

7

A participatory approach to monitoring slum conditions: an example from Ethiopia

by **TSION LEMMA, RICHARD SLIUZAS and MONIKA KUFFER**

Introduction

The eradication of slums is currently on the global agenda. One of the Millennium Development Goals (MDGs) is to 'achieve significant improvement in the lives of at least 100 million slum dwellers, by 2020' (UNDP, 2003). Efforts are being made to localise the MDGs. But in many developing cities, the scarcity of relevant data – coupled with lack of both human and financial resources for data collection and analysis – is a significant constraint.

The large-scale implementation of slum upgrading and improvement programmes is one of the biggest challenges that communities and municipalities in developing countries face today. Such programmes aim to overcome diverse problems such as poor housing conditions, limited access to improved water and sanitation, insecure tenure, hazard risks, and high unemployment.

In this article, we describe a participatory approach that could improve slum monitoring processes. It involves various actors with local knowledge and uses Geographic Information Technology (GIT). The approach reduces resource requirements while providing locally relevant and spatially detailed information. The data can be used for both planning and monitoring the effectiveness of slum intervention projects. This low cost participatory approach has been tested in

Addis Ababa, the capital of Ethiopia – a large city with a high proportion of slum households.

We used rapid urban appraisal methods, supported by GIT tools to map and analyse the slums. The methods and techniques used included focus group discussions, field observation with community members and local experts, and visual image interpretation using satellite images and aerial photographs. The approach has potential for replication and up-scaling to produce a city-wide database of slums that could be used to monitor the effectiveness of ongoing upgrading projects.

Background

One important prerequisite for improving slum conditions is local intervention strategies that build on adequate and timely available information that spatially locates slum areas – but which also reflects their diversity in a local context. The use of performance targets such as the MDGs requires a workable monitoring mechanism so that the societies involved can measure its progress.

Addis Ababa has estimated population of over 3 million, with ten sub-cities. Between 85% and almost 100% of its population are slum dwellers (UN-Habitat, 2004). But the central government has only recently given urban develop-

Photo 1: A street scene in Addis Ketema sub-city



THEME SECTION

Photo: T. Lemma

ment issues any attention, as agriculture is still the dominant source of livelihoods for most Ethiopians.

The neglect of urban issues has had severe consequences for the physical, social and economic development of Addis Ababa (Solomon, 2005). Recently, the national government and the local government of Addis Ababa have formulated policies to target urban poverty reduction and slum upgrading by:

- providing infrastructure;
- improving tenure security;
- improving water supply and sanitation;
- improving housing conditions; and
- improving the urban environment (e.g. improving the solid waste management).

(AAWSA, 2004; HDPO, 2004; MOFED, 2002).

Main strategic decisions about slum intervention and budget allocation are still done at the city level. The actual

implementation and resource mobilisation is prepared on the lowest administrative level, or kebele, and is based on community participation. There are 203 kebeles in the city. The sub-city level is not very involved in this process.

The importance of the kebeles is rooted in the reform of the administrative structure in 2003. This emphasised decentralisation and public participation. But the programmes on poverty reduction and slum upgrading increase the need for detailed information on slum areas. So information is required to gain a better understanding of the complexity and diversity of such areas – and to support the more strategic allocation of scarce resources for slum upgrading.

The local demand for information on slum areas goes beyond the simple classifications that characterise most parts of Addis Ababa as 'slums'. This demand reflects the views and needs of the inhabitants. It calls for 'high-resolution' as well as qualitative information (Kumar, 1987). Because fast

Photo 2: Participants of a city-level professional focus group marking slum areas on a satellite image of Addis Ababa

