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The experience and impact of urban floods and pollution in Ebo Town, Greater Banjul Area, in The Gambia

Afi Kavegue & Irit Eguavoen

Abstract

The unplanned settlement Ebo Town is flooded almost every year with polluted water from uphill Kanifing Municipality because of a lack of infrastructure for sanitation and drainage. When droughts occurred in the 1970s, destitute people started to move to the peripheral swamp of Tambi Wetland Complex first to cultivate rice and later to settle. Today, after wetland conversion, Ebo Town is blocking the runoff to the lagoon. Most inhabitants subsist on very low incomes. Based on interviews with teachers, school children and their families, the authors analyze how lives and family income change as a result of floods. Accessing school on safe ways may not be possible during the floods and the risk of becoming ill increases. The study also investigates what schools, authorities, parents and external agencies do to improve the situation. The key findings show that Ebo Town residents undertake minor modification on their houses, carry valuable property to safe places and restrict school attendance in order to protect their children from floods and illness. They pursue reactive and concurrent strategies on household level rather than mobilizing the Ebo Town community for more effective action. Many people thought they would not be able to change the situation anyway and waited for government support.

Keywords: urbanization, wetland conversion, flood, disaster, children, storyboard, West Africa, Gambia

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1 Introduction¹

The areas most vulnerable to flood in the Gambia include lowlands and waterways, such as the riverine areas of the River Gambia, as well as wetlands and unplanned urban settlements. Flood risk is significant for the low-altitude country where 20 percent of land is covered by wetlands. The marine coast and riverine wetlands are partly lined with and protected from tides by mangrove swamps. Further inland, the land is seasonally flooded by the river. The mangrove systems bordering on Banjul, the capital; the tourist beaches of Bakau; and the coastal areas of Old Jeswang, Ebo Town, Tallinding, Kukunjang, Fagikunda, and Abuko have had their hinterland reclaimed for urban settlements. Thus, the mangrove fringe and the adjacent agricultural lands had become narrower by the 1990s (Jallow et al., 1996). The trends of rural-urban migration toward the coastal areas on the one hand and the encroachment of wetlands on the other hand side have continued since.

Vulnerability to flooding is particularly increased where inappropriate or inadequately maintained infrastructure, low-quality shelters, and the lower resilience of the urban poor interconnect. The urban poor are often excluded from the formal economy and lack access to adequate basic services. Because they cannot afford to buy housing, they reside in densely populated informal settlements, which may be constructed with materials and techniques that cannot resist extreme weather or natural disasters (Parry et al., 2009).

Flooding in urban areas is related to heavy rainfall and extreme climatic events, as well as to changes in the built-up areas themselves. Urbanization restricts runoff by covering large parts of the ground with roofs, roads, and pavement, thus obstructing natural channels. Under such conditions, drains should ensure that water moves to rivers more rapidly than it would under natural conditions. Urbanization and population increases in Africa have also led to large numbers of people, especially the poor, settling and living in floodplains in and around urban areas (Douglas et al., 2008). As Ajibade and McBean state in the context of their study about three highly populated floodplains in Lagos and about Africa in general, *“To date, very little planning and investment are directed towards housing for the local poor”* (2014: 76) and that appropriate housing tackles a human-rights issue as these poor and flood-prone settlements were a result of economic, social, and political marginalization of their residents.

Flash floods² immediately following abnormally heavy rainfall events, which will be described in this chapter, affected mostly Greater Banjul Area. The projected sea level rise, shallow water tables, waterlogged soils, coastal erosion, and the steady encroachment of the wetlands are adding to the flood risk in settlements in Greater Banjul, such as in Old Jeshwang, Fajikunda, and Ebo Town (Jarju, 2009). There, flooding has a direct impact on society in terms of loss of assets and an indirect impact in terms of goods and services (for example, medical expenses, loss of productivity from increased numbers of disease, injury, and death). But there are also psychological impacts, such as the feeling of uncertainty or the fear to loose property or attract diseases from polluted water.

People usually avoided building in the historical floodplains of the River Gambia and instead used the land for the cultivation of lowland rice, as pasture, and for the extraction of forest products. However, population pressures in urban areas and an increase in aridity over the past 30 years have resulted in

¹ The paper was written as a chapter for the edited volume by Ebrima Ceesay: *The Gambia. Perspectives on contemporary issues and future direction(s) 1965-2016. Continuity or change.* African World Press/CODESRIA. The chapter is currently under review. We thank the editor for the permission to pre-publish the paper in the ZEF Working Paper series to allow its earlier use as teaching material.

² *“Flash floods happen suddenly, with little lead time for warning; they are fast-moving and generally violent, resulting in a high threat to life and severe damage to property and infrastructure; and they are generally small in scale with regards to area of impact.”* (Douglas et al. 2008:188)

the expansion of settlements at the foreshores of mangrove swamps. In current academic debates, floods in coastal cities of Africa, while often linked to the impact of climate change, such as the increase of precipitation and sea level rise, also hint at unplanned urban sprawl into floodplains, an increase of runoff due to compacted and sealed surfaces, and problems with the infrastructure and management of sewage and drainage (Douglas et al., 2008.) The poorest part of Kanifing Municipality, Ebo Town, provides empirical evidence for most—though not all—of these arguments. The case also suggests that the four-type categorization of urban floods introduced by Douglas et al. (2008) is incomplete because flash floods occur in Greater Banjul Area as a result of coastal urbanization but not from high tides.³

This chapter will, after a brief introduction of the methodology, describe the settlement history of Ebo Town that led to land use change from swamp and mangrove forest to a dense urban conglomeration. We will then focus on the exposure to regular floods and pollution from Kanifing by first describing the phenomenon and then reflecting upon it from the perspective of resident children who have expressed their views in drawings and short essays. After that, we will analyze how floods and pollution impact schoolchildren and what coping strategies residents of Ebo Town use in order to prevent sickness and flood damage.

2 Methodology

Ebo Town was selected as the case study due to frequent flooding events and the need for disaster relief. The study (April – July 2015) had two parts, including ethnographic field research in Ebo Town and participatory research among school children. Ms Kavegue hired a local research assistant to help with translations of local languages. They started with an explorative transect walk through Ebo Town, accompanied by staff of the Young Volunteer for Environment organization that is running environmental campaigns in Kanifing. The research team later visited the area to conduct semi-structured interviews in schools and with local residents and observe activities in the quarter. Because Ebo Town has neither a primary nor secondary school, ten schools were randomly selected in adjacent parts of Kanifing where children from Ebo Town were enrolled. After receiving permission from the Ministry of Basic Education and the principals, data was collected on the number of grades, classes, and children that resided in Ebo Town by using school registers. The next step was the random selection of children (10 percent from each school based on the total number of pupils), resulting in a sample of 95 children.

