A Participatory Approach to Monitoring Slum Conditions

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Abstract

Currently the eradication of slums is on the global agenda. Accordingly one of the Millennium Development Goals (MDG's) has been set to 'achieve significant improvement in the lives of at least 100 million slum dwellers, by 2020'. Even though efforts are made to localise the MDG's, in many developing cities, the scarcity of relevant data, coupled with lack of both human and financial resource for data collection and analysis is a significant constraint to operationalise their adoption and the necessary monitoring process.

In this regard, this paper highlights how a participatory approach involving various actors with local knowledge and using Geographic Information Technology (GIT), could improve slum monitoring processes. The approach reduces resource requirements while providing locally relevant and spatially detailed information usable for both planning slum intervention projects and for monitoring purposes. This low cost participatory approach has been tested in Addis Ababa, Ethiopia, a large city with a high proportion of slum households.

In testing the methodology, the identification and spatial analysis of slums was conducted using Rapid Urban Appraisal methods supported by Remote Sensing and GIS tools that have enabled the spatial distribution and quantification of slums and slum dwellers to be captured and visualized. The methods and techniques used in data capture include focus group discussions, field observation with the community, local experts, and visual image interpretation on the basis of satellite images and aerial photographs together with other secondary data resulting in both non-spatial and spatial information in the form of thematic layers in a GIS environment.

1. Introduction

The large scale implementation of slum upgrading and improvement programs is one of the biggest challenges that communities and municipalities in developing countries are facing. Such programs aim to overcome diverse problems such as poor housing conditions, access to water, sanitation, insecure tenure, hazard risks, missing access to employment opportunities. The need to address these problems is reflected by the high priority within the Millennium Declaration, Goal 7 - Target 11 that aims at the improvement of the lives of 100 million slum dwellers by 2020 (UNDP, 2003). One important prerequisite for improving conditions in slums are local intervention strategies that build on adequate and timely available information that spatially locate slum areas but also reflect their diversity in a local context. Moreover, the use of performance targets such as the MDG's requires a workable monitoring mechanism so that the engaged societies can measure progress.

According to UN-Habitat, Addis Ababa, the capital of Ethiopia, with an estimated population of over 3 million has an amount of slum dwellers between 85% and almost 100 % within the districts (Sub-Cities) (UN-Habitat, 2004). But the central government has only recently given urban development issues attention as there has

been a traditional focus on the agricultural sector that is still the dominate source of livelihood for most Ethiopians. The negligence 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 that target urban poverty reduction and slum upgrading by improving tenure security, water supply, sanitation, housing conditions etc. (AAWSA, 2004; HDPO, 2004; MOFED, 2002). Main strategic decisions about slum intervention and the allocation of the budget is still done on the City level, while the actual implementation and resource mobilization based on community participation is prepared on the lowest administrative level[1], namely the Kebeles, with less involvement of the intermediate level (the Sub-Cities). The decentralization approach was motivated by the reform of the administrative structure in 2003, which also emphasizes public participation. The programs on poverty reduction and slum upgrading increase the necessity to have detailed information on slum areas in order to seek for a better understanding of the complexity and diversity of such areas, which then could finally support a more strategic allocation of the scarce resources for slum upgrading.

The local demand of information on slum areas goes beyond simple classifications that characterize most parts of Addis Ababa as slums and that reflect the views and needs of the inhabitants. This calls for "high-resolution" as well as qualitative information (Kumar, 1987). In the view of the need for fast but also reliable data collection methods, participatory assessment that focuses on the local perception of slums and their diverse characteristics in combination with very-high resolution imagery[2] is presented here as an alternative approach to overcome the lack of conventionally available data for local upgrading strategies (Sliuzas, 2004). The advantage of information collected in such a way, besides its timeliness and low cost, is that locally generated information is easier for institutional embedding (Turkstra & Raithelhuber, 2004).

For this paper[3] one Sub-city (Addis Ketema Sub-city) and within its area one Kebele (No. 14) is selected to demonstrate the different levels of information that can be obtained from local knowledge in combination with satellite imagery and aerial photos for monitoring slums. Addis Ketema Sub-city 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 with in this Sub-city (approx. 700 inhabitants per hectare).

Figure 1: Addis Ketema Sub-City

2. Methodology

Acquiring comprehensive slum information for the campaign of slum improvement in cities like Addis Ababa is entwined with issues of extreme resource constraints, data limitations and the heterogeneous characteristics of the city. A previous study in

[1] The administrative structure of the city consists of three levels: the City, 10 Sub-Cities and 203 Kebeles.
[2] A QuickBird image of 2002 and aerial photos of 2002 with a scale of 1:10,000 was used.
[3] The original study covered 3 Sub-Cities and 4 Kebeles.