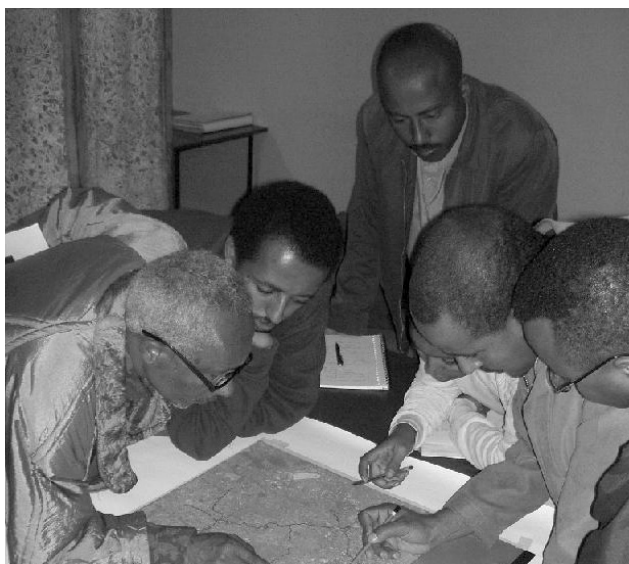


Photo: R. Sliuzas

but also reliable data collection methods are needed, we found participatory assessment to be a highly appropriate methodology for slum surveys. This approach focuses on local people's perceptions of slums and their diverse characteristics. We used participatory approaches that incorporate the use of Geographic Information Technologies (GIT) such as high resolution QuickBird satellite imagery and aerial photographs at scale 1:10,000.¹

This approach could be an alternative to overcome the lack of conventionally available data for local upgrading strategies (Sliuzas, 2004). The approach offers several advantages over conventional, more technocratic approaches such as:

- its timeliness and low cost;
- the increased ownership of the data collection process and the revealed problems;
- the local learning that results from participation; and
- a greater ease of embedding locally generated information in institutions such as city and sub-city authorities and community-based organisations (CBOs) (Turkstra and Raithelhuber, 2004).

In this article, we describe the work carried out in Addis Ketema sub-city and Kebele 14.² This kebele was selected to demonstrate the different levels of information that can be obtained from local knowledge in combination with satellite imagery and aerial photos.

¹ For more information about very high resolution satellite imagery visit one of the following websites: www.terraserver.com/; www.digitalglobe.com (QuickBird) or www.spaceimaging.com (Ikonos).

² The full study covered three sub-cities and four *kebeles* and is reported in Lemma, 2005.

Box 1: An example of questions to explore how people understand the term 'slum'

- How is 'slum' defined in the local context of Addis Ababa?
- a) Are there official definitions related to slums that are used for policy purposes or other official use?
- b) Is there a local language term used (for example, like *cherekabet* for informal settlements)?
- c) If not, how would you define slum in a local context?
- What characteristics do slum areas have?
- What are the most common characteristics (list and prioritise accordingly)? Why?

Addis Ketema is part of the old city centre and is dominated by a mixture of commercial activities and deteriorating residential areas. It includes the largest market place of the nation, Merkato, and the intercity bus terminal. Kebele 14 is one of the most densely populated areas within Addis Ketema, with approximately 700 inhabitants per hectare.

Methodology

Acquiring comprehensive slum information for slum improvement in cities like Addis Ababa is entwined with issues of extreme resource constraints, data limitations and the heterogeneous characteristics of the city. We employed rapid appraisal techniques, integrating local knowledge with GIT using a participatory approach. This approach is preferable as it is cheap to build, easy to use, robust and flexible in its application (Sliuzas, 2004). Through focus group discussions, direct field observation, and visual image interpretation complemented by secondary data we were able to generate both spatial and non-spatial information on slums in the form of thematic layers in a GIS environment.

Using focus groups

Focus group discussions were held at city, sub-city and kebele level with different types of participants. This enabled us to observe the differences in the competencies and knowledge between professionals, technicians and residents. We held ten focus group discussions involving three to eight participants each. Similar sets of open-ended questions (checklists) were developed and used (see Box 1).

