

# Low-cost housing in zimbabwe essay sample



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In the 2016- 2017 rain season among other cities in Zimbabwe Harare experienced more rainfall as compared to the previous seasons. This can be attributed to the global climate change; however, these rains brought more damage than good to the existing infrastructure in the city center. The high rainfall that occurred during this season caused an increase in the surface runoff, with the poor storm water drainage that has both incurred leaks and is now not sufficient over the years because of ageing. In this report the study sought to identify the various problems caused by this increased rainfall, degree of damage caused and suggest possible solutions .

Harare city, in the past was known as the “ Sunshine city” one of the cleanest cities known for its beautiful Jacaranda trees that covered the vast area of the city. Recently since the year 2000, economic hardships in the country has seen this state of the city deteriorating year by year . The 2016 - 2017 rain season. Harare experienced more rains than before. Harare city center’s infrastructure increased over the years and with increased urbanization in the city. The surface runoff quantities has increased over the years but with no significant upgrading of the storm water drainage systems. This caused flooding in the streets of Harare as the existing storm water systems failed to clear water from the streets.

The flooding that occurred on 16th of January (Newsday 16th of January) caused traffic congestion, which in turn disturbed business on that date. Most people who work in the city center use public transport of which on the day the public vehicles could not access the CBD hence people were forced not to attend work. In a nation that is struggling economically, absence of employees at the few industries that are currently operating has very detrimental effects on the nation economically.

This outcome i. e. flooding is evidence of other problems that has been there for a long time . The city of Harare is relatively a young city that was built in the 1970s during the colonial era, and then known as Salisbury. During that time the city was built based on the city status at that time, since then they has been not much improvements or refocus of the storm water management. Even though more buildings have been built, infrastructure development has never stopped but on the same storm water management

system. Increased water runoffs caused an overload in the existing pipes; this caused the bursting of the pipes.

## 2. 0 MAIN OBJECTIVES

This study was motivated by the recognition of a failed storm water drainage service in the Central business district of Harare within the rainy season of 2016-17. Newspaper articles, reports on this matter from the region and local scholars underscored the desire to conduct this study. This study examines the causes and impacts of water flooding in Harare CBD.

The primary objective of the study was to analyse the flooding that occurred in the city center with the aim of identifying challenges and shortcomings therein. Results of the analysis should be used in discussions of relevant stakeholders to invest and refocus on the existing storm water drainage system.

### 2. 1 Specific objectives of the research were to:

Identify the challenges in the storm water drainage system for the development of a better system that will be able to cater for larger volumes of water runoffs of the ever-growing city ; examine the storm water disposal (processes and procedures) and synthesize, document and disseminate relevant recommendations from the above processes to relevant stakeholders.

## 3. 0 STUDY METHODOLOGY/ ACTIVITIES

The study was conducted from December 2016 to February 2017, and was qualitative in nature as it was a general survey of storm water drainage

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system and flooding in Harare C. B. D. It is a desktop study, mainly relying on analysis of interviews that were conducted. From these interviews, observations were made to establish information regarding urbanization, ageing drainage systems and lack of resources both material and financial. Such an analysis enabled clear identification of some of the causes of the water flooding in the urban areas and the magnitude of their impact in a short over time, while highlighting other approaches adopted.

That historical analysis enabled clear identification of some of the drainage problems and the magnitude of their impact over time, while also highlighting some other innovative ways adopted so far. The sources included mainly newspapers and published articles written about the flooding situation during this season.

A lot has been written concerning this issue on the problem relating to the continuously dilapidating storm water drainage system of Harare. So researchers sought to get firsthand information on the problem and the reason why the problem is persisting and perhaps suggest a possible solution.

Two methods were used to achieve the above:

- The first one involved review analysis of past literature within the subject, study of meteorological surveys reports and newspapers.
- The second one involved engagement of the relevant personnel i. e. the experienced council workers responsible for storm water drains and reticulations of the city.

