

Building in Wetlands to Meet the Housing Demand and Urban Growth in Harare

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Abstract

The research assesses the challenges of building in wetlands to meet housing demand. The City of Harare has been in the limelight owing to the reclamation of wetlands for urban development as a remedy to rapid urbanization. There is an increase in the number of people living in wetlands and the inhabitants of wetlands encounter a number of problems that include structural failure of their housing units and they are prone to waterborne diseases. The research recommends that the government and local authorities increase residential development in satellite towns to avoid reclamation of wetlands, and wetlands have to be restored and rehabilitated. There is need to develop effective urban policies and plans concerned with protection and restoration of wetlands. Consultation and participation of all the relevant stakeholders must be treated as a matter of urgency before the utilization of wetlands. Essentially wetlands need to be strictly reserved for recreational purposes.

Keywords: wetlands, housing demand, urban growth, water borne diseases

1. Introduction

Harare, formerly Salisbury has a population of 2 098 199 ZimStat (2012). It is Zimbabwe's largest city and its administrative, commercial, and communications centre. Harare is situated at an altitude of 1,483 m. The topography of the city is hilly in rocky areas, flatter in the south, and undulating in the north Rakodi & Mutizwa-Mangiza (1990). The city lies on a watershed plateau with some of the country's best agricultural soils; hence the above stated advantages of this city have led to the massive attraction of population to this city since colonial times. According to Wekwete (1992), with the lifting of controls at independence, urban populations grew by leaps and bounds. This was due to the rural-urban drift that was characterised during the times. Urban areas were very attractive as they offered better job opportunities as well as social facilities relative to the rural areas. An article by Mandava (2012), shows that the first census after independence, in 1982, put the population of Harare at 700 000, representing about 10 percent of the country's population. Recently the August 2012 census results highlighted that, Harare's population in August 2012 stood at 2 098 199 including the metropolitan areas, translating to 16 percent of the total population and making it the most populous province in Zimbabwe.

After the attainment of independence in 1980, the urban population of Zimbabwe rose rapidly from 23% in 1982 to 30% by the early 1990s; rapid urbanization and urban growth took centre stage escalating the supply of housing thereby leading to the high demand for housing. Simultaneously the rapid urbanization and urban growth led to reclamation of wetlands as arable land for urban development gradually became scarce. Mushamba (2010) illustrates that, local governments derive a lot of revenue from the sale of land and property tax. In addition local governments are responsible for the approval of construction plans, provision of building permits and the inspection of construction.

Nevertheless, during the Zimbabwe hyper-inflationary era (2005-2008), the local authority abused this function as property developers had an alarming interest on acquiring more and more land and property within the confines of the City of Harare. Once neglected open spaces, wetlands and other poorly drained soils in Harare were invaded by developers who had the motive of attaining the much need foreign currency. Despite the establishment of an 'inclusive government' and the economic stabilization that followed, environmental issues are still peripheral as wetlands continue to be exploited to meet the needs of housing demand and urban growth.

Wetlands serve as the major sources of water and maintain the well-being of the biodiversity. The unique state of their soil composition makes them unfit to accommodate urban human settlements. According to Whitlow (1985), almost all open green space in the greater Harare are wetlands and these form the head waters of the Manyame/Marimba/ Gwebi catchment basin, upon which the city is built. This basin is the water source for half of the population of Zimbabwe. The water supply is downstream of Harare, so it is important to keep wetlands intact. Urban growth has resulted in massive construction in the City of Harare and its needs have led to the reclamation of wetlands for urban housing developments.

1. Land shortages

Rapid urbanization and urban growth in Harare have led to the construction of housing units and other buildings to cater for the needs of the growing population whilst the availability of arable land has spontaneously declined. Boadi, Kuitunen, Raheem & Hanninen (2005) clarify that, because of such a development, urban authorities have resorted to wetlands to meet the demands of the population at the same time undermining the status of such vulnerable land. The UNHSP (2009) highlights that, there is an acute shortage of virgin land in some areas, but the issue of shortage of serviced land pervades all local authorities in Zimbabwe. This issue needs to be addressed as a matter of urgency so as to accommodate the needs of rapid urbanization and urban growth. According to Boadi et al, urban growth and rapid urbanisation have been the major drivers diminishing the land resource in sub-Saharan cities. It is therefore against this background that the city authorities have resorted to building and allocating stands even in wetlands to meet the housing demand.