It was essential to form a shared conceptual base for identification, characterisation and analysis of slums. So during the focus group discussions, slums were defined in the local context. Indicators considered relevant by each group were developed (e.g. access route condition, access to improved water and sanitation). The indicators then provided a basis for conducting slum identification. In addition, existing interventions in slums were discussed and

Figure 1: Some sketch map outputs from focus groups for slum identification at sub-city and city level

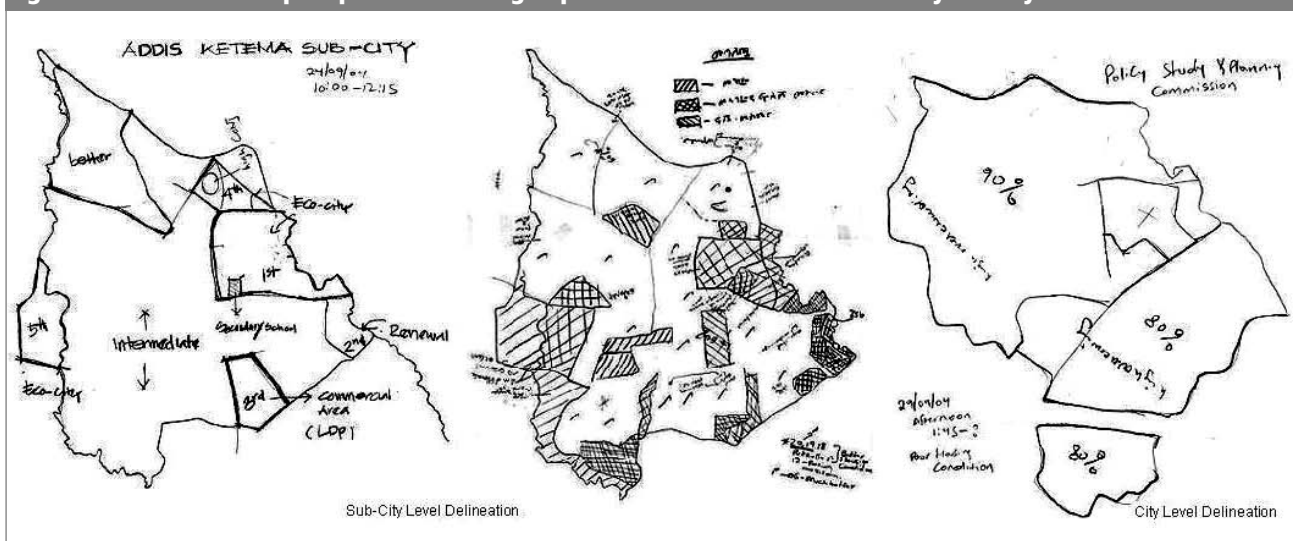


Photo: T. Lemma

related problems were identified (e.g. affordability of improved water).

Organisations and administrative offices involved in the physical development of slums were selected at all administrative levels. The local authority focus group participants were experts involved in municipal works such as urban planning, urban management, land administration, housing development and water supply. Six experts in urban planning and urban infrastructure from Addis Ketema sub-city participated in the sub-city level focus group discussion. At kebele level, three representatives from the Kebele Development Committee were identified and invited to participate, as they were all key actors in slum upgrading projects. This committee has an important role in raising local funds, mobilising and organising the community, prioritising needs, and raising funds via NGOs.

Each focus group was asked to discuss and agree on a set of variables that could be used to characterise slums in their area. They were then asked to identify and delineate slum areas within the city, the sub-city or the kebele based on the agreed characteristics. Each delineation was done on a piece of tracing paper overlaying a QuickBird satellite image, scale 1:15000, that included the sub-city boundary. This process involving considerable discussion and exchange of local knowledge by all group members (see Photo 2).

An important characteristic of Addis Ababa is that there is a high degree of spatial mixing between slum and non-slum areas. This often makes it impossible to separate slum and non-slum areas at the working scale used for this study.

