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Toward sustainable rural land use planning practices in Botswana: the concept for an “Integrated Rural Plan”

By

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ABSTRACT

Due to a number of emerging problems with the current practice of using a partial approach to Botswana’s rural planning and development, it is gradually becoming necessary to move towards the adoption of an integral approach, which focuses on both rural settlement and its countryside, as a unique territory and functional entity. Currently, the rural areas are experiencing three processes: (a) depopulation, ageing of population and reduction of its most productive cohort because of rural–urban migration and the influence of AIDS; (b) gradual de-agrarisation and uncontrolled rural urbanisation, especially in the fringe zones of the major towns and cities like Gaborone and the major urban villages; and (c) poor use of land and inadequate use of land, according to its capability and suitability, land tenure and ownership.

All of the above mentioned and some other negative impacts should be investigated before making, approving, implementing and renewing of different planning documents. Production of an integrated rural plan for rural settlements and countryside is a way to revive and reaffirm Botswana’s rural communities. Through its implementation, an integrated rural plan can have a positive contribution in solving existing land use problems and resource depletion. During this procedure the same attention has to be paid to regulatory urban land use elements for rural settlements, together with development of land use elements that are important for countryside planning.

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1. INTRODUCTION

Rural settlements are the oldest human settlements. Through history they have been changing very slowly. Life and work in them mainly depended on natural resources and environmental conditions. Between the built-up area of rural settlement (i.e. village, hamlet) on one hand and the countryside (i.e. rural area, rural landscape, rural territory, hinterland, cadastral area\(^3\)) on the other hand, there was always a close connection. That connection exists in the geographical location of rural settlements, their morphology, economic life and types of houses. Through history, permanent rural settlements of different types and different characteristics grew from periodical rural hamlets, where people lived like nomads, hunters and gatherers.

In contrast to cities, towns and urban areas, rural communities have smaller population densities, most often between 10 or 20 people/ha up to 40 people/ha. Different communal improvements and utilities, such as sidewalks, water supply, tree corridors, squares and plazas, streetlights and power, and especially sewerage and solid waste management system, etc., were always on a lower development level than in towns. Usually, village plots have residential buildings, but also they host some other economic functions (sties for animals, food storage, storerooms for machines, tools, etc.). This makes dwelling and work closely connected. Social and public services (i.e. schools, hospitals, and offices) are not well developed in most of rural settlements.

The definitions of „town” and „village” are a result of combined historical, administrative, population, spatial, economic and other criteria and it is often a subject of convention. Mostly, “urban settlements” are defined as such, while the rest are considered as “rural settlements”. Some authors (cf. Kojic, 1977) argued that a rural settlement is an “unique form of social and economic organisation of people, who are mostly engaged in agriculture production within a framework of designated territory.” Although it is a relatively easy process to specify what is not a rural settlement (Philip et al., 1978), it is much more difficult to provide a positive and rigid definition of what a rural settlement (Cloke, 1983) and rural territory is. It is therefore more realistic to talk about a transition zone from “strongly rural” to “strongly urban” (Cloke, 1979).

Differences in population size, economic activities, public services, land use, physical pattern and social milieu are evident in rural and urban communities. Today, it is more difficult to make a strict line boundary between villages and towns in a way that was acceptable a few decades ago. This was true especially for developed countries, where the towns expand intensively and indigenous villages melted into urban fringe zones.\(^4\)

In developing countries, like Botswana, there is still an obvious difference between rural and urban environment. Just in the urban fringe zones of Botswana’s capital

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\(^3\) In European countries, the cadastral area is used as a term for rural territory and/or countryside around the one or two to three major villages. In Botswana, this term can be put in use for a community that uses a certain rural area for production, and which includes major village, dispersed hamlets, cattle posts and lands.

\(^4\) According to Blacksell & Gilg (1981) the fringes of urban areas have always been subject to rapid change. They are zones of transition from urban to rural land uses and the change continues unabated, in spite of development control powers and the sanction of Green Belt designation, which has been world wide copied following its initial success around London in the post-war era. It is, however, particularly difficult to measure accurately land use changes in these areas because of the enormous diversity of land use and the speed and subtlety of many of the new developments.
Gaborone (Tlokweng, Mogoditshane, Gabane, etc.) and major urban villages (Molepolole, Mochudi, Ramotswa, etc.) there is an overlap of different ways of using urban and rural land. From a geographic point of view, the rural environment in Botswana is a wider area, which consists of a built-up area of major village and rural or countryside area outside the major village. Most of the people still live in major villages of designated rural communities, and the land is primarily used for agricultural and animal food processing. However, today, especially in primary Botswana settlement (e.g. urban villages), more often one can also find intensive development of urban, tourist, recreational, mining, industrial, infrastructure and other important functions.

