

Urban Environmental Management in Botswana: Toward a Theoretical Explanation of Public Policy Failure

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ABSTRACT / For the last three and half decades, Botswana has been widely acclaimed to be one of sub-Saharan Africa's longest and most stable liberal democracies, coupled with and sustained by a growing economy. One of the major contradictions, however, within this development scenario, has been the neglect of environmental problems in the country in general, and urban environmental issues in particular.

Part of the problem fueling the misconception of environmental issues in Botswana is the state's domination of the country's environmental agenda. This is linked to the power disjunction in decision-making and policy processes between state and nonstate actors over the most appropriate course of action to tackle the problems. Without adopting appropriate analytical frameworks, it is possible that the problem of urban environmental mismanagement in Botswana will persist. This article examines some of the major urban environmental issues in Botswana from neighborhood, citywide, and urban-rural interface perspectives. Further, the elite theory of public policy is used to explain constraints on policy change in the urban environmental management arena in Botswana.

Botswana, like most of Africa, the least urbanized continent in the world, has in recent years been experiencing rapid urban growth (Chanda 1996, Mosha 1996, Campbell 1998, Kruger 1998). The current rate of urban growth per annum in Botswana is about 8% (Central Statistics 1998).

Botswana's Central Statistics Office defines an urban area as a settlement with at least 5000 people of which 75% of the labor force are engaged in nonagricultural occupations. In the 1971 census, 9.3% of the national population was resident in urban areas, rising to 17.7% in 1981 and to 45.7% in 1991 (Campbell 1998). Urban growth in Botswana is mainly through rural-urban migration and to a limited extent by natural increase (Kruger 1998).

Despite rapid urban growth in Botswana, there is a problem of general neglect of documentation of urban environmental issues in the country (Molebatsi 1998, Toteng 2000). The Botswana National Conservation Strategy of 1990 (also known as the National Policy on Natural Resources Conservation and Development) recognizes "industrial and urban pollution" as one of Botswana's major environmental problems, but the pol-

icy has so far been unable to improve the urban environmental management system in the country. Systematic analytical frameworks are rarely adopted in urban environmental analyses in Botswana as one critical factor to guide policy formulation, its implementation, and evaluating its effectiveness on improving overall urban environmental management. This article contributes towards bridging this gap in the country's urban environmental studies based on two analytical devices discussed in the next section.

Analytical and Theoretical Framework

Two analytical devices are used in this article to facilitate an understanding of the manifestation of urban environmental issues in Botswana and to explain public policy failure to adequately resolve the problems.

One device is a three-tier framework of looking at urban environmental problems in the developing countries from citywide, neighborhood, and urban-rural interface perspectives (Hardoy and others 1992, Molebatsi 1998).

Neighborhood-level environmental problems include shortages of natural resources essential for human survival, location of residences in marginal or disaster-prone physical environments, and exposure to human health risk areas such as those areas prone to pathogens and pollutants—common modes of patho-

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gen transmission include contaminated water, air, food, and soil.

Citywide urban environmental problems may arise from accumulated neighborhood level environmental problems, and some of these may reach magnitudes where they are no longer restricted to the neighborhoods where they are most prevalent. Various forms of pollution such as air, noise, and water are examples of citywide urban environmental problems.

A further level at which adverse environmental impacts of urban centers can be delineated is at the periurban areas, the urban fringe, or the rural-urban interface. Urban fringe problems are more difficult to enumerate and delineate compared to those at the neighborhood and citywide levels. Examples include poor solid waste disposal and other bad waste management practices and pollution of waterbodies by polluting sources located within the urban areas.

The second analytical and theoretical device is the elite theory or model of state or public policy. This focuses our attention mostly on how public policy is developed, and only occasionally on implementation. The elite theory of state or public policy development asserts that this is a set of preferences of the ruling class or elite (Dye 1995). The ruling class, however, often wishes to depict public policy laden with and driven by their own class interests as a reflection of "the people" or "the public's" wishes. From this theoretical standpoint the elite tend to manipulate public opinion to set their own policy agenda; however apathy and misinformation among "the people" or "the public" may be pervasive. Any shift in public policy in this context is therefore likely to be piecemeal and more a function of variations of the elite's own interests rather than any fundamental changes instigated by the public (Dye 1995). In the elite model, state policy is a top-down rather than a bottom-up, participatory activity.

Environmental Policy in Botswana: The Botswana National Conservation Strategy

Botswana's National Conservation Strategy (NCS), adopted in 1990, is so far the country's only environmental policy. Among the primary goals of NCS are: (1) to increase the effectiveness in use and management of natural resources, and (2) integrate work of sectoral government ministries and other interest groups to conserve natural resources (Government of Botswana 1990b, p. 2). Although industrial and urban pollution was identified as one of the country's major problems, clearly, from a statement of the goals above, there is emphasis on natural resource conservation (such as water, rangelands, wood resources, and veld products)

and less on how urban environmental management is to be improved.

The NCS Coordinating Agency (NCS-CA) is the secretariat under the NCS Advisory Board. The main function of the board is to coordinate and advise both government and the private sector on all environmental issues. The agency services the board and coordinates the execution of its decisions.

It should be noted that NCS-CA is merely an environmental advisory body (Reynolds 1998, Toteng 2000). It does not have legislative powers to enforce its will on other government departments (Reynolds 1998). At the outset this scenario points to a very weak national-level environmental management policy and institutional framework. The NCS strategy and structure was never intended to change the status quo; no new statutory powers to enforce environmental management laws and regulations in Botswana were allocated to the agency when it was set up. In this context, a 1991 Government of Botswana discussion asserts that:

The [NCS] Board will have . . . advisory powers. The Board will not have any executive powers. It will not take over any functions of any line ministry or parastatal. . . it will . . . promote a uni-sectoral management approach to natural resource management. In this context it is not . . . proposed to introduce or amend any legislation which falls within the area of any ministry (Ministry of Local Government, Lands, and Housing 1991, p. 20) (emphasis added).

