RUBKONA COUNTY - UNITY STATE
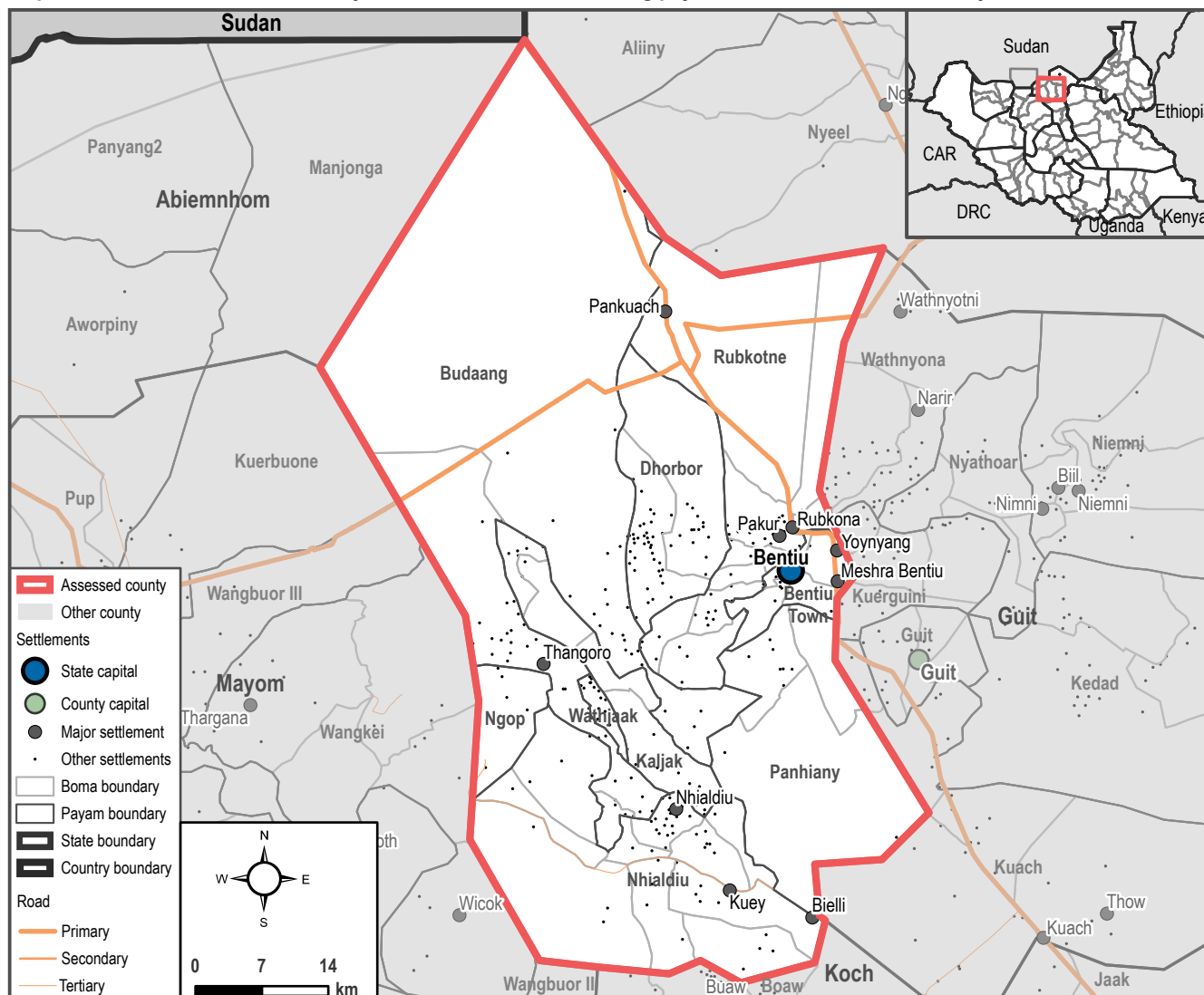
Map 0.1. Location of Rubkona County within South Sudan indicating payams, boma boundaries and key settlements