Opposite to rural settlement, open countryside indicates total rural land territory within strictly established boundaries. A major village belongs officially to this territory, and it is under direct control and management of one or more land boards. Spatially, countryside includes all land together with built-up land of major villages and other rural settlements such as hamlets, different infrastructure corridors, industrial complexes, as well as agriculture and forest land, range land, vacant and all other lands that exist within its administrative and cadastral boundaries.

Here, we can come to the conclusion that the main characteristic of rural environment is its territorial and certain communal and economical organisation. Together with its hinterland or countryside, a village is a specific geographical unit. In regard to this, the Botswana’s rural environment presents a territorialised group of people, engaged in cattle raising, agriculture, collecting veldt products, and in forestry. Today, Botswana’s villagers and rural dwellers very often also try to fulfil other important needs (e.g. working, cultural, educational and health) outside of their villages, travelling and commuting to the nearest towns.

2. AN OVERVIEW OF RURAL RESEARCH AND DEVELOPMENT PROBLEMS

At the end of XIX and beginning of XX century, many researchers, especially geographers were systematically exploring the village and its life. Mostly, they were researching rural settlements, their genesis (origin), and development, their locations and transformation, their population and production systems.

In the second half of the forties of the XX century, rural research and studies got new dimensions inside geography, rural sociology, architecture, urban and regional planning, landscape planning, regional economy and land management. According to Waugh (1996), geographers have become increasingly interested in morphology, pattern and shape of settlements. Although village shapes vary spatially across the world, it has been possible to identify some common types such as isolated, dispersed, nucleated, linear, ring, and even composite and poly-focal (Roberts, 1987).

However, in the fifties and sixties of the XX century, while the cities were growing and urbanisation was intensive, there was an obvious slowdown in rural settlements research. That hold up was mainly caused by the worldwide socio-economic changes and by the forced scientific orientation to urban issues. In a large number of countries rural communities were stagnating. An individual, domestic farming agricultural production had not been stimulated and people have had to migrate from the village to the town. At the same time, although rarely, there are cases of planned development, and some villages are becoming growing poles, incorporating several plans and phases of development (Roberts, 1987).
Today, in developing countries like Botswana, some urban agglomerations (e.g. Greater Gaborone Region) have spatial and economic problems due to demographic pressure from the rural areas. Within Botswana, there are regions (e.g. Central and Southern Region), especially those with major urban centres, where rural population is increasing and others (e.g. Western and Northern Region), usually in more remote locations, where rural population is decreasing. Because of increased pressure of people onto existing physical, public and economic infrastructure in the towns, there is a crisis of quality of environment, shortage of food, shortage of working places, poverty, social riots and a series of other problems, which in retroactive sense make society’s attention turn onto the village and its values again.

For example, at the independence in 1966, the Botswana population was largely rural (94%) and the majority of the population resided along the rail line in eastern Botswana. The population was also mobile, commuting between villages, land areas and cattle posts. With the rapid expansion of economic activities (e.g. “diamond boom”) in the mid 1970s and 1980s, the pattern of settlement changed. There is a growing concentration of population in five areas, i.e. around Gaborone, Serowe/Palpye, Francistown, Selebi Phikwe and Maun catchment areas. In terms of urbanisation it was estimated that 46% of the Botswana population was urban in 1991 and it is envisaged to have grown to 52% by year 2001 (Segodi, 1998).

Physical planners in Botswana mostly deal with countryside parts, the so-called “Planning Areas”. It is because of the rules of the existing Town and Country Planning Act of 1977. This Act anticipates making development plans for “Declared Planning Areas” only. Land inside planning areas is normally transformed into state land, while the land outside the planning boundaries can be communal (i.e. tribal) or in some cases a freehold.

Practically, there is one or more rural settlements in such areas and the land between them is normally used for agriculture, tourism, wildlife, roads, etc. However, the boundaries of the planning area are not identical with the administrative boundaries of the whole rural territory (i.e. entire rural community) which is managed from the primary rural centre and which is under jurisdiction of main or sub-land boards. The land of the entire rural community (including countryside and all rural settlements) includes the area that is a few times larger than the territory of the designated planning area. In this situation, the conflicts between the State Land Act and the Tribal Land Act on the one hand, and the property conflicts (State vs. tribal/community land) are inevitable. Once designated as a planning area, land tenure and ownership changes from being communal to state land. Automatically, the legal competencies of the land board are reduced. Most often, they are brought down to the protection of agriculture land and its transformation to some other ways of using it (i.e. residential, commercial, industrial) inside the planning area boundaries.

In non-designated parts of the countryside territory, the land boards perform functions of planning and allocation of land. In the case of state land outside of declared planning areas, the physical planners together with other members of the “Development Land Use Planning Unit” (DLUPU) prepare land use plans. For the land outside of the designated planning area, land use district plans are prepared and utilised as statutory instruments. Unfortunately, the mapping scale and the level of details in development plans (1:5000 – 1:25000) for the countryside do not allow their co-ordination and reconciliation in a way, which can satisfy different interests of land users and owners.
Because of that, in Botswana there is a large number of land use conflicts and disputes, as well as problems in connection with land degradation. For example, interests of settlement development and expansion, as well as construction of different infrastructure facilities are in opposition with agricultural development. Surface mining and opening of new coal exploitation sites is controversial to tourism development and protection of the natural heritage areas. Uncontrolled wildlife expansion is controversial to cultural vegetation development. Furthermore, changing natural land cover and overgrazing, affect micro-climatic changes, land erosion, and stability of water regime etc. All this shows that it is necessary to change existing planning practice by introducing new approaches and techniques.

