

# SIERRA LEONE

## Floods in Freetown

Torrential rains starting from 2 August have led to flooding in Freetown. Despite the normal peak of the rainy season in August, the soil was previously saturated by rains in July. At least 6 people are reported dead and some 5,000 people are believed to have lost their shelter. Informal settlements, including impoverished slum communities, scattered around the city and mostly built in flood or landslide prone areas, are likely the most affected and at risk of further flooding, considering the forecasted rains in the coming days.

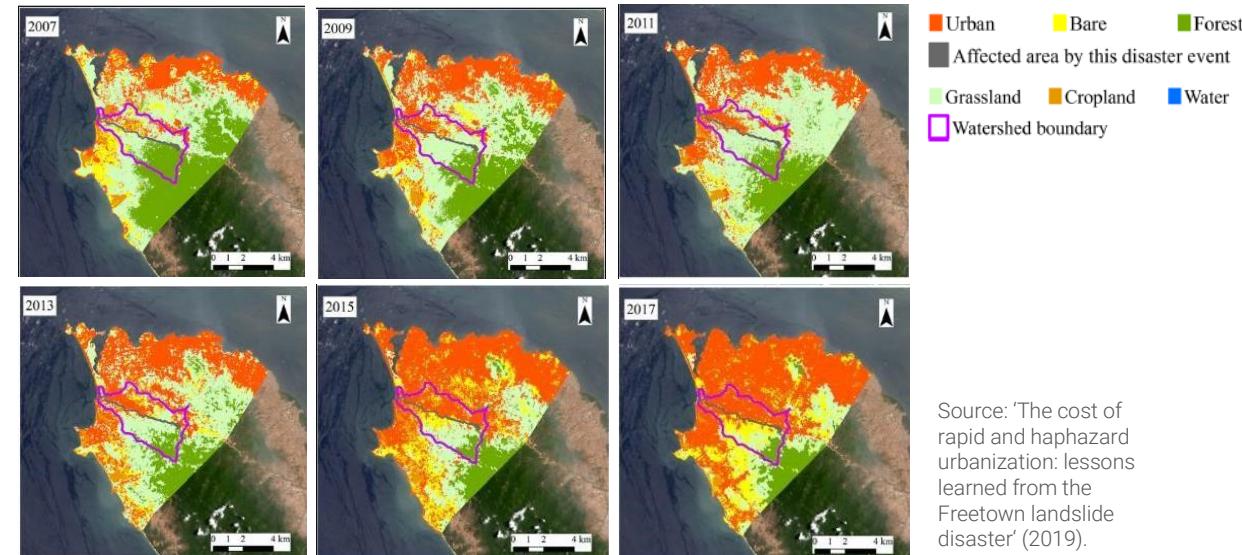
### NEED FOR INTERNATIONAL ASSISTANCE



### IMPACT



Changes in land use in Freetown, Sierra Leone, 2007–2017.



### Anticipated scope and scale

Heavy rainfall is forecast to continue across Sierra Leone during the week of 2-8 August. This would lead to **severe impact on people and damage to infrastructure**, particularly in the densely populated northern area of Freetown. Madongo Town and New England are prone to localised flooding; Susan Bay, Lumley and Kroo Bay are prone to coastal flooding due to their location in low-lying areas and are likely to report a higher **human impact** as a consequence of poor shelters and dense population. **Risk of mudslide is high** for areas such as Regent, Leicester, Gloucester and Kissy.

### Key priorities



#### Shelter

5,000 people are displaced

#### Health

high risk of waterborne diseases

#### WASH

need for clean-drinking water and sanitation facilities

### Humanitarian constraints



Despite a current lack of information, based on previous similar disasters, it is very likely that access is constrained due to flooded roads and bridges, debris blocking roads, and poor communication networks.

#### Limitations

The overall number of people affected and in need remain unclear until floodwaters recede, which might take few days as rains are still ongoing. There is a lack of specific information on sectoral needs at the time of writing. Because of disruption of communication lines and electricity, the full extent of the damage is still unknown.

