

Participatory Methodology for Planning of Peri Urban Land Use in Situ: The Case of Kibamba Dar Es Salaam

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ABSTRACT

The future is increasingly urban and inevitably so. Urbanisation is increasing at unprecedented rate in both Sub-Saharan Africa and developing world (UN Habitat, 1999). Alongside this rapid expansion comes the emergence of the peri-urban areas that are characterised of increasing intensification and co-existence of urban and rural areas, marked by dynamic flows of commodities, capital, natural resources, people and environmental pollution.

This paper describes a participatory planning methodology for the peri urban settlements in-situ. The methodology uses a variety of spatial imaging and information capture techniques to link different components of the peri urban processes' together, thereby providing a basis for reliability and replicability. This approach is based upon the appreciation that peri urban settlements are vibrant environments which require to be planned considering all its components.

At the same time the planning and management may require that some of the families be relocated internally or externally. The integrated spatial information systems described here provide the framework to support and merging these diverse needs. The process begins with obtaining latest satellite imagery which enables the planners to see a actual situation on the ground.

Key elements of the system comprise shack data, constraint factors, existing access and movement routes, existing properties and a detailed social and economic survey supported by on the ground corroboration analysis using GPS. The way in which this information is linked and utilised provides the basis for replicability in planning methodology for situ peri urban areas. Finally the overlays of this the different layers provide a basis for planners to propose a layout plan for discussion and implementation with stakeholders.

Key words: GIS, peri urban areas, urban planning, database management, property registration, map overlaying

1 Introduction

The rapid densification of peri-urban areas presents both opportunities and enormous challenges for urban and rural sustainability. Conflicts over land, water and tenure emerge namely: polluting industries, waste disposal, mining, construction and large scale cash crops all jockey for position with small scale agriculture and indigenous lands. This rapidly changing environment poses enormous challenges for the health and livelihoods of an increasing number of dis-enfranchised, poor and marginalized citizens who often lack access to basic health, water and sanitation services. These changes in the peri-urban environments also raise larger questions about the future and sustainability of our cities/towns Adell, G. (1999).

Despite an increased awareness of peri-urban transformations and a growing research demand,

there is still little insight into the management approaches that will tackle the management of the land use in these areas, poverty alleviation and social justice alongside environmental integrity, and draw synergy from urban and rural relationships.

Peri-urban areas lie at the interface between urban and rural, in some form of transition from strictly rural to urban and are often places in crisis (Development Planning Unit (DPU) (2003). They commonly comprise a mixture of encroached farming land, older settlements surrounded by new developments, industrial sites and slums. These areas often form the immediate urban- rural interface, and may eventually evolve into cities of tomorrow (Allen A. Dávila, J. 2002, Mushi, N. 2003, Mushi, N. 2008).

Typically, these areas are outside the responsibility of city authorities and sometimes called grey areas. More than half the world's population lives in and

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around urban areas. In developing countries this proportion is higher and increasing. The impact that this growth has on food security, services, infrastructure and urban livelihoods needs to be understood and solutions found. Sub Saharan Africa is facing the greatest movement of people from rural to urban areas (UN Habitat, 1999). This movement unlike in Europe is not accompanied by provision of employment opportunities and as a result most of the people are settling in peri-urban areas (Choguill, C. L. 1991). The capacity of the responsible institutions in terms of human and financial resources is not adequate to provide the required services and infrastructure before people settle in peri urban areas. The planning of such areas thus demand more professional input in terms of knowledge, time, methodology, commitment and understanding.

They are the places where the greatest pressure on the natural resources, on poor people's livelihood strategies, on access to land, and on public amenities takes place (Rakodi, C. 1998, Payne, G. 2001). It is the place where the farming household and the urban migrant and/or slum dweller meet head on the former diversifying into more urban based livelihood strategies, the latter moving where new job opportunities are likely to be. Rural local authorities, who are responsible for managing peri-urban areas, lack both the capacity and the resources to manage their unplanned development; while urban governments are not necessarily keen to take them on. A Peri urban area has been defined differently by different people and groups in different regions. Below are some of the definitions:

- Peri-urban area in spatial context is defined as a zone around the built up area of a city, its perimeter or edge, the 'rural-urban fringe' where city and country land uses overlap (Aslin et al, 2004, Abbott, J 1994, 2000),
- It is a zone of interaction between urban and rural socio-economic systems or a transition zone between fully urbanized land in cities and areas in predominantly agricultural use / mixed land uses and indeterminate inner and outer boundaries or a zone of rapid economic and social structural change (Rakodi, 1998 cited in Adell, 1999).
- It is the space into which the town extends as the process of dispersion operates an area with distinctive characteristics which is only partly assimilated into the growing urban complex, which is still partly rural and where many of the residents live in the country but are not socially and economically of it (Adell, 1999).

