



Needs assessment of vulnerable populations living in flood-prone areas in Khartoum State

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COOPI in Khartoum State is implementing WASH, Shelter, DRR and Livelihood programming in Mayo, as well as the Open Areas (Dar Es Salaam, Al Takamol, Bentiu and Naivasha). The programmes in Khartoum State are supported by the Italian Agency for Development Cooperation – AICS, the Sudan Humanitarian Fund (SHF) and UNHCR.

INTRODUCTION AND BACKGROUND

The overall objective of this assessment is to **map and analyse the WASH, Shelter/Non-Food Items and Food Security/Livelihoods (FSL) needs of vulnerable residents living in flood-prone areas in Khartoum State**. The assessment provides cohesive data on the household characteristics, economic situation and food security of vulnerable households across Khartoum. Within the parameters of WASH, the assessment also provides an overview of water access and quality, latrine access and quality, hygiene practices, as well as solid waste management practices. Additionally, living conditions related to the different shelter conditions are analysed. A gender- and disability analysis is included, related to specific risks faced by children, women and people with disabilities (PwDs).

In addition, this assessment focuses specifically on **disaster risks related to the annual flooding** during the rainy season (July – September) and focuses on the needs in the community as well as their capacities to prepare and respond. Based on the findings, the assessment will present several recommendations to be included in the design of humanitarian and nexus programming responding to the needs of vulnerable communities in Khartoum State, including in preparation and response to natural disaster.

The assessment was conducted in the most vulnerable and flood-prone settlements across Khartoum state. Settlements include **Mayo in Jabal Awlia locality**, where IDPs, refugees, and vulnerable host communities reside, as well as the **Open Areas of Khartoum**, home to appr. 40,000 South Sudanese refugees.¹ In addition, **villages along the White Nile basin** are included as they are affected by flooding on an annual basis.

The needs assessment is based on **296 household surveys** as well as rapid site matrices filled out based on key informant interviews in the communities. Data was collected in December 2021.

CONTEXTUAL BACKGROUND

Open Areas

Approximately **300,000 South Sudanese refugees live in Khartoum State**. According to the UNHCR Population Dashboard, appr. 40.000 of them live in the so-called Open Areas in Khartoum. Open Areas have been present since 2011 as a way to organize the South Sudanese population in temporary settlements after separation of South Sudan. Though relocation of South Sudanese was anticipated and efforts had started up, due to the civil war which erupted in 2013, the vast majority of refugees have not been able to return and they continue to reside in these settlements for appr. 10 years. According to UNHCR data, Open Areas are characterized by poor WASH conditions, lack of durable shelter solutions, lack of access to basic services such as healthcare and education, and high protection risks including Gender-based Violence (GBV). **Appr. 75% of refugees in Khartoum experience high or extremely high shelter vulnerability.**² Many refugees continue to reside in improvised/makeshift shelters in Khartoum, which is a combination of plastic sheets, burlap, branches, and bamboo. Poor WASH conditions include a **lack of latrine adequacy, access to clean water, handwashing facilities, and access to waste disposal**. As a result, communities are forced to buy water, leading to negative coping mechanisms as a result of high prices. Communicable disease outbreaks are proliferating at the same time, with water and vector-borne diseases leading to high mortality and morbidity,

¹ UNHCR Sudan Population Dashboard: Overview Refugees and Asylum-Seekers per State (30 November 2021)

² UNHCR; Voluntas Political Advisory: Basic Needs and Vulnerability Assessment (BaNVA) for refugees hosted by Sudan (September 2021)

particularly among new-borns. In Jabal Awlia locality, the Open Areas for South Sudanese refugees included in this assessment are Dar Es Salaam Block 7, Dar Es Salaam Block 8, and Bentiu. In Sharq Al Nile, Open Areas include Al Takamol, Haj Yousef Baraka Block 3, and Haj Yousef Baraka Block 4.

Mayo

Jabal Awlia also comprises of Mayo, which is a **large settlement where a combination of IDPs, refugees and vulnerable host communities** reside. Although demographic data is very limited, it is estimated that appr. 600,000 vulnerable people live in Mayo, with the majority IDPs from Darfur, Nuba Mountains and Kordofan, as well as refugees from South Sudan, Nigeria, the Central African Republic and Chad.³ The conditions in Mayo are harsh, characterized by **poor infrastructure and facilities, lack of solid waste management, and a lack of access to WASH, leading to Open Defecation, water-borne, and diarrheal diseases**. Similar to the Open Areas, because of the lack of water access, communities are also forced to buy water from donkey carts, though the vast majority of the population lives below the poverty line. Protection issues including GBV are high. Mayo also experiences high levels of insecurity and tensions between host communities, IDPs, and refugees, with many people working in the informal sector, including e.g. in alcohol production, and high rates of criminality.

Mayo, as well as the Open Areas in Khartoum hosting South Sudanese refugees, are located in low-lying informal settings in the periphery of Khartoum state, which are **extremely prone to flooding during the rainy season**, mostly due to the poor drainage system. This leads to the annual destruction of thousands of shelters, as well as WASH facilities. Due to extreme vulnerabilities and a lack of government planning a response, communities have limited capacities to prepare for the rainy season.



Map of assessed areas in Khartoum

³ University of Khartoum, ArCo - Architettura e cooperazione and HOPE Sudan: A Place called Mayo, a Path to Resilience (June 2021): https://khartoum.aics.gov.it/wp-content/uploads/2021/08/The-Final-Ghaar-Hiraa-Booklet-Spread_qr-new-compressed.pdf

White Nile Basin

Disaster-prone areas in Khartoum also include a number of villages in the White Nile basin, located on the eastern side of the White Nile in Jabal Awlia locality. These communities almost exclusively consist of **Sudanese populations (non-displaced)**. Vulnerability levels are lower than in the Open Areas or Mayo, with people relying on a more stable income and engaged in subsistence farming, resulting in limited figures of food and water insecurity. However, as a result of climate change leading to **higher water levels in the Nile River during the rainy season, the villages are affected by severe flooding on an annual basis**, leading to the annual destruction of shelter and many are forced to move increasingly further away from the river bank.

METHODOLOGY

OBJECTIVE

The overall objective of the rapid needs assessment is to **map and analyse the WASH, Shelter/Non-Food Items and Food Security/Livelihoods (FSL) needs of vulnerable residents living flood-prone areas in Khartoum State**, focusing specifically on disaster risk reduction and management in relation to the annual flooding. The rapid Needs Assessment specific objectives are:

- i. To analyse and understand the WASH, Shelter/NFI and Livelihood needs for different vulnerable groups (men, women, children, the elderly, people living with disabilities) in vulnerable and flood-prone areas of Khartoum State;
- ii. To map and analyse the effect of the annual flooding on the communities needs as well as assess their preparedness and response;
- iii. To inform current and future humanitarian and nexus programming, including a needs-based assessment of project locations;
- iv. To support the influence of government and international stakeholders on the ongoing humanitarian needs in Mayo, the Open Areas and the Nile basin in Khartoum State.

DATA COLLECTION TOOLS

The assessment provides an overview of primary data collection in December 2021. Data collection tools included:

1. **Household surveys**, covering:

- i. General household information
- ii. FSL
 - a. Livelihoods and average income
 - b. Food security and coping mechanism
- iii. WASH
 - a. Water access and quality
 - b. Sanitation facilities and access, including latrines and hygiene practices
 - c. Solid waste management
- iv. Shelter
 - a. Condition of housing
 - b. NFIs available in the household
- v. Protection

- a. Security incidents and mechanisms
 - b. Risks for women and children
 - c. Gender-based Violence (GBV)
- vi. DRR
 - a. Effect of the flooding on FSL, WASH and Shelter
 - b. Preparedness

2. **Rapid site assessments** and Observation Checklists, based on observations and Key Informant data

The data was collected by four trained volunteers, using **KoBo toolbox**. During the data collection, they were supervised by two experienced COOPI staff. During the data collection, the COOPI staff conducted observations and semi-structured interviews with the key informants to map the different sites.

TARGET LOCATIONS AND SAMPLING

For the household surveys, 300 surveys were planned, using a **95% confidence interval and a 10% margin of error**. The target locations have been selected based on consultations and data showing the most flood-prone areas of Khartoum State. Beneficiaries were selected using random sampling methods, convening at a starting point with enumerators moving in different directions to select random participation in the household survey.

LIMITATIONS OF THE ASSESSMENT

The assessment has been conducted predominantly in areas where COOPI had operational presence in Khartoum in December 2021. Due to operational and time constraints, this means for example that a large Open Area such as Naivasha was unfortunately not included in the assessment.

