PLANNERS’ ROLES AND TECHNIQUES IN DEVELOPING SUSTAINABLE “ECO-CITY”
The Case of Gaborone, Botswana

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Efforts to incorporate sustainability principles into city planning demands new relationships between traditional and contemporary culture of key players involved in urban development arena. Many stakeholders involved in urban projects, management and governance are tailoring the destiny of urban world. Unfortunately, their contribution to sustainable practices show the lack of awareness and negative attitude towards protection of basic environmental, economic and social elements for the benefits of future generations of urban dwellers.

By changing the way in which they think it is important to spell out clearly the role of planning professionals which should be more active and persistent in educating and advising decision-makers and other stakeholders helping them not to think and act only sectorally supporting individual and forgetting common interests. With carrying capacities and sustainability in mind these “key players” should be trained and guided by planners and diverse community entrepreneurs to have a look well beyond current planning horizons of socio-economic and physical plans, because sound sustainable solutions need wider and more ecologically friendly temporal frameworks.

This paper explores contemporary physical planning concepts for sustainable development of Gaborone city, the capital of Botswana. Sensitive development solutions, lamenting more on behavioural, organisational and technological improvements in city planner’s “toolkit” and planner’s roles of technocrats and advocates of sustainable change. The purpose of this exploration will also be to suggest how to create enough manoeuvring space beyond the exclusive political power and how to apply different planning concepts which can help to create a sustainable eco-city.

INTRODUCTION

The sustainability movement, like the smart growth and ecological movement, evolved as a response to declining quality of regional and urban environments worldwide. The concept of sustainability has been accepted in Botswana as a part of National Vision 2016 based on local Agenda 21 (Botswana Agenda 21, 2002). The Rio 1992 Earth Summit was quickly translated into Local Agenda 21 initiatives around the world. The HABITAT II conference (Istanbul 1996) proclaimed the right of appropriate living space to everybody and the world conference URBAN21 (Berlin 2000) showed 'best practice' examples of sustainable development of cities. Sustainable urban development was also treated as a crosscutting theme on the JOHANNESBURG SUMMIT 2002 (Keiner and Cavric 2002).

The concept and ideas of sustainable development offer an inspiration and address numerous aspects of urban life in Gaborone and other major urban settlements of Botswana. However, the implementation and translation of sustainable urban practices is still pending. Concerns with sustainable city development are not yet prominent in local planning concerns (Molebatsi, 1996), although sustainable and smart growth might be affordable solutions in a country with limited natural, population and economic resources. Definitely, if further urban sprawl in Gaborone if continues at such a high rate, it cannot be sustainable, because it is not economically and socially viable.

There is a clear evidence from DIMSUD research (2003) and through series of maps and aerial photographs that Gaborone urban...
image has changed enormously in the last 30 years characterised by indefinite urban sprawling outside declared city boundaries (see Figure 1). The change was signified by an important shift in the country’s economy, rural-urban migration and acceptance of road transport as the only suitable way for commuting between functional city zones. Initially the city was planned and assembled around the “garden city model” followed by the “super block” development and other experimental forms originating from “western planning” laboratories. From the physical planning perspective these models were artificially incorporated into the traditional “Kgotla social and settlement setting”, changing the lives and behaviours of newly born “urbanites” with still have strong rural identities (Hall & Pfeiffer, 2000:16) say that to bridge this gap between economical and social development, it would require generations of inculcated habits.

Furthermore, the majority of today’s senior local planning staff have been engaged in applying above foreign planning models which is not surprising because they have been trained abroad, mostly in UK and USA. The faster the development of Gaborone, the more difficult becomes the mastering of the urban challenges based on non-indigenous planning concepts. Obviously, authorities are neither in terms of human resources nor in terms of problem perception ready to be confronted with the urbanisation wave. In Botswana, there is a lack of qualified and skilled engineers and planners. Indeed, only recently (in the last 10 years) over 100 physical planners have acquired their degrees at the University of Botswana Department of Architecture and Planning, (formerly Planning Unit of the Department of Environmental Science).

There is no doubt that the economic shift from an agricultural towards diamond-based economy fuelled the city’s and country’s progress. However, this progress didn’t take care of the capacity of urban environs to absorb an increased number of job seekers from rural areas, coming to Gaborone and wishing to start new life. An imbalance between Gaborone as a hub and the rest of the predominantly waste deserted territory become more visible with an appearance of dramatic problems such as biosphere resource depletion, urban poverty, congestion, inadequate facilities, lack of affordable housing, HIV/AIDS, uncontrolled waste disposal and many others.

Certain aspects of unsustainable change discovered in Gaborone and its vicinity are underpinning its progressive urban development. The city is now urbanising very rapidly and changing the environment on a scale comparable to some southern African cities. But the difficulty lies in the fact that the city’s economy is not able to produces the financial surpluses sufficient to support prudent environmental management. Despite the level of concern now being expressed by numerous stakeholders (professionals, politicians, businessman, communities) it is necessary to develop new awareness and implement a sustainability agenda for all particular types and levels of urban land developments which take place in the city centre, inner ring and its periphery. Hall & Pfeiffer (2000, p.14) state that “the overwhelming problem is not the urban growth in itself, but the fact that city administrations lack the will, the competence or the resources to manage that growth.”

Notwithstanding, the role of urban planners in such a situation should not end with the approval of the urban plan which is a common practice in Botswana. However, it should be realized that the planning profession worldwide is turning into a profession of urban technocrats, facilitators, negotiators, mediators, political advisers, urban designers, environmental mana-

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**Figure 1. - Agricultural and Urban Sprawl in and around Gaborone 1966-1999**

Source: DSM Topographic Map and aerial Photographs, GIS and thematic map compilation by R. Chalashika and B. Cavric 2004
gears, urban governors and advocates of urban change. The DIMSUD project indicates the need for human and organisational re-structuring in which the current position of physical planners in implementing sustainable paradigm would change the focus from passive administration to active advisory and multidisciplinary services. The burgeoning literature on the role of the contemporary planner involved in application of sustainability principles, highlights his ability to play a variety of tasks in integrating multi-disciplinary perspectives into plan-making and plan implementation (Randolph 2003, Kelly & Becker 2000). Their changing role and daily practice also demand a sound understanding of theoretical paradigms underpinning "environmental agenda", as well as hand-on knowledge of different methods and techniques based on advanced technologies.

**SUMMARY OF DEVELOPMENT AND ENVIRONMENTAL ISSUES IN GABORONE CITY**

For the past 40 years, Gaborone city has undergone a rate of change unprecedented in Botswana settlement history. The "diamond boom" of the seventies and eighties has tailored the capital city as an engine of growth but at the same time it was a source of increased environmental concern. The rapid expansion of diamond mining and the country’s economic renaissance created many positive effects in terms of improved human life for people who incidentally become "urban dwellers". As revenues from the mining sectors are directed towards the promotion of the country’s development, Botswana was able to make a big step in its economy. The "diamond boom" enabled the country to invest in urban housing programmes for rural migrants and other sectors of the country’s economy.

In recent years, however we have began to recognize many of the problems caused by overwhelming growth which exceed city’s environmental and spatial limits. The forces which have recently been driving higher productivity of Gaborone urban communities are not able to swallow easily today’s environmental and development pressures such as endangers natural resources, increased poverty, high unemployment rate, lack of serviced land, declining agriculture that should feed the city, frequent droughts, water famine, limited market, a non-diversified economic base, HIV/AIDS plaque, increased crime rate, cultural and behavioural decay, etc.

**Urban Dynamics**

The knowledge of contemporary urban developments in Botswana can be better acquired if we distinguish some important factors. According to Sillitshena and McLeod (1998) there are three reasons behind the formation of Botswana’s modern towns: the need to exploit mineral deposits, the development of commerce, and the need to create a new administrative capital. Gaborone was created as the capital of the new state of Botswana as the time of independence approached. Gaborone was built to satisfy two essential needs: the effective administration of Botswana and the promotion of a modern economy (Sillitshena and McLeod, 1998). Comparing to other emerging African capitals Gaborone is a relatively young city (only 39 years old), but is one of the fastest growing cities on the African continent.

Diamond based socio-economic development brought about changes in the system of Botswana settlements. New towns sprang up, traditional villages were restructured and transformed into urban villages and agro-towns and there has been considerable migration from villages to towns and cities (Cavric 2001). The National Settlement Policy (NSP) was introduced to counteract the prevailing bias of investments in urban areas, particularly in capital city and several new mining towns For example the capital of Gaborone has had the greatest urban growth rate in Africa. From the planned 17000 inhabitants in 1967, it has grown to a city with a population of 186,607 (CSO, 2001) people. Today, almost a half (46.3%) of the country’s population live in urban settlements (see Table 1).

Urbanisation in Botswana has resulted in Gaborone (in less than 40 years) becoming two times larger than the next largest town Francistown. In addition, Francistown is several times larger than the other inter-immediate towns. In 1981, about half of the country’s population lived within a radius of 200 km of Gaborone, and in 1991 the corresponding figure was 100 km, which shows an increased concentration. Similarly to other southern African countries, rural-urban migration in Botswana was one of the major contributors to the fast transition from rural to urban society with an urbanisation rate reaching almost 50%. For the first time in

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Source: CSO, NSP, 1981-2001

Table 1. - The structure of Urbanisation growth in Botswana
Urban sprawl and Low-density Developments

Other major factors of unsustainable land use planning and development practices in and around the capital city are urban and agricultural sprawl and the enormous extent of low-density areas where 90% of buildings are detached structures (usually one storey buildings) located on individual plots. As a consequence of such urban milieu, city perimeter has been stretched into the tribal land (see Figure 1 above). Furthermore, an overdeveloped road network, individual cars and private public transport based on kombis and taxis have accelerated urban sprawl beyond city limits.

Numerous underlying factors which promote today’s sprawling pattern of Gaborone are mostly related to:

- mechanistic application of conventional western planning concepts based on private transport requirements and super-block system
- lack of ecological, traditional and smart growth planning initiatives
- flat terrain with a few natural barriers and constraints
- lack of consolidated agricultural land parcels in the city vicinity and vast open spaces inside the city
- development of roads/streets and other infrastructures in a vicious circle followed by out-laying tract of land developments in leap-frog and peace mall fashion
- application of urban development standards (UDS 1994) based on big plot sizes
- functional zoning which separates different land uses (e.g. mixed land use is a rare category in Gaborone land use classification matrix)
- subsidised petrol prices, favourable rates for car loans and hidden costs of transportation system operation
- government sponsored residential schemes (e.g. ALSP, SHHA) for low income groups
- extended payment schemes (period of 4 years) for urban state land that support land acquisition on a first-come-first served basis
- exaggerated demand for urban land (e.g. people applied for plots even though they had neither the immediate intention nor resources to develop them)
- lack of development and land use control in the city proper and Gaborone region which falls under the tribal authority and district council jurisdiction
- limited professional and human resources in the planning sector
- speculation with land prices, allocation of non-serviced plots, illegal conversions and subdivision of agricultural land, and informal land transaction
- issuing of fictitious "certificates of customary land grants"
- allocation of plots by influential people to their children, relatives and friend for free
- lack of cost recovery system for urban development programmes (e.g. land cost being separated from land servicing costs)
- lack of communal tax, capital investment and operating cost systems and other urban-economic instruments associated with varying density and spatial patterns
- deficiency of a land information system
- the rural mentality of new urban dwellers brought from their home villages (e.g. different sense of space and place, difficulties to adapt to urban life)
- extension of the city (Gaborone City) and metropolitan area (Greater Gaborone) boundary into surrounding freehold farms rather than incorporating or buffering nearby villages of Tlokweng, Mogoditsane, Mmpo-nae, Metsemotlhabe and Gabane.