Inspired by a research project conducted in the United Kingdom to study the impact of floods on children (Walker et al., 2010; Walker et al., 2012), storyboard sessions were organized in each school, where participants drew pictures or used creative writing to tell their stories. These storyboard sessions were followed by interviews with 63 children and staff of the school administration. Altogether, 12 principals and 11 other members of Ebo Town and parents were interviewed.⁴ The intention to accompany all the children to their houses and conduct interviews with their parents was discarded because most parents seemed too busy during the field research period.

³ The four suggested types are: (a) localized flooding due to inadequate drainage, (b) flooding from small streams whose catchments lie almost entirely within built-up areas, (c) flooding from major rivers on whose banks the towns and cities are built, and (d) coastal flooding from the sea or from a combination of high tides and high river flow. Banjul was categorized under four, but the case in Greater Banjul Area is different. (Douglas et al 2008: 191)

⁴ Of the 63 school children between 11 and over 18 years old that were sampled for the survey, 44.4% were boys and the remainder were girls. Most of them were aged 14 – 17, followed by 11 – 13 and 18+ years. The interview was extended to the parents, of whom 54.5% were male and 45% were female.

3 Urban sprawl and reclaiming mangrove swamps

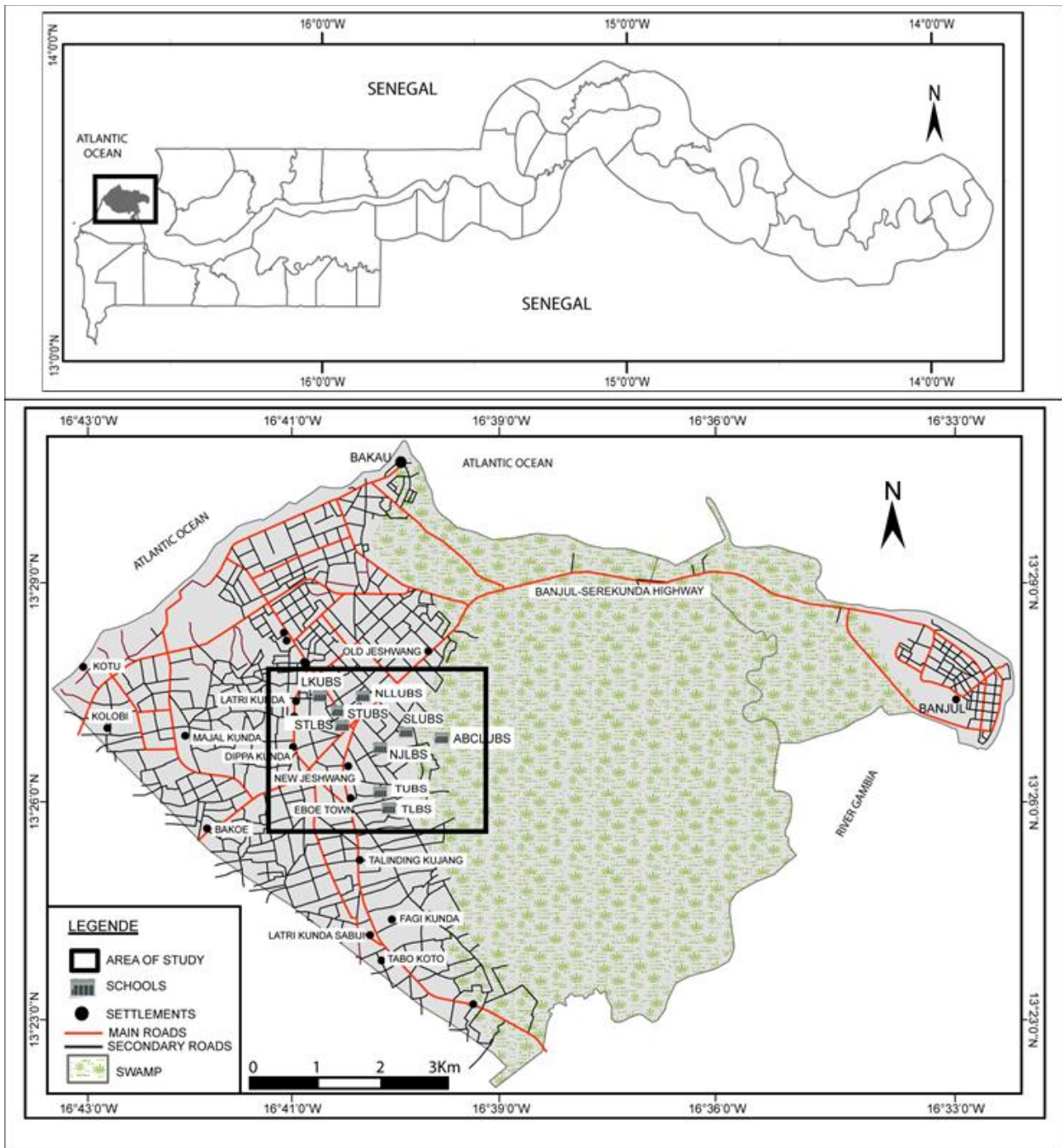
Greater Banjul Area is approximately 93 km² and the home of about 26% of the Gambian total population. It has two municipalities: the capital, Banjul, and Kanifing, as well as one district of the West Coast Region called Kombo North. Ebo Town is situated in the northern part of the Kanifing Municipality and consists of three quarters, the oldest being Manoballa (“near the road”), Santiaba (“new settlement”) and the youngest being Badalla (“near the river”), which already indicates the sprawl from the urban periphery toward the waterside. Most interviewees lived in Badalla.

Kanifing Municipality is the most densely populated area in the Gambia with about 4,478 people per km². As outlined by the mayor in 2011, *“The municipality remains a highly multicultural society. It is the centre of attraction for both internal and external migrants”* (UN-HABITAT, 2011: no page number). High population inflow and demand for residual land led to land speculation, which was supposed to be hindered by the 1991 State Land Act that declared all land in Kanifing to be state land. Customary land could be registered as a lease for 99 years (21 years for foreigners) but registration was not often practiced for several reasons. Poor people, for example, could not afford the fees for the registration. As a result of the ever increasing demand for land in Kanifing, *“[!]and encroachment had become uncontrollable”* (UN-HABITAT, 2011: 15).

