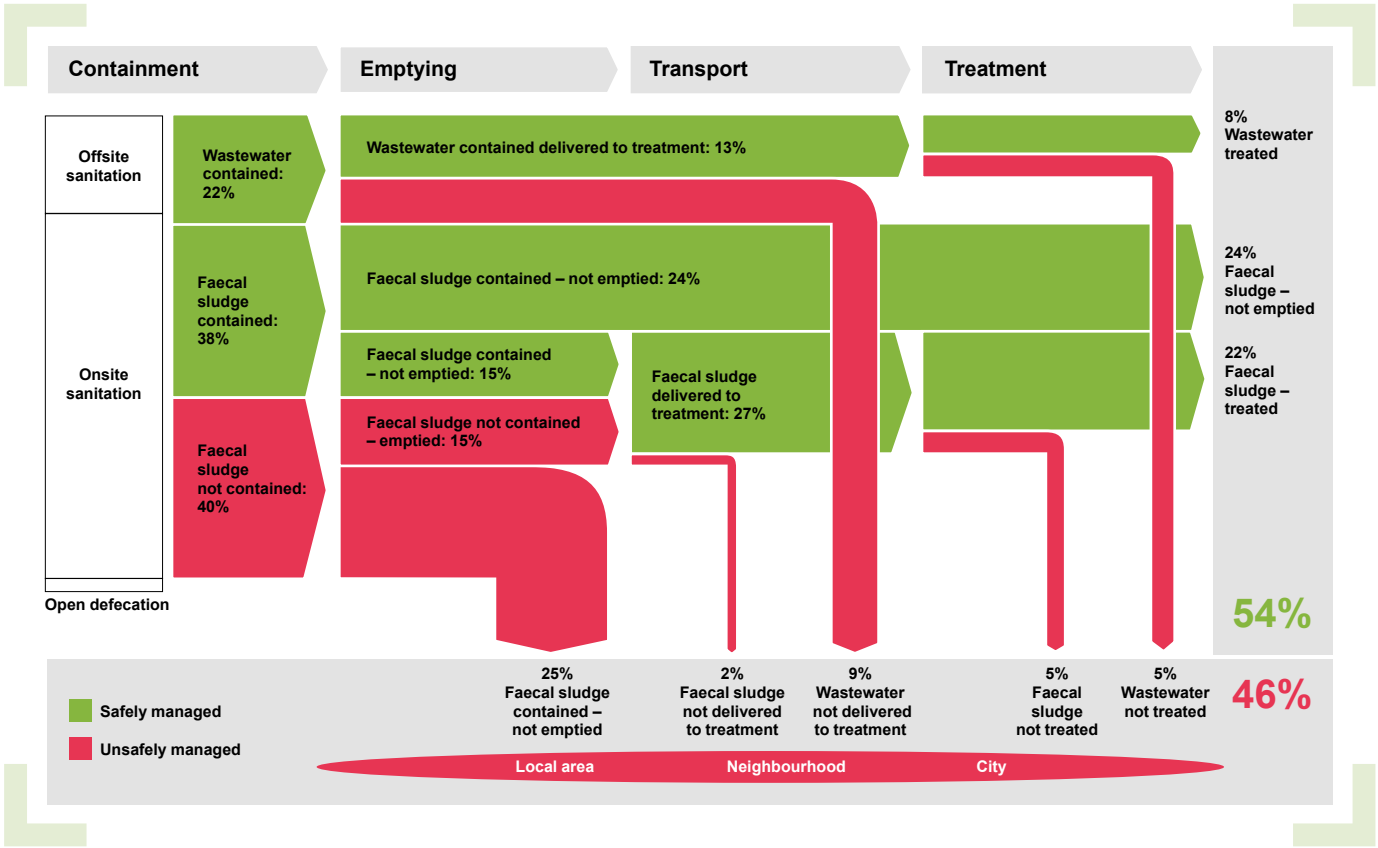
FIRST PUBLISHED:
2015

SUPPORTED BY:
Bill & Melinda Gates Foundation

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
1) Diagnostic

SFD Promotion Initiative / prepared by: Eawag-Sandec



WHY IT WAS DEVELOPED?

The SFD tool was developed to provide a structured approach to analysing the sanitation situation in cities. It presents complex information in a simple diagram and report. The first SFDs were developed by the World Bank's WSP in 2013.[2] The SFD PI developed an automated tool to generate the graphic, and defined a common methodology, terms, and definitions. The SFD graphic provides an overview of the current situation that is easily understood by non-technical decision-makers and does not necessarily depend on detailed and costly primary data collection. A complementary tool, the City Service Delivery Assessment (CSDA)[3], examines institutional aspects and helps to explain where and why system failures may be occurring.

