Experiences with stakeholder involvement in strategic sanitation planning: a case study of the city of Darkhan, Mongolia
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ABSTRACT
Stakeholder involvement is a prerequisite in urban strategic sanitation planning, particularly in low-income countries. This paper investigates the experiences and lessons learnt in terms of effective stakeholder involvement gained from a case study on strategic sanitation planning in a peri-urban sub-district in the city of Darkhan, Mongolia. Conceptually the Darkhan case study builds on a participatory sanitation planning approach known in the literature as community-led urban environmental sanitation (CLUES) planning. Firstly, a brief introduction to the CLUES approach, its basic principles for effective stakeholder involvement and its adaptation to the Darkhan case study is given. Secondly, two relevant planning steps including the building and testing of pilot facilities are described and assessed in terms of effective stakeholder involvement. It is shown that even if not all basic principles could be fulfilled adequately, the participatory planning framework helped to improve the scientific outputs of the project – mainly the technological research and development – and to smooth the way for further actions towards the sustainable implementation of measures on a larger scale.

Key words | case study, CLUES, community participation, stakeholder involvement, strategic sanitation planning

INTRODUCTION
Globally, almost 1 billion people lack clean drinking water; 2.4 billion people have no access to hygienic sanitation facilities; 1.2 billion lack any sanitation facilities at all. Each day, an average of 5,000 children die due to water and sanitation related diseases, many easily preventable (http://www.undp.org, accessed December 19, 2013). It is widely acknowledged that the global water and sanitation crisis is above all due to a governance problem and that there is a need for strategic sanitation planning and effective stakeholder involvement (Tayler et al. 2000; UNDP 2006; ICLEI 2011; Bahri 2012). Stakeholder involvement in public decision making processes and also in applied, problem-oriented research projects, is regarded as desirable for various reasons. It facilitates knowledge transfer and mutual learning processes and therefore fosters well-informed decision making. In a more general sense it helps to make sound decisions which are both socially acceptable and politically enforceable. In the field of strategic sanitation planning, stakeholder involvement can enhance users’ acceptance, receptivity and ownership of a new alternative sanitation system, thereby increasing the progress towards successful and sustainable implementation (Roma & Jeffrey 2010). The term stakeholder is understood here to mean those individuals or organisations that are either directly or indirectly affected – or able to affect – the sanitation situation within a particular community or area. The challenge of ensuring effective stakeholder involvement is tackled by several approaches to strategic sanitation planning, so-called participatory, demand-responsive approaches, like for example the strategic sanitation approach, Sanitation
To what extent was it possible to conduct stakeholder involvement effectively in the Darkhan case study? What are the lessons that can be learnt?

Even if this paper addresses this question from the perspective of an applied, problem-oriented research project it is expected that some of the results can also be transferred to public decision making processes in general. Conceptually the Darkhan case study builds on the participatory sanitation planning approach CLUES. Accordingly, key definitions and basic principles for effective stakeholder involvement are taken from the CLUES guidelines.

METHODS

Basic principles for effective stakeholder involvement and planning framework

The concept of the Darkhan case study is based on a participatory sanitation planning approach known in the literature as CLUES (Lüthi et al. 2011). CLUES is a step-by-step procedure for planning and implementing environmental sanitation infrastructure and services in urban and peri-urban communities in low-income countries. It is a multi-stakeholder approach that provides an open-ended and flexible planning framework. It has been developed to provide guidance to a broad target group: to experts and professionals from local authorities, donor agencies, planners, and non-governmental organisations (NGOs) dealing with infrastructure programming and service delivery, as well as to non-experts, local NGOs and community-based organisations taking part in such planning processes. The very name CLUES highlights the importance of broad community involvement in the planning process.

The CLUES process was selected for the Darkhan case study because of its high suitability to the special conditions in Mongolian ger areas (peri-urban communities in a low-income country where a large majority of the people is without adequate water, sanitation, drainage and solid waste services), its flexibility, and because it provides 30 practical tools to support and streamline the implementation of the process. Beyond that, many key characteristics of CLUES correspond with significant research aims and approaches targeted in the Darkhan case study. For example, (i) CLUES has a clear priority on urban sanitation planning for the entire sanitation value chain (toilet, storage, transport, treatment and disposal or re-use), (ii) it promotes a shift away from centralised conventional sewerage, (iii) it emphasises the importance of exposing the community to facilities and pilots and (iv) it aims to assess and foster an enabling environment, that is, a political, legal, institutional, financial, sociocultural and knowledge...
framework. In terms of stakeholder involvement, CLUES sets the following basic principles.