The findings do not show a representative sample of men and women as head of household. The large majority of respondents were women, very likely due to the time of day in which the assessment was conducted, coinciding with working hours.

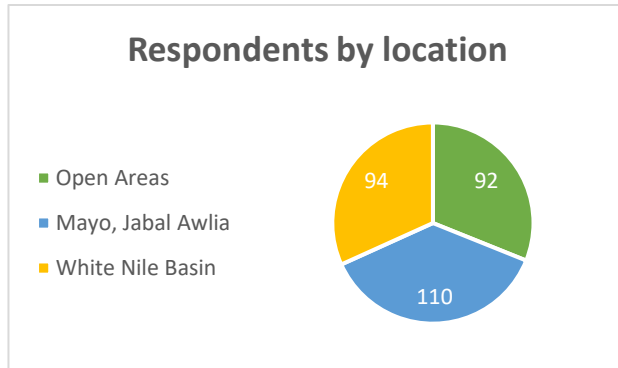
Though the surveys were conducted anonymously, due to the over-crowdedness of the sites, privacy of the respondents could often not be guaranteed and more than one person from the household was present when the survey was conducted. As a result, in comparison with secondary data, there are relatively very low levels of reporting on issues that can be considered stigmatized. For example, the reports on domestic violence and open defecation are lower than when compared to secondary data.

Relatively high numbers of people reported having a water source within walking distance, though the majority of people also reported relying on donkey carts for their water supply. Based on additional consultations about conflicting data, it became clear that respondents reported a water source as accessible if a donkey cart could reach it for them, as opposed to a water source they personally fetch water from. This is aligned with the site assessment matrices, noting the lack of direct water access particularly in Mayo and the Open Areas.

KEY FINDINGS

RESPONDENT DATA

Location



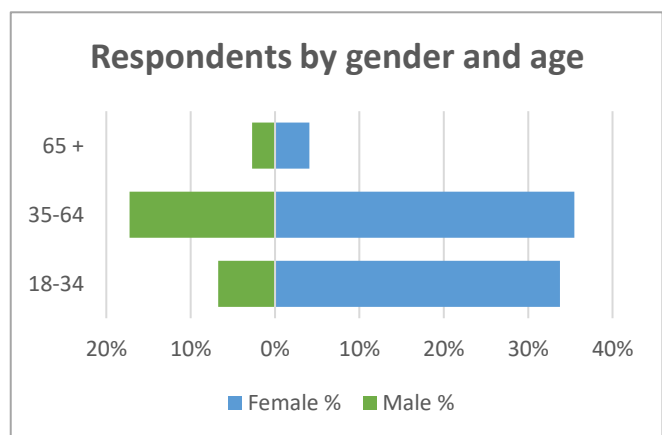
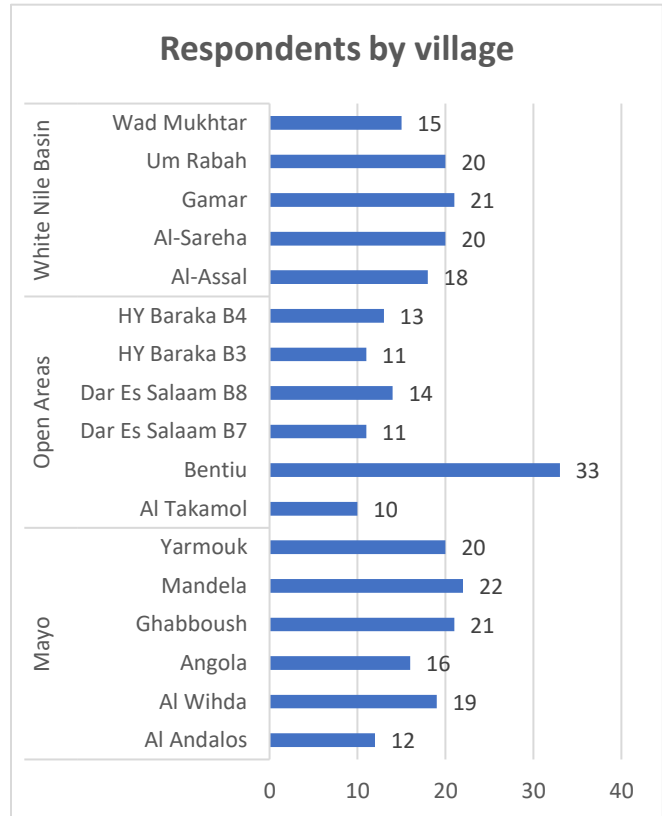
In total, **296 households** participated in the survey, divided in three types of flood prone areas across Khartoum state. Firstly, the most vulnerable areas in **Mayo** consists mostly of displaced communities, predominantly IDPs, as well as 4 refugee households from South Sudan. Secondly, the **Open Areas** are designated areas where South Sudanese refugees have resided since relocation by the government of Sudan after the separation of the two counties. Thirdly, as DRR is highlighted in the assessment, **villages in the White Nile basin** have been included as they experience flooding on an annual basis.

Gender and age

The assessment respondents in 296 households included **73% female and 27% male (217F, 79M)**, most of them were between 35 and 64 years old. A likely reason for the vast difference in male and female respondents was the fact that all surveys were conducted during the day, when men are often not present in the house (e.g. due to work).

Disability

8% of respondents has a disability, namely visual impairment (4%), movement impairment (2%) and hearing impairment (1%). No disability was reported in the age group 18-34. In addition, overall, it was reported that **18% of household live with someone with a disability**, particularly visual impairment and movement impairment.

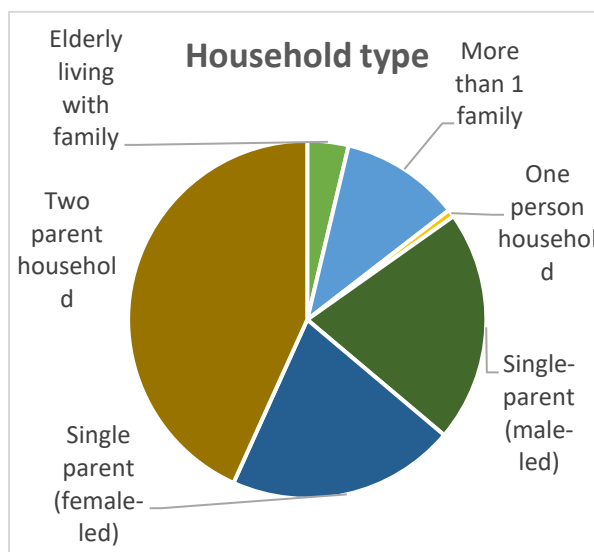


Household characteristics

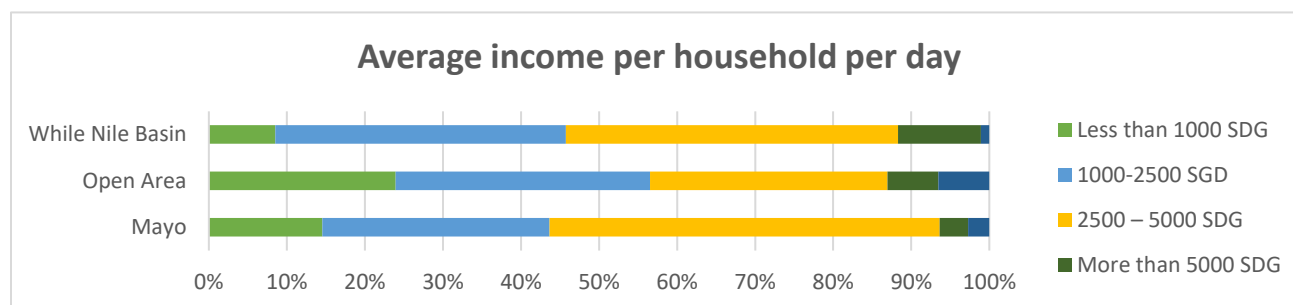
The average reported **household size across the sites is 7.5**. This is much higher than the government estimates of 5 people per household. **100% of households reported having at least one child below the age of 12**, with most household (18%) reporting 4 children under 12, followed by 3 children (17%), and then 5 to 6 children (both 16%).

42% of the households reported to be single-parent households (21% male-led and 21% female-led). Particularly in the Open Areas, there are many female-headed household, with 42% of households (39/92) reported being headed by a woman. Only 22% of households in the Open Areas consist of 2 parents (46% in Mayo; 60% in White Nile Basin). In Mayo and the Open Areas, it is somewhat common that **more than 1 family is living in a house**, with 15% and 13% reporting rate respectively.