Since NCS inception, therefore, the urban environmental management system in Botswana has not been revamped. This is despite the fact that, as noted above, NCS identified industrial and urban pollution as one of the country's foremost environmental problems. This is also despite the fact that part of "the solution package" was identified as the need to tighten and enforce legislation (Government of Botswana 1990a, p. 58, 1990b, p. 11). Most of the problems identified within a three-level framework in this article have not been so identified in both policy and practice. This limits the effectiveness with which environmental policy resolves the problems.

To date at least two major changes since NCS was adopted in 1990 can be identified, although their impact is still not clear. First, the NCS Coordinating Agency (NCS-CA) was established as an executive arm for implementing the strategy under the then Ministry of Local Government, Lands and Housing (MLGLH) (now Ministry of Lands, Housing and the Environment as of October 2000). The NCS Board was also established to be serviced by NCS-CA. Second, and the most recent, was the introduction of the Waste Management Act (WMA) in 1998, and the establishment of the Waste Management Department (WMD) in April 1999 to im-

plement the act. As noted elsewhere in this paper, the effect of these changes is still uncertain. Arguably, therefore, the urban environmental management regime in Botswana has remained very similar to that of the pre-NCS 1990 era despite the fact that on paper some changes have been proposed.

Some Major Urban Environmental Problems in Botswana

Urban environmental problems in Botswana are wide ranging. However, these can be simplified within the three-level framework discussed in the previous section, namely as neighborhood, citywide, and urban-rural interface environmental problems. The three levels are not mutually exclusive in the sense that there is much overlap of problems among the three categories.

Neighborhood-Level Environmental Problems

A neighborhood as a unit of analysis in urban form can be defined in simplified terms as a collection of dwellings or other areas normally occupied by humans, situated in proximity to one another. Common features such as infrastructure may tie the areas together.

Neighborhood urban environmental problems mostly occur and affect people closest to where they live and work. Most of these problems invariably tend to be endured by the urban poor socioeconomic groups.

Neighborhood-level urban environmental problems in Botswana include: poor quality housing structures, inadequate infrastructure and services, location of low income areas (especially informal settlements) in environmentally hazardous or marginal areas, and overcrowding. Each of these problems is considered in turn.

Poor quality housing structures. Poor quality housing structures means residential structures that lack durability both by reason of use of nondurable building materials and the construction methods used to assemble these. Poor quality or substandard housing in Botswana is associated with low income—it is therefore prevalent among poor people. In most cases they do not have sufficient income to afford the purchase of both durable materials and to hire skilled craftsmen to build decent and durable houses; this problem is prevalent in both rural and urban areas (Toteng 1988, Molebatsi 1998).

Poor quality housing in the urban areas of Botswana is mostly found in site and service areas (also commonly known locally as SHHA, for self-help housing areas), upgraded areas, and informal settlements. Site and service areas are residential areas provided with basic infrastructure such as a few tarred primary roads, mostly

gravel secondary roads, communal water standpipes (although these are envisaged to be phased out in favor of private water connections), and uncovered stormwater drains, among other things. Houses in these areas, as noted previously, are generally of poor quality because of both the substandard construction materials used and the poor construction methods. Often because of lack of funds, the safety of the houses is severely compromised during construction. In turn, the houses become environmental health and safety hazards in themselves to the occupants. Given the semiarid and hot climate in Botswana, vermin breeding by potential disease-transmitting vectors such as mice and cockroaches become widespread. In terms of safety, during past tropical thunderstorms and strong wind or dust storms, houses have collapsed, putting the lives of occupants at risk.

In informal squatter settlements, development control and building standards or codes are often not applied by virtue of the illegality of the housing structures. In upgraded, mostly former informal or squatter settlements, the enforcement of development and building codes is sporadic. In site and service areas, the expectation is that building control regulations are more rigorously applied. However, evidence from research indicates that even in these areas building standards are rarely complied with (Rasisigo 1991, Molao 1996, Molebatsi 1998). The environmental implications of poor housing quality therefore revolve around concerns for safety and public health.

Inadequate infrastructure and services. Infrastructure and services can be divided into different categories. Basic infrastructure includes: piped water, sewerage systems, and stormwater drains. Basic infrastructure is a priority for human residential development in particular. Without basic infrastructure, the environmental health of local communities is severely threatened. Social services are another category of infrastructure, which can be ranked second in terms of priority. These include educational facilities (such schools and crèches); health facilities (such as clinics); and recreational facilities (such as children's playgrounds and parks). Other types of infrastructure are facilities and services, which, although people may survive without, are nonetheless essential for the operation of an efficient urban system. This is especially so in the context of seeking to boost local urban economies by attracting investment. Examples of infrastructure and services are traffic and transport networks, telecommunications networks, and electricity.

Often infrastructure and services in Botswana are inequitably distributed among income groups based segregated housing areas. Urban residential segrega-

tion in Botswana is accompanied by disproportionate access to services by the poorer income groups. This phenomenon historically developed in Botswana during the colonial era. In some cases such as in Francistown, it was based on racial lines although less in extent compared to neighboring erstwhile apartheid South Africa and Zimbabwe (formerly Rhodesia). In postcolonial Botswana this continued, but this time based solely on income rather than race. The inequalities, however, have largely persisted despite recent efforts in urban plot layout and design to spatially juxtapose different income groups' housing areas as part of a mixed urban residential land-use policy. It was hoped that with the adoption of the mixed land-use policy, not only would social integration of the different income groups be achieved, but that also greater equity in the sharing of infrastructure between low and high income groups would be achieved through cross-subsidization.

Low income housing in upgraded areas in particular often has poor and inadequate infrastructure. Lack of sewerage systems, for example, has meant that pit latrines are the principal method of human waste disposal. The trouble with this is that, depending on the geology, soils, and hydrology of an area, and through infiltration, water sources may be polluted. Similarly, disease-transmitting vectors from the pit latrines may pose a health hazard to the local population. Lack of proper stormwater drains means that during heavy rains, the removal of dirty runoff remains inadequate. This may become an additional environmental health hazard to the local population. Diseases such as *bilharzia* (*Schistosomiasis haematobium*) as the vectors for these diseases conveniently breed in dirty water pools (c.f. Raditloaneng 1986).