- All key stakeholders from different sectors (public, private, parastatal) and levels (local, municipal/provincial, and national) should be included in the planning process from an early stage.
- Going through a CLUES process should be considered a mutual learning experience for all stakeholders.
- The process should be ‘owned’ by the stakeholders who are directly affected: even though experts may provide advice and take a lead role in certain activities, the local community should take responsibility for the overall planning process.

These basic principles were targeted within the Darkhan case study from the very beginning. They therefore form the basis of the subsequent assessment regarding the effectiveness of stakeholder involvement and the respective lessons learnt therein.

In the Darkhan case study the CLUES process was iteratively adapted to the specific conditions in Darkhan and the determining factors of the project (timeline, preliminary work, etc.). Figure 1 shows the adapted planning framework of the Darkhan case study in its final version.

The project could build on a detailed assessment of the current environmental sanitation situation (step 1) in a selected ger area sub-district in Darkhan (Bag 7), which had been carried out during a previous research project (Sigel 2010; Sigel et al. 2012). Steps 2–5 encompassed the actual ‘actions’ undertaken within the Darkhan case study. Step 2 only included some kick-off measures. Steps 3–5 were all based on stakeholder workshops. In this paper, steps 3 and 4 and the two cross-cutting tasks ‘stakeholder analysis’ and ‘building and testing of pilot facilities’ are described and assessed in detail because they are crucial in terms of stakeholder involvement. The procedure and the results of all stakeholder workshops were summarised in the form of minutes (only in German). Step 6 comprises ‘further actions’ which might be undertaken after the end of the Darkhan case study by the Mongolian partners.

Figure 1 | Planning framework of the Darkhan case study (adapted CLUES process).

![Planning framework of the Darkhan case study (adapted CLUES process).](https://iwaponline.com/ws/article-pdf/14/3/504/415636/504.pdf)
There is one important difference between the planning framework of the Darkhan case study and the CLUES process: The CLUES process is aimed at the development of an ‘action plan’ which is costed (and ideally funded), timed and guided by output-based targets and which is going to be implemented by the community, the local authorities and the private sector. As this aim couldn’t be achieved within the time frame of the Darkhan case study, the last two steps (5 and 6) were modified and reworded.

Selection of the study area Bag 7

As CLUES is a demand-responsive approach, ‘only those communities showing willingness to participate in planning, training and operation and maintenance’ should be selected as a study area (Lüthi et al. 2011: 25). At the beginning of step 1, several interviews were conducted with the governors of different ger area sub-districts in Darkhan. As the governor and the residents of Bag 7 showed a very high interest in the case study, this sub-district was selected for the ‘detailed assessment’ and the case study. Bag 7 is the largest of 8 ger area sub-districts in Darkhan. In Table 1 the most important baseline conditions of Bag 7 are summarised (Sigel 2010).

In Darkhan, water supply and sewage are operated by a single local, state-owned entity – Water Supply and Sewage Authority Co. Darkhan City (USAG). About 50% of the inhabitants, mainly apartment dwellers, are provided with central water supply and sewage services by USAG. In the ger areas, water is generally distributed via water kiosks. The residents of Bag 7 consume on average 12 litres per capita per day, which is very low. Non-affordability and long transport routes might be an important reason for the under-consumption of water (Gawel et al. 2013). The residents of Bag 7 generally use self-built, unsealed pit latrines without cleanouts on their plot of land.

Stakeholder analysis (cross-cutting task) and strategy for stakeholder involvement

To include all key stakeholders in the planning process, a stakeholder analysis was conducted within step 1, that is, before project ignition. As stakeholders and their roles evolve over time, the analysis was continuously enhanced until the end of step 4 (cf. Figure 1). All stakeholders, persons or institutions, that are either directly or indirectly affected – or able to affect – the environmental sanitation situation in ger areas in Darkhan, and in particular in Bag 7, were identified and assessed to understand their different roles and responsibilities (Sigel 2012). Figure 2 gives an overview of the key stakeholders in the Darkhan case study, including the overall administrative level to which each belongs and the main relationships each is involved in (indicated by arrows).

