SPECIAL FOCUS – September 2019

Floods affecting main crop production areas in Sudan

The current rainy season has been characterized so far, by average to above-average precipitation over most cropping areas. Heavy rainfall since mid-August has affected several parts of Sudan, triggering localized floods and causing damage and casualties. In particular, flash floods have been reported in the key agricultural eastern states (Figure 1), including Al Jazeera, El Gedaref, Kassala, Khartoum, Sennar and White Nile, as well as in Darfur.

As of 19nd September, heavy rains and flash floods have affected an estimated 364,200 people across 17 of the 18 states in the country according to OCHA and the government's Humanitarian Aid Commission (HAC). Particularly, in White Nile and Khartoum where nearly 147, 200 people and 32, 060 have been affected respectively. HAC has reported 78 people died in flood-related events and approximately 45, 104 homes have been destroyed and 27, 742 damaged.

Flooding caused infrastructure damages, losses in livelihoods, livestock and crop production. Media sources report entire villages that were swept away and 123 that were cut off from communication on 11th September. The effect is expected to be more severe in poor households that have less means to cope with the emergency situation. Additionally, as floodwater lingers, the risk of waterborne diseases, such as cholera and diarrhea, remains high (OCHA).

In response, the International Charter Space and Major Disaster was activated for Sudan floods on 26th August and produced maps on flood extent for some regions of Sudan. UNITAR/UNOSAT submitted the request for Charter activation on behalf of UNOCHA, UNICEF and Sudan's Ministry of Agriculture and Forestry.

The 2019 main season crop started in June with positive rain from mid-May that compensated pre-season moisture stress and supported crop establishment and crop growth. The rainy season has been characterized by abundant seasonal rains with above-average precipitation amounts and with peaks of more than 30 mm above average in late August. Looking at the percentage anomalies over the last 90-day period, it is visible that above average rainfall characterized the Nile river basin, mainly the White Nile River (Figure 2).

Parts of the country have been hit by intensive rainfall since mid-August resulting in localized floods for the second consecutive year (ASAP, 2018). Likewise, persistent rainfall led to river flooding in several states. According to OCHA, particularly flooded areas extend to the River Nile (Al Zeidab district), Khartoum State (Wad Ramli and Al Gaili districts), White Nile (Al Shawafa Al Kwahala 1 and 2 districts). In the southern part of Khartoum, the total rainfall for one night of downpour (155 mm) was above the average rainfall normally received in the whole season (120 mm), according to the Early Warning Unity at Sudan's Meteorological Authority.