Ebo Town, with a population of 18,363 (GBOs, 2003), is a tight and densely populated place that lies lower than the rest of the municipality because it is located directly at the banks of the delta of the Gambia River (see Figure 1). According to climate change projections, the river delta as well as the coastal areas, will be exposed to sea level rise. Parts of the capital, Banjul, which sits on an island at the edge of the delta, will be inundated if these projections materialize (Ampomah et al., 2012). Much of the land of Ebo Town is situated along the foreshore on former mangrove swamps adjacent to the Tanbi Wetland Complex, which is still *“the largest intact WAMER [West African Marine Eco-Region] mangrove forest under protective status”* (Carney et al., 2014: 127). The complex covers about 6.300 ha and was declared a National Park in 2008 after receiving Ramsar protection status in 2007. Sea level rise, however, is less dangerous for Tanbi than urban sprawl because *“[s]everal hundred thousand people now live within 5 km of the Tanbi Wetlands”* (Crow and Carney, 2013: 281).

The land in Ebo Town is generally flat with loamy, waterlogging soils, which are dusty during the dry season and muddy during the wet season. The land rises in an easterly direction as one moves from the river bank toward the central part of the municipality. Green space scarcely exists apart from grasses and cultivated crops in gardens. Only a few palms and mangrove trees, as well as a single baobab tree grow along the river bank, where the land almost immediately turns to mangrove forest. There are different watersides in Ebo Town, including a landing place for canoes for oyster collection, which is a typical female occupation in the Tanbi Wetlands (Crow and Carney, 2013; Carney et al., 2013; Lau and Scales, 2016).

Figure 1: Location of Ebo Town



Source: Kavegue, 2015

Ebo Town's settlement history illustrates how poorer families in search of freely accessible land for housing and rice cultivation moved to the western periphery of Kanifing Municipality and increasingly encroached into the swamps. The ethnography and oral history of Ebo Town, however, revealed that there were competing histories of the settlement, including questions of motivation, ethnicity, and occupation of first settlers, as well as uncertainties about the role of public authorities.⁵ According to

⁵ The first migrants were Banjolians. The current *alkalo's* grandfather was the chief. From there, the grandfather first called his fellow Banjolians to come and then started sharing the land when they brought the cola nut. It happened during the drought period experienced in the area. Therefore, people started migrating, some in order to attend high school, others for a better life. According the *alkalo's* saying, the first *alkalo* was named after the area, Ebo Town, town Kujabi; by then they were Jarjukundas. These people occupied Santiaba, others were in

Mr. Jarju, the *alkalo* (local leader) of Ebo Town, the first settlers were from the Mandinka-speaking Ebo group, whose origin is unclear. The alkaloship can be traced back to the founding fathers who were members of the Kujabi kinship group.⁶ In 1947, they occupied a brushy land near the Brikama-Banjul Highway called Manoballa that divided the communities of Tallinding and Jeshwang. The rest of the area was a swamp and therefore attractive for wetland rice cultivation.

Higher soil moisture in swamps helped in times of drought, which occurred more frequently from 1974 – 1979. This drought lasted five years and parts of the swamp became much drier. From 1979 to 1983, when rice cultivation was no longer attractive, people from other parts of town began to migrate to the place where the rice fields had been and created a new quarter called Santiaba. Some new residents moved from Old Jeshwang when the government needed land for the new airport that opened in 1977. Mangroves were cut to create additional plots of land and swamps continued to fall dry. In the 1980s, drought, dust storms, and food shortages also occurred in other parts of the Gambia. More rural people moved to the coastal areas, looking for residential space at the fringes of Kanifing. The third town quarter established after Santiaba was called Badalla and was located directly on the bank. Until 1988, even though people lived in Ebo Town, they continued to cultivate rice, pushing their fields more into the wetlands. During the period from 1988 to 1994, rice cultivation in the swamp finally stopped because of land shortage and residential buildings began to dominate Ebo Town.

The settlement was upgraded by the inhabitants over the years who invested in replacing huts with more permanent houses, in roads and wells. The area was equipped with a main paved road and drainage canals at some places. Public infrastructure was not up-scaled by the municipality to meet the continuous influx of people. This is one reason why Kanifing became part of the UN-HABITAT participatory Slum Upgrading Programme. The first phase assessed the situation, stating, *“Very little assistance, if any, is given to squatters on housing and transportation. The only assistance comes in the form of providing food and clothing when disasters occur. No housing survey has been carried out in slum areas, thus little information is obtained on the activities of slum dwellers”* (UN-HABITAT, 2011:15).⁷ The municipality did not invest much in Ebo Town and there was little consideration for urban planning. When the new settlers requested schools, the government responded and built the Tallinding Lower Basic School in 1984. Children attend this school and other schools in the neighboring parts of Kanifing. Ebo Town currently has only nursery schools, one skill center and qur’anic schools.

It was generally believed that no schools or other health centers could be constructed due to the swampy topography, density of the settlement and lack of other infrastructure.⁸ In 2013, for example,

New Jeshwang. Therefore, there are Old Jeshwang, New Jeshwang and Ebo Town. When the Jola kinship group established the community of Ebo Town, the Jola-speaking people occupied the entire community with little or no mixture of other linguistic groups. Also, the majority of the people who settled in this community were the relatives of the Kujabi family, the majority of whom came from Umorto. However, as time went on, the migration of people into the new settlement intensified.

⁶ As tradition demands, the *alkaloship* of the community of Ebo Town rests in the hands of the founding fathers, the Kujabi Kinship Group. From generation to generation, successive sons of the Kujabis pass on to each other the *alkaloship* and this tradition was upheld until recent times. The current custodian of the land of Ebo Town belongs to the Jarju Kinship Group. The reason for this is that the Jarjus have family ties with the Kujabis. Our sources explain that one of the daughters of the Jarju Kinship Group married a Kujabi and, through that process, the two families consolidated ties. This relationship further deepened until the Jarjus were able to acquire the *alkaloship* after no competent male adult was left in the aboriginal Kujabi family.

⁷ We do not like to call Ebo Town a slum. It is an informal settlement with little public infrastructure and originally poor settlers. Today, poverty persists but there is socio-economic stratification with some better-off households. Houses are permanent structures made from clay or cement with an iron roof.

