Report

WaterAid learning for advocacy and good practice

Water and sanitation mapping in Nepal

WaterAid/Marco Betti

A WaterAid report

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Based on a field visit to WaterAid Nepal and its partners, September 2006

November 2006

Acknowledgements

My thanks go to all the individuals who took time to answer my questions during interviews in the UK and Nepal and to explain and demonstrate their mapping methodologies and outputs to me. I am especially grateful to WaterAid in Nepal and their partners NGOFUWS, CIUD, ENPHO, Lumanti and NEWAH. This report would not have been possible without their professional and dedicated organisation of my itinerary in Kathmandu and their openness to all my questions and comprehensive explanation of their work.

Acronyms

CIUD	Centre for Integrated Urban Development
DDC	District Development Committee
DWWS	Department for Water Supply and Sewerage
ENPHO	Environment and Public Health Organisation
GoN	Government of Nepal
KMWA	Kathmandu Valley Water Authority
KVWMSC	Kathmandu Valley Water Management Support Committee
KCWMSP	Kathmandu Valley Water Management Support Project
KVWSB	Kathmandu Valley Water Supply Board
LICSU	Low-Income Consumer Support Unit
MC	Management Contractor
MDGs	Millennium Development Goals
MPPW	Ministry of Physical Planning and Works
MWSDB	Melamchi Water Supply Development Board
NEWAH	Nepal Water for Health
NGO	Non-governmental Organisation
NGOFUWS	NGO Forum for Urban Water and Sanitation
NWSC	Nepal Water Supply Corporation
PRA	Participatory Rural Appraisal
TRC	Tariff Regulatory Commission
TSS and SSA	Traditional Stone Spout and Source Conservation Association
WAN	WaterAid in Nepal
WUO	Water Utility Operator

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Executive summary

This report is part of WaterAid's project on Learning for advocacy and good practice – water and sanitation mapping. The purpose of the project is to create a better understanding of the processes, methodologies, outputs and impacts of mapping carried out by different WaterAid country programmes and their local partners so as to encourage learning around water and sanitation mapping across WaterAid's country programmes and partners. The project comprises case studies from six different countries: Malawi and Tanzania in East/Southern Africa, Nepal and Pakistan in South Asia, and Ghana and Nigeria in West Africa. The present report focuses on the experiences of the WaterAid in Nepal country programme.

The **purpose** of this report is twofold. On the one hand the report documents how WaterAid in Nepal applies water and sanitation mapping. This includes the objectives, target groups, inputs, methods and processes of mapping in-country. On the other hand the report assesses the repercussions of WaterAid in Nepal's water and sanitation mapping approaches and – as far as possible – the use of its mapping outputs by different stakeholders.

WaterAid in Nepal has embarked on a number of mapping activities. This report focuses on three mapping activities in urban areas that focus on advocacy as opposed to solely supporting project implementation and monitoring. The three activities are (1) mapping and enumeration of slums, squatters and public stand posts under the Urban Water Supply Reform process, (2) stone spout and dug well enumeration in Kathmandu and (3) poverty mapping, an activity to support community-managed water supply and sanitation schemes. The **main features** of these three water and sanitation mapping activities are summarised in Table 1 below.

Based on the field visit to Nepal, the following **challenges and opportunities** arise for mapping in the WaterAid in Nepal country programme.

In the urban areas of Kathmandu, three different categories of poor dwellers can be distinguished. In the peri-urban areas, former rural villages of poor dwellers now form part of urban areas of Kathmandu. In the city of Kathmandu, there are pockets of newly arrived poor households clustered in slums and squatters and there are also individual poor households that live scattered among better-off families. These three different categories of poor have different characteristics and need to be catered for by different types of water supply and sanitation services.

The urban mapping approaches developed by the WaterAid in Nepal country programme respond to the different situations that poor urban dwellers are faced with. Accordingly, different challenges and opportunities arise.

The mapping and enumeration of slums, squatters and public stand posts under the Urban Water Supply Reform process has successfully made the case that the needs of slum and squatter populations need to be taken into account in the design of a new water supply and sewage infrastructure. The challenge and opportunity arising for future mapping here is to enable citizens

to hold the service provider into account for delivering adequate water supply and sanitation services to them.

In the case of stone spout and dug well mapping, which currently relies on a number of volunteers, the main challenge is to sustain and further publicise the initiative. This could be achieved, for example, by cooperating with the university.

Poverty mapping, which is currently carried out in peri-urban communities, questions arise with regard to the use of mapping results. How can information about the identity of the poorest be translated into targeted subsidies? Another open question relates to the cooperation between the municipality and the local user committee. In how far, cooperation will be possible in practice also depends on the wider political developments in Nepal.

Overall, the challenge and opportunity for taking each mapping activity forward in Nepal is to revisit the objectives and methodology of each approach in light of the particular policy/governance process to be targeted. The design of the future mapping activities should help to sharpen the message the map intends to convey and should actively include those in the process that need to advocate for change or implement a particular policy process.

Table 1: Main features of water and sanitation mapping in WaterAid in Nepal's country programme

	Nepal		
Main features			
History of mapping	In Nepal, mapping for advocacy purposes started as a reaction to the urban sector reform process in Kathmandu Valley. It was kicked off by a disagreement between the NGOs on the one hand and government and donor representatives on the other hand regarding the significance of poor urban dwellers relying on public stand posts as their main source of water supply. Subsequent to this mapping activity, other mapping initiatives evolved. Of those, this report also deals with stone spout enumeration and poverty mapping. The three activities are summarised separately below.		
	Mapping under urban water supply reform process	**Stone spout enumeration**	**Poverty mapping**
Objectives	The objective of mapping for the urban sector reform process is to influence policies in the direction of pro-poor service delivery of water supply and sanitation.	Stone spout enumeration aims to raise awareness about alternative water sources to the government's urban water supply network and to mobilise support for the conservation of these traditional water sources.	Poverty mapping was designed to support user committees and local governments in improving planning and implementation of service delivery, and for internal project identification and implementation procedures.
Target groups	High level government bureaucrats and donor agencies funding the sector reform process.	Users of stone spouts and government officials	Water user committees and municipalities
Implementing partners	The NGO Forum for Water Supply and Sanitation in cooperation with other local partner organisations of WaterAid	The NGO Forum for Water Supply and Sanitation in cooperation with local volunteers and user committees	WaterAid's local partners CIUD and ENPHO in cooperation with local user groups and the support of UN-HABITAT .
Inputs			
Costs	Quantifying the costs involved in this process is difficult because the	The costs are minimal as the activity mainly draws on	unknown

	individual organisation contributed their staff time on a voluntary basis.	volunteers.	
Methodology and technical inputs	The methodology combined the mapping of public stand posts with the identification and enumeration of poor households living in slums and squatters and a sampled household survey regarding consumption patterns and preferences. ArcView, Access and Excel programmes were used for the data analysis.	The methodology is a combination of simple water quality and quantity testing techniques and a sample of qualitative key informant interviews. Technical inputs are water quality test kit, digital map, 2 litre bucket	The methodology is similar to PRA-type social mapping exercises regularly used to reach poor segments of the population during project implementation. It has two broad components: a digital map displaying services and housing infrastructure and a socio-economic household survey (based on ArcView, Access and Excel).
Time and human resources	5 months by 3-4 people and 30-40 additional enumerators for HH surveys	1-2 persons per survey	Approximately 3 months carried out by 4 civil engineers, 2 assistants, 30 enumerators
The mapping process			
Sensitisation, training and surveying	The process started with the establishment of a task force representing the major government, financial and civil society institutions. After that, all public stand posts, slums and squatter settlements were identified and sampled, detailed surveys carried out for additional information on service levels and management arrangements.	Youths and students are trained in water quality and quantity testing. They then visit all stone spouts in one administrative area, carry out water quality testing, counsel local water users and identify existing management arrangements.	A user committee is formed and indicators for data collection are refined in cooperation with the committee. A map displaying the major features of the settlement including water and sanitation facilities is prepared, focus group discussions and household surveys are carried out to identify the socio-economic status of each individual household.