- Municipal reports and plans.
- Senior residents of the CBD interviews were conducted.

### 3. 1 SITUATION

1Samora Machel Avenue. Picture courtesy of the Humanitarian Information Facilitation Centre Facebook page

2Corner Samora Machel Avenue and Julius Nyerere.(Newsday papers 17th February 2017)

### 4. 0 CONCLUSION

From the information gathered during the period of the research, it is evident that the state of the city's storm water drainage is far below the required capacity. Attention to the drainage system is a matter of urgency. With the city expecting such rains in future, they is need to renovate and unblock pipes of the existing drainage system, with the possibility of installing new pipe infrastructure.

The information gathered together with other written documents the municipal and the relevant parties responsible for the development of the infrastructure in the city could pin point areas of much concern and prevent such disasters from occurring in the future.

### 4. 1 RECOMMENDATIONS

These are some of the designs that could be implemented to improve the current storm water drainage system in Harare.

#### 4. 1. 1 Detention Basins

A storm water detention basin is an example of a Best Management Practice used to attenuate runoff from a storm event. A detention basin fills with water during rainfall, and a small outlet (“weir”) at the bottom of the basin controls the outflow rate of runoff. This is advantageous in that the runoff has a gradual rise and fall as opposed to the sharp peak of uncontrolled, “flashy” runoff. The gradual nature of the runoff hydrograph (chart of streamflow versus time) reduces flashiness of streams, which in turn mitigates erosion.

#### 4. 1. 2 Rain Gardens

Various areas in the city center will be evaluated for the implementation of a rain garden. Rain gardens are landscaped bowl-like areas that have permeable soil which facilitates slow percolation of water. A rain garden is typically planted with native species that can survive with little maintenance, and are constructed in areas where the water will naturally flow to them.

If they are constructed near a building, they need to be sited at least ten metres away from the building’s foundation to avoid structural issues. Soil is a key component to the success of a rain garden, therefore soil tests will be performed to determine if the soil needs to be engineered and augmented. The size of each rain garden is determined by how much runoff will be expected to flow to it, and how quickly.

#### 4. 1. 3 Green Rooftops

As an alternative to direct soil infiltration, the various buildings in the city center will be probed for possibility of adding a green roof. A green roof is a building partially or completely covered in vegetation and planting medium. A green roof will capture the rainfall and slow its progress to the ground. Green roofs also protect the roof from extreme climates by providing a durable buffer zone. Green roofs provide increased insulation and create a habitat for wildlife, yet most important for this project, they absorb rainwater. The buildings will be evaluated for current runoff and post-implementation runoff.

#### 4. 1. 5 Rainwater Collection System

Rainwater can also be diverted from the gutters into a collection system that will store the water for irrigation use or stream release when the threat of flooding has passed. The buildings will be evaluated for the retrofit of a collection system that will maximize the amount of water captured. Above or below ground storage systems could be constructed and the feasibility of both will be considered. Cost estimation will be provided along with various storage capacity options. This will be a good water conservation mechanism considering the vast shortage of water currently experienced in Harare.

#### 4. 1. 6 Pervious Pavement

Concrete and asphalt pavement areas contribute highly to flashy, concentrated runoff events because so little rainwater is allowed to infiltrate into the underlying soil. One emerging technique for reducing this effect is the use of “ pervious” paving products. Such products have porous interstices incorporated into the material which allow rainfall to seep into the

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underlying soil instead of running into storm sewers, which rapidly deliver high volumes of water directly to the nearby creek.

While there may be concerns about the increased maintenance required and appropriateness of these surfaces for harsh winter conditions such as are common in Iowa, there are many different types of pervious pavements with different properties. This option may or may not be optimal for high traffic areas such as main streets, but less used areas such as parking lots and walkways may provide opportunities to greatly reduce flashy runoff during rainstorms. The EPIC team will quantify the impact that these surfaces could have in reducing the rapid runoff events in the park.

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