WHAT PURPOSE DOES IT SERVE?

The SFD graphic and report assists advocacy and engagement among Urban Sanitation stakeholders assessing the current sanitation situation. Different levels of SFD reports (lite, initial, intermediate and comprehensive) can be selected to fit available data and resources, and result in different levels of detail and credibility. The SFD report should inform and generate support for a subsequent process on priority sanitation interventions, further data collection, an institutional analysis (CSDA), and the detailed planning and design of improved services and infrastructure.

CURRENT STATUS / PRACTICAL EXPERIENCES

The SFD tool has been widely used to trigger open discussions and to focus political and technical priorities on critical city sanitation challenges. The reporting templates have been used in more than 150 city reports. The SFD Graphic generator has been used in many more cities worldwide, but their data and reports have not been submitted for publishing on the SFD webportal.

WHERE IT HAS BEEN USED?

SFDs have been developed for hundreds of cities mainly in Africa and Asia, but also in Latin America, and over 150 reviewed SFDs can be retrieved from the SuSanA SFD repository.[1]

DISCUSSION

There are other tools that map excreta flows along the sanitation service chain. Some of these are: SaniPath[5], CLARA simplified planning tool[6], and Saniplan[7] and the Faecal Waste Flow Calculator[4]. Two exclusive features of the SFD are the graphic generator and the manual. These assist users to produce standardised SFD diagrams and reports. The graphic generator is available as a web-based tool and as a downloadable offline version for local use. The SFD PI also offers a review process that ensures that SFD estimates are appropriately referenced and that a credible explanation of assumptions is provided. Lastly, the SFD webportal provides a publishing platform for SFD reports. They can be used individually as reference materials and have also provided the opportunity to aggregate the data, allowing for national, regional and global insights into sanitation service delivery[8].

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[8] Peal, A. et al (2020).

IMPORTANT POINTS & LESSONS LEARNED

Local ownership of the SFD graphic and report is fundamental to generating traction for its message. Local stakeholders need to be involved in its development, and have the final say in its conclusions.

The SFD represents public health hazards, not risks, along the sanitation chain. It does not assess treatment performance or provide a quantification tool for the detailed planning of interventions.

The SFD has proven to be a powerful advocacy tool, allowing non-technical personnel to rapidly comprehend the main sanitation problems in a town or city.

The SFD PI provides an external review procedure that increases the credibility of the results.

SFD graphics are based on the contributing population, not volumes of faecal sludge or wastewater. This can easily be misunderstood.

T5 CSDA

City Service Delivery Assessment

A tool to assess the enabling environment for citywide inclusive sanitation

The CSDA tool supports a systematic process for working with stakeholders to assess the enabling environment for Citywide Inclusive Sanitation (CWIS), complementing the SFD assessment [2]. The tool has three main components:

1. optional initial assessment, which provides a rapid high-level overview;
2. full assessment, which analyses the enabling environment in more detail and
3. Action Checklist, which lists a number of interventions that have been found useful in improving sanitation services, and how they link to the CSDA analysis.