- It is ill defined as unrecognized and unregularized zone that has become a major hub of European Development, but is also a source of social inequality and where a land is wasted (Fagergren, C: 2000).
- An "uneasy, phenomenon usually characterized by the loss of rural aspects (like fertile soil, agricultural land, natural landscape) or the lack of urban attributes (such as services and infrastructure)" (Allen, 2003).

This paper has no intention of assessing the success or failure of different definitions of the peri-urban to account for the phenomenon. It needs to be kept in mind that all definitions are constructed; they can never be a map that entirely covers its territory at a one-to-one scale, in four dimensions and full technicolor.

2. Recent approaches in peri urban planning

Current approaches to peri urban planning fall into one of the two broad categories. The more common approach in Anglophone countries is that which evolved in countries such as Sri Lanka (e.g. Pathirana & Sheng, 1992), India (Ableson, 1996; Asthana, 1994), Pakistan (Environment and Urbanisation, 1995; Hasan & Vaidya, 1986) and Tanzania Infrastructure provision in informal settlements, (Kyessi A. 2002). These focus very much on upgrading and tend to operate on a sector basis.

In Tanzania, there has never been a comprehensive approach to upgrading of existing unplanned areas nor planning of the peri urban areas (Kombe, 2000). Past upgrading attempts have been sporadic and narrow. Major upgrading in Manzese and Mtoni Tandika areas in the 1970s and 1980s was supported by the World Bank as part of the Sites and Services and Squatter Upgrading Schemes. By the 1990s, as a result of maintenance neglect, the upgraded infrastructure had deteriorated and required a re-upgrade. Almost 20 years after the initial upgrading, the Community Infrastructure Upgrading Programme (CIUP) funded by the World Bank was launched in 2005. Despite its coverage of 31 settlements in Phases 1 and 2 (2005-2011), the bulk of unplanned and un-serviced areas still need to be upgraded.

To be precise, all the past attempts seek to address a specific need (e.g. water supply or housing) and do not seek to map out a long-term plan for the

settlement. This approach works reasonably well in very poor areas, where there is little chance of achieving more than the provision of basic needs and where there is little or no relocation of existing dwellings. In this approach, the spatial relationship between the dwellings is kept unchanged. This approach does not really change the status of the peri urban area nor does it provide additional benefit to the residents.

This second approach was pioneered in de-Soto in Brazil, and is now the dominant approach in Latin America and has also been applied in African countries Tanzania included. This approach is based more upon the principle of formalizing the property than upon sectoral improvement. De-Soto (2000) maintains that capitalism has triumphed in the developed world and by implication making them rich because every asset every piece of land, every house, every chattel is registered. He however notes that most poor people in the third world possess dead capital (property that is unregistered) and that is why they are unable to create wealth. He carried out a survey of five Third World cities (Cairo, Lima, Mexico City and Port-au-Prince) to determine the value of landed property or real estate (land and/or buildings), which has been locked out of the capitalized economy due to non-registration of title. According to him, the value of a building is ascertained by simply surveying the cost of building materials and observing the selling prices of comparable buildings.

De-Soto asserts that most people's resources are commercially and financially invisible. Nobody really knows who owns what and where, who is accountable for the performance of obligations, who is responsible for losses and fraud, and what mechanisms are available to enforce payment for services and goods delivered. Consequently, most potential assets in these countries have not been identified or realised. There is little accessible capital and the exchange economy is constrained and slow-moving.

Findings from applying de-Soto's approach in developing countries were not in support of his arguments. The conclusion here appears to be that de-Soto's ideas cannot work because, for social reasons, people will not participate in the market even if they are granted formal property rights. Another major issue is that there is widespread aversion to the use of land as collateral. According to the book *The Mystery of Capital* (p. 147) land

tenure regularisation is supposed to facilitate access to finance but the plot holders in all the three countries were reluctant to pledge title deeds in case they lost their land.

