

FUNCTIONALITY ASPECTS ON INDICATORS OF PUBLIC HEALTH - A STUDY ON ACCESS TO INFRASTRUCTURAL SERVICES BY A GROUP OF FEMALE-HEADED HOUSEHOLD IN VINGUNGUTI, DAR ES SALAAM

ELISABETH ILSKOG

KTH, School of Technology and Health, Marinens väg 30, 136 40 Handen, Sweden
Email: elisabeth.ilskog@sth.kth.se (corresponding author)

EVA-LOTTA THUNQVIST

KTH, School of Technology and Health, Marinens väg 30, 136 40 Handen, Sweden

ABU A.K. MVUNGI

Department of Sociology and Anthropology, University of Dar es Salaam, Tanzania

ABSTRACT

A public health case study in the informal settlement of Vingunguti, Dar es Salaam, organised for a small group of female household-heads to document aspects of the infrastructural services with the help of photo eliciting and compared this to the results of a traditional socio-economic survey, previously implemented in the area.

It is argued that, in the case of Vinguguti, major problems concerning infrastructure such as the sewage dam and the function of services, could not be properly described by traditional indicators. The study showed that there is a need for an increased focus on functionality and accessibility, dimensions not covered by indicators commonly utilised.

Key words: Indicators, infrastructure, informal settlements, Tanzania

BACKGROUND

According to the United Nations Populations Division, the world continues to urbanize quickly. Half of the world's population in 2008 was assessed to be represented by urban dwellers (UN, 2006). The provision of urban services to city dwellers is one of the biggest challenges faced in developing countries (Sohail and Baldwin, 2004).

Informal settlements (slum-areas) are often considered a transient phenomenon and an outcome from economic hardship, which will ease once the national economy improves. This has however been proven to be a myth rather than a reality. Instead, different forms of informal settlements in and around cities are constantly growing worldwide (Kombe, 2005).

Access and affordability to infrastructure services such as water and sanitation is essential for sustainable development and poverty eradication, and can provide major benefits in the area of health, literacy and equity (e.g. Kyessi, 2005; Gulis et. al., 2004; World Bank, 2006). Even so, the living conditions for people in these areas are far below an acceptable level and have lead to exclusion of the poor from adequate provision of modern quality and essential services. As has been pointed out by Sida (SIDA, 1993) among others, some groups in the society are more vulnerable; such as disabled people, and female-headed households. The conventional development

framework is patriarchal and has marginalised women in the development process (Hans, 2001). Field studies indicate the weakness of women's participation in community meetings, especially concerning development of their settlement (Winayanti & Lang, 2004).

For the purpose of planning and evaluation different forms of surveys are used. Compilation of the information collected is commonly used by means of indicators, which present data in a comprehensive form and at the same time display an appraisal message. However, along with the growing faith on indicators as 'the' means for communication, comes a risk of limiting the scope and simply focus on the message given. It is not clear that the indicators chosen are giving a realistic picture. In particular for vulnerable groups in the society that are less represented on a planning and decision level, the everyday life can differ considerably.

OBJECTIVE

The objective of this paper is to compare the results of the traditional socio-economic survey in relation to infrastructure services with the manifest functionality and accessibility as experienced by those exposed.

METHOD AND MATERIAL

The approach used for verification of the objective was to compare results from a large survey in an informal settlement in Dar es Salaam, Tanzania, with the perceptions of a small group of female-headed households in the same area.

The survey, was implemented by the University of Dar es Salaam in 2007 (University of Dar es Salaam, University Consultancy Bureau, 2007), and covered a total of 1 200 households randomly sampled from three municipalities in Dar es Salaam. In the survey, data were mainly collected through interviews on household level, where information on incomes, income generating activities, status and access to social services were collected. In addition, meetings were held in a form of focused groups, with NGOs and Civil Societies Organisations. For the process to be participatory, the local communities were requested to choose representatives to attend meetings and agreeing on what to discuss in relation to the whole of the exercise. Finally, the survey team members carried out physical observation of the socio-economic levels and services status in the study areas (University of Dar es Salaam, University Consultancy Bureau, 2007).

