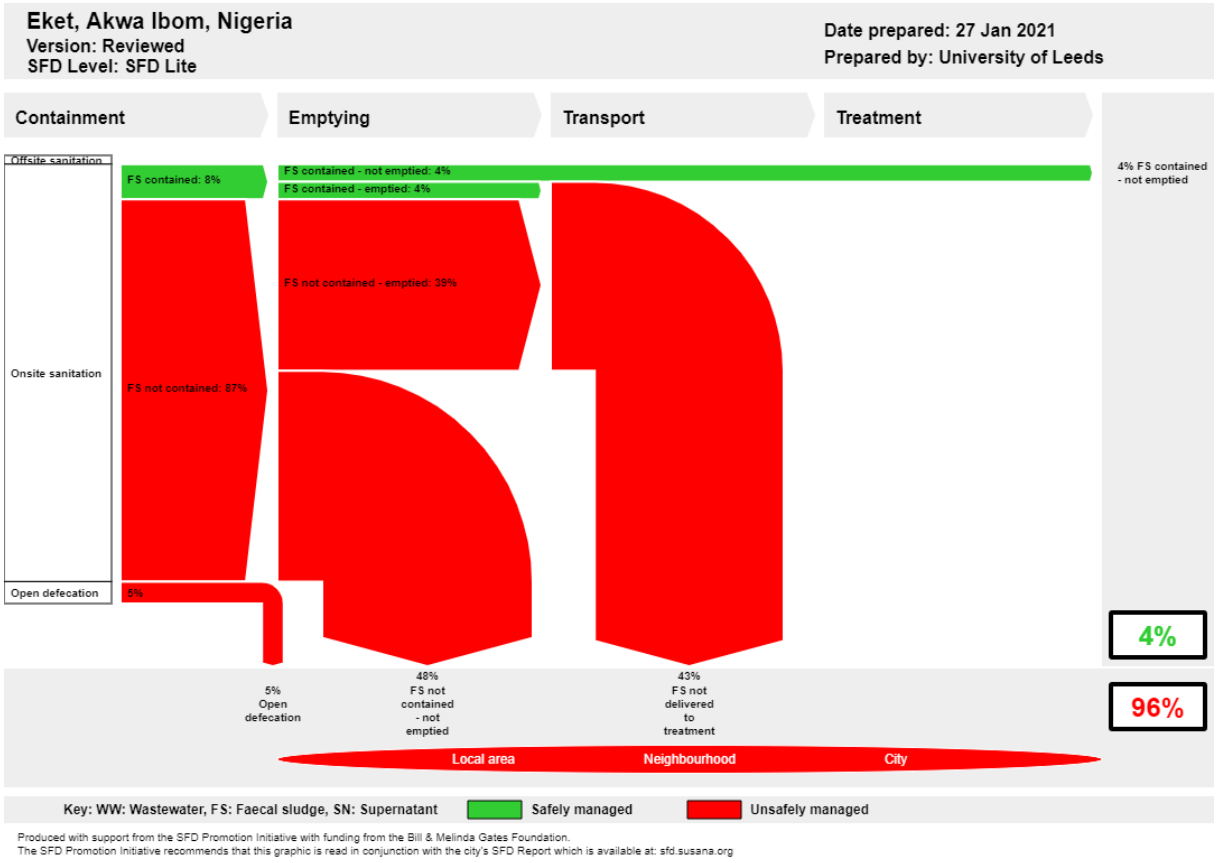
# SFD Lite Report

# Eket
# Nigeria

This SFD Lite Report was prepared by the University of Leeds

Date of production: 01/02/2021

# 1 The SFD Graphic




Produced with support from the SFD Promotion Initiative with funding from the Bill & Melinda Gates Foundation.
The SFD Promotion Initiative recommends that this graphic is read in conjunction with the city's SFD Report which is available at: sfd.susana.org

# 2 SFD Lite information

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# 3 General city information

Eket is a city in Akwa Ibom state in the southern region of Nigeria. It is one of the thirty three (33) local government administrative areas (LGA) in the state, located between latitude 4°33" to 4°45" and longitude 7°52" and 8°02". The city is bordered by Nsit Ubiom LGA to the north, Ibeno LGA to the south, Onna LGA in west and Esit Eket in the east, and is the second largest city in the state, covering a land mass of 214 $km^2$ (Figure 1).