## Crisis impact

Sierra Leone, has recorded significant rainfall since beginning of June. On 2 August, torrential rains falling on already saturated soil caused flooding in Freetown, Sierra Leone's capital. Between six or seven people have died so far, reportedly from the Kroo Bay slum area and the nearby village of Bathurst (The Calabash Newspaper 03/08/2019; Political Analysis South Africa 5/08/2019; Journal du Cameroun 05/08/2019). Serious damage to houses, roads and bridges has been reported (Africa News 03/08/2019; Xinhua 04/08/2019).

Despite a lack of accurate numbers, it is estimated that thousands of people living in Kroo Bay, with a population of 6,000 residents, situated by an estuary, have been left homeless as their shelters were washed away. It is unclear at the time of writing if the people affected are being sheltered somewhere. During the rainy season from May to November, the flat area of Kroo Bay is at high risk of flooding as coastal and river floods occur on an annual basis (World Bank 10/2018).

Many people are reported trapped in vehicles under several metres of water in the east of the city, and likely to have drowned because of this. The port seems to have been heavily damaged. The perimeter wall of Freetown's seaport, the Queen Elizabeth Water Quay in Cline Town, was breached by a massive flow of water; dock workers are reportedly missing and feared dead (The Sierra Leone Telegraph 02/08/2019).

There are preliminary reports of significant cracks opening up on the hills in the mountainous village of Regent some 9 kilometres from Freetown, creating risk of mudslides, which have proven to be deadly like in the case of August 2017 when at least 500 people died (The Sierra Leone Telegraph 02/08/2019).

Heavy rainfall is forecast to continue during the coming days (FEWS NET 01/08/2019).

**Shelter:** Although preliminary reports are not available, a few thousand people, mainly from the flood-prone settlement of Kroo Bay are believed to have lost their shelter, although it is unclear if and where they have been provided accommodation (The Sierra Leone Telegraph 02/08/2019). Housing conditions in informal settlements in Freetown are generally poor. Temporary houses made out of mud or sticks and corrugated sheets are predominant, influenced by topography and cost of construction. This type of shelter is highly vulnerable to extreme weather conditions, like the current rains (SLURC 03/12/2018).

**WASH:** Access to water is one of the major challenges faced by residents of Freetown. Following the rains, contamination of drinking water and sewage overflows are highly probable. Pit latrines are used generally, but in poor sanitary conditions. Informal communities along the coast are inclined to use toilets built with sticks and sacks, depositing human wastes into the sea or streams; open defecation is also common (SLURC 03/12/2018). Informal settlements are also characterized by lack of a regulated

waste-management system, a driver for indiscriminate dumping which ends up in waterways and drainages. The resulting water-logging and contamination increase the risk for waterborne diseases (The Sierra Leone Telegraph 02/08/2019).

**Health:** The risk of waterborne diseases is high, due to very probable contamination of water sources from sewage and inadequate health services. In slum settlements residents suffer from poor health due to insalubrious living conditions and lack or limited access to healthcare due to on one side lack of space for the expansion of service infrastructure and on the other high charges for treatment, long distances and poor roads networks, long waiting lists, and social barrier related to religion and gender (SLURC 03/12/2018; Future Health Systems). Malaria remains the most common cause of illness and death in the country, accounting for about 38% of hospital admissions and 41% of all hospital deaths among children aged under 5 years (Afro WHO).

**Protection:** Evacuations by the Government, especially among slum communities might cause protection concerns if temporary shelter is not provided and the population affected doesn't have the possibility to be accommodated elsewhere – with host families in other areas, for example. Evacuations reportedly are already underway; however it is not clear in which locations exactly, the size of the target population, nor the general dynamics and needs of the people affected (The Sierra Leone Telegraph 02/08/2019).

Family separation during the flooding is also an issue, with children of particular concern, should they get separated from caregivers.

## Vulnerable groups affected

**Population living in flood prone areas** are considered more vulnerable due to increased exposure and reduced coping capacities. In Freetown, these communities are also the poorest; for instance, Kroo Bay (est pop. 6,000), one of the largest coastal slums, was built on a natural low-lying river delta created by repeat flooding and deposition of sediment and garbage. Erosion from surrounding hills and overflowing of the river banks mark the highest threat to Kroo Bay's settlements (VSO 18/9/2019; Awoko 24/7/2017; APA News 5/3/2019; Shack Dwellers International 4/2015; World Bank 10/2018). This area has flooded every year since 2008. In terms of vulnerabilities poor shelter is the first concern, but reduced food security due to poor livelihood opportunities is also to be taken into consideration.

