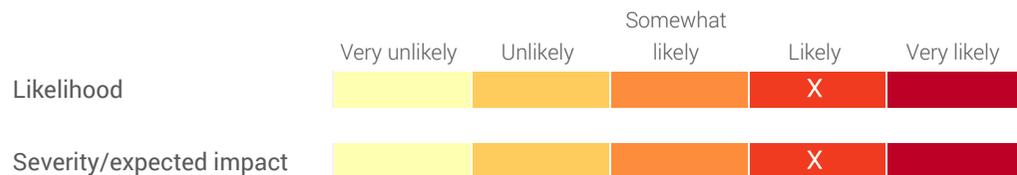


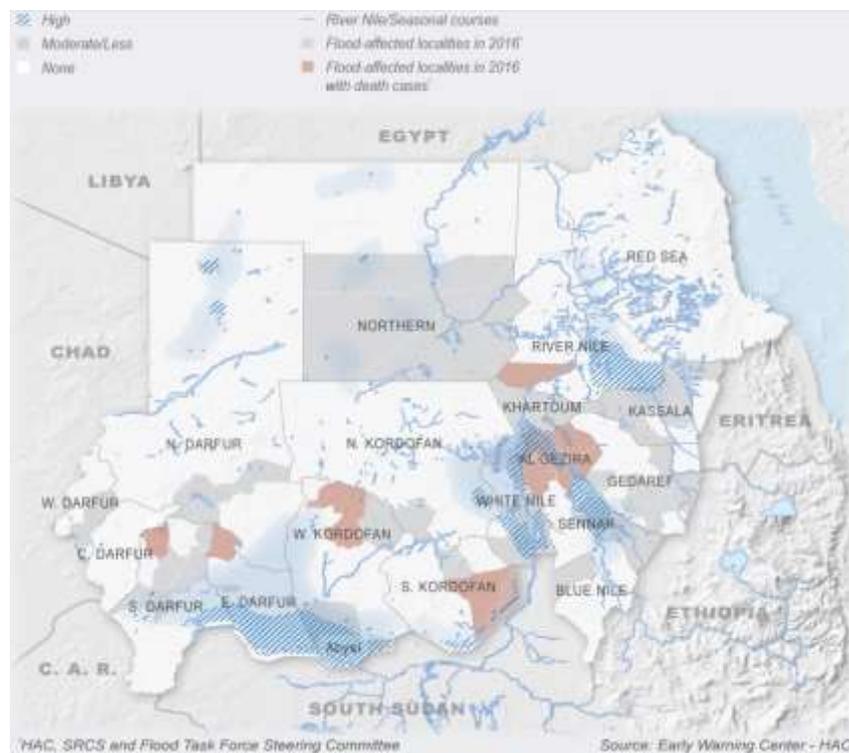


# SUDAN

## Anticipatory: Impact of rainy season on IDPs and refugees in southern Sudan



### Flooding in Sudan, 2016



### Anticipated scope and scale

Floods during the rainy season from June until at least October will affect about 200,000 people, mostly in southern Sudan. Particularly vulnerable are the displaced in southern Sudan, where there are 2.3 million IDPs and about 400,000 South Sudanese, 110,000 of whom arrived in 2017. Floods will damage key WASH infrastructure and increase the caseload of diseases including cholera and malaria. Houses will be destroyed and flooding will damage crops and isolate some localities, driving up food prices.

**Aggravating factors:** Existing outbreaks of malaria and cholera among refugee and IDP populations, poor WASH infrastructure, and overcrowded camps aggravate health conditions while the lean season worsens food security and nutrition levels.

**Preparedness and response:** Response will be limited as there is a lack of presence to respond to isolated flooding. Many South Sudanese refugees who arrived in 2017 are located in areas where there is limited or no humanitarian presence.

### Priorities

- WASH** infrastructure will be damaged and safe water sources will be contaminated
- Health** response to outbreaks, including cholera and malaria
- Shelter** to repair and replace housing, especially in camps

### Humanitarian constraints

Humanitarian access will be limited as roads are damaged and river transport is difficult. Some areas are likely to be cut off. As humanitarian presence is limited in some likely flood-affected locations, particularly West Kordofan and East Darfur, immediate response will be difficult. Poor reporting on weather conditions and diseases further constrains response.