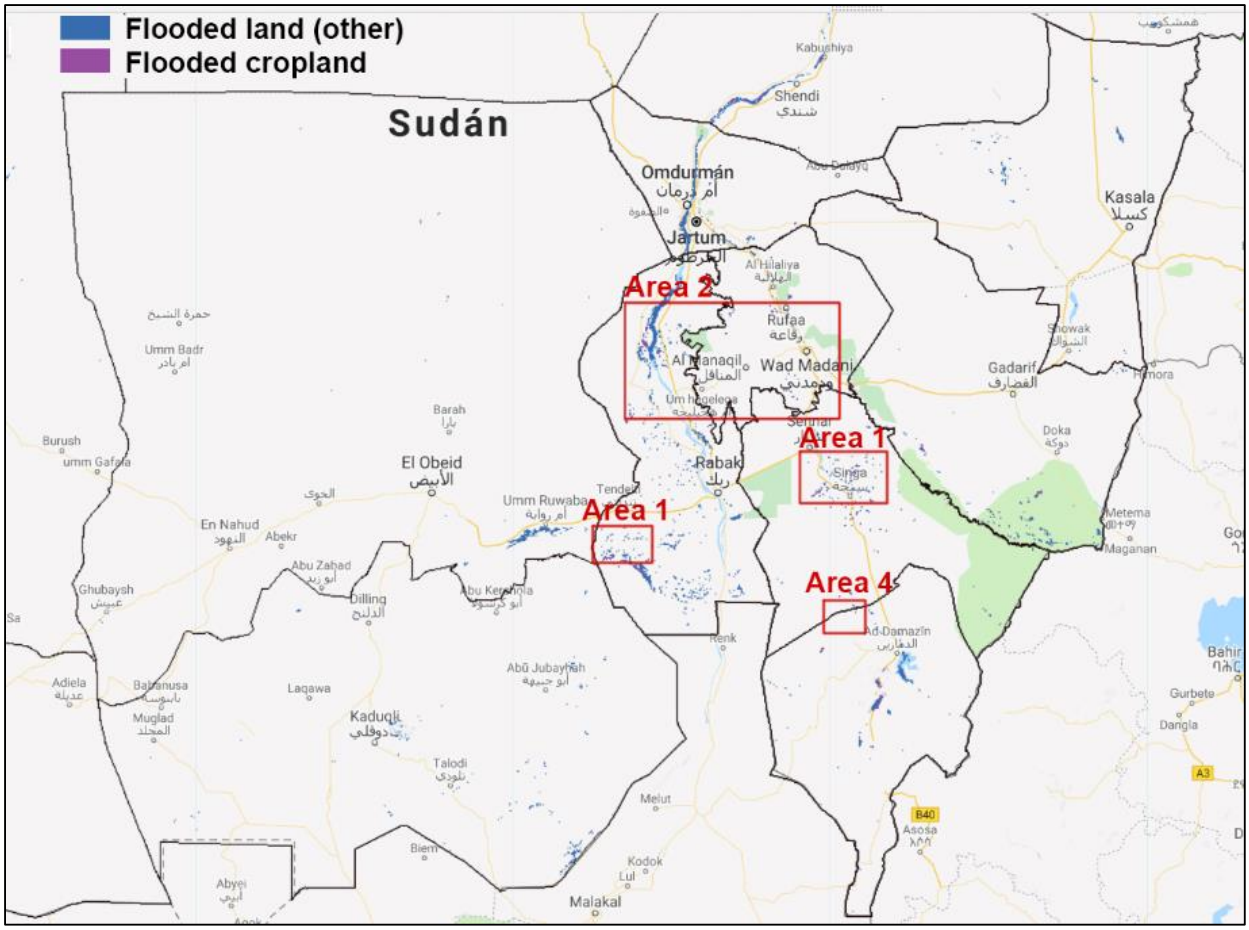

Figure 1. Overview map of Sudan, where red rectangles indicate areas with zoomed thematic maps included in this special alert and the extent of water in Eastern Sudan mapped by Sentinel-2. Surface water extent was computed by applying a threshold to the Normalized Difference Water Index (NDWI) in the period 20th August to 10th September 2019. Purple corresponds to flooded cropland, while blue to flooded areas of other land use (including the rivers). This is a rapid preliminary analysis and has not been field validated.

While the abundant rains are generally expected to lead to a favorable situation with a positive impact on crop yields and pasture regeneration, the inundation also cause damage to standing crops and to rural infrastructure. The most affected areas are located mainly in the riverine area along the White and Blue Nile river and their tributaries. In El Gedaref, the overflowing of the Atbara River caused the loss of 2,000 acres of horticultural areas in El Gureisha and El Fashaga localities and farmers have expressed “their concern of the loss of the agricultural harvest in White Nile,” according to media sources. Furthermore, flood risk persists in eastern parts of Sudan because heavy rainfall is forecasted for the coming days. More rain coupled with soil saturation is highly likely to lead to further flooding (FEWSNET (13-19 September, 2019). The main limitation to agricultural production in the semi-mechanized and irrigated Sudanese sectors continues to be fuel shortage and the soaring of prices of agricultural inputs that caused a reduction of the 2019/20 planted area.