2. Wetlands

Wetlands are areas that are seasonally or permanently covered by shallow water and areas where the water table is close to or at the surface, and such areas are characterised by water-saturated soils and water-tolerant or water-loving plants. According to Muderere (2011) wetlands comprise an incredible array of landscapes. They can be found near the banks of rivers and streams, along the edges of lakes and ponds, or in open fields and wooded areas where the water table is near the surface. Some wetlands may not even appear wet all year-round while other wetlands occur widely throughout both rural and urban areas and can be very small or thousands of hectares in size. In some areas, particularly near cities and towns, wetlands may be the only remaining under-developed open spaces. In Zimbabwe, wetlands cover approximately 4.6 percent of the land; vleis are the most dominant as they cover 3.6 percent of the land area Muderere.

Throughout the world many different names are used to describe wetland areas. Wetlands can also be termed as marshlands; they have been classified internationally into marine, estuarine, riverine, palustrine and lucustrine systems Whitlow (1985). They either contain salt or fresh water. Marshes, vleis locally known as dambos, floodplains, and springs are the types of wetlands found here in Zimbabwe. Vleis in general are seasonally waterlogged grass covered depressions mostly found in river headwaters and along stream banks but can also occur independently of the drainage system. In Zimbabwe it is estimated that there are 1 262 000 hectares of wetlands, Whitlow. Wetlands are home to many plants such as reeds, grasses, water lilies, sedges and trees. These plants in turn provide food, a place of attachment and shelter for many species furthermore wetlands are essential to the health of our lakes, rivers and streams because water sources start from them and by disturbing them, we are making it possible for the water table to go deeper Sarukhán & Whyte (2005). Wetlands also act as natural sponges for precipitation run-off. Besides being effective at filtering and cleaning water and sinking carbon, wetlands are actually the main source of our drinking water and also serve as natural wastewater purification systems. According to Timberlake (1998) wetlands, particularly swamps and marshes are not stable environments. They fluctuate in extent and distribution depending on natural phenomena such as climatic cycles and channel blockages, as well as from human activities such as dams, drainage and pollution. Disturbance in wetland functions that are life support systems has detrimental effects on them and the surrounding environment.

3.1 Urban developments in wetlands

Numerous wetlands that can be identified in and around Harare have since been converted to stands, most notable being the Monavale wetland where houses now stand, the Belvedere wetland by the National Sports Stadium where construction of a multi-purpose centre (hotel and wholesale) was recently completed, while a school was built on the Ashdown Park wetland. Wetlands in Ballantyne Park, Borrowdale (opposite the race course), Budiro 3 and 4, Tynwald, Glen Lorne, Eastlea, and many in Chitungwiza also face imminent danger in the face of constructions taking place on them Masara (2012).