### Limitations

Existing WASH, nutrition, health, and shelter needs for the displaced and resident population is lacking. The number of IDPs is not accurate due to lack of access. Reporting on previous flooding is inconsistent

## Drivers of the crisis

### Rainy season and flooding

The annual rainy season in Sudan usually lasts from June until October or November, affecting approximately 200,000 each year (Floodlist 2013; OCHA 27/03/2017). This year's rainfall is predicted to be only slightly below average levels in Sudan, as well as in Ethiopia, where rainfall affects flooding in Sudan (FEWSNET 04/17; FEWSNET 04/17).

Widespread flooding is caused by overflow from the Nile and its tributaries, as well as the Gash River. Localised flashfloods are also common, caused by heavy rains. Although flashfloods are generally of short duration, they can cause major damage to villages, and urban and agricultural areas located in catchment and drainage zones (UNOSAT 26/08/2016).

Areas bordering South Sudan, as well as the River Nile and Al Gezira state are highly vulnerable to flooding, as shown in the map to the right, where shaded blue areas indicate high vulnerability. Desertification makes the areas around rivers more susceptible to flooding, and flooding more likely, as deforested soil is unable to absorb rain. The main cause of desertification is climate-based (UNEP 2016).

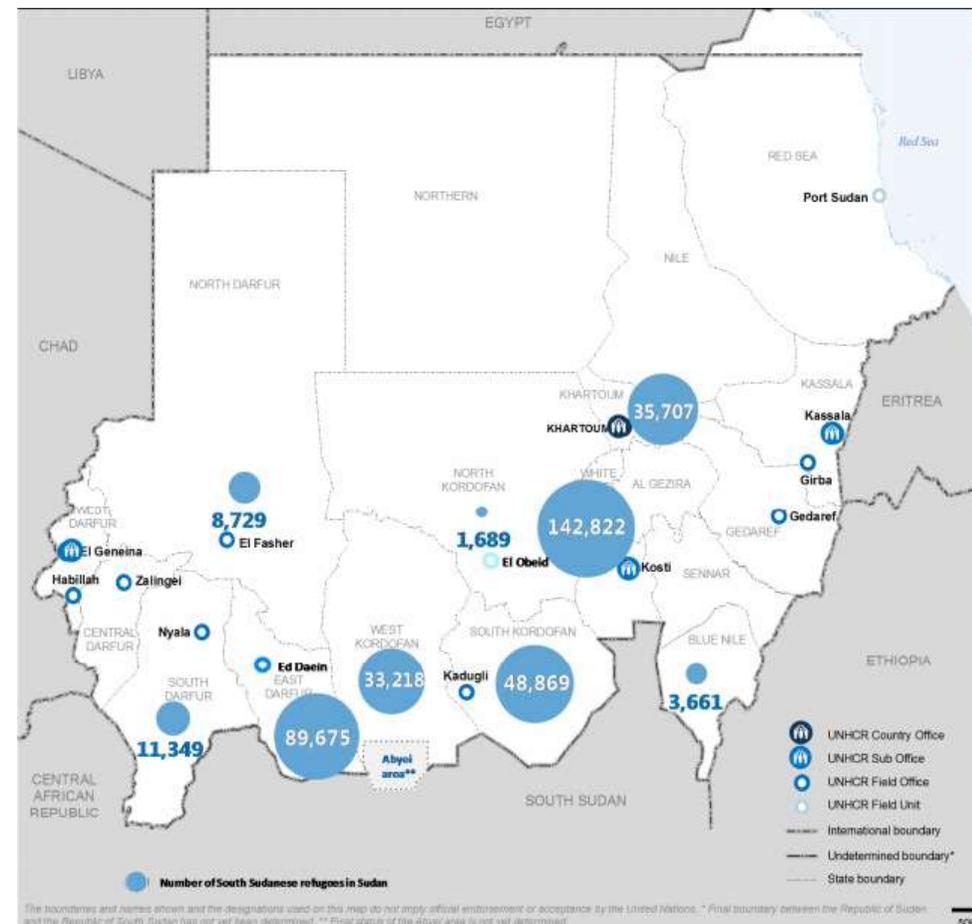
### Displacement

The displaced population is the most vulnerable to the effects of flooding and heavy rains because of poor conditions and infrastructure in camps, and dependence on humanitarian assistance.

