

The role of knowledge and opinions in understanding the dynamics of informal housing in Dar es Salaam.

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Abstract

The formulation of policies related to informal housing and the development and implementation of intervention strategies in specific informal settlements are processes that should, ideally, be based upon a good understanding of the dynamics in such areas. In practice, in cities with a highly dynamic informal housing sector, the data that is required as a basis for this understanding is likely to be limited by deficiencies in either the spatial, thematic or temporal domains. For instance, official maps, a potential source of data on physical development processes of settlement creation, expansion and consolidation, may not cover the full extent of urban development at required scales and be produced irregularly at an interval of as much as 10 years. Thematically, our understanding of socio-economic processes in informal housing may also be limited by a lack of information on relevant variables.

Under such conditions, the relative importance of professional opinions and beliefs of key actors in policy debates concerning these processes is likely increase. The opinions and attitudes of such actors are therefore important variables in determining the outcomes of policy decisions and they may also have spill-over effects to other actors engaged in these debates. Such opinions are likely to be formed on the basis on a variety of informal channels and first hand experience and could therefore differ widely between individuals.

This paper reports on the findings of a recent survey carried out amongst senior professionals involved in urban management in Dar es Salaam. Although rather small, the sample includes most of the senior professionals in planning, land management and engineering at municipal level, key planning and land administration staff at central government level and senior academic staff in planning, land management and land surveying. As such, the group is believed to be highly representative of the level of professional experts that is involved in policy making in this field and in the academic forming of future professionals.

The survey shows that there is a fairly high degree of consensus exists amongst urban management professionals as to the status and likely future trends of informal development in Dar es Salaam. However, it is also evident that the first hand experience of this group tends to be limited to older more established settlements while knowledge of certain fringe settlements is less widespread. The survey also reveals that considerable variation in naming and delineation of informal areas exists between professionals. The observed "fuzziness" in the location and spatial extent of informal settlements in itself has the potential to undermine the quality of decision making if stakeholders do not share a common understanding of the policy objects. However, innovative methods to data capture incorporating both community based strategies and technology associated with low cost GIS approaches have the potential to improve the data base on informal settlements, thereby enriching the knowledge base and understanding of all stakeholders.

Introduction

Informal development processes are highly dynamic and, by their very nature cannot be described or monitored via formal development control procedures. However, even when some data is available, it is likely to be deficient in one or more ways. Limited spatial coverage of maps and the inability to maintain appropriate temporal resolutions are but two of the problems that may regularly confront professionals in the field of urban management. Yet, despite the limitations of poor data, decisions must be taken on policy issues concerning interventions in informal areas.

This paper presents some results from ongoing research on informal development in Dar es Salaam, a fast growing city characterised by a high degree of informality and relatively poor systems for collecting and maintaining data on informality. The paper concentrates on data related to physical development. Although, it is realised that insights into the socio-economic process are also essential to fully appreciate the dynamics of informal development, these are beyond the scope of the current work. The paper looks briefly at some of the major transformations in the planning system in Tanzania before presenting some results from a recent survey of urban professionals on their opinions on recent trends in informal development. A brief comparison is also made with some empirical data derived via an analysis of digital mapping data and a more recent satellite image of the city.

A tentative framework for analysing and monitoring the status of informal settlements is then suggested. This framework is based upon a set of variables covering physical, socio-economic and service related dimensions of development. The framework provides scope for integrating data from various data sources, including the direct involvement of informal populace in the collection and use of relevant data.

Urban planning in Dar es Salaam

The roots of the planning system in Dar es Salaam are to be found in the British system of master plans and development control [Armstrong, 1986]. Despite the obvious failure of this system of interrelated laws and procedures for planned development and implementation in the post-colonial period, it is only comparatively recently that significant reform has taken place. In particular, the adoption of a strategic planning framework in the major cities and towns of Tanzania, via the auspices of the Sustainable Cities Programme (SCP), is a major departure from the traditional approach to planned urban development [Halla, 1994; SDP, 1999].

In addition to including provision for a city-wide consultation, the strategic planning system functions through a set of working groups each of which concentrates on a limited number of substantive issues identified as having highest priority. One of these groups was directly concerned with the upgrading of unserviced settlements. In Dar es Salaam unserviced settlements include both formally planned and unplanned areas, though it is the latter that are more extensive and are the primary subject of this paper.

Informal housing in Dar es Salaam

Although it is generally accepted that informal housing is the major source of shelter in Dar es Salaam, estimates of the scale of informal housing in the city do vary. Kyessi [1994, 1997] for example is one of several authors who refer to a proportion of 70% of the population in informal settlements that comprise 50% of the total residential land area. Official estimates, based upon data extracted from aerial photographs from 1992, put the informal population at 60% of the total population [Mgwheno, 1999]. While the difference of 10% between these two estimates is perhaps not startling, in absolute terms it amounts to in approximately 250,000 persons, a substantial number of households with very real social and physical needs.

From a policy development perspective the data clearly underline the deficiencies in the monitoring capacity of the planning systems. Two main points should be made at this time.