From the beginning of the Darkhan case study the German researchers, including one social scientist and two engineers, closely cooperated with local staff from the ‘MoMo-2’ project office in Darkhan. Furthermore, a very close collaboration was sought with the governor of Bag 7, members of the Bag 7 administration, and community representatives. One administrative assistant of Bag 7 was remunerated by the ‘MoMo-2’ project.

To ensure that all the key stakeholders were properly involved in the planning processes, a key distinction was made between stakeholders who were residents of Bag 7 (the local community) and all the other key stakeholders from different sectors and levels, who are referred to in the following as Mongolian experts. Separate stakeholder workshops were conducted for each of these two target groups in order to enable a response more effectively related to their different needs. The residents’ workshops targeted all residents living in Bag 7, the experts’ workshops targeted all stakeholders identified as Mongolian experts (about 40 persons or organisations). All workshops were chaired and facilitated by two German professionals. The workshops were conducted bilingually in German and Mongolian with the help of a professional interpreter.

RESULTS AND DISCUSSION

In the following, the two stakeholder workshops corresponding with steps 3 and 4 of the planning framework and the cross-cutting task ‘building and testing of pilot
facilities’ are described and assessed in terms of effective stakeholder involvement.

First stakeholder workshop (step 3): launch of the planning process and identification and prioritisation of community problems

The aim of the first stakeholder workshop was to develop a common understanding of the current environmental sanitation situation in ger areas in Darkhan, to identify and prioritise the main problems and to agree on the next steps of the planning process.

To begin with, a one-and-a-half-day experts’ workshop was organised. The workshop was held in the municipality of Darkhan and was attended by about 11 participants. The national level was represented by just one person. After a briefing about CLUES, the results of the ‘detailed assessment’ (step 1) were presented and discussed. The participants were then split into three working groups to identify and prioritise the main sanitation problems in ger areas in Darkhan and to think about possible solutions. The results from these working groups were discussed in a plenary meeting. The workshop concluded with the formulation of a verbal agreement about future planning activities.

In the second stage, a 1-day residents’ workshop was organised. This workshop was attended by about 63 participants. It took place in an elementary school close to the study area. The first part of the workshop was similar to the experts’ workshop. After this, the participants were asked to prioritise the problems in the study area regarding water supply, sanitation, solid waste management and stormwater management. (CLUES includes not only sanitation in the narrow sense but also related fields such as water supply, solid waste management and stormwater management.) At the end of the workshop the participants were encouraged to get involved with further planning activities and to attend the next residents’ workshop.

The first stakeholder workshops revealed that most of the stakeholders, experts and residents alike, were acutely aware of the sanitation-related problems in ger areas in Darkhan. Problem prioritisation showed that water supply, sanitation and solid waste management were considered as being of equal importance. Stormwater drainage was clearly defined as the least pressing issue. This led the German researchers to focus on sanitation with regard to the ‘pilots’ because it is the most complex issue, but to also keep the other two important issues in view.

Second stakeholder workshop (step 4): identification of service options

The aim of the second stakeholder workshop was to identify the service options that are technically viable for Darkhan’s ger areas and that may be accepted by the stakeholders, who were mainly the end-users. The most promising option was to be built and tested in the study area in the form of pilot facilities.
Four different service options were developed by the German researchers in preparation for the workshop (cf. Figure 3). Each service option consists of a specific type of dry toilet as part of an integrated sanitation system. (More information about the research on the development of an integrated sanitation system for the whole city of Darkhan within ‘MoMo-2’ and the four service options can be found on http://www.ipit.eu.) The options can generally be differentiated between (i) above ground and underground toilets and (ii) no mix toilets (separate collection of urine and faeces) and mix toilets (collection in one container or pit) respectively.

According to CLUES, local experts take on the responsibility for the identification of feasible systems and the end-users, that is, the local community, assume the responsibility for the selection of the most appropriate options. In contrast to this, within the Darkhan case study the German researchers had already preselected four different service options in preparation for the second stakeholder workshop. One reason for this is that the service options had to fulfil some specific research criteria (e.g. the capability of being part of an integrated sanitation system designed for the whole city of Darkhan). Another reason lies within the time constraints of the research project ‘MoMo-2’: the ‘pilots’ had to be built as soon as possible to investigate and improve their performance through two Mongolian winters. Despite this the German researchers emphasised that the four preselected service options offered a real choice to the Mongolian partners and primarily the end-users.