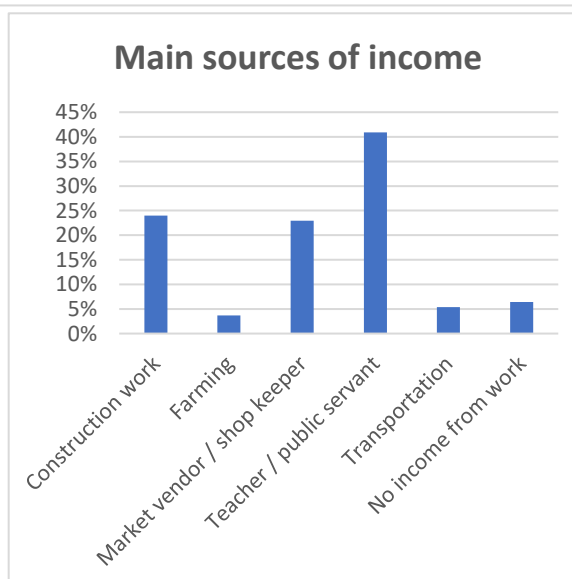
93% of households has access to a mobile phone.



FOOD SECURITY AND LIVELIHOODS



On average, **16% of respondents lives of less than 1000 SDG (appr. 2 EUR) per household per day**: 15% in Mayo, 24% in the Open Areas and 9% in the villages in the White Nile Basin. The vast majority of all households (90%) earns less than 5000 SDG per day, which considering the average household size of 7.5 is **under the international poverty line** of 1.90 USD per day. Many families participate in daily labour or seasonal work, including a type of public service (teacher, nurse, community worker) (41%), construction work (24%) and farming (4%), which means the **daily income is very unstable**. 6% of families reported absolutely no income from work.



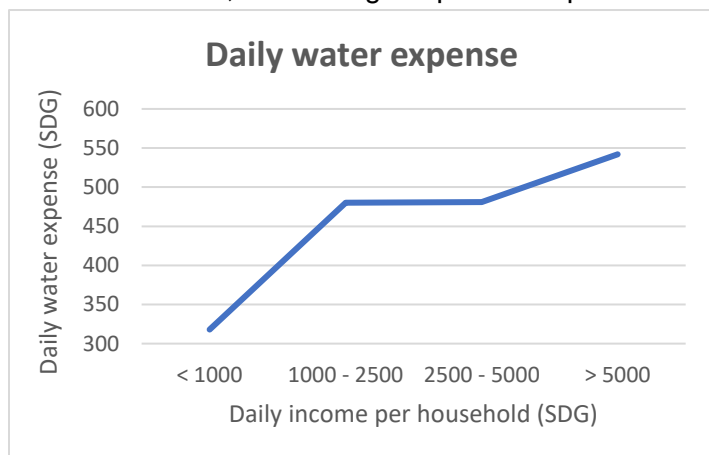
In the Open Areas, **54% of households reported that the average number of meals consumed per day is 1 or less.** This is 14% in Mayo and 2% in the villages in the White Nile Basin. On average across respondents, 23% of households consumes 1 meal or less per day.

Of those living on one meal or less per day, 38% reported that as a coping mechanism they rely on less expensive or non-preferred food options (unvaried diet). 18% reported they stay hungry as a result of lack of food options. 6% limits their portion size at meal times.

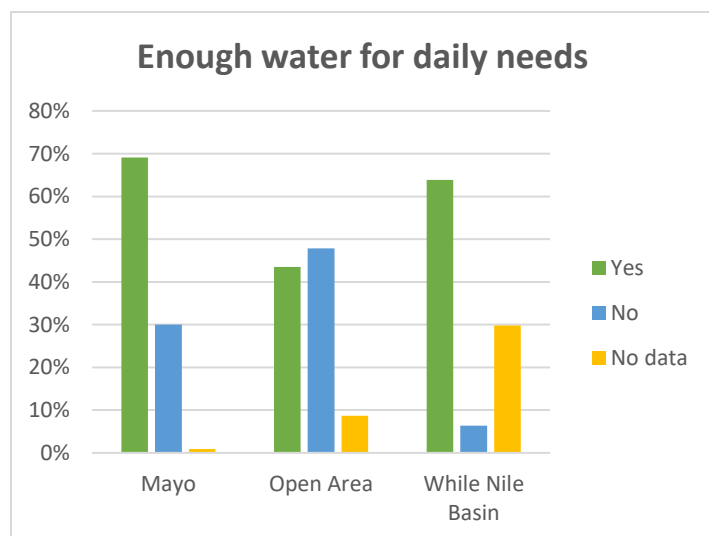
WATER

Access to water

Apr. 55% of respondents⁴ do not fetch water themselves, but rather rely on donkey carts for their daily water consumption. On average, in Mayo households spend **369 SDG** per day on water from carts and in the Open Areas households spend **585 SDG**. In the villages in the White Nile Basin, the average expenditure per household per day on water is **1,552 SDG**.



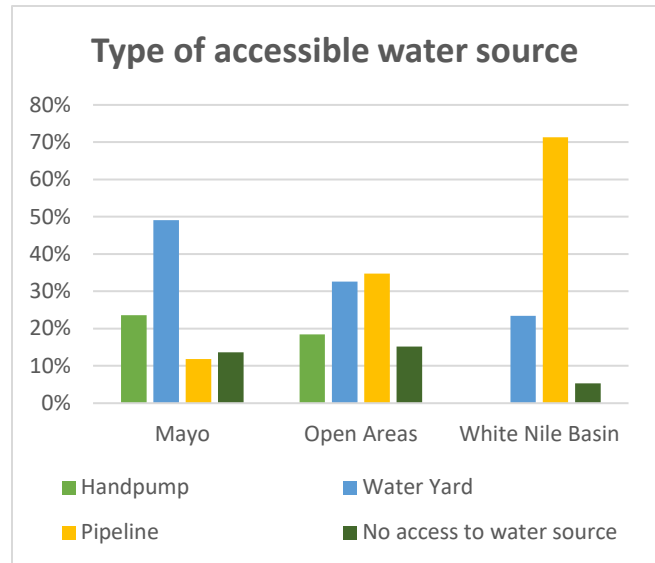
Comparing this to the average income per day, of those reporting an income of less than 1000 SDG, the average expenditure on water is 318 SDG. For households reporting an average daily income of between 1000 and 2500 SDG, they report 480 SDG expenditure. At the maximum income level in those categories, this means **32% and 19% of daily income respectively is spent on water within household in the highest poverty brackets.**



28% of people reported they do not have access to enough water to serve their daily needs. In the Open Areas, this is 48% and in Mayo, this is 30%. Coping Mechanisms reported among the people who reported not having enough water include: using less water for washing (72%); using less water for cleaning (64%); and using less water for cooking (5%).

⁴ Average of those reporting to buy water from donkey carts (53%) and those reporting they do not fetch water themselves (58%)

Comparing the **types of accessible water sources in the communities**, it is evident that in Mayo communities mostly rely on **water yards** (49%) followed by **handpumps** (24%). In the Open Areas, people mostly rely on **piped water systems** (35%) and water yards (33%), followed by handpumps (14%). Though the Open Areas are not connected to the government pipeline, the communities in Sharq Al Neel receive water from houses in the host communities. In addition, in Bentiu, the constructed Water Yard in the Open Area is connected to distribution points through pipes, of which some are functioning (mostly they are non-functioning due to low pressure or needed maintenance). In the villages in the White Nile basin, people mostly are connected to the pipelines (71%). **14% of respondents in Mayo, 15% of respondents in the Open Areas and 5% of respondents in the White Nile Basin reported no access to a water source within walking distance.**

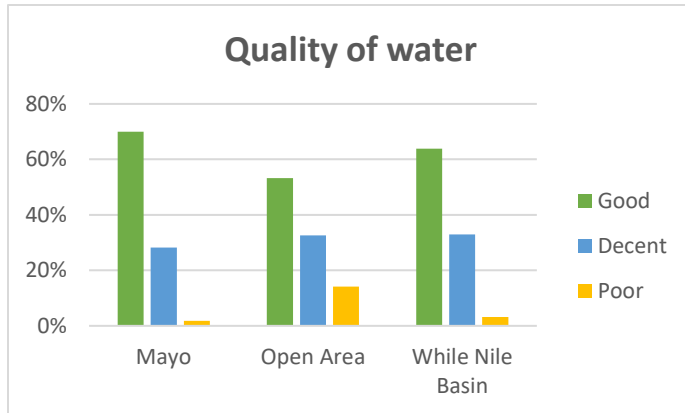


Children getting water from the water points with donkey carts in Mayo

Water points

122 respondents (41%) reported fetching water themselves. In Mayo 47% are women, 18% are children and 10% are women and children together. In Open Areas, 41% are women, 13% are children and 30% women and children together.