So groups were asked to classify the identified areas containing slums into one of three classes:

- Low (5-20% slum houses)
- Medium (21-74% slum houses)
- High (75-95% slum houses)

The delineation of slum areas by lower level focus groups (i.e. sub-city and kebele) were more detailed than that obtained from city level groups (see Figure 1). The lower level groups were better able to discuss the prioritisation of specific areas, according to the severity of problems, with selected variables.

Direct field observation

We also used direct field observation for primary data collection within the city. This approach was used for three different purposes:

- To better understand and describe the diversity of physical conditions and characteristics of the slum areas and in order to validate delineation of the slum areas done by the experts.
- To identify areas of inadequate water supply with the help of field technicians from the water and sewerage authority. The existing water supply map does not indicate the layout of the water pipe to individual housing units. It was not possible to get the spatial information from the secondary data. So field technicians were chosen for their richer knowledge of areas with limited piped water supply. As the technicians were sometimes unable to indicate problem areas on the image or maps, field observation was chosen as a means of data capture for this variable.

Photo: T. Lemma



Public water tap in Kebele 14



Typical street after first level improvement

Figure 2: Examples of slums delineated by T. Lemma on a QuickBird image of 2002:



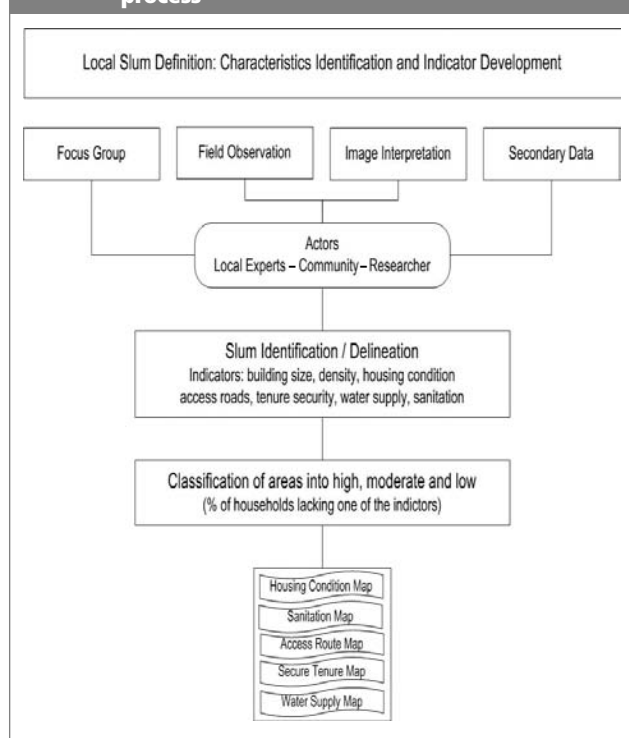
- To identify and describe specific problem areas with the help of the kebele neighbourhood development committee. It was easier for the committee members to indicate specific problem areas through direct field observation rather than relying solely on the QuickBird image.

Visual image interpretation

Image interpretation was very effective for capturing data that could not be easily captured using field observations or in focus groups. The focus group discussions revealed key visual image interpretation elements for slum identification and delineation (i.e. irregular street and building pattern and

small, densely distributed houses). As Addis Ababa has been growing spontaneously without any significant guiding plan or standards for many years, irregular layout and high density are two key manifestations of poor living conditions in the built environment of the city.

Based on two elements of image interpretation pattern and size, we identified groups of buildings with an irregular layout and lacking open space (see Figure 2). We also used the QuickBird image and aerial photographs when clarification was needed. This process of data capture has helped in filling the data gaps that remained after the focus groups and field observation (e.g. due to poor accessibility).