The settlement of Vingunguti in Ilala Municipality, which is categorised as an unplanned inner-city area, contributed to the study with results from a total of 81 households, and was selected as reference area for the subsequent small case study on female-headed households. During the field visit, contacts were taken with ward executive officer and street leaders after which identification of the participants were made. This was followed by a snowball sampling procedure which is commonly used to obtain potential respondents in a situation where a researcher uses a small group of identified people to establish contacts with others (Wright and Stein, 2005). The sampling procedure resulted in a selection of 18 female-headed households. Each of the selected households was equipped with a disposable camera, with which they were asked to document the problems of their everyday life. The instructions did not specifically point out "infrastructural issues focused on public health", rather all their problems. The photos were developed and used as a base for individual discussions carried out in Swahili. The women in were instructed to take at least 10 pictures of things they defined as 'problems'. The remaining photos were left for the participants to be used for photos of family and friends. Of the 18 female-headed households included in the study, 11 managed to take photos and to participate in individual discussions of these photos. In addition, 6 of them participated in a group discussion.

Of the 11 women participating in the discussion, they had all lived for a long time in Vingunguti, between 23 and 56 years. One of the ladies were born in Vingunguti. Those born outside of Vingunguti came from rural areas in the vicinity of Dar es Salaam. Most of the participants were widows supporting large families, from 6 to 14 people. They all had their own children (minimum 3 and maximum 9) and some also had grand children staying in the household. Many of the women interviewed reported to be unemployed.

The field study was mainly carried out by a (male) student from the University of Dar es Salaam, supervised by senior project implementers (female) during July to October 2009.

The issues highlighted by the respondents as problems, were matched with indicators utilised in the socio-economic survey made by the University of Dar es Salaam, referred to above. The matching was followed by an analysis phase.

Dar es Salaam, a city of more than 3 million people, is urbanising fast at a rate of about 8% per annum. Unplanned settlements are growing faster than the rate of urban populations (Marobhe, 2007). The Vingunguti

settlement is located six kilometres from the city centre and covers an area of about 32 hectares. According to the last census in 2002 the total population was close to 70,000, with a high increasing rate (Kiunsi & Mchome, 2006). A critical characteristic is the near total lack of common service infrastructure like water, electricity, drains and sewer networks. Roads are poor without any formal constructed drainage. In 1992 one of Dar es Salaam's main disposals was shifted to Vinguguti. The site is located adjacent to the Msimbazi River and is subjected to flooding which makes it unsuitable for dwellings. The flooding increases the risk of malaria or other vector borne diseases, and the river has showed to be seriously polluted with high levels of faecal coliform and total coliform (Mbuligwe and Kaseya, 2005).

The rain falls mainly during two seasons from March to June and from October to December. The annual rainfall ranges between 1000 and 1200 mm. The flow of the Msimbazi river is perennial (Mbuligwe and Kaseya, 2005).

RESULTS

Most of the indicators used in the reference survey carried out by the University of Dar es Salaam are related to a description of the status of a particular category. Examples are; "source of drinking water", and "type of floor" in a house, e.g. data that can be quantitatively measured. Only in a few cases, the actual perspectives of the participants has been included. One example is "the perception of socio-economic services in the area". Examples of indicators of particular interest from a health aspect are given in Table 1 below.

Table 1 Examples of indicators used in socio-economic surveys on infrastructure. Source: Based on indicators used in a mapping study performed by the University of Dar es Salaam in 2007 (University of Dar es Salaam, University Consultancy Bureau, 2007).

Category	Typical indicator used in surveys
Public Health	<ul style="list-style-type: none"> - Malaria, HIV/AIDS, and waterborne diseases (diarrhoea, cholera, schistosomiasis, dysentery, etc.) are expressed as "common diseases in the area" - Perception of health services
Water	<ul style="list-style-type: none"> - Expressed as "distance to and status of services" - Expressed as "source of drinking water" - Perception of water services
Sanitation	<ul style="list-style-type: none"> - Expressed as "type of toilet facilities"
Waste	<ul style="list-style-type: none"> - Expressed as "Waste generated per day" - Expressed as "Waste collector" - Expressed as "Place of disposal" (used for those who dispose themselves) - Expressed as "Cost of solid waste collection services" for those respondents reports "collection of solid waste by someone else"
General perception of services	<ul style="list-style-type: none"> - Expressed as "perception of socio-economic services in the area"

A comparison with the results of the survey made by the University of Dar es Salaam shows that the perceptions of the Vinguguti case study households are, overall, in agreement with those of the full survey group. All respondents in the case study pointed out sanitation and its related infrastructure as a major problem. Just as in the larger survey (80% (Table 2)), they had pit latrines. However, discussions in the small group revealed that these were not functioning properly. The issue of functioning sanitation was not covered in the set of indicators used in the large survey.