18% of respondents reported water points as unsafe for women and girls. Main risks include conflict at the source (15 reports in Mayo and 11 in Open Areas), and fatigue from long walk (10 reports in Mayo, 15 in Open Areas)



Overall, in Khartoum the **quality of water from the sources is good (63%) or decent (31%)**. 6% of the overall respondents rated the water quality as poor, particularly in the Open Areas, where the percentage of respondents rating the water quality as poor was 14%.

SANITATION AND HYGIENE

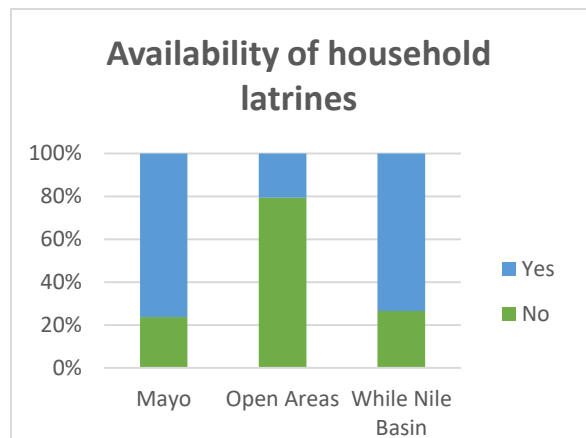
Household latrines

42% of people do not have a household latrine. This is **79% in the Open Areas**, 24% in Mayo and 27% in the villages in the White Nile Basin.

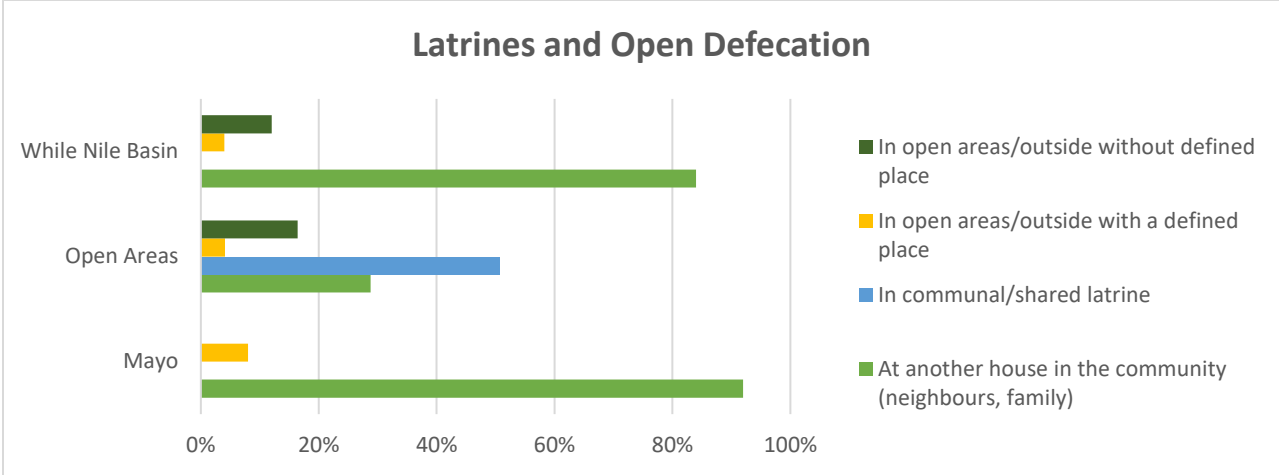
73/296 respondents (25%) reported to **either have a disability or have someone in their household with a disability**. Of these 73 HH, **38 households (52%) reported to not have access to a household latrine**.

Of the people who report they do not have access to a household latrine (42% of overall respondents), in Mayo, 92% of people reports **using the latrines in another house** in the community. 8% reports Open Defecation (OD). In the Open Areas, 29% reports using a household latrine in the community, 51% relies on **communal latrines**, **20% practices OD**. In the villages in the White Nile Basin, 84% relies on communal latrines and 16% practices OD. It is very likely OD is underreported because of stigma, as key informant data reported OD to be very common. The most common issue reported about communal latrines is that they are dirty. It was reported **that 88% of communal toilets are not accessible for people with disabilities**.

Of the 123 people who reported they do not have access to a household latrine, 23% reported embarrassment of going outside the HH, and 15% reported they are at risk of physical violence and/or sexual violence.

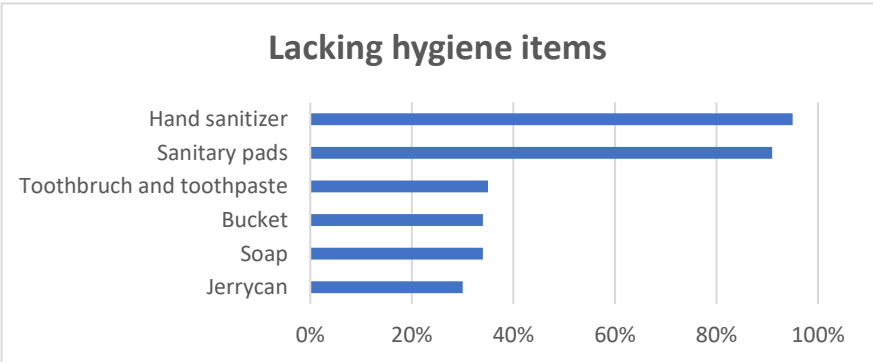


Only communal latrine in Dar Es Salaam Block 7



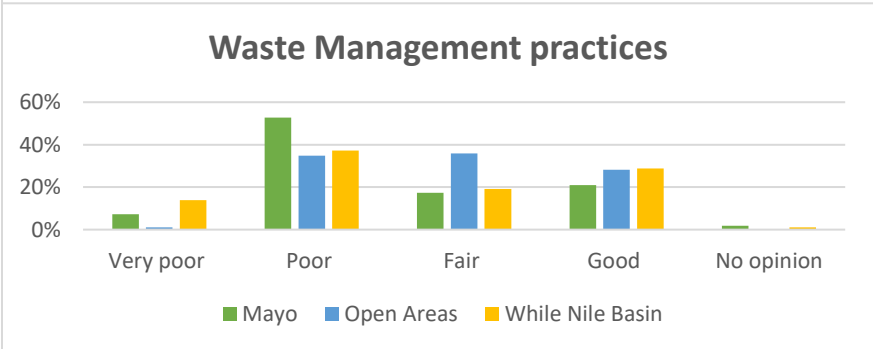
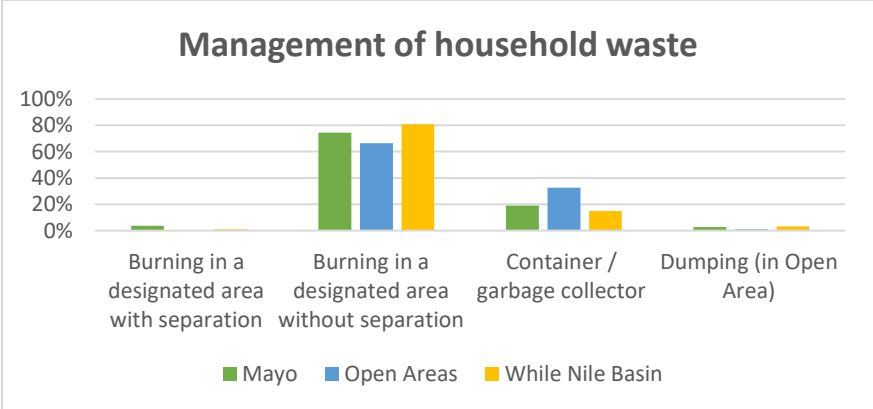
Hygiene items

The vast majority of people reports **not having sanitary pads and hand sanitizer in the household**. Appr. 1 out of 3 households reports not having access to a toothbrush / toothpaste, a bucket, soap and a jerrycan.