In informal (or squatter) settlements, and given their illegal status, the problem of inadequate infrastructure is usually worse (Molamu 1989, Toteng 1995). The environmental problems arising from lack of infrastructure are therefore more acute in urban informal settlements in Botswana (Toteng 1995, Molebatsi 1998). The quality of infrastructure generally deteriorates with housing income types: the lower the income the worse the quality of infrastructure.

Marginal location of low-income residences. Environmentally marginal urban areas are those that, because of certain geographic or physical features, are expensive to provide with infrastructure. The physical features in question include geology, soils, hydrology, and geomorphologic features, which may adversely affect the prevailing drainage system. The marginal areas are often not earmarked for residential development in the normal urban land development processes. They may be left as derelict land or be designated for industrial or

recreational uses. In Botswana, marginal areas tend not to be provided with infrastructure in initial phases of land servicing. Marginal areas therefore easily become target destinations for squatters.

At least two types of marginal location constraints have been documented in Botswana: areas liable to flooding, and areas with a difficult geological or rock structure (Setimela 1984, Molebatsi 1998). Examples of areas with a difficult geology are the squatter settlements of former PWD in Francistown and Peleng in Lobatse. In hilly or rocky terrain, the provision of infrastructure is more expensive. Where no sewerage systems exist, pit latrines are used. Often these become a health hazard and a nuisance, especially due to the pungent smell and breeding of vermin. Some residents may not even be able to afford the construction of pit latrines, resulting in defecation in nearby bushes and open spaces, further increasing the probability of fecal-related infections (Setimela 1984). Likewise, pollution of groundwater and surface water sources is worsened by lack of adequate infrastructure.

As for the problem of location in areas subject to flooding, the classical example is the Machimeryanga (Francistown) squatter settlement flooding disaster of 1990 (Molebatsi 1998). This prompted the emergency evacuation and relocation of residents to a new and habitable site and service areas after much damage to residents' properties. Brickfield in Lobatse, and parts of Palapye and Mahalapye are also areas subject to flooding by virtue of their location on floodplains. Poor drainage as a result of both the physical conditions of these areas as well as inadequate infrastructure such as stormwater drains combine to worsen the risk of flooding. In the context of widespread use of crude sanitation facilities (such as pit latrines) in most marginal areas, the public health implications arising from the flooding environmental disaster are too ghastly to contemplate. The spread of water-borne diseases such as cholera and other diseases such as malaria and *bilharzia* often put the local population at high risk of infection, particularly in cases where flooding extends over long periods.

Overcrowding. Overcrowding occurs at different levels in low-income residential areas. It may be in terms of the number of people occupying a dwelling relative to the amount of space available (housing density) or the number of houses per unit area (plot density). Most low-income houses in the urban areas of Botswana are overcrowded. For example, in 1990 it was established that the housing density in most low-income housing areas averaged about 3 persons per room (Euroconsult 1990); also, there were 1.9 rooms per household in low-income site and service housing areas compared to

a corresponding figure of 4.6 in private high-income areas (Euroconsult 1990). Similarly, there were 1.8 persons per room in site and service housing compared to 0.8 persons per room in high-income private housing. Clearly, there is overcrowding in low income housing areas, and this has potential adverse environmental implications, initially at the household level, and ultimately at the neighborhood, citywide, and urban-rural interface levels. These include the higher propensity for the spread of infectious diseases, overloading of the limited capacity of crude sanitation facilities (such as latrines), and contamination of water sources in the vicinity of urban centers from nitrate leaching (GCC and DTRP 1997, Bogatsu and others 2000). The problems related to vermin in warm climatic conditions also persist in overcrowded conditions.

Citywide Level Environmental Problems

Citywide environmental problems are those that are not confined to local or small areas. They include air, noise, and water pollution.

Air pollution. The most significant air pollution concerns in Botswana are emissions of sulfur dioxide in the mining town of Selibe-Phikwe. This emanates from the process of sulfide ore body smelting where enormous amounts of sulfur are discharged and combine with oxygen to form sulfur dioxide. Poor siting during the physical planning of Selibe-Phikwe in relation to sulfur dioxide source has resulted in about 25% of the total time the gas being blown by prevailing winds directly into residential areas (Matale 1992).

There are other forms of air pollution in large urban human settlements besides the Selibe-Phikwe case. Complaints about foul smells have been raised in Lobatse, Gaborone, Serowe, and other areas. Abattoirs and related activities have been the main sources of foul smells. Other forms of pollution, which are neither monitored nor hardly mentioned officially include particulate dust material, carbon monoxide, nitrogen oxides, and smoke (GCC and DTRP 1997). These gaseous emissions come from various sources such as motor vehicles, combustion processes such as the burning of coal, burning of solid waste, and less costly but largely dirty household energy sources. Semidry fuelwood and paraffin, mostly used as household energy in low-income areas, are typical examples.

Noise pollution. Although this is one of the fast growing forms of urban pollution in Botswana, it is also one of the most neglected and is grossly underdocumented. Noise pollution is also barely considered in urban physical planning such as in plot design and layout out. As a result of the above factors, it is difficult to find any data yet on noise pollution levels. Urban noise in Botswana

originates from different sources such as industrial activities, traffic flow (including from aircraft and trains where these exist), and unenclosed night entertainment centers such as open-air discos. Industrial noise is diverse, ranging from small workshops to medium industrial activities.

The detrimental urban noise effects in Botswana on human health include disturbing sleep and interfering with communication [Gaborone City Council and Department of Town and regional Planning and (GCC and DTRP 1997)]. The effects of noise pollution on special groups such as children, old people, and sick people can be particularly devastating (GCC and DTRP 1997). Noise pollution is therefore an urban environmental issue that warrants attention that it has hitherto not received in urban environmental planning and management in Botswana. Further, noise also negatively affects wildlife found in urban fringe parks. Noise pollution destroys the tranquillity and hence environmental character of local areas.

Controlling noise sources can be done through noise abatement measures after initially assessing the potential adverse environmental effects of the noise levels. Mitigation measures such as noise barriers can then be set up in the case of noise from vehicular traffic. Enactment and enforcement of legislation against those making noise is another measure. Public education is an additional measure to minimize noise pollution.