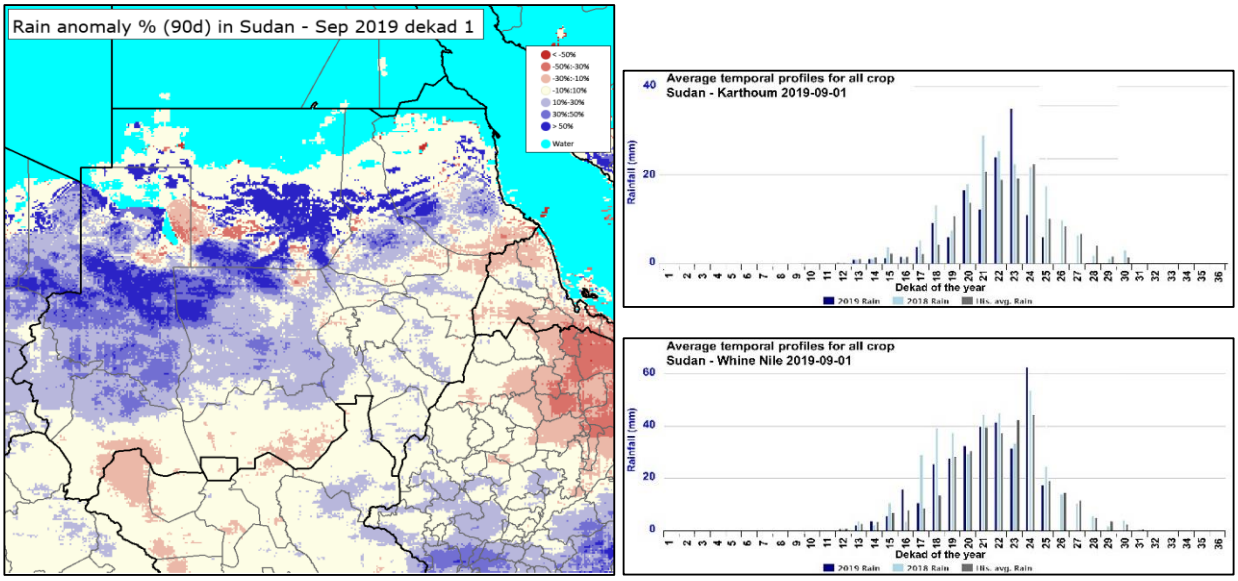

Figure 2. Rainfall estimates distribution map based on CHIRPS data (left) and rainfall temporal profile in White Nile state (right).

The real impact of floods on agriculture can only be established on ground data and for the moment, no estimates about the extent of farm and rangeland have been provided. Nevertheless, the flooding of large farmland areas is also well visible on satellite imagery as shown in Figures 3-6, which correspond to zooms of the most concerned cropland areas in Al Jazeera, Sennar and White Nile states. The maps show the extent of agricultural areas (blue), flooded cropland (purple) and non-flooded cropland areas (green). For reference in orange/red (right), the areas which have been flooded from a minimum of 1 to a maximum of 15 times in the previous 15 years, according to the Global Surface Water Explorer (JRC).