Addis Ababa (Turkstra & Deng, 2004) proposed to compensate the out-dated data sets through the combination of local expert knowledge, high-resolution images and locally available data. Their work suggested that the combination of these data sets within a GIS can generate a wealth of information on urban inequities. Having this as a base concept, Rapid Appraisal Techniques were employed to extract the required data by integrating local knowledge with GIT through a participatory approach. The techniques are preferable as they are cheap to build, easy to use, robust and flexible in their application (Sliuzas, 2004). Accordingly, focus group discussions, direct field observation, and visual image interpretation were used and complemented by secondary data resulting in both non-spatial and spatial information in the form of thematic layers in a GIS environment.

Focus Group

Several sessions of focus group discussions were held with different groups at City, Sub-city and Kebele level. Similar sets of open-ended questions (checklists) were developed and used. As it is essential to form a shared conceptual base for identification, characterisation and analysis of slums, during the focus group discussions slums were defined in the local context, described and indicators were developed. The indicators provided a base upon which slum identification was conducted. In addition, existing interventions were explored and related problems were identified.

Figure 2: Focus group discussion

Several organisations and administrative offices were selected at all administrative levels including representatives of the community at the lower administrative level, who are the main actors in slum upgrading projects (Abbott, 2003). From the local authorities, the target groups (participants) for the focus group discussion were experts who are mainly involved in municipal works such as urban planning, urban management, land administration, housing development and water supply.

Sub-city Level Delineation City Level Delineation

Figure 3: Participatory slum identification (at Sub-city and City level)

While from the community mainly members of the neighbourhood development committee[4] were involved (for the focus group discussion at Kebele level). In total, at Kebele level (Kebele 14) three members of neighbourhood development committee and at Sub-city level (Addis Ketema Sub-city) six experts have participated in the focus group discussion.

Within each focus group problem areas were delineated by the participants at City and Sub-city level based on the identified variables and their components. The delineation was performed on the QuickBird satellite image that was overlaid with the Sub-city boundary. The process was conducted in such a way that in each Sub-city, areas with high percentage of slum households were identified, as well as areas with low percentage of slum households and the rest was left as an intermediate class. This was done because slums are distributed throughout the city with varying percentages and there is a mixture of slum areas and non- slum areas in each Kebele. Thus, three classes of poor households were created based on the experience of local experts: Low (5-20%), Medium (21-74%) and High (75-95%).

Direct Field Observation

Further, it was essential to conduct direct field observation for three different purposes and with different groups:
First, to understand and describe the physical condition and characteristics of the slum areas; to cross validate delineation of the poor areas by the experts and the interpreted image on selected areas. *Second,* to identify areas of inadequate water supply with the help of field technicians from the water and sewerage authority. (As 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. Thus, field technicians were chosen for their richer knowledge of areas with no piped water supply service provision. As the technicians had problems to indicate problem areas on the image or maps, field observation was chosen as a means of data capture for this variable.) *Third,* to identify and describe specific problem areas with the help of the Kebele neighbourhood development committee. It was found to be easier for the committee members to indicate problem areas through direct field observation than on the QuickBird image.

Figure 4: Field Observation

Visual Image Interpretation

Image interpretation was employed effectively in capturing data that could not be easily captured through field observation and the focus group. The identification of the visual image interpretation elements was extracted from the focus group discussions. As Addis Ababa has been growing spontaneously without any significant guiding plan and 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 the two elements of visual image interpretation pattern and size, irregularity and a group of small size buildings lacking open space are identified (see figure 5). The interpretation was performed on the QuickBird image of 2002. Aerial photographs with the scale of 1:10,000 taken from the same year as the QuickBird image was used for clarification. This process of data capture has helped in filling the

[4] Under each Kebele, there is a neighbourhood development committee, which has an important role in raising local funds, mobilizing and organising the communities and prioritising the needs of the community including fund raising from NGOs.

data gaps that remained after the focus groups and through field observation (e.g. non accessible areas).

Figure 5: Example of visual image interpretation (slum areas delineated in black)

Based on the image, the identified categories of variables are delineated through a combination of the three methods, namely focus group discussion, image interpretation and field observation all supported by available secondary data. The results are digitised and classified according to the initial classification set by the focus group. An overview of the primary data preparation is shown in figure 6. The final product was a set of delineations of problem areas, related to housing condition, sanitation, access routes, tenure security and water supply.