Mapping and analysis of results	Mapping, socio-economic surveys and analysis of results were carried out together.	The location of the stone spouts is marked on a map and results are summarised in a report.	The information is analysed and translated into a number of different maps.
Feedback	Feedback sessions were arranged at local level to counter-check the accuracy of the data; the multi-stakeholder task force was given opportunities for feed back on a regular basis and a national workshop was conducted at the end to disseminate the results to the wider public.		Feedback meetings are carried out with the community to validate findings.
Updating and institutionalisation	No updating was foreseen as this mapping process was a one-off activity to confront preconceived perceptions about the number and water consumption patterns of poor urban dwellers.	Updating of the stone spout survey is done on an ad hoc basis	The intention is that the user committee (in cooperation with the municipality) uses the data set and maps for taking decisions on project interventions and for the management of the scheme after project completion.
Source: Interviews in Nepal			

1 Introduction

This report forms part of the second phase of WaterAid's project on Learning for advocacy and good practice – water and sanitation mapping. The purpose of the project is to create a better understanding of the processes, methodologies, outputs and impacts of mapping carried out by different WaterAid country programmes and its local partners so as to encourage learning around water and sanitation mapping across WaterAid. This fourth report[1] documents water and sanitation mapping examples from Nepal, based on a field visit in September 2006. It draws on interviews with water user associations, government officials, non-governmental organisations (NGOs) donor organisations, international financial institutions (IFIs), WaterAid, and some of its local partners – the NGO Forum for Urban Water Supply and Sanitation (NGOFUWS), the Centre for Integrated Urban Development (CIUD), the Environment and Public Health Organisation (ENPHO), Lumanti and Nepal Water for Health (NEWAH). The report also draws on a review of background literature including published and unpublished reports and studies.

In Nepal, WaterAid's local partners have been using community mapping methodologies for a long time in order to guide and monitor their project interventions. WaterAid in Nepal's mapping for advocacy purposes started with its engagement in the Kathmandu Valley urban water supply reforms in the beginning of the new millennium. Since then, WaterAid in Nepal's partners have diversified these activities in urban and peri-urban areas. In Nepal, mapping takes account of a reality where poor, middle income and wealthy people live door-to-door. The tool thus serves to identify pockets of poor people and their respective needs and preferences in addition to analysing the distribution of public services across a geographical area. Rather than using mapping purely for advocacy purposes, a number of different methodologies have been developed to facilitate project implementation and future planning and monitoring activities. There is thus not one single mapping method but a number of different parallel activities.

The report is divided into four chapters. Section 2 describes the context in which mapping takes place. It briefly outlines the current political situation impacting on decision making around water supply and sanitation and, in more detail, the progress of urban water supply reforms in Kathmandu Valley. In section 3, WaterAid in Nepal's and its local partners approaches to water and sanitation mapping are described, including the inputs, process and various outputs of mapping, and the repercussions and use of the mapping work are laid out. Section 4 contains the analysis, which is based on a framework developed by ODI's Research and Policy in Development Programme[2] in order to investigate how CSO's use evidence to influence policy processes. Finally, opportunities and challenges are pointed out.

[1] The previous reports documented water point mapping experiences in Malawi and Tanzania (Welle, 2005), sanitation mapping in Pakistan (Welle, 2006a) and water and sanitation mapping in Ghana and Nigeria (Welle, 2006b).

[2] See also: http://www.odi.org.uk/RAPID/Tools/Toolkits/RAPID_Framework.html

2. Urban water supply in Kathmandu Valley

In 2006, an estimated 28 million people lived in Nepal (CIA, 2006). In 2004, 16% of Nepal's inhabitants lived in urban areas. With a growth rate of 6.6% per annum, the proportion of the urban population is expected to increase rapidly in the coming years, reaching 27% by 2021 (NGOFUWS, 2005). In 2006, the majority of the urban population lived in the Kathmandu Valley, which consists of five municipalities and a number of rural villages that are in the process of being reclassified as urban areas.

There are three different types of poor people in Kathmandu Valley. First, there are squatter settlers who live in various agglomerations across Kathmandu municipality; second, there are poor households who live among better-off citizens and third; there are formerly rural poor communities which are in the process of being reclassified as urban areas. All these groups have different backgrounds and therefore different needs.

According to official figures, there are 132,803 legal connections including 809 community taps in the five municipalities covering Kathmandu Valley. Based on these connection figures, the NGO Forum for Urban Water Supply and Sanitation estimates that approximately 55% of the urban population has access to a legal connection provided by the Nepal Water Supply Corporation (NWSC), the current urban water supply service provider. Around 34% of the valley's urban population are estimated to be poor, 63% of which do not have access to a legal connection (NGOFUWS, 2005).

Apart from the limited access to the municipal piped network, overall water supply service throughout the valley is poor in quality and quantity. In all neighbourhoods, regardless of the economic status, water supply is intermittent which leads to better-to-do households using electric pumps to 'suck' water into their compounds once it does flow thereby leaving less for those who cannot afford to do so. Households without a private NWSC connection rely on a number of alternative sources including shallow wells, traditional springs and water tankers. Poor urban dwellers get their water supply mainly from public NWSC stand posts, natural springs, so-called 'stone spouts' (see also Box 1), from dug wells and peri-urban water supply schemes. Some of the NWSC stand posts, stone spouts and peri-urban water supply schemes are run by user committees but the quality of management differs largely depending on the capacity of the local community/neighbourhood to organise itself.

Box 1: Historical Stone Spouts in Kathmandu

Municipal water supply in Kathmandu Valley reaches only around 55% of the population. Traditional stone spouts are an important alternative water resource for poor urban dwellers. Stone spouts are natural springs that were developed as sites for public water consumption several hundred years ago. In Kathmandu Valley, there are 382 stone spouts. Apart from 41 sources that have gone dry and 104 that have been connected to NWSC, 237 stone spouts still serve as independent water sources catering for approximately 10% of Kathmandu's population today. Stone spouts are not only a crucial local water source; they are also of an important aesthetic and traditional value and sites of cultural heritage.

Source: NGOFUWS (2006)

Faced with an already desperate supply situation, Kathmandu Valley will have to cope with an expected rise in demand for water by 82% within the coming 10 years (NGOFUWS, 2005).

2.1 The institutional set up

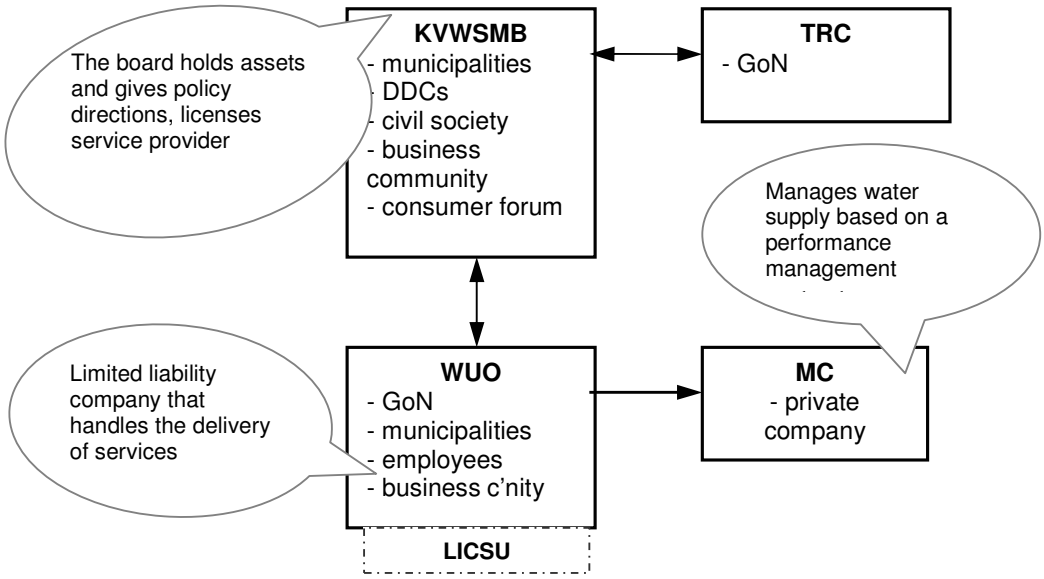
Since 1988, the Nepal Water Supply Corporation is responsible for the management of water supply and sewerage services to the urban areas of Nepal. Its counterpart for delivering water to rural areas is the Department for Water Supply and Sewerage (DWSS). Both, NWSC and DWSS form part of the Ministry of Physical Planning and Works (MPPW). The Local Self Governance Act of 1999, which sets out a framework for decentralisation of government in Nepal, establishes municipalities as the main bodies responsible for water supply and sanitation in urban neighbourhoods and Village Development Committees in rural areas (WaterAid, 2005a). Yet, municipalities, as all other local government bodies have been in a political vacuum over the last six years (Interview with WaterAid). Having no elected representatives, municipalities are headed by bureaucrats in the interim. With a very high staff turnover, these bodies lack not only democratic representation but also currently the capacity to manage water supply systems effectively according to WaterAid and the NGO Forum for Urban Water Supply and Sanitation. As a result, NWSC effectively continues to oversee the day to day operations of the urban water supply and sewerage system. This is, however, currently restricted to emergency operations because all governmental budget allocations for investments in urban water supply infrastructure are tied to the planned urban water sector reform project described below. An integral part of this reform project is the implementation of institutional reforms, which will replace NWSC by a more autonomous set up.