Firstly, the most complete data available in 1999 (and still today) dates from 1992, and given even a conservative estimate of population growth of 4% per annum, is therefore highly outdated. Secondly, the 1992 data does not relate to the complete administrative region of Dar es Salaam, but is focussed on the core of the city as covered by aerial photographs. The lack of photographs of peri-urban areas has excluded settlements in these areas from counting. This provides a possible explanation for the difference between the two population estimates but also raises some new concerns about the lack of a complete 'picture' of urban development resulting from the narrow view of urban adopted in the traditional mapping process. The usability of this data for policy development related to informal housing is therefore diminished due to limitations in the temporal and spatial domains of the data itself [Sliuzas and Brussel, 2000].

Policy development in a data poor environment

Urban policy development in Dar es Salaam clearly takes place in a data poor environment. However, as policy development and policy decisions continues the relative importance of informal channels of information and professional judgements or opinions concerning informal development, is likely to increase. Parsons [1995, pg 385] describes the use of information within decision making in terms of four quadrants defined: formal and informal versus internal and external (see Fig 1). Applying his view to the current situation in Dar es Salaam, would entail a shift from more formal sources of information toward informal sources, as resource constraints and the requirements of the policy process itself do not provide for a new research studies to be carried out. The shift from the traditional master planning to more open and participatory planning styles, on the other hand, implies a greater emphasis on external information sources, and information sharing through multi-stakeholder working groups established under the umbrella of the SCP initiatives. In practice the information sources used at any one time is likely to comprise a mixture of these dimensions, with gaps in more formal sources being compensated via more informal channels.

	Internal	External
Formal	<i>Quadrant 1</i> Departmental research/inquiry Internal think-tank reports Internal expert reports	<i>Quadrant 2</i> Commissions Reports from legislature Commissioned research Formal consultation
Informal	<i>Quadrant 4</i> Informal discussions Gossip and rumour Folklore Informal advisors	<i>Quadrant 3</i> Discussions Consultation Reports Informal information

Figure 1: Formal and informal sources of information (Source: Parsons, 1995, page 385)

A survey of urban professionals

In order to investigate the degree to which urban management professionals share similar views and opinions on informal development in Dar es Salaam a small exploratory survey was held in March-April 2000. A short questionnaire was distributed to 46 senior urban planners, engineers, land managers and surveyors working at either the Local Government (14), Ministry of Lands, Housing and Urban Development (8), and the University College of Lands and Architectural Studies (24). Although not a large group, the respondents included senior government officials and academics who could be expected to be well acquainted with the local situation, as many are either working on a daily basis in parts of the city or have been involved in various research and project activities related to the SCP or other urban projects throughout the 1990's.

The survey forms for local and central government officers were distributed by hand to the target group and an appointment was made to collect the completed forms. For the UCLAS

group forms were generally distributed via department heads to selected staff. The overall response rate was 59%, with the lowest response from local government and UCLAS primarily due to logistical constraints in the follow-up.

Main questions

The main focus of the survey was to establish to what extent local professionals shared a common view of the status and trends of informal development in the city. In particular questions were passed on the sources of information, their own personal views and respondents were asked to identify those settlements that they had visited for either professional or personal reasons in the 15 months prior to the survey (i.e. since January 1999). Respondents also provided information on their opinions regarding density levels in settlements according to a 4 level scale ranging from well below to well above acceptable density levels. Further their views on a number of other related issues such as future roles of local and community level agents, norms and selective demolition as a response were obtained.

Discussion of responses

Likely growth and density of existing development

The responses reveal a strong consensus on the current status and likely future developments of informal settlements. The average estimate of population in such areas is 70%, which is hardly surprising given that many respondents cited the work of Kyessi [see for example Kyessi, 1994] as a source. However, some members of the LGO and UCLAS groups gave extremely low estimates as low as 20% and 30% and some even expected that the proportion of informal development would decrease in the next 10 years, contrary to the overriding expectation of further increase.

To develop a more detailed picture of current and likely future developments at settlement level respondents were asked to:

1. classify the density in informal settlements which they had personally visited since January, 1999, using a 4 class categorical scale: density well above acceptable levels, density just above acceptable levels, density just below acceptable levels, density well below acceptable levels.
2. identify existing informal settlements which will have the highest growth in the next 5 years;

Some general observations can be made on the basis of the response to these 2 questions. There appears to be considerable ambiguity as to the number and names of many informal areas and, this is likely to also extend to the location and extent of such settlements. Many official planning documents are vague about their exact number [SDP, 1992 #303; SDP, 1999 #180], stating only that they are in excess of 42. However, the combined responses of this survey include in excess of 100 settlement names. While this is partly attributable to the ambiguity between fringe villages and urban informal settlements, there is considerable evidence of variation in the knowledge base of the respondents and different interpretations of the location, extent and names of informal areas. In itself this is not completely surprising, as mental maps are known to differ between individuals. However, such ambiguity is a potential source of confusion and error in consultative processes, as stakeholders may mistakenly believe themselves to be discussing a settlement's problems when they are in fact thinking of different areas. The potential for miscommunication here is high.

A summary of the numbers of settlements referred to be each group is contained in table 1.