⁸ Interview transcription, Mr. P.L. Sarr

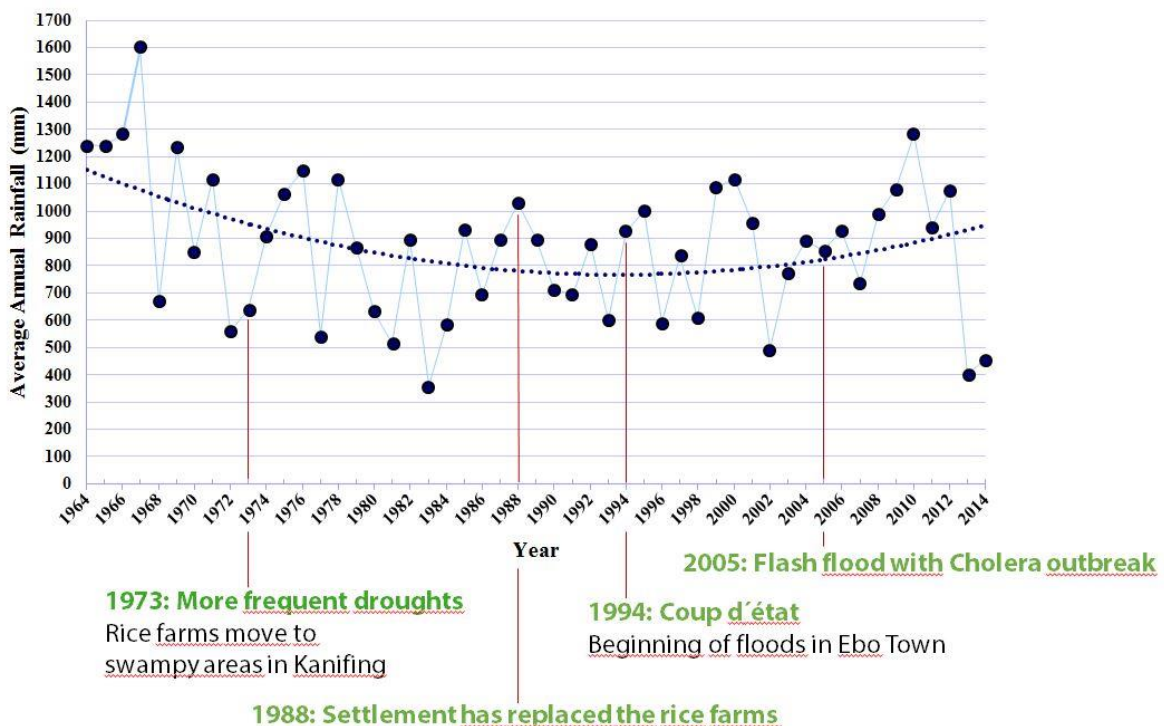
⁸ UN-HABITAT (2011:8). The assessment also quotes the National Bureau of Statistics which calculated a population increase in Kanifing of 9.9% from 1973 – 1983, 8.4% from 1983 – 1993, and 15% from 1993 – 2003.

the privately financed construction of a multipurpose center for youth came to a halt because of the high water table.

4 Floods and pollution in Ebo Town

Records of floods by the Gambia Bureau of Statistics date back as far as 1948. Other flood events were accounted for in 1954, 1955, 1956 and recent floods were recorded in 1988, 1999, 2002, 2003, and 2004 – 2011 (NDMA, 2011). Apart from this report, there is no other study from 2012 to 2014 that supplies information about the flood system. In 2015, the National Disaster Management Agency did not record flash floods in Kanifing. According to records, in the year of the coup, 1994, the first floods occurred in Ebo Town⁹ and they have been a regular annual phenomenon since. When floods returned in 2005, they caused the loss of 13 lives. Diseases affected about 450 people when cholera broke out after polluted water had contaminated household wells, the only source of drinking water at this time. This called for the intervention of the United Nations International Children’s Emergency Fund (UNICEF) to provide humanitarian help, relief, and a rehabilitation project for Ebo Town. In 2007, UNICEF also paid for a piped water system to Ebo Town, which was co-funded by other NGOs (Grey-Johnson, 2010).

Figure 2: Total annual precipitation in Banjul (1964-2014) overlaid with observations from local residents



Source: The Gambia Meteorological Unit, NDMA report, and field research

⁹ Respondents did not relate the two events causally but used the change in leadership as a reference date.

As illustrated in Figure 2, an increasing trend in the average annual precipitation was recorded in Banjul during the early to mid-1990s, though there has been a yearly variation in the total rainfall since, ranging from a minimum 400 mm/year to 1300mm/year in 2010. The period of the first flash flood was characterized by a total annual precipitation between 800-900 mm, which does not indicate an extreme climatic event. Thus, there must have been a combination of other factors that contributed to the flood. In Banjul, floods were explained by a combination of the rise of the sea level, shallow water tables, waterlogging clay soils, coastal erosion, and a dysfunctional or non-existent urban sewage system (NDMA, 2011).

Adult residents of Ebo Town gave several reasons for the flash floods. About 30 percent of the adult respondents to the survey mentioned the swampy ground as the main cause, closely followed by the dense structure of the settlements, poor drainage, and the topography. There were mainly five ways to explain the floods, which differed in the way they employed various trajectories of blame: (a) Floods occur due to the swampy topography. (b) It is the fault of the Ebo Town people because they decided to settle in the swamps. (c) The reason is the swampy topography but people could not know that when they came and they should not be blamed. (d) There was lack of town planning and government concern: *"It is rather local planning. That is why we are experiencing flooding."* And finally, (e) the causes are the swampy topography and floods were reinforced by houses that were built in a way that blocked waterways and natural drainage.

More rainfall had been observed and reported by a number of adults, as the following example shows: *"Flood is caused by heavy rain. And also the settlements have blocked the waterways that are leading the water to enter houses."* The following statement is given in support of the argument that Ebo Town residents should not be blamed: *"When the rain became normal [after the dry period of the 1970s and 1980s], and people have already occupied the place, flooding starts to disturb them."* According to this respondent, the rainfall amount had normalized, not increased. People had not considered the long-term variation of climate with drier and wetter spells. It should also be noted that adults neither mentioned sea level rise (as a possible impact of climate change) nor the degradation of mangroves or land conversion as contributing factors to the floods. In fact, the adult interviewees thought the drought that occurred in 2013 and 2014 was due to climate change because a dry wetland was perceived as something abnormal and not characteristic for their place of residence.