ORIGIN:
Inclusive Sanitation in Practice

FORMAT:
Excel tool, PDF manual and online tool within FSM toolbox

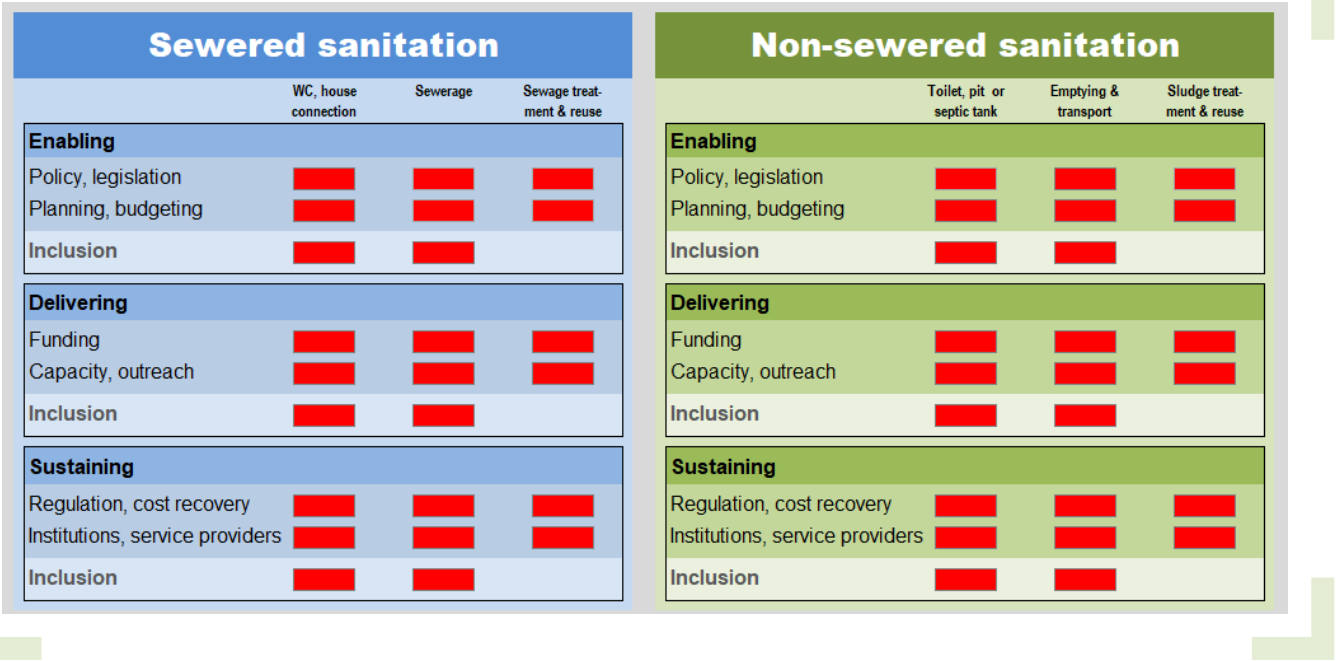
FIRST PUBLISHED:
2019

SUPPORTED BY:
Bill & Melinda Gates Foundation

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
1) Diagnostic

City Service Delivery Assessment for citywide inclusive sanitation – tool and user guide [1]



WHY IT WAS DEVELOPED?

A Shit Flow Diagram (SFD) illustrates the sanitation situation in a city, but not the underlying reasons for that situation. The CSDA is a complementary tool to assess why the situation is as it is.

WHAT PURPOSE DOES IT SERVE?

The CSDA tool is designed for use by consultants, facilitators or in-house specialists to facilitate working with stakeholders at the city or town level. The CSDA graphics are intended to support a process of discussion and decision-making on sanitation with government, utilities, municipal authorities, service providers, sanitation users, development partners and any other key stakeholders.

CURRENT STATUS / PRACTICAL EXPERIENCES

The CSDA has been especially useful in situations where:

- An SFD has been completed, but the stakeholders and decision-makers do not yet have a clear idea of what is required to improve the sanitation situation – but are motivated to improve it.
- CWIS is a new or emerging concept, and stakeholders have not yet worked together.
- Sanitation development has not previously been addressed in a systematic way, but there is some stakeholder interest in doing so.

The CSDA is currently available via the SuSanA website[1] and as a module within the FSM Toolbox[4].

WHERE IT HAS BEEN USED?

The CSDA concept builds on experiences in Dhaka, Bangladesh, Hawassa, Ethiopia, Balikpapan, Indonesia, Santa Cruz, Bolivia, and Lima, Peru. A first CSDA assessment was conducted by Makerere University for the city of Mbarara, Uganda, in 2020.

DISCUSSION

The CSDA is an updated version of a tool that was developed by the former Water & Sanitation Programme (WSP) in 2014. It is similar to other tools developed for reviewing the Urban Sanitation enabling environment, such as the sanitation component of Water and Sanitation for the Urban Poor's (WSUP) Evaluative Framework for Urban WASH Sector Functionality. However, the WSUP framework is designed to be applied at the national level. There are also parallels with IWA's Sanitation 21; Eawag's institutional 'flower diagram' and Pippa Scott's Sanitation Cityscape Conceptual Framework in stressing the importance of the enabling environment and the citywide perspective.

However, the CSDA is not necessarily suitable everywhere. Some situations in which it may be less suitable are where:

- No SFD has been developed, and data is limited.
- Decision makers are not yet motivated to prioritise actions to improve sanitation.
- Many reports on the enabling environment for sanitation have already been produced.
- A more specifically relevant local tool exists.
- No facilitator or consultant is available to facilitate the process.

REFERENCES / LINKS

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[2] SFD Webportal: https://sfd.susana.org
[3] CSDA User Guide: https://incsanprac.com/tools.html#CSDA
[4] FSMToolBox: www.fsmtoolbox.com

IMPORTANT POINTS & LESSONS LEARNED

The CSDA tool is complementary to the SFD and should be adapted for every situation and context.