In informal settlements residents are faced with persistent threats of eviction on the basis of both living in areas designated as risk prone and/or protected areas for ecological conservation. This designation appears to lack a systematic analysis of which areas of the settlements can be safe or unsafe for living; uncertainty increases residents' vulnerabilities and undermine community collective action to address known risks (UARK 06/04/2017).

**Children:** According to the Office of National Security of the Government of Sierra Leone, about 56% of people affected in the August 2017 flood and mudslide disaster were children between the age of 1 and 19.

**Women:** Some research suggests that in general, women are most exposed to the impact of natural hazards such as flooding and landslides. Pregnancy is a further factor of vulnerability during disasters, due to higher risks of complications. Culturally embedded gender roles puts the burden on women of getting flood water out of the house and cleaning up the debris, exposing them and the children under their care to contaminated wastewater and waterborne diseases. Particularly in the case of localised flooding, women's exposure rate is higher as this event usually happens in residential areas of Freetown; women are more likely to be trapped in the house when a disaster occurs (UCL 2018).

## Humanitarian and operational constraints

Despite the lack of information, based on previous similar disasters, it is very likely that access is constrained due to flooded roads and bridges, debris blocking roads, and poor communication networks. Road infrastructure is generally already limited or poorly built.

## Aggravating factors

Torrential rains in this period of the year are common in Sierra Leone and usually peak in the month of August. They pose a serious threat, particularly in the capital Freetown, due to a combination of factors including population growth, rapid urbanization and deforestation, further aggravated by the poor city's drainage system and inadequate waste management policies all leading to a higher human impact, in terms of loss of lives, shelter needs and risk of disease outbreaks, when this type of disaster happens (World Bank 02/05/2019; Concern 16/09/2017).

### Population density

Population in Freetown stand at over 1 million people, a tenfold increase since Sierra Leone became independent in 1961, and with a density of 13,000 inhabitants/km<sup>2</sup> (SL 2015 Census). Population density, like in the case of Freetown, usually results in a single localised incident having impact on a very high number of people.

### Informal settlements

The city extended outwards to accommodate the rapid population growth, but lack of urban planning has resulted in the creation of informal settlements in risk prone areas along coastal and riverbed lands, and along mountains slopes. There are 61 informal settlements in Freetown, unevenly distributed (UCL 2018; World Bank 10/2018). Because

informal settlement are perceived as illegal by the Government, they are not provided with basic services through official means. Therefore, living in these settlements in Freetown has been frequently associated with extreme poverty, congestion, poor housing, lack of access to water and sanitation facilities, and lack of health care services (SLURC 12/2018).

### Environmental impact

Uncontrolled construction has also led to the degradation of protected areas, like the rain forest of Sugarloaf Mountain, the highest peak in the North Western Area Peninsula, overlooking Freetown. Deforestation also happens for firewood and charcoal in the Western Peninsula. These two factors have contributed to weaken the soil reducing its ability to absorb heavy rains (World Bank 02/05/2019). The vegetation used to provide a sort of protection for the populated areas around and below the forest; without the protection of trees, landslides are more likely to occur and the exposed soil is carried off the hills and down into the city during heavy rainfall (LSE 18/11/2017).

### Waste management

In addition to the mud, garbage also causes blockages. There are very few formal roads for waste collection vehicles to operate in informal settlements, people dump their rubbish in dumpsites that are seldom cleared, drains become blocked and flash floods from the mountains down to the coast end up spreading the waste along its path (UCL 2018; The Sierra Leone Telegraph 02/08/2019).

## Response capacity

### Local and national response capacity

The Office of National Security in Sierra Leone (ONS) is responsible for the overall coordination of disaster management.

The Central Government disbursed 2.4 billion Leones (equivalent to USD 260,000) on 26 July as part of its commitment to address underlying issues that cause flooding, particularly in Freetown. On 28 July, the Freetown City Council started implementing the Flood Mitigation Plan activities, complemented by community engagement in the form of awareness raising campaigns, like appealing to residents to not throw waste in the streets or cut down trees in water catchment areas in the city (Global Times 29/07/2019; The Calabash Newspaper 28/07/2019).