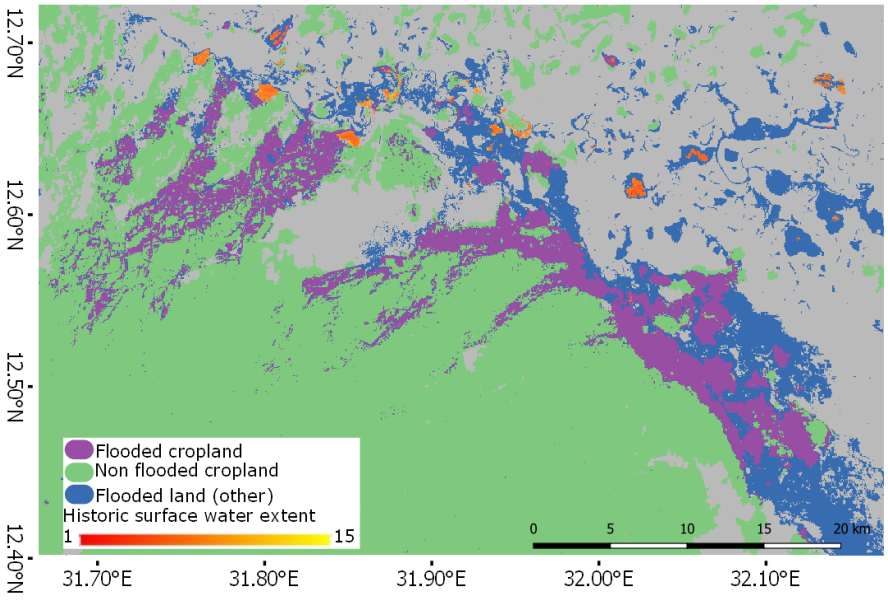

Figure 3. Flooded areas and other land use in White Nile (Area 1). SENTINEL2 data shows the flooded areas during the period (20th August – 10th September). The flooded cropland area corresponds to 15,831 ha.

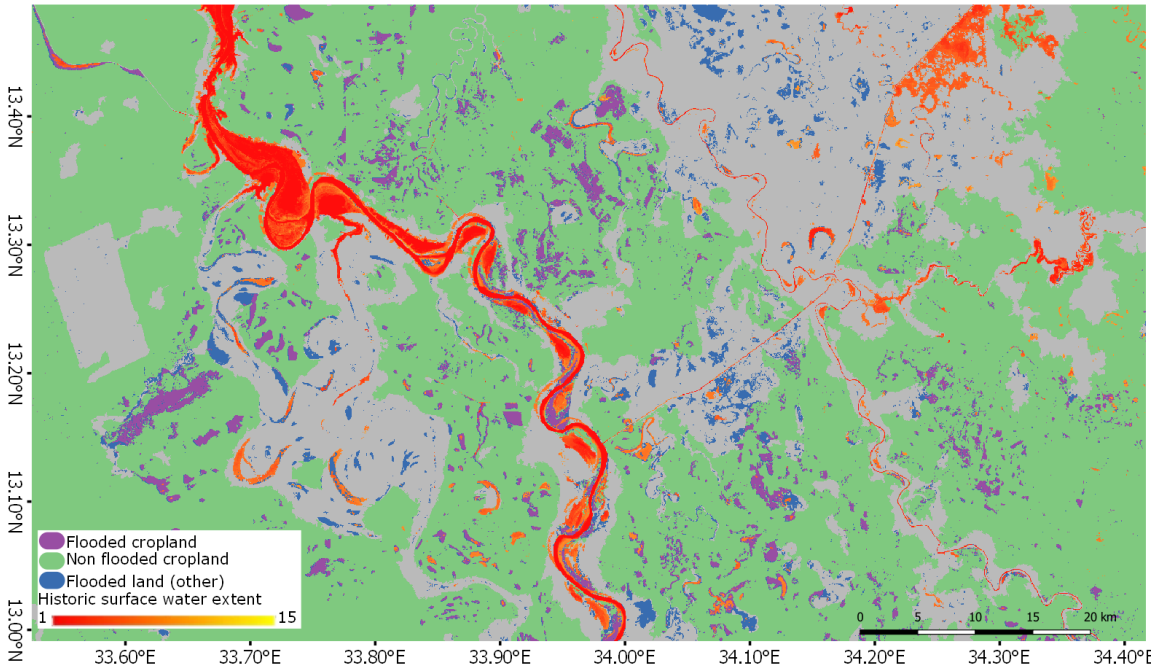

Figure 4. Flooded areas and other land use in Al Jazeera, White Nile and Sennar (Area 2). SENTINEL2 data shows the flooded areas during the period (20th August – 10th September). The flooded cropland area corresponds to 41,743 ha.