The truth is that banks consider and evaluate both the quality and location of the property to be used as collateral. Financial institutions are not interested in poorly constructed properties that are not accessible for mortgage purposes because they are susceptible to weather or environmental conditions and also not durable. It must be noted however that a finding of risk aversion to mortgages is not the same as finding that formal credit is not beneficial to poverty alleviation efforts (Antwi and Adams, 2003; Gough and Yankson, 2000; Kironde, 2000; Payne, 1997).

2.1 The approach explained

The approach sought to combine two elements of planning. The first was an understanding of community needs, which provided the social basis for development within a settlement. The second was the adaptation of a new mapping tool, the GIS property demarcation tool. These were combined into an integrated urban planning system, which was known as Visual Settlement Planning (VSP). In essence, VSP created a settlement analysis for the development of the peri-urban area based upon the principle of minimum relocation. It required work to map all properties on all facets of the settlement to take place simultaneously. It also required negotiating with property owners to come to agreement. This negotiation was given a kick start by political leaders at regional and district levels. This serves to minimize complaints and build confidence to the property owners. In addition, where relocation was inevitable there state compensation should be mobilized. And finally, the system uses a strong social support system of community social and development workers to liaise between government and community namely mtaa leaders and councilors.

In 2004, the project was started in Dare es Salaam with the objective of establishing a satellite town to decongest the city of Dar es Salaam. It began first as a desk study and sensitization at Regional and District levels. The net result was that the project was carried out with a consciousness of a much more open view of what constituted peri-urban planning, and an approach that sought to draw benefits from both the entire city and the Luguruni and Kibamba residents. The result was a

methodology that, while still GIS-based, followed more of a middle path between the two extremes outlined above. It is this methodology that is discussed here.

Description of the planning methodology As mentioned earlier, the approach taken was one that sought to find a balance between the de-Soto adhoc formalization and the sectoral development. This method appreciates that peri urban settlements are multifunctional environments; hence any attempt to plan these areas in a sustainable manner has to recognize and support this multi-functionality. This means working on all facets of development. At the same time, this has to be balanced by an implementation programme that is flexible, and which caters for a range of different affordability/expenditure patterns. The use of individual project or sector development within a multifunctional strategic approach is made possible through the use of a GIS-based operating environment. The starting point is an assembly of geo-spatial information, bearing in mind that this is now being collected to support a broad-based development. On this basis, the information gathered can be divided into three categories, as follows:

- i. Baseline data,
- ii. Demographic, social and organizational data, and
- iii. Spatial and physical data.

2.2 The baseline data

The collection of the base data represents the first change in thinking away from a conventional squatter upgrading approach. Here the focus shifts from the site (parcel) as the basic spatial unit (BSU) to the dwelling. This is what exists and it is this unit that will have information attached to it. This means that the cadastre is no longer central to the development process, a major change from current thinking. There are three components to the base data. The (fixed) cadastre is no longer the basis for development. Hence the development strategy will need to be based upon transient data. Similarly, because the BSU is now a physical feature, the data source will need to be spatial in type. This data source is a photographic/satellite image of the site. There are two image types available: satellite and aerial. In the initial stages it is not necessary to have high levels of accuracy in the positioning of the shacks. In the Luguruni and Kibamba project aerial photo was used and the satellite images were warped into position using an affixing process, with the

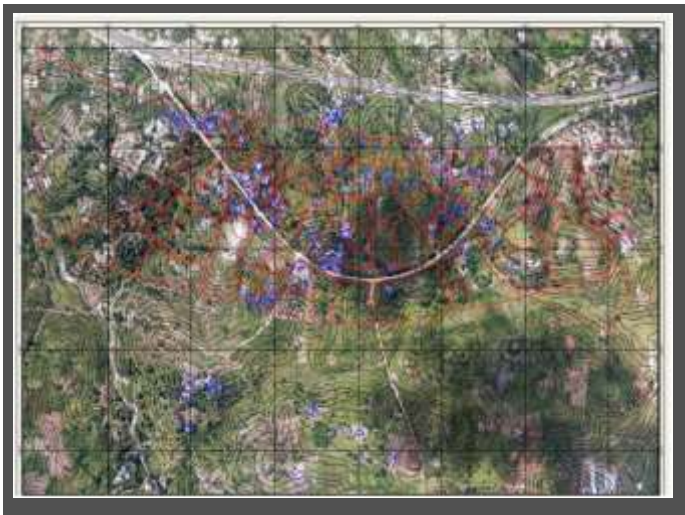
reference points being taken from a 1996 in 1:50,000 aerial photograph. This was adequate for the first phase of the work, which was concerned with capturing demographic data. This type of image generation is cheap and rapid, which means that any house movement can be monitored and integrated.