**Figure 1: Map of Eket Municipality (Google Maps)**

With a total population of 211,255 (male: 108,778, female: 102,477), Eket has the fourth largest population in the state with Uyo (the state capital) having the highest at 373,929 (Directorate of Staistics, 2013). The municipality has a population density of 1,200 people per square kilometre, with rural duellers amounting to eighty percent (80%) while the remaining twenty (20%) reside in the urban areas of the municipality. The average household size is 6 persons with children constituting a greater proportion of the members. Eket is a coastal community in the vast low-lying region of the Niger-delta where the waters of the Niger River drain into the Gulf of Guinea (Encyclopedia Britannica, 2020). Fishing, subsistence agriculture and commerce are the common occupation of the indigenous people of the community. The average income are low, with earnings as USD 2 per day (Ajah *et al.* 2017). Although in recent years, there have been increase in industrial activities including crude oil exploration around the coastal plain sands that characterises the soil in the area (Akpabio and Ekanem, 2009), these have not greatly impacted the living standard of the community. However, they have influenced the increased movement of persons into Eket, thus adding pressure to existing social amenities for health, water supply and sanitation.

The raining season is characterised by long months of rain (April-October), with annual rainfall range between 2000-3044 mm and annual temperature between 25-35℃ (Ajah *et al.* 2017; Nta and Odiong 2017).

For their water supply, residents in the urban areas of Eket depend largely on drilled boreholes that are distributed through yard connections or public standpipes. Motorised pumps constitute majority of privately owned boreholes and hand pump boreholes are found in most public places. This high dependency on groundwater sources is explained by the fact that only 2.2% of the urban population have access to piped water supply, which is provided by the state owned water supply company (Akpan and Aster 2010; Akpabio *et al.* 2015).

The most common household toilet are pit latrines, which are used by 87% of the household in the municipality. Flush toilets (locally known as water cisterns) are the second most common (8% of the households) (Akpabio et al., 2015; NBS and FMWR, 2018).

There is no sewer system in the municipality, excreta and wastewater from households are either discharged to septic tanks, pits, roadside drains, open spaces or nearby water bodies. Some households use inadequately built and/or maintained septic tanks that occasionally overflow into the nearby environment. While some of these tanks also leak, this is only a risk in locations where the risk of groundwater pollution is significant and is used for drinking water (see section 4.2). Wastewater from institutions is released without treatment to nearby open drains or if emptied from pits and tanks, are disposed directly into nearby water bodies. Open defecation from various sources, including the disposal of faeces from children under five and potties into the environment, is still practiced by some households.

Unsafe disposal of excreta is therefore clearly a major issue and improving sanitation service delivery is a challenge that should be made a high priority.

# 4 Service outcomes

## 4.1 Overview of Sanitation Systems

This section provides an overview of the sanitation systems used and how they are managed as summarised in Table 1 and the SFD graphic. Overall, only 4% of excreta is safely managed.

**Table 1: SFD Matrix for Eket**

| Eket, Akwa Ibom, Nigeria, 27 Jan 2021. SFD Level: SFD Lite<br>Population: 211255<br>Proportion of tanks: septic tanks: 100%, fully lined tanks: 100%, lined, open bottom tanks: 1 | | | | |
|---|---|---|---|---|
| **System label** | **Pop** | **F3** | **F4** | **F5** |
| **System description** | Proportion of population using this type of system | Proportion of this type of system from which faecal sludge is emptied | Proportion of faecal sludge emptied, which is delivered to treatment plants | Proportion of faecal sludge delivered to treatment plants, which is treated |
| **T1A2C5**<br>Septic tank connected to soak pit | 8.0 | 50.0 | 0.0 | 0.0 |
| **T1B11 C7 TO C9**<br>Open defecation | 5.0 | | | |
| **T2A4C10**<br>Lined tank with impermeable walls and open bottom, no outlet or overflow, where there is a 'significant risk' of groundwater pollution | 5.0 | 0.0 | 0.0 | 0.0 |
| **T2A5C10**<br>Lined pit with semi-permeable walls and open bottom, no outlet or overflow, where there is a 'significant risk' of groundwater pollution | 71.0 | 55.0 | 0.0 | 0.0 |
| **T2B7C10**<br>Pit (all types), never emptied but abandoned when full and covered with soil, no outlet or overflow, where there is a 'significant risk' of groundwater pollution | 11.0 | | | |

As shown in the SFD Graphic, all households with toilets use some form of onsite sanitation (there is no sewer network). However, nearly half (48%) of the population use an onsite sanitation containment system which is not emptied, and where there is a significant risk of groundwater pollution. The excreta in these systems is therefore unsafely managed. Emptying services are limited and there is no treatment plant or safe disposal sites, which means that all emptied waste is disposed unsafely (43%), especially in water bodies around the city, and eventually reaches the Imo and Qua Ibo rivers.