The consequence of human development and intervention in Gaborone are similar to the introduction of a stress into any natural system. Of course the effects of stress are most dramatically observed after critical thresholds of tolerance (which is weakening in Gaborone area) are exceeded and a strain of anomalous response in the system is produced. Figure 2 illustrates a number of characteristic problems caused by ecological stress. Most of them are related to environmental, social and economic aspects of urban sprawl in low density and car-dependant land development patterns like Gaborone.

Australian researcher Peter Newman (1990) notes that "the most unsustainable form of settlement yet developed—the low density suburb—has been a relatively recent phenomenon, motivated by a strong anti-urban Anglo-Saxon sentiment and facilitated by the automobile. Similarly, in their former African colonies there was little opportunity to tailor different paths in which urban authorities can develop much autonomy, either legal or financial (Stren, 1989:21). Colonial and Indigenous
anti-urban inheritance are also dominating creation of Gaborone spatial assembly. Social organization for ecological sustainability will need to reverse this trend and Newman's analysis of settlement patterns and sustainability suggests that sustainable settlements require making cities more urban and making the countryside more rural.

According to Roseland (2000:103) making cities more urban can be accomplished by "reurbanizing" Gaborone's city centre and sub-centres, re-orienting transport infrastructure away from the automobile; removing subsidies on the automobile; and providing a more public-oriented urban culture, assisted by attractive urban design (townscapes, streetscapes, malls and squares) and by "traffic calming" measures to facilitate bicycle and pedestrian use of residential areas and major roads. Making the Gaborone countryside more rural can be accomplished by means such as protecting and encouraging sustainable agriculture and forestry in neighbouring village areas and moving towards bioregionalism as the basis of local government boundaries and responsibilities.

Environmental Issues

In less than a century, a large scale intervention sometimes very sensitive and fragile to the natural environmental setting brought to light a new image of small Gaborone's urban enclave and its surroundings. The natural and built-up environments are now revealed melting as spatial structures located in the heart of a tremulous "green garden". Gaborone and its present inhabitants have rediscovered an unknown pages of natural and human history by piecing together fragments of memories from pre-colonial, colonial and modern times. The existence of urban agglomeration in expansion is evitable. Though Gaborone is built on a relatively small scale compared to other African capitals, over the several decades it has been faced with a litany of environmental problems. Each one can be distinguished as one move through city's districts, neighbourhoods and its sub-urban periphery (Figure 3).

The following paragraphs provide a summary of environmental problems facing Gaborone City. The method used, particularly the presentation of the problems on sectoral basis, can help physical planners to depict the current situation and the extent of different environmental impacts. It is important to note that the environmental problems identified are area specific. Similarly, the solutions should be local and relevant.

Open spaces - Gaborone was once planned as a Garden City. A city with such an image may be attractive, however, it might not be the right concept in a country regularly afflicted by drought. Unfortunately, many of city's open spaces are frequently abused as dumping sites, driving schools, parking lots, driveways, refuge for criminals, open space toilets, informal vending, urban agriculture and other uses. Their main functions as recreational and leisure resorts, places for children to play freely and neighbour's to socialize, as well as pedestrian and bicycling corridors, are hampered by negative intrusions. These open spaces are essential for improvement of bio-diversity and protection of limited urban habitats. They change micro-climate through shading, cooling, and absorption of air pollutants.

Figure 3. - Environmental and physical constraints for future Gaborone growth
addition they influence aesthetic pleasure and secure human comfort and enjoyment. As the city grows open spaces are becoming more rare and valuable, and their protection, maintenance and upgrading become a matter of urgency.

Solid waste, recycling and hazardous waste - There is a huge number of illegal dump sites and burrow pits within the city's perimeter, especially in the urban-rural fringes. This is both a serious environmental threat and a visual intrusion to the city's image. Separation of different types of solid waste is not common. Although about 1/3 of Botswana's cans are recycled, there is still a major lack of education, awareness and governmental initiative concerning this subject. What is happening at the moment is that all sorts of waste are collected and brought to the landfill. By recycling paper, glass, iron etc., Gaborone could create new jobs and, of course, protect the environment. Poorly managed hazardous wastes present another growing threat, particularly when industrial discharges are poorly regulated and when municipal waste management is inadequate. Because of these shortcomings, it is difficult to monitor discharges as well as to ensure that hazardous waste does not end up in city sewers, landfills, or drinking water. This problem is accompanied by the large quantities of waste generated by small-scale industries and by hospitals and clinics located in and around cities. Human exposure to these waste materials whether ingested, inhaled, or absorbed through the skin—may result in short-term acute effects, long-term irreversible chronic diseases, or genetic mutations affecting future generations (Bartone et al. 1994: 30).

Water supply, sanitation, sewage and storm water drainage - The use of pit latrines and the overcrowding in some areas (e.g. Old Naledi, SHHA) can cause health problems, and pollute the ground water. Over spilling sewage ponds endanger both the ground and superficial water, like the Gaborone dam or Notwane river. There is an urgent need to connect all plots to adequate water and sewage services, and to regulate industrial discharge into municipal sewer system. Waste water, if recycled in a correct way, can be reused for ground water recharge, as potable water or for irrigation. Since the water situation in Botswana is not the best, water recycling must have a high priority. Leaks and poor management of water distribution systems need also to be addressed. The storm water drainage of Gaborone is inadequate to handle high quantity of seasonal storm-water. The open channels are often filled and blocked with mud, sand or rubbish, which leads to recurrent street floods. Poorly drained wastewater and runoff are ideal nest for outbreaks of mosquitoes and other water-borne environmental and health diseases.

Urban Transport - Every day more and more vehicles are added to the Gaborone transport park. In average almost every fourth household is motorized and some of them are having more than one vehicle. It is not surprisingly to see the latest model of fancy car parked inside the low or middle income limit plot. Private cars, similarly to mobile phones and HIFI equipment are status symbols in Botswana. As Tyler states (2004: 673) to many people, cars are also symbols of power, sex, excitement, social status, and success and islands of privacy in an increasingly hectic world. Someone of wealth and social appearance is usually followed by their shiny metal puppets. The inefficiency or lack of urban transport services and infrastructure will be one of the major impediments to economic growth and urban productivity in Gaborone. Increasing motorization, poorly operating public transport services, inadequate road maintenance, insufficient bike-ways and walkways, poor traffic management, lack of enforcement, transport education and culture are contributing factors to congestion, road accidents, and air pollution. Already in Botswana's capital the morning and afternoon traffic congestions lead to lost work and leisure time, increased fuel consumption and emissions, and high accident rates. Indeed, road safety is a major concern. The costs of road accidents in Gaborone, are increasing due to high fatality and injury rates and material damages on vehicles.

Air and noise pollution - Gaborone is not yet seriously affected by polluted air. There is no heavy mining close to the city (except Kgale quarry). Although some urban corridors are congested during rush hours, the overall traffic volume is still moderate. However, vehicle ownership is increasing, traffic-intensive decentralised shopping malls are mushrooming and the surrounding villages are becoming huge dormitories for numerous daily commuters. Another source of air pollution are distributed construction activities, back yard burrow pits and landfill where rubbish is dumped and burned purposely or incidentally. Furthermore, many disadvantaged citizens use wood for cooking and heating. This has a double environmental impact. First on the range ecology around the city and secondly on the air, which is polluted by the combustion products and is visible especially during winter months. In addition to the problems of increased air pollution, noise levels are on the increase, caused by higher traffic volumes, construction and quarry operations, and large sport and cultural events. Any unwanted, disturbing or harmful sound become a threat to citizens working and living in semi-arid conditions, where peaceful sleeping and relaxing are very important. Since they will undoubtedly increase further, air and noise pollution are going to be a topic of concern in the foreseeable future.

Energy - Very soon energy resourcing and consumption will become one of the key factors for future urban development of Gaborone. However, the supply and demand of virtually every type of fuel generates varying degree of environmental impacts. Because Gaborone, is a major consumer of petrol fuel, wood, coal, and electricity - energy-related environmental problems spill over to neighbouring rural areas. On the supply side, the extraction and conversion of energy resources for urban use can harm the environment in many ways, some of which may occur outside the city (for example, deforestation from fuel wood harvesting or disruption of watersheds and evictions of communities to make way for coal projects. On the demand side, human health is affected largely because of fuel combustion and its resulting emissions. Secondary impacts include the generation of heat that can raise temperatures. The nature of these impacts is dynamic: as economic development occurs, the structure of the energy balance changes and the environmental effects shift accordingly (Leitmann 1991). For example, poor people who cannot afford electricity depend on wood...
for fuel. This leads to deforestation of the areas surrounding the city. Also, the severity of impacts is affected by land use patterns. Urban form and density influence energy consumption for travel. Density and land use affect energy consumption for heating and cooling, and landscaping affects microclimatic conditions (Organization for Economic Cooperation and Development 1993). Gaborone has very good prospects to promote alternative energy sources and technologies like photovoltaic plants, since there is a lot of sparsely used desert land where this equipment could be installed. Solar energy can also be used for water heating because there are more than 300 sunny days annually with an average temperature of 25°C. If the city change its energy resource policy from non-renewable to renewable ones (gas, solar), it would be a big step towards sustainable development.

Human Health - When compared with the rest of country and smaller settlements, it is evident that Gaborone residents enjoy a better health status than people elsewhere in the country. However, the number of people who wants to remain healthy trough walking, cycling or playing in the open and recreational areas, is decreasing, due to lack of safe pedestrian and cycling routes, and the absence of well organised recreational and open spaces. This is a critical element in a healthy Gaborone urban planning which should offer more opportunities to its dwellers in order for them to develop a healthy life style. Regular exercise and exposure to recreational activities protects against increasing heart diseases, obesity, and diabetes. It promotes a sense of wellbeing and protects older people from depression (Wilkinson R., & Marmot M., 1998). Human health in Gaborone is also triggered by social, economic and environmental conditions, as well as by the spread of HIV/AIDS. The current deficiency in social communication networks caused by numerous prejudices, lack of social services and facilities, increased unemployment, traffic congestion, sexual behaviours, work pressures and other stressful episodes can help aggravate the wellbeing status of Gaborone citizens. Barton and Tsuru (2000) explain that this does not mean that urban planning can "create" communities. It is people who choose to form communities. But planning affects the opportunities they have to choose. In the case of growing Gaborone these warning notes are of crucial importance in developing more sustainable approaches to human health issues.

FACTORS AGGRAVATING DEVELOPMENT AND ENVIRONMENTAL PROBLEMS

To reverse unsustainable development and environmental degradation in most developing and transitional countries, it is essential to understand and specify the factors that perpetuate the lack of appropriate preventive and curative environmental actions (Bartone et. al. 1994). There are numerous actors in the city arena that could initiate and implement these actions. Sometime their roles are very specific and politically restricted. While at other times they can operate in a more freely and innovative fashion. In most of the cases urban environmental problems can be anticipated before they become burning issues. To rectify them it is necessary to back-up activities such as improvement of public and political awareness, development of sound governance, and securing of smooth access to knowledge and information.

Public and Political Awareness

These two important elements that influence recognition and acceptance of current environmental deterioration in Botswana capital are hidden factors for pursuing more efficient and productive urban environment approach. Even when they have acute environmental risk at their doorsteps people are closing their eyes expecting government and city official to intervene. Cases of public awareness and pressures to change unsustainable development practices or wrong decision making are very rare. Only occasional environmental disasters can influence the public to play more active role in mitigation campaigns.

For example a recent disastrous flood in Notwane’s river corridor between Tlokweng and Gaborone that took place four years ago, did not affect the final decision to locate and develop the new River Walk Shopping Centre in 50-years flood zone. Even the proximity to old dumping site (only 300 m) has not changed the decision where to locate another new shopping mall. The lack of public participation in this case demonstrates that final decisions supported by political leaders and "hidden business forces" have not been influenced by potential environmental threat. Permissions are given, before anyone (publicly or professionally) could intervene highlighting the link between environmental cause and effects. Potential disaster was recognised as remote danger for people’s wellbeing and properties.

