

PROBLEMS OF DATA ACQUISITION AND INFORMATION MANAGEMENT FOR PLANNING PERI-URBAN SETTLEMENTS IN BOTSWANA

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ABSTRACT:

This paper discusses some of the major problems that have made it difficult to acquire and manage spatial information in the peri-urban areas of Botswana. The main problems include the separate historic development of urban and peri-urban settlements; contrasts in land tenure; and the acquisition and organization of data, and management of information on peri-urban areas along sectoral lines. In addition, there is a shortage of personnel to survey and record information on land parcels. Although some of these problems are currently receiving attention, they are likely to play a big role in slowing down the application of geographic information science for planning peri-urban areas in Botswana.

1. INTRODUCTION

This paper addresses some of the major problems that have made it difficult to acquire data and manage information for planning peri-urban areas in Botswana. Internationally, the development of skills and techniques in geographic information science has been useful in acquiring and organizing data for improved decision making in planning urban and peri-urban areas in many parts of the world (Timmermans, 1998). Attempts made to acquire up-to-date data required for planning peri-urban areas have been described in many studies (Martin and Howarth, 1989; Trietz et al., 1990; Lo and Wu, 1984) and proposals and problems in building multi-purpose data bases that can be used for various departments in planning urban and peri-urban areas have been addressed (Zhao, 1993; Wilcox, 1984; McLaughlin and Nichols, 1987; Dueker, 1987). In many cities where peri-urban areas have been successfully and continuously used for solving problems of land shortage for urban functions, acquisition of data and organization of information for peri-urban areas is as important as it is for the urban areas themselves (Trietz et al., 1992; Martin and Howarth, 1989). In many countries in Eastern and Southern Africa, however, coordinated data acquisition and information management for peri-urban areas is commonly neglected until crises develop requiring the expansion of urban limits. Given chronic shortages of financial and personnel resources, improvements in data collection and management is focused on poorly planned areas within the city limits (Barry, 1998; Cross, 1999; Byerley and McIntosh, 1994; Barry and Ruther, 2001). Consequently the lateral expansion of urban areas into peri-urban zones is a major administrative challenge. Yet the expected rapid increase of urban population in Africa (Farvacque-Vitovic and Godwin, 1998) may be expected to be accommodated in current peri-urban zones where currently little attention is being given to data collection and information management. Botswana clearly illustrates this problem. Although the growth rate of some of the country's cities such as Gaborone rank with the highest in the world interest in coordinating peri-urban data acquisition and information management is quite recent (Nkambwe and Arnberg, 1996). The problems that have been considered responsible for this are mainly historical, social, and administrative, not technical. The rest of this paper discusses some of these problems and points out recent efforts to overcome them.

2. HISTORICAL INDEPENDENT GROWTH OF URBAN AND PERI-URBAN AREAS IN BOTSWANA

Urban and peri-urban areas in Botswana have developed independently, under different land tenure and administrative systems. Urbanization and rapid urban growth are recent phenomena in country. Other than the town of Francistown established as a mining town in the late 1880's, there were virtually no urban areas in the country until the 1960's. Gaborone, designated as the capital city of Botswana in 1964, had only a few thousand people by the time of independence in 1966. At independence, Botswana had only 4% of its population of 550,000 living in urban areas. The prospects of urban growth seemed so little that planners saw no reason to expect towns to expand beyond very limited areal extents. Some of the urban areas that developed were cookie cut-outs from Tribal Territories and many large villages which might have been declared towns remained part of Tribal Territories. With no history of urban growth, the areal extent of the urban areas was planned to accommodate small populations. For example Gaborone now with a population of 150,000 was "ambitiously" designed to accommodate 5000 people over a very limited area surrounded by commercial farms and Tribal Territories. Consequently the tribal territories adjacent to the demarcated urban areas were left to develop without control. But with time Tribal Territories became peri-urban zones in which migrants from rural areas became commuters working in the urban areas. Increased prosperity from diamonds starting in the mid-1970's drastically increased the rate of urbanization and urban growth, but very little effort was made until recently to improve the information base for planning these zones. The most important difference between the urban areas and their peri-urban Tribal Territories was in land administration and land tenure. Urban areas developed on Crown Land (later referred to as Government Land) with strict regulations of planning. Except for a few pockets of very limited slum areas land parcels and plots were properly surveyed and allocated by the Government's Surveys and Mapping Department. Proper records that were kept have been useful in introducing geographical information science in the acquisition of data and management of information within the urban areas. By contrast the Tribal Territories on the rural-urban fringe were left to develop under customary tenure which has been described elsewhere (Shapera, 1943; Kalabamu, 2000). In terms of data acquisition and

information management, the important features that have developed in practising it were a complete lack of regular land parcels and the fact that no planning regulations were followed, nor proper records kept. In 1968 efforts were made to improve the situation by transferring the responsibility for land allocation and management from tribal chiefs to Land Boards whose members are appointed by the Minister of Lands, Housing and Environment. The Land Boards are expected to keep records of all the land parcels they allocate and efforts have been made to plan newly developing areas on the rural urban fringe in the Tribal Territories. However, residents and arable land owners who acquired land parcels before the creation of the Land Boards have not been required to recognize new regulations on planning. Many land parcels have retained unclear boundaries and rules of ownership in spite of the fact that it has been demonstrated that the old rules of communal land ownership have to be modified to suit changing social and economic circumstances (Kalabamu, 2000; Mathuba, 1989).