Figure 3: Overview of the data collection and integration process

Integrating multi-source slum data

The identified set of slum variables was established and delineated through a combination of the three methods. Focus groups, image interpretation and field observation were all supported by available secondary data. In producing the final data products, the initial classification by the focus groups was adopted as the major source because of the richness and detail that was available from the various groups. An overview of this process is shown in Figure 3. The final product was a set of delineations of problem (slum) areas, with deficiencies related to housing condition, sanitation, access routes, tenure security and water supply.

Discussion of results

The focus group approach that we used provided an opportunity for direct learning by the study team. It allowed for an adaptive methodological approach. Minor deficiencies in the pre-set discussion guide were revealed and we made some adjustments during a group meeting while maintaining the main framework of each focus group. We then acquired information about the local views of slum definition, slum characteristics, and also existing slum interven-

tion strategies and programmes in the local context.

The focus groups identified and prioritised poor sanitation, poor housing conditions and poor access routes as the main physical manifestations of slums in Addis Ababa. Water supply was not included into the first rank of slum indicators because of the widespread nature of this problem, i.e. water supply problems are also common in newly developed middle class residential areas, which the focus group members do not consider to be slums.

We can't show all results in this article. But we will give an example of the data collected for two variables in Addis Ketema: poor housing conditions and poor access roads (see figure 4). Although substantial data on slums, policies, and intervention programmes is captured at city level, these examples show that the diversity of local living conditions is lost at higher spatial (administrative) levels. Even in a centrally located and relatively well established central area such as Addis Ketema, there are substantial differences between the data derived on housing and access conditions from the different levels. Clearly the level of detail increases from city to sub-city to kebele level. But we also observed inconsistencies between the different levels. Areas considered by one level to have serious problems with poor housing or access may be excluded from higher or lower level representations.

There are several disconcerting features of such differences that can be illustrated by comparing the city and sub-city levels. The sub-city level is mainly concerned with the implementation of various plans formulated at city level. However, these results reveal that even there, the two levels may not have a common view of the problems and their spatial extent. This could lead to miscommunication and excessive or inadequate resource allocations for plan implementation. Our focus groups revealed that with the exception of the higher management staff, sub-city staff tended to be less well-informed concerning areas of the existing policy and strategy, as well as the future plans of the government in relation to slums.

At kebele level, the residents of the area have been directly involved through the neighbourhood development committee, so more detailed data could be captured. However, the neighbourhood development committee is even less knowledgeable than sub-city staff on the existing and future government plans and strategies for the specific area. There are apparently significant weaknesses in the flow of information and sharing of knowledge between administrative levels and these weaknesses are apparent in both directions (i.e. top-down and bottom-up).

Figure 4: Comparison of problem area delineation (housing and access route conditions) at three administrative levels