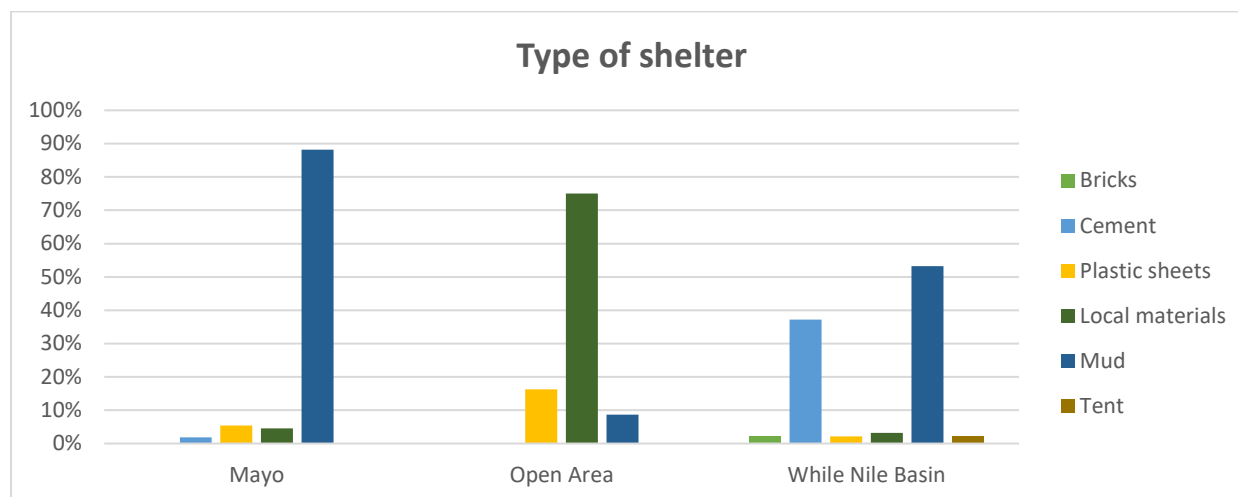
Solid waste management

The vast majority of people **burns their garbage in designated areas, without separation**. Only 21% of the overall respondents report having access to a garbage container. Particularly in Mayo, the communities rate **current waste management practices as very poor (7%) and poor (53%)**. In the villages in the White Nile basin, this is 51%. Only 26% of respondents rate current waste management practices are good.



SHELTER

In the Open Areas, 75% of respondents report they do not rent or own the land they live on. This is in line with the Commission of Refugees (COR) strategy as the Open Areas are designated areas managed by the Sudanese government. Some people in the Open Areas rent outside the camp settings, due to the poor living conditions inside the settlements. In Mayo, 17% of respondents does not own or rent land. In the villages in the White Nile Basin, the vast majority of people, 95%, do own or rent the land they live on.



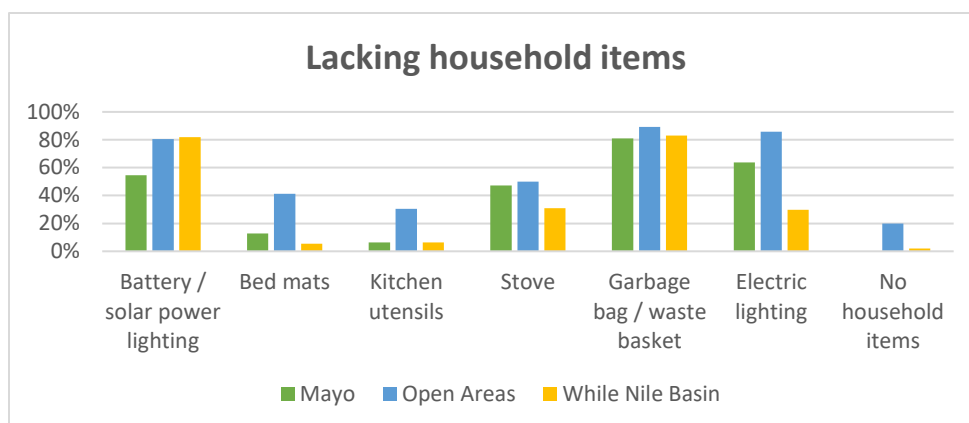
In Mayo, 88% of respondents report living in mud brick houses. In the Open Areas, **16% of people live in houses mostly made of plastic sheets. 75% of respondents live in houses made of local materials such as bamboo, branches and burlap.** In the White Nile Basin, the majority of people live in cement and mud houses.

In total, **84% of respondents report their house in not rain and wind resistant.** This includes 87% in Mayo, 99% in the Open Areas and 67% in the villages in the White Nile basin. The main problems reported are **holes and leakage in the roof (80%); bad or no doors and windows (55%); old and damages building materials (48%); an unstable foundation (44%); and holes and leakages in the walls (35%).**



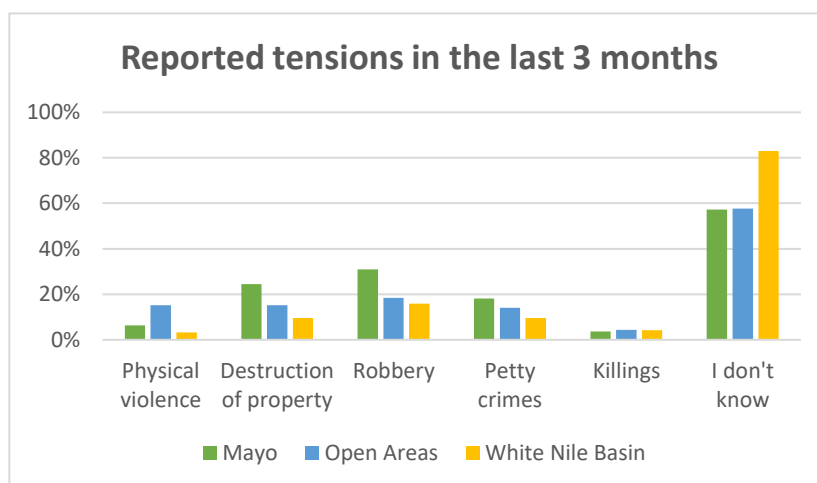
Common shelter conditions in the Open Areas of Dar Es Salaam

In terms of Non-Food Items (NFIs), it is evident that the respondents in the Open Areas reported **significant gaps in household items**. 80% has no battery powered lighting and 86% has no electric lighting. Besides from that, a lack of stove (50%) and kitchen utensils (30%) was also reported. **20% of the respondents in the Open Areas reported having no household items at all.** In Mayo, lighting and a stove (47%) are the main challenges. Across the locations, over 80% report no access to waste bins.



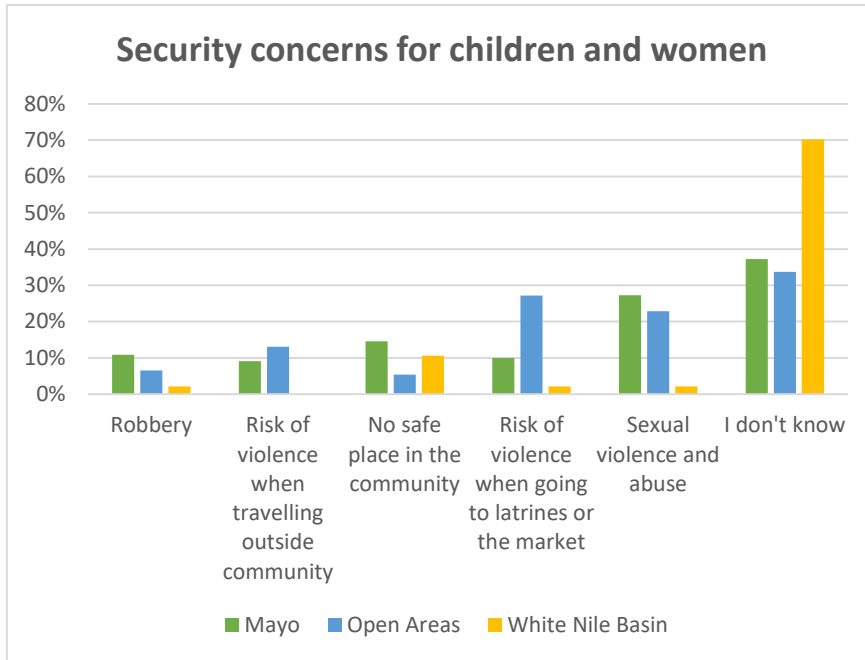
GBV AND CONFLICT

66% reports they do not know about any tensions between IDPs, refugees and host communities in the last 3 months, particularly in the villages in the White Nile basin, there seem to be very little incidents (83% does not report any incident). **In Mayo, the highest number of incidents are reported**, with 31% (34 reports) of respondents reporting robbery, 25% (27 reports) destruction of property, 18% (20 reports) petty crimes, 6%



(7 reports) physical violence and 4% (4 reports) killings. In the Open Areas, 18% (17 reports) report robbery, 15% (14 reports) destruction of property, 15% (14 reports) physical violence, 14% (13 reports) petty crimes, and also 4% (4 reports) killings.