	Groups			
	LGO	CGO	UCLAS	Total
Settlements with highest growth in next 5 years?				
Total no. of cases mentioned	33	25	40	98
Total no. of settlements mentioned	28	21	20	47
% of all settlements mentioned	60	45	43	100
No. of valid respondents	7	7	12	26
Average cases/respondent	4.7	3.6	3.3	3.8
Opinion on informal settlements visited since January 1999				
Total no. of cases mentioned	69	37	74	180
Total no. of settlements mentioned	47	24	44	78
% of all settlements mentioned	60	31	56	100
No. of valid respondents	7	7	10	24
Average cases/respondent	9.9	5.3	7.4	7.5

Table 1: Basic data on responses related to knowledge on existing settlements in Dar es Salaam.

All but one of the settlements that is expected to have the highest growth in the next 5 years is located in the urban rural interface of the city (see Figure 2). There is a clear preference for settlements to the south (Mbagala, Yombo Vituka) and west (Kimara) of the main city, particularly amongst academics from UCLAS, while the inclusion of Manzese is surprising as it is a highly consolidated settlement, with seemingly little scope for further *swahili-style* development. Three main factors are considered to be most influencing growth: Good accessibility to improved roads and public transport, relatively low land prices and the availability of sufficient land (i.e. still at relatively low density).

The responses on density levels in recently visited settlements is shown in Figure 3. Only 14 settlements were mentioned by at least 4 professionals with a strong preference for the older more established settlements in the central sector such as Manzese, Tandale, Hana Nasif, Keko, Ubungo and Buguruni. The opinions expressed on density in these older areas tend to be quite uniform. Two main factors are likely to contribute to this variation in this data. Firstly, a precise, common definition of each settlement's location and extent is lacking. Secondly, density is never uniform over entire settlements and the variation in newer settlements may be considerably higher than that found in older, more consolidated settlements. Further, it can be concluded that comparatively recent personal exposure to a settlement is not the only factor influencing an opinion concerning likelihood for future growth. This is well illustrated by Kimara, which was mentioned by 9 persons as being a likely growth area, yet only 4 of those persons listed the settlement as one that they had visited in the previous 15 months for professional or personal reasons.

It would appear that the personal experience of the senior experts tends to be more concentrated in the more centrally located settlements. At the same time the opinions expressed on the development density in these areas is more similar than their views on the more remote and less accessible fringe settlements. There are some indications that the spatial definition of fringe settlements is more "fuzzy" than that of other areas, while perceptions of density also show a greater range of variability.