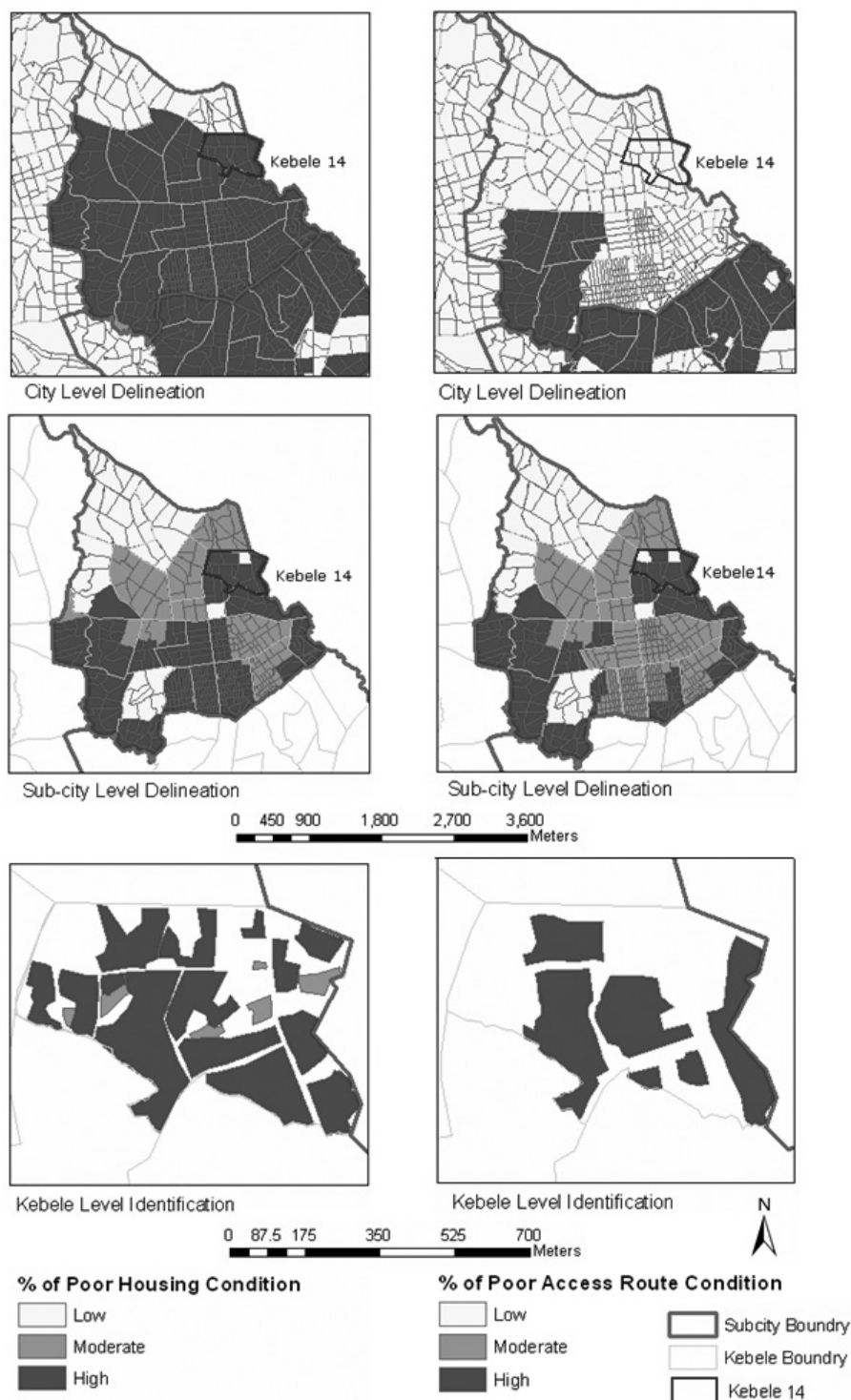


Figure 5: Aerial photo of Kebele 14

Clearly, more detailed data could be captured at lower administrative and community levels, enabling a deeper understanding of the multifaceted nature of specific slum areas. Such detailed information on slums is essential for local level decision-making and to form local policies through which sectoral or geographically targeted interventions can be planned and implemented. Each level has its own role in slum improvement. So the inclusion of all administrative levels and the community in data acquisition and monitoring processes should help develop a more relevant and accurate information system on slums in the city. The methodology we used seems to offer some potential for further development and implementation in Addis Ababa. It has at least pointed to weaknesses in information handling and sharing that could potentially undermine the development of effective strategies toward the elimination of slums in accordance with the MDG campaign.

Conclusions

We acquired a richer understanding of slums and their characteristics through the combination of focus group discussion, field observation and image interpretation. This experience has shown that it could be an effective, economical and reliable method that is suitable for replication and adoption throughout the city.

In particular, focus group discussions have the potential for gathering in-depth knowledge and insights in a rapid and economical way. These methods allow different actors – including the community – to participate and collaborate. It can create opportunities for data sharing and improved mutual understanding that is needed for collaborative slum upgrading interventions.