2.2 Urban water supply reforms

In the Kathmandu Valley, efforts to reform the urban water sector to alleviate water shortages in Kathmandu Valley and improve wastewater management have been ongoing since 1988. The first reform project supported by the World Bank from 1991 to 1998 was classified as unsatisfactory mainly because of a lack of autonomy of the service provider NWSC. At the end of the seven year project, access to water had decreased rather than increased in the valley (NGOFUWS, 2005). In the second round of reforms, donor organisations insisted on institutional reforms leading to a higher degree of autonomy for the utility operator as a precondition for financing any physical works. The current Kathmandu Valley Water Management Support Project (KVWMSP) therefore envisages a new institutional set up separating out policy formulation and planning, day-to-day operation and regulation. As shown in Figure 1, NWSC will be replaced by three different bodies. The Kathmandu Valley Water Supply Management Board (KVWSMB) will be responsible for the broad policy directions including investment planning, licensing, and water supply development. KVWSMB will be the owner of the assets.

The board will be represented by the municipalities, District Development Committees (DDCs), and by members of the civil society and the business community. The delivery of water supply and wastewater services will be handled by the Water Utility Operator (WUO), which will be established as a limited liability company. The asset holders of this company will be Government of Nepal (GoN), the municipalities and a trust representing employees. The reforms also foresee the creation of a department under WUO, the Low-Income Consumer Support Unit (LICSU), which will be dedicated to serving low-income consumers. A condition from the side of the donors financing the Melamchi Water Supply Project is that the daily management of staff and assets will be outsourced to a private Management Contractor (MC) for an initial term of at least four years. No funds for project implementation will be released until this arrangement is in place. The MC will manage the water supply system based on a performance management contract. The English company Severn Trent was likely to be awarded the contract in January 2007 after a succession of prolonged and controversial bidding processes from 1999 onwards. The water tariff, proposed by WSMB, will be approved by an independent Tariff Regulatory Commission (TRC).

Figure 1: Institutional set up of Kathmandu Urban Water Supply Reform Project



As mentioned earlier, all physical are contingent on the above described institutional reforms including the management of the assets and staff by a private sector company. The proposed works comprise (1) the diversion of the river Melamchi to Kathmandu Valley, (2) the construction of water treatment plants and of (3) a bulk distribution system, (4) the improvement of the distribution network and (5) the improvement of the existing wastewater management system. All these investments were still pending in September 2006, which means that an improvement in the water supply situation cannot be expected before at least another four years.[3]

2.3 Obstacles to pro-poor infrastructure development

Until very recently, the project's infrastructure design assumed that all urban dwellers would be capable to afford a private water connection in future. The existence of low-income consumers and slums in Kathmandu was completely ignored.

This was possible because poor sections of the urban population of Kathmandu and the water supply infrastructure that serves them are not well documented in official statistics. In Kathmandu, poor segments of the population tend to live among middle-class and well-to-do citizens. Their settlements are not officially documented and therefore invisible to urban planners (Interview with Lumanti). Government statistics of urban water supply infrastructure are incomprehensive and outdated. In addition, the

[3] A study carried out by JBIC estimates that the Distribution Network Improvement in Kathmandu Valley will take at least 10 years because improvement works will need to keep disruption of traffic at a minimum in the urban areas of the valley (Interview with JBIC).

documentation is fragmented between the five municipalities and NWSC, with each institution only keeping records of the particular part of the distribution network and public stand post that it financed and implemented. The mapping work of the NGO Forum for Urban Water Supply and Sanitation helped to bring the location and needs of poor urban dwellers to the forefront as will be shown in the following sections of this report.

This notwithstanding, any government capital investments in Kathmandu Valley have been suspended until the implementation of the urban sector reforms. This is contingent on the employment of a management contractor, which delayed the reform process for several years. Furthermore, the political vacuum in Nepal, i.e. the lack of democratic representatives in local governments, puts decision making around service delivery in a limbo.[4] Should the Maoist representatives gain a stake in the government, it is likely that the participation of a private sector company in service delivery will be put into question again.

This leads to a situation where infrastructure improvement is likely to continue to remain largely dependent on private initiative and on alternatives to public provision of water supply for the coming years. Even if capital investments will get a go-ahead, a tangible improvement in service delivery is not likely to materialise before another five to ten years.

[4] This was last confirmed by the suspension of municipal elections in February 2006.

3. Water and sanitation mapping

WaterAid has been operating in Nepal since 1986. It works through six partner organisations that implement service delivery projects on behalf of WaterAid. The country programme's main rural partner is the organisation Nepal Water fore Health (NEWAH). WaterAid's urban partners are Lumanti, an organisation that is dedicated to supporting squatters and the urban poor through direct support and grassroots advocacy work, CIUD (Centre for Integrated Urban Development), a centre specialised in urban planning that works closely with municipalities, ENPHO (Environment and Public Health Organisation), specialised in technical aspects of water and environmental sanitation and the NGO Forum for Urban Water and Sanitation (NGOFUWS). NGOFUWS is described in more detail in Box 2 below.

WaterAid's partners have been using community mapping methodologies to facilitate project implementation for a long time. Mapping for advocacy purposes is linked to the start of WaterAid in Nepal's engagement with the urban water reforms in Kathmandu Valley in the year 2000 and applies, until now, to urban and peri-urban areas rather than to rural areas. Mapping in Nepal differs from mapping by other country programmes in that there are not one or two major approaches but rather a number of different mapping avenues that have evolved from each other or in parallel with varying objectives, inputs and methodologies. The different types of mapping are listed in Table 1 below, which also shows the area of implementation, the implementing organisations, the major purpose of the activity and the stakeholders that are to use and/or act upon the mapping information.

Table 2: Different types of mapping used by WaterAid in Nepal's partners

Type of mapping	Area of implementation	Implementing organisations	Purpose	Targeted stakeholders
(I) Mapping and Enumeration of Slums, Squatters and Public Stand Posts	Urban areas in Kathmandu Valley	WaterAid's urban partners under NGO Forum	Policy influence	- Donors - Government (MPPW, KVWSMSC)
(II) Stone spout and dug well survey	Urban areas in Kathmandu Valley	NGO Forum, volunteers	Awareness raising and policy influence	- Citizens - User committees - Government (MPPW)
(III) Poverty mapping	Peri-urban areas and small towns	CIUD and ENPHO with UN-HABITAT	Project implementation,	- For internal use - User committees

			future planning	- Donors - Local government
(IV) Social mapping	Squatters and urban poor, rural communities	Lumanti, NEWAH	Mainly project implementation, future planning	- For internal use - User committees - Local governments
(V) Arsenic Mapping	Terai region, mainly rural areas	NEWAH	Information sharing, potentially policy influence	- Affected people - For internal use - Donors and government
Sources: Interviews with WA and local partners				