An integral approach to planning of rural settlement and rural territory (countryside) is one of possible ways for solving the present crisis and to protect future generations of rural people and villagers. The work of urban and regional planners (i.e. physical planners) is based on the integrity, interdisciplinary and synthesis and they must co-operate closely with specialist from other disciplines. Unfortunately, such a practice doesn’t exist in Botswana. Planners do only planning, architects and engineers make designs and construction, agronomists deal with agriculture, etc. There is no contact between these professions on a daily basis, except within professional project reference groups, but they don’t have enough time and space for deeper analyses and solving professional problems of common interest.

Complexity of the whole social and economic development, especially rural communities, based on protection and usage of sustainable resources is standing on its turning point. Because of that, it is unavoidable in the future to establish stronger connections between disciplines like architecture, urban design, urban and regional planning, land use planning, landscape architecture, environmental planning, geography, geodesy and surveying, soil science, agriculture, land management, engineering, ecology, forestry, rural sociology, agro-economy, Law, etc. At the same time, it is a stimulus for further development of the planning profession in Botswana.

In a research titled “An Overview of Village Planing in Botswana” (Kiamba, 1996), it was pointed out that planning and development of rural villages and territories is very complex. Because of mutual connection between rural settlement and its hinterland (countryside) on one hand, and contemporary, most often spontaneous process of spreading or disappearing of settlements on the other hand, this problem should be treated more seriously. This article is a follow up of this research. Its basic aim is to give some practical ideas on how to carry out an exercise on integrated land use planning in Botswana. The idea is that it has to be understandable and applicable not only for urban and regional planning, but also more widely, to all other professional disciplines engaged in rural development.

3. EXISTING RURAL (VILLAGE) LAND USE PLANNING IN BOTSWANA

The actual planning of rural settlement and countryside in Botswana has been implemented through development plans and land use plans. Development plans cover territories of one or more villages and their immediate hinterlands. They all cover territories declared as a “planning area”. On the contrary, land use plans are produced for the whole rural territory, including all settlements and its hinterland within the administrative framework of rural district and/or sub-district. The major difference between development and land use plans is in the level of generalisation and the size of the area under consideration.
Most often, development plans are implemented through the preparation of detailed layouts for the parts of rural settlement. Existing Law doesn’t suggest making subject and action area plans or other kinds of detailed rural plans for the rest of rural territory. Major rural settlement has been planned independently from the countryside territory, which is their economic base. Numerous hamlets, lands and cattle posts have been excluded from the integral development plan and their land territory is treated partially (superficially) and not precisely enough.

The land outside a declared planning area (i.e. the rest of the countryside, including all rural settlements and other spatial elements) is planned through making land use plans only. However, these plans cannot be applied on smaller land area units because of inappropriate scale of a map and its detail level. Individual locations in land use plans are not visually recognisable and suitable for detailed land use analysis. Boundaries of land use development zones are relatively and absolutely incorrect. Mistakes vary in the span of a few hundred meters to a few kilometres. Of course, this creates a problem of establishing real boundaries of properties and developing land use zones in the field and in nature. These mistakes influence land use designation and create land use conflicts and disputes.

Modern rural planning approach in Botswana is supposed to deal with rural settlements and countryside together, in a way that provides precision and reliable protection of interests of all land users. Villages and countryside should be treated like an united entity in their economic, spatial, environmental and functional sense and their plan should be based on following:

- Clear and precise differentiation and separation of individual and group land uses in rural settlement as well as in rural territory (i.e. countryside.)
- Land use data collection, data processing and data management should be generalised on plot level as a basic spatial (land) unit.
- Applying GIS/LIS (geographical and land information system) technologies while collecting, sorting and managing land use data, as well as for the plan preparation, implementation, and monitoring.
- Special regime for using and protection of developed, undeveloped, reserved and vacant land inside the boundaries of village build-up area should be introduced and strictly respected.
- Special regime for using and protection of fertile and unfertile land within the boundaries of the whole countryside territory under the jurisdiction of the authorised land board and sub-land board.
- Interdisciplinary approach in preparation of rural plans through involving experts (specialist) of different profiles (not only physical planners) should be followed.
- Introduction and official defining of new types of local rural plans (i.e. subject plan, action area plan, detailed plan) for selective areas and locations within rural settlement and rural area boundaries.