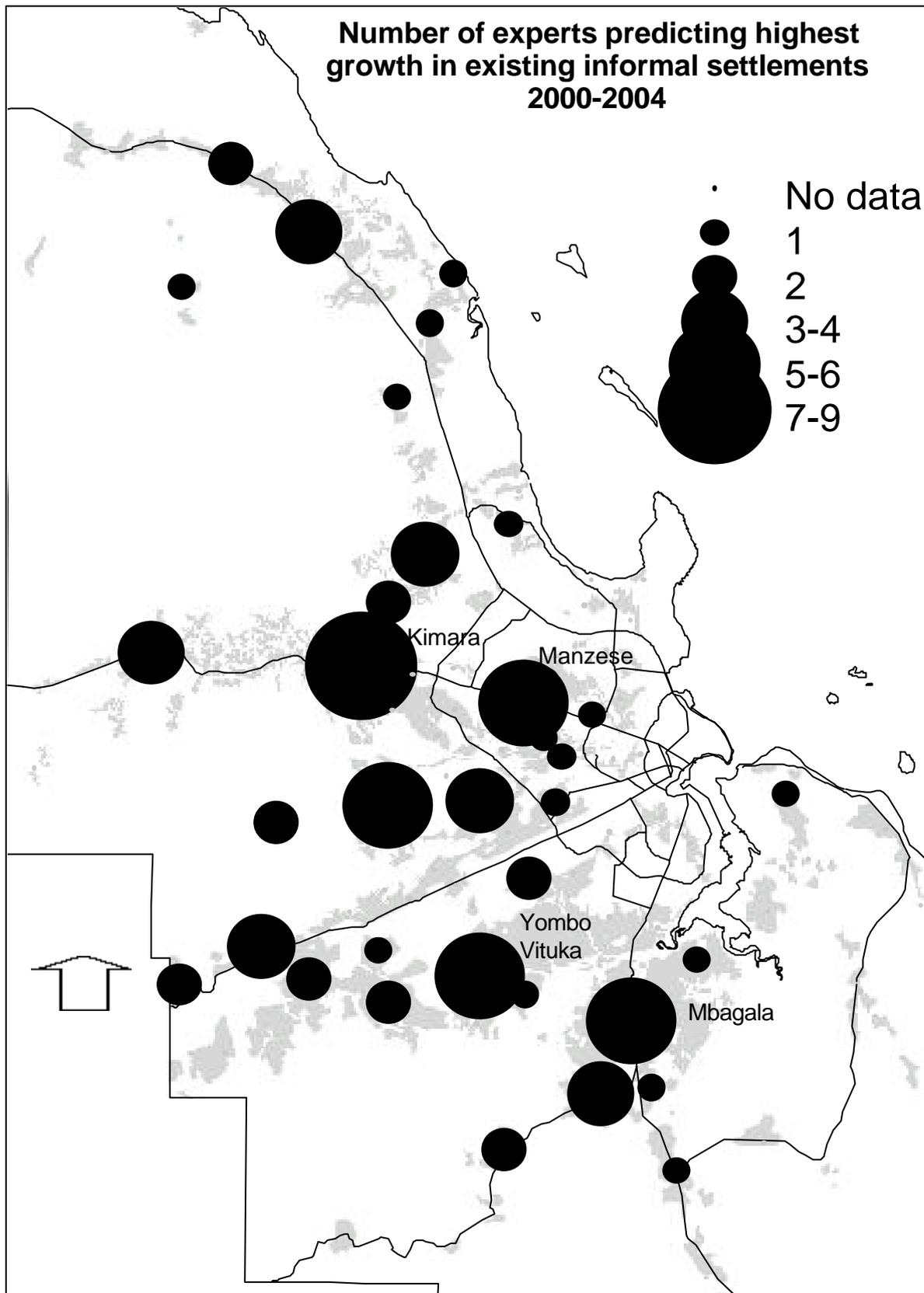


Figure 2 Expected growth of existing informal areas 2000-2004 (grey areas are informal settlements in 1998)

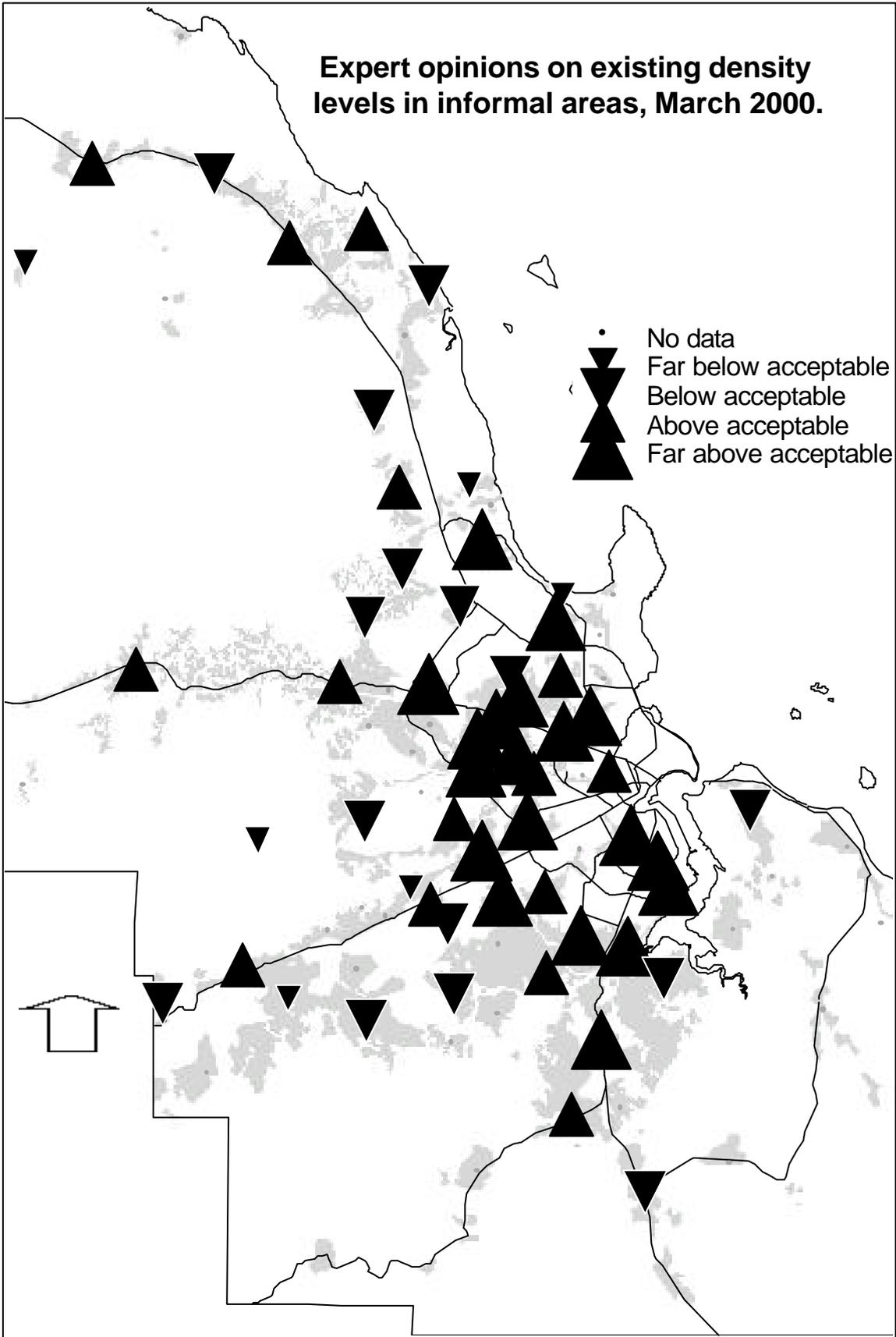


Figure 3 Opinions of professionals on density levels in informal areas

Comparison with data derived from remote sensing

Some experiments have been made to derive density data from SPOT satellite images have enabled a city wide estimation of development density in informal settlements to be made [Sliuzas et al, 1999]. Figure 4 shows a map of settlement consolidation levels that illustrate in a systematic manner the density over all informal areas in 1998. This map is in general agreement with the opinions of the local professionals but enables a more spatially explicit representation of the settlements to be produced. The Mbagala area in the southern part of the city for instance, is seen to consist of several areas with somewhat different density levels. Whereas many local experts tended to refer to the more general name of Mabagala, the area is highly differentiated in terms of its physical and spatial characteristics and referring to its smaller settlement units is preferable.