In the WaterAid in Nepal country programme, there is an area of overlap between mapping carried out predominantly to facilitate project implementation and mapping information primarily geared at informing citizens and used for advocacy purposes. While mapping activities I and II, namely mapping and enumeration of slums, squatters and public stand posts and the stone spout and dug well surveys in Kathmandu Valley seek to influence policy and/or raise awareness, mapping activity III, poverty mapping, carried out by CIUD and ENPHO is more ambivalent about this objective. Mapping activity IV, social mapping, carried out by Lumanti and NEWAH, is today first and foremost employed as a project implementation tool although maps have been used to advocate for the inclusion of poor communities in official planning. Mapping activity V, arsenic mapping, is still in its infant stage but NEWAH hopes to develop it into a policy influencing tool in the future. In this report, the focus is on the first three mapping activities, which have all been carried out in urban and peri-urban areas of Kathmandu Valley. Where appropriate, reference will also be made to the remaining mapping activities.[5]

3.1 The history of WaterAid in Nepal's urban water and sanitation mapping

WaterAid in Nepal started to build an urban programme in the year 2000 when the second phase of the urban water reforms were getting underway. At that time, urban poverty was not yet recognised as a major issue and only few civil society organisations catered for poor urban dwellers in Nepal. WaterAid therefore started supporting nascent organisations such as Lumanti, CIUD, and ENPHO. In order to create a platform to accompany the design and

[5] WaterAid has produced a guide on community mapping (WaterAid, 2005b) for development practitioners working in water and sanitation at community level. The guide summarises different approaches to community mapping and lessons from case studies of WaterAid projects. This publication can be downloaded from http://www.wateraid.org/documents/community_mapping_manual_oct_2005.pdf

implementation of the Melamchi Water Supply Project from a perspective of poor urban dwellers, WaterAid set up a process of regular meetings between NGOs, municipalities and the private sector. This platform later became established as the NGO Forum for Urban Water and Sanitation (see also Box 2 for more information).

Box 2: NGO Forum for Urban Water Supply and Sanitation

The NGO Forum started in 2001 as a series of informal meetings between NGOs active in water supply and sanitation to discuss the likely repercussions of the Kathmandu Valley Urban Water Reform Project on the urban poor. While driven by WaterAid in Nepal in the early days, NGOFUWS is now steered by a board of seven of its member organisations. Today, the forum has 114 members, which are drawn not only from the NGO community but also represent municipalities. In 2002, a secretariat was formed, which had three staff and a number of volunteers in 2006.

In the early process of mapping the urban poor under the reform project, the NGO forum played an important role by providing a platform where different stakeholders could meet to discuss and voice their concerns. This helped the NGOs in forming a common position but also gave the donor community and government a counterpart to interact with. NGOFUWS has been instrumental in channelling concerns into a process that led to a search for common solutions rather than confrontations.

Apart from engaging with the institutional reform process and infrastructure project, the NGO forum also explores and advocates for the use of alternative water sources for the urban poor such as stone spouts, dug wells and with rooftop rainwater harvesting.

Source: Interviews

The mapping and enumeration of slums, squatters and public stand posts under the institutional reform process was started by a disagreement between donors and government on the one side and NGOs on the other side over the significance and needs of the urban poor under the urban water sector reforms. The GoN and international financial institutions assumed that the number of poor households without private water connections was negligible and that no specific consideration of their needs (e.g. public stand posts) was needed in the project design. NGOs, for their part, insisted that a high number of urban poor relied on public stand posts for their daily water consumption.

A discussion in 2000 facilitated by a consultant from the Water and Sanitation Program identified a number of recommendations to ensure that the planned reforms reached the poor. One of these recommendations was to use poverty mapping in order to identify the geographical whereabouts of the unconnected poor and the public stand posts that serve them (NGOFUWS, 2005). This initial mapping activity was funded by the Japan Bank for International Development (JBIC) and carried out in 2002 by an external consultant agency based on information on the location of poor households provided by Lumanti. The findings of this mapping activity had a number of shortcomings: the list of public stand posts was incomplete and the dataset of poor unconnected

dwellers, putting the number at 3,000 persons in total, remained contested. This first mapping round could thus not resolve the disagreement between the different parties. It was then followed up by a more inclusive mapping process in 2004 led by NGOFUWS and CIUD. This latter process, which will be described in more detail below, led to a common understanding of the location, numbers and needs of the poor and the related public water supply infrastructure between the different parties involved.

However, the overall delay of project implementation meant that suggested arrangements for urban poor have not yet been implemented. Due to the uncertain timeline of the project, NGOFUWS started a process of mapping alternative water sources that currently cater for poor urban dwellers. The stone spout and dug well survey is fairly different in scope and method from mapping for the urban water sector reform process.

Independently, CIUD and UN-HABITAT in cooperation with WaterAid also embarked on a process called poverty mapping in peri-urban areas, which was piloted in two communities in Kathmandu Valley in 2006. This mapping process is based on a global UN-HABITAT initiative to improve methods for identifying the poor for project implementation and build local capacity for planning in South Asia. It relies on a sophisticated methodology developed by CIUD. This is the third mapping activity documented in this report.

3.2 Objectives and target groups

Overall, mapping processes carried out under the WaterAid in Nepal country programme have **four objectives**: (1) to influence policies in the direction of pro-poor service delivery of water supply and sanitation, (2) to raise awareness about alternative water sources to the NWSC supply network, (3) to support user committees and local governments in improving planning and implementation of service delivery, and (4) for internal project identification and implementation procedures. While mapping and enumeration of slums, squatters and public stand posts and the stone spout and dug well surveys fall under objective 1 and 2, the purpose of poverty mapping falls under objectives 3 and 4.

The **target groups** for mapping also differ between the four activities. While the mapping and enumeration of slums, squatters and public stand posts is predominantly directed at international donors and high level government bureaucrats, the stone spout and dug well surveys are designed to inform and mobilise the users of the mapped water sources. For poverty mapping, there are several target groups. Primarily, mapping information serves to inform and guide the decisions of the implementing organisations and user committees responsible for the future operation and maintenance of the services and infrastructure. In addition, the objective is to relate mapping to the planning process of municipalities, the official entities responsible for water supply and sanitation service provision. The objectives and target groups are also listed by mapping activity in Table 1 above.

3.3 Inputs

The inputs for the different types of mapping differ with the methodologies employed. They are listed separately for the different types of mapping in Table 2 below.

Mapping and enumeration of slums, squatters and public stand posts covers all five municipalities of Kathmandu. As mentioned above, the process was carried out in two phases. During the first phase, mapping was carried out by an external consultancy agency, which had a budget of USD 20,000. More interesting for this study, though, is the second round of mapping, which was implemented by WaterAid in Nepal's local partners under the lead of CIUD. WaterAid had provided the equivalent of USD 10,000 for the whole exercise but this budget does not reflect the real costs of mapping because the staff of NGO Forum for Urban Water Supply and Sanitation, CIUD, ENPHO and Lumanti worked on a voluntary basis to complete the report. In the survey, GIS/ArcView was used to locate public tab stands in combination with Ms Access and Excel to analyse socio-economic data sets and link them with geo-referenced data. The whole exercise took around five months. During this time, three to four people worked full-time on the study, supported by 30-40 enumerators carrying out a sampled household survey.

For the **stone spout and dug well enumeration**, which also covers all five municipalities of Kathmandu, the inputs are low-cost and low-tech. The NGO Forum, which coordinates this activity, mainly draws on a group of volunteers for the enumeration and water quality testing. This limits the costs to expenses for water quality testing kits and printing flyers. The technical inputs, a 2-litre water bucket, a mobile water quality test kit and a digital map, do not require any particular technical skills apart from general computer literacy for producing a report. Since the activity does not rely on household surveys, it does not involve a high human resources input. The stone spout enumeration was carried out by six to eight people within a period of two months.

Poverty mapping was carried out by CIUD and ENPHO in two peri-urban communities in Kathmandu Valley, so far. The methodology is still being refined at this stage. Poverty mapping is relatively high cost moment because it involves not only mapping physical infrastructure and socio-economic data collection but also the design of infrastructure rehabilitation and expansion. Poverty mapping requires GIS/ArcView skills and the ability to work with statistical programmes. The process of completing poverty mapping in a community of 6,000 inhabitants takes approximately three months. The bulk of the data collection and analysis can be carried out by four civil engineers and two assistants with additional support of approximately 30 enumerators and key informants during the household survey. The enumerators are generally volunteers drawn from the community itself.