When asked about the common risks facing women and children, **18% of the overall respondents reported sexual violence and abuse**, including 27% in Mayo and 23% in the Open Areas. This can be characterized as the gravest concern affecting women and children. At the same time, **62% of respondents reported there are no GBV services in place in their community**. In terms of other risks, risk of violence when moving inside the community (13%), no safe place in the community (10%), robbery and risk of violence when travelling outside the community (both 7%) were indicated. 3% of households reported child labour, which is prevalent around Mayo and the Open Areas, as a concern. A possible explanation for the low report on



child labour as a risk is the perception of child labour and the number of risks it poses, compared the perceptions of the community / household of the benefits of working children. 2% of respondents reported domestic violence, though this figure may be higher due to the circumstances in which the survey was answered (i.e. with other members of the household present). **47% report they do not know or are not aware of specific risks affecting children and women.**

Almost half of respondents report that the open areas around the households / communities are not safe spaces for women and girls, particularly in Mayo and the Open Areas (54% and 53% respectively). In Mayo, 15% also considers the market an unsafe space for women. In the Open Areas, the latrines are reported by 14% as an unsafe space. In the villages in the White Nile Basin, 11% of respondents report that unoccupied shelters are unsafe for women and girls. 27% of respondents report all areas are safe, 11% does not know or is not aware of any unsafe spaces.

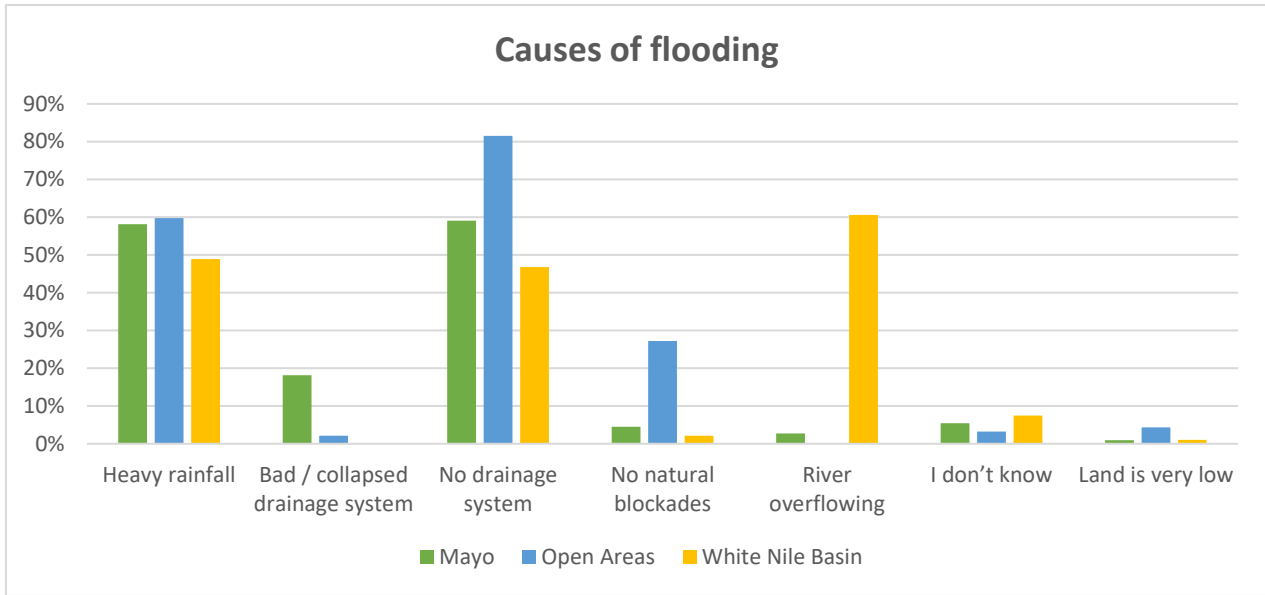
DISASTER RISKS (FLOODS)

99% of households reported that the community had been affected by floods in the last 3 years. When asked specifically if the **household of the respondent was affected, 88% of respondents reported** that this was the case. In the Open Areas, 99% of respondents reported their household has been affected directly. In Mayo, the total is 85%. In the White Nile Basin, 80% of surveyed households had been affected directly by flooding in the last 3 years.

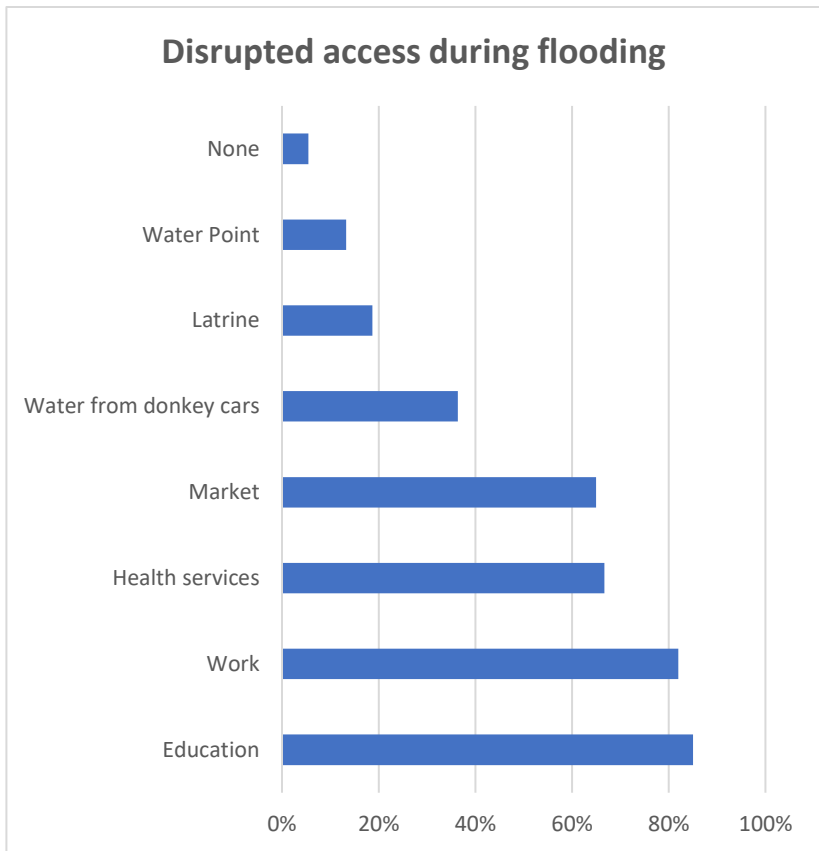
The main reasons for flooding as reported across the communities are the **lack of a functioning drainage system combined with heavy rainfall.** In the White Nile basin, communities also reported the **river overflows** during the rainy season, affecting their livelihood and shelter.



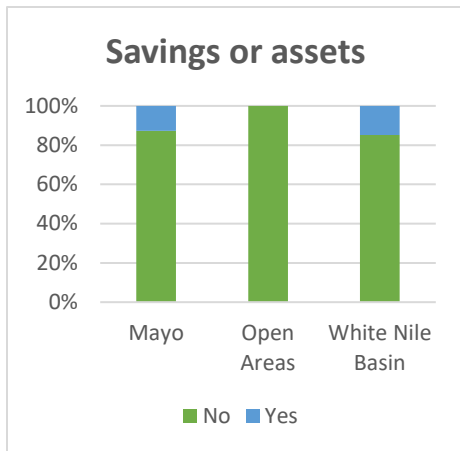
Community members in Mayo during the flooding in 2021



During the flooding, **access to services is massively disrupted**, particularly education (85%), work (82%), health services (67%) and the market (65%). In terms of WASH services, **36% of respondents that the donkey carts cannot reach their communities** during the floods and 13% of respondents reported their water point is out of service. 19% of respondents reported having no access to latrines during the flooding. The percentages are similar across the 3 sites. In terms of accessibility of the community via roads, **all communities report the access to the community is very challenging during the floods as the roads are inaccessible** (Mayo: 72%; Open Areas: 80%; villages in the White Nile Basin: 68%).