An estimated 2.1 million IDPs have been displaced by the conflict in Darfur and are in need of humanitarian assistance. In South Kordofan, West Kordofan, and Blue Nile states, there are an estimated 200,000 IDPs resulting from clashes that have worsened in recent years due to conflict between the government and the Sudan People's Liberation Movement-North (SPLM-N) (HNO 01/2017).

In addition, an estimated 110,000 South Sudanese have arrived in Sudan so far in 2017, with 34% arriving in East Darfur, 34% in White Nile, and 27% in South and West Kordofan. These refugees bring the total number of South Sudanese refugees in Sudan to approximately 400,000 (UNHCR 30/04/2017; OCHA 23/04/2017).

### Sudan: South Sudanese Refugees, 30 April 2017



Source: UNHCR 30/04/2017

## Anticipated crisis impact

### WASH

18 of the 60 IDP camps in Sudan are at a critical sub-standard level (water supply is less than 7.5L per person per day in camps in South, West, Central, and North Darfur states). Of the 3.5 million people in need of WASH assistance, 2.1 million are IDPs in Darfur and South Kordofan (OCHA 27/03/2017; UNHCR 30/04/2017). In areas of poor WASH services, which includes most of Darfur and southern Sudan, flooding will worsen WASH

conditions. Latrines will likely be destroyed, especially in IDP and refugee camps. More than 20,000 latrines were destroyed in 2013 flooding (IFRC 25/04/2017; IFRC 30/09/2014; Dabanga 09/10/2014; OCHA 21/09/2014). Safe water will likely be increasingly inaccessible as drainage is compromised, leading to contamination of water sources. Flooding is also likely to destroy hand pumps and boreholes (Dabanga 17/08/2016; OCHA 31/07/2016).

## Health

The highest frequency in reported illnesses during flooding will likely be diarrheal diseases, respiratory tract infections, malaria, and skin diseases. High death rates were reported during disease outbreaks, such as a malaria, during flooding in 2013 (IFRC 30/09/2014; Dabanga 03/09/2013).

Although caseloads are hard to predict, the reporting of diseases has increased from weekly to daily, indicating that the rainy season is already having an impact (WHO 13/04/2015). New refugees are reportedly arriving with diseases. Many have poor health and nutrition, making them vulnerable to disease (MSF 11/05/2017).

In the event of flooding, diseases are likely to increase further, and available medicine supplies and health facilities are likely to be overwhelmed by the increase in caseload (IFRC 30/09/2014; Dabanga 09/09/2013). Cholera or acute watery diarrhoea will likely increase, as has occurred previously (USAID 30/09/2014; UNICEF 30/11/2016). Malaria will likely increase as stagnant water facilitates mosquito reproduction. A 45% increase in malaria cases was reported in one month during flooding in Blue Nile in 2016 (June to July) (Dabanga 05/09/2014; OCHA 17/10/2016). Other diseases, such as yellow fever, are possible following mosquito proliferation during flooding. Yellow fever outbreaks in October and November followed flooding in 2012 and 2013 and continued for at least two months (IFRC 31/05/2013; WHO 15/12/2013).

Hepatitis E was also reported during the rainy season in 2016 in North Darfur and linked to poor WASH conditions due to overflowing latrines (OCHA 31/07/2016).

## Shelter

IDP and refugee camps are especially vulnerable due to overcrowding and poor housing structures in the camps. Most refugee camps are hosting population numbers far beyond capacity (UNHCR 15/05/2017). Approximately 4,000 cases of Acute Respiratory Illnesses (ARI) were reported among refugees in White Nile in March. ARI is associated with poor shelter conditions and overcrowding and reflects the living situation for displaced people in Sudan (OCHA 28/08/2014; Dabanga 09/10/2014; Dabanga 18/09/2014; UNHCR 31/10/2016; UNHCR 28/02/2017).