Table 3: Mapping inputs

	Geographical Area	Costs	Technical Inputs	Time and Human Resources
Mapping for urban water supply reform project I: mapping of public stand posts	Kathmandu Valley (5 municipalities)	USD 20,000	GIS/ArcView	Different organisations involved at different phases and exact reporting of total man power involved other than the professional man power. Took more than a year.
Mapping for urban water supply reform project II: mapping and enumeration of slums, squatters and public stand posts	Kathmandu Valley (5 municipalities)	USD 10,000 but this does not reflect the actual costs of mapping	GIS/ArcView, Ms Access and Excel,	5 months by 3-4 persons and 30-40 additional enumerators for HH surveys
Stone spout and dug well enumeration	Kathmandu Valley (5 municipalities)	Minimal by drawing on volunteers	Water quality test kit, digital map, 2 litre bucket	1-2 persons
Poverty mapping	Peri-urban settlements (500 and 6,000 inhabitants)	unkown	GIS/ArcView, MS Access, Excel	~ 3 months, 4 civil engineers, 2 assistants, ~30 enumerators

Source: Interviews with CIUD, ENPHO, NGO Forum and WaterAid in Nepal; NGO Forum, 2005; Shreshtha and Shreshtha, 2005; UN-HABITAT , 2005

3.4 Methodology and process

In this section, the methodology and process will be described for the different types of urban water and sanitation mapping used by the WaterAid in Nepal

country programme. The emphasis will be on the overall approach since the methodology has already been documented in detail for each case.

3.4.1 Mapping and enumeration of slums, squatters and public stand posts

Mapping and enumeration of slums, squatters and public stand posts is directly related to a disagreement over the number of public stand posts and of poor unconnected urban households in Kathmandu Valley who are supposedly served by these including their consumption patterns and needs. The mapping methodology and process respond directly to this need.

The methodology: The methodology combined the mapping of public stand posts with the enumeration of poor households and a sampled household survey on water supply consumption patterns and preferences. Although the process relied on key informants and on a number of volunteers for carrying out the household survey, it was essentially not a participatory activity. Rather, the intention at the time was to deliver a quick response to the high level planners and decision makers involved in the reform process. The methodology is described in detail in Shrestha and Shrestha (2005).

Establishing a task force: A specific feature of mapping under Melamchi was the establishment of an inclusive task force that overlooked the process. The task force consisted of the major governmental, financial and civil society stakeholders engaged in the urban sector reform process.[6] The responsibilities of the task force were to reach agreement on the methodology and validate the findings of the study coordinated by the NGO Forum. As part of this, the task force developed a common definition for slum and squatter areas in the context of Kathmandu and developed a set of indicators (NGOFUWS, 2005). Determining indicators for slums and squatters was important since GoN and the IFIs had previously refused to accept the existence of slums in Kathmandu.

The **mapping process** contained five major steps. First, the location and working condition of stand posts were identified based on NWSC lists, field visits and key informant interviews. The location of the stand posts and their working condition were marked on a digital map.

The second step consisted of a sampled, detailed survey of stand posts to obtain information about functionality, sanitary aspects and management arrangements.

Third, slums and squatters were identified (based on indicators developed by the task force) through the consultation of existing databases, key informants

[6] The task force consisted of ADB, JBIC, KVWSRB, MPPW, NWSC, Ministry of Finance, National Planning Commission, community representatives, the Federation of Squatters, the Consumer Watch Group and the NGO Forum. The municipalities were not part of the task force at the time because they did not have democratic representatives in place. In addition, municipalities also initially boycotted the reform process refusing to participate in any related activities.

and through field observations. The population of the identified slums and squatters was enumerated and grouped into 295 clusters.

Forth, a detailed survey was carried out in selected clusters to obtain information with regard to social status, migration patterns, access to water and consumption patterns such collection time, water quality and quantity, sources of water and ability to pay.

The last step of the mapping process consisted of feedback meetings. At ward level enumerators, ward representatives and ex-elected members validated the study results in their geographic area. This was followed by a national workshop to disseminate the findings. During this workshop, the NGO Forum made the results available to the public in the form of a summary in Nepali and a CD containing all maps and the study report with the main findings. Large-scale maps were also distributed to the municipalities displaying the squatter and slum settlements and all public stand posts within their jurisdictions.

Mapping outputs consist of a report and the accompanying maps. The major findings of the study are summarised in Box 3 below followed by a sample of a map in Annex 1. The study shows that 885 public stand posts still exist in Kathmandu city of which 612 were working in 2005.

Box 3: Major findings of mapping under the urban water supply reform project

In 2004/5, the NGO Forum carried out a study on stand post and water accessibility of slums and squatters in Kathmandu Valley in order to shed light on (a) the number of poor urban dwellers in Kathmandu and (b) their sources of water supply. The study provided the following main findings:

In the five urban municipalities of Kathmandu Valley there are 137 slums and 37 squatters of 31,463 and 8,771 inhabitants respectively. 58% of the slums and 95% of the squatters are not connected to a NWSC pipeline. Regardless of whether squatter and slum households have a private connection, poor dwellers also use other sources of water provision. Approximately 30% of all poor dwellers use public stand posts and 43% of all slum dwellers use stone spouts and private wells in comparison to 66% of squatter dwellers making use of these alternative sources. The total number of NWSC provided public stand posts is 885, of which 612 were working in 2005.

When asked about their preferred source of water, three quarters of the slum dwellers preferred a private connection to a stand post while the percentage was reversed for squatter inhabitants. The study also demonstrated a strong correlation between the level of poverty and the prize people are prepared to pay for water services.

Source: Shrestha and Shrestha (2005)

Maps provided by the NGO-Forum together with the report show the location of all public stand posts and of all urban slums and squatters. In their current

form they are directed at planners who need detailed information about settlements rather than at the ordinary citizen.

Updating and sustainability: Mapping under the urban water sector reform project was intended as a one-off activity rather than an exercise that would be updated on a continuous basis. The intention was to confront preconceived perceptions about the number and water consumption patterns of poor urban dwellers. Therefore no regular updating of the data was envisaged under the activity.

The mapping results have now been taken up by a consultant team who is in charge of designing a Low-Income Consumer Support Unit as a department of the Kathmandu Water Utility Operator. Independently, NGOFUWS plans to develop a small booklet on slums and squatter settlements in Kathmandu as guidance for NGOs wishing target these areas.

While the second mapping process under the Melamchi Project reached a common understanding between government, the financial institutions, donors and NGOs about the number of the poor and the location of public stand posts, no major further action has been taken so far. This is mainly due to the delay in the overall reform process i.e. the continued difficulties in hiring a private management contractor. In the meantime, the NGO Forum for Urban Water Supply and Sanitation has shifted its attention to raising awareness about alternative water sources accessible to the urban poor in Kathmandu Valley. [7]

3.4.2 Stone spout and dug well enumeration

When talking about alternative water sources to NWSC supply in the urban areas of Kathmandu Valley, the main sources of supply are private dug wells and traditional stone spouts (see also Box 1). Contrary to the mapping process under the urban water reforms, the information produced by this enumeration was collected with the users rather than the policy makers in mind. A detailed description of the methodology and analysis of findings can be found in NGOFUWS (2006).

Methodology and process: The methodology and process employed to survey stone spouts and dug wells are simple and geared towards awareness rising. The methodology consists of a combination of simple water quality and quantity testing techniques and a sample of qualitative key informant interviews around management issues.

The survey had three major steps. First, a number of volunteers drawn from youths and undergraduate students are trained on water quality and quantity testing. Second, the actual survey is carried out. For this, surveyors are

[7] In addition, NGOFUWS also promotes rainwater harvesting in order to replenish the local aquifer. In cooperation with UN-Habitat, it is now drawing on this aquifer to produce low-cost bottled water to be sold to low-income consumers in Kathmandu.

equipped with a local area map, a 2-litre water bucket for measuring the discharge and with a mobile water quality test. The surveyor carries out the quality testing in public so as to counsel community members about the results and precautionary measures on the spot. In some cases, the public tests were also broadcast on television. In addition, the surveyor records the location and functionality of the stone spout and, in selected cases, conducts key informant interviews concerning the management of the source. In the final phase, the information is brought together on a map separately displaying the stone spouts for each municipality. In addition, a short report is compiled, which summarises and analyses the major findings. An example of a stone-spout map is displayed in Annex 2.