2.3 Socio demographic data

This section presents a more fundamental input to peri urban areas. It was pointed out earlier in the paper that in situ peri urban planning covers all facets of development. The only common denominator running through all facets of peri urban planning is the community. Hence the second shift reflects a change in focus from the physical site to the people who are living on the area. From this it follows that an understanding of the community is central to the process. Such an understanding comes from information participatorily collected and logically interpreted. This in turn is derived from a combination data and intuitive analysis guided by experience. Effective integration of the two can only be achieved through spatial referencing of the data. In addition, once it is constructed in this way, the social database provides the framework for an interactive education process, between community and professionals, which operates in two directions. For the reason that each family is interviewed, this presents an opportunity for everyone to be informed of the project and to discuss it. This is a process that has enormous value in deepening the community participation process.

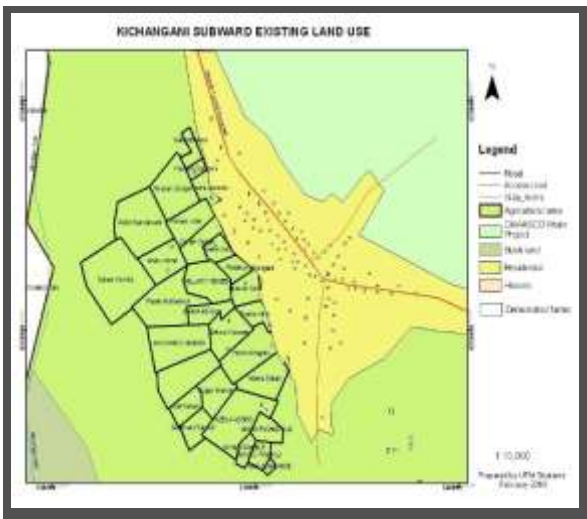
In addition, it allows the professionals to get to know the community on the ground and to obtain an understanding of the problems to be dealt with at first hand. Again this has immense value, particularly when it comes to defining and pooling land for social physical infrastructure needs and the relationship between people and levels of service. The database is organized into a number of categories, which cover the head of household, the spouse, children, and other residents. The information covers a basic profile of the individual, his/her residence in the area, linkages to other geographical areas, education, employment and skills. The information is linked to the property number, and this forms the linkage with the base data. The output from this second set of data then takes the form of a series of thematic maps, which portray the information spatially.

Map 1: Parceling of Luguruni/Kibamba periurban areas



Source: Field survey 2007

Map 2: Parceling of Individual property boundaries part of Kichangani sub ward



Source: Field survey 2007

Map 2 provides one example of this output. If you press one property it shows the gender distribution of the head of household and the structure of the household. Such a finding clearly has a major impact on the planning process. A second distribution provides a breakdown of employment. In this analysis employment has been divided into four categories: formal employment, informal employment inside the project area, informal employment outside project area and no recognized form of employment. In this case one can discern the percentages of formal employment versus informal employment.

It can be seen from this brief description that the survey represents a distinct shift away from the

information gathering exercise associated with random interviews. Nevertheless, it is important to recognize that this is only the base. The success of the project lies in the detail; in the ongoing involvement of community workers coupled with extensive and ongoing interaction; and most importantly in the extent to which the process empowers the community to take control of the wider upgrading process.

2.4 Spatial and physical data

The third area is the spatial analysis as it relates to spatial and physical data. The order of prioritizing this list is deliberate and reflects the reality of upgrading. It is recognized that most peri-urban areas are located on peripheral of the city, and that this will have a major impact of their planning. However, successful planning is impossible without community support. If the community is integrated into the process, then the constraints imposed by the physical environment can be accommodated. The impact of the physical environment is twofold. First comes the impact on individual families, i.e. which will have to be relocated (either internally or externally) due to the physical constraints imposed by the site? Second, what is going to be the impact of installing collective services by land pooling? There are a number of factors that might require dwellings to be relocated. These are:

- Bad ground (this could be an unstable slope, a flood prone area or a fault in the underlying ground),
- Existing road reserves/rights of way,
- Competing claims for ownership,
- The need for pooling land for public or social services,
- The provision of access routes,
- Changes in the house clustering pattern, and
- Physical risk factors (e.g. flood-prone areas or geologically unstable sites), as well as cadastral constraints, requiring the relocation of individual shacks, is linked to the site and shack data.