The CSDA can be started at the initial or full assessment stage. However, a full CSDA assessment is needed to usefully apply the Action Checklist.

The CSDA is applied at the city or town level, where sanitation services are provided. It also considers the role of national policy, legislation, transfers to local government budgets and the monitoring progress and compliance.

Identification and involvement of all relevant stakeholders is necessary. This results in indicators and scores that are easily understood and results that have buy-in by decision-makers.

The tool is not designed for in-depth detailed reviews on, for example, sanitation legislation or monitoring systems. Such detailed reports may be required later when the situation is better understood by the stakeholders and the priority next steps have been agreed.

T6 SSP

Sanitation Safety Planning

A tool to coordinate actors and identify, manage and monitor health risks along the sanitation chain

The SSP tool assists all stakeholders, from sanitation system operators, households to farmers, using treated waste, to maximise health benefits and minimise the health risks of their systems. It can be used to assess, manage and monitor risks along the entire sanitation chain, and it provides a structure to bring together different stakeholders to agree on improvements and regular monitoring. SSP ensures that control measures target the greatest health risks and emphasises incremental improvement over time.[1]

ORIGIN:
World Health Organization (WHO)

FORMAT:
Book, PDF manual
(available in 8 different languages)

FIRST PUBLISHED:
2015

IMPLEMENTATION:
Global

SANITATION PLANNING PHASE:
1) Diagnostic
2) Strategy
3) Evaluation
4) Planning

WHY IT WAS DEVELOPED?

SSP was developed as a step-by-step guide to assist in the implementation of the 2006 WHO guidelines for the safe use of wastewater, excreta and greywater in agriculture and aquaculture. The overall objective of these guidelines is to maximise the benefits of reusing wastewater,[3] while minimising potential health and environmental risks. It helps in selecting economically feasible and technically sensible wastewater treatment methods and to suggest on-farm measures to limit exposure.[3] During the piloting phase, demand for SSP grew beyond reuse scenarios to all aspects of safely managed sanitation services. SSP features in the new WHO Guidelines for Sanitation and Health[2] as the approach for local level risk assessment and management. The 2nd edition of the SSP manual will align with these new guidelines and include additional detail on climate risk assessment.

Cover Page – Sanitation Safety Planning Manual[1]

WHAT PURPOSE DOES IT SERVE?

The purpose of SSP is firstly, to systematically identify and manage health risks along the sanitation chain, by applying a multi-barrier approach that combines several control measures. It provides practical guidance to prioritise and target these risk management efforts. Secondly, SSP provides assurance to authorities and the public on the safety of sanitation-related interventions. It is also used to stimulate policy dialogue and coordinate the efforts of many different stakeholders along the sanitation chain, including Departments of Health, utilities, the private sector, and environment and agriculture authorities. SSP also brings a human health perspective to traditional non-health sectors, such as agriculture and sanitation engineering.

CURRENT STATUS / PRACTICAL EXPERIENCES

Prior to the release of the first SSP manual, the approach was pilot tested with national authorities in six countries (India, Peru, Portugal, Philippines, Uganda and Vietnam). In these cases, national authorities worked with local experts to develop SPPs for each pilot site. In the course of the Swachh Bharat Abhiyan (Clean India Mission), many cities started developing city sanitation plans. SSP is central to such initiatives and efforts are being made to use SSP in ongoing programmes. Likewise, in several parts of Sri Lanka, opportunities are being explored to implement SSP in catchment areas of drinking-water sources where Water Safety Planning (WSP) is implemented as a means of protecting the water catchment areas from contamination by wastewater.[2] SSP has also been applied in the MENA region (Jordan, Iran and Iraq) as well as in Latin America (Brazil, Columbia and Nicaragua).

WHERE IT HAS BEEN USED?

SSP was pilot tested in six countries: India, Peru, Portugal, Philippines, Uganda and Vietnam and has since been implemented in over 20 additional countries.

DISCUSSION

WHO's experience in South-East Asia shows that SSP is contributing to more efficient and safer sanitation systems. In particular, its focus on operational and verification monitoring helps operators and regulators to concentrate on the key issues affecting the health of sanitary workers, farmers and consumers. A challenge for SSP is the requirement for cross-sectoral cooperation of multiple actors in often siloed institutions and agencies (health, agriculture, environment and urban planning). Especially, the informality of the farming sector can make the coordination of actions and responsibilities a difficult task.[7] Another challenging aspect can be the assessment of existing control measures, in particular if: i) the scale of the sanitation system involves many stakeholders and ii) there is a lack of site-specific and reliable data on personal hygienic behaviour and habits.[8] SSP served as the basis for the development of other approaches and tools, such as NaWaTech's Safety and operation and management (O&M) planning approach[5], WECF's Water & Sanitation Safety Plan Compendium[6] or the SaniPath[7] tool developed by the Center for Global Safe Water.