There are cultural explanations by respondents for floods as well. One elderly man made reference to the Gambian folk tales of Ninki Nanka, a large reptile-like beast believed to live in the swamps: *"During 1947, when the river overflows it comes up to the town, meaning the highway. There was a big tree near the beach, where people believe that there is a dragon. So when the dragon wants to move, heavy rain comes and the water will flow into the town to permit the dragon to go to the high sea. After some fishermen came to settle at the beach because they wanted to be close to Banjul to take their fish to, so they build hut houses to stay after fishing. One day when the dragon wants to travel, it makes heavy rain and their houses get flooded. When coming from the sea, Ninki Nanka comes with power, heavy rain and destroys the fishermen houses and made the area flooded. From those days Ebo Town started encounter flood."*

Arguing against this folktale are Gambian scholars who emphasize sea level rise and coastal erosion; the flash floods in Ebo Town do not originate from the water side of the lagoon but flow from the uphill municipality into the streets and houses at a lower elevation. Also, the residents observed an overall rise of the water table when water stagnates rather than entering the soil or when water even comes out from the ground [from the soil]. One respondent who observed this stated, *"Our problem here is the rainy season. The water used to come from the hill area and enter our compound."* Obviously the current sewage system cannot canalize the ever-growing amount of urban waste water and increased precipitation. The system has not been upgraded since 2005, after the cholera outbreak, and as a result Ebo Town becomes flooded. The water is polluted with infectious matter and carries huge amounts of

solid waste which increase the health risk in Ebo Town, especially by polluting the ground water (which is used for household purposes and gardens) and attracting disease vectors.

Figures 3 & 4: Dumping site at the mangrove fringe and garbage at the river bank



Source: Kavegue and Eguavoen, 2015

Once the flash flood is over, Ebo Town community is overburdened with solid waste, which is found everywhere—on the street, in drainage and sewage canals, in home gardens, and even in the cemetery. The entire neighborhood looks dirty and unattractive. But more importantly, apart from the disturbing smell, polluted water and solid waste fills may contain harmful substances that cause public health hazards. When located where runoff drains, dump sites, and landfills act as dykes that block the flow of water from the town to the swamps. As can be seen from Figure 3, the waste-filling of swamps and river banks also results in land reclamation, which can be attractive in wetlands where many people have no secured land rights. Ajibade and McBean (2014: 81), when discussing the floodplain communities in Lagos, say that they “*were immersed in heaps of waste [...] Waste is voluntarily collected and serves three purposes. [...] cheaper alternative to sand filling [...] as material for flood control [...] generates income for garbage collectors and un-authorized developers who waste-fill parts of the canal for sale.*” The latter was possibly due to a weak local authority that was “*unwilling and unable to regulate the reclamation of prohibited areas.*” Illegal professional waste-filling was not observed in Ebo Town but this practice in Nigeria hints at fatal courses as a result of municipal neglect, lack of support for poor people, and insecure land titles in flood plains.

A mapping exercise in Greater Banjul Area conducted by the National Environment Agency (NEA, 2014) stated that about 70% of all existing dump sites visited during the assessment were situated in wetlands, drainage channels, gullies, depressions, and waterways. In Kanifing Municipality alone, 16 legal and illegal dump sites for waste were documented, including seven sites in Ebo Town. Tallinding Swamps, which are part of the Tanbi Wetland Complex, were particularly affected. Dumping is practiced within and at the edge of the swamps. The combined total volume of solid waste accumulated in these places is estimated to be 11.292 m³, which accounts for about 78 percent of the total solid waste dumped in Kanifing. These numbers indicate that much solid waste is produced at the center of Kanifing Municipality and then brought by trucks from better income neighborhoods to poor peripheral quarters at the waterside (known as the garbage-dump syndrome). In addition, poor quarters near coasts lines or lagoons are situated downstream in the municipal sewage system and therefore are interconnected with better-off parts of the municipality (Obrist et al. 2006). The NEA study recommends that dump sites with severe flood potential should be cleared immediately and their use as dumpsites should be discontinued. Regional councils have been asked to develop and implement effective strategies to manage waste within their jurisdictions in an environmentally sound manner (NEA 2014). This political strategy is supported by national initiatives, such as the monthly Clean the Nation operation and the current work on an Anti-Littering Bill.

The crucial questions are, however, where else solid waste should be disposed, how the overall quantity of solid waste could be effectively reduced,¹⁰ and whether dumping in swamps is purposely pursued by inhabitants in an effort to reclaim land.

Land reclamation may explain why Ebo Town residents complain about but do not fight the pollution even though they are aware of the health risks they face. According to Satyanarayana et al. (2012), the local population, who made various uses of the mangroves, had knowledge about mangrove ecology and the role of mangrove forests in preventing hazards. There were, however, knowledge gaps with regard to local tree species and a misleading perception among the urban residents that the mangroves were disease-infested wastelands. Respondents in Ebo Town said that during the rainy season many people are in the habit of throwing rubbish in the flood water on the streets. Due to this attitude, dirty run-off from uphill Kanifing is becoming even dirtier and streets and gutters are full of solid waste, even long after the flood has ended. The following pictures (Figures 5 and 6) were taken in February 2015, five months after the previous flood was over. Local flood prevention strategies, such as effectively un-blocking drainage and sewage canals and disposing the solid waste at safer sites, seemed to be missing. But as mentioned before, safer dumping grounds were also in short supply.

Figures 5 & 6: Polluted drainage canals and home gardens



Source: Eguavoen, 2015

The River Gambia also passes by an illegal dump site. Some of the waste ends up in the river and is carried to downstream communities that depend on the river for domestic and agricultural uses. There is evidence that pollution leads to diseases among the inhabitants after the floods have ended. As the *alkalo* of Ebo Town explained, “*There has been an outbreak of infectious diseases like cholera, dysentery—just to mention a few that have so far emerged at any time when there is flooding within the community.*”

5 Floods and pollution seen from the eyes of schoolchildren

This part of the analysis is based on 83 drawings and 63 short essays written by children from grades five to eight. The drawings indicate that most of the children understood the problem of floods and were able to draw their Ebo Town surroundings while showing flooded places where water normally

¹⁰ Sanneh et al. (2011:1070) describe the official Bakoteh Dump Site in Kanifing, which is about 17.8 ha large as follows: “*Burning and smoldering garbage is a regular feature on the site. There is no compaction of waste or application of cover material. Indeed, there is no equipment on site and the dumping of waste is uncontrolled. With the steady increase in population and the demand for land, the dump site is now at the center of human settlement.*” They state a lack of land for new official dump sites and suggest a strict recycling scheme.

stagnates, such as roads, yards of compounds, the school, and in buildings. Of the 83 drawings, 48 showed flooded paths blocking the easiest way to go to school. Sixty-five drawings showed that the compounds and schools were not safe (Figure 7). When this happens, buildings are also affected as 65 pupils highlighted. The rain water was considered by the children respondents as the main cause of flooding in the community. In essays, flooding was described as a place full of rain water that stagnated for several days. It was also mentioned that floods occurred as a result of bad behavior—because the sewages were full of waste, the runoff could not proceed to the river. In that regard, a schoolchild said, *“Ebo Town is a difficult place to go. Sometimes the water used to stay and some people will throw rubbish in the water.”* Quotes from the interviews further illustrate that the whole area has been damaged because of bad attitudes: *“It is a serious case. Some parents do not care about their children. And no road there. And all the places are damaged and in rainy season, when coming to school, we suffer a lot.”* Children found it very difficult when going to school, saying, *“We even remove our shoes. Sometimes our books used to spoil [break].”*