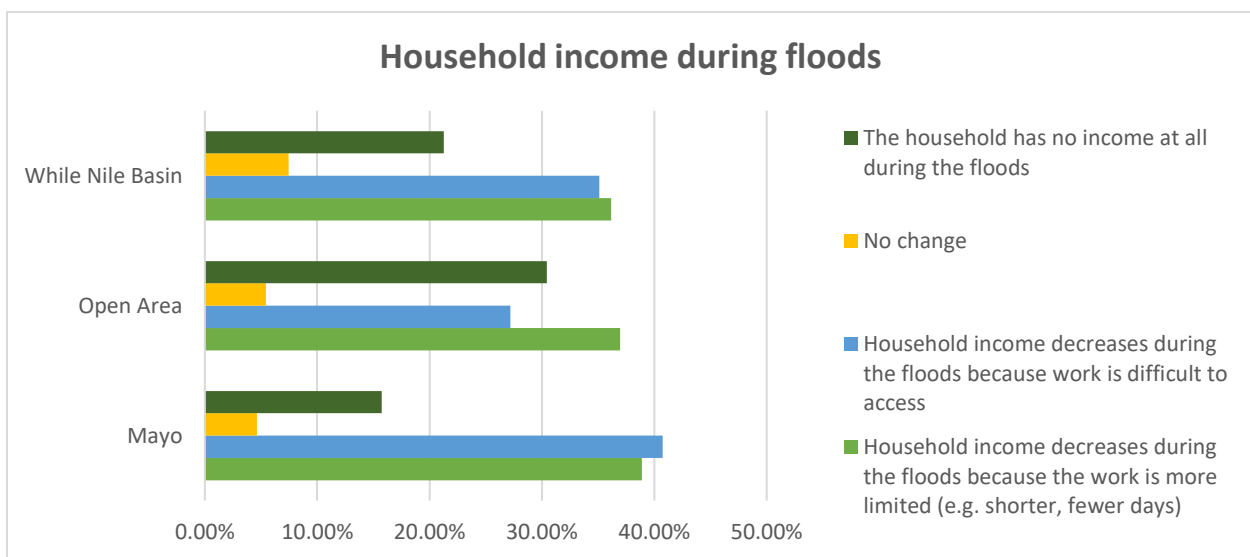


14% (41 respondents) of overall respondents own farms land or livestock (28% of respondents in the White Nile basin and 14% of respondents in Mayo). Out of these, 57% of respondents reported their **farmland or livestock had been partially destroyed (33%) or fully destroyed (24%)**.

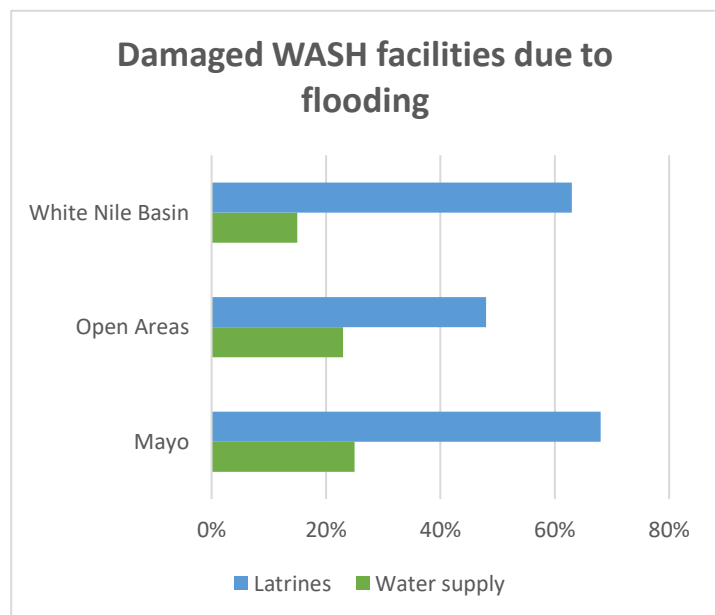


The vast majority of respondents reports having **no saving or assets**, creating challenges in absorbing the shocks related to the floods. In the Open Areas, 100% of respondents reported having no savings or assets.

In addition, **72% of the respondents reported that their household income decreases during the flooding season**, both as a result of limited work opportunities as well as work which is difficult to access because of e.g. the road conditions. In addition, **22% of the households report they have no income at all during the floods**, 16% in Mayo, 30% in the Open Areas and 22% in the White Nile Basin.



25% of respondents in Mayo, 23% of respondents in the Open Areas and 15% of respondents in the villages in the White Nile Basin reported their **water supply had been damaged or adversely affected by the flooding**. The main problems reported was the **lack of access, and damage to the water source**, both by the communities and as a result of the floods. In addition, 68% of respondents in Mayo, 48% of respondents in the Open Areas and 63% of the respondents in the White Nile basin **reported their latrines had been damaged or destroyed by the floods in the last 3 years**. On average, 66% of respondents reported they had no access to another latrines during this time.

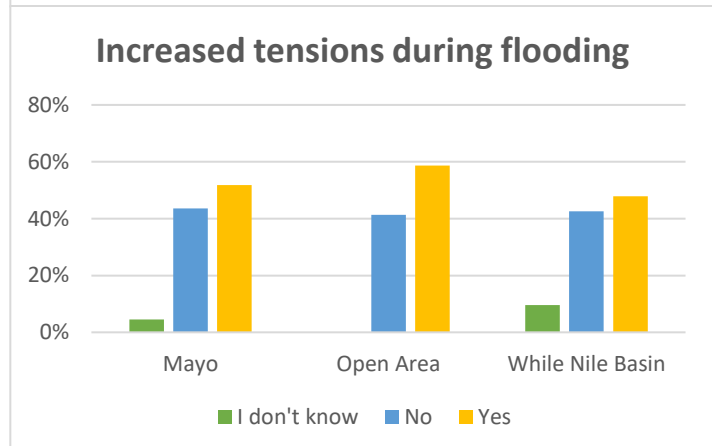
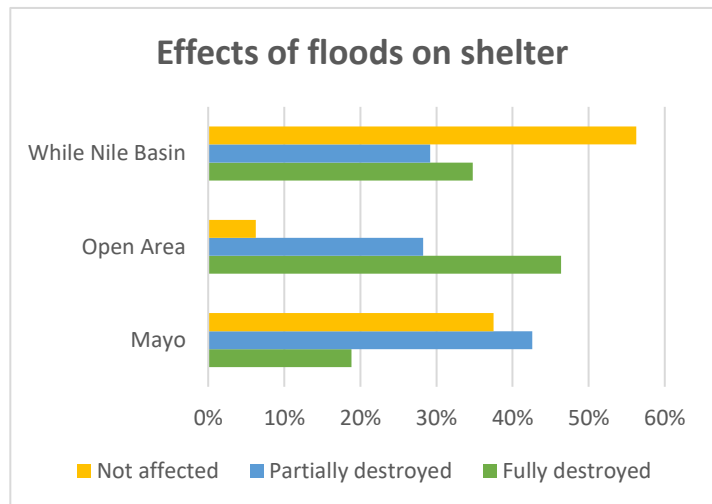




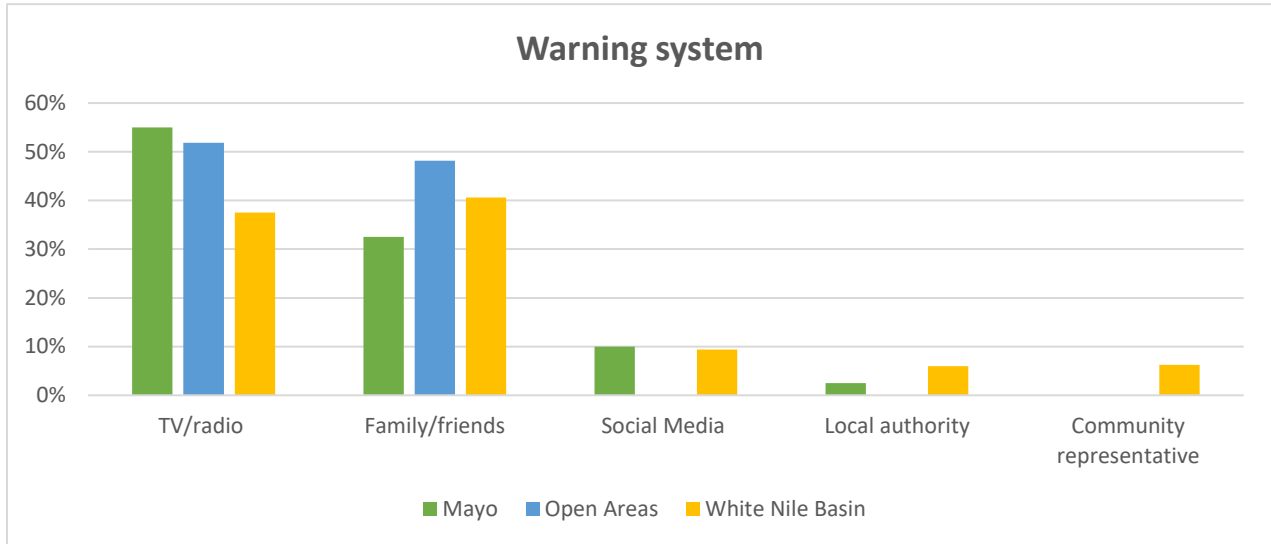
The donkey carts face challenges to reach the communities during the flooding

The majority of respondents reported their **shelter in the last 3 years has been partially or fully destroyed by the flooding**. In the Open Areas, 75% of people reported their shelter had been affected. In Mayo and the White Nile Basin, 62% and 64% respectively. **34% of people in the White Nile Basin reported having been (temporarily) displaced because of the flooding**, mostly moving to family members and community members further removed from the river banks. In Mayo, 11% of people reported having been displaced as a result of the flooding.