The only safely managed sanitation is from the households using septic tanks connected to soak pits that are not emptied (4%). These are in an area where there is a low risk of groundwater pollution.

#### 4.1.1 Containment

The SFD matrix in Table 1 shows that pit latrines are the most common sanitation system (82%). A much smaller proportion use either flush toilets connected to septic tanks (8%) or flush toilets connected to lined tanks with open bottoms (5%). The balance (5%) of the population still use open defecation (Akpabio et al., 2015; NBS and FMWR, 2018). These sanitation systems are largely funded by households, and there is very little investment in public sanitation service delivery (anecdotal evidence indicates only one public toilet in the central market).

#### 4.1.2 Emptying and Transport Services

Records of the number legal emptying service providers operating in the city are scarce. Households with septic tanks who engage emptying service providers do so every 9-10 years (Felix Evans et al., 2019). Emptying services are provided by independent providers using motorised vacuum tanker trucks. The author (who has lived in city 15 years) observes that emptying services are largely available to urban households whose toilets are connected to septic tanks and the proportion of these that are emptied was estimated to be 50%.

Furthermore, 55% of households with lined pits with open bottoms are reported to have had their system emptied, of which 26.5% don't know where it is emptied to, 8.1% to water bodies or open pits, 10.7% either buried or covered in pit (NBS and FMWR, 2018). The method of emptying the faecal sludge from pit latrines is not clearly been stated in literature, however from observation, it is understood these are carried out by local, manual pit emptiers.

Some households choose to dig a new pit when the old one is full (T2B7C10, 11%). This approach is most common in the rural areas and may be because they cannot afford the cost of emptying and/or have adequate land space available. Similarly, the households with lined tanks with open bottoms (T2A4C10, 5%) also do not empty their tanks. When these proportions (11% + 5% = 16%) are added to the 45% of the lined pits (T2A5C10, 71%) which are not emptied, the total population using systems that are not contained and not emptied amounts to 48% (16% + 45/100*71=48%).

#### 4.1.3 Treatment

There are no faecal sludge treatment plants in Eket.

#### 4.1.4 End use and disposal

There are no data on end use.

### 4.2 Pollution of water sources

#### 4.2.1 Groundwater pollution

Eket municipality is underlined with sedimentary rocks and lays along the estuaries of the Imo and Qua Ibo river. It is a low-lying area of mainly coastal plans with sand that are mature, coarse and moderately sorted (Magnus Uzoma Igboekwe, 2012). The aquifer which contains the groundwater in the area is at relatively shallow depth of between 9m to 16m (Ibuot et al., 2017; James et al., 2019). The depth of pit latrines ranges between 3-5m and lateral separation between the water sources and the sanitation facilities in most households is less than 15m, which is contrary to the recommended distance by the WHO for safe siting of a sanitation facility (James et al., 2019; WHO, 2003). Because of the nature of

the soil in the region (sandy coarse), combined with the seasonal fluctuation in water table (higher in the wet season), contaminants can easily infiltrate the soil, risking groundwater pollution (James et al., 2019). Moreover, there are evidence of high coliform counts and *E.coli* in some water samples from boreholes and wells in Eket (ibid). In the same study, areas with high faecal coliform counts correlated with the number of hospital cases with waterborne disease (i.e. cholera, typhoid fever, dysentery, diarrheal and eepatitis) compared to areas with low coliform counts. Although the study did not highlight exact exposure pathways and the kind of settlement (rural or urban) where the samples were collected, they however attributed their observation to a number factors including the proximity of the borehole water source to septic tanks, direction of flow, and the soil physics of the area. This agrees with the groundwater risk assessment which showed that faecal sludge management in Eket could pose a significant risk to groundwater in the area.

### 4.2.2 Surface water pollution

The faecal sludge from the private emptying services is largely disposed into the adjoining Imo and Qua Ibo rivers. Although in the urban areas most of the household have access to boreholes for water, this is not the case for rural households, especially coastal settlements, which depend on these surface water sources. The upstream pollution of these rivers therefore causes a significant public health risk for the downstream rural, coastal populations.

## 5 Data and assumptions

- National estimates were used to compute the percentage of pit and tank emptying. However, because of the the lack of data on septic tank emptying, it is asummed that 50% are emptied (in order to minimise the maximum error).
- Based on the available evidence and use of the risk of gorundwater pollution etimation tool, the risk of groundwater pollution is estimated as significant (except where the septic tanks are located where the pollution risk is considered low).
- There are no reliable data on transport or on end use of faecal sludge. However, since there are no treatment plants, all emptied faecal sludge is assemed to be unsafely disposed.

## 6 List of data sources

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This Executive Summary and the SFD Report are available from:

www.sfd.susana.org