The spatially heterogeneous character of the city often limited the ability of participants to distinguish between 'relatively poor' and 'relatively rich' areas by visual image interpre-

tation. This was especially problematic for the technicians from the water and sewerage authority. There are many small areas without access to these services scattered throughout the city. So it was important to crosscheck the information derived from the focus group discussions and the field observations.

The use of the satellite images with the focus groups was not entirely successful. This was due to difficulties that some participants – particularly the community representatives at the kebele level and the utility company technicians – had in interpreting the images. As such imagery has been very useful in other studies, it is quite likely that these difficulties could be overcome with increased exposure to such images, particularly if image scale is increased to make individual houses more easily visible and recognisable.

Integrating methods and techniques had advantages over using any single method. The limitation in one method can be amended by the strength of the other. In particular the interactive participatory mapping done by experts – and the community representatives' spatial knowledge translated into

maps – gave a rich information base for this analysis. It has the potential to create a basis for learning about the opinions, intents and needs of various technical and resident groups. This can be a first step toward a better understanding the different perceptions of the slum characteristics in various locations.

The problem areas identified at the different administrative levels were not entirely contradictory. But the richness of detail obtained at kebele level cannot be matched at higher levels. The information gained at community level is of great value, especially if scarce resources for slum improvement are to be effectively targeted. The exchange of information gained from the different levels will be essential in generating a shared vision and working in a coordinated manner toward common goals. If community participation is to be used in future slum upgrading programmes in Addis Ababa and elsewhere, the further development of such participatory approaches to slum monitoring should be encouraged and adopted.

CONTACT DETAILS

Tsion Lemma
Addis Ababa City Government, City Manager's Office, City Planning Preparation and Inspection Department, P.O. Box 10653 AA, Ethiopia. Email: tsionlm@yahoo.com

Richard Sliuzas and Monika Kuffer
International Institute for Geo-Information Science and Earth Observation (ITC), Department of Urban and Regional Planning and Geo-information Management, PO Box 6, 7500 AA Enschede, The Netherlands. Tel: +31 53 487444; Fax: +31 53 4874575; Email: sliuzas@itc.nl, kuffer@itc.nl

REFERENCES

- AAWSA (2004). Sectoral Development Programme. Addis Ababa Water and Sewage Authority: Addis Ababa.
- Abbott, J. (2003). 'The use of GIS in informal settlement upgrading: its role and impact on the community and on local government.' *Habitat International* 27(4)
- HDPO (2004). Integrated housing development programme. Housing Development Project Office: Addis Ababa.
- Kumar, K. (1987). 'Rapid, low-cost data collection methods for AID.' *Program Design and Evaluation Methodology Report* 10. AID: Washington DC
- Lemma, T. (2005) 'A comparison of methodologies for monitoring slum conditions within millennium development goals: the case study of Addis Ababa, Ethiopia.' UPLA MSc thesis. , ITC: Enschede. Available online: www.itc.nl/library/Papers_2005/msc/upla/lemma.pdf
- MOFED (2002). Sustainable development and poverty reduction programme. Ministry of Finance and Economic Development: Addis Ababa
- Sliuzas, R. V. (2004). 'Managing Informal Settlements, a study using geo-information in Dar es Salaam, Tanzania.' *ITC Publication Series* 112. Available online: www.itc.nl/library/Papers_2004/phd/sliuzas.pdf
- Solomon, K. (2005). 'Housing Development as Instrument to Alleviate Urban Poverty (The Case of Addis Ababa).' Paper presented at the International Conference for Integrating Urban Knowledge & Practice, May 29 – June 3, 2005, Gothenburg, Sweden.
- Turkstra, J., & Raithelhuber, M. (2004). 'Urban slum monitoring.' Available online: <http://gis.esri.com/library/userconf/proc04/docs/pap1667.pdf>
- UNDP (2003). 'Millennium Development Goals: A compact among nations to end human poverty.' Human Development Report 2003: New York.
- UN-Habitat (2004). Internal report on urban inequity in Addis Ababa (unpublished).