According to Bartone at. al. (1994: 33) political leaders often focussed on immediate and highly visible problems, leading to short-term "band-aid" solutions and are inclined to skimp on meeting the recurrent costs of maintaining local infrastructure or the investments needed to control environmental spill-over effects that extend beyond political boundaries. Regrettably, it often takes an environmental disaster to stimulate profound change. The flooding accident in the area of River Walk shopping centre is a moderate example of an environmental disaster in which political expediency in alliance with an influential businessman was a contributing factor leading to failure.

In the absence of public pressure to improve environmental controls over industry and other polluting sectors, the easiest government response is inaction or disregard for environmental considerations. In making investment decisions, government policymakers typically consider direct economic benefits above all other considerations. In assessing a proposed industrial facility, for example, the prospect of new jobs usually overrides concern about potential environmental degradation. Another impediment to industrial pollution control is that many of the large-scale pollution-intensive industries (for example, mining, paper and pulp, chemicals, iron and steel, and nonferrous metals) are owned and managed by the state or by the politically powerful upper-income elite. Under these conditions, government officials have a difficult time summoning the political will needed to impose strict regulations, particularly when the targeted industries are viewed as vital to economic development (Bartone at. al., 1994: 33).

To change the current situation and enforce environmental safety in anticipation, people are obliged to pressuise local "decision makers" and curb frequent misleads with regard to environmental friendly propositions. Indeed, in
a cacophony of different interests, public awareness needs to be articulated through continuous education and neutral professional expertise. On the other side of the coin, politicians with their own agenda should stop to undermine the public solicitude on environmental aspects of urban life. Awareness reforms and educational boosting are the musts in all public and political scrutinising. An atmosphere of free and open dialog, environmental debate and precise action plans must bring communities and their respective political leaders into harmonic force to enable to work and act together.

The latest political rallies in anticipation of this year’s parliamentary elections show that the majority of political front runners have included an environmental agenda in their public speeches and marketing pamphlets. The public and concerned citizens believe that this time politicians are not wearing “environmental dresses” only until they reach their electoral offices. Public expectations are much broader due to a long period of neglect where emphasis was not on seeing Gaborone urban area in “functional ecological terms, reflecting the daily patterns of human activities rather than defining it by physical edges or administrative boundaries which includes environmental and social benefits” (Barton & Tsrour 2000: 84).

Readiness for Sound Governance

Governance machinery in a “sustainable city” can be aimed at two crucial aspects: technical and political. The ultimate and most important task is to balance two. Unfortunately, Gaborone City Council (GCC) machinery as the only responsible authority doesn’t have enough finances, man power or expertise to handle the emerging number of environmental issues, whether independently or in co-operation with community and professional associations. The influence of politics in creating objectives and rigidity of a central government framework are overwhelming technical “know-how” and the daily routine of GCC. Copying the central government counterpart, GCC authorities are losing operational power and their links with grassroots stakeholders. Numerous impacts and pressures by players involved in the urban land use game, leaves the city officials in limbo, where their and central government responsibilities are mixed and overlapping. Too many expectations, pressures, requests and responsibilities are served on the plate of the city governor and its team. But not enough flexibility and trust is given to them to execute their decision making and technocratic power. As a result of such powerlessness, the implementation of city environmental management projects encompasses only declarative and decorative actions, and implementation of a “top-down” approach.

In addition to the above there is also the problem of jurisdictional complexity (sometimes confusion) where there are overlapping activities of GCC, Central Government departments, South-East and Kweneng District Councils and Tribal Land Boards. Poor co-ordination and duplication of efforts among these parties complicate recognition of responsibilities and executive power in the greater Gaborone metropolitan region. In contrary this also affects Gaborone city as a part of the region. These overlapping settings, together with the competing priorities of satellite villages, local neighbourhoods, district government, municipal officials, regional and national policy-makers, contribute to jurisdictional mosaic. Resolving issues of interfering jurisdictions and spatial scale (that is where the environmental problems spill over local boundaries), requires finding a balance between decentralised and centralised. (Bartone et al., 1994: 34).

However, in the case of Gaborone and Botswana, the process of decentralisation is only a declared goal and a “curtain” for continued presence of the central government in the matters of local (district, city, town, village) importance. This interference is clearly visible in the physical planning process where involvement of central government and its agencies is a prerequisite (see Table 2).

Sound governance and management activities are an inherent part of securing commitment to the projects, obtaining resources; involving and educating stakeholders and creating a tandem or team structures which can effectively utilise multidisciplinary capacities, envisioning of political flags and growing public needs. Targeting these prerequisites the GCC could channel its efforts toward sustainable development. With shared responsibilities and co-ordinating contextual factors of sound managerial routine, the GCC executives could influence a new approach in running the city and providing equitable services to all community groups. In such a scenario a citizenry would have an opportunity to voice concern about all aspects of urban life and the state of the environment.

The emerging environmental policies should be based on adopting an intersectoral approach that will facilitate the formation of partnerships between city government and civil society. Such an approach is commonly referred to as governance. Although the need for government institutional reform is recognised, GCC government may be slow to respond. Moreover, while the technical and institutional capacity of the local government side of partnerships has been considered, the technical ability and cultural willingness of civil society still need to be considered. (Harpham & Allison 2000). Numerous case studies of cities like Davis, Chattanooga, Tapiola, Curitaba and Portland might show how improved consensus between local governance and community can lead to a marriage of convenience, which can be an essential guide to reconsidering current GCC practices.

Improved knowledge and environmental information

Knowledge and smooth access to information are essential conditions for all urban dwellers who wish to tailor the destiny of their cities. Paul (1986) argues that nowhere is the need to manage both resources and information more acute than in developing countries, where poverty and underdevelopment have created a vicious cycle whereby those living directly from this resource base are, at the same time, wreaking such devastation on this same resource base.

The development and implementation of an education system and training facilities by different government, parastatal and private organisation, shows enormous progress in last decade of Gaborone’s expansion. However, most of these positive trends have not advanced urban education and research that emphasizes environmental focus. For example, a current syllabus in the school of planning
and architecture at the University of Botswana only takes into consideration a few environmental planning, management and sustainability related subjects. Other departments are lightly covering the topic, with only exception being the Department of Environmental Science which mostly produces secondary school teachers and an insufficient number of specialised professionals who can take a role as environmental planners and managers in central and local government offices.

The another problem is a lack of education efforts directed into the improvement of public knowledge. The capacity to acquire and disseminate knowledge on urban environmental problems to citizenry in concerned Gaborone communities and ability to educationally empower lay persons is still not common practice. Few managers within GCC departments see the benefits of such an approach. However, many of them remain quiet even when the knowledge is at the door step of the GCC. Little effort has been spent on transforming current practice into weaponry for institutional and public “know how” necessary for objective scrutinizing and supportive decision making. In some cases GCC units (e.g. planning, engineering, environmental health) that have a potential for in-house and training for public are headed by people who are not up to date with the latest educational opportunities, and the benefits institutional-public ventures. For that reason their own training and knowledge refreshment should be taken care of in the form of “education for educators”.

With regard to urban environmental informatics there is also a “status quo” where adequate environmental data series for Gaborone urban areas are lacking and they are not developed on a systematic basis. Legislatively requested Environmental Impact Assessment reporting (on case by case basis) is a novelty in Gaborone’s land planning development practice. But still there is no any regular service which can for example provide monthly reporting on air, water, noise and soil pollution, or the health situation in the form of written referrals, tabular series, graphical charts and/or environmental zone mapping. A permanent network of spatially distributed “environmental hot spots” for instrumental data sampling and collection doesn’t exist. Only Department of Mines (DoM) Air Pollution Unit, Department of Water Affairs (DWA) and GCC Environmental Health unit occasionally collect environmental data. Integrated urban environmental laboratories are not a part of GCC, and the most of the data is available in manually designed form. Existing laboratories for analysis of individual environmental media (e.g. water, soil, air) can not comprehensively contribute to the city environmental informatics.

Although, the GIS and other spatially and environmentally oriented IT tools exist in Botswana in last 10 years, their utilisation and implementation for urban environment related application are not priority. A common situation is grouping of hardware and software which is not used in practice. Dependency between the successful use of GIS technology and a number of personal, organisational, and institutional factors has been widely recognized, but unfortunately these findings were not applied in changing GIS status within Gaborone GCC and other institutions oriented towards urban planning, environmental management and governance. The problem of employing all personal, organisational, and institutional factors in GIS implementation is still pending (Cavric 2002a). Until it is resolved, the current GIS outcomes will be only recognised through mapping production, pore networking, duplication of data and efforts, organisational disarray, unnecessary expenditures and unreliable decision making about allocation of natural, human and financial resources.

In summary it can be said that most authorities are not aware of the magnitude of ongoing environmental damage or how various land development intrusions may be threatening human health and environmental resources. Similarly, local authorities do not have adequate data on the locations of environmentally fragile or hazard-prone lands. They have not pinpointed where vulnerable populations are, nor do they maintain adequate record on the development intrusions may be threatening human health and environmental resources. Similarly, local authorities do not have adequate data on the locations of environmentally fragile or hazard-prone lands. They have not pinpointed where vulnerable populations are, nor do they maintain adequate record on the locations and capacities of existing utilities and services. Gaborone city also lack the necessary information to facilitate land transactions,

**Table 2. - Planning process and levels of planning in Botswana**

<table>
<thead>
<tr>
<th>Planning level</th>
<th>Spatial Extent</th>
<th>Responsible Authority</th>
<th>Final Outcome</th>
<th>Adoption</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Whole country</td>
<td>Central Government (DTRP)</td>
<td>Laws, standards, Codes, policies</td>
<td>Central Government Ministries</td>
<td>Parliament</td>
</tr>
<tr>
<td>Regional</td>
<td>Planning region</td>
<td>Central Government (DTRP)</td>
<td>Regional Master Plan</td>
<td>District &amp; urban Councils</td>
<td>Ministry of Lands &amp; Housing (MLH) Cabinet Parliament</td>
</tr>
<tr>
<td></td>
<td>District</td>
<td>Central Government (DTRP)</td>
<td>- District Settlement Strategy - District Integrated Land Use Plan</td>
<td>District &amp; urban Councils</td>
<td>District &amp; urban Councils MLH</td>
</tr>
<tr>
<td>Settlement</td>
<td>City, town, village</td>
<td>District &amp; Urban Councils Central Government (DTRP)</td>
<td>- Urban Settlement Development Plan - Village Development Plan</td>
<td>District &amp; urban Councils</td>
<td>District &amp; urban Councils MLH</td>
</tr>
<tr>
<td>Local</td>
<td>Part of settlement</td>
<td>District &amp; Urban Councils Central Government (DTRP)</td>
<td>Detailed layout plans, urban &amp; site designs of – New Development Areas – Upgrading Areas – Specific Areas</td>
<td>District &amp; urban Councils</td>
<td>District &amp; urban Councils MLH</td>
</tr>
</tbody>
</table>

Source: GoB (1997:83) and GoB (2004:20)
effective land use planning, property taxation, and hazard mitigation. To make matters worse, education programs covering the scientific, technical, and managerial aspects of urban environmental management and pollution are either weak or non-existent. Consequently, there is a shortage of professionals who can adequately understand and analyze the relationship between environmental problems, impacts, causes, and preventive and curative actions (Bartone at. al., 1994: 36).

THE NEED FOR THE CHANGING ROLE OF PLANNING PROFESSIONALS IN CURBING CURRENT UNSUSTAINABLE PRACTICES

Aforesaid, discussion on sustainability and environmental issues have significance and present a challenge for a new generation of planning professionals who work in an environmentally fragile Gaborone setting. Despite the numerous problems, it appears that there is still room and good prospect to curb unsustainable practices, and find alternative and environmentally friendly solutions. A small but growing contingent of environmentalists, planners, scientists, and community activists is trying to get the word out that our current way of doing business and shaping Gaborone city environmental image need a serious rethink (Krizek and Power, 1996) for the benefit of today and future generations.