Map 3 provides an example of the physical constraints identified for Luguruni. In this case the constraint derives from existing cadastral boundaries. The figure shows the impact of the existing site boundary (red lines) on shacks and also the impact of current servitudes (rights of way) (green lines).

Map 3: Physical constraints identified (site analysis)

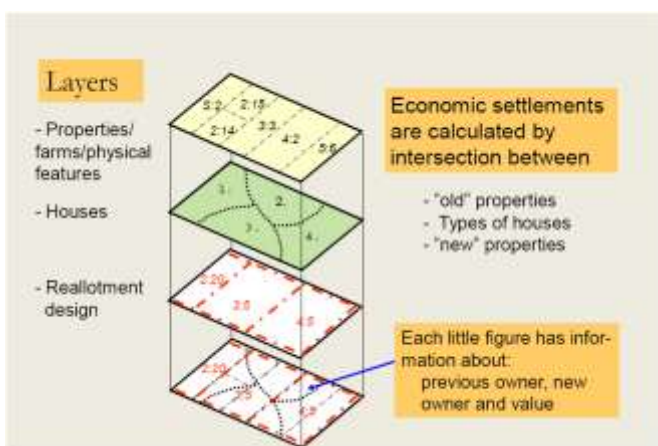


Source: Satelite image 2007

2.5 Overlaying the information to generate development structure

This section deals with the overlaying of the different information sets described above. It uses GIS analysis techniques of queries and buffers to arrive at key indicators. In its approach it represents the third shift from a traditional planning approach. For while the traditional approach creates a development from a blank sheet of paper, this approach uses elements that already exist, and whose details planning is built around the retention of social cohesion, the retention of the social capital base, an the maximizing of economic opportunities.

Figure 1: Overlay-techniques in Land Consolidation



Source: Lake Victoria Environmental Assessment Report 2004

The setting of roads, cadastral boundaries and amenity areas divides the area naturally into blocks. The social survey data, integrated into a

participatory decision-making process, ensures that the factors described above are taken into account fully in planning the relocations. Once relocation has been agreed then the physical planning at a local level can begin. Here again, however, the process is very different to a conventional one. Planning at the level of the cell deals with the following components:

- Site planning and cadastral boundaries,
- Social services,
- Infrastructure provision,
- Improvement of the environment.

This is achieved through a GIS-based management system. Accommodating these diverse needs requires that there be overlaying of the different spatial activities using the GIS platform. All activity (e.g. spatial planning, infrastructure planning and design, housing and building development) therefore takes place within the same GIS environment. At the same time, it is important that the community plays a key role in decision-making, and this requires that the same GIS system be capable of providing a degree of interactive planning with members of the community.

Map 4: Final overlay map for Luguruni



Source: Kibamba data collection 2007-8

2.6 Conclusions and recommendations

This paper has proposed that geo-spatial information management is the key element in establishing a new planning paradigm appropriate to the development of peri urban areas. The methodology adopted has the objective of the creation of well managed and planned peri urban areas. The spatially referenced management system

is used to incorporate the different components of the environmental management process, to provide key management tool for development, and empower the local communities to make all key decisions.

The way in which the information is structured and spatially referenced is central to the achievement of the methodology. The core data set is that constructed around the existing dwellings, and it is kept as simple as possible. Linkages within the GIS environment are then used to overlay all other data with this data set. Starting this point data collection falls into two categories, one dealing with physical and spatial data and the other with social and economic data. These three data sets together then form the basis for all decision making.

The planning process that emerges from this approach differs significantly from that used to plan both informal and peri urban areas and new site developments. Firstly the basic spatial unit for referencing is the dwelling unit (property). Secondly, the whole emphasis moves from one where the site (the piece of land to be developed) dominates the process, to one where people and their needs dominate.

The remodeling of the site is submissive to the needs of the community. In the end, there is the issue of servicing the site. In the conventional approach services move out from the individual parcel, which is seen as the point of delivery. In this method a hierarchical approach is adopted, whereby people are grouped through a re-location exercise into smaller spatially defined sub-areas. The initial planning of infrastructure seeks to operate at a communal level to service these sub-areas, with the individual servicing of parcels coming later and being dependent upon a different set of affordability criteria.

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