Water pollution. Water pollution takes various forms such as groundwater pollution, surface water pollution, and nitrate leaching. In the face of rapid urban settlement growth in Botswana, the demand for potable water has been increasing; in 1990 urban areas used 19.6 million cubic meters of water, a figure that was forecast to rise to 41.3 million cubic meters in 2000 (Snowy Mountains Engineering Corporation and others 1991).

The increased use of fresh water and the discharge of wastewater, coupled with spills of hazardous substances within urban settlements is increasingly threatening the country's limited water resources, especially those in the vicinity of urban settlements (Mabua and others 1994, GCC and DTRP 1997, Bogatsu and others 2000, Toteng 2000). The threats to groundwater include a wide range of contaminants from point urban sources such as industrial activities, landfill sites, and military activities where these exist (GCC and DTRP 1997). Leaching of nitrates from pit latrines also poses a groundwater pollution risk to waterbodies in the urban fringe.

In general, therefore, the environmental effect of

water pollution is to place further stress on the country's limited water resources.

Rural-Urban Interface Level Environmental Problems

Many environmental problems occur in the urban hinterland. This is attributable to the extension of the ecological footprints of cities beyond the municipal boundaries. This impact is both in terms of the abstraction of natural resources from the urban fringe and the disposal of various wastes on the urban hinterland. A city system in this context can be visualized as an input-output operation or process. Water, for example, has been adopted as a proxy to explain how urban centers in Botswana take in fresh water, use it, and then dispose of it as wastewater, much of it into the urban hinterland with adverse environmental impacts on livestock and villages in the Gaborone urban fringe (Toteng 2000).

Environmental dereliction and excessive natural resource use. In Botswana, some of the documented urban-rural interface problems are extraction of building materials such as sand, gravel, poles and grass, and fuelwood collection (Molebatsi 1998). The environmental impact of these activities is wide ranging and include the following. First, environmental dereliction such as indiscriminate creation of burrow pits and dumping of building construction debris occurs (Geoflux 1994). This is a common feature in most of Botswana's urban centers. Second, urban centers consume resources from their hinterland. Such resources include the most basic natural resource—land—mostly agricultural land, water resources, and wood resources. Land-use competition and fuelwood crises have been documented in southeastern Botswana in the urban periphery of Gaborone, (Kgathi 1992, Toteng 1998). This is also the case with water resources.

The use of the urban fringe resources certainly has adverse implications for the sustainability of urban centers. If cities were to draw all resources as well as dump waste in the urban hinterland, the viability of the city systems themselves as well as the rural-urban region would be seriously hampered in the long term (Tjaligii 1995).

Soil degradation. Soil degradation here means both different forms of soil pollution and soil erosion. Both these activities adversely affect the quality of soil. Soil erosion is a common phenomenon in the vicinity of large settlements in Botswana due to an increase in human activities that disturb soil structure. Such activities include clearance of vegetation and trampling by both humans and livestock. In the urban context, and with an increase in hardened and compacted surfaces, these surfaces become less impervious. Coupled with stormwater drains, the impervious surfaces lead to fast rainwater runoff. This accelerates the erosion processes

in the context of removed vegetation and unstable soil structures.

Soil pollution arises from similar sources that pollute water resources. There is evidence that in the vicinity of major urban centers in Botswana (such as Gaborone), waterbodies and soil are increasingly being exposed to pollution (Bogatsu and others 2000). Poor sanitation facilities (such as pit latrines), for example, generate high nitrate concentrations that adversely affect soil quality. Additional heavy metals from dumping of scrap metal onto soil further compromise soil quality.

The effect of soil degradation is loss of productive soil for agricultural productivity, loss of ecosystem viability, and siltation of surface water reservoirs such as dams (in the case of soil erosion) resulting in their diminished capacity. Dams are the most common source of water supply to the burgeoning urban areas of Botswana. Their siltation is therefore an undesirable environmental outcome, as this would curtail their capacity to cope with rising water demand.

Inappropriate waste management practices. Waste disposal methods raise the question of waste management as an urban environmental issue. Given the growing and rapid concentration of population in urban centers in Botswana from about 17% in 1971 to 45% in 1991, it can be expected that waste generation in terms of both volume and frequency of output will also be concentrated in these areas.

The waste management problem is the most emphasized urban environmental issue in official and environmental advocacy circles in Botswana. It is therefore "the most studied environmental issue in Botswana's urban areas" (Molebatsi 1998, p. 275). The attention accorded waste management largely arises from indiscriminate disposal of solid waste, in particular littering, throughout the country. Indiscriminate solid waste disposal seems to be attributable to ineffective administration of waste management legislation with which to police and penalize perpetrators. However, as of September 1998, Botswana's first Waste Management Act was promulgated. The establishment of the Waste Management Department to implement the act in April 1999 followed. It is premature (at the time of writing this article) to comment on the effectiveness of the legislative and institutional changes described above as these are relatively new. Because of the incremental and elitist nature of state policy in Botswana, and the power differentials that exist between state and non-state stakeholders in decision-making and policy processes over urban environmental management issues, the effect of policy change on the ground in Botswana can be very slow (Toteng 2000).

The problems surrounding waste management em-

anate from factors such as poor waste collection as well as its disposal. Although, ideally, in the urban areas there should be weekly collection of garbage, irregular collection is common. This is attributable to inefficiency and lack of sufficient resources available to the local authorities (Silitshena and others 1996).

Crude methods of waste disposal such as dumping and tipping of solid waste in undesignated and unsupervised landfills occurs (Segosebe and Van der Post 1991, Esselfie 1997). Even within some site and service residential areas, open spaces designated for recreational areas by local urban planning authorities have been found by Somarelang Tikologo, a local environmental nongovernmental organization, to have been turned to dumping sites. To rectify this problem, Somarelang Tikologo has been actively mobilizing local communities and securing funding to develop the open spaces into proper recreational parks and enhance the environmental character of urban neighborhoods.

Medical waste. Medical or clinical waste in Botswana is generated in hospitals and health clinics. In 1996 about 2428 tons per annum of clinical waste was produced, and this equated to 1.71 kg/person/yr, a figure slightly higher than the European Union average (NCSCA and GTZ 1996a).