3.2 Consequences of constructing on wetlands

Environmentalists propound that most cities in Sub-Saharan Africa have not been able to develop the basic utilities for water and environmental services to keep pace with the rapid growth, Boadi et al (2005). Incidentally, Zimbabwe's, rapid urban growth which is among the highest in the world, has led to the occupation of wetlands. As a result, residents have become vulnerable to water-borne diseases, such as cholera, typhoid, dysentery and diarrhoea among others. Settling in wetlands creates a situation that provides a conducive and willing environment for the propagation of disease. Since council is failing to collect refuse in residential areas; wetlands have been turned into illegal dump sites. Additionally, with the increased pace of sewerage burst run-off, such water eventually makes its way straight into wetlands. This can be seen in the light of one such area like Mbare which recorded some of the highest cholera related deaths during Zimbabwe's worst cholera epidemic in 2008-2009, Mandava (2012). The World Health Organization (WHO) reported in *The Zimbabwe Situation* on 24 May 2009 that cumulative cholera deaths were 4 276 of which 2 627 were community deaths as a result of environmental pollution and inability to supply clean water in urban areas. UNDP (2009) reported that environmental problems bedeviling Dzivarasekwa are manifold and have resulted in serious land degradation in particular the general deterioration of the environment. The illegal solid waste dumps in wetlands are ultimately burnt and in so doing release a lot of pops like dioxins and furans which end up affecting the health of the local population. Houses built on these wetlands are prone to flooding and collapsing through structural failure, cracking, and bending of structures leading to reduced lifespan of the structures built, Muderere (2011). It has become the norm that during heavy rains structures built on such poorly drained soils cannot stand the course of nature and are eventually filled up and flooded with storm waters and to make matters worse sewage overflows make their way into houses located in wetlands.

Wetlands remove and store greenhouse gases from the Earth's atmosphere thereby slowing the onset of global warming ("EarthTalk Why are wetlands," 2013). Therefore building on wetlands has severe environmental implications which if not addressed may see future generations failing to benefit from wetlands as we are currently doing. (The Florida Department of Environment Protection [FDEP], 2012) illustrates this by saying that "the altered flow patterns can also concentrate pollutants, cause erosion, cause sedimentation, and reduce valuable shallow water habitats" (p.5).

3.3 International Conventions and treaties concerning the protection of wetlands

The policies for the protection of natural resources require an international approach because they cannot be accomplished by local and national approaches to sustainably manage the utilization of natural areas. To counter this limitation, conventions, treaties, and protocols were designed to manage externalities that cross boundaries of countries. According to McInnes (2010) February 2 marks the date assigned to wetlands and is known as World Wetlands Day (WWD) commemorating the Convention of Wetlands that was signed on the 2nd of February 1971, in Ramsar, Iran. WWD was first celebrated in 1997 and now each year government agencies, nongovernmental organizations, conservation organizations, and groups of citizens can help raise public awareness about the importance and value of wetlands. McInnes states that the Convention is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their wetlands and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories. Unlike the other global environmental conventions, Ramsar is not affiliated directly to the UN system of Multilateral Environmental Agreements (MEA), but it works very closely with the other MEAs and is a full partner in the "biodiversity-related cluster" of treaties and agreements. Sustainable wetland utilization is defined as human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations, McInnes.

In accordance to the Ramsar Convention different provinces in Zimbabwe commemorate the World Wetlands Day on the 2nd February of each year and the theme for the year 2012 was “Wetlands and Tourism — My responsibility, My leisure”. On the 2nd of February 2009, the Conservation Society of Monavale (COSMO) had the privilege of hosting Zimbabwe’s national commemorations of World Wetlands Day on Monavale Vlei. The preservation of Monavale Vlei is due principally to the efforts of the local community, working together as the Conservation Society of Monavale, with the assistance of local NGO’s BirdLife Zimbabwe and Environment Africa, the City of Harare, the Ministry of Environment and Natural Resources Management and other organizations. Legal protection has been secured and COSMO manages it under a licence from the Ministry of Environment and Natural Resources Management.

The current constitution of Zimbabwe has no specific clause that provides for the protection of the environment. However, section 4 of the Environmental Management Act (Chapter 20:27), affords every citizen of Zimbabwe the following environmental rights: the right to live in a clean environment that is not harmful to their health; access to environmental information; the right to protect the environment for the benefit of present and future generations; and the right to participate in the implementation of legislation and policies that prevent pollution, environmental degradation and sustainable management and use of natural resources, while promoting justifiable economic and social development .