Updating and sustainability: The volunteers who remain active carry out ad hoc updates of the stone spout survey and report them to the NGO Forum for Urban Water Supply and Sanitation.

3.4.3 Poverty mapping

Among WaterAid's partners, poverty mapping is currently piloted by CIUD and ENPHO in two peri-urban settlements in Kathmandu Valley. It evolved independently from the above mapping activities coordinated by NGOFUWS. The initiative for poverty mapping originated from UN-HABITAT's regional "Water for Asian Cities" programme. The objective of that programme is to facilitate project implementation and to build capacity at the local level to operate and maintain the services delivered by the project. In Nepal, there is also an interest to set an example of an alternative implementation model to the ADB's Small Town Water Project, which is considered to be high-cost, slow and of limited sustainability. The focus of this mapping activity is thus oriented towards project implementation and local level planning rather than towards advocacy and awareness rising. Mapping, in this context, is also an instrument to identify the poor and to tailor interventions to their specific needs within a wider community. The major elements of the mapping methodology and process are summarised below. A detailed description can be obtained in UN-HABITAT , 2005.

The **methodology** for poverty mapping in Nepal was developed by CIUD, an organisation that is experienced in working closely with municipalities. Overall, the methodology is not dissimilar from existing PRA-type social mapping exercises regularly employed by organisations to reach poor segments of the population during project implementation. It has two broad components – a digital map displaying services and housing infrastructure and a socio-economic household survey. The spatial and socio-economic data sets are integrated so as to be able to prioritise interventions benefiting the poor.

Ideally, the **mapping process** is carried out in close cooperation with the respective community. Before commencing the actual mapping and data collection process, a user committee is formed, which coordinates all activities for project design, implementation and is subsequently responsible for the

operation and maintenance of the services provided. CIUD and ENPHO also plan to closely involve the municipalities in the mapping process in order to integrate private management into local level planning processes as far as possible. In practice, the degree to which the user committee can be involved in the mapping process also depends on the capacity and skills of the individual committee members.

The total process can be broken down into three broad steps.

First, project team and the user committee identify relevant indicators required to map the poor. For this, general indicators derived from the MDGs, UN-HABITAT and other guidelines, are adapted to the local context.

Second, a digital map is prepared, which displays the essential physical and social infrastructure of the settlement. Focus group discussions and key informants help to identify all important features in the settlement, which are incorporated into a digital map with GIS or CAD software. The settlement is then subdivided into a number of clusters and each house in the cluster is given an identification number in the database, which is linked to the spatial dataset.

Third, a household survey is carried out in the entire settlement. For this, enumerators are trained and sent to survey each household with a questionnaire based on the previously developed indicators. The survey assesses the socio-economic status of each household with a specific emphasis on access to water supply and sanitation. The data is entered into an Ms Access data base and subsequently linked to the spatial data set. This makes it possible to visualise the spatial distribution of socio-economic information. For example, it is possible to identify agglomerations of poor households or of households without access to sanitation and their distance to public toilets.

Updating and sustainability: The intention is that the user committee (in cooperation with the municipality) uses this data set for taking decisions on project interventions and, subsequently, for the management of the scheme. For example, the spatial data set can help the committee in identifying households that should receive subsidies for latrine construction. After the project is completed, CIUD and ENPHO hand over the database to the user committee. It is then their responsibility to update information and make use of the data sets and maps.

3.5 Repercussions and use

The three different types of mapping process have different target audiences and vary in the degree to which they are linked to policy processes. Repercussions and use therefore vary substantially. They are described separately for each mapping type.

3.5.1 Mapping under Melamchi

The mapping process for the urban sector reform process had a number of positive **repercussions** on the urban water supply reform process.

Mapping poor urban dwellers and their water sources made low-income consumers, their needs and demands more visible to urban planners. There is now an increased understanding of which services low-income consumers desire and how much they are able to pay.

The mapping process, especially the set up of an inclusive task force, also facilitated the interaction between the different stakeholders involved in the urban reform project. This helped to reach a common understanding about the number of the poor and of existing public stand posts and to create trust between government officials and donors on the one side and NGO representatives on the other side. In retrospect, the representatives from the KVWMSC and MPPW described the process as a “team work” activity and judged the information to be very useful for their future interventions. The government stakeholders and major funding organisations interviewed agreed that the study findings by NGOFUWS were correct and trustworthy. Similarly, the representative from JBIC felt that the process was inclusive in that all stakeholders had opportunities to raise their concerns and provide comments. Furthermore, the mapping process put the NGO Forum in touch with existing user committees of public stand posts. NGOFUWS’ better understanding of public stand posts led on to exploring alternative water sources such as the mapping of stone spouts and dug wells. This, in turn, led to the expansion of the network between the NGO Forum and user committees. The forum now also cooperates with MPPW, the ministry in charge of water supply on the question of water quality testing.

Most of the stakeholders described the establishment of a Low-Income Consumer Support Unit (LICSU) under the envisaged utility as an outcome of the NGOFUWS’ mapping process. Yet, a proposal for establishing LICSU seems to have been on the table even before the mapping process had taken place (NGOFUWS, 2005). In addition to the establishment of LICSU, one of the performance criteria of the Management Contract is now supposed to refer to serving low-income consumers. A separate project for the rehabilitation of 300 existing public stand posts and the construction of 50 new public connections is now underway. A technical assistance team under the ADB is charged with the implementation of these agreements. The opportunities and challenges arising from this development will be discussed further in section 4.

Concerning the **use of the mapping data**, not much has happened since March 2005. This is mainly due to the continued delay of the wider reform process and political context. So long as the appointment of the MC is pending, no investments will take place. The TA team under ADB had just started to design LICSU in September 2006 and made use of the NGO maps

and data set for this purpose (Interview with ADB). The municipalities, which had been supplied with maps for each ward, and could have made use of maps in the interim, continue to lack democratic representation. They have remained largely inactive for that reason. For the user committees of public stand posts, the existing maps are not of immediate relevance because they are designed for planners and not easily accessible to non-specialists.

3.5.2 Stone spout and dug well enumeration

The stone spout enumeration helped to increase the visibility of these alternative water sources and to underline their cultural and socio-economic importance. In Lalitpur, one of the five municipalities of Kathmandu, the enumeration gave rise to the formation of an association, the Traditional Stone Spout and Source Conservation Association (TSS and SSA). The TSS and SSA's objective is to improve the management and conservation of traditional stone spouts and to secure the sustainability of water supply from these sources. In this context, the association now lobbies for a law that limits other users from unsustainable groundwater extraction. The fact that the TSS and SSA is informed about the number, condition and discharge of each stone spout, gives weight to their arguments as does the fact that user groups from all 56 stone spouts of Lalitpur are part of the association.

The **use of the maps and data** related to the stone spout and dug well enumeration was not further explored during the field visit.

3.5.3 Poverty mapping

As stated earlier, poverty mapping has different objectives from the other two mapping approaches. It is more geared towards project implementation and future local planning processes around the implemented project. In the case of poverty mapping, the emphasis will be on the **use rather than on the repercussions.** The objective of poverty mapping is not explicitly to influence policy but rather to assist in project planning and implementation and to facilitate the subsequent management of the scheme by the user committee in conjunction with the local government. Project implementation is still ongoing in both pilot communities, Tigni and Siddhipur.

In Tigni and Siddhipur, the user committee said that the mapping process helped them in better understanding the situation their communities are faced with including the location and number of poor people, the different categories of poor and the needs and sequence for improving service delivery. The use of the mapping data, however, differed between the two communities. In Tigni, where the skills of the user committee are lower, and which was the first pilot community, the committee does not possess a map is not actively using the data collected during the survey. In Siddhipur, on the contrary, where the chairman has computer skills, he makes use of the data sets, i.e. the excel sheets, to retrieve information. The digital poverty maps produced by CIUD and ENPHO could not be discussed during the meeting as they were not available. Yet, it is clear that also the Siddhipur user committee will not be

able to produce their own maps or to independently adapt maps to their needs based on their present skills.

In both cases there is an issue with regard to the allocation of subsidies, one of the core functions of poverty maps. In both cases, the user committees were able to identify the most deprived households. However, when it came to the allocation of subsidies e.g. for latrine construction the user committees encountered resistance from community members. Each household requested a subsidy, which made targeting of extremely poor households very difficult.