In contrast to the first stakeholder workshop, this experts’ workshop was held twice, once in Ulaanbaatar and once in Darkhan. The reason for this was to allow experts from all levels to attend the workshops without incurring any travel expenses. (The distance between the capital Ulaanbaatar and Darkhan is 230 km. The journey takes about 3 hours by car one-way, that is, participants in a 1-day workshop would have to stay overnight.) The experts’ workshop in Ulaanbaatar

- **Option 1**: Above ground – no mix „dehydration toilet UDDT“
- **Option 2**: Above ground – no mix – „Mongolian eco toilet“
- **Option 3**: Underground – no mix toilet „Goldmine“
- **Option 4**: Underground – mix toilet „sealed pit latrine (VIP)“
was attended by 18 participants, the experts’ workshop in Darkhan by 23 participants. After a briefing about CLUES and the aims of the Darkhan case study, the four service options were presented. In the plenary discussion that followed, the participants were able to ask questions about the technical details and to express their views about the pros and cons of the different options. The workshop was concluded with a discussion about the political, legal and institutional framework conditions for the implementation of an improved sanitation system in Mongolia and Darkhan’s gers.

The residents’ workshop in Darkhan was attended by about 80 participants. The first part of the workshop was the same as the experts’ workshops. After the presentation of the four service options the participants were asked to discuss the pros and cons of the different options further in small groups and to note down any questions that emerged. After a break, the questions presented were answered by the German researchers in a plenary session. Finally, the participants were asked to give their vote by sticking self-adhesive dots to their most preferred option.

The discussions during the experts’ workshops revealed that the experts showed nearly the same interest in options 1, 2 and 3 and significantly less interest in option 4. The residents voted as follows. (The total number of the residents’ votes (60) is less than the total number of workshop participants counted at the beginning of the workshop (about 80). The reason might be that some participants did not give their vote and/or that some left the workshop early.)

- Option 1 (UDDT): 5.
- Option 2 (Mongolian eco toilet): 35.
- Option 3 (Goldmine): 13.

This result brought the German researchers to select option 2, the ‘Mongolian eco toilet’, for further research and development in the form of pilot facilities.

**Building and testing of pilot facilities (cross-cutting task)**

The German researchers agreed with the governor of Bag 7 on several criteria for the selection of 12 pilot households within the study area. These included technical, geographical, social and motivational aspects such as the size of the household, location and accessibility to/from the compound, household income, and the willingness to cooperate in the construction work. The criteria were discussed in plenum at the end of the second residents’ workshop. Under the lead of the governor of Bag 7, a task force was established which promptly selected 12 pilot households.

The toilet design was inspired by the workshop discussions and the work of Action contre la Faim Mongolia in Ulaanbaatar. The toilet, later registered under the name iPiT®, aims to integrate private toilets into an overall sanitation system for the whole city of Darkhan. In July and August 2011, 12 iPiTs® were built and installed under the leadership of the German researchers and with the help of residents and local craftsmen on the compound of 12 households in Bag 7. They are currently being tested, analysed and optimised. Faeces and urine are collected in two separate containers. A local service team regularly exchanges and removes the containers to the local sewage plant.

**Lessons learnt**

One basic principle for stakeholder involvement according to CLUES is that all key stakeholders from different sectors and levels should be included in the planning process from an early stage. In the Darkhan case study, the number of participants who attended the first and the second stakeholder workshops respectively indicates that the level of interest of the stakeholders was much greater at the local level than at the national level and that interest increased during the course of the process. This accords with the observation described in the literature that the closer stakeholders are to the problems, the more interested they are in becoming actively involved in participatory processes (Lüthi et al. 2011). Particularly the building and testing of pilot facilities inspired a high degree of motivation at the local level. Many residents of the study area Bag 7 wanted to become owners of a pilot toilet. Some of them were even willing to share the costs of the toilet and the operation of the system. Regarding the experts’ interest in the stakeholder workshops, the list of participants reveals that the experts mostly represented organisations or departments directly linked to water. It would have been preferable had representatives from other sectors like solid waste, land-use planning, housing or local economic development also attended the workshops. More attention should have been paid to this in preparation for the workshops.
The idea to hold the second experts’ workshop twice, once in Ulaanbaatar and once in Darkhan, helped to activate more experts from the national level. However, the possibility of bringing together experts from the national level with those from other levels was limited. The division into experts’ workshops and residents’ workshops made it possible to respond more effectively to the different target groups and to invite all residents of Bag 7 to the workshops. The disadvantage, however, was that only little exchange could take place between experts and residents. Regarding this problem no hard and fast recommendation can be given. Even CLUES is not explicit in this respect. It states that in order to enable a fruitful exchange between experts from different sectors and levels as well as between experts and residents is an important precondition for a mutual learning experience for all stakeholders involved. However, CLUES does not give strict recommendations about how to involve different stakeholders and stakeholder groups in the workshops. Only regarding the workshop which aims to identify the service options does CLUES suggest adopting a two-step approach: first, to conduct an expert consultation workshop to identify the feasible systems, and second, to conduct a community consultation workshop to select the most appropriate options (Lüthi et al. 2011: 33).