The Environmental Management (Environmental Impact Assessments and Ecosystems Protection) Regulations, Statutory Instrument No. 7 of 2007, deals with the regulation of the Environmental Impact Assessment (EIA) process and protection of ecosystems. Part 11 of the Act provides that no industrial project shall be implemented without an EIA having been done. In preparing an EIA, a developer is obliged to consult widely with all stakeholders. The Agency will not issue a licence if it is not satisfied that the developer consulted with all relevant stakeholders in the preparation of the prospectus. Regrettably, the regulations do not provide specifically for the manner in which the consultation of stakeholders should be done nor who the stakeholders are. There is also no measure to ensure that the concerns of the stakeholders are incorporated in the prospectus. Therefore the regulation has a loophole which then is utilized to carry out environmentally unsustainable operations such as building in wetlands.

Chiesura (2009) says that, waste and solid waste disposal regulations such as the Statutory Instrument No. 6 of 2007: regulate the disposal of effluent and solid waste, prohibiting any person from disposing waste into a public stream or ground water without a licence. Furthermore, every generator of waste (except households) is now required to come up with a waste management plan by 31 December of each year which deals with quantity of waste, components of the waste, goals for reduction of the quantity and pollutant discharges of the waste, transportation and disposal of the waste and adoption of environmentally sound management of the wastes. It is an offence for any waste generator to fail to produce the waste management plan, Chiesura. Local authorities do produce these plans but fail to implement and execute the plan citing lack of resources, leading to further destruction of the environment.

Wetlands are principally protected by the laws of Zimbabwe and it is illegal to cultivate or build in wetlands before getting approval from the Environmental Management Agency (EMA). Wetland utilisation is governed by Section 113 of the Environmental Management Act (Chapter 20:27). Section 113 of the Environmental Management Act (Chapter 20:27) states that the minister may declare any wetland to be an ecologically sensitive area and may impose limitations on development in or around such area. Any activity conducted on/in a wetland, without a licence from the agency is considered illegal, and is punishable with a level 10 fine and or a prison sentence of no more than six months. It is therefore a legal requirement to apply for wetland utilisation from the nearest EMA offices throughout the country.

Local governments also have the responsibility of protecting wetlands since they perform an environmental management function. Mushamba (2010) asserts that local governments functions related to the environmental functions include management of open spaces and recreational facilities, conservation of natural resources, effluent or refuse removal and treatment. Local governments in Zimbabwe have the powers through various Acts which include the Urban Councils Act (Chapter 29:15), the Rural District Councils Act (Chapter 29:13), and the Regional Town and Country Planning Act (Chapter 29:12) to ensure that the environment is managed in a sustainable manner.

Conversely, the City of Harare has turned a blind eye on the environmental consequences of building in wetlands concurrently stands are still being allocated and developed in low lying areas whilst population pressure and high demand for arable land continues to undermine marshlands status and functions. Surprisingly councils, which are expected to safeguard these ecologically vital areas that we definitely need if we are to secure future water supplies, are at the forefront of running them down. The Harare and Chitungwiza local authorities have recently, sat before the EMA facing, among other environmental destruction charges, those of allocating stands on wetlands. It is therefore important to look more closely into some of the policy measures and strategies that have been put in place to deal with the problems (as well as to tap on the opportunities put forward) by urban growth pressure on wetlands.

3.4 Opportunities presented by wetlands

Major purposes of wetlands were outlined by Sarukhán & Whyte (2005) when they said that, wetlands ecosystems provide a diversity of services vital for human well-being and poverty alleviation. It is well established that provisioning services from wetlands, such as food (notably fish) and fibre are essential for human well-being. Supporting and regulating services (such as nutrient cycling) are critical to sustaining vital ecosystem functions that deliver many benefits to the people. The principal supply of renewable fresh water for human use comes from an array of inland wetlands, including lakes, rivers, swamps, and shallow groundwater aquifers. Additionally, wetlands have significantly provided invaluable opportunities for recreation and tourism as they present sustainable habitable environments for wildlife. Wetlands also have considerable aesthetic, cultural, educational and spiritual values and provide sustainable opportunities for recreation and tourism.

The ‘wise use’ of wetlands, at the centre of the Ramsar philosophy, is defined as “the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development” Ramsar Convention Secretariat (2007). Wise use therefore has at its heart, the conservation and sustainable use of wetlands and their resources for the benefit of humankind. The principle of wise use is especially relevant for wetlands located in urban areas and for those wetlands which support essential water and food requirements of urban areas McInnes (2010).