In addition, mapping information will be useful for future interventions of other NGOs. As a general data set is already available, information does not need to be collected again, according to ENPHO and CIUD. This depends, of course, on the availability of all datasets with the user committee member in question. In future, this information could also be provided by the responsible municipality. Although they were not involved in the mapping process during the time of the field visit, one municipality reportedly expressed interest in getting closely involved in the mapping process as part of their strategy to localise the Millennium Development Goals. Nevertheless, this intention needs to be seen in the wider context of a political deadlock that still endures in Nepal.

4. Analysis

In section 3.5.4, the main repercussions and uses of mapping have been highlighted. There have been some clear successes in each case but also areas where use and/or repercussions could go further in the future. In this section, we will discuss some of the factors that have been particularly successful and some areas with space for improvement. The analysis is based on a framework developed by RAPID, ODI. This approach postulates that three main areas determine the influence that evidence has on policy processes. These are the process of collecting and producing evidence, the links and relationships between different stakeholders for the communication of evidence and the wider context with its potential to either facilitate or limit the impact evidence can have on a particular policy. Rather than discussing each of the three approaches in turn, the analysis is organised along the three aspects of evidence, links and context. The chapter concludes by highlighting challenges and opportunities for future mapping under the WaterAid in Nepal country programme.

4.1 Evidence

The production of evidence is a basic ingredient to change a policy process. For evidence to be taken up, it must be trustworthy, readily understandable and easy to produce by those who intend to use it. The following examples highlight some factors that might warrant some further consideration.

Transparency and documentation: In all three mapping approaches, the methodologies used and different steps taken for the production of evidence have been extensively documented. This is not the norm in development cooperation, which is often preoccupied with implementation. The detailed documentation of the approaches by the NGOFUWS and CIUD helps to increase transparency and to facilitate the potential replication of their approaches by other actors.

Do mapping tools match capacity of stakeholders? In the case of poverty mapping, neither of the user committees had the capacity to reproduce or change maps. If the intention is that the mapping data provides the basis for the future independent management of services by the committee, the question arises whether simplified methodologies ought to be used in order to facilitate the active engagement of the user committee not only in data collection but also in data input, analysis and future updating.

Is evidence useful? Generally (and this does not particularly apply to mapping approaches in Nepal) there is a tendency to collect much more information than is subsequently used. It might be useful to carefully consider which information will be used for which purpose before embarking on data collection. A particular challenge arising in the context of poverty mapping is the question of subsidies. A major objective of poverty mapping is to identify the poor in order to be able to target project interventions to their particular

needs. The identification and classification of the poor and their needs for services fulfils this purpose. Yet, acting upon the information is a different story in the case of poverty mapping. For example, in Siddhipur, the user committee reported that the poor did not want to be organised into categories that directly referred to their socio-economic status. A neutral categorisation such as A, B, C, D was accepted. Another example is the difficulty in targeting subsidies to the poorest section of the community. Additional social negotiation processes are necessary to do this and, in some cases, acting upon the mapping information remained socially unacceptable. Other solutions had to be found such as the provision of additional funds, which resulted in subsidies for all. These examples show that mapping is only the entry point for a more difficult process. The design of the mapping methodology and process could be rethought based on the potential to provide a good entry point into these social negotiation processes.

Is data protection necessary? Poverty mapping not only provides information about the number of poor households in a community, it also makes it possible to trace the socio-economic status of each particular household. This begs the question of the individual household's right to data protection. Are there measures to protect each household from being openly portrayed as being among the weakest socio-economic group? The resistance of community members to be associated to a particular category of poor as discussed above confirms that the need to revisit the current methodology.

4.2 Links

Communicating evidence to target audiences and stakeholders is another important element for changing policy processes. Established practices are generally supported by special interests and changing them involves attacking existing preferences. Thus, communicating evidence effectively, and creating networks of support for new practices, is crucial in this process.

The creation of an inclusive task force: In mapping under the urban water sector reform process, the NGOFUWS established a task force with all important stakeholders on board. This task force accompanied the mapping process and validated results. It appears that this was a crucial element for reaching a common understanding on issues that had previously been highly controversial. The fact that both governmental and IFI-representatives actively participated in defining the indicators for a slum and squatter was the basis for them accepting the subsequent study results. Of similar importance was that, at all important stages of the data collection and analysis, the task force had the possibility to raise concerns and provide input into the process and methods used. As a result, all parties accepted the study outcomes, which provided a basis for discussing how the needs of the poor could be catered for under the reforms.

Creation of a win-win situation: the consensus-based rather than provocative line taken by the NGO Forum provided the basis for a win-win situation, which is rather unusual when it comes to private sector participation in urban water reform processes. In fact, the information provided about poor sections of the population with regard to their location, service preferences and willingness to pay is reportedly of great value for the broader reform process. Having a good basis of information about the population to be served and the status of the network effectively reduces the operational risk for the management contractor. The existence of an inclusive forum further reduces the political risks for private management, which is of particular relevance as past examples of PSP in urban water management have shown.

The use of public fora and media: The NGO Forum for Urban Water Supply and Sanitation established various channels to communicate mapping results to a wider audience. It held a so-called "national consultation" following the mapping and enumeration of slums, squatters and public stand posts. In addition, the NGO Forum used television and newspapers to further publicise mapping results and create awareness about alternative water sources among the Kathmandu city dwellers.

4.3 Context

The wider political context greatly impacts on how readily new evidence is adopted. Some policy processes are defined as more 'closed' than others, thereby making it difficult for new evidence to be taken up.

Deadlock in the overall reform process: In Nepal, the overall political deadlock has, without any doubt, a major impact on any activities aimed at influencing policy processes. This is particularly obvious in the case of the urban water sector reform project and for poverty mapping. The Kathmandu Valley Water Sector Reform Project awaits implementation since the beginning of the new millennium. As long as the institutional reforms do not go ahead, no investments will be made in infrastructure, with the result that all, rich and poor, suffer. The wider political deadlock also weakens if not completely undermines the accountability of local governments to citizens. In this situation, it becomes more difficult for poor consumers to direct their demands for improved service provision to those who take decisions.

Should the political deadlock be resolved in the near future through an increased participation of Maoist representatives in the political process, the current project design, which includes private sector operation, is again put into question. It seems therefore logical to concentrate on alternatives to public provision of water supply in Kathmandu in the short to medium term. This is what the NGOFUWS is doing through the mapping of stone spouts, dug wells and other activities.

The role of self-managemente in Nepal: The political context is also relevant for poverty mapping led by CIUD and ENPHO. As mentioned earlier, the municipalities or Village Development Committees (VDCs) expressed interest in being involved in the poverty mapping process. Yet, when talking

about municipalities or VDC, this currently excludes political representatives and therefore democratic channels that citizens could use to get their services improved. It seems that the design envisaged for the future operation and management of services in peri-urban communities like Tigni and Siddhipur will be much more reliant on self-management through the user committee than on management channelled through the municipality. This is in line with the Local self Governance Act of 1999. Interestingly, in the case of Siddhipur, the current chairman also used to be a member of the local VDC. In the case of Nepal, where official democratic processes are in an infant stage (and effectively stalled since a number of years), informal governance mechanisms are likely to be important. They seem to be in place in Siddhipur, where the formation of the user committee was based on meetings between local politicians, intellectuals and **guthis**, the local traditional institutions.

4.4 Challenges and opportunities

In the urban areas of Kathmandu, three different categories of poor dwellers can be distinguished. In the peri-urban areas, such as Siddhipur and Tigni, former rural villages are now part of urban areas of Kathmandu. In the city of Kathmandu, there are pockets of newly arrived poor households but there are also individual poor households that live scattered among better-off families. These three different categories of poor have different characteristics to them and need different mapping approaches to be supported.

The urban mapping approaches developed by the WaterAid in Nepal country programme in a way, already respond to the different situations that poor urban dwellers are faced with. When taking each of the mapping approaches forward, it is important to keep their different needs in mind. Some of the future challenges and opportunities are highlighted for each type of mapping in turn.