Many shortcomings confront the clinical waste management subsector, and these ultimately have adverse environmental implications, particularly in urban areas where most medical facilities are located. The weaknesses include: lack of training and sound management practices, lack of clarity and standardization of practices and responsibilities among medical institutions, lack of financial resources, shortage of equipment and physical facilities, and poor operating procedures for disposal of equipment (NCSCA and GTZ 1996a). The cumulative effect of the weaknesses in medical waste management is poor disposal strategies that have adverse environmental implications.

Metal waste. About 80% of Botswana's population live in the southeastern part of the country. This is an area with habitable geographical conditions compared to the western part, dominated by Kalahari semidesert conditions. Urban centers dominate the populated areas of Botswana, and they are the principal source areas for metal wastes.

Some of the major streams of metal wastes in Botswana are: motor vehicles, household equipment, used beverage cans, and obsolete electronic devices.

In 1996 scrap metal from motor vehicles accounted for about 20,000 tons per annum, and this figure is estimated to rise to 38,000 tons per annum in 2005 (NCSCA and GTZ 1996b).

Household metal waste emanates from scrap equip-

ment such as refrigerators, air conditioners, washing machines, and stoves or cookers. Although in the past, factors such as low ownership of household metal equipment ensured that household metal wastes did not become a major environmental problem, the future is more uncertain. With rapid urbanization and possible increasing ownership of this equipment, and the disposal of aging equipment, this source of metal waste is likely to present itself as a new urban environmental management constraint.

Beverage cans are another major source of metal waste in Botswana; and this problem is also widespread throughout southern Africa (NCSCA and GTZ 1996b). As a result the steel manufacturing industry introduced a can collection scheme in South Africa for recycling through a company called Collect-A-Can. Since 1993, this company has introduced its service in Botswana, and achieves a recovery rate of 55%. However, some scrap metal cans do not get collected and some are from past backlogs, all of which are to be found in urban dumping sites.

The burgeoning global phenomenon in the adoption of information technology sector has seen much computerization and related forms of automation in Botswana as well. Added to this, is the growth in scrap waste from conventional electronic devices such as television sets, radios, and other forms of audiovisual equipment (NCSCA and GTZ 1996b). Waste from this stream is set to become an additional form of urban environmental management constraint in the future since most of them were imported recently (NCSCA and GTZ 1996b). It is expected that between 1996 and 2000, only a total of 1350 tons of electronic scrap will be produced, but thereafter about 750 tons per year will be produced (NCSCA and GTZ 1996b).

Natural hazards. In Botswana various forms of natural hazards occur at one point or another at different scales and magnitudes and affect human settlements. Periurban areas, where most urban squatter or informal settlements tend to be located, are some of the places worst affected by natural disasters in Botswana. Although human beings generally have little control over when and how natural disasters occur, in this age of technological advances, it is possible to forecast and therefore anticipate the impact of natural disasters. Consequently, it is also possible to set up some disaster mitigation measures. These factors notwithstanding, incidences of natural disasters still cause much destruction in Botswana's settlements. In early 2000, for example, the wave of torrential rains that caused much flooding in southern Africa, and particularly caught media attention in Mozambique, also affected Botswana. Periurban and informal settlements were in this

case the worst affected. Roads and weak houses were destroyed. A combination of physical and human factors tends to exacerbate incidences of natural disasters. Physical factors include the physiology and landforms of areas. This comprises geology, hydrology, soils, climate, and vegetation among other things. Human factors include structures put up by people for their own use such as stormwater drains, houses, dams, and other forms of infrastructure.

As noted earlier, residential development in the urban fringe in Botswana has tended to be at a higher risk of natural disasters. Clearly, this has partly been due to spontaneous development in response to rapid urban growth, viewed against a lack of development control standards within these areas to assure safety and durability of housing structures.

The State and Development Policy in Botswana: Implications for Urban Environmental Management

Urban environmental management policy and practice can be read as part of a country's broader development policy. Therefore, to understand the manifestation of urban environmental-problems in Botswana and the policy framework for their management, it is useful to briefly examine the nature of the state in Botswana and its role in development policy.

The state in Botswana has been described by political scientists as a "developmental state" (Edge 1998, pp. 333–344, Tsie 1998, p. 14). The point here is not to repeat what the political analysts have competently done in characterizing the nature of the state in Botswana, but rather to reexamine and reinterpret the manifestations and implications of the developmental state, its role in development policy, and how this affects urban environmental management policy. This is because "if we have to understand the policy decisions of the elite in Botswana, it is important at least as a basis for discussion to examine the nature of the state" (Molebatsi 1994, p. 154). What then is a developmental state? And how does this type of state manifest itself in Botswana?

Although it is difficult to find a universal definition of what a developmental state entails, some basic and common characteristics of this type of state have been identified as well as their manifestation in the context of Botswana (see for example, Tsie 1998, Edge 1998). Tsie (1998, p. 14) argues that the Botswana state meets five of the six major characteristics of a developmental state, namely, relative autonomy; a determined elite; an insulated, powerful, and effective bureaucracy; a weak

civil society; and effective management of public-private sector relations. Edge (1998) agrees with Tsie (1998) on some aspects of the nature of the developmental state in Botswana. Edge further elaborates on the characteristics of the developmental state in general, and points out features with which it is manifested in Botswana. The primary elements of a developmental state as identified by Edge (1998, pp. 333–334) are as follows:

- the government's leading role in the development process;
- the existence of an authoritarian government directing the state administration;
- state control and mediation of workers' wage demands upon employers;
- the existence of a weak military;
- vast foreign aid provision in the state's infancy;
- the expansion of social services and infrastructure;
- increases in the rates of growth in, gross national product (GNP) and per capita income during an extended period of time;
- a national development plan that serves to unify the various sectors of economic, social and infrastructural development as a whole; and
- increased manufacturing output and government effectiveness in the delivery of goods and services.