Figure 7: Inundated school compound

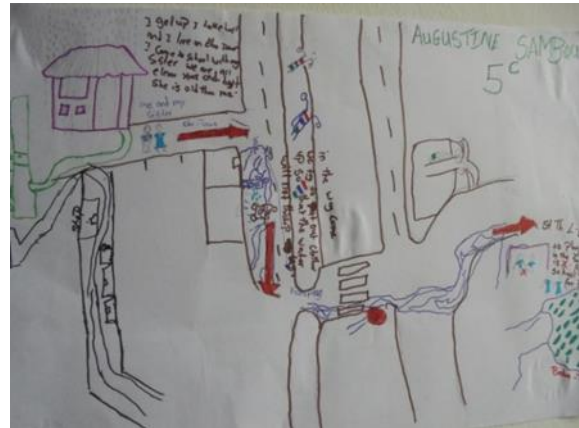


Source: Kavegue, 2015

Rainwater was often present in the drawings (65 of 83), written stories (9), and in the oral accounts of the schoolchildren from different grades. According to the survey, 16 fifth-grade pupils out of 25 felt disturbed by the rain at home and on the way to school, while 21 pupils from seventh grade mentioned this (out of a total of 24). The percentage of having water all over the house and in the surroundings was the highest, compared to having little water or no water at all.

Figures 8 - 13: Drawings from storyboard sessions





Figures 14 & 15: Pollution in Ebo Town



Source: Kavegue, 2015

Waste was also documented in interviews and the children almost always talked about it. It was noted during the transect walk and the community visits.

Other than in the study by Walker et al. (2010), the research did not document the experience of children after an exceptional event but rather their experience based on several years of annual floods. Since there was little rainfall in 2013 and 2014, the observations were more general. Walker et al. (2010; 2012) analyzed detailed accounts about what had happened at school and on the street when children went home. They were able to present accounts of how parents reacted, which household items were rescued, and who decided what to do when water entered the houses. They then analyzed

the impact of floods on the child respondents by looking at physical well-being, emotional well-being, and the school journey from the perspectives of the children and adults. We will follow the approach of these researchers in the next section by first discussing impact and then returning to coping strategies.

6 Impact of floods and pollution on schoolchildren

When children attend school on a regular basis, they take an important step toward reaching their full potential and are given the greatest opportunity to learn new things and develop their skills. Children who miss lectures may fall behind with their work or be absent during exams. The more time a child spends with other children, whether in the classroom or as part of a school team or club, the more opportunities he or she has of making friends and feeling included, which can boost social skills, confidence, and self-esteem. School attendance needs to remain a priority to ensure that children and young people are given the chance to achieve their potential. Generally, floods have health and psychological effects on school children in Ebo Town. According to one school principal, floods *“have an effect on children because they cannot go to school. Lack of good roads.”* Floods may also cause tardiness since the children’s usual routes may be blocked and no longer accessible. Stepping and jumping on stones and sand bags placed in the water may be risky for younger children. Many schoolchildren, however, try to find solutions such as using stepping stones for their school journeys. This coping strategy is frequently illustrated in the drawings (22 of 83). Some children drew vehicles that passed through the floods, such as a taxi or a school bus (Figures 11 and 12). Altogether, about five drawings illustrated vehicles. Most families do not have vehicles at their disposal nor do they have the money to pay a taxi to take their children to school.

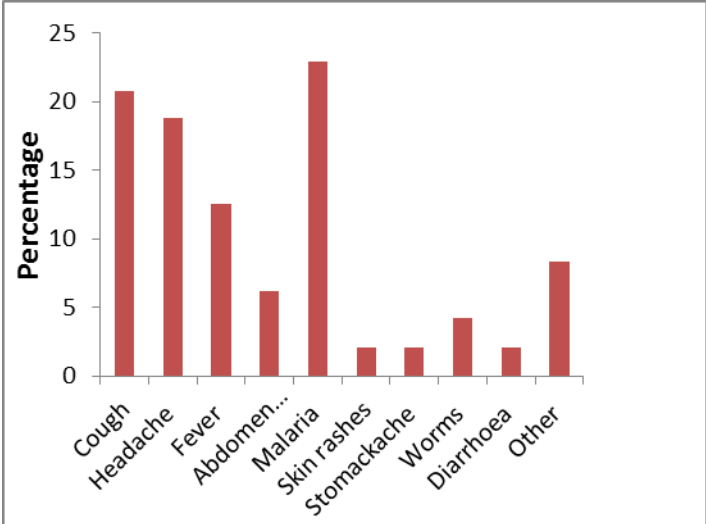
The school journey becomes even more dangerous when the water is very dirty and may bear infectious matter. On the way to school, some children remove their shoes because the area is too slippery or because they want to protect their precious property. Even though they wash their feet when they arrive at school, the health risk remains because children walk with bare feet and play in the dirty water after school. As one teacher described the situation, *“School children, especially from Ebo Town, like in our school here, are at risk in most cases. Water has been pouring from the rest of the town to this place. If you see the deposit of water here, you will see human feces, wastes from the market. Waste of all kind of nature. And when school is over, they will have to pass through that water to go. They might not have contracted diseases like cholera, but infectious diseases like boils, dysentery, etc. [...] There are times some will even complain about stomach ache.”*

This particular school has a health center where the *“majority of cases we get are stomach ache, ring worms, mostly rashes on their skins, especially on their feet,”* which can be attributed to contact with polluted water. Therefore, some parents allowed their children to stay at home for a few days: *“When it happens, the children can stay at home for three days without going to school.”* But as one parent reasoned, *“I think it [flood] can have impact on their health because walking bare footed in that flood water will give some sicknesses. Even though the school is closed, they still attend Arabic [qur’anic] school.”*

The majority of children seemed to remain enthusiastic about going to school, even during times of flood, though some children said they could not focus on their lectures because they were worried about the struggle of getting home safely. Psychologically, many children felt insecure and anxious. During times of flooding it can be assumed that their stress levels are higher. They also worried about their parents and whether their houses would become uninhabitable. These issues may create psychological problems if not addressed because the worrying may affect the students’ overall

performance at school.¹¹ The experience of disaster differs with age and gender; boys in Ebo Town experience floods differently from girls. Floods create a gender bias among children with regard to school attendance. A few teachers stated that parents would allow their sons to attend school but wanted to make sure that their daughters stayed at home where they would be safer and where they could help their mothers secure the household assets. There was, however, variation among families. Some families preferred their daughters to attend school and relied on the help of their sons in the house. But even the houses are not safe. Parents pointed out that flooding can cause malaria, fever, and smallpox due to poor sanitary conditions. This impression is backed up by data from New Jeshwang Hospital near Ebo Town, which shows that most of the diseases during the rainy season are cough, headache, fever, abdominal pain, malaria, skin rashes, stomach ache, worms, and diarrhea. Malaria dominated before the flooding season in 2015. It was especially associated with coughing (see Figure 16). Obviously, malaria vectors also find breeding places outside Ebo Town but a great deal of stagnant and dirty water certainly supports the spread of mosquitoes and increases the number of infections. If children become ill, their school attendance is affected.