3. INCOMPLETE CADASTRE AS A PRIMARY PROBLEM

Information for planning settlements in general characteristically requires a cadastral layer to provide the key theme for a multi-purpose land information system. All other information is organised with this as the basis to improve data flow among the various users (Chrisman and Niemann, 1985; National Research Council, 1980, 1983). Where such a layer is missing or is incomplete multi-purpose planning becomes difficult. In Botswana the contrast between urban and peri-urban areas has made it difficult to attempt building a complete cadastral layer in the latter. There are three main problems with the current effort to develop a complete cadastre in peri-urban areas. Firstly, surveying and recording land parcels is not mandatory for land parcel owners in peri-urban Tribal Territories. In the older part of the built-up areas, owners of land parcels are not required to have plots allocated to them before the creation of the Land Boards surveyed. In spite of various incentives provided to encourage parcel owners to get their plots surveyed and recorded, a complete cadastre may not be expected in the near future. Secondly, the Department of Surveys and Mapping which normally carries out the surveys of plots cannot have sufficient personnel to complete all the parcels allocated though peri-urban Tribal Territories have been given priority. Private surveyors licensed to conduct these surveys charge rates that many owners consider unreasonable for the benefits of having a land parcel surveyed. Besides, until recently when a coordinated effort was launched, poor coordination among various Government Departments handling the information acquired made it difficult to add all the data to the existing cadastre. Thirdly, illegal self-allocation of land parcels in peri-urban tribal territories (Government of Botswana, 1992) has been a major problem in the development of peri-urban cadastre. These illegal allocations are made outside the records of the Land Boards and cannot be entered in the cadastre. Several methods have been attempted to circumvent the necessity for proper surveying until resources are available. For example, recent aerial photographs have been used to re-align and regularize land parcels. However, lack of a complete cadastre and the problems of getting one remain major and primary problems in organizing information for planning peri-urban areas in Botswana.

4. SECTORAL DATA ACQUISITION AND INFORMATION MANAGEMENT

Nkambwe and Arnberg (1995) have attempted to analyze the problems introduced in planning peri-urban areas in Botswana due to poor data flow among those planning for peri-urban areas. For tribal lands in any peri-urban zone the most important responsibility is held by the Land Boards which administers the lands including the allocation of land parcels and adjudication of disputes on ownership. The Boards are expected to have records of all the land parcels they have allocated since their inception in 1968, currently being changed from paper folders to computer based files. They also keep records for each parcel that individuals get surveyed in the older parts of the built-up areas. The records are kept at the offices of the Land Boards in the Tribal Territories but they are not complete since having a land parcel recorded is not mandatory. The Boards are advised on peri-urban planning matters by two Government Officers: the District Officer (Lands) (DO(L)); and the Physical Planner (PP). The DO(L) reports to the Lands Department while the PP reports to the Department of Town and Regional Planning, both in the Ministry of Lands, Housing and Environment (MLHE). Although these officers regularly meet (with other officers) in the District Land Use Planning Unit (DLUPU), they only discuss ideas on planning in general and there is no formal way for them to exchange or use each other's data. Each gets support in collecting data from his/her Department where the data collected is kept. The Land Board thus does not have complete access to all the data relevant to allocating land parcels. Of some relevance to planning too are the tribal chiefs, who, although they do not give out land parcels directly, are very influential in settling disputes on land parcel ownership. This group has no regular access to any of the data collected and kept by either the Land Boards or the Government officers. These divisions have compartmentalized information relevant to planning by sectors with officers and Departments unwilling to adjust their data to suit others' formats. Thus even where data is available they may have limited value in solving problems of information management for peri-urban planning.

5. RECENT EFFORTS TO BUILD A SPATIAL DATA INFRASTRUCTURE

The problems of data acquisition and information management in Botswana's peri-urban areas are clearly recognized. Many efforts have been made for a long time to carry out pilot projects in various parts of the country (McCormick, 1982; Swedeplan, 1990) and in peri-urban villages to try and find techniques that might be useful in general data acquisition (Maphanyane, 1993); monitoring change (Nkambwe and Arnberg, 1996) and general land information systems (McVey, 1993). The pilot studies undertaken to assist in developing improved techniques for data acquisition and information management have been done in isolation without relating them to an overall effort. Recently with leadership from the Department of Surveys and Mapping, an overall effort has been launched that has brought all previous efforts at information management as an effort to build a National Spatial Data Infrastructure (Morebodi, 2001). The advantage of this effort is broader than peri-urban data acquisition and information management. However, of all pressing problems this may be the most acute together with Land Information Systems in general. Coordination of projects and programs, and the cooperation of Departments including those mentioned above has already been declared a priority in developing the SDI. Within the national framework, organizing information for peri-urban areas has been linked to a national

effort to coordinate urban, peri-urban and rural land information systems. This project is already under way as the Botswana Land Information Systems (BLIS) and it is clear inter-departmental coordination has prospects for improving peri-urban data acquisition and information management.

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