4. NEW APPROACH TO RURAL PLANNING AND DEVELOPMENT IN BOTSWANA

Botswana rural communities’ rhythm of life and work differs from rhythm in towns, as most of activities depend on natural conditions and resources. For the same reason

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5 Most rural settlements in Botswana depend directly on natural resources for their sustainability. In the 1970s and 1980s some resources were depleted and this resulted in a shift of population to areas with better resources. However, this is becoming difficult due to established permanent structures and
the existing rural planning methodology has to be co-ordinated with specifics of some regions, rural districts and local zones. Introducing a new category, called “Integrated Rural Plan”, can do this co-ordination. In this way, existing duality in rural planning, which plans rural settlement separately from the countryside, can be avoided.

In practice, this plan can have structural land use development proposals for the whole rural community (countryside and settlements) and detailed land use and regulatory building proposals for rural settlements, hamlets and other built-up areas within the whole rural territory. This allows applications of complex methods and techniques from disciplines such as agronomy, forestry, geodesy, geography, geology, biology, meteorology, hydrology, etc., in order to match countryside development interests with the development interests of rural built-up areas. Applying methods and technique from the urban planning and design, architecture, landscape design, infrastructure planning and design, etc. being the most important.

Classic urban planning within a rural settlement/village contents aims to stimulate infrastructure and social services development, and to put them on a similar level as in the towns. Basically, that is a positive trend. However, if this approach is strictly and uncritically applied, it can destroy natural balance and the rural image can be lost. Applications of urban planning in rural contents should be adapted to life, dimension, values and rhythm of the village and it should respect natural conditions. Aesthetics and physical shaping of rural settlement should be coexisting with its history and tradition, basic production orientation, mentality and the way of its people’s life.

An integrated approach proposed in this article can guarantee the adequate level of correspondence of rural settlement with the whole countryside territory. At the same time development and improvements of different utilities and services, can follow the level and dimension of rural community development, in accordance with its position and role in national development plans and strategies. Such an approach obliges the planner and other specialists to communicate and to aim to support the improvement of life, work and environmental conditions in rural areas of Botswana.

5. THE SCOPE AND PROCESS OF INTEGRATED RURAL PLANNING

The scope and process of integrated rural plan preparation can be defined through the development of specific technical guidelines and handbooks. These documents should come out of the newest initiative for changing the existing Town and Country Plan Act. At the same time, it is necessary to co-ordinate them with similar documents from Ministries and Departments in charge countrywide. The procedure for integrated rural plan preparation can keep on developing in three phases:

- Data collection and Base Line Studies

investments in existing villages. It is therefore very important that the country has an efficient and appropriate approach concerning resource exploitation (NSP, 1998).

6 Urban Planning as a form of physical planning is dealing with settlement planning and development. However, it has been primarily oriented for the planning of towns and cities and due to this, it is not adequately applied in the case of rural settlements.

7 For many the countryside is one of the last frontiers of individuality and freedom, where the lucky few can still make eccentric decisions far removed from the restrictions and bureaucratic frustrations of urban life (Blacksell & Gilg, 1981).

• Report of Survey (including data analysis, programme, and future projections and forecasts)
• Draft and Final Plan

Between the mentioned phases, time and opportunities for public and professional consultations are to be included, so that plan solutions can have wide community input and professional support and fulfil numerous, most often different interest and expectations.

Data Collection and Base Line studies

This phase incorporates collecting, selecting and systematising different information about natural and built-up environment, population data, as well as planning, statistical and development indicators and projections (see table 1).

This stage is crucial to the success of the rural integrated plan, and the planning team carrying out such a study has to review information such as: structural and detailed land use and development topics, survey detailing methodology, data collection and processing, identification of information gaps ensuring key contacts with resource people, and resource information from different government departments, local authorities, parastatal, and private organisations, reviewing specific details of the rural planning project and identifying factors which might have changed after the A data collection Report have been presented for evaluation and approval by government authorities and the rural community.

The data collection phase is a critical orientation task that should, from the onset, bring the rural community aspiration into the desired action-path. The findings from this phase will form the basis upon which the future research on the new Integrated Rural Plan document is going to be directed. Thus this is seen as the most important task and must be allowed to take place in order that problems could be solved as they arise.

Report of Survey

This is the initial stage of research, which shall include final formulation of goals and objectives; data collection; analysis and identification of issues. This should be a distillation of the information gathered from various sources (i.e. maps, aerial photographs, satellite imagery, available digital GIS/LIS data, questionnaires, various project documentation, field surveys, meetings, etc.), and it might be published as a stand alone project document, and is therefore an important milestone in the integrated rural planning process.

Through this phase the rural community shall find that a major ingredient leading to a sound land use plan is an inventory of different natural, physical, environmental and man made resources (see table 2). This inventory provides people with information which allows better understanding of ongoing natural and man-made processes that occur within their rural area and settlement, economic opportunities for land use development, forces that might constrain better land utilisation, and the problems that might result from resource use, new land use and development programmes.