Figure 16: Reported sick cases for children in September 2015



Source: New Jeshwang Hospital

7 Coping strategies against floods in Ebo Town

Children did not present coping measures independent from strategies of adults. They rather told what they had observed and how they had supported their parents. Parents and other adults who were approached as interview partners suggested a differentiation of coping measures before, during, and after the rainy season (inter alia, anticipatory, concurred, and reactive, see Kabisch et al., 2015). Before the flood season starts, Ebo Town residents contribute money to a community fund in order to buy gravel to place around flood-prone areas. The fund is administered by a local association (including heads of households). Other people use local methods, such as boreholes, canals, stones, and sand bags, to drain the area before the rainy season begins. Some families engage private garbage collectors for cleaning the draining canals in order to avoid water logging. Those who cannot afford the cost either dry and burn the waste or throw it onto empty land or into uncompleted houses.

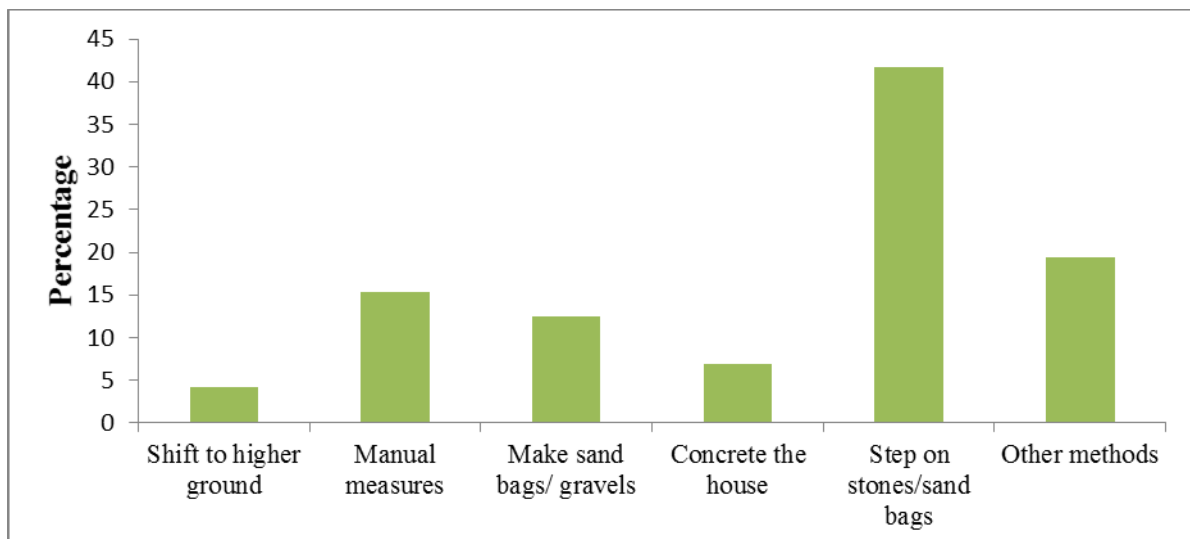
¹¹ We would like to especially thank Mrs. Fatou Kinneh Kantara for the conversation about psychological effects after we presented the data to her.

Depending on the household income, families are prepared to meet the seasonal challenge. Measures vary from one family to another and parents generally look for safe, dry places for their children to stay. They dig trenches around their houses before and during floods and construct temporary dykes to divert water from the house (highlighted by 11 parents and eight teachers). If money is available, houses are strengthened with concrete linings (eight teachers of 12). The gates to the yard are raised and the yard of the compound and the ground are plastered with either cement or tiles to prevent the rising water to enter. Holes are made at higher places in the walls to allow the water to flow out of the compound (24 children of 63 during interviews). The gates are blocked with stones and sand bags (34 children of 63 during interviews).

During the flood, some families move away temporarily to stay with friends and family. This may also have a negative impact on school attendance if relatives live far from Ebo Town. Other residents said they would wait until the floods were over. Many respondents said that life becomes very difficult. Many businesses cannot operate during this period, which diminishes household incomes even more: *“When flooding occurs, our daily transactions become difficult. We do not do anything when it rains, unless we wait until it stops and then decide on what to do.”* *“We manage to go through the water like that, passing edges and so on. I do not allow the children to go out. I will go to the shop and market myself.”*

People try to find places to secure their property, *“like those people; they have to find a place to secure their properties first, the valuable properties; try to transport them to a safe place [outside Ebo Town].”* If this is not possible, families create high places inside their houses to store and protect their most valuable items from the flood (mentioned in 11 parent interviews). Parents stated that during the flooding, household items might easily break and they constantly need to be kept dry: *“When flood happens, each year, our things used to get spoiled [broken]. “You need to hang your things; if not, it will easily get spoiled.”* Among the precious household items are school uniforms and books because they are necessary and costly, as well as family documents because they are difficult to replace. *“It became better when the government constructed the roads of Tallinding. The water flowing toward the river is so powerful that it digs holes on its way, making the water stagnate. We do not take any action when it is rainy season; we suffer, but when it finishes, we enjoy,”* said one parent.

Figure 17: Coping strategies in times of flood



Source: Survey 2015

Households with higher incomes can afford water pumps to remove water from their homes. One person reported that when it rains, *“none of us will sleep, we use the generator to pump the water outside.”* Poor households *“use local systems. It disturbs everybody in the area when water enters the*

rooms. At present, individual coping strategies include bailing water out of the house with buckets.” The Fire Service may also come and pump the water out of the houses. All measures mentioned by the parents and illustrated by the children show rather individual coping measures that have been employed ad hoc, concurrently, or reactively rather than anticipatory measures that could reduce the risk from flash floods in the future. All observed measures were described in the literature on floods in urban Africa (e.g., Douglas et al., 2008; Kabisch et al., 2015). No specific local coping measure or innovative adaptation strategy was observed in Ebo Town.