3. Findings and discussion

The informants for the study included the Harare residents with houses in or near wetlands, the councillors who represent wards which encroach into wetlands, the Planning Officials, the EMA officials, representatives from The Zimbabwe National Water Authority (ZINWA), Central Statistical Office officials, Department of Physical Planning officials, and civil society organizations officials. They agreed that urbanization is one of the major causes of the housing demand and urban growth in Harare. Harare being the country’s capital city means that it is the epicentre of development hence has greater economic opportunities therefore it is a major attraction of the population. All the officials who were interviewed highlighted the same views about the implications of building in wetlands. They made it clear that infrastructural developments on wetlands increase surface runoff and thus increase chances of flooding. A Conservation Society of Monavale (COSMO) official cited that some areas in Monavale are not easily accessible during the rainy season because of flooding.

The residents who have houses located in wetlands have witnessed the depreciation of their houses. This is evidence that building in wetlands results in structural failure to precast walls, fences and buildings; tilting of electricity poles, this poses a threat to human safety, whilst it remains a looming threat to sustainable housing provision. An interview with a senior official of the Zimbabwe Rural Urban Planning Association (ZRUPA) revealed that houses built on wetlands are prone to flooding and collapsing. The danger associated with housing developments on wetlands may include cracking and bending of structures reducing the lifespan of the structure. Essentially therefore building in wetlands is not a lasting solution to ensure the sustainable delivery of housing but has rather disturbing implications which undermine the housing delivery effort.

The failure of the City Council to collect refuse has meant that residents who reside in or near wetlands practice unsustainable means of disposing of refuse, such as disposing in wetlands. The majority of the residents dispose of their refuse in wetlands, while the rest of the residents have resorted to disposing of their refuse in open spaces or burning it.

However the residents in Monavale are practising environmentally friendly methods of waste disposal. They said that they operate a community based collection mechanism in which they liaise with the City Council and use their own vehicles to transport their refuse to legal disposal sites. Literally the residents practice the mismanagement of solid waste because their waste is not disposed of in a proper way, not collected regularly, or not collected at all. In this case the waste can cause risks to people's health and the environment they live in. Uncontrolled burning of waste and uncollected piles of garbage are all examples of waste mismanagement. Uncollected piles of garbage in wetlands, open spaces and also burying of waste leads to the risk of polluting the ground water and in turn the water that people drink.

Cholera, dysentery and typhoid are the main health environmental problems in the surveyed area. Furthermore the respondents reported that mosquitoes were numerous in their areas as compared to other areas in the city which are not located near wetlands, therefore making them prone to malaria. The water crisis situation and the increased pressure of sewerage drainage due to rapid population growth in Harare have been evidenced by numerous sewer burst pipes. The sewerage run-off then easily flows to wetlands because they are low lying areas thus creating conditions necessary for water borne diseases, thereby posing serious health threats to the inhabitants of wetlands.

3.1 Environmental implications of building in wetlands

The research also analyzed the implications of some environmental aspects or consequences of wetland change. An EMA official asserted that urban development in wetlands compromises sustainable development as such actions reduce ground water recharge capacity and lead to loss of water reservoirs, drainage congestion, water logging and loss of vegetation.

An interview with the ZINWA groundwater department official, revealed that the construction of houses on wetlands coupled with a sharp increase in the use of borehole water has contributed to the depletion of Harare's water table. According to the ZINWA official, the water table used to be around 15 to 18 metres below the earth's surface but now it has gone down to about 30 metres in some areas. Currently the City of Harare has a water crisis, the researchers observed that close to almost 4 in every 10 residents of the new houses located on the wetland that overlooks Budiriro 4 have dug water wells. Equally the water table depletion is evidenced by boreholes in some parts of Borrowdale and Ballantyne Park that have dried up.