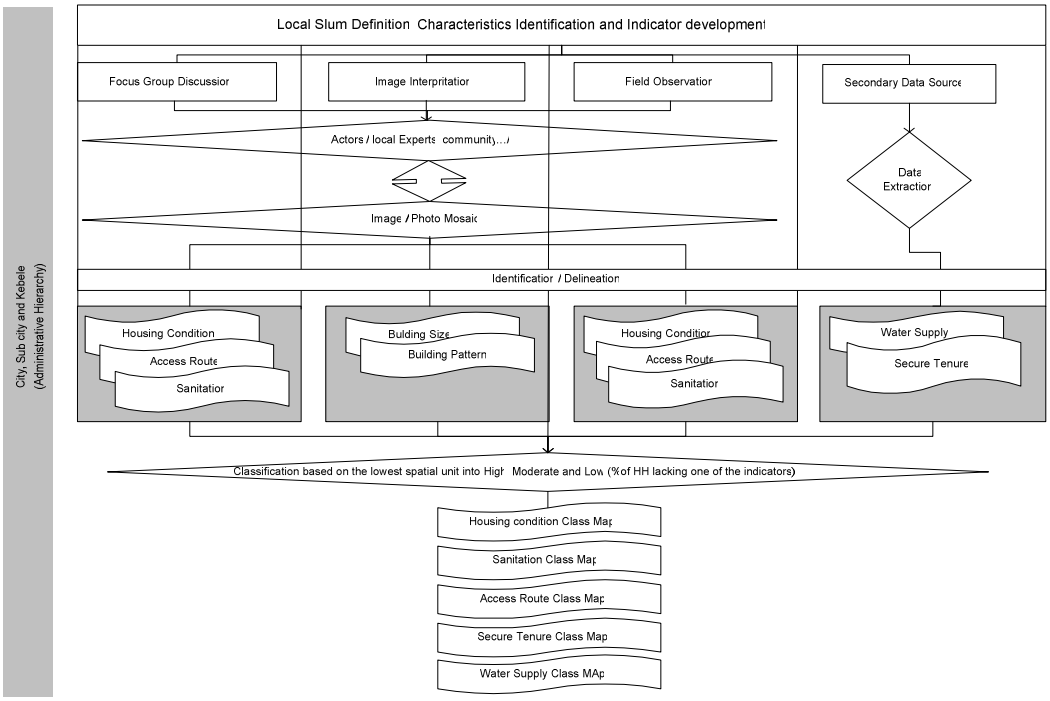

Figure 6: Overview of data collection

3. Discussion of Results

In view of functions, powers and the role played at each administrative level, some adjustments were made on the preset discussion guide while keeping the main framework the same. Accordingly, information was acquired regarding the slum definition, slum characteristics description and also existing slum intervention strategies and programmes in the local context. Moreover, poor sanitation, poor housing condition and poor access routes were identified and prioritised within the focus group discussions as the main physical manifestations of slums in Addis Ababa. The reason for having water supply not included into the first rank of slum indicators is related to the widespread nature of this problem, i.e. water supply problems are also common in newly developed middle class residential areas.

In order to describe the spatial variation captured at all levels and to make a comparative analysis of the method, the identification of poor housing condition and access routes are chosen as examples in the following maps. Although substantial data is captured at City level concerning the slum concept, policies and intervention programmes, it is evident from the result (see figure 7) that the acquired spatial information is more generalised. Specifically, it is observed that their knowledge on the newly developed expansion area is minimal.