A National Cleaning Day exercise is carried out the first Saturday of every month in order for residents to dispose of their garbage and clean roads, side-walks and other public spaces. The initiative was reintroduced in April 2018 under President Bio; firstly initiated between 1992-1996 and from time to time after that (SwitSalone 10/07/2019).

## International response capacity

Information is lacking with regards to which international organisations are responding or intend to do so. Cordaid, Caritas Sierra Leone, Red Cross, ActionAid, Save the Children and others are said to play a crucial role in post disaster recovery by distributing relief items, responding to urgent medical needs, searching for missing people, etc.

## Information gaps and needs

Due to the sudden-onset nature of the crisis, information is only preliminary with updates necessary as the impact continues to be assessed.

- There is little information on the extent of damage caused to houses and infrastructure, whether completely or partially destroyed.
- There is no demographic breakdown of the affected population, nor any information about underlying vulnerabilities of the affected population.
- There is no comprehensive sectoral breakdown of specific needs of the affected population.

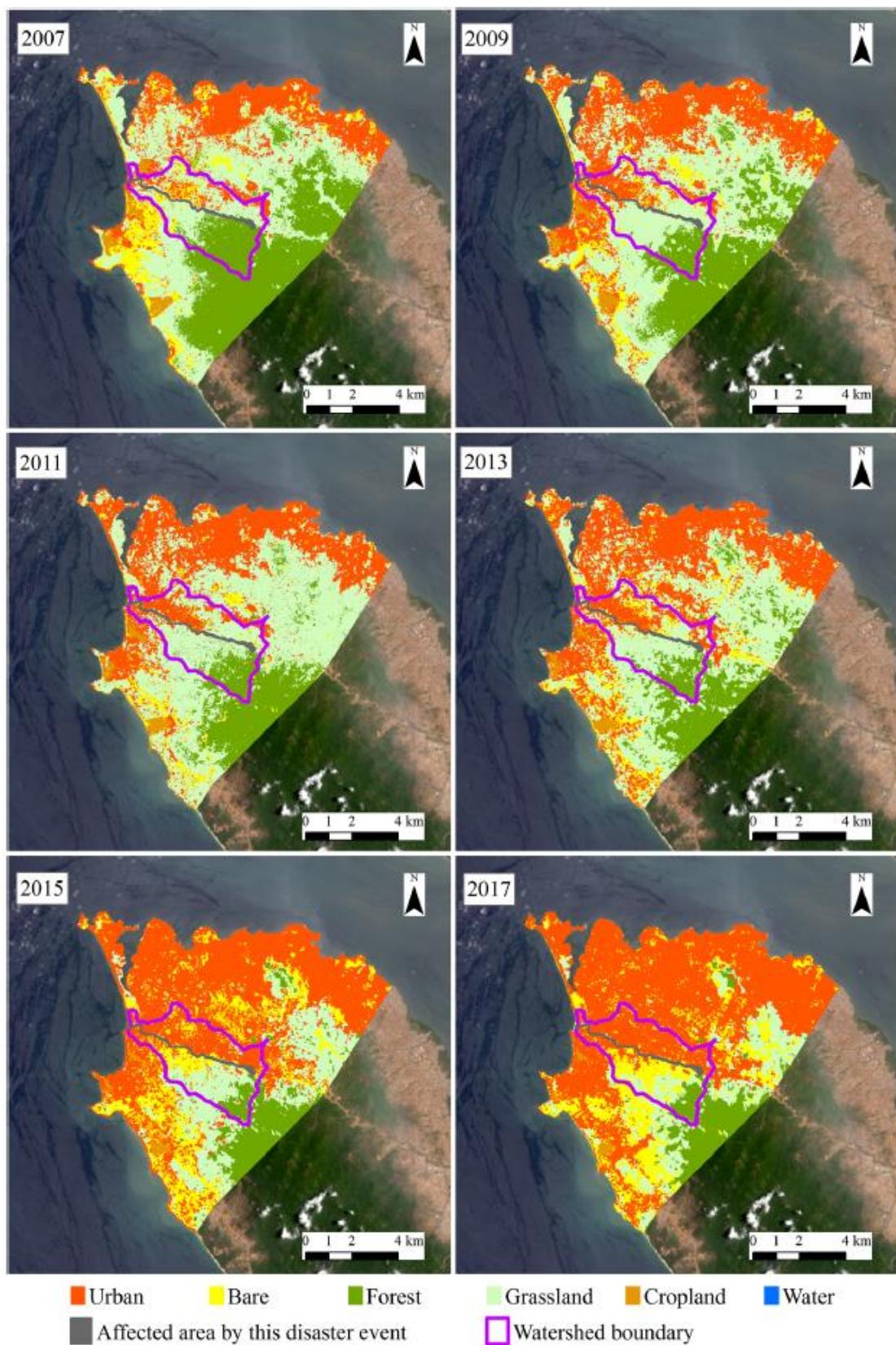
## Lessons learned

- For the whole of Freetown, over the 10-year period, grasslands decreased by 25% and urban areas increased by 34%, a large increase for a small city. Rapid vegetation clearance on steep hills, like in the case of Freetown, has been demonstrated to enhance the effects of rainfall runoff and soil erosion and reduction of soil strength.
- The high loss of human lives and damage to infrastructure during August 2017 mudslide disaster was mainly due rapid, uncontrolled, and poorly planned urban expansion in an area that was already hazard-prone due to its mountainous location, aggravated by ecological damage due to deforestation and slope denudation, thus suggesting insufficient risk management by the government and insufficient risk awareness by individuals.