RUBKONA COUNTY - KEY FACTS

- **Estimated population: 333,412**[1]
- **Area: 3,564 km^2**
- **Population density: 94 persons per km^2**
- **County headquarters: Bentiu**
- **Payams: Bentiu Town, Budaang, Dhorbor, Kaljak, Ngop, Nhialdiu, Panhiany, Rubkotne, Wathjaak**

Rubkona County is located in the north of Unity state, on the Sudan border. Population is centred around the main towns of Bentiu and Rubkona, which are situated on the Bahr al Ghazal River, as well as in the Bentiu Protection of Civilians (PoC) Camp.[2] Wetlands surrounding the Bahr al Ghazal flood seasonally. However, more extensive flooding occurred in 2021, triggering the development of dykes and largescale displacement to IDP camps.

The county was significantly impacted by the outbreak of conflict in 2013-14. By November 2021, the PoC (the largest in the country), still hosted approximately 113,000 people[3] who had been displaced during the conflict. Rubkona is an oil producing region and the population has been involved in various disputes with oil companies over the years. Infrastructure remains in poor condition, having been damaged by floods and conflict.[4]

About REACH Initiative

REACH Initiative facilitates the development of information tools and products that enhance the capacity of aid actors to make evidence-based decisions in emergency, recovery and development contexts. The methodologies used by REACH include primary data collection and in-depth analysis, and all activities are conducted through inter-agency aid coordination mechanisms. REACH is a joint initiative of IMPACT Initiatives, ACTED and the United Nations Institute for Training and Research - Operational Satellite Applications Programme (UNITAR-UNOSAT).

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1

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Map 1.1. Natural features including wetland areas, rivers and water bodies in Rubkona County. Elevation is also shown.
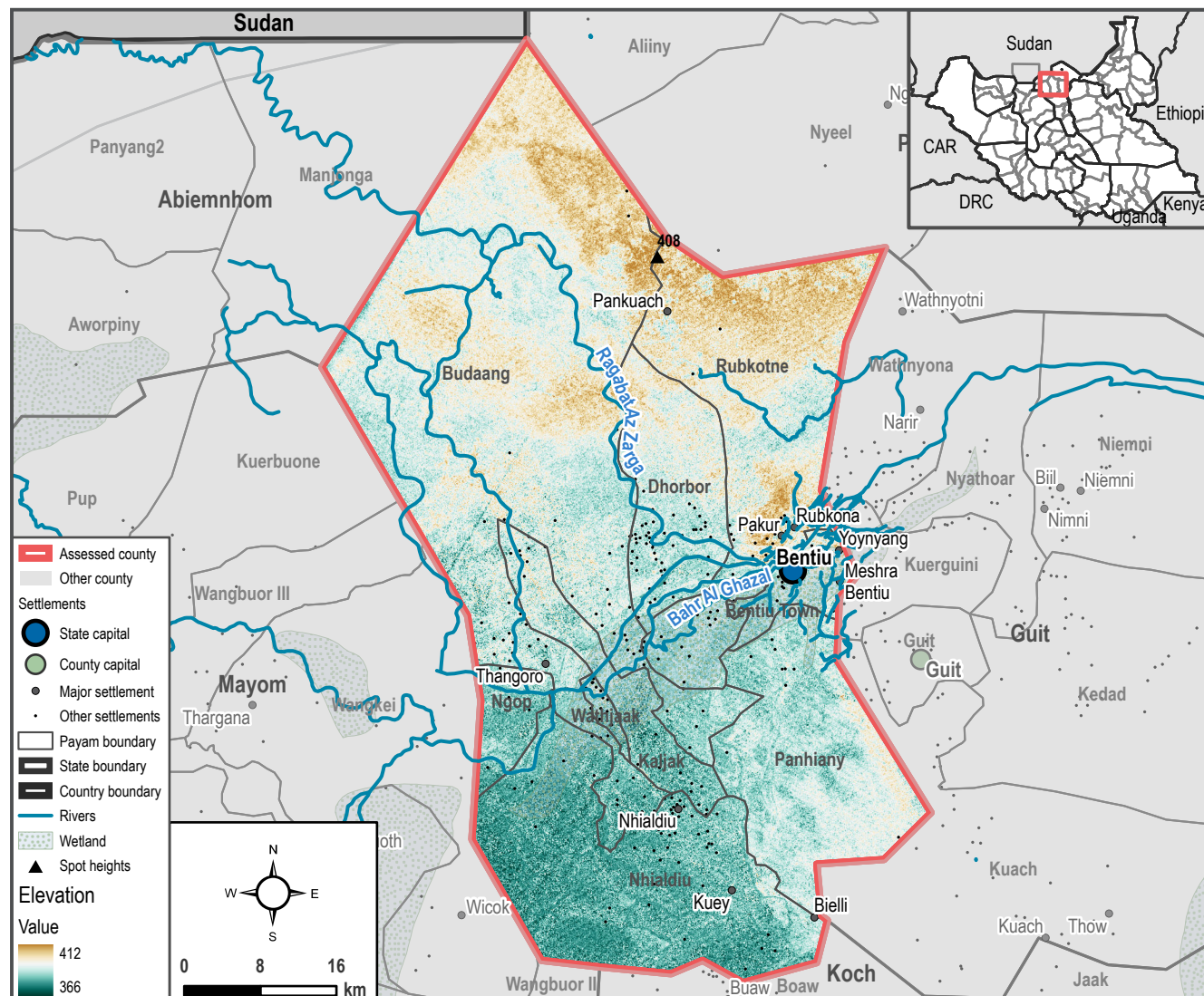
Highest point
412 m