Unfortunately, the planning offices in Gaborone are short of staff with specialised environmental and sustainable development knowledge. This problem affects daily operations and efficiency of physical planning units that need to deal with more sophisticated problems such as: urban renewal, squatter settlements, environmental impacts, Agenda 21 and sustainability, urban agriculture, gender issues, urban indicators, globalisation, the HIV/AIDS pandemic, land evaluation, planning techniques (e.g. GIS), etc. There is also a serious gap between senior and junior planning staff, as well as a lack of leadership and coordinating skills. This has resulted in out-sourcing and commissioning environmental and planning projects to external consultant. How will Gaborone planning develop further, and what are its existing experiences to date? Does planning practice have to be firmly rooted in environmental science, or is this the time to go “back to basics” grounded in design (Hague, 1994)? Could there possibly be some other way it could follow, perhaps a combination of these, or does it need a marriage of convenience based on an interdisciplinary set-up?

Planning paradigms have changed over the past decade and they are continually evolving as we work to address the many new problems of environmental impacts, urban renewal, sustainable development and urban revitalisation of human settlements. In this respect, planning today is not what it used to be in the past, and what it will be tomorrow. Change will be continuous and evolution prolonged. Current planning practice is deeply involved in the social, economic, environmental and political aspects of urban development. For example “planners” who have recently started their careers, will spend at least a third of their time specialising in particular aspects of planning. More likely than not, they will have focused on environmental planning and management, urban design, housing or economic development.” (Batey, 1994).

Hague (1994) argues that if you ask practising planners what today’s planning professionals lack, they will answer an understanding of development funding, and graphical and written communication skills. Furthermore they will require skills in identifying policy, evaluating service options, letting and monitoring contracts, and management and an understanding of the principles of quality assurance. All these novelties in the same time means to the more fundamental end of changing the context and ethos of a central and local government authorities.

Involvement of physical planners and other professionals working in public, parastatal, private or non-governmental agencies is only a part of a comprehensive community campaign to trace the road to sustainable development. Today there are so many concerned parties which raise their voices in democratic societies. Physical planners are now beginning to be a force that expands the horizon of activity advancing the concept of sustainability. They are becoming more and more aware of their safe guarding function in protecting urban health, productivity, and quality of life of city dwellers. In the course of these permanent interactions with the people physical planners should be tasked to educate average citizens on the importance of the physical (built) and natural environments that surround them, as well as on changes in those environments induced by human activities. Their daily practice should be attuned with societal needs offering strong professional background and spirit of interdisciplinary thinking.

The role of physical planners varies. However, in many countries it has been affected by growing democratization; increasing public value for environmental resources; an information revolution; and a movement toward more ecological, equitable, and sustainable forms of development (Randolph 2004: 29). Today’s planning practice should focus more on a science-based approach, where a fundamental understanding of social, economic and environmental phenomena is emphasised. Planners are expected to perform a wide range of roles as generalists and all-rounded planners, as well as specialist in any given socio-economic and environmental context of Gaborone (e.g. government agencies, community based organisations, NGOs, private consulting firms, development and parastatal corporations, research and education). In addition, the intention is also to ensure that planners are equipped to perform well and learn from any position in which a newly qualified planner might be employed. Such work should involve planning at any city scale from metropolitan (e.g. Greater Gaborone Region) to the site level (see Appendix A.).

The new approach towards the changing role of planners in Gaborone aims at a shift, where the passive administrator should become a “manager of environmental change”. This requires an ability to enrich analytical and interpretative views on urban environs from single towards multidisciplinary perspective which includes architecture, engineering, planning, humanities, social, natural and health sciences. In addition, an understanding of legal, political, and organisational context within which Gaborone planning occurs will ensure that future planners are able to function effectively and creatively in different office environments and situations, working towards the well - being of all people in Gaborone.

Following a proper sequential and interdiscipli-
linary process, planning should always come before other development expertise such as surveying, engineering, architecture, urban design, landscape architecture, quantity surveying and building. Also, during the implementation of plans, planners should be heavily engaged in integrated development together with representatives of other professional fraternities, mostly architects and engineers. In the case of Gaborone all other disciplines and stakeholders should follow and work closely together with planners.

**BETWEEN THEORY AND PRACTICE**

The complexity and distinctiveness of Gaborone's urban environmental issues demand diversification in the physical planner's opus. What local planners may not have realized is that the sustainability of the planning profession is at as a risk as the sustainability of Gaborone communities. As communities gradually become more autonomous, the days of "planners as technician, town and country planning board administrator, or building and planning permiitte" are ending. The planning profession needs to recognize that the same strategies that work for sustainable communities foresight, partnerships, communication are also necessary to make their work relevant in the context of sustainable communities (Krizek and Power, 1996).

For a long time our fellow colleagues have used to imagine planning is knowing, now they have to realize planning is learning. A quiet revolution is underway in environmental planning and management. In response to the increasing complexity of the remaining problems, protracted disputes, constrained government budgets, and recent movements toward deregulation and property rights protection, new approaches have emerged. They aim to provide more effective, more efficient, and more publicly accepted decisions in environmental management. These approaches are given different labels: "civic environmentalism," "integrated resource management," "community-based environmental protection," "ecosystem management," "watershed management," and "negotiated agreements" to name a few (Randolph 2004: 29).

From the current planning scheme of services (DPSM 1993, DTRP 2000) and workshop results (DIMSSUD Workshop, 2002) it is evident that there is a growing need for local planners to rejuvenate theoretical and practical skills, and become more productive and self-sustained. They have urgently to pick up on the sustainability agenda, and necessary theories, tools, and case studies which may highlight different approaches and open wider horizons of sustainable development.

For a successful professional shift local planners must realise, first, the need for sound theoretical background relevant to sustainable development. Contemporary planning thinkers offer different modalities for such a venture into the world of "theoretical principles" and "pragmatic implementations" relevant to the development and maintenance of sustainable urban enivrons. Roseland (2000) argues that traditional theories like "social reform", "policy analysis", "social learning" and "social mobilisation" elaborated by Friedman (1987) are relatively impoverished in relation to sustainable development. They need to be coupled and refreshed with paradigms associated to "healthy communities" (WHO, 1986), "appropriate technology" (Shumacher 1973, Foster 1987), "social ecology" (Bookchin 1987), "green movement" (Capra and Spretakn 1984, Swift 1987), "bio-regionalism" (Sale 1985, Dodge 1981, Berg at al., 1989, Aberley 1994, Wackernagel and Rees 1996), and "native world view" (Callicot 1982, Smith 1989).

**Healthy communities and healthy people**

A healthy planning agenda is hidden in the grassroots of the planning profession and it was traditionally their responsibility for years until some other professions have been advancing and taking over. Although the name "healthy communities" makes an impression on communal medicine and public health issues, the Ottawa Charter for Health Promotion (WHO, 1986) gives a lot of room for planners to influence programmes for smart use of natural conditions and resources, provision of shelter and services, stabilisation of ecosystems, sustainable resources, social justice, and equity. Proliferation of HIV/AIDS in Gaborone and Botswana is a warning sign and strong motive for local planners to take a role in "better physical facilitating" of people affected by this plague.

**Appropriate technology (AT), innovation and diversification**

AT is an excellent umbrella for application of all technological novelties which bring positive effects to our societies. Technologies which make our lives more productive, healthier and sustainable are always welcomed, compared to technologies which are only profit oriented and not environmentally friendly. Beside common public effects these technologies can improve the lives of the lay-man and secure their self-subsistence even in harsh semi-arid and arid conditions. Roseland (2000) gives numerous examples which can be suitable for Gaborone and Botswana environmental settings. These include passive solar design; active solar collectors for heating and cooling; small windmills to provide electricity; roof-top gardens and hydroponic greenhouses; permaculture; and worker-managed craft industries. In addition to their environmentally positive effects, the ATs can also support a process of economic diversification which is one of the "most burning" issues for the future country prospect.

**Social ecology vs. social stratification**

This theoretical framework has already been applied in Botswana and especially in Gaborone through avoidance of social segregation based on income. Unfortunately, this approach has not careful in regards to the physical dimension where there is still no mixture of land uses that could help curb urban sprawl. Furthermore, some other premises of social ecology have not been implemented in Gaborone local planning practice. Deficiency in equal gender treatment, more liberal position of industrial class, and disadvantaged social groups like HIV/AIDS orphans, tribal minorities, urban poor, "makwerekers or makulas", gay and lesbians, juvenile and (always) foreign criminals, teenage mothers, etc., are some of few examples of

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1 In Setswana's unofficial but widely used lexicon such as Makula and Makwerekerere – in reference to Indians and nationals of other African countries respectively (Mmegi, 2004:6).
2 It is common understanding that every criminal act in this country is the work of foreign nationals from Botswana’s northern neighbour (Mmegi, Ibid).
Gaborone polluted social environment, and they are ultimately all part of the struggle against domination, hierarchy and unfavourable working and living conditions.

“Social ecology advances a holistic worldview, appropriate technology, reconstruction of damaged ecosystems, and creative human enterprise. It combines considerations of equity and social justice with energy efficiency and appropriate technology. Social ecology goes beyond environmentalism, insisting that the issue at hand for humanity is not simply protecting nature but rather creating an ecological society in harmony with nature. The primary social unit of a proposed ecological society is the eco-community, a human-scale, sustainable settlement based on ecological balance, community self-reliance, and participatory democracy.” (Roseland, 2000: 92).

The Green Movement and greening the urban change

The Greens believe in the “four pillars” of ecology, social responsibility, grassroots democracy, and non violence (Capra and Spretnak, 1984). These pillars translate into principles of community self-reliance, improving the quality of life, harmony with nature, decentralization, and diversity, as well as freedom, equality and democracy (Tokar, 1987), or supporting civil liberties, working for solidarity with Third World peoples, and standing for an end to the arms race (Swift, 1987). From these principles, the Greens question many cherished assumptions about the rights of land ownership, the permanence of institutions, the meaning of progress, and the traditional patterns of authority within society.

Although some of the above principles (e.g. decentralisation, diversity, democracy, freedom) are proclaimed in numerous Botswana policy documents, there is still a long way to go before their real implementation. The postulates of a green movement can have different forms in different countries. In some countries they became equal political partners (Germany), while in other countries they only back-up environmental campaigns and struggles against environmental pollution and degradation. Many ecologically oriented international and local NGOs operate by following the green movement agenda. Worth of mentioning is “Somarelang Tikologo” or Environment Watch Botswana, a Gaborone based NGO involved in many local environmental campaigns. The basic principles of this NGO are very similar to those of the green movement.

Inheritance of the green agenda practices can help local planners to come out with challenging alternatives vs. rigid government and privately sponsored developments. Recently, approved EIA legislation form a good framework for the “greening” of Gaborone urban development proposals. This greening is expected to be urgently incorporated first in the “city open space” programmes, and secondly in protection of “Gaborone north area”, where a big chunk of prime agricultural land has been taken away from its primary use. This battle should show a strong “green force” in saving one of the biggest city’s food resorts and biodiversity settings for small animals and different natural and man-made flora.

Bio-regionalism and eco-zoning

The meaning of bio-regionalism encompasses territorial planning and governing based on the rules of nature, its carrying capacity and suitability ratings (e.g. eco-zoning). Unfortunately, these rules have not been applied in Gaborone Region and City planning and governing practices. Both physical plans, the Greater Gaborone Region Structure Plan (1994) and Gaborone City Development Plan (1997) were prepared, without necessary soil, engineering geology, climatic, hydrology, climatic and studies of other natural complexes. Even today, detailed soil map in scale 1:5000 is only available for limited part of the city, and it has been prepared after plan was approved.

Also, the constitution and the forming of Gaborone Greater Region were forced without the knowledge of linkages with its hinterlands. Bio-regional practice applied in this case was not oriented toward resistance against the continuing destruction of savannah natural systems (through urban and agricultural sprawl), and toward the renewal of this natural system based on a thorough knowledge of how natural systems work and the development of techniques appropriate to specific sites (Dodge, 1981). However, prospect are good that a new generation of physical planners trained locally will expose their fellow colleagues (from older generation) to professional critiques for mistakes that have been made. Acceptance, of theoretical paradigm which support both, human dictate, as well as the dictate of “natural conditions and resources” might be a logical way forward.