## Key characteristics

- **Demographic profile:** Freetown is a coastal city of one million inhabitants, in a country of 7.8 million people in total. Sierra Leone has 16 different ethnic groups, each with a different language. The largest ethnic group is the Temne (35.5%) dominant in the Northern Sierra Leone, followed by the Mende (33.2%), who live mostly in the South-Eastern Sierra Leone and the Kono District (CIA World Factbook).
- **Food security:** In Sierra Leone, an estimated 3.2 million Sierra Leoneans were food insecure at the end of 2018. Most vulnerable are people residing in informal settlements (WFP 12/2018).
- **Health statistics:** Infant mortality is 117 per 1,000 live births. Under-five mortality is 187 per 1,000 live births (UNDP 2014). Maternal mortality is 1,100 per 100,000 live births (WB 2013). These indicators are among the worst in the world.
- **WASH statistics:** Access to improved water sources is 47% in rural areas and 88% in urban. Coverage of improved sanitation is much lower: 6% in rural and 22% in urban areas. Open defecation is higher in rural areas, at 26%, compared to 7% in urban areas (SL DHS, 2013).
- **Lighting and cooking sources:** 98% of Sierra Leone's population uses solid fuels for cooking; 85% uses wood, and 14% uses charcoal (Clean Cookstoves).
- **Literacy levels:** In Sierra Leone, 36% of women and 52% of men are literate (SLDHS, 2013).
- **Poverty:** In Sierra Leone, 77% of the population is multidimensionally poor and living on less than 2 dollars per day (IFRC 03/2019). 70% of youth is unemployed or underemployed (UNDP).

## Map 1: Changes in land use in Freetown, Sierra Leone, 2007 - 2017



**Fig. 5** Changes in land use in Freetown, Sierra Leone, 2007–2017. The maps show progressive expansion of the urban area into the mountains

Source: Cui, Yifei & Cheng, Deqiang & E. Choi, Clarence & Jin, Wen & Lei, Yu & S. Kargel, Jeffrey. (2019). *The cost of rapid and haphazard urbanization: lessons learned from the Freetown landslide disaster*. Landslides. Accessed on August 2019.