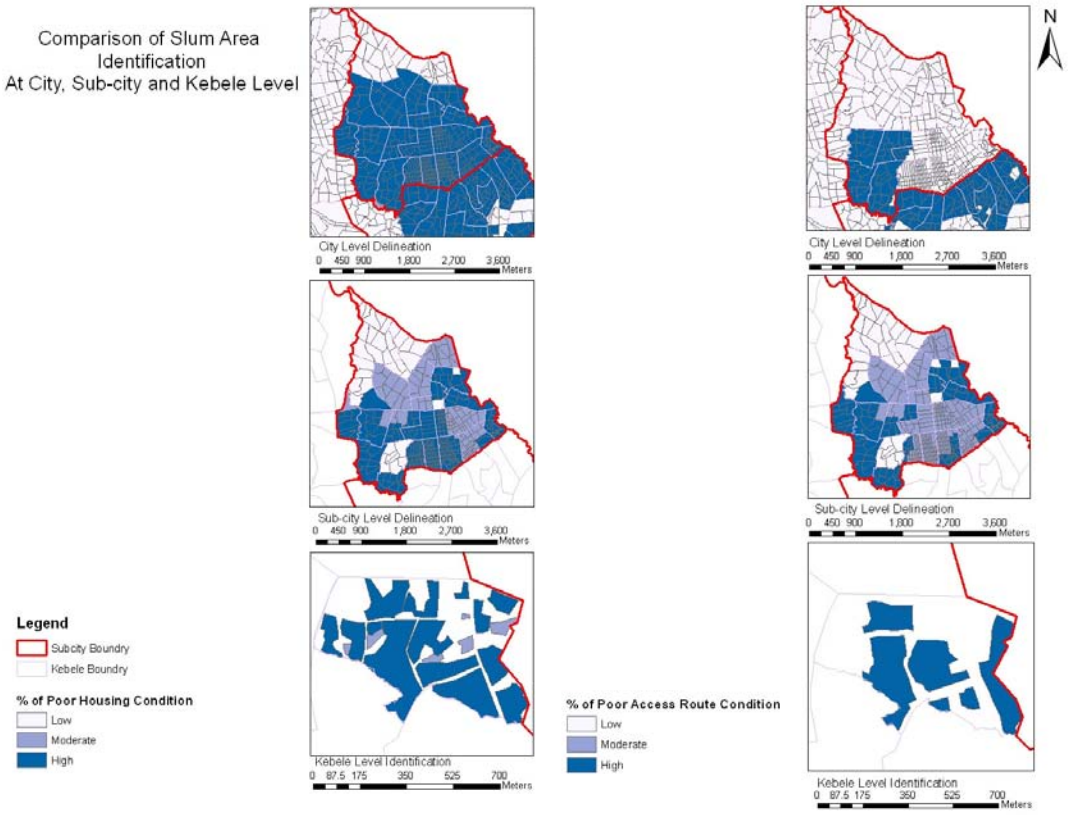

Figure 7: Comparison of problem area delineation (housing and access route conditions) at various administrative hierarchies

At Sub-city level, with the exception of experts at the higher managerial level, less detailed information and knowledge is observed concerning areas of the existing policy and strategy as well as the future plans of the government. The role played at this level concerns mainly the implementation of the plans designed at City level. However, much more detail data on slum identification has been captured at this

level. As shown on the map (see figure 7), a significant level of spatial variation is observed than the City level. Moreover, in-depth knowledge of both physical and socio-economic characters of each Kebele is observed.

At Kebele level, as the residents of the area have been directly contacted and involved through the neighbourhood development committee, more detailed data could be captured. Moreover, the size of spatial coverage which is much smaller than the other levels, has facilitated and enabled the capture of much more detailed and accurate information at this level. However, among members of neighbourhood development committee less knowledge is observed on the existing and future government plans and strategies for the specific area, pointing to weaknesses in the knowledge exchange processes between administrative hierarchies down to the neighbourhood level.

Figure 8: Aerial photo of Kebele 14 showing the Kebele boundaries

In the process of data capture, both limitation and strength at each administrative level are observed. Such participatory approach in a GIS environment together with the decentralised hierarchical administrative structure gave a good opportunity of capturing different insights and knowledge from local experts and the community. Clearly more detailed data could be captured at lower levels in the administrative hierarchy. However, each level has its own role in slum interventions, thus the inclusion of all administrative levels and the community in this process should contribute to getting more comprehensive information.

The participatory approach of data capture at various levels has enabled a deeper understanding of the multifaceted nature of slums to be acquired. Even though all slums have some commonalities throughout the world, they are also found in a wide diversity having typical characteristics at different localities which calls for different types of policy intervention. Such detailed information on slums is therefore essential for local level decision making and formulation of local policies through which sectoral or geographic targeted intervention is possible.

4. Conclusions

Direct information and a richer understanding on slums and their characteristics were acquired through the combination of focus group discussion, field observation and image interpretation. Both the ease and difficulties of combining the participatory approach with GIT are encountered through the process of data capture. This experience has shown that it could be an effective, economical and reliable method. In particular focus group discussions have potential in extracting in-depth knowledge and insights in a rapid and economical way. Moreover, the inclusion of such method gives an opportunity for participation and collaboration of different actors including the community thereby creating opportunities for data sharing and improved mutual understanding of actors necessary for collaborative slum upgrading interventions.

Data capture through field observation with the help of technicians from the water and sewerage authority was found to be difficult. Acquiring comprehensive information in many places of the inner city was not possible because, there are many small areas without access to water supply. Because of the heterogeneous character of the city, the distinction between “poor” and “relatively rich” areas by visual image interpretation alone was in several cases difficult. Thus it was important to cross check with the information derived from the focus group discussion and the field observation. Also the usage of the satellite image within the focus group discussion was not entirely successful due to difficulties that some participants had to interpret the image. This problem occurred in particularly at the Kebele level, with the community representatives and the utility company technicians.

However, the integration of methods and techniques has enabled the acquisition of rich information, which could not be possible to achieve in a single method, thus the limitation in one method can be amended by the strength of the other. In particular the interactive participatory mapping of experts and the community representatives’ spatial knowledge translated into maps, gave a rich information base for this analysis.

This approach has also demonstrated the potential in creating the basis for learning the intents and needs of various groups, the target groups (the community where upgrading is required) on the one hand and the technicians and professionals of intervention programs and policy makers on the other hand. This is essential in generating a shared vision and working towards the same goal and there is therefore potential to employ such approaches in future slum upgrading programmes in which community participation is to be stimulated.

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