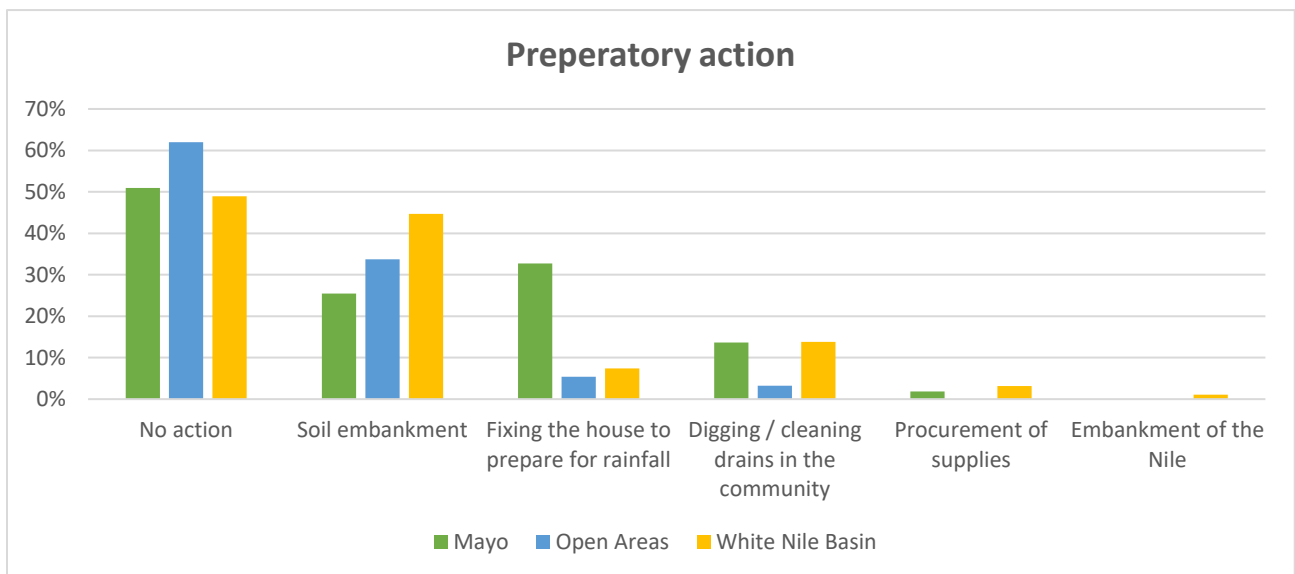
The **majority of respondents (52%) report that community tensions and conflict increase during the flooding** due to a lack of resources and services being available and/or accessible, particularly in the Open Areas (59%), followed by Mayo (52%) and the White Nile basin (48%).



Two-thirds of all respondents reported never receiving any warning before the floods (62% in Mayo; 71% in the Open Areas, 66% in the White Nile basin). Of the 99 respondents who reported having received a warning, the warning predominantly came from **TV and radio, as well as family and friends. 90% of respondents is not aware of any plans to prepare or respond to the floods.** Of those who do, 28/31 respondents (mostly located in the villages of the White Nile basin) clarify they are aware of plans at the locality level.



The majority of households (54%) undertakes no action to prepare for the floods. 34% of households focuses on soil embankment in the time leading up to the flooding, particularly in the villages in the White Nile basin followed by the Open Areas. In Mayo, households predominantly focus on **fixing their houses to prepare for rainfall.** In the White Nile basin and Mayo, 14% of respondents also reported being involved in **cleaning or digging of drains to avoid overflowing of the drainage system.**



RECOMMENDATIONS FOR PROGRAMMING

Across Khartoum state, the rainy season generally represents a marking point in the lives of households and poses a stop to their internal economy, means of livelihood, and access to basic services like education, water and health.

The floods have the highest effect on the most vulnerable people, including refugee and displaced populations who live in make-shift shelters, do not have access to household latrines, and rely on donkey carts for their water supply. The vast majority of this population does not have assets or savings to face this recurring crisis, and is at high risk of adopting negative coping mechanisms to disaster, including school drop-out, child labour, GBV, etc.

Based on the assessment, several programmatic recommendations are taken into account:

WASH

- ❖ There is a need for increased and improved water supply as the majority of people is reliant on procuring water from donkey carts, which poses limitations to their household expenses and is often disrupted during the rainy season. In addition, due to the anticipated inflation, the procurement of water will increase as a financial burden to the household. It is key to ensure rehabilitated or constructed water sources are flood-resistance, and accessible for the communities during the rainy season.
- ❖ Rehabilitation and construction of water points needs to take into account gender considerations, as currently the area outside of the communities is reported unsafe for girls and women and 18% of respondents even reported particular water points to be unsafe. Considering that overall, one-fifth of the household is female-led, and women and children are mainly responsible for fetching water, this is pertinent to take into account. Water points need to be upgraded and rehabilitated within the communities by focusing on existing boreholes or the instalment of distribution points closer to the communities, as well as a focus on sustainable water operations and maintenance committees who are trained on gender and age considerations.
- ❖ As a very high number of household and shared latrines, particularly in the Open Areas, collapse during the rainy season, which means they are not sustainable, but also poses a public health hazard. The focus needs to be on more sustainable solutions including the construction of latrines with a cement slab.
- ❖ Constructed latrines need a focus on disability-friendly construction as the vast majority of communal latrines is not accessible to people with disabilities, even though 18% of households report having someone with a disability living in their household. Particularly in the Open Areas this is important, as half of the population according to the data relies on communal latrines.
- ❖ The total absence of a functioning solid waste management system and the lack of a safe disposable area to burn garbage, automatically translates into massive sanitation issues during the rainy season, due to e.g. stagnated water in the communities. Approaches to ensure designated waste management areas, as well as cleaning and enhancing the drainage system and infrastructure of the roads, are absolute key for a sustainable solution to the problem of flooding in Khartoum.

SHELTER

- ❖ Shelter solutions should focus increasingly on enhancing flood-resistance as currently 84% of the households reported not being wind or rain resistant and the vast majority of households has been partially or fully destroyed by flooding in the last three years. Shelter solutions should take into account a solid foundation as well as an elevated floorboard to stop the rain from flooding inside the shelter.
- ❖ All programmes should take into consideration a conflict-sensitive approach, as tensions between host communities, IDPs and refugees continue to be reported.

DRR

- ❖ The vast majority of people in Mayo and in the Open Areas lives below the poverty line. This has a big implication on their capability to prepare and respond to the floods. DRR actions should be accompanied by livelihood interventions to support household resilience to disasters.
- ❖ There is a high need for localized and community-based solutions as often, access to communities is very limited during the flooding season and the community has limited access to basic services. Mobile approaches should be considered as well as the pre-positioning of stock relying on a structure of local volunteers who are inside the community.
- ❖ 46% of people take some action to prepare for the floods. This needs to be enhanced through the provision of technical guidance, training on anticipatory action, and community-based approaches. In order to achieve this, an early warning system is key, enhancing the potential of social networks as well as TV, radio and social media to inform communities about the flooding, preparatory actions they can undertake, and response tactics. It can be taken into account that almost all households have access to a mobile phone.
- ❖ Continuous advocacy with local authorities is needed to ensure they are incorporated in local planning, as the most vulnerable areas of Mayo and the Open Areas are currently very underserved. This is key in relation to services, as well as basic infrastructure, such as e.g. the embankment of roads leading up to the communities.