Longitudinal data is needed to provide insights into dynamic processes. The adoption of digital mapping technology makes it possible to use roof area coverage as a measure of density in informal areas. Dangol [1998] has shown how such data can be used in combination with sample socio-economic surveys to estimate population and other socio-economic characteristics of informal residents. The same data can also be made compatible with the 1998 data on physical consolidation levels enabling an analysis of physical consolidation processes at settlement level (see Figure 5). In this manner, relatively straightforward and replicable approaches to generating data on the dynamics of informal areas can be developed. However, although the technology and expertise is locally available, in practice, to date little use has been made of these techniques for data acquisition and analysis.

Attitudes to interventions and professional roles

More insights into opinions on informal development were sought by requesting individual responses on a fixed, 4 class scale to 7 statements related to the management of informal development (see Table 2). In addition to responding via the fixed scale, many respondents also added explanatory remarks as requested.

The responses to statements 1, 2 and 3 confirm that generally local professionals strongly support public sector intervention in informal settlements and are willing, if necessary to demolish houses if necessary to provide access or community facilities. Further, there is overwhelming support for urgent regulatory action in the settlements. In contrast, opinions are divided on the value of population density standards and the significance of the lack of data as an inhibiting factor in establishing effective control over informal development. Even amongst those supporting population density standards there does not appear to be consensus on what may be an appropriate level, with figures ranging from 120 to 300 persons/hectare, while others stated that it would be preferable and easier to use a housing density, with a density of 40 houses/hectare being suggested as a useful limit. Those in disagreement with *Statement 5* frequently expressed the view that other factors such as the lack of political will, corruption, and the lack of technical, financial and human resources are major barriers more important than any lack of data. In the view of some, site visits and media attention are adequate to develop a "feel" for the situation, and one may also assume, provide a basis for basic policy decisions related to housing.