The ZINWA official added that the construction of houses on wetlands has also caused an increase in the contamination of underground water. Houses with septic tanks that drain sewer effluent into soakaways pollute underground water through seepage. Since soakaways are not connected to the main sewer channels, solid waste settles in the deep pit and the waste water seeps into the ground. Septic tanks also burst thereby getting into waterways and polluting underground water. He explained that, if construction of houses on wetlands continues at the current rate we run the risk of declaring underground water unsafe for drinking and projections indicate that, by 2025 there will be water scarcity in Zimbabwe as a result of the deterioration and mismanagement of valuable ecosystems.

A COSMO Trust official revealed that the City of Harare is built on top of its water source and its main water supply Lake Chivero is downstream. This means that much of the water deposited in Lake Chivero, in particular, takes with it a portion of Harare's sewage and pollution, as well as increasing amounts of siltation, all of which have served, in the last decade or so, to seriously decreasing the capacity of the Lake whilst increasing the impurity of the stored water. This puts greater strain on Harare's water purification facilities, tasked with pumping water upstream, as well as costing the City's ratepayers huge outlays to provide the chemicals needed to make this water potable hence Harare should have been located downstream rather than upstream of Lake Chivero. The official exemplified the City of Gweru and said that it is located downstream of the Gwenhoro and White Waters Dams. In addition the official also took note of the City of Kwekwe which is located downstream of Lake Sebakwe, therefore these two cities are strategically located and do not face acute water shortages furthermore their location does not pollute their water sources.

An official from EMA mentioned that the construction of houses on wetlands also causes a decrease in biodiversity because wetlands provide a habitat to different species of flora (plants) and fauna (animals) that live in semi-aquatic conditions.

Some of these land and semi-aquatic animals and plants include amphibians and arthropods which are at the beginning of the food chain supporting all other kinds of life such as frogs, fish, birds and large dry land animals. Essentially these findings support the view that urban developments in wetlands destroy wetlands biodiversity. The respondents emphasized that the legislations in place for the protection of wetlands are not being fully implemented by the City Council and they confirmed that building in wetlands is being carried out without necessarily consulting all the relevant stakeholders and this is evidenced by the poor living conditions in residential areas in wetlands such as perpetual existence of water borne diseases and structural failure of housing units amongst other problems. In essence, all the officials had the knowledge about wetlands as none of them responded that they do not know anything about wetlands but they all concurred that building in wetlands is one of the controversial issues prevailing in the Harare City Council.

The COSMO Trust official stated that in most cases the majority of developments are taking place without any EIA being done, because a house cannot be developed a few metres from a stream in a flooding zone. One of the City of Harare officials confirmed that no EIAs were being done at most of the current building sites and that is why the city has been accused for operating without an EIA simply because EMA's laws are not stringent enough to stop construction of houses on wetlands. It appears that EMA lacks the capacity to protect the wetlands from land developers. If EIAs were carried out, it baffles the mind as to how infrastructure development is taking place on designated and protected wetlands without the EMA objecting. The failure by the EMA to protect the country's wetlands effectively betrays the commitments made under the Ramsar Convention to promote the conservation of wetland areas.

4. Conclusions

The research identified the causes of the housing demand and urban growth which include rapid urbanization which is a product of natural population increase and rural to urban migration, economic meltdown and shortage of land for urban development. These causes have proved that they are central to the reclamation of wetlands for the purpose of urban development. A fact to note following the results of the research findings is that urban growth in Zimbabwe has been very rapid following the relaxation of the pre-independence racial influx control measures on rural to urban migration, despite the Operation Murambatsvina (Restore Order) of 2005. Rural-urban migration has been occurring at unprecedented levels, yet government and local authorities have not been able to provide sufficient accommodation for these people.

Wetlands are essential for human well-being, the remaining wetlands are crucial for Harare as they are the main sources Lake Chivero, the City's major water source and they maintain the environmental ecological balance. Therefore, the reclamation of wetlands is not the solution for the housing demand and urban growth but is formula for disaster to future generations. The results of the data collected revealed that residents with houses built on wetlands complained about the dangers that they face as they conduct infrastructural development on wetlands, these include the reduced lifespan of their houses owing to massive cracking and bending as a result of excessive moisture in the wetlands soils, inaccessibility to their homes during the rainy season due to flooding and that they are vulnerable to waterborne diseases.