The implications of bio-regional social organization are clearly for local political control by communities on their own behalf combined with broader allegiance to an institutional structure that governs according to an ecological ethic. Bioregionalism considers people as part of a life-place, as dependent on natural systems as are native plants or animals. By virtue of the emphasis it places on natural systems, perhaps, bioregionalism may perhaps appear weak in terms of human systems; however, some “Green City” ideas (e.g. Berg et al., 1989) are rooted in bioregionalism. Recent volumes edited by bio-regionalist Doug Aberley explain how to do bioregional mapping for local empowerment (1993) and cover the history and theory of ecologically sound planning (1994). The "ecological footprint" analysis developed by Wackernagel and Rees (1996) is a bioregional tool which can consider the impact of cities on natural resources and ecosystems.

Native world view and indigenous knowledge

This theoretical concept is becoming very intriguing in academic and professional debates. Some authors observe that sustainable patterns of resource use and management have for centuries been reflected in the belief and behaviour systems of indigenous cultures. These systems traditionally have been based in a world view that does not separate humans from their environment (Callcott, 1982). A good illustration for these observations can be found in indigenous practices of Botswana traditional leaders (chiefs) who have been involved in practical settlement planning scrutiny.

The structure and shape of the traditional Botswana settlement symbolised the nature of the social structure of the Tswana political life (Rankhuna, 1997) and its natural setting. The highest rank in social hierarchy and organisa-
tion of everyday life and work in a settlement and its hinterland was the chief. Comparing to other tribesman, he had an absolute administrative and judicial power, topping the hierarchical scale. For example, all decisions in connection with selection of place for settlement development, grazing the livestock or ploughing were relegated exclusively to him. Technically speaking, he played a role of a manager, planner and developer, with all the attributes that accompany such a position. His personal intuition and wisdom, combined with heritage, experience of past generations and cognition of principles of nature and environment were of extreme importance.

The World Commission on Environment and Development recognized how much industrialized cultures have to learn about sustainability from traditional peoples, and at the same time, how vulnerable the latter are to encroachment by the former (WCED, 1987). As a native chief speaking at a symposium on sustainable development suggested, mainstream society would be wise to look at native “history, culture, and traditions and practices, and find out how they managed to survive for thousands of years before European contact” (Smith, 1989).

Analysis of these alternative-planning paradigms has significant pedagogical implications for the education and training of professional planners and other municipal officials who increasingly must address sustainable development issues and concerns in their work. It indicates that much of what is currently taught in the name of planning theory is of limited value in addressing sustainable development, and that planners concerned with these aspects of sustainable development must look elsewhere for relevant theoretical guidance (Rospeland, 2000: 94).

THE PLANNING SPECIALIST OR JACK OF ALL TRADES

Planners must always have their own way of thinking and judging. Their proactive approach towards development and environmental issues is the basic premise of their existence in the world of limited natural and social resources. The game of planning is a mother of resource distribution, in which planners and their multidisciplinary skills are more useful than the skills of other individual key players.

Planners should recognize that this changing role won’t be a major stretch because many of the fundamental philosophies behind sustainability are also an integral part of what for years has been considered good planning. Integrating many of the concepts of some of planning's best ideas (mixed-use development, compact urban form, non motorized transportation) is necessary to effectively address the land-use aspects of local governance. In fact, the day-to-day work and education of most people in the planning profession make planners ideal candidates to exert a leadership role (or assume an active role) in such programs.

Physical planning as an attractive profession which includes numerous interdisciplinary skills, the knowledge of social and natural sciences; the vision of politics, vocation of negotiations; and the creation and futurism of urban design. Seven different elementary roles of today's physical planning arena are essential ingredients for every planner involved in sustainable development programmes. These are the following: 1) technocracy and information provision; 2) regulation and land development co-ordination; 3) negotiation and mediation; 4) facilitation and initiation; 5) political advising; 6) designing; and 7) advocacy. An efficient planning professional could adopt all of them and become skilful as a “jack of all trades”, or a specialist in some of them. Depending on where they work physical planners can undertake all these roles and manage the change that comes with it.

Planner as Technocrat and Information Provider

Technocracy based on data and information provision is one of the most traditional and common roles of physical planners world wide. “A Planner’s source of influence includes specialised knowledge or technical expertise, a monopoly on organisationally and politically relevant information, and the role of gatekeeper of information and access” (Forester, 1989). This role has been improved recently by advancements in information technology (IT) in general, and Geographic Information Systems (GIS) in particular. Processing and provision of spatial and environmental data for decision makers is fruitful when it leads to sustainable development practices, but it is disastrous when it leads to land speculation and environmental decay. Planning technocratism in developing and transitional countries like Botswana, and most of the third world and eastern European countries is “sourcing power” and critical part in planning process and plan implementation.

Prudent use of advanced information technologies is a must for contemporary planning professional. Good information not only provides a direct basis for decisions, it also informs citizens of problems and possibilities and thus can directly advance decision politically by building community support (Randolph, 2004: 30). Botswana society is very much political. It is rooted in the traditional tribal democracy that influences all aspects of daily life. The questions of politics, instability and the balance of power are consumed on daily basis in this country. First of all, local politics can favour technocrats and information providers if there is recognition that for example GIS can help political rallies. The 1999 parliament and presidential elections showed that GIS can be viewed as very useful tool for political marketing. A carousel of colourful maps and flows of images combined with tendering charts have been very impressive elements of the candidates’ presentations of their political programmes. The advantages of Botswana’s long term political stability and balanced power between ruling party and their opposition counterparts will be fertile environments for future GIS diffusion, and political debates on burning land and environmental issues

Planner as Regulator and Development Control Coordinator

Land allocation and development practices have been an extremely “hot potato” in the hands of Gaborone and Botswana officials over the last five years. Numerous public and official enquiries are shaking chairs of cabinet ministers and local businessman involved in unlawful practices. This is a good sign that democracy has a means to curb unsustainable development. However, the role of planners in this activity was not of the “highest professional” level and their ethical conduct was overshadowed by the power of political influences. Planning and building permits have been issued without serious professional ana-
involved in conflicts resolutions between Planner as Negotiator and Mediator

sprawl and avoidance of mixed-land uses. The day, it was just a game in which "local
to stop "radical practice" of killing down-towngartens, attorney offices) and planners decided
for certain land uses (e.g. clinics, kinder-
retracted, and some relaxation is being allowed
quickly. With hindsight, that decision has been
process and pushed plot occupants to move
already in the pipeline. In such a situation GCC
ness District has been delayed for years, and
enough provisions for offices and small busi-
benefits. At that time (1995) there were no
nately this shift caused more damages than
where have been operated for years. Unfortu-
agreement between conflicting and/or parties
quences of present actions and for the ways
increase for planning act in negotiation with
developers, than when they are sitting on the
other side of the table working for private
developers and investors. If a planner repre-
sents government and community his or her
obligation is to serve the public interest. This
includes concern for the long term conse-
quences of present actions and for the ways
which various decisions relate to each other. It
also includes provision of full, clear and
accurate information on planning issues and
their social effects to both the public and to the
decision-makers. This also includes protection
and conservation of the environment in line
with principles of sustainable development.
Such situations are still common in transitional
and developing countries where majority
planners work in government agencies.

In the case of representing private entrepre-
teurs, a planner follows the instructions from
management boards and their executives who
usually aim at most profitable land project
solutions. A physical planner working in such
setting is obliged to support the request for
maximal land utilisation, but also he should be
diligent, creative, competent and independent
in spelling out environmental and socio-eco-
nomical consequences of intensified land
development. A planner’s ability to mediate
between the “boss’s orders” and private inter-
ests on one side, and legal, spatial and people’s
induced needs on the other, puts him
in an extremely sensitive and responsible
position where the highest level of negotiation
skills and prudent balancing among interested
parties are a real challenge for the planning
professional. Planning can then be looked at as
a competitive marketplace of ideas and alterna-
tives (Susskind and Ozawa, 1984). In such a
context, an alternative reflecting a negotiated
agreement between conflicting and/or parties
involved, stands the best chance of winning the
competition for acceptance and being publicly,
politically and business wise adopted and
successfully implemented (Randolph, Ibid)

Planner as Facilitator and Initiator

As a facilitator, the planner should initiate land
development projects by making public and
relevant departments/organisations aware of the
purpose of the planning activity and practice.
The question of cultural context, human and
organisational behaviour is crucial for further
diffusion of planning awareness amongst diffe-
rent stakeholders in Gaborone. It directly relates
to the prevalence of people who will understand
the message and importance of planning in
creating sustainable communities. There is no
reason for planners not to facilitate different
societal and economic groups that form the
core of Gaborone’s cosmopolitan urban village.
Planning facilitation and initiatives could always
help build awareness about various local and
national sustainability agendas among all inter-
rested groups and individuals, their needs
wishes and interests. The philosophy of domi-
nation and prevalence is goes against Bots-
wanas’s democratic principles; hence the plan-
ning facilitation and their development initia-
tives should be accessible to everybody.

The best way to facilitate urban change is to re-
gularly chair public debate on actual planning
and development problems, monitor urban
change dynamics and orchestrate discussion
and democratic scrutiny from the top level to
the neighbourhood grassroots. For example, in
discussion about alternatives of the general
urban plan, a good planning facilitator is a
master of ceremonies. He manages and leads
the neighbourhood or professional meetings,
ensuring that the planning process and its con-
secutive parts accomplishes commoners and
individual stakeholders goals. Like the conduc-
tor in the orchestra or an air traffic controller,
a physical planner leads the assembled group of
stakeholders towards creating more inviting
and pleasing urban settings. While everyone’s
contribution is most welcomed and noted in
planning debate, true excellence can be only
achieved under the skillfully orchestrated scru-
tiny in which a planner as facilitator inspires all
contributors to give their best.

“Community action runs counter to this so-
called facilitated growth machine, trying to
compensate for the social imbalance of the
market. Action by civil society has emerged as a
third system of power, joining governments
("the state") and economic powers. Environ-
mental planning needs to enlist citizen action
and encourage a process of citizen empower-

ment. Collaborative environmental planning has emerged as an approach for the engagement of citizens and other stakeholders. This begins with participatory planning and joint decision making but also includes environmental education, encouragement of “counter planning” by citizen groups, and citizen involvement in program implementation.” (Randolph, Ibid: 30) In all these collaborative actions it is expected that planning facilitation will take a pivotal role, which would in contrary influence that the character and appeal of community stems from its cultural milieu.

**Planner as Political Advisor**

Politics in planning is becoming more and more important due to the increased sensitivity of democratic processes and its outcomes. In most of the countries prominent ministers of planning, housing and environment do not necessarily posses a planning or similar background. In such situation their ability to handle peculiar land development and environmental issues can trigger animosity amongst the public, land owners and their opposition competitors. Self confident and wise politicians tasked with “land development” and planning cases should always listen to the voices of planners, and other professionals involved in interdisciplinary advisory teams. Of course, every political leader has right to make their own decision, but if such a decision is not coupled with professional opinion it can lead to political and other disasters. The cases recently presented before the Land Commission show how professionally blind decision making can haunt prominent political figures. Nobody can be immune to knowledge deficiencies including government officials in high positions and their most junior and senior advisers. Consultation (or confrontation) with physical planning bodies is a necessary part of decision making process and should be most welcomed by ministers, permanent secretaries, directors and other highly ranking members of government machinery.