22,000–85,000 houses will likely be destroyed if flooding occurs on a similar scale to previous years, with many more houses damaged. This will displace up to 300,000 people across the country (OCHA 27/03/2017; IDMC 09/07/2014; IFRC 30/09/2014; OCHA 28/08/2014; Dabanga 09/10/2014; Dabanga 18/09/2014; UNHCR 31/10/2016; UNHCR 28/02/2017).

## Food

Food access for poor families will be affected as areas become isolated and prices increase (Dabanga 03/09/2013). Damage to livestock, crops, and arable land will pose a serious risk of long-term food insecurity (OCHA 27/03/2017; OCHA 28/08/2014). In various localities prices increase as flooded roads limit access, cutting off supplies. This particularly affects poor and displaced people (Dabanga 03/09/2013).

## Education

Schools are closed as classrooms are damaged or flooded (Dabanga 17/08/2016). Schools are often used to house patients when health facilities are overwhelmed, as is likely (Dabanga 14/05/2017).

## Humanitarian constraints

Humanitarian access to affected areas will be limited as roads become damaged and river transport is difficult. Various localities in Darfur and Blue Nile have previously been isolated for up to four months due to flooding. One of the major highways connecting Khartoum with South Sudan leads through White Nile state, and runs on both sides of the river and is likely to be affected by flooding (HDX Sudan Roads). Refugee sites in White Nile and South and West Kordofan are largely inaccessible during the rainy season (UNHCR 15/05/2017; Dabanga 03/09/2013; Dabanga 06/09/2016). Delays are expected to access areas affected.

Bureaucratic constraints to obtain travel permits to field locations exist, although this situation is improving. Access to areas of active conflict in Darfur, South Kordofan, and Blue Nile is largely denied (UNHCR 15/05/2017).

The Sudanese government is reluctant to report cholera cases, and has arrested journalists who publish material related to acute watery diarrhoea (AWD). Cholera cases are therefore underreported, and many unreported cases are likely to exist across the country (Dabanga 07/04/2017).

## Aggravating factors

### Lean season

The lean season runs from May to August (FAO 22/11/2016). Emergency (IPC Phase 4) food security levels are expected for IDPs and poor residents in SPLM-N areas of South Kordofan and new IDPs in Jebel Mara from June until September. In April, food prices were 45% above the long-term average rates across the country, with prices expected to increase along the lean season (FEWSNET 04/2017).

The lean season also aggravates malnutrition levels in Sudan (FAO 22/11/2016). Common ailments for children hospitalised during the flooding season have included malnutrition, which can exacerbate the impact of malaria and other diseases (IFRC 22/10/2013; Dabanga 03/09/2013).

### Location and type of housing/infrastructure

Houses in Sudan are vulnerable to the effects of flooding. Most people live in *gottias*, which are single-room houses with straw roofs and mud walls. Only about one-third of the population live in *menzils* – multi-room houses with sanitation facilities (Encyclopedia 2016).

## Additional contextual information

### Conflict in South Sudan

Violence between the South Sudanese army (SPLA) led by President Kiir, and the SPLA-IO led by former Vice-President Riek Machar intensified at the end of January 2017 in Upper Nile state. Sporadic clashes have occurred since then, resulting in displacement of almost 400,000 people towards Sudan (IPC 20/02/2017). In the northwest of the country, trade disruption and food shortages bring South Sudanese towards Sudan in search of food (FEWSNET 08/05/2017).

Refugee flow towards Sudan is also caused by high levels of food insecurity in the north of the country. Famine was declared in the conflict-affected state of Unity in February 2017, with 100,000 people facing Catastrophe (IPC Phase 5) food security outcomes (IPC 20/02/2017).

## Response capacity

### Local and national response capacity

The Sudan Meteorological Authority is in charge of weather surveillance and early warning and provides flooding forecasts. In the past, there has been no weekly or daily updates on the flooding situation and information is largely satellite-based. Information does not seem to reach the whole population because of lack of internet access (Ersad 2016).