In the group of female-headed households, the availability of fresh water was also seen as essential priority. Limited services and low water quality heavily affected their livelihood. All stated that there was a lack of water, at least seasonally. Thus the indicators "distance to and type of service" and "source of drinking water" in the two tables, do not adequately describe the situation. The lack of service and maintenance of the piped water system, and the uneven water availability in the pipes due to low availability of electricity, also implied health hazards due to inflow of contaminated water or deteriorated water quality due to long storage in tanks. These issues are to some level covered by the indicator "perception of water services" in the full survey, however without any relevant information on the reasons for the expressed opinion given. It is also worth noticing that 55% of the respondents in the full survey regarded the water services as moderate (Table 2), whereas the majority of the women in the small case study viewed this issue as a major problem.

Table 2 Socio-economic status and services in Vinguguti, Ilala Municipal, based on perception of respondents. Source: University of Dar es Salaam, University Consultancy Bureau, 2007.

Common Diseases (81);
Malaria (97.5%), water borne diseases (Diarrhoea, Cholera, Schistosomiasis, Dysentery, etc.) (90.3%), HIV/AIDS (95.2%), other (3.5%)
Perception of health services among respondents (81);
Good (9.9%), moderate (82.9%), bad (6.2%)
Source of drinking water (81);
Pipe in house (0%), pipe outside of house (3.8%), bore hole (23.8%), bought water (67.5%), other (4.9%)
Perception of water services among respondents (81);
Good (0%), moderate (55%), bad (45%)
Toilet facilities¹;
Flush toilet (WC) (5%), ventilated improved pit (VIP) (15%), pit latrine (80%)
Perception of socio-economic services among respondents (81);
Very poor (5.0%), poor (37.5%), moderate (53.7%), good (3.8%), very good (0%)

Figures in brackets indicates number of respondents

Also the relation between dust and indoor climate in homes and schools received a strong attention from the respondents among the female-headed households. Dust, and in particular contaminated dust, was claimed to bring airborne diseases, specifically if activities had to be performed on the ground/floor (school classes, cooking and sleeping, etc.). Furthermore, the respondents pointed out the relation between different types of diseases and the limited amount of water/contaminated water, and the risk for diseases in relation to flooding was highlighted (malaria, worms, bacteria, virus etc.). In particular the flooding of the sewage dam was claimed to bring not only bad smell, but also illness as the flooded sewage water was said to force its way into houses. Such consequences of bad performing infrastructures are likely to be missed out in a regular survey, although indicators on common diseases (Tables 1, 2), and type of floor in the houses are included.

Finally, the sewage dam was brought up by the female-headed households as a problem also under the dry season. Two of the respondents pointed out that kids are often playing around the dam and the risk for them to fall into the sewage water. The existence of a sewage dam was not identified in the reference survey made by the University of Dar es Salaam.

A detailed description of the discussions with the respondents in the female-headed households in Vingunguti, and the method of photo eliciting are given in the paper “The figures behind facts – photo-eliciting infrastructural consequences in Dar es Salaam” (Thunqvist et. al., 2011).

DISCUSSION

The comparison of issues raised by the group of female-headed households, with data from the reference survey made by the University of Dar es Salaam result in a similarity of issues highlighted. As presented above; sanitation and lack of fresh water services are areas that are pointed out in both study groups as the cause of severe problems in the unplanned settlement of Vingunguti. While this was expected, it is clear from the discussions with the female-headed households that one of the main issues is not only the lack of infrastructure per se, but rather the function - the services. One example can be taken from the area of sanitation, were pit latrines claimed to be used until they are full and emptied only by the flooding of the rains. If data collected in a survey is focused only on the type of toilet facilities existing, these problems are missed out and not properly addressed by future development activities. The access to a pit latrine does not imply that the latrine itself is in fact functioning. The informants may feel obliged to answer a direct question, and therefore the statement that they do have a latrine does not necessarily guarantee that the latrine is possible to use. This aspect is not clearly covered in the larger reference survey.