The question of the political side of planning involvement in political advising and decision making has not been directly tackled yet in Gaborone’s professional and political circles. The scope of this factor ranges from professional motivation and commitment to the details of political career opportunities and multisided political and professional satisfaction. Planning experts in Botswana are an enthusiastic fraternity, but not always welcomed and well understood by politicians. Sometime politicians limited awareness about the value and usefulness of physical planners as political adviser leads to discriminatory practices, but to be most effective planners must recognize the political context in which they operate and adapt their strategies accordingly.” (Randolph, Ibid: 31). As consequence of political non-adaptiveness of some fellow colleagues they may be treated as a “dead wood” or being “re-located” to rural district administration where their voicing or advising would not harm those in power. “If planners ignore them, they insure their own powerlessness. Alternatively, if planners understand how relations of power shape the planning process, they can improve the quality of their analyses and empower citizen and community action.” (Forester, 1989).

**Planner as Designing Visionary**

Urban planning has its roots in design tradition and city beautification. These roots are extremely important for better understanding of the forces they have been shaping and assembling cities all over the world. Urban design as a bridge between architecture and urban planning can always help to improve and polish city image. In the contrary we can always appreciate or refuse consequences of urban design expressing our satisfaction or dissatisfaction with different urban places. Meaningful city design at different urban scales from the entire city to an individual site shape guides our cognition and recognition. City image carousel is a natural part of an urbanite whose life depends on the urban sense of place. A planner as designer of such imagery should always contribute to city visioning and development of its long term character. Cities without such character are like music without emotion and the planner’s designing role is to fill the city with space, scale, colour, texture and furnishings. Only these “contributory features” can help that our cities carry a sense of place, history and spirit of its developers.

Having said that, there is an urgent need to skillfully attend to city designing following the principles of sustainability, traditional design practices, smart growth and new urbanism which should recognised as a “resurgence of innovation in the planning profession” (Calthorpe and Fulton, 2001; Corbett and Corbett, 2000; Duany et al., 2000; Myers and Kitsuse, 2000; Neuman, 1998). Many critics of today’s urban development patterns lament the loss of a design perspective in planning and suggest that emphasis on rational science and political participation cannot always project future scenarios necessary to create sustainable environments (Randolph, Ibid:32). The Gaborone city is an excellent framework and opportunity to design and build an “urban village” where we have place that feels like a village and a big city at the same time. The design of such a place should be solely provocative and poetic hosting concurrently an intimacy and quietness on one side, and bustling and diversification on another. Its design should conjure two different form of settlement (and their associated emotions) and rhetoric that calls for the creation of city of contrary sensations (Sucher, 1995)
behaviour, urban design planners have to find ways to involve the public in their proposals and designs (Kelly and Becker, 2000). Plan development is a participatory exercise, but this does not mean that planners are just facilitators. By providing good information, by offering creative and visual alternatives, and by clarifying opportunities, planners play a principal role in "organising attention to possibilities" (Forester, 1989). This is no less creative a task than that other planner tasked described above.

**Planner as Advocate of Change**

By the nature of his profession the planner should be an agent of positive change. Working with numerous stakeholders his role is to fertilise democratic debate and participatory involvement. Promotion of local community empowerment and development of sustainable natural and built-up settings for today's and future generations are basic ingredients of planners advocacy. As advocate, the planner represents the interests of the people affected by a proposed development, in their dialogue with government or private developers. In this role the planner ensures that the views and anticipation expressed by people are incorporated in the plan proposals (GoB, 1997).

All planners can use their authority as regulators, as gatekeepers of information, as negotiators and political advisors, and as designers to promote certain programs, plans, and patterns of development or non-development. However, the degree to which a planner can overtly advocate positions depends on the type of planner he or she is and the position he or she holds. For example, county (district) and city planners, as part of local government administration, are somewhat constrained in their ability to openly promote new initiatives. Their actions need to be more discreet, working with community organizations and sympathetic elected officials. On the other hand, "citizen planners" or counter planning community groups are the strongest advocates. However, they have less authority and their influence depends on building a constituency and using community support to affect decisions (Randolph, 2004: 32-33).

In exercising the advocacy role planners must be fluent in legislative issues and legal practice. Sometimes they will need advice from professional lawyers who are specialists in land, environmental and property law. The complexity of spatial and environmental issues influenced an increase in number of physical planners who are now adding law and other specialised degrees to their planning background. Equipped with such weaponry the implementation techniques for plans such as ordinances, control codes and other forms of local laws become easy tasks for the multi-disciplinary professional. There is also an excellent opportunity for planners to enrol some combined planning/law degrees that open more room for their engagements as real advocates of change. This trend has started in USA and continues in Australia, Britain and some European countries. On another side traditional planning and law schools are introducing more subjects originating from other school. For example at the University of Botswana planning and architectural school it has been proposed to introduce 3 law subject on undergraduate level and several electives on post-graduate level.

**APPLICATION OF SUSTAINABLE ECO-PLANNING CONCEPTS**

Many researchers have recognised the importance of the changing role of the contemporary planning professional (Batey 1994, Hague 1994, Kelly and Becker 2000, Krizek and Power 1996, Randolph 2004, Roseland 2000). However, this also needs to move towards application of sustainable planning concepts and techniques by which physical planners should actively be exposed as a leading professional force in solving the developmental problems of existing and new cities. Currently, many national policies are driving prosperity through the economic prism only, where ecological sustainability that includes trends in natural and social capital is not considered seriously. Economic modelling and prediction of urban growth without sound ecological instruments are dominating today's scene. The battle between parties of reds, greens, browns and whites on one side, and profit oriented on another side is still on. The more practical tools you have in this battle, the better possibility of winning or at least establishing a clear line of defence of basic "environmental and social values" (see Table 3).

Planning of cities as an ongoing attempt to guide their future development and redevelopment should rest on ecosystem premises, and apply an approach where cities and towns should be treated together with their hinterlands and seen as an entire ecosystems. The strength of this approach is its capacity to treat urban settlements holistically through an effective application of planning models and techniques that have been developed to support "ecologically sustainable change". While this is an essential step in moving toward creating different and more sustainable urban environs in Gaborone, there is also concern about the ability of decision makers to accept and understand disadvantages of current "urban patterns" and need for its rectification based on ecological principles and collaborative learning.

The purpose of this part of article is to initiate the planning auditorium, decision makers and public with the "eco-system approach" which is deeply rooted in numerous "sustainable planning concepts and techniques" such as: 1) new town development; 2) urban growth boundaries, buffering and purchasing of development rights; 3) green belts, greenways and urban blue; 4) clustering, densification, compacting and vertical expanding; 5) mixed land use development (M XD); 6) traditional and modern neighbourhood planning; 7) the new urbanism and smart eco-growth. Selection and implementation of planning modalities outlined here in the planning daily practice is a question of concrete local needs and characteristics of current development trends. These concepts and instruments illustrate diverse pathways in curbing unsustainable urban development and securing more environment user friendly strategies. As an ending consequence it is expected that they can lead to the planning and development of the "eco-city".

All these selected concepts are highlighted in terms of their guiding concerns which can improve "urban environs" based on the following: 1) creation of an urban environment that improves a social, economic and psychological sense, the quality of life of those communities that experience that environment; 2) facilitation through a variety of transport modes, the circulation of people, goods and services within a local neighbourhood, and
between the neighbourhood, districts, zones and larger city environment; 3) facilitation of the provision of mixed land uses by identifying appropriate locations for, and quantities of facilities and amenities; and 4) facilitation of the provision of the full range of utility services, by ensuring that the spatial and environmental requirements of the various services are met within the city plan (Behrens and Watson, 1997).

**New Town Development**

Application of the new town development is a very popular way to escape from problems of population pressures and environmental decays. Planning literature and practical cases show that there are three potential types of the new town development. These are 1) satellite town development; 2) freestanding new towns development; and 3) development new towns in-town. The first type can be applied in Gaborone setting by establishing clear “green belts” between city proper, surrounding fields and sprawling areas of neighbouring villages. The second type is characterised by the development of mining towns in the areas where the diamonds have been discovered. The third type is visible in the northern part of Gaborone city, where the development of Phakalane Estate takes a place.

A combination of second and third sub-type in this planning model can be a sound solution for the future of Gaborone in terms of fragile environment protection and benefits for those who can afford to live in such places. Some critics are concerned that most of these communities do not provide affordable housing for the poor and for many middle-class families. In the Botswana context these disadvantages can be curbing with government programmes that support mixing low-income and middle-income developments in the same neighbourhoods. The quest here is not to secure only that poor, middle class and reach live in the same vicinity, the more important question is how they are going to utilise the public facilities and utilities in such new development assemblies? Are they going to have an equal access and opportunities or will the new town setting will restrict accesses based on income abilities? Some of these dilemmas need to be addressed before actual planning starts.

**Urban Growth Boundaries, Buffering and Purchasing of Development Rights**

Current boundaries of the Gaborone metropolitan region and the city proper are an administrator’s fictitious (both City Council and South-East District) which support sprawling of built-up areas and sub-division of natural savannah into small pieces of agricultural land. It was very difficult to keep stable boundaries in the dynamic evolution of Botswana capital, due to unpredictable development of the new city which has been planned for only 20,000 people at it beginnings in 1966. An urban growth unprecedented in the history of this country has triggered almost uncontrolled movements towards virgin lands in the city vicinity.

Urban growth boundary as a line surrounding a city beyond which new development is not allowed is one possible option in societies with strict legal regulations and opportunity to protect the state interest. Also, people’s behaviour and cultural preferences can support or discourage how boundaries are set-up. In most of the cases, is quite difficult to assure that communities worldwide would follow this concept in preserving their open spaces, agricultural land, forests, wildlife habitats, and water features.

An extended version of this concept so-called “buffering” gives more freedom outside the strict boundary line, including the space on both sides of the line, in the form of narrow protection zones and corridors. This transitive solution can be more acceptable in situations where land users don’t want rigidly imposed restrictions. As ever cities expand these small pockets and corridors can save fragile locations to be encroached with negative impacts from surrounding areas. Creation of small or medium-size parks or open spaces in “buffers” by (1) removing buildings and streets, (2) planting trees and grass, and (3) establishing ponds, wetlands, and lakes in areas where buildings have been abandoned (Miller, 2003:681) shows some options in applying this planning technique.

Many interest groups may support government policies intended to intensify the process of (1) buying land for use as parks and other forms of community open space and to protect environmentally sensitive land or surrounding farmland from being developed or (2) purchasing development rights that prohibit certain types of development on environmentally sensitive land (Miller, 2003:681). Different stakeholders and interested groups may be involved in a such venture (e.g. government agencies, NGOs, parastatals, private enterprises, non-profitable, charitable and religious organisations, city communities).

Unfortunately, the case of Gaborone shows that farmland acquired through government intervention has been mostly planned and developed as a built-up area for future expansion of the city. Farmers located near the city have

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Table 3. - Smart growth tools used to prevent and control urban growth and sprawl

<table>
<thead>
<tr>
<th>Limits and Regulations</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit building permits</td>
<td>Preserve existing open space</td>
</tr>
<tr>
<td>Urban growth boundaries</td>
<td>Buy new open space</td>
</tr>
<tr>
<td>Green belts around cities</td>
<td>Buy development rights that prohibit certain types of development on land parcels</td>
</tr>
<tr>
<td>Public review of new development</td>
<td>Taxes</td>
</tr>
<tr>
<td>Zoning</td>
<td>Tax land, not buildings</td>
</tr>
<tr>
<td>Encourage mixed use</td>
<td>Tax land on value of actual use (such as forest and agriculture) instead of highest value as developed land</td>
</tr>
<tr>
<td>Concentrate development along mass transportation routes</td>
<td>Tax Breaks</td>
</tr>
<tr>
<td>Promote high-density cluster housing developments</td>
<td>For owners agreeing legally to not allow certain types of development (conservation easements)</td>
</tr>
<tr>
<td>Planning</td>
<td>For cleaning up and developing abandoned urban sites (brownfields)</td>
</tr>
<tr>
<td>Ecological land-use planning</td>
<td>Revitalization and New Growth</td>
</tr>
<tr>
<td>Environmental impact analysis</td>
<td>Revitalize existing towns and cities</td>
</tr>
<tr>
<td>Integrated regional planning</td>
<td>Build well-planned new towns</td>
</tr>
<tr>
<td>State and national planning</td>
<td>Source: Miller, 2004</td>
</tr>
</tbody>
</table>
been left with small chunks of unsustainable and unconsolidated land which cannot secure community self-sufficiency in food production. For example, the prime land in Gaborone north, that buffers the College of Agriculture (north of Sebele and Glen Valley) is zoned for low and medium density residential land uses in the latest Gaborone City Development Plan. This case demonstrates the significant obstacles in traditional zoning where economic factors were not sufficiently strong to keep this prime farmland as a base for the entire city food supply. Ideally, preservation, smart subdivision, consolidation and conservation should follow application of purchasing development rights. This will limit leapfrog development in open country and allocates the concentration of development in urbanising part of the growing Botswana capital.