The government has the primary responsibility for assessment and response coordination (Al Jazeera 25/08/2016). Within the government, the flood response is shared between the state, the Ministry of Irrigation and Water resources and the Ministry of Humanitarian Affairs (Nationsonline 2016). During the last major floods in 2016 and 2014 the government activated the flood task force and collaborated with key stakeholders including representatives from the HAC, the Civil Defence Authority, the Sudanese Red Crescent Society and United Nations agencies (IFRC 25/09/2014; Al Jazeera 25/08/2016).

Popular initiatives have previously mobilised volunteers to engage in distributing aid to affected areas in a phenomenon commonly known as Nafeer (Al Jazeera 25/08/2016). The Sudanese Red Crescent Movement also mobilised over 1,000 volunteers during the 2016 floods (IFRC 25/04/2017).

### International response capacity

Humanitarian operations are limited throughout the south of Sudan, especially in West Kordofan and East Darfur where 50% of South Sudanese refugees have arrived (OCHA 23/04/2017). The number of humanitarian workers in Darfur has steadily declined from 17,700 in 2009 to 4,208 in 2017 (OCHA 01/01/2017; OCHA 01/04/2017).

The limited presence of international organisations besides the UN and the limited capacity of local organisations make an immediate response in the area difficult and lead to a need for external assistance (OCHA 3W 2015).

Most localities in southern Sudan have more than five agencies present, although in certain localities of Blue Nile, Darfur, and West Kordofan there are fewer. Across southern Sudan, the number of humanitarian workers is low, suggesting low capacity and inability to reach all the population (OCHA 01/01/2017; OCHA 01/01/2017; OCHA 01/01/2017). No clusters are currently operating in Sudan (Humanitarian Response 2016).

## Information gaps and needs

- Information on malnutrition, WASH, health, and shelter needs in southern Sudan is limited.
- Reporting on flooding is inconsistent in the country and across different areas.
- The available population data for the districts is outdated, which makes it difficult to assess the real need in the affected areas.
- The number of IDPs is not accurate in many areas of Sudan due to access issues and a lack of assessments.

## Lessons learned

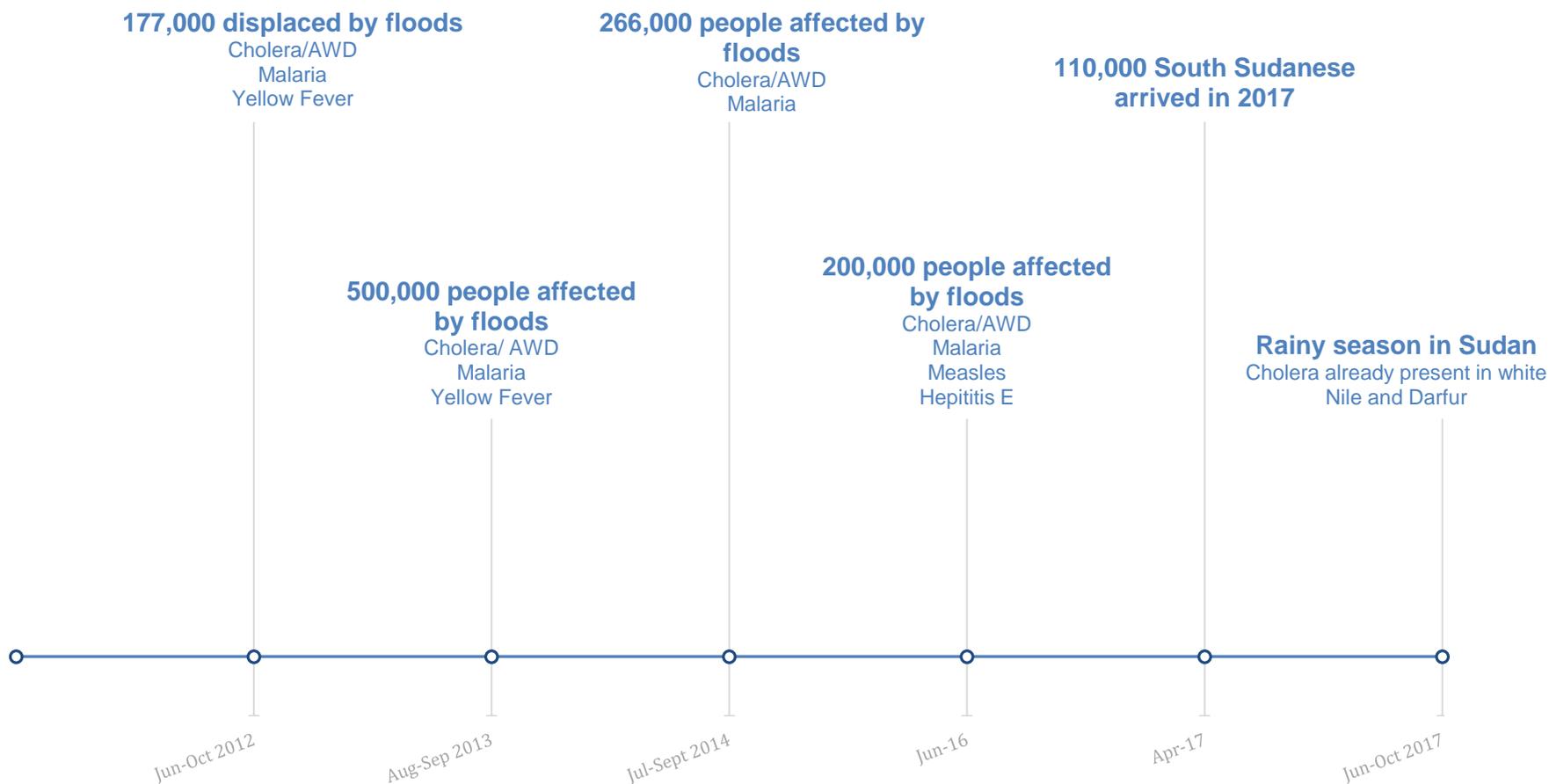
- As many areas are inaccessible during the rainy season, preparations should be made in advance to supply humanitarian needs. One example is the establishment of a storage tent at the Kario refugee site in East Darfur (UNHCR 28/02/2017).
- Adequate shelter should be provided for newly arrived refugees before the rainy season to avoid adverse health effects that exposure to rain or overcrowded conditions could cause.
- Early warning information should be disseminated through local authorities and community leaders and a standard format for data collection should be adopted.