An assessment on the effectiveness of legislations and policies for the protection of wetlands was carried out. The research revealed that the Government of Zimbabwe has made tremendous progress in terms of legislating for environmental issues. However, a key finding is that there is a serious disjuncture between the legal provisions and what happens on the ground in terms of the implementation of those legal provisions. The evidence from the assessment concluded that, despite environmental policies and laws for the protection of the wetlands, Harare City Council continues to allow urban development to encroach wetlands because local government legislations out muscle the Environmental Management Act Chapter 20:27 whilst those responsible for the protection of wetlands start pointing fingers instead of coming up with a lasting solution to this predicament. It has been proven by the research findings that wetlands sustainable utilization presents opportunities to progressive urban development. Wetlands have an un-rateable value to the society because they play a major role in the environment to keep it in a balanced state and they support multiple value ecosystems. They perform a number of vital functions in the maintenance of the overall balance of nature, flood control, soil erosion control, water storage and purification, ground water recharge and discharge, protection and stabilization of storm water by acting as natural barriers and recreation sanctuaries, besides providing outputs of commercial value and economic sustenance.

Therefore wetlands should be conserved by ensuring their wise use of their resources and whenever possible they should be restored and rehabilitated for the benefit of humankind.

5. Recommendations

The emerging challenges of urbanization facing urban residents appear universal, irrespective of the country, location, or economic prosperity of the city. It is only the magnitude of change and the transferability of solutions that needs to be refined to ensure that urban growth solutions are directed in a sustainable manner that does not compromise the environment.

The best way to limit urban encroachment in wetlands is to ensure that the government and local authorities direct massive housing supply to production of satellite towns so as to release pressure on wetlands in the city. This can be achieved if the Government and local authorities coordinate with the private sector and the international community to address the housing needs, of the ever increasing urban population, in a sustainable manner.

Millennium Development Goal 7 calls for different sectors to join forces to secure wetland environments in the context of sustainable development and improving human wellbeing therefore there is a clear need to develop effective urban policies and plans around the protection and restoration of wetlands ecosystems. Regional and town planners must first consider planning on land use with the environment in mind thus essentially rethinking, re-planning and saving the remaining wetlands from ongoing environmentally unfriendly construction work. The EIAs must be a priority and officials must avoid tendencies of ignoring this legal requirement by only completing it after construction has taken place to proposed building activity in or near wetlands.

There is an immediate need for the Government of Zimbabwe to review the Regional, Town and Country Planning Act Chapter 29:12, the Environmental Management Act Chapter 20:27, the Urban Councils Act Chapter 29: 15 and all other relevant Acts to align the substance and the procedures of these Acts with urban planning in terms substantive protection of wetlands to urban development. This alignment will necessarily result in the change of current norms, standards and by-laws governing wetlands protection. It will also review and establish a clear definition of the significance of wetlands to urban areas and responsibilities between different spheres of government in ensuring compliance and enforcement with provisions of the law.

There is an immediate need to create a practical dialogue through the creation of a consultative climate concerning the urban development on wetlands between various stakeholders which include different spheres of government, urban planners, managers, civil society and the residents. It is recommended that local authorities and the EMA must advocate and come up with public awareness campaigns which are aimed at educating the general public and policy makers about the value of wetlands in Harare therefore the participation of local people in conservation initiatives of wetlands will ensure a sustainable management of wetlands. The most important action which can be taken by local government to ensure wetlands protection is for their clear delineation on the Master Plan for all open green spaces to be re-zoned to prevent their use for residential or other uses. Re-emphasis considering the wise use of wetlands must be carried out by Council restricting wetlands to be delimited to recreational facilities that are environmental friendly such as golf courses, parks as this it does not affect the ecological function.

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