Therefore, aspects on *functionality* of infrastructural services are proposed to be added to the indicators used in standard socio-economic surveys (Table 3), with the aim to attain a more comprehensive understanding of the problems and priorities of people in unplanned settlements. This aspect of “functional” services is not new. WHO/UNICEF (2000) used a definition based on who had “improved” provision of infrastructural services,

¹ Juma, 2002

whereas a UN–Habitat study (2003) used the word; “adequate” provision. Continuing with sanitation as an example this includes “hygienic, well-maintained, easily accessed toilets that are used by all family members, and have a safe and convenient disposal of waste water”. The different definitions of course have serious influence on the assessment of sanitation. For example, it is assessed that 50–60% of the urban population in Africa lacks “adequate” provision for sanitation, which is more than three times the number lacking “improved” provision (IIED, 2003).

This paper suggests the term “functionality”, which defines a system working in accordance to its description of the goods. In other words, a simple pit latrine is functioning if it is used daily without any leakage, and is exposed for regularly emptying services. The opposite is an overfull pit latrine that is only drained by the flooding during the rainy season.

In addition to functionality, the result from the study shows that the terms “*affordability*” and “*seasonal variation*” can provide supporting qualitative information if included in lists of indicators utilised (Table 3). Again taking the example of pit latrines, it might be that although emptying services are available it is not evident that all citizens in the area will be able to afford the services, and if the question is raised in a survey shortly after the pit latrine has been drained by the rains it might be that the issue will not be at all observed. There are considerable variations between the dry and the rainy seasons in Dar es Salaam. Thus the results of an investigation may also be affected by the time of sampling. Based on the result from the study of the female-headed households, it is clear that the main problem areas highlighted by the respondents were subject to seasonal variations. Taking the category of waste as another example, the issue is likely to receive more attention during the rainy season as the rain and wind spread the waste throughout the surroundings.

Table 1. Indicators proposed to be added to standard socio-economic surveys, based on results from discussions with participants from female-headed households in Vingunguti, Dar es Salaam.

Sanitation	Water
<ul style="list-style-type: none"> - Access to functional toilet facilities (<i>positive responses, share of number of total respondents, %</i>) - Type of toilet facilities (<i>no facility/individual toilets/shared or public toilets, share of number of total respondents, %</i>) - Affordability of services for regular emptying and maintenance (<i>positive responses, share of number of total respondents, %</i>) - Seasonable availability of toilet facilities (<i>all year/dry season/wet season, share of number of total respondents, %</i>) 	<ul style="list-style-type: none"> - Access to functional fresh water supply (<i>positive response, share of number of respondents, %</i>) - Primary source of fresh water supply (<i>private piped/yard tap/kiosk/vendors/ neighbours/ ground water or other natural source/ other/ no supply, share of number of total respondents, %</i>) - Seasonal availability of functional fresh water (<i>all year/dry season/wet season, share of number of total respondents, %</i>)
Waste	Transport and Communication
<ul style="list-style-type: none"> - Access to functional waste disposal services (<i>positive responses, share of number of total respondents, %</i>) - Seasonal availability of functional waste handling and disposal services (<i>all year/dry season/wet season, share of number of total respondents, %</i>) 	<ul style="list-style-type: none"> - Access to functioning roads for waste collection (<i>positive response, share of number of respondents, %</i>)

CONCLUSIONS

Informal settlements have expanded rapidly during the last decades, driving the world towards an urbanised society (Kombe, 2005). As the living conditions for people in these areas are far below acceptable levels, excluding the poor from the adequate provisions of modern and essential services, there is a need for continued development work.

Results presented in this paper, illustrate a correspondence between findings from a larger socio-economic survey made by the University of Dar es Salaam, and a small case study on female-headed households. However, the comparison also shows that the data collected and indicators compiled in the large survey do not fully demonstrate the circumstances for the people living in Vingunguti. The case study identified a need of indicators that describe functionality of infrastructure services.