The survey report shall describe the information collected and will be made available for each of the development components in further planning phases. It is envisaged that the time scale of the report of the survey phase always has to provide for meetings with public groups and local government officials sharing similar
interdisciplinary interest. Inventories and assessments of natural and physical conditions will be combined with inventories and studies of economic, social, legal, man-made and built environment aspects and conditions, and will be analysed to serve as the basis for the evaluation of future development potentials on the base of existing constraints (see table 3).

<table>
<thead>
<tr>
<th>INFORMATION BASE</th>
<th>COUNTRYSIDE</th>
<th>RURAL SETTLEMENTS &amp; BUILT-UP AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Survey Base)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>A. Different project documents and information on <strong>natural environment</strong> (resources, conditions and constraints) should include the following data sets:</td>
<td>A.1.1 relief (physiography, hipsometry, slope, aspect, landforms, mass movements, etc.)</td>
<td>Note: A.2.1 Information about rural settlement and other built-up areas within countryside should include the data sets from A.1.1 to A.1.7 at a very detailed level such as plot and/or zone level.</td>
</tr>
<tr>
<td>B. Different project documents and information on <strong>man made and built up environment</strong> should include the following data sets:</td>
<td>A.1.2 climate (solar radiation, temperature, rainfall, humidity, winds, evaporation, frost, etc.)</td>
<td>A.2.2 Particularly the data about terrain and soil suitability, natural and scenic landmarks, flood zones, seismic risk, prevailing wind directions have a crucial importance for issuing planning and building permits for sites and locations in rural settlement and individual built-up areas in countryside.</td>
</tr>
<tr>
<td>C. Different project documents and information on <strong>social and economic environment</strong> should include the following:</td>
<td>A.1.3 hydrology and hydrogeology (surface water and underground water such as rivers, streams, dams, lakes, ponds, boreholes, flood zones, etc)</td>
<td>Note: The same data sets from C.1.1 – C.1.6 should be generated for the level of settlements and their parts.</td>
</tr>
<tr>
<td>D. Different project documents and information on <strong>census</strong></td>
<td>A.1.4 geology and engineering geology (mineral resources, terrain stability, seismic risk, etc.)</td>
<td>Note: The information for the level of settlement</td>
</tr>
<tr>
<td>B.1.1 General Land use (for entire countryside territory including all topographical features)</td>
<td>A.1.5 soils (soil properties for plants production, landscaping, construction, erosion analysis, etc.)</td>
<td></td>
</tr>
<tr>
<td>B.1.2 Built-up areas of rural settlements and hamlets</td>
<td>A.1.6 flora and fauna (wildlife and natural land cover i.e. forest and grazing land)</td>
<td></td>
</tr>
<tr>
<td>B.1.3 Built-up areas of other man made features (infrastructure corridors, industrial, commercial, agricultural, community, mixed and other land use developments and individual structures outside of settlements and hamlets but within the whole countryside territory in question)</td>
<td>A.1.7 natural landmarks (areas of scenic interest and natural beauty, game reserves, national parks, etc.)</td>
<td></td>
</tr>
<tr>
<td>B.1.4 Cultural land cover areas (agricultural land and other productive land areas)</td>
<td>B.1.1 General land use (planned, developed, land under development, vacant and all other lands within the built-up area of rural settlement)</td>
<td></td>
</tr>
<tr>
<td>B.1.5 Areas of cultural and historical interest</td>
<td>B.2.1 Detailed land use (residential, transport, civic &amp; community, commercial, industrial, open space, agriculture and other land designation)</td>
<td></td>
</tr>
<tr>
<td>B.1.6 Protected areas and landmarks</td>
<td>B.2.2 Plot and area characteristics (number, size, type, shape, density, plot/building relations i.e. building coverage, set-backs, etc.)</td>
<td></td>
</tr>
<tr>
<td>B.1.7 Special and action plan areas</td>
<td>B.2.3 Landscaping (number, types, age, height, location, quality, environmental function, etc.)</td>
<td></td>
</tr>
<tr>
<td>C.1.1 Population characteristics (size, age, sex, other structures, migration, etc.)</td>
<td>B.2.4 Buildings (number, types, age, material, heights, ownership, quality, floor space, amenities, etc.)</td>
<td></td>
</tr>
<tr>
<td>C.1.2 Household characteristics</td>
<td>B.2.5 Infrastructure &amp; utilities (roads, drainage, power, telecommunications, street light, solid waste, solid waste, etc.)</td>
<td></td>
</tr>
<tr>
<td>C.1.3 Employment characteristics</td>
<td>Note: The same data sets from C.1.1 – C.1.6 should be generated for the level of settlements and their parts.</td>
<td></td>
</tr>
<tr>
<td>C.1.4 Economical and financial characteristics</td>
<td>Note: The information for the level of settlement</td>
<td></td>
</tr>
<tr>
<td>C.1.5 Social Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.1.6 Sociological characteristics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note:

The information for the level of settlement.
statistic and development plans should include the following:

D.1.3 National Settlement Policy (NSP)
D.1.4 National Water Master Plan (NWMP)
D.1.5 District Development Plan (DDP)
D.1.6 District Settlement Strategy (DSS)
D.1.7 District Land Use Plan (DLUP)

and its parts should be extracted from D.1.1 – D.1.7

E. Different base and thematic maps, aerial photographs, images, physical models and digital data on natural, man-made and built-up environment:

Recommended Map Scale:
1: 100 000 for big countryside area
1: 50 000 for medium size countryside area
1: 25 000 for small countryside area

Recommended Map Scale:
1: 10 000 for big rural settlement
1: 5 000 for medium size rural settlement
1: 2 500 for small rural settlement
1: 1 000 for settlement and built-up area parts

Much of the information might be presented for easier understanding in the form of GIS maps and associated data sets and could be integrated with other inventory elements. The most important part of this planning stage is to identify zones of special planning interest for future land utilisation and development expansion. These areas will vary somewhat depending on the specific local, natural and cultural conditions. The following section describes in more detail of how to address inventory/assessment of the resource base.

Table 2. Individual aspects of Survey Analysis for the countryside, rural settlements and built-up areas in Botswana

<table>
<thead>
<tr>
<th>COUNTRYSIDE</th>
<th>RURAL SETTLEMENTS &amp; BUILT-UP AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Regional and district profile (the whole countryside area location, size and boundaries)</td>
<td>• Settlement location, size and boundaries</td>
</tr>
<tr>
<td>• Natural resources and conditions</td>
<td>• The form and structure of settlements and built-up areas</td>
</tr>
<tr>
<td>• Regional environmental impacts and environmental quality</td>
<td>• Natural potential, resources and physical constraints</td>
</tr>
<tr>
<td>• Population</td>
<td>• Urban environmental impacts and environmental quality</td>
</tr>
<tr>
<td>• Settlement network</td>
<td>• Settlement population</td>
</tr>
<tr>
<td>• Economic development and indication of national policies</td>
<td>• Settlement economy</td>
</tr>
<tr>
<td>• Land use, tenure and ownership</td>
<td>• Existing land use, tenure and ownership</td>
</tr>
<tr>
<td>• Regional/district infrastructure systems and utilities</td>
<td>• Settlement social and community services</td>
</tr>
<tr>
<td>• Environmental and other protection aspects (i.e. military, hazards)</td>
<td>• Settlement infrastructure and utilities</td>
</tr>
<tr>
<td></td>
<td>• Settlement natural, scenic and cultural landmarks</td>
</tr>
<tr>
<td></td>
<td>• Environmental and other protection aspects (i.e. military, hazards)</td>
</tr>
</tbody>
</table>

Existing conditions and potentials in the research process have a special value, which is placed in techniques of analytical map overlays and threshold analysis. These techniques support clear and precise suitability map zoning, based on geo-technical, hydro-geological, soil and agricultural suitability to accommodate different land uses (see table 4). In practice, proper land suitability zoning is especially important for land use management and administration practice, which can lead to: (a) a sub-division of parcels and properties, which makes modern agricultural production difficult; and/or (b) a consolidation of properties, which guarantees more rational land use and contributes to spreading different cultural belts and saving natural land covers.

Table 3. An inventory of most common development constraints in the countryside, rural settlement and built-up areas of Botswana

<table>
<thead>
<tr>
<th>COUNTRYSIDE</th>
<th>RURAL SETTLEMENTS &amp; BUILT-UP AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Environment</td>
<td>Natural Environment</td>
</tr>
<tr>
<td>• Aridity</td>
<td>• Relief and topography related problems</td>
</tr>
</tbody>
</table>
• Scarcity of water resources
• Soil erosion
• Poor soil quality for plant production

• Engineering geology and seismically related problems
• Aridity and other climate related problems
• Scarcity of water resources and other water related problems
• Soil erosion, fertility and soil stability related problems

Population and Economy
• Rural-urban migration
• HIV AIDS influence
• Population ageing
• Unemployment
• Inadequate educational structure
• Rural poverty and crime
• Destitution

Man-made Impacts
• Fencing, land use competition and disputes
• Lack of accuracy in land boundaries designation
• Range land depletion
• Veld product depletion
• Wood resources depletion
• Illegal hunting and poaching
• Fuel wood collection and logging
• Land clearance for arable agriculture
• Soil pollution (inadequate usage of fertilisers and pesticides)
• Mining and quarrying

Man-made Environment
• Inadequate designation of settlement and built-up area boundaries
• Dispersion and disconnection of settlements, hamlets, and built-up areas within the rural fringe
• Uncontrolled expansion to agriculture arable land
• Inadequate infrastructure supply and reticulation distribution
• Inadequate social services supply and facilities distribution
• Inadequate block and plot pattern
• Illegal dumping sites and borrow pits
• Air, water, noise, and soil pollution

Considering that land consolidation demands large financial funds and time, it is advisable for an agricultural dweller to become associated in the process of consolidation of neighbouring land parcels where the soils have similar quality. It is the same in those parts of rural areas where similar agricultural crops can be grown (i.e. orchards, vegetables, sorghum, and corn). Such consolidation is especially stimulated in the same or similar ecological zones (i.e. hardveld and wet sand), designated by Botswana National Settlement Policy (DTRP, 1998). The advantage of this is that in recent years practical agricultural experience has been reflected in different rural communities countrywide. The results of this continuing learning process are shown in the further development of the natural resources utilisation for commercial and domestic purposes.