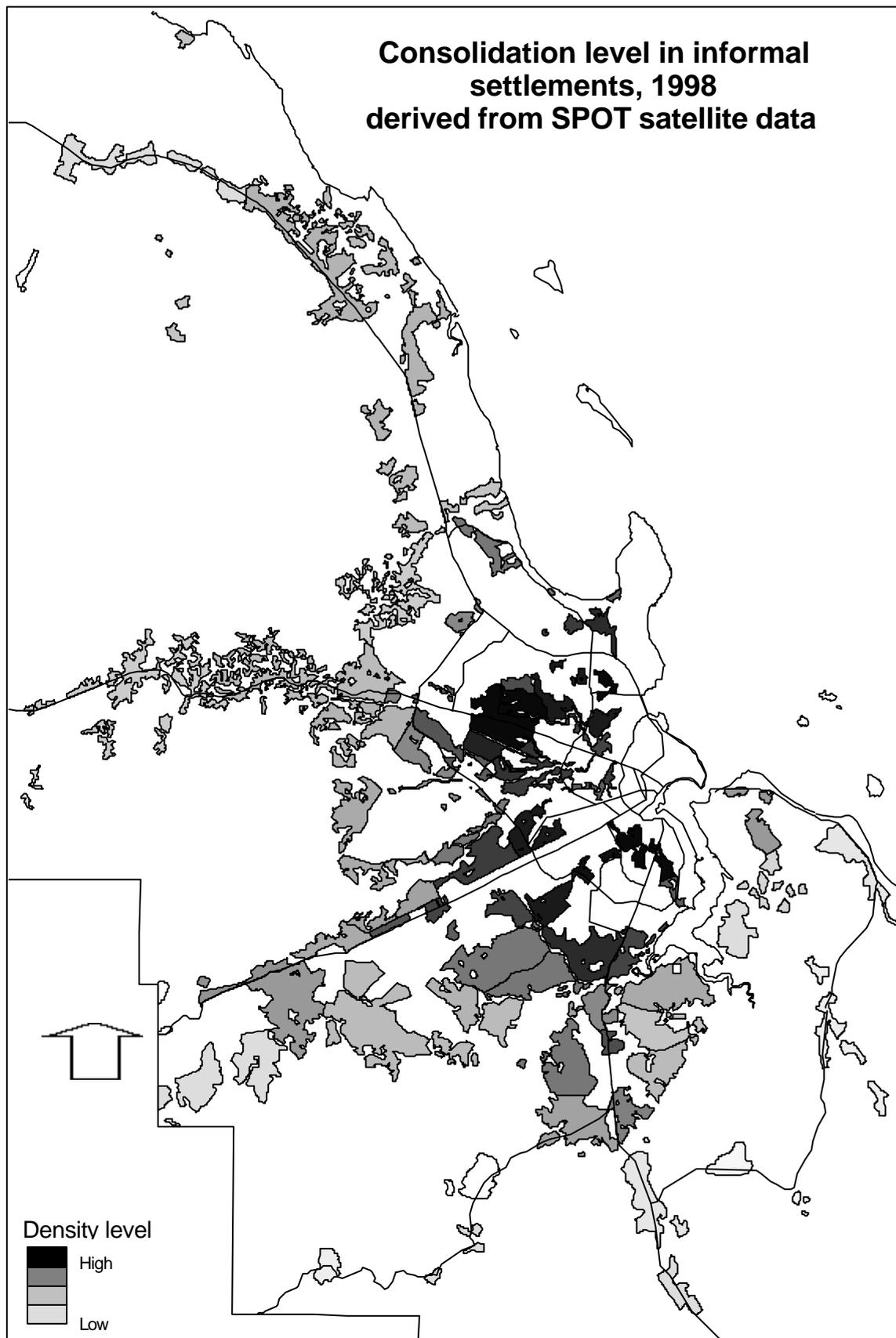


Figure 4: Consolidation levels in Informal settlements derived from SPOT data 1998.

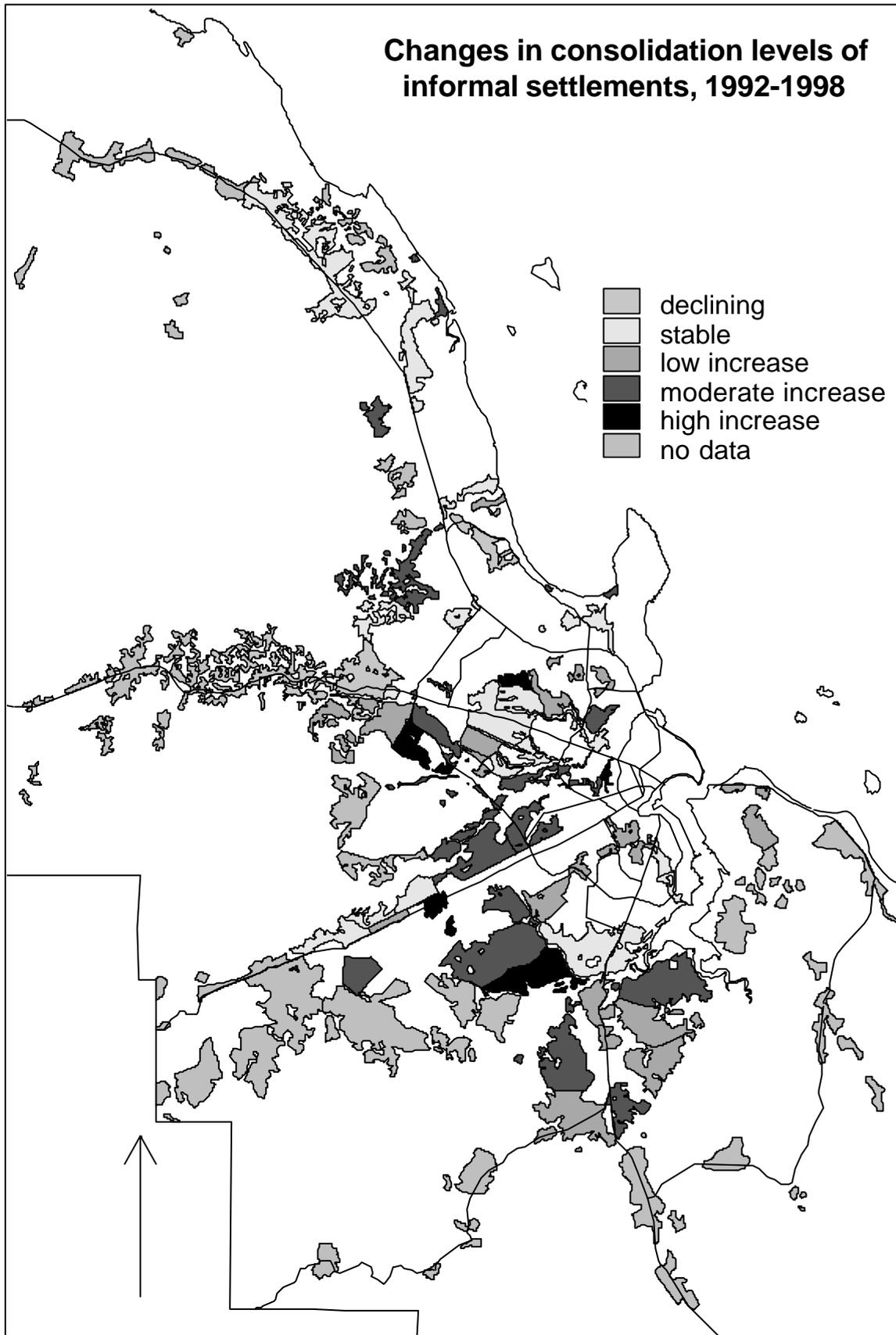


Figure 5: Changes in consolidation levels, 1992-1998

Lastly, Statements 6 and 7, relate to attitudes toward the capacity of two specific actors operating at the lowest level of local government in DSM. Current opinions suggest that while the potential of these actors is generally recognised, there is at present little confidence in their ability to actually regulate informal development. The cited barriers include:

- inadequate knowledge of relevant laws and regulations
- inadequate technical and administrative skills
- subject to local political influence
- general lack of a sense of responsibility amongst community
- low literacy rate of mtaa leaders
- the current financial benefits for mtaa leaders attached to their role as witnesses of land transactions

No.	Statement	agree	more agree	more dis-agree	dis-agree	Total	n
1	Public sector has primary responsibility to monitor & regulate informal development.	56	30	7	7	100	27
2	Action to regulate informal settlements is urgently required.	81	15		4	100	27
3	Demolition of houses in informal areas is OK under certain conditions.	74	15	7	4	100	27
4	It is important to establish norms for population density in unserved settlements	44	12	20	24	100	25
5	The lack of data is a major barrier to effective control.	27	19	23	31	100	26
6	Local administrative officers and mtaa leaders are best placed to monitor and regulate informal settlements.	63	22	7	7	100	27
7	Local administrative officers and mtaa leaders have the ability and skills to monitor and regulate informal settlements.	15	11	41	33	100	27

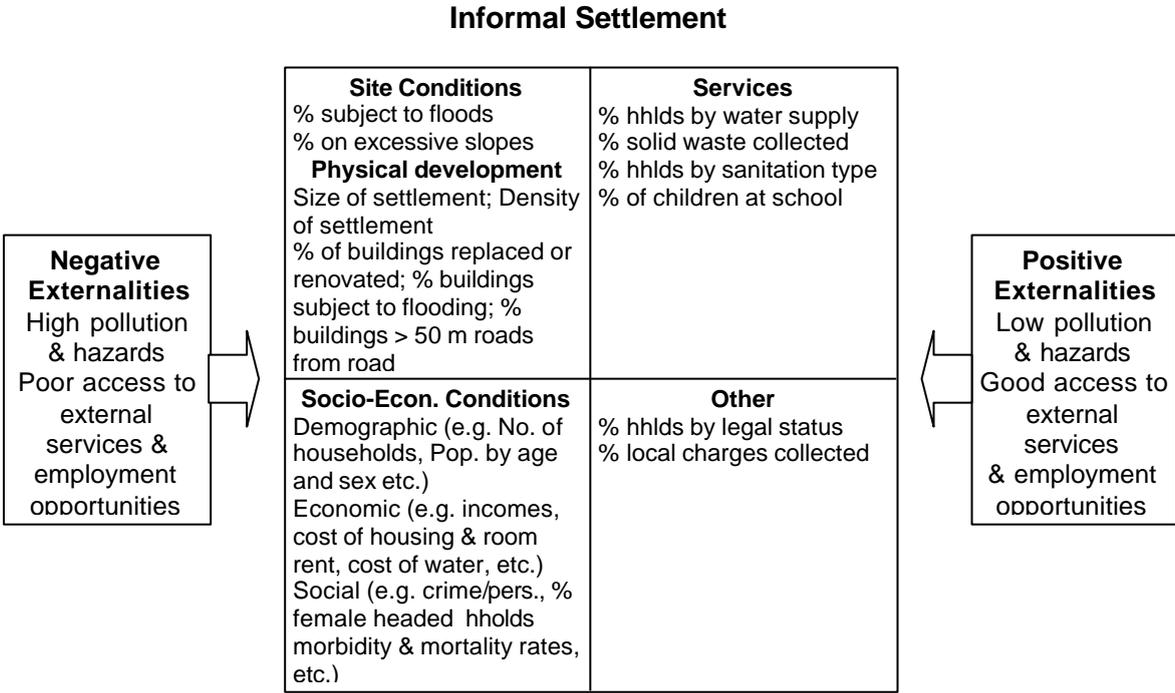
Table 2: Reactions to statements concerning informal development.

Several conclusions can be drawn on the basis of the above discussion. It is evident that much has been done in recent years to improve planning process. However, it is also evident that the rate of expansion of informal development has continued to increase and that relatively little is known about the dynamics of this process. The knowledge of senior local professionals is limited geographically as well as in terms of detailed understanding of the development processes themselves, though the growing amount of research in this area is addressing some of the gaps (see for example [Kombe, 1995, 1998, 2000; Kironde, 1995, 2000; Kreibich and Kombe, 1999]. While the professional group generally recognises the urgency of developing actions that will respond to the needs of residents in informal areas they are not optimistic about the ability of local level officials and community leaders to do so at this time. The focus on data related to physical aspects of informal settlements is also a major limitation that must be addressed as it presents an important but partial view of the ongoing dynamics.

Towards a framework for monitoring the dynamics of informal settlements

The remaining part of this paper examines a possible framework for monitoring the dynamics of informal settlement development. The framework is based on the premise that the essential dimensions of change can be captured via a relatively small set of key indicators, as shown in Figure 6. The basic characteristics of any informal settlement are described by sets of variables related to the internal environment: site conditions, the nature of physical development, service levels and socio-economic condition and, in addition, the external environment as described by both positive and negative externalities may also be significant.

Figure 6: A tentative framework for indicators related to the status of informal settlements with examples of possible variables.



Given that it is the *dynamics* of informal development that is to be understood, data on the relevant variables should be available over time. Ultimately, a database would be created describing the status of each indicator as a series of snapshots over time. In its most simple form, data from each snapshot would be contained in a separate table, with each record referring to a specific settlement, which is identifiable via a unique number. Analysis of dynamics (changes in variables) would be made by relating the required snapshot tables as required.