## Methodology

ACAPS anticipatory briefing notes provide a brief outline of the likelihood and impact of a particular crisis or spike in crisis.

The objective of estimating likelihood is to indicate how certain we are that the identified risk will occur. It is a subjective measure.

## Flooding in Sudan: Timeline of previous events



## Key characteristics of host population and area

Key indicators	Darfur	South and West Kordofan	White Nile	Blue Nile	Total Sudan	
Total population		9,241,369	2,047,294	2,410,260	1,080,743	<b>42,144,000</b>
Population density and urban composition	22/km <sup>2</sup> (2015 estimate for Sudan). 33% urban, 67% rural.					
Life expectancy at birth and age distribution.	Life expectancy- 64.1 years. 39.43% of the population is under 15, and 3.25% above 65. (2016 est.)					
South Sudanese arrivals 2017 (as of 30 April)	42,719 (40%)	29,054 (27%)		36,641 (34%)	0	<b>108,214</b>
Total South Sudanese refugee population	83,992 with 63,193 in East Darfur	56,084		116,035	3,661	<b>297,168</b>
IDP population estimate	2,100,000	200,000 (South Kordofan and Blue Nile)			200,000 (South Kordofan and Blue Nile)	<b>2,300,000</b>
People in need (January 2017)	3,000,000	420,000		160,000	140,000	<b>4,800,000</b>
WASH figures						
<i>People in need</i>						<b>3,500,000</b>
Health figures						
<i>People in need</i>						<b>4,300,000</b>
Food security						
<i>People in need</i>						<b>3,600,000</b>
Nutrition levels						
<i>People in need</i>						<b>2,200,000</b>
Literacy rates						<b>76%</b>

Sources: UNHCR 30/04/2017; HNO 01/2017; World Bank 2015; OCHA 2015; UNDP 2015; UNDP 2014; Transparency International; Global Hunger Index 2014; World Risk Report 2014; Sida 2014. WHO 2016. Sudan Central Bureau of Statistics.