In addition, the method of using photo eliciting illustrated some major problems concerning the local infrastructure such as the sewage dam and the city dump. The method also clarified the awareness of the respondents of health implications due to inadequate infrastructure (e.g. no water-dust problems-bronchitis-expensive drugs; rain emptied latrines-bad water quality-stomach problems etc.). None of these issues could have been properly identified and described only by the use of traditional surveys and quantitative data alone.

ACKNOWLEDGEMENT

This study was financed by the Swedish International Development Cooperation Agency (SIDA).

REFERENCES

- Gulis G, Mulumba JAA, Juma O, Kakosova B, 2004. Health Status of people of slums in Nairobi, Kenya. *Environmental research* 96 (2004) 219-227. Elsevier Ltd.
- Hans, A., 2001. Locating women's rights in the Blue revolution. *Futures* 33, 753-768. Elsevier Ltd.
- International Institute for Environment and Development (IIED). Editorial 2003. Water, sanitation and drainage: ensuring better provision with limited resources. 2003 15: 3 *Environment and Urbanization*. DOI: 10.1177/095624780301500217. SAGE Publications. <http://eau.sagepub.com/content/15/2/3>
- Juma, M. 2002. Poverty Assessment Based on Access to Basic Infrastructure and Services in Some Selected Unplanned Settlements in Dar es Salaam: The Case of Vingunguti, Tandala and Manzese, Unpublished Dissertation, Dar es Salaam
- Kiunsi R, & Mchome E. 2006. Community Initiatives in Managing Urbanization and Risk Accumulation Processes: Learning from Dar es Salaam, Tanzania.
- Kombe, W., 2005. Land use dynamics in peri-urban areas and their implications on the urban growth and form: the case of Dar es Salaam, Tanzania. *Habitat International*, 29, 113-135.
- Kyessi A.G. 2005. Community-based urban water management in fringe neighbourhoods; the case of Dar es Salaam, Tanzania. *Habitat International* 29 (2005) 1-25. Pergamon. Elsevier Ltd.
- Marobhe, J. N. 2007. Critical review of water supply services in urban and rural areas of Tanzania. *Water Policy* Vol. 10, No 1, 57-71.
- Mbuligwe, S., and Kaseva, M., 2005. Pollution and self-cleansing of an urban river in a developing country: A case study in Dar es Salaam, Tanzania. *Environmental Management*, Vol 36, No 2, 328-342.
- Sida (Swedish International Development Agency), 1993. Country gender analysis for Tanzania. Prepared for SIDA by Patricia Mbughuni, Tanzania.
- Sohail, M. and Baldwin, A. N. 2004. Performance Indicators for 'Micro-Projects in Developing Countries. Loughborough University. Leicestershire. UK <http://hdl.handle.net/2134/3855>
- Thunqvist E-L, Ilskog E & Mvungi A, 2011. The figures behind facts – photo-eliciting infrastructural consequences in Dar es Salaam. *Manuscript submitted for publication*.
- UN, Department of Economic and Social Affairs. 2006. Populations Newsletter. <http://www.un.org/esa/population/publications/popnews/popnews.htm>
- UN-Habitat (2003), *Water and Sanitation in the World's Cities; Local Action for Global Goals*, Earthscan, London, 274 pages.
- University of Dar es Salaam, University Consultancy Bureau (UCB). 2007. Socio-Economic Survey (Mapping) of Dar es Salaam City. The Cities Alliance Programme for Dar es Salaam. Dar es Salaam City Council. Dar es Salaam. Tanzania.
- WHO and UNICEF (2000), *Global Water Supply and Sanitation Assessment, 2000 Report*, World Health Organization, UNICEF and Water Supply and Sanitation Collaborative Council, 80 pages.
- Winayanti L. & Lang H.C, 2004. Provision of urban services in an informal settlement; a case study of Kampung Penas Tanggul, Jakarta. *Habitat International* 28 (2004) 41-65. Pergamon, Elsevier Science Ltd.

World Bank, 2006. Inside Informality: Poverty, Jobs, Housing and Services in Nairobi's slums. Report No. 36347-KE, Water and Urban Unit 1, African Region.

Wright, R. and M. Stein. 2005. "Snowball sampling." Pp. 495-500 in The Encyclopedia of Social Measurement edited by K. Kempf-Leonard. San Diego, CA: Elsevier.