**Green Belts, Greenways and Urban Blue**

Greening and refreshing of thirsty cities are truly important components of healthy and aesthetic urban growth. Greener and water features change the micro-climate, secure tranquillity, help recreational opportunities, boost city breathing capacity and beautify its communities settings. Developers as well as interested citizens recognise the value of green belts, green ways and urban blue (e.g. water features) in diverse neighbourhood settings. However, the quantity and quality of these natural and semi-natural landmarks is shrinking and in the most of the cases they are converted into residential, commercial and transportation land cover.

Actions in providing green belts to save open spaces and control urban growth are aimed to curb speeding land conversions and ensure that some areas are left for a more sustainable utilisation than the thousands of hectares covered by street concrete and building footprints. Many cities all over the world have started to implement the “green belt concept” where a large belt of greenery is encircling the city proper (see Figure 4). The main city is usually surrounded by a network of satellite towns connected to the major urban centre of green belt region by an extensive public transport system network.

Some cities have converted abandoned railroad rights-of-way and dry creek beds into bicycle, hiking, and jogging paths, often called “greenways”. More than 500 new greenway projects, developed largely by citizens’ groups, are under way in the United States. Many German, Dutch, and Danish cities are connected by extensive networks of footpaths and bike paths (Miller, 2003: 682). Everywhere across urban world once-barren streets are now a-greening and a-blooming. Flower bedecked planters, window boxes, and hanging baskets enframe store windows. Recessed bays and setbacks are converted to mini parks with raised planting beds and seating. Concrete boulevard medians are converted to seasonal showpieces. Vacant lots in the inner city are cleared of trash by citizen groups and, with the help of civic groups or clubs, made neighbour- hood gardens and gathering places. Waterish arrangements flows through the dry landscapes and many formerly polluted river streams and riverbanks have been cleared of debris and restored to verdant waterways. Lake-shores and waterfronts have become a focus of public improvements and the focal points and pride of many cities (Simonds, 1997:344-5).

Gaborone and its surroundings were once areas of more green and blues then today. However, not only because climate changes, but mainly due to human interference, greenery and water resources have become scarce. One of the solutions to improve the situation and provide urban habitat for an increasing number of people was to construct the dam as main source of potable water. The seasonal character of rainfall has put restrictions on dam operation, especially during the periods of prolonged drought which sometimes had the character of a natural disaster. In such a situation the development of Gaborone urban greenery and urban blue system have become heavily dependant on the water situation. Water scarcity is inevitable during the dry season, but unfortunately during the short and mostly reach rainfall episodes water is not collected and saved. The majority of rain water drains into the ground instead of being seized and utilised during the time of low rainfall. Besides, the dam as a main water circuit, city planners, engineers and developers should consider some other water accumulation and conservation techniques. Greening the city, but not only within the perimeters of individual plots and establishment of more local water collection points can be a prudent way in applying “greenway and urban blue” strategies in Gaborone context. Small semi-treated sewage water ponds in Phakalane Golf estate are good example of how water can be preserved and utilised for watering grass, urban agriculture in neighbouring Glen Valley and Sebele areas and for keeping small animal habitats alive.

**Clustering, Densification (infilling), Compacting and Vertical Expansion**

Urban sprawl, leapfrog development and a lowered skyline silhouette are the dominant characteristics of Gaborone’s horizontal and vertical urban morphology. Consequences of such an urban pattern have been discussed earlier and the conclusion is to try to find the ways how to make Gaborone’s image more compact and robust. The first available option in a planner’s toolkit can be introduction of “cluster subdivisions”, which can help to protect environmentally sensitive areas and compensate individual owners with more communal space (see Figure 5).

To be effective, this requirement should rate building sites according to some functional criterion such as soil suitability for on-site sewage disposal, degree of slope, or degree of soil erosion. The clustering provision in a development control code or zoning ordinance should indicate the maximum number of building units per hectare. Bylaws that could be adopted by the Gaborone City Council jurisdiction could set aside one-half or more of a parcel for agricultural use or open space while still allowing the same number of plots that conventional subdivision permits. For example, cluster zoning could require a...
minimum of ten hectares for a development. The prospective developer may be restricted to building on only 25 percent of it and nily on a portion of the land with permeable soil or some other specific criterion. Approval may depend on development rights on the remaining land being dedicated to the town or estate jurisdiction (Sargent et al., 1991:96)

When done properly, high-density cluster developments are a win-win solution for residents, developers, and the environment. Residents get (1) more open and recreational space, (2) aesthetically pleasing surroundings, and (3) lower heating and cooling costs because some walls are shared. Developers can cut their costs for site preparation, roads, utilities, and other forms of infrastructure by as much as 40% and sell units that have a higher market value (Miller, 2003:680). Cluster developments are often very attractive, from visual point of view, and therefore may be quite marketable (Anderson, 2000). In addition, the argument for clustering development and higher densities development includes optimum use of infrastructure, recreational and cultural facilities, as well as employment opportunities and financial viability (Righini, 2000).

The 1963’s master plan for Gaborone followed the principle of a “Garden City”, allowing low densities. Even with the expansion of Gaborone City, the demands for plots continued to outstrip supply. Planning could neither satisfy the high demands for plots nor could it turn the page from cost-intensive low-density, low-floor housing to low-cost high-density and multiple floor housing. One reason for these failures is that Batswana (the people of Botswana) are not used to live in multi-storey buildings. As the migrants come from rural areas, where land and space seems unlimited, there is no need to build technically complicated and costly two- or more storey houses. This flatlander culture has been shaping the development of the new quarters of Gaborone. Mostly, vast single storey houses cover only between 100-150 m² of the plot, which gives very low ratios of the sum of all floor spaces to plot area (0.4 to 0.6). On those plots, building coverage is approximately around 10-20% (Keiner & Cavric, 2004). Changes in flatlander “sense of place” and culture are very slow, but an appearance of the first multi storey buildings in Government Enclave, and multi-family (2 to 3 storey) flats and town houses in Gaborone West (e.g. Block 2, Village area, Ext. 9) are good signs that developers, urban designers and officials in planning and engineering agencies are trying to contribute to densification and vertical expansion of city skyline. It has been assumed that this process can mark a new milestone in anticipated urban development trends. More rational, less expensive, and socially and environmentally pleasing set-ups in these types of building constructions could bring a sustainable and more compact form of city in the future. Off course, avoidance of sky-scrapers as monuments of “some other worlds” and reasonable height between 8-12 storeys for office blocks, and 2-4 storeys for residential and 3-5 for commercial buildings, could be a good guideline in re-shaping Gaborone’s sky-line and “compacting” its built-up footprint based on the following premises:

- shortening trip lengths (than a dispersed pattern) and giving more opportunities for exercise through walking and cycling;
- lowering car dependence and reducing levels of air/noise pollution;
- offering a wide choice of facilities within easy walking distance, promoting greater access to and choice of food;
- securing land values that can be sufficient to encourage urban renewal and regeneration, which can help foster pride and a sense of community;
- bolstering the vitality and viability of the city centre, improving the economy and providing more employment opportunities;
- recycling and reusing building materials, reducing energy and resource consumption; and
- improving access to rural open space, providing opportunities for increased recreational activity (Barton & Tsorou, 2000).

**Mixed Land Use Development (MXD)**

Horizontal and vertical mixtures of different land use activities is another opportunity for redevelopment and rejuvenation of Gaborone City. A simple look at the latest Gaborone City Development Plan (GoB, 1997a) land use proposal map shows that there is practically no mixed land uses. A limited area of 51,17 hectares has been recognised as a MXDs, which represents only 0.27 % of the total land mass (e.g. 19,096 ha). The system of 14 large super blocks with internal rigid zoning is dominant planning tool applied in the plan. Unfortunately, this proposal will shape the destiny of the Botswana capital in the next 17 years.

![Cluster vs. conventional development](source: Miller, 2004:682)
Today there is clearly a significant difference in planning based on private car ownership. All over the world, and even in USA which was years if responsible officials don’t react and include: “MXD” development patterns and principles. Emerging trends on the content and context of “MXD” which brings mosaic city experience at the doorstep of its urban dwellers.

A renewed focus on the connectivity within and between developments in ensuring adequate and alternative means of vehicular movement as well as greater attention to pedestrian opportunities. A reassessment of the location of open space with recognition of its role in place making and elevating it beyond the unusable or leftover ground within a development (Dewbery, 2002: 220-221).

A means of achieving higher densities and rapid development of the site’s potential. A means of sharing infrastructure, thereby making possible economies of scale in development and operation. A means of achieving greater long-term appreciation in land and property values. A means for balanced development, representing a compromise between broad control over development for fiscal, environmental, or other reasons and narrowly sufficient regulation of the real estate industry, and A means to provide an attractive transition between different land uses and districts.

By virtue of their scale and design complexity, as well as by functional diversity, mixed-use developments can have a far greater impact on community development than single purpose projects (Schwanke at al., 1987: 45-46), which are the current in urban development in Gaborone. The contribution of MXDs in creating spaces with more sense and individual character is enormous, especially in the parts of city which can be called “sleepy” or “dead” districts. A mixture brings new life to these urban areas and makes them vibrant and liveable 24 hours a day. It is an amazing experience for the occasional visitor or tourist that in Gaborone’s down-town (e.g. Central Mall, Government Enclave, and African Mall) there is a complete absence of entertainment, cultural or recreational attractions. Instead one finds that after working hours these areas attract people with vices. This makes visiting this part of the city unpleasant, uninteresting, and sometimes even dangerous. With a little bit more of vision, imagination and diversification ideas, MXDs can add a new dimension to the Gaborone urban experience. It could help to revitalise and revivé the downtown, inner city and the suburbs which are mostly echoing a boring weekend rhetoric of “braai (grill)” and “chibuku (traditional brew)” culture.

Traditional vs. Modern Neighbourhood Planning

The generations of physical planners who were trained abroad are forgetting their roots and the culture of “Kgotla” neighbourhood planning concept and the way of life in traditional Bots-wana. The influence of modernists coupled with traditional concepts in future planning and design of Gaborone might be a good “marriage of convenience” and answer for transition which is anticipated in this country and its capital.

Many years before Howard (1898), Perry (1929), Solow and Copperman (1948) produced topical works on “neighbourhood planning concept”, settlements in Botswana had a distinctive form of physical and social organisation based on “Kgotla public democracy” and a “traditional wards system” (e.g. neighbourhoods). The dominant position in internal physical structure of traditional Tswana settlement was designated for the chief’s Kgotla. In every small village, and In each town ward there is a Kgotla (Rankhuna, 1997). The Kgotla is a nucleus of public and political life and a meeting place. Beside main chief’s Kgotla, which is usually located in the geographical focus of the village, there are several word’s Kgotlas (or headmen’s digkotla). They usually assemble extended families from 3-6 wards. The role and location of the Kgotla as a principal meeting and decision-making place and centre of socio-political and public life is preserved to the present time in almost all major urban villages.