## Map 2: Spatial mapping of urban flooding and mudslides in Freetown, Sierra Leone

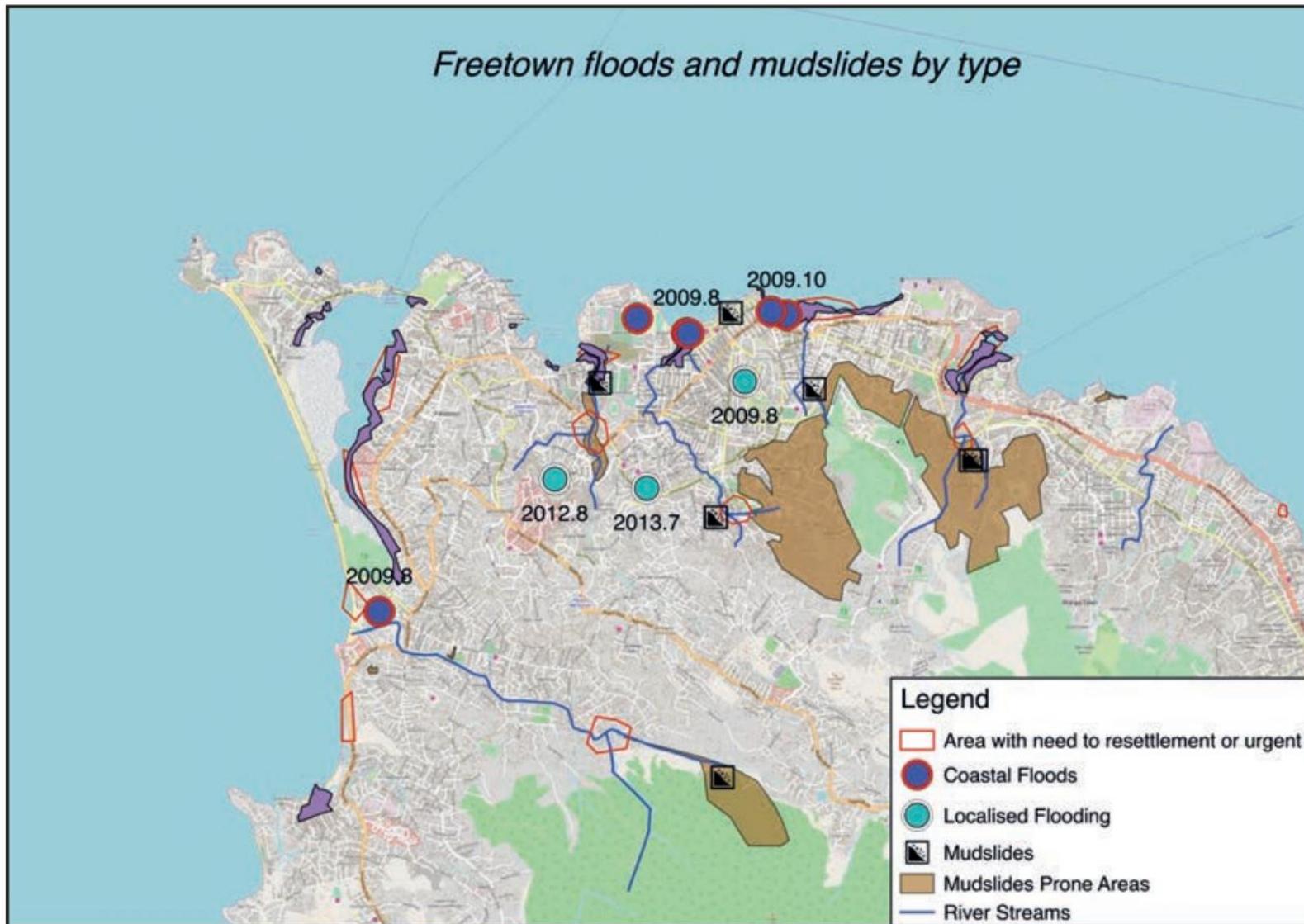


Fig 5: Spatial Mapping of Urban Flooding and Mudslides in Freetown. Data Source: Desinventar[11]

Source: SLURC/DPU Action-Learning Alliance, Understanding urban risk traps in Freetown, MSc Environment and Sustainable Development, 2018

### Map 3: Land reclamation in Kroo Bay, Freetown, Sierra Leone, 2006-2017



Fig 4b: Land reclamation in Kroo Bay over time. Left 2006, right 2017

Photo Source: Google Earth

Source: SLURC/DPU, Action-Learning Alliance, Understanding urban risk traps in Freetown, MSc Environment and Sustainable Development, 2018