However, unlike other developmental states such as those of South Korea, Taiwan, and Hong Kong, "Botswana has been unable to stimulate a large-scale, internally generated, competitive manufacturing sector" (Edge 1998, p. 334). Furthermore, despite the general agreement among political scientists on the existence of the developmental state in Botswana, there is disagreement on one major aspect: democracy versus authoritarianism. On the one hand, Edge (1998, p. 333) points out that "the existence of an authoritarian government" is a characteristic feature of the developmental state," and he does not refute this aspect in the case of Botswana. On the other hand, Tsie (1998, p. 13) argues that: "Botswana is a *democratic developmental state* in the sense that it has promoted rapid economic growth and capitalist development *without abandoning democratic norms and practices*". (my emphasis). With regard to the urban environmental management question in Botswana, one thing is certain: the democratization of environmental issues and the attendant agenda is very limited (Molebatsi and Toteng 1998, Toteng 2000). The involvement in environmental decision-making processes of nonstate stakeholders such as nongovernmental organizations, the private sector, community-based organizations and the general public

"remains marginal . . . [to] minimal if not nil" (Molebatsi 1998, p. 151). The nonstate actors have little power in decision-making and policy processes over urban environmental management issues (Toteng 2000, p. 144). Part of the problem stems from the fact that: "the political leadership has remained remarkably aloof from the deeper issues of resource conservation and environmental protection" (Yeagar 1993, p. 127). Likewise, rather than providing sufficient opportunity for local communities to define environmental problems and set the environmental agenda, the state in Botswana invariably dominates the scene (Molebatsi and Toteng 1998, Toteng 2000). To the above list of characteristics of the democratic developmental state in Botswana, and as noted at the outset, one aspect generally neglected in the country's development policy is the environmental question, especially in the urban areas (Molebatsi 1998). Part of the problem has been attributed to the fact that "Botswana's politicians are [more] inclined to allow . . . conservation agendas to be defined by expatriate advisers" (Yeagar 1993, p. 127). Yet, it is argued that Botswana's future social and economic development will very much "depend on . . . whether public policy can balance environmental exploitation with [natural] resource conservation" (Yeagar 1993, p. 130).

An implicit question is: Of what relevance is understanding the developmental state in Botswana? This type of state has been able to spearhead vigorous and sustained economic growth and a liberal democratic political climate. Ironically, there has not been similar success in addressing the problem of environmental degradation in general (Tsie 1998, Molebatsi and Toteng, 1998), particularly urban environmental management problems (Molebatsi 1998, Toteng 2000).

Bureaucratic and Administrative Centralism in Botswana

In the previous section, the developmental nature of the state in Botswana and its dominant role and power in development and environmental policy was discussed. Features of the developmental state in Botswana pertinent to understanding differential power between state and nonstate actors in this article include both a dominant ruling elite and bureaucracy (Somolekae 1993, Neme 1997, Tsie 1998, Toteng 2000). Edge (1998) argues that Botswana has an authoritarian public administration system that directs most aspects of development policy and the development process. These aspects are referred to as "bureaucratic and administrative centralism" in this discussion.

Bureaucratic and administrative centralism in Botswana is manifest on two fronts: the creation of modern administrative institutions and the central government's excessive control over local government, limiting its autonomy (Molebatsi 1994, pp. 165–171, Silitshena and others 1996).

The creation of modern public institutions in postcolonial Botswana is one mechanism by which a hierarchical and centralized administrative and development planning system at the national level was entrenched and replicated at the local level (Molebatsi 1994, p. 165). The new institutions primarily removed many of the powers and functions hitherto the prerogative of tribal authorities. Urban councils are an example of postcolonial modern institutions in Botswana. They have limited jurisdiction over urban environmental management issues, primarily because central government retains the most power in decision-making and policy processes (Toteng 2000).

The central government in Botswana has maintained a stranglehold over local government, through various bureaucratic and administrative centralist measures. The measures include the central state's overwhelming control over finance and human resources allocated to local authorities (Molebatsi 1994, Silitshena and others 1996). The factors limit the local authorities' ability to deal with urban environmental management problems (Toteng 2000).

Certain questions emerge from the picture painted above: Why has centralism been the preferred option in Botswana's postcolonial development policy and development strategy? Molebatsi (1994, pp. 168–180) posits some explanations. One justification, often advanced by the bureaucracy and politicians themselves is that "centralism ensures that limited national resources are used optimally in accordance with national development priorities" (Molebatsi 1994, p. 171). Whether the priorities actually reflect the aspirations of the ruled and powerless is beyond the purview of this article. Another explanation is that bureaucratic and administrative centralism in Botswana is a function of elitist manipulation of the state system itself to serve the elite's own interests in capital accumulation (Molebatsi 1994, pp. 170–171 citing Picard and Morgan, 1985, p. 132 and Reilly, 1983, p. 144). This issue is further examined below under the exploration of the relevance of elite theory to explain public policy failure in Botswana, and the potential effect of this on failure to resolve urban environmental management problems.

Toward a Theoretical Explanation: Urban Environmental Management Policy Failure in Botswana

The first major section of this article critically evaluated Botswana's environmental policy and pointed to its weakness in the urban context. Following from this, some of the major urban environmental problems in Botswana were identified within a three-level framework. Third, the developmental state in Botswana was outlined, and the problem of bureaucratic and administrative centralism linked with this type of state was analyzed. It was shown that central government is the dominant player (which maintains the most power) in both development and environmental policy. Bureaucratic and administrative centralism is one mechanism by which the ruling elite dominate the development policy agenda in the country, but in the process neglect environmental issues in general, and urban environmental management issues and problems in particular. Is it feasible to derive a theoretically based explanation on public policy performance to adequately address the many urban environmental problems set out within a three-level framework? To what extent is elite theory relevant to our understanding of the nature of urban environmental policy failure in Botswana?