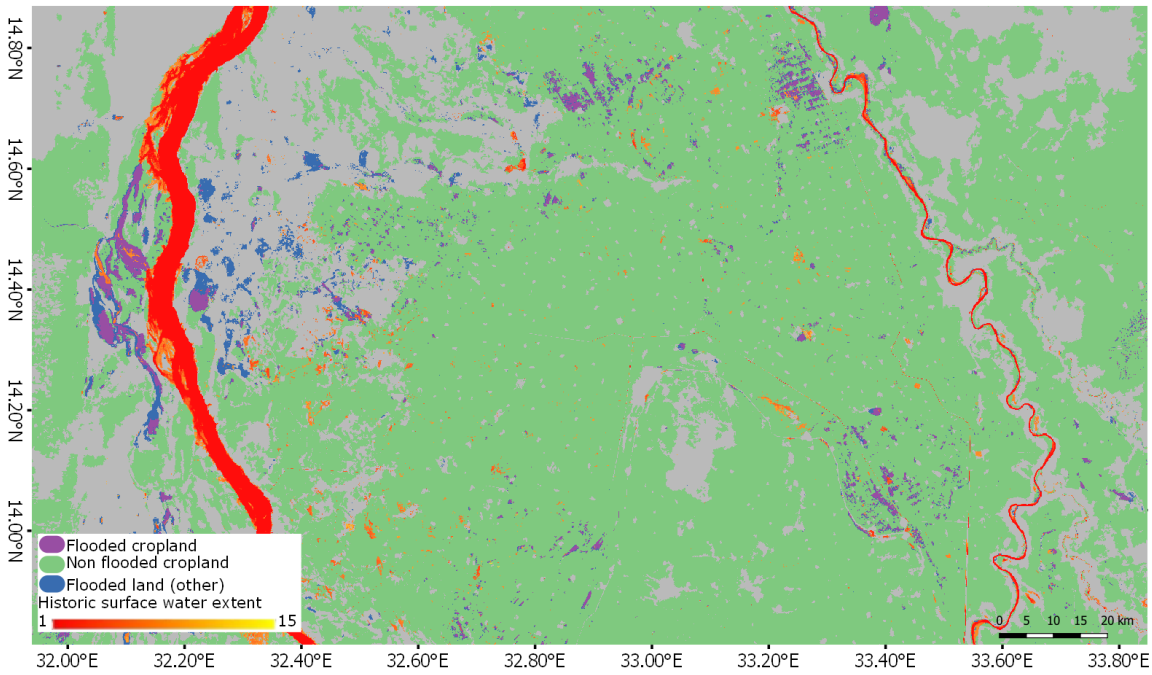

Figure 5. Flooded areas and other land use in Sennar (Area 3). SENTINEL2 data shows the flooded areas during the period (20th August – 10th September). The flooded cropland area corresponds to 20,369 ha.

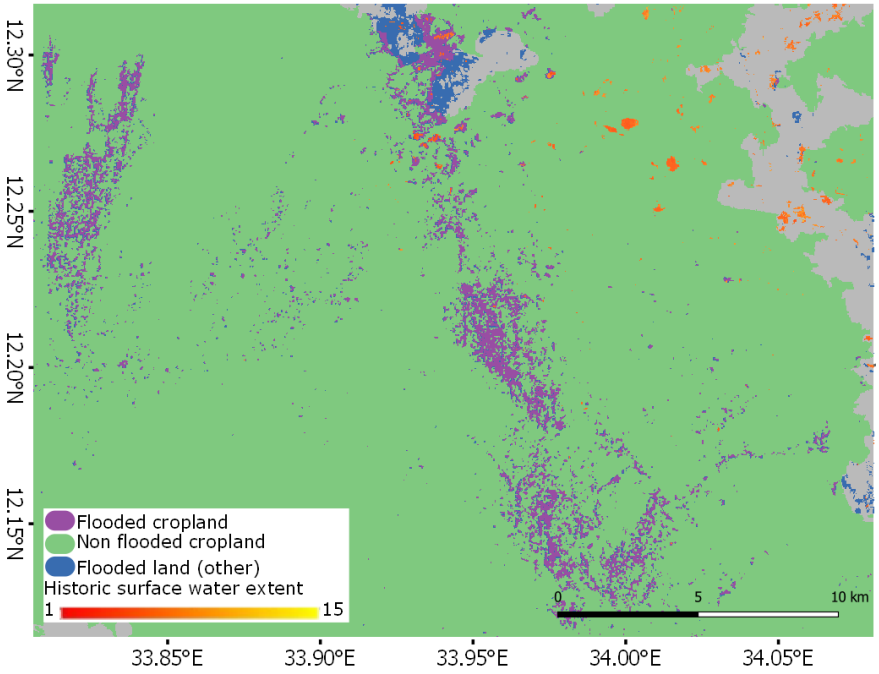

Figure 6. Flooded areas and other land use in Sennar (Area 4). SENTINEL2 data show the flooded areas during the period (20th August – 10th September). The flooded cropland area corresponds to 2,596 ha.