In practice, such detailed data is not frequently available because it either depends on top-down data collection processes or is based on surveys that cover a limited study area. Generally it is also not made available at the required level of aggregation. For example, highly centralised systems such as the National Census and traditional mapping approaches are expensive and highly complex operations that involve considerable time delays before products become available. Though available, even the standard products of such systems

that could contribute to local area management are not provided as a part of normal procedure.¹

New approaches in data collection are required in which communities and other partners could work in a collaborative manner to their mutual benefit. Internationally there are a growing number of examples in which low income communities or networks participate in the collection of baseline data on their settlements (see for example the work of Shelter Associates in Pune in assisting slum dwellers in empowerment through data collection and other initiatives or the Society for the Promotion of Area Resource Centres and related community based initiatives and networks operating in Africa, Asia and Latin America, <http://clic.org>).

The work of Heholt [1996] has also demonstrated that with even relatively little training and support, community residents are willing and able to collect basic socio-economic data. A capacity building programme designed to enable local communities to design, collect and manage data on their own settlements has several benefits. The process itself provides a focal point for community interaction and learning; it could raise awareness amongst the public and official agencies about the state of living conditions in informal settlements and contribute to a strengthening of the dialogue and other linkages between stakeholders; it would encourage communities to reflect and debate on the development related issues which affect their lives and livelihoods.

A settlement's ownership of data on key development related variables, can also be seen as a form of empowerment, in that it may be used to provide leverage in their collaboration with local government and other stakeholders. Though the data collected by communities could be also provided to other stakeholders, this should not be seen as automatic. By releasing control of their data communities also relinquish a degree of power that is inherent in their intimate knowledge of their locality.

There are of course, many barriers to the implementing what, for some, may be seen as revolutionary practices. The acceptance of community data collection mechanisms as valid sources of knowledge about informal development implies a redistribution of power amongst the stakeholders, as ... "it is power that defines what can *count* as knowledge" [Pløger, 2001, pg 227]. The acceptance of new techniques for data capture by the most powerful stakeholders is therefore by no means automatic, as criticism related to methods, quality assurance and scientific rigor are likely to abound.

Also from the side of more technical procedures for the capture and provision of spatial data alternatives exist for the traditional mapping systems. Although the latest high resolution satellite imagery is expensive² it does begin to offer the kind of technical specifications which would be suitable for mapping equivalent to traditional maps at scale 1:10,000. For smaller areas such as settlements, where a more detailed image is required to understand the complex, high density development, Small Format Aerial Photography offers excellent

¹ Discussions with a ward level executive officer and two (Mtaa) community leaders in March 2000, revealed that the 1992 topographic base maps which were on sale by the end of 1994 had never been made available at this level to facilitate the performance of their local management duties. Tanzania's decennial census was scheduled for 1998 but funding problems have delayed the data collection till 2001.

² For example in April 2000 a fused colour and panchromatic Ikonos image with a resolution of 1 m of the city of Cochabamba, Bolivia was purchased at a cost of \$28/sq.km. by the ITC and CLAS, Bolivia. The City has since decided to order a new image for 2001 to enable it to maintain its fiscal cadastre and improve its revenue collection system. Similar imagery for the whole of Dar es Salaam Region would cost approximately US\$40,000 and given the frequent cloud cover problems, it may be extremely difficult to achieve complete coverage of the city.

opportunities for quick and relatively inexpensive base map updating that meet the needs of communities [Sliuzas and Ottens, 1999]. Small format photomaps can be produced and digitally enhanced with locally available technologies. They are easily understood and used by local residents and other stakeholders for the improvement and management of the area³. Recent research in South Africa is also successfully incorporating such technology as a component of community based approaches for settlement planning and management [Abbott, 2000].

Conclusions

Currently little data is available for the analysis on the complex and multi-dimensional dynamics of informal development in Dar es Salaam. The lack of relevant data is a prohibitive factor in understanding the nature of the physical and socio-economic processes occurring within the informal settlements that dominate housing supply in this city. Traditional approaches to data collection that rely on infrequent centralized mapping and census systems are a barrier to understanding and thereby to effective local policy making and action. As a result, the opinions of policy advisors may become relatively more important in policy processes, even though they may be based on limited and scattered first hand experience and knowledge.

The combination of community based approaches to socio-economic data collection and low cost geographic information technology has the potential to address many of the shortcomings of traditional systems. Community based data collection can also contribute to the empowerment of the informal citizens, lending legitimacy to their demands for recognition and services from the formal urban management systems. Locally available Geographic Information Technology can now also contribute to improving spatial and physical information on informal settlements. The acceptance of such innovative approaches has obvious impacts to current power relationships and will not come easily. The message from the limited data that is available however, suggests that the scale of informal development is such that further innovation in urban planning and management practice is required.

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³ Such small format photomaps have been successfully used by the author as a tool in focus groups with residents in the Keko Mwanga settlement in Dar es Salaam held in April 2000. Subsequently the same photomaps were used by the settlement's Development Committee to discuss possible expansion of the school, by the local government to identify flood prone buildings, by an NGO working on water supply systems for the area and by statistical officers for defining collection units for the Census.

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