The typical layout plan of a traditional Tswana settlement is characterised by a range of circular and semi-circular geometric features, which are not based on strict planning principles and infrastructure matrix. As Wareus (2000) notes, the traveller can see “horse-shoe” clusters of houses with the private lowlapas (small yard with 2-3 individual buildings). These are followed by communal areas and oval shaped and circular with even a central point for the local post and communication spaces between. This plan was created without the aid of modern planners and it was an indigenous adaptation of a communal solution to the surrounding environmental settings.

In a physical sense, the Kgotla and areas that are formed around it from the centre of the settlement reflect social and physical organisation and segregation. The chief was in the centre with members of his family, his brothers, uncles, cousins, while other radiated outwards in order of seniority and importance, including other Batswana families and numbers of people who acted as servants (Rankhuna 1997, Tlou and Campbell 1984). The analysis of an overall “Kgotla” organisation of traditional Tswana settlement, evidently shows the distinctive elements of the neighbourhood planning concept. In connection with it Wareus argues that “modern thinking about neighbourhood planning suggests about the full range of private, semi-private and public areas should be included in planning layouts and that the ideal size of neighbourhood clusters is the same as the typical of villages in Botswana” (1997).

The Kgotla is a traditional instrument for articulating public and individual interests in Botswana. Its functions are similar to those of a local parliament. The Kgotla is a meeting place in a ward. Wards are subsets of Council political areas. The Kgotla is regarded as a legitimate institution for public decision-making.
making. Once a decision has been made at the Kgotsa, it is considered binding for the entire community. The Kgotsa should hold public meetings for development activities concerning the city, in addition to its customary court functions the Kgotsa forms an important forum that should bring urban development issues to the attention of the government. It is the starting point for bottom up development and forms an important basis for involving the people in decision-making processes. (Keiner, Salmeron, Schmid and Poduje, 2004:208).

However, the opportunities given by this traditional framework for social and physical organisation has not been implemented in today’s modern planning of Gaborone city. Supper block arrangements have killed opportunities for closer contacts among people and their opportunity to express and advocate their interests and requirements for improving their physical and socio-economic environment. According to Anderson (2000) some sociologists and urban planners have suggested that the residential pattern of the neighbourhood would foster an increase in social contacts ('neighbouring'). This, they said, would reduce the impersonal atmosphere that is found in many of our cities. The degree to which this has come about in newly developed neighbourhoods can be argued. It appears that increased localized “neighbouring” does occur to some degree in sections of planned neighbourhoods, but that this does not spread over wide areas, in such super-blocks which are the basic spatial-units in Gaborone city.

The New Urbanism and Smart Eco-Growth

When rural migrants reach Gaborone city and decide to stay, work, study and live in a new ambient, they are exposed to numerous challenges and dilemmas in the daily battle for adaptation and smooth settlement. Whatever the changes they feel, between their previous rural and current urban type of setting, a city makes a radical impact on their behavioural and cultural senses. At first glance they look lost, in limbo between, urban and village metaphors, and between freedoms and restrictions posed by both urban and rural environments. They start to memorise dualistically all aspects of their lives then and now. The words urban and village are bringing to them the following opposing emotions (Sucher, 1995:8):

Urban: hustle-bustle, liberty, hostility, far away, strangers, possibilities, growth, complex, large, skyscraper, liberal, anonymous
Village: tranquility, structure, together, closeness, kindred, stasis, simple, small, cottage, conservative, familiar

In countries like Botswana the planning concept which should recognise both scale of settlement cognition has a good prospect for success because it tries to balance and translate both settlement perceptions into the real world of physical patterns. In 1972, a young builder named Michael Corbet began implementing a development concept for “Village Homes” and other developments suitable for new comers and indigenous urban dwellers. The ideas around this concept have sprung quickly covering issues such as:

- Energy efficiency and natural heating and cooling
- Water resources and riparian habitat management through natural drainage systems
- Agricultural production for local consumption
- Provision of consumer services, jobs, recreation, education, and cultural opportunities within walking and cycling distance to reduce dependency on the automobile
- Orientation of development away from streets and toward pedestrian and open areas to reduce people's confrontation with vehicles
- Useful, satisfying employment within the community, including small businesses and entrepreneurial activities
- Opportunities for low-income people and new comers to get job training, to buy housing, to become part of the community (Randolph, 2004:114)

Latter on, this original idea was improved on by Calthorpe (1993), Duany, Plater-Zyberk and Speck (1993), Kunstler (2001) and others, culminating in the Charter for the New Urbanism (2002) in which the preamble highlights:

“Existing patterns of urban and suburban development seriously impair our quality of life. The symptoms are: more congestion and air pollution resulting from our increased dependence on automobiles, the loss of precious open spaces, the need for costly improvements to roads and public services, the inequitable distribution of economic resources, and the loss of a sense of community. By drawing upon the best from the past and present, we can plan communities that will more successfully serve the needs of those who live and work within them. Such planning should adhere to certain fundamental principles”.

Admirers of this new way of urban thinking believe that cities and their integral parts should be designed and built in a far better manner. Applied in a regional constellation this concept is also known as “smart growth”. Randolph (2004) lists the key elements of its application at regional level. These are regional integration, conservation design, rural and greenfield development, sub-urban revitalisation, village and small town development, and urban fill and brown field development.

Analysing Gaborone Greater Region and Gaborone City as its integral part, all the above listed elements are already issues which need serious consideration. Regional integration call for more integrative role of Greater Gaborone Structure plan and cooperation of Gaborone City Council, Kweneng and South-East District authorities. Conservation design have not been applied as an instrument in preserving indigenous African character of Gaborone city and its rural hinterlands.

In situation where the food resources and local healthy agricultural products are becoming priorities, conservation and green-field development should appear at the planning stage. The development and more sustainable design of surrounding peri-urban villages of Mogoditsane, Tlokweng, Mmopane, Metsimothabe, Gaphatshwa, Gabane and Mopane, is also an element of serious concerns. Curbing their sprawl, buffering, and establishment of green belts should help them not to be consumed by the growing Gaborone agglomeration. Already
there is no hope for Tlokweng and Mogoditshane which are integral parts of the city's expansion. Urban in-filling, densification and clustering, as well as sanitation, clean-up and closure of brown field development (e.g. dumping sites, borrow pits) are burning issues and priorities which need urgent attention when applying smart growth instruments.

CONCLUSIONS

Sustainable future of Botswana capital will not come easily and overnight. It will require a transition in our cultural, behavioural and socio-economic values which are becoming more and more attitudes of western societies that should not be always a model for our anticipated destiny. More active and changing role of physical planners in designing and developing Gaborone city recognises that the key to a sustainable shift lie in different perception of today reality which is full of problems. Physical planners as frontrunners for sustainable change should professionally and intuitively understand and guide public how to sense what are the alternative solutions for improvement of societal well being. "What really matters is not always one's material possessions but one's psychological economy, one's richness of human relations and freedom from the conflicts and constrictions that prevent us from enjoying what we have" (Wachtel, 1989). Examples of "psychological economy enjoyments" are becoming parts of Gaborone daily scenery which is full of clashes between poverty and extreme richness.

Not long ago Botswana was one of the poorest countries in the world, then become pretty reach. The change of its economy from agriculture to diamond-based and limited market economy has brought many challenges in less than 30 years. However, today there are lot of signs of economic, social and environmental decline. The race for fast economic growth based on western principles, have melted traditional frameworks of Botswana sustainable life. This retrograde trend is immenently recognised in urban part of this society, where negative impacts are reaching almost every individual. This trend still continues and it will bring more problems, if we don't wake up from fallen dreams and false notions about our greatness amongst other African brothers. Only with wealthy, educated and knowledgeable people we can curb negative consequences of non-diversified economic matrix and thresholds of our urban settlements in general, and Gaborone city in particular.

Sustainable Gaborone eco-city require unprecedented and simultaneous emphasis on the efficient use of its urban space, on minimizing the consumption of essential natural capital, on multiplying social capital, and on mobilizing citizens, their associations and city government toward these ends. This synergistic approach will enable our capital to be cleaner, healthier, and less expensive; to have greater accessibility and cohesion; and to be more self-reliant in energy, food and economic security than it is now. Sustainable Gaborone will not, therefore, merely “sustain” the quality of our lives—it will dramatically improve it (Roseland, 2000). The case examples of cities like Curitaba (Brazil), Waitakere (New Zealand), Tapiola (Finland), Portland, Davis and Chattanooga (USA), confirm that "eco-city" which should be the target in future planning of Gaborone is not a futuristic dream. The development of such an eco-city capital of Botswana can be based on:

- preventing pollution and reducing waste,
- using energy and matter resources efficiently
- recycling and reusing at least 60% of all municipal solid waste
- using solar and other locally available (e.g. natural gas) renewable energy resources
- encouraging biodiversity
- using composting to help create soil
- using solar-powered living machines
- walk or bike to most places, including work
- use low-polluting mass transit
- requiring that all buildings, vehicles, and appliances meet high energy efficiency standards
- planting the trees and other greenery that is adapted to the local climate and soils only
- introducing small organic gardens and a variety of plants adapted to
- reducing pollution, noise, and soil erosion, and securing supply for limited urban wildlife habitats
- cleaning and restoring polluted and abandoned lots, industrial sites, landfills and other brownfields
- preserving urban forests (eucalyptus, bush trees), grasslands (savannah), wetlands (se-wage ponds), and farms from urban sprawl.
- producing food from organic farms, solar greenhouses, community gardens, and small gardens on rooftops, in yards, and in window boxes (Miller, 2004).

This article urges planners to assume a changing and stronger role in planning the future of Gaborone city. In many people's minds, the role of the planner has always been about securing a more sustainable future (i.e., allocating resources wisely, reducing waste, making transport cheaper, easier, and better). In this respect, sustainability may require new generations of planners to emphasize what people thought they should have been doing all along helping people arrive at the future they desire. What may be new (or rediscovered) is the commitment to extend the time horizon beyond a reasonably predictable future and clarifying possible outcomes and opportunities that are available. As members of a profession dedicated to making communities, states, nations (and for that matter, the world) more livable and humane, it is the planning profession's responsibility to ensure that our vision includes not just the current generation but future generations as well (Krizek and Power, 1996).

People designing and living in eco-cities should take seriously the visionary statement of Lewis Mumford in which he advised more than three decades ago that we have to "forget the damned motor car and build cities for lovers and friends." In reaching such a lofty ideal, our planners have a whole fan of applicable tools. Gaborone planning and development are still passing through pioneering stage. The list of planning techniques discussed in previous section of this article is only a part of potential planners' arsenal and it is not exhausted. Most of them can be varied in Gaborone local context. They can have indigenous approach and the scope, and the way in which they can help supporting sustainable urban development practices. Their selection is given for an illustrative purpose, but if they are practically implemented, they can have the catalytic effect on other interdisciplinary stakeholders involved in creating Gaborone' responsive environment. This requires powerful reform in planners and decision makers' knowledge, as well as in public perception of their mother city.
Paraphrasing the words of John Ormsbee Simonds (1998: 346-350) we can say that the people of Gaborone would live and work in its urban spaces; enjoy its sunsets, blue skies and desert green; rise their children and tell the stories of grand-grandfathers to the new generations of urban dwellers must have city rich in a variety of urban spaces. Each should be planned with sensitivity to best express and accommodate its function; patterns through which everyone may move with safety and with pleasure and in which they may congregate. Citizenry of this “petite and cosmopolitan African urban village” must have health, convenience, and mobility on scales as yet undreamed. There must be also an order. Not an antiseptic, stylistic, or grandiose order of contrived geometric dullness or sweeping emptiness but a functional order that will hold the city together and make it work—an order as organic as that of the living cell, the leaf, and the tree. A sensed cohesive and satisfying order that permits of the happy accident, is flexible, and combines the best of the old with the best of the new. An order that is sympathetic to those structures, things, and activities that afford interest, variety, surprise, and contrast and that have the power to charm the heart. Today’s and future inhabitants of Gaborone need their city as a source of the heart. Today’s and future inhabitants of Gaborone need their city as a source of the heart.

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