In spite of this, in the course of the Darkhan case study process, it became apparent that a number of different learning processes were taking place, both among Mongolian stakeholders as well as between them and the German researchers (the latter aspect is not an intention of CLUES because it is not explicitly targeted at research projects). For example, at the first stakeholder workshop, most of the residents argued that the sanitation problems could only be solved by connecting the ger areas to the central sewage system. During the second stakeholder workshop, however, the participants showed considerable interest in all four service options presented. The German researchers themselves also experienced several revelatory moments, such as when it became obvious that a means of disposal had to be found for bones and paper. These substrates occur in large quantities and are currently thrown by household members into the existing pit latrines. Overall, the participatory planning process based on CLUES enabled a multidirectional transfer of knowledge which proved to be very fruitful. Furthermore, it catalysed change in how the problems were perceived and valued.

According to CLUES, the process should be ‘owned’ by the stakeholders who are directly affected, that is, the local community should take responsibility for the overall planning process. Yet, in the Darkhan case study, this aim could only be achieved partially. The German researchers chaired and coordinated the whole process: they decided whom to involve, why, when and how much in the process. They decided on the contents of the workshops, they accounted for the building and testing of pilot facilities, etc. Only in certain activities, like for example the selection of pilot households, did the Mongolian stakeholders take a lead role. The German researchers tried to hand over responsibility to the Mongolian stakeholders, for example to establish a local process leader or a community task force, but they didn’t succeed. There may be many reasons for this, of which some may be related to the country’s post-socialist culture (Sigel et al. 2014). For example, one observation that was made is that institutions are rather weak and that stakeholders frequently change their jobs. This entails considerable disadvantages in terms of stakeholder involvement. Besides, Mongolia is essentially centralised and there is still a considerable lack of experience with stakeholder involvement and public participation. This makes it difficult, of course, to initiate stakeholder involvement at its highest level, that is, in the sense of ownership – especially as an academic from outside the country.

CONCLUSIONS

The Darkhan case study has shown that effective stakeholder involvement in strategic sanitation planning is a very challenging and complex task. Not all basic principles set by the CLUES guidelines could be adequately fulfilled. This leads to the questions, if and to what extent stakeholder involvement really was essential for the Darkhan case study and what conclusions can be drawn for the design and implementation of similar research projects. First of all it has to be stated that stakeholder involvement as pursued by CLUES is very demanding, time-consuming and requires that the people involved, the researchers as well as the stakeholders, possess the necessary skills and willingness. Hence, whether a certain research project should include stakeholder involvement or not should be considered at length. In the Darkhan case study, the participatory planning framework helped to improve
the scientific outputs of the project, mainly the building and testing of pilot facilities. It enhanced users’ acceptance, receptivity and ownership of the pilot facilities – a precondition for technological research and development – and helped to respond directly to users’ needs and demand. It is possible that similar scientific outputs could have been achieved on the basis of a more simplified strategy for stakeholder involvement, such as including only selected stakeholders from the local level. However, it should be kept in mind that the far-reaching goal of applied, problem-oriented research is not only to deliver successful pilot facilities and tangible scientific outputs but to smooth the way for the sustainable implementation of measures on a larger scale. The more this comes into focus, the more important it is to ensure effective stakeholder involvement at the highest possible level. In Darkhan, however, it is still uncertain whether the Mongolian decision-makers will seize the chance and take further actions towards the sustainable implementation of measures on a larger scale. Currently, a prefeasibility study is being carried out with funding from the Asian Development Banks’ City Development Initiative Asia (CDIA) to improve sanitation in the city of Darkhan. Hopefully it will also address the problems of the population living in the peri-urban ger areas.

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