Similar to 2016 and 2018, the number of people affected by floods peaked in August. Figure 7 illustrates differences between flooded areas in Sennar, when compared to 2018. Overall, floods where more concentrated in White Nile and Sennar regions as While Nile, as compared to Northern and Kassala regions in 2018 (see Figure 1).

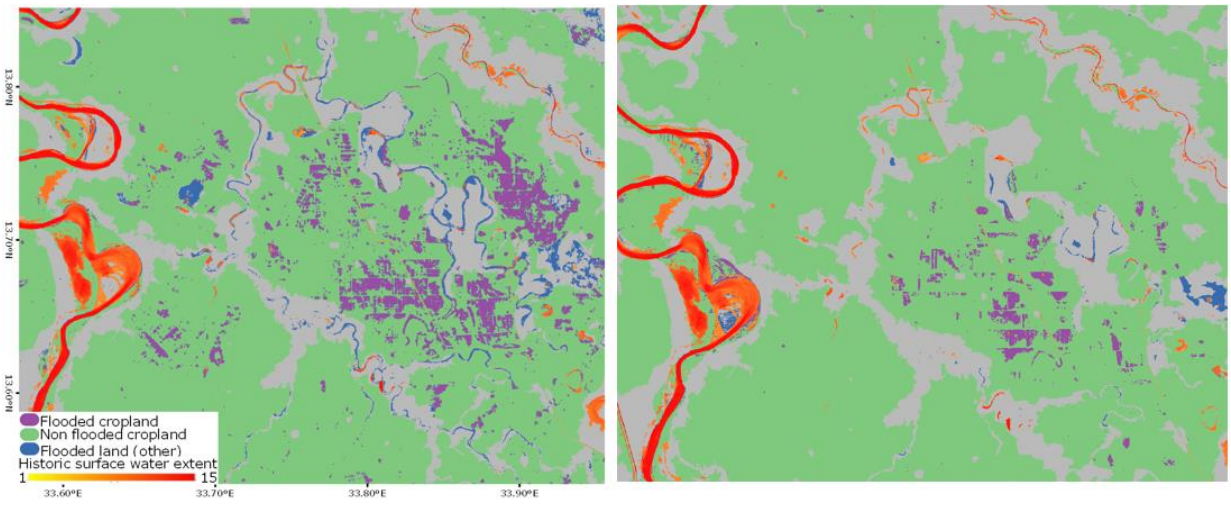

Figure 7. Extent of flooded crop areas along Blue Nile River, close to Sennar during 2018 floods (left, 25th July-20th August) and 2019 floods (right, 20th August-10th September).

More information about floods in Sudan can be found here:

- ACAPS site: https://www.acaps.org/country/sudan/crisis/complex-crisis
- ASAP Special Alert- https://mars.jrc.ec.europa.eu/asap/files/special_alert_2018_08.pdf
- IGAD site: http://www.icpac.net/
- ECHO DAILY FLASH site: https://erccportal.jrc.ec.europa.eu/ECHO-Flash/ECHO-Flash-List/
- NASA site: https://earthobservatory.nasa.gov/images/145589/floods-swamp-sudan
- OCHA site: https://www.unocha.org/sudan
- RELIEFWEB site: https://reliefweb.int/country/sdn
- UNITAR-UNOSAT site: https://www.unitar.org/unosat/maps/SDN
- DABANGA https://www.dabangasudan.org/en/all-news/article/thousands-left-homeless-by-sudan-floods
- https://3ayin.com/sudans-floods/

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JRC ASAP team

Jrc-asap@ec.europa.eu