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IMPORTANT POINTS & LESSONS LEARNED

SSP is a 6-step process to drive incremental improvements according to risk[1]:

1. Establish objectives and assemble the team or SSP steering committee.
2. Describe the sanitation chain and exposure groups.
3. Identify hazardous events and prioritise by risk.
4. Develop and implemented control measures according to an improvement plan.
5. Monitor control measures and verify system's performance.
6. Establish supporting programmes and review processes.

SSP pilots identified mainly two success factors. First, implementation at the municipal or district level anchored by the municipal authorities is most effective. Second, the ownership and impact of SSP can be strengthened by developing implementation and investment partnerships with donors and civil society organisations for system improvements.[2]

And finally, SSP supports effective and broad-ranging stakeholder engagement for local level risk assessments and management.[2]

SSP is most applicable to enhance safety when managing and improving existing sanitation systems.[1]

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About the Sustainable Sanitation Alliance / SuSanA

The Sustainable Sanitation Alliance (SuSanA) works towards a world in which all people have access to adequate sanitation, regardless of gender, age, income, culture or location.

SuSanA is an open network of people and organisations who share a common vision on advancing sustainable sanitation systems. The overall goal is to contribute to achieving the Sustainable Development Goals (SDGs), in particular SDG #6, by promoting a systems approach to sanitation provision.

SuSanA came into existence in early 2007. Since then, it has been providing a platform for coordination and collaborative work. Today, it connects more than 14,000 individual members and 360 partner organisations (NGOs, private companies, multilateral organisations, government agencies and research institutions) to a community of people with diverse expertise and opinions.

By supporting its partners in developing, accelerating and exchanging innovations, SuSanA also serves as a sounding board for innovative ideas.

Finally, SuSanA contributes to policy dialogue through joint publications, meetings and initiatives.

HOW SuSanA WORKS

SuSanA's most important assets are the knowledge, experience, creativity and energy of a large and diverse membership. SuSanA focuses on all the different dimensions of sustainable sanitation and the full spectrum of development contexts. It provides its members fora for discussion and analysis, structures to support collaboration, and a range of channels for effective communication.

SuSanA strives to be a true partnership, in which all members can have a voice and can contribute. New members and organisational partners are welcome. Decision-making is achieved through reaching a broad consensus. Interactions within the network are creative, respectful and constructive.

SuSanA is guided by the SDGs. It provides policy advice, practical guidance and up to date knowledge about how to realise sustainable sanitation for all.

SuSanA THEMATIC WORKING GROUP 6 – CITIES

SuSanA members can participate in 13 thematic working groups (WG) to effectively communicate and work together. The WG 6 – Cities, for example, aims to develop strategies on how cities can adopt appropriate planning, implementation and management processes that lead towards more sustainable sanitation solutions.

The members of the WG 6 – Cities played an important role in critically discussing, advancing, and disseminating the urban approaches and tools in this publication. WG members were able to communicate through WG meetings, a thematic mailing list and several discussions on the SuSanA Discussion Forum. This allowed sanitation actors from all over the world to use SuSanA as a platform for information and ideas exchange and thus amplified collaboration. Furthermore, the discussions in the working group led to consensus building within the sector about the different aspects of Urban Sanitation.

SuSanA's VISION

The SDG #6 on sustainable water and sanitation management aims at providing access to water and sanitation to all by 2030. This is not just about achieving a narrow sanitation access target. The targets under SDG #6 address sanitation beyond toilets, including aspects of excreta management and reuse. Furthermore, good sanitation, hygiene and wastewater management are fundamental to achieving many of the other SDGs. The SDGs and the broader 2030 Agenda for Sustainable Development make the work of SuSanA more important than ever.

JOIN SuSanA

SuSanA is open to anyone who wants to join and be active in the promotion of sustainable sanitation systems. Membership is open to any individual.

Members can receive updates on SuSanA activities and discussions that interest them, take part in the discussion forum, and become active in the thematic working groups.

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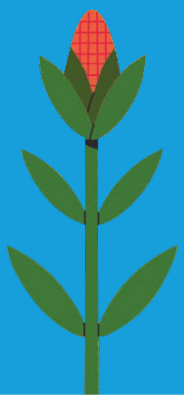

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