Average elevation
397 m

Elevation range
46 m

Annual precipitation
866 mm/yr

Average temperature
28.5°C

Wettest month
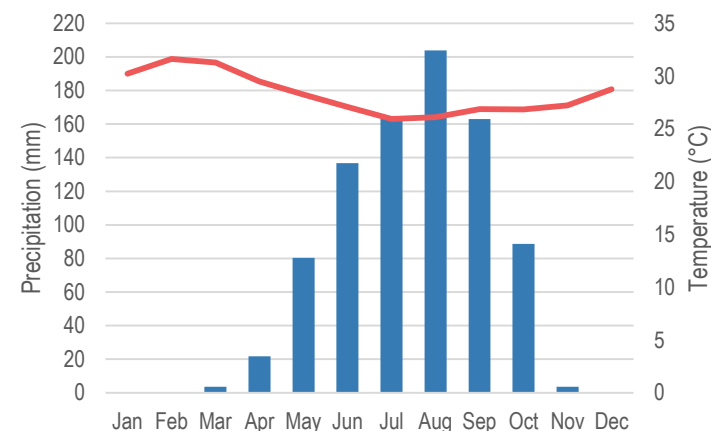August

Driest months
Dec-Feb

As Map 1.1. indicates, the **topography of Rubkona County is relatively flat, with an average elevation of 397 metres above sea level and limited elevation range.** The highest elevations are found to the north of the county, gradually decreasing towards the Bahr al Ghazal basin in the central-south. Elevation also rises marginally to the southeast of the river basin.[5]

The **Bahr al Ghazal river runs through the county from west to east.** The river is the main western tributary of the Nile, flowing through the Sudd and joining the White Nile at Lake No.[6] A number of other tributaries run into the Bahr al Ghazal river from the north of Rubkona County. The area around the Bahr al Ghazal itself is charcterised by seasonally flooded wetlands.

The landscape across the county is **characterised by floodplains, with extensive savannah, bush and patches of forest. There are significant reserves of natural resources including oil, timber and grasses.** Soils are predominantly clay near the rivers, becoming sandy loam on the plains.[7]