The elite theory would suggest that public policy in Botswana is dominated by a few elite and as such it is devoid of the wishes and aspirations "the people" or "the public," although the elite often give the impression that this is not the case. It is noted, for example, that "the neutral state thesis is the image the state in Botswana portrays of itself. . ." (Molebatsi 1994, p. 157). In this context, to understand policy decisions of the state in Botswana, it is useful to note that these are inalienable from the elite themselves (Molebatsi 1994, p. 154, Holm and Molutsi 1992, p. 83). In fact, in Botswana, state policies reflect interests of the ruling class (Molebatsi 1994, p. 159). Further, Botswana's political and ruling elite aggressively manipulate public thinking in the design of public policy (Holm and Molutsi 1992, p. 83). The problem of elite domination in Botswana's policy development process is worsened by other factors. For example, civil society in Botswana is generally weak and poorly developed, therefore it has marginal if any influence in policy-making (Holm and Molutsi 1992, Somolekae 1993, Lekorwe 1998, Tsie 1998). This situation is also prevalent in environmental resource management as well (Toteng 2000). Vast differences in power between state and nonstate stakeholders in decision-making and policy processes are also a common feature in the urban arena in Botswana over issues such as urban water management (Toteng

2000). Likewise, although in recent years there has been a proliferation of environmental nongovernmental organizations, most of these are at a nascent stage (Molebatsi 1998), and they have little power compared to the state over urban environmental decision making and policy processes (Toteng 2000). These problems are exacerbated by poor access to financial and organizational resources (Lekorwe 1998). Besides, although out of the desire of the elite to depict a politically correct public facade so as to be seen to be working with special-interest groups, generally, politicians and civil servants in Botswana tend to look at special-interest groups as nuisances that should be marginalized rather than recognized as partners in the policy development process (Holm and Molutsi 1992). Yet, it has been observed that most urban environmental problems in the developing countries cannot be resolved while there are barriers that deny poorer groups access to economic and political power, and hence their ability to insist and demand policy changes (Hardoy and others 1992). The elite policy development theory is therefore instructive in seeking to explain why existing urban environmental policy in Botswana is weak and does not go to the bottom of solving urban environmental problems.

Conclusion

This article initially critically evaluated Botswana's environmental policy, particularly the extent to which it fails to address urban environmental management problems. Following this, some of the major urban environmental issues in Botswana were identified within a three-level framework. It showed that these problems can be simplified and explained at the neighborhood, citywide, and urban-rural interface scales, although these are not mutually exclusive. Urban neighborhood environmental problems in Botswana include poor housing structures, inadequate infrastructure and urban services (particularly in low-income housing areas), location of housing for poor socioeconomic groups in environmentally hazardous areas and overcrowding. Citywide environmental problems in Botswana are air pollution, noise pollution, and water pollution. Urban-rural interface environmental problems are the most difficult to delineate but they encompass soil degradation and inappropriate waste management practices—including poor disposal of medical and metal waste.

The article also identified the nature of the state in Botswana in relation to development policy and its link to environmental policy. It was argued that the state in Botswana has been dominant in spearheading eco-

conomic development in the last three decades, but failed to address urban environmental management problems. Botswana's version of an environmental policy, the NCS was adopted 20 years after independence, but has not led to any radical changes that address the dismal state of urban environmental problems.

Bureaucratic and administrative centralism was shown to be a mechanism by which the state in Botswana retains and maintains the most power in development and environmental policy in decision-making and policy processes, much to the exclusion of nonstate actors. This problem, together with lack of use of appropriate analytical frameworks to identify urban environmental problems, contributes to public policy failure to adequately address urban environmental problems.

Theoretically, the failure to conceptualize and manage the urban environmental problems identified above can be explained through the elite policy model. It was shown that the ruling elite who have access to much state power dominates Botswana's policy development regime. As a result, the elite tend to dominate and manipulate state power in decision-making and policy processes, and there is very little input by non-state actors (such as environmental nongovernmental organizations) in decision-making and policy processes in the urban environmental management arena, a factor that largely accounts for urban environmental management policy failure.

Literature Cited

- Bogatsu, Y., E. Atekwana, G. Ekosse, and O. Totolo. 2000. Hydrochemical Impacts of the Gaborone Landfill on its Surrounding Subsurface Environments. Report of a collaborative study. University of Botswana, Gaborone.
- Campbell, E. K. 1998. Population distribution and urbanisation. Pages 261-280 in W. A. Edge and M. H. Lekorwe (eds.), *Botswana: Politics and society*. J. L. van Schaik Publishers, Pretoria.
- Central Statistics. 1998. *Statistical Bulletin*. Vol. 23 No. 1. CSO, Gaborone.
- Chanda, R. 1996. Dimensions and correlates of environmental quality concern among residents of an African subtropical city: Gaborone, Botswana. Research report. Department of Environmental Science; University of Botswana, Gaborone, 22 pp.
- Dye, T. S. 1995. *Understanding public policy*. Prentice Hall, Englewood Cliffs, New Jersey.
- Edge, W. A. 1998. Botswana: A developmental state. Pages 333-348 in W. A. Edge and M. H. Lekorwe (eds.), *Botswana: Politics and society*. J. L. van Schaik Publishers, Pretoria.
- Esselie, V. N. 1997. Solid waste management in Gaborone: The role of government, NGOs and the public. MSc thesis. University of Botswana, Gaborone.
- Euroconsult. 1990. Housing preferences study. Ministry of Local Government and Lands, Gaborone, 178 pp.
- GCC and DTRP (Gaborone City Council and Department of Town and Regional Planning). 1997. Gaborone City development plan. Ministry of Local Government, Lands and Housing, Gaborone, 343 pp.
- Geoflux. 1994. Environmental impact study of exploitation of sand, clay, gravel and rocks and dumping of construction waste in the Gaborone region. Department of Town and Regional Planning, Gaborone, 106 pp.
- Government of Botswana. 1990a. Report on the Botswana national conservation strategy. Government Printer, Gaborone.
- Government of Botswana. 1990b. Botswana national conservation strategy: National policy on natural resources conservation and development. Government Printer, Gaborone.
- Government of Botswana. 1997. National development plan 8: 1997-2003. Ministry of Finance and Development Planning, Gaborone, 509 pp.
- Hardoy, J. E., D. Midin, and D. Sauerthwaite, 1992. Environmental problems in Third World cities. Earthscan Publications, London.
- Holm, J. D., and P. P. Molutsi. 1992. State-society relations in Botswana: Beginning liberalization. Pages 75-95 in G. Hyden and M. Bratton (eds.), *Governance and politics in Africa*. Lynne Rienner Publishers, Boulder, Colorado.
- Kgathi, D. L. 1992. Household response to fuelwood scarcity: Implications for energy policy. PhD thesis. University of East Anglia, Norwich, England.
- Kruger, F. 1998. Taking advantage of rural assets as a coping strategy for the urban poor: The case of rural-urban interrelations in Botswana. *Environment and Urbanization* 10(1): 119-134.
- Lekorwe, M. H. 1998. Local government, interest groups and civil society. Pages 87-96 in K. R. Hope and G. Somolekae (eds.), *Public administration and policy in Botswana*. Juta and Co, Kenwyn, South Africa.
- Mabua, I., K. Mokokwe, and K. Busch. 1994. Protection of water resources against pollution by vulnerability mapping in Botswana. Pages 98-99 in *Integrated water resources management workshop 1994: Proceedings*. 17-18 March, Kanye and Gaborone. Department of Environmental Science and Department of Geology, University of Botswana, Gaborone.
- Matale, C. 1992. Environmental impacts of mining: strengths and weaknesses of environmental legislation. Pages 61-68 in *Report of the National Conservation Strategy (co-ordinating) agency workshop on environmental impact assessment legislation*. Government of Botswana, Gaborone.
- Ministry of Local Government, Lands and Housing. 1991. The National Conservation Strategy (NCS) Board and Coordinating Agency discussion paper No. 1, May, 1991. Ministry of Local Government and Lands, Gaborone.
- Molamu, L. L. 1989. Francistown phase IV development area study. Applied Research Unit, Gaborone, 129 pp.
- Molao, R. 1996. How lack of public participation in development control contributes to failure of development control

