

## Surface Water Management in Ghana

Michael Padi\*

Ghana Meteorological Agency, PO Box 9471, Airport-Accra, Ghana

\*Corresponding author: Michael Padi, Ghana Meteorological Agency, PO Box 9471, Airport-Accra, Ghana, Tel: +233030701001; E-mail: michaelpadi2000@gmail.com

Rec date: June 22, 2016; Acc date: July 11, 2016; Pub date: July 20, 2016

Copyright: © 2016 Padi M. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

If adequate measures are not taken to protect the water bodies in Ghana, the rivers will dry up and those left will be highly polluted and the country will have to import drinking water from the neighbouring countries and from abroad for human consumption. Also, lots of lives and property would be lost through flooding in most cities in every rainy season if certain habits like building on water ways and dumping of rubbish into drains are not discouraged.

**Keywords:** Surface water; Floods; Ghana

### Introduction

Floods usually occur when land, which is normally dry, is inundated with water. Rainfall is a very common but not the only cause of floods in Accra. On Wednesday June 3, 2015 Accra suffered from severe flooding for several hours of heavy rainfall, and gas explosion which killed more than 100 people sheltering from the rains at a GOIL fuel station near the Kwame Nkrumah Circle, and injured others.

As the flood waters recede and residents are recovering from the trauma and try to salvage property, several studies on the floods and why they occur are been conducted. It has been realized that for coastal cities in Africa, south of the Sahara, impacts from climate change are understood to include sea-level rise which leads to the inundation of lagoons and seaside wetlands, increased storm surges and consequent flooding, changes in disease vectors, and drought. Many of these factors have implications that go far beyond the coast and sometimes threaten the fragile national economies.

Vulnerability to flooding has both hydrological and anthropogenic sources in Ghana, especially in Accra. Hydrological factors include rainfall, its formation and the flow of water on the surface of the earth, while anthropogenic factors are those caused by human activities like building on water ways and dumping rubbish into the drains.

Accra, located in the coastal savannah ecological zone, in the south-eastern corner of Ghana receives the least rainfall annually, (600 mm to 800 mm). However, heavy rains exceeding 84 mm in one day, and 91 mm in two days do recur biennially. This zone has two main rainy seasons; the major and the minor rainy seasons in any particular year. In recent times, the zone's tendency to such heavy rains is exacerbated by climate change and variability and its associated extreme weather events.

Generally, rubbish and other things on the ground, including polythene and leaves are carried by the rain water from the road sides and pavements into the drains. Eventually they turn to slow down the speed of the run-off, but in the case of the main cities in the country, the vegetation had been cleared and the space used for buildings, car parks, roads and playgrounds so there is large amount of run-off whenever it rains moderately or heavily.

The cities in Ghana are spreading very fast and the paved land surfaces are also increasing because most people like to cover their compounds with pavement blocks so eventually reduce the previous bear land that allows percolation or sinking of water into the ground when it rains. Consequently, heavy rains produce large volumes of run-off and flush floods that results in loss of life and property. The rain water sometimes carry human beings and belongings of people when heavy rain storm affect the cities.

Accra is at an elevation of about 95 m above mean sea level but some areas are much lower. There are a number of rivers and streams that run through the city that feeds in to the Odaw River which is the biggest of all and runs into the sea through the Korley Lagoon. Areas and settlements around this drain which include suburbs like Dzowulu, Alajo, Avenor and Adabraka are the most prone areas to flooding. These areas are very low lying areas so when rubbish gets stuck in the drains and can no longer be transported, the water over flows its banks to flood the place.

The Odaw River which is believed to be in its maturity stage of its course has a gentle gradient and the speed of flow is also reduced than it was in its youthful and middle stages. As a result, rubbish that finds its way into the drains at different places get stuck and thereby increase the level of its base through the accumulation of particles. Silt and debris deposition becomes the order of this stage of the river. Sand banks develop in the lowest areas along the channel between Odawna, a suburb near the Kwame Nkrumah Circle and the Korle Lagoon, very close to the sea. These sand banks obstruct the rivers flow and results in overflow of its banks to flood the surrounding lowlands. Bad waste management and attitudes are the result of this siltation that leads to the flooding.

The rate at which population is growing in the cities is very rampant and it is believed to be rural-urban migration. These migrants only find areas close to these river banks, unoccupied by the real natives of the city and other authorized inhabitants. These people are mostly low income earners and people living in poverty. Sodom and Gomorrah in the central part of Accra are clear examples of those areas in question. The residents construct cottages with cardboards, or thin plywood and iron sheets. In some instances, the builders fill-up dry stream channels with rubbles to construct their houses and such developments lack building permits and are never supervised by qualified technician. Those poverty enclaves are vulnerable to flooding almost always when there are conditions that leads to flooding.

Most parts of the cities also have drainage networks that are underdeveloped in connection with other rivers and streams that drain the cities. Some sections of these drains are reinforced with concrete fortifications. There are also drains that are much smaller to contain the increased amount of flush floods that are developed these days than what used to occur in the past. Apart from the insufficiency of the drains, most of them have been observed to be undersized, unconnected, or improperly channeled and some floods have ever been traced to these faulty drains.

A large amount of orange and palm tree farms in the Eastern Region of Ghana have been destroyed in 2016 following a long dry spell that hit the country from November, 2015 to March, 2016. The farming communities that have been affected said they have lost their investments after contracting loans from the banks to support their farms. Some farmers said the level of destructions of orange and oil palm trees has come at a great loss and has been attributed climate change. The farmers said their only option is to resort to irrigation so experts from the Ghana Irrigation Development Authority went to inspect their farms for the irrigation to be provided but the farmers found the irrigation prohibitively expensive and asked for government's support in building dams for them through soft loans to enable them to win their livelihood back from the drought.

Residents in other parts of the regions also battled with acute water shortages that hit the country which led to the drying up of the Densu River, for example, which is their main source of water in the Eastern Region. The river had dried up due to farming activities by the residents along its banks, which has caused sand from their farm lands to be washed into the river, causing the water level in the dam to drop. Illegal mining activities has also polluted the little water left in some of the rivers. Reports from the Council for Scientific and Industrial Research (CSIR) proved that traces of mercury have been found in some of the river bodies, and besides that, the water in some rivers have changed colour to brown, completely.

## Conclusion

Ghana's potential importation of water from its neighbouring countries seem to be at hand if activities that cause water in rivers to go bad for human consumption is not discouraged. Ghana is not a desert country, but certain unfortunate events may be overtaking the country. How could anyone even think of water importation to a country like this? Ghana, with its rivers flowing full all-year-round and in the rainy seasons having its towns flooded, can easily get into this kind of situation. It may then sound strange for Ghana to even contemplate importing water to a few Ghanaians.