Table 4. Common land use classification techniques for countryside, rural settlement and built-up areas planning and development

<table>
<thead>
<tr>
<th>CLASSIFICATION TYPE</th>
<th>BASIC DATA INPUT</th>
<th>CLASSIFICATION OUTPUTS</th>
<th>CLASSIFICATION VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geo-technical classification system</td>
<td>Engineering geology data Hydrogeology data Seismic data Relief energy data Slope stability data</td>
<td>Land suitability for building and infrastructure development Hydrogeological and geomorphologic conditions for arable production</td>
<td>More important for settlement development from the building and construction aspect. Less important for countryside because of agricultural orientation.</td>
</tr>
<tr>
<td>Cadastral and land use classification system</td>
<td>6-8 cadastral suitability classes based on natural, man-made and economical data</td>
<td>Land use suitability for arable agriculture and other biologically oriented productive activities</td>
<td>Greater importance for countryside from agricultural production aspect.</td>
</tr>
<tr>
<td>Agro-ecological and soil suitability classification system</td>
<td>6-8 soil suitability classes based on natural evaluation data sets only</td>
<td>Natural soil and land suitability for arable production regardless existing land use</td>
<td>More important for countryside because of agricultural production. Less important for rural settlement because of fertile land as a limiting factor.</td>
</tr>
</tbody>
</table>
Draft and Final Planning Report

This stage will usually commence after the Report of Survey has been presented and approved by government officials and local community representatives. The most important task in the Draft Report is to generate structural and detailed land use planning proposals for the entire rural community, including its rural area part as well as rural settlement part. These proposals will be based on broad analysis of existing situations, issues, constraints and various opportunities given in the previous phase (i.e. report of survey).

It involves steps of deciding on recommended land use proposals and its evaluation and detailing through specific land-use-control devices, which help carry out the integrated rural plan, such as zoning, consolidation and/or subdivision. Each expert will focus on his/her particular area of expertise. However, all will contribute to each other’s work and synthesis as well.

The process of reviewing proposed land use designations prepared by an interdisciplinary team can serve as the vehicle for assuring that the proposals and policies stated in the plan will be carried out as development and utilisation proceeds. It will also assure not only that proposed land use occurs in the action and subject areas (individual places and locations of particular interest) where the entire rural community feels it should go, but also that each new land use proposal and development is sensitive to physical and environmental conditions.

In broad terms, the purpose of this report is to inform any interested parties or persons about the use proposals, and obtain their comments. Equally important are objectives or representations on the planning report which should be given in writing from the responsible government authorities (i.e. Department of Lands, Department of Town and Regional Planning, Ministry of Agriculture) and transferred to the planning team for final consideration. Furthermore, for professional and public inspection, a notice of the Draft Integrated Rural Plan together with general and detailed land use maps should be placed at various places as well as in the local newspapers circulating in the planning area.

The Draft Report should constitute the findings of the entire land use planning activity. At this stage, the document should be sent to Government Ministries and Departments, parastatals, and to relevant local authorities for final consultation. It is worthy to note a series of consultation sessions be mounted as soon as the Draft Report is ready. This opportunity will enable participants from Ministries, parastatals, private sectors, and members of the public to have an in-depth discussion on the report. Their input shall be incorporated in the Final Plan.

The Final Report should incorporate all comments from responsible authorities, public and consultation bodies, and should represent the final comprehensive document ready for official blessing. This includes the final review and analysis of comments received from various interested parties or groups. Comments noted will be incorporated and adjustments will be made accordingly. Thereafter, the integrated rural plan will be formally ready for implementation, monitoring and review.
The Contents of Integrated Land Use Proposals

An Integrated Rural Plan deals mainly with the development of the rural area, determines the primary organisation of land into agricultural, forest and built-up land. Further, the plan separates the zones for each category of land. Detailed designations should be given to the land in rural settlements and built-up areas, in accordance with the proportion of the map and the importance of rural settlement within the national settlement hierarchy. The next step establishes the zones and landmarks, with a special regime for protection and use.

As already pointed out, planning of development of rural area is a very delicate task, because of the complex retroactive connection on the relation of settlement–hinterland (residential vs. housing-agricultural land). This is fully expressed especially at dispersed settlements, where some hamlets, cattle posts and lands must be considered as parts of the whole rural area. Rural area planning, as an interdisciplinary activity, is primarily directed to agricultural development. It has an obligation to co-ordinate with development proposals in the major rural settlement of the rural area. It is so, because the protection of agricultural and forestland have a priority, as well as the improvement of grazing land.