- in low income residential areas: A case study of Francistown. BA dissertation. University of Botswana, Gaborone.
- Molebasi, C. O. 1994. Towards understanding policy-practice disjunction in urban planning: The case of Kanye, Botswana. PhD thesis. University of Newcastle-upon-Tyne, England.
- Molebasi, C. O. 1998. Urban environmental problems in Botswana. Pages 131-155 in J. R. Adhopheng, C. O. Molebasi, E. N. Toteng, and O. Totolo (eds.), *Environmental issues in Botswana*. Lenswe-la-Lesedi, Gaborone.
- Molebasi, C. O., and E. N. Toteng. 1998. Introduction in J. R. Adhopheng, C. O. Molebasi, E. N. Toteng, and O. Totolo. *Environmental issues in Botswana*. Lenswe-la-Lesedi, Gaborone.
- Mosha, A. C. 1996. The city of Gaborone, Botswana: Planning and management. *Ambio* 25(2):118-125.
- NCSCA and GTZ (National Conservation Strategy Coordinating Agency and German Agency for Technical Cooperation). 1996a. Study on the management of medical wastes. National Conservation Strategy Coordinating Agency, Gaborone, 161 pp.
- NCSCA and GTZ (National Conservation Strategy Coordinating Agency and German Agency for Technical Cooperation). 1996b. Study on the recycling of metal wastes. National Conservation Strategy Coordinating Agency, Gaborone, 77 pp.
- Neme, L. A. 1997. The power of a few: Bureaucratic decision-making in the Okavango Delta. *Journal of Modern African Studies* 35(1):37-51.
- Raditloaneng, N. W. 1986. The National schistosomiasis control programme: Baseline survey of the Ngamiland district. Applied Research Unit, Gaborone, 54 pp.
- Rasisigo, L. 1991. The effectiveness of development control in Botswana planning areas: A case study of Gaborone. BA dissertation. University of Botswana, Gaborone.
- Reynolds, M. 1998. Book review. in J. R. Adhopheng, C. O. Molebasi, E. N. Toteng, and O. Totolo (eds.), *Environmental issues in Botswana*. Lenswe-la-Lesedi, Gaborone.
- Segosebe, E. M., and C. Van der Post. 1991. Urban industrial solid waste pollution in Botswana: Practice, attitude and policy recommendations. National Institute of Research and Documentation (NIR) paper No. 17. University of Botswana, Gaborone, 43 pp.
- Setimela, M. 1984. Peleng Baseline study. Applied Research Unit, Ministry of Local Government and Lands, Gaborone.
- Silishena, R. M. K., F. Kalabamu, E. N. Toteng. 1996. Urban indicators for Botswana. Report for the Ministry of Local Government, Lands and Housing, Gaborone, 15 pp.
- Snowy Mountains Engineering Corporation, WLPU Consultants, and Swedish Geological International AB. 1991. Botswana national water master plan study, Volume 3: Economics, demography and water demand. Department of Water Affairs, Gaborone, 98 pp.
- Somolekae, G. 1993. Bureaucracy and democracy in Botswana: What type of relationship? Pages 113-122 in S. J. Siedman (ed.), *The political economy of democratic development*. Lynne Rienner Publishers, Boulder, Colorado.
- Tjallingii, S. 1995. Ecopolis: Strategies for ecologically sound urban development. Backhuys Publishers, Leiden.
- Toteng, E. N. 1988. Population factors and financial constraints to the development of rural housing in Molepolole. BA dissertation. University of Botswana, Gaborone, 93 pp.
- Toteng, E. N. 1995. Urban Informal settlements in Botswana. Paper. International conference on informal settlements. University of Durban-Westville, South Africa. July 1995, 20 pp.
- Toteng, E. N. 1998. Depletion of wood resources in Botswana. Pages 59-78 in J. R. Adhopheng, C. O. Molebasi, E. N. Toteng, and O. Totolo (eds.), *Environmental issues in Botswana*. Lenswe-la-Lesedi, Gaborone.
- Toteng, E. N. 2000. A stakeholder approach to understanding the political ecology of urban water resource management in Gaborone, Botswana. Unpublished PhD thesis. Cardiff University, Wales.
- Tsie, B. 1998. The state and development policy in Botswana. Pages 1-20 in K. R. Hope and G. Somolekae (eds.), *Public administration and policy in Botswana*. Juta and Co., Kenwyn, South Africa.
- Yeagar, R. 1993. Governance and the environment in Botswana: The ecological price of stability in S. J. Siedman (ed.), *The political economy of democratic development*. London, Lynne Rienner Publishers, Boulder, Colorado.