Mapping under the urban water supply reform process has fulfilled its original purpose of making the poor more visible to the service provider and their needs being adhered to under the overall project. The envisaged design establishes a low-income consumer support unit under the water utility operator and ties the performance management contractor inter alia to progress in serving low-income consumers. In addition, a separate fund by a bilateral donor will serve the rehabilitation of existing and construction of additional community stand posts.

The proposed design, does, however, raise some questions. The funding for the provision of communal stand posts is not part of the wider project. Instead, it is a one-off contribution by a donor that does not guarantee similar expenses by the government in the future. Furthermore, it is not yet clear how the performance criteria of serving the poor will be weighed against other performance criteria the management contractor will have to fulfil and, following on from that, how citizens will be able to hold the service provider into account. From discussions with various stakeholders it appears that

citizens could voice their concerns to their political representatives in municipalities, which sit on the board of the WUO and could thus put pressure on the day-to-day operations of the operator. However, municipalities are presently not democratically governed.

Future mapping under Melamchi could directly involve citizens in the monitoring of the implementation of communal stand posts. Such a future monitoring mechanism could be more participative e.g. similar to monitoring sheets used by OPP-RTI in Karachi to ensure contractors adhere to official construction standards. It could also monitor the overall implementation of public stand posts and lobby for other services such as the provision of private connections, which seems to be the preference of the majority of the slum settlers. A related question here is why this does not figure among the current options under the project although it is one of the outputs of the mapping and enumeration of slums, squatters and public stand posts?

Stone spout and dug well mapping seems to respond to the urgent need of making alternative water sources more visible and safer for consumers. Here, the main question seems to be how the results of quality tests can be more widely disseminated among users. This activity currently relies on a limited number of volunteers. It could be strengthened by creating links with the university, i.e. the media and urban planning department.

The challenge for **poverty mapping** in Siddhipur and Tigni is to concentrate on those aspects of mapping most relevant for implementation and to make the activity sustainable beyond the project implementation period. This could be done by reconsidering mapping objectives in the light of future needs for self-management by the user committee. For example, the committee in Siddhipur highlighted the value of having enumerated all households for future tariff collection purposes. It might thus be useful to elaborate excel sheets so that they serve as an accessible tool for tariff collection rather than training the committee on producing maps. In the case of poverty mapping it was not quite clear (during the field visit) which role the municipality could play for the future operation of the services. In case the water and sanitation schemes will be run by user committees, the municipality might have a regulatory and supportive rather than an operational role to play.

In a nutshell, the challenge and opportunity for taking each mapping activity forward is to revisit the objectives and methodology of each approach in light of the particular policy /governance process to be targeted. The design of the new mapping avenue should help to sharpen the message the map intends to convey and to actively include those in the process that need to advocate for change or implement a particular policy process.

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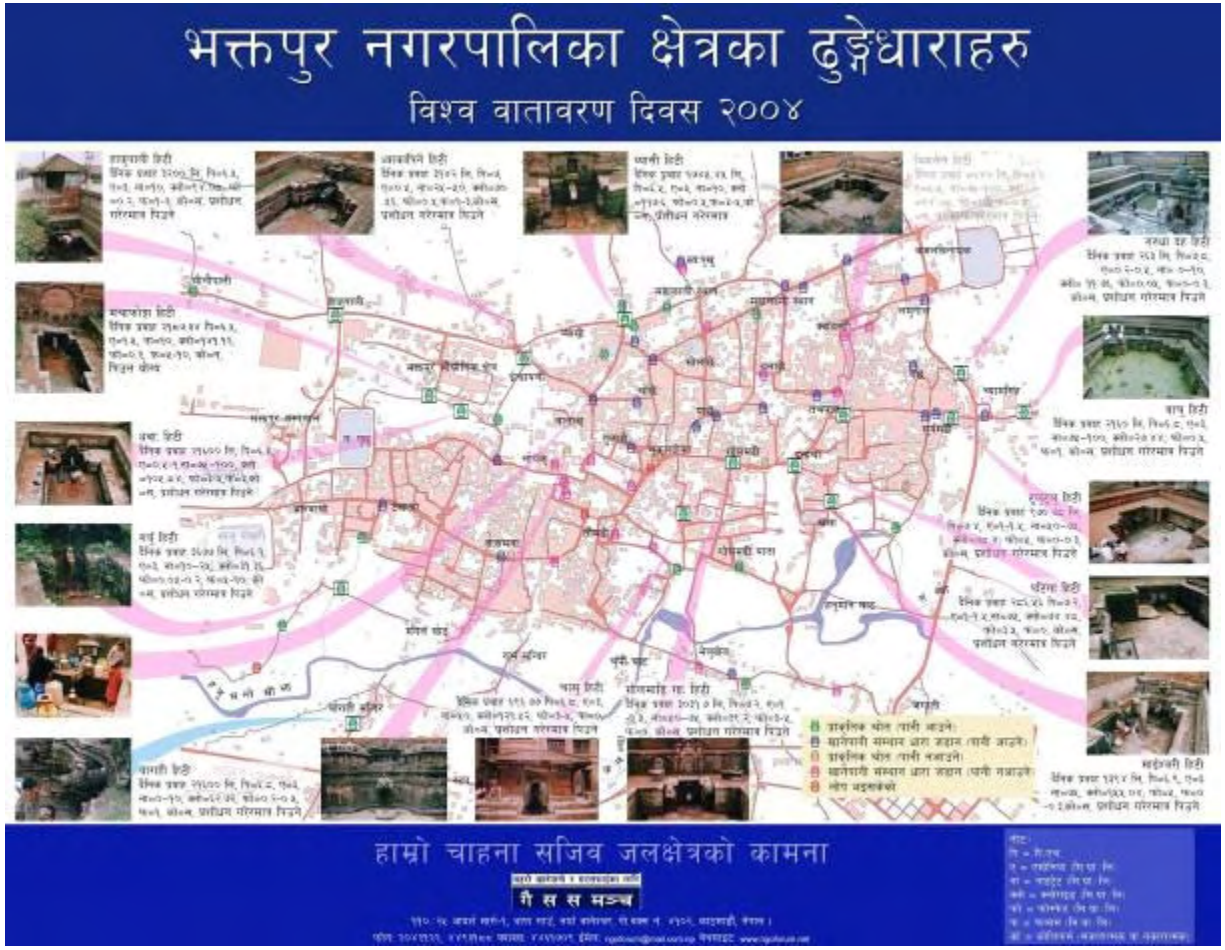
Mingma Gyalzen Sherpa	Programme Manager, ENPHO
Noor Kumar Tamrakar	KVWS Management Support Committee
Oliver Jones	Rural Programme Coordinator, WaterAid in Nepal
Padma Sunder Joshi	Executive Director, CIUD
Paras	Programme and Resource Planning, NEWAH
Poorna Adida	Programme Manager, Lumanti
Prakash Amatya	Executive Director, NGO Forum
Poorna Das Shrestha	Deputy Director, Melamchi Water Supply Project
Rabin Lal Shrestha	Research and Advocacy Manager, WaterAid Nepal
Rajendra Shreshtra	Project engineer, ENPHO
Rajesh Mahayan	Employee of Siddhipur WSUC
Roshan Raj Shreshtra	Chief Technical Adviser, UN-HABITAT
Sanjaya Adhikary	Country Representative
Santosh Basnet	Technical Division Manager, NEWAH
Suman K. Shakya	Deputy Executive Director, ENPHO
Sumitra Manandhar Gurung	Chairperson, Lumanti
Gyan Kaji Shakya	Secretary, Alko Hiti Stone spout conservation and consumers' committee
Sunil Shakya	Liaison officer, NGO Forum and TSS and SCA
Sunkaji Rajbahak	Chair, Tigni Community Development Committee
Sushil Shrestha	President, TSS and SCA

Annex 1: Sample of a map showing the slums, squatters and public stand posts in Kathmandu Valley at ward level

This is one of the maps showing the water supply network including public stand posts and the number of people living in slums or squatters as well as their location relative to the public stand posts and water supply network. The example represents ward 25 in Kathmandu.

Annex 2: Sample of a stone spout map



This is a poster showing all stone spouts in one of Kathmandu's municipalities. The map shows the location of each stone spout and also explains the water quality and quantity next to a picture of it.

WaterAid's mission is to overcome poverty by enabling the world's poorest people to gain access to safe water, sanitation and hygiene education.

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