The preparation of the Final Integrated Land Use Proposal for one or more major settlements is based on project objectives and goals, as well as on demographic, economic and area projections. Projected gross built-up area of the settlement and land use proposal for the entire rural settlement is established on it. The general part of the land use proposal precisely states basic zoning (residential, commercial, transport, civic and community, etc.), and gives locations for the most important objects (bank, post-office, local administration, school, etc.). The detailed land use proposal presents diagrams for sub-division and plot consolidation, standards and criteria for building placement and construction, horizontal surface levelling, infrastructure development, etc. Besides built-up land, other land uses (i.e. arable, wood lots) are also planned, if they still exist within the major rural settlement.

6. CONCLUSION

It is obvious that the integrated approach to planning rural communities means a combination of a general plan for rural areas and a detailed plan for rural settlements. The Integrated Rural Plan should come as a result of co-ordinating development interests and the possibility of using land in rural areas and rural settlements. This plan should provide time and financial compatibility in its natural surrounding and adequate community and economic conditions. A special advantage of this new approach is in the possibility of aggregation of land use data from the plot level to larger area units (i.e. settlement, area, sub-district, district) in the process of production, as well as in the process of their implementation, monitoring and review.

Countryside and villages are the parts of natural environment, which is a condition for their existence and development. Community and economic factors only reflect the tempo of that development. Because of that, it is logical that while researching and planning we must start from the natural surroundings, in which economic factors (population, produced goods, and capital) exist and make all developments possible. Planning how to use agricultural, forest and built-up land must be treated together. Using any of these three sorts of land shouldn’t have a negative effect on the other two sorts, as well as on the whole environment. All planned interventions in the area (zoning, sub-division, construction, production) should be mutually co-ordinated and
subordinated to space, community and economic development of the whole rural community (countryside and settlements) and to improvement of environmental quality and living conditions of the total rural population.

Table 5 An inventory of potential land use proposals for countryside, rural settlements and built-up areas in Botswana.

<table>
<thead>
<tr>
<th>COUNTRYSIDE</th>
<th>RURAL SETTLEMENT AND BUILT-UP AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Non-development zones</strong></td>
<td><strong>1.1/1.2 agricultural and forest land</strong></td>
</tr>
</tbody>
</table>
| A.1 Arable land | • Detailed land use for some kinds of agricultural production and some kinds of forest production according to the land suitability and possibility for rational production organisation.  
• These areas are important as agricultural land close to dwelling places in villages, but also as important areas which should be reserved for eventual future expansion of the rural settlement. |
| A.2 Forest land and grazing land | |
| • Areas of forest land which should be considered for amelioration, and land areas that should be planned for forest, and protection forest with special aim.  
• Forest land use plan should be in conformance with special forest detailed plans that include data on forest road network, buildings and installation for forest management. |
| **B. Buildable land within the whole countryside territory** | **B. Buildable land within the built-up area of rural settlement** |
| B.1 Buildable land within designated built-up areas might be: | • Residential zone consisted of individual and collective plots with agricultural, mixed and non-agricultural households  
• Production and service zone of village with different commercial, manufacturing and servicing objects depending on the rank of the rural settlement in national settlement hierarchy.  
• Civic and community centre with the buildings of a different size and appearance, depending on the settlement rank.  
• Open space, recreation and sport zones in larger villages and tourist centres.  
• Infrastructure system and utilities which include roads, water supply, power supply, telecommunication network, and other system and utilities important for normal life of villagers. |
| • Proposed in nucelated rural settlement  
• Proposed in ribbon rural settlements  
• Proposed in dispersed hamlet groups  
• Proposed in isolated homesteads (i.e. cattle posts, lands). | |
| B.2 Buildable land outside designated built-up areas might be: | |
| • Proposed in special and/or action zones designated for public, agricultural, industrial, communal buildings and facilities, and/or in infrastructure and utility corridors. | |
| **C. Zones, areas and landmarks with special protection** | |
| C.1 Environmental pollution protection (water, air, soil, vegetation, noise protection) | |
| C.2 Natural, scenic, and cultural landmark protection (areas of special natural beauty, natural, historical and cultural monuments and land marks) | |
| C.3 Natural hazard protection (explosion, fires, flood, soil and rock sliding, earthquakes, storms, hail, drought, epidemics and similar) | |
If rural planning wants to reaffirm the village, a comeback to the village, or urban to rural migration is unavoidable. Financial investments into rural communities and keeping balance between the natural and built-up environments are the basic prerequisites for activating different rural potentials. For that reason, the process of integrated rural planning should include all investments and effects in financial, intellectual, ecological, demographic, and other aspects, which can be alternatively evaluated. At the end of this process, a wide range of different land locations with the largest possibility for a certain development and land utilisation is going to be accepted like a final proposal.

REFERENCES