8 Disaster relief and flood prevention

The Kanifing Municipal Council and the Fire Service have provided disaster relief many times during the floods and have given people what they have needed most, such as clothing, bedding materials, rice, oil, and necessary items for children. The Red Cross/Red Crescent were involved in the disaster relief in 2010, when heavy rainfall from mid-July resulted in floods that damaged the infrastructure and affected people’s livelihoods in the Gambia. The floods hit the Western, Upper River, Lower River, North Bank, and Central River regions, as well as the Kanifing Municipality. The River Gambia in the Upper River Region overflowed its river banks by about 150 meters, causing flooding in residential areas, markets, and the offices of the Medical Research Council located in Basse. Access to both banks of the river proved to be very difficult with ferry crossings at a standstill. The movement of people, goods, and services from both sides were incapacitated. With the support of and the overall coordination by the National Disaster Management Agency (NDMA), local authorities under the lead of local Red Cross volunteers were quickly able to assess the situation and initiated an immediate response by distributing food and non-food items in the selected districts or wards. The government of the Gambia declared a state of national disaster on September 7th and launched an appeal both within the county and abroad for additional relief and rehabilitation efforts.

Since 2008, when the National Disaster Management Act was introduced, encouraged and supported by a UNDP project, the National Disaster Management Agency has conducted training for disaster relief and set up a geographic information system (supported by the World Bank). The agency has also contributed to the National Adaptation Plan of Action (NAPA). The NAPA’s Rehabilitation of Early Warning Systems was established in 2015 and will provide better data and information services with regard to floods. The ongoing NAPA action, Restoration/Protection of Coastal Environments, will mainly work on coastal fortifications and management in Banjul and Kanifing. However, the Reduction of Climate-Related Diseases, which aims to improve urban health facilities and prevent flood-related diseases, has not yet received international funding. Programs of the United Nations (UNICEF, UN-HABITAT, UNEP, and UNDP) have attempted to prevent further health hazards in Ebo Town by providing safe water and infrastructural upgrades. Disaster relief has been seen as helpful emergency aid but the people of Ebo Town said it did not support the affected families in recovering from losses and damages.

The interview respondents told that they felt rather helpless in face of the flash floods. Many respondents reported that they would need government support in dealing with floods: *“Normally, water coming from Serrekunda and going to the river passes through this area during the period of the rainy season; anything on the floor used to get spoiled. To protect the water coming into our house, we try blocking water ways. We cannot do anything to prevent flood unless the government helps us.”* Apart from buying gravel to fill the holes in the roads, the Ebo Town community seems unable to mobilize residents to tackle the flood problem.

Mobilization for activities called for at the Ebo Town level (from few household heads) were not successful because residents said the call did not come from the government. Respondents explained

that even if Ebo Town authorities were able to mobilize the residents, they would not be able to combat the flash floods. People believe so much in government actions that they think there is nothing they can do for themselves. Since the government has the power, it is the only entity that can help them solve the flood problem in the area. Certainly, Ebo Town will need a proper plan with engineers viewing the area before any infrastructural improvements can be implemented. The UN-HABITAT intervention may help in some respects, even when tackling infrastructural up-scaling in the uphill Kanifing Municipality. As Douglas et al. (2008) argue, flood management should be practiced collectively by local residents and supported by local authorities. Evidence from poor communities in St. Louis, Senegal, underlines how flood prevention measures can be successfully implemented when municipal authorities and civil local associations work together to mobilize the residents (Vedeld et al., 2015). Future research could focus on associations in Ebo Town and other flood-prone areas in Greater Banjul Area which could potentially play a bigger role in mobilization.

The state plays a major role by providing funds to the local authorities. This seems to be a challenge in other poor neighborhoods of African coastal cities where municipal authorities face an ever-increasing list of prioritized actions that they are expected to perform with a very small budget (calculated per capita). Larger infrastructural programs are often implemented directly by either government agencies, public enterprises or donor organizations without (or with little) involvement of municipal offices (Vedeld et al., 2015 on Dar es Salaam and St. Louis). This has also been observed in Greater Banjul Area where many UN interventions took place, targeting tasks that actually fall under the responsibility of the government of the Gambia, NEA as its implementing agency, or the Kanifing Municipality, such as the provision with safe drinking water or basic urban infrastructure.

9 Conclusion

When considering contemporary challenges around the Tanbi Wetland Complex and Ebo Town, a combination of mainly anthropogenic variables, such as the encroachment of swamps, urban planning, and waste management, are to blame. Local trajectories of blame, however, have tended to focus on single variables rather than their combinations and remain rather unspecific about the potential impact of climate change and the problems they envision for the future.

The study shows how floods have had an adverse impact on children's health in Ebo Town where most residents are poor and have very limited financial abilities to protect their property, recover from damages, or to adapt to flooding by upgrading their houses, drainage systems, and streets. Mobilization of the residents, who could do more than they did in flood prevention and waste disposal, was somehow paralyzed by a sit-and-wait-attitude that seemed to originate from past experiences with government support and donor aid.

We believe that in order to overcome this situation, an emphasis will need to be placed on local civic associations on the one hand and the younger generation on the other hand. Findings from storyboard sessions show that children are aware of the challenges related to flood. They, however, are not able to overcome them. Storyboard sessions could serve as an entry point for environmental education programs. If the younger generation were better informed about the importance of mangroves for the Gambia and the value of a clean environment, present attitudes of waste disposal might change with time. It is also necessary to organize sensitization programs to raise awareness among adults about environmental issues (see also Satyanarayana et al., 2012; Attemene and Eguavoen, 2016), in line with providing safer waste disposal sites outside the swamps. The experiences of the Volunteers for the Environment indicates, however, that there is a need to inform the youth about environmental education.

Under the given political and economic conditions, there are a number of increasing trends, such as urbanization, increasing urban population, sealing surfaces, encroachment into wetlands, and growing quantities of urban waste. Political decisions will need to be made of how to restrict additional settlements in flood-prone areas and how to prevent further encroachment on the mangrove swamps. As the influx of people to Kanifing continues, planning authorities will need to consider different housing structures that can accommodate more people and require less and less vulnerable land. But while legislation is one issue (and the Gambia is doing well in this regard), the enforcement of rules is quite another. Encroachment, as defined by the government (Development Control Regulations from 1995), refers to houses that were constructed without a development permit from the Department of Physical Planning and Housing. However, the consequent eviction of so-called illegally settled families from flood-prone areas, without offering compensation or new housing plots in order to upscale flood-prevention infrastructure, as happened in Greater Banjul Area in 2011 and 2013, cannot be the solution because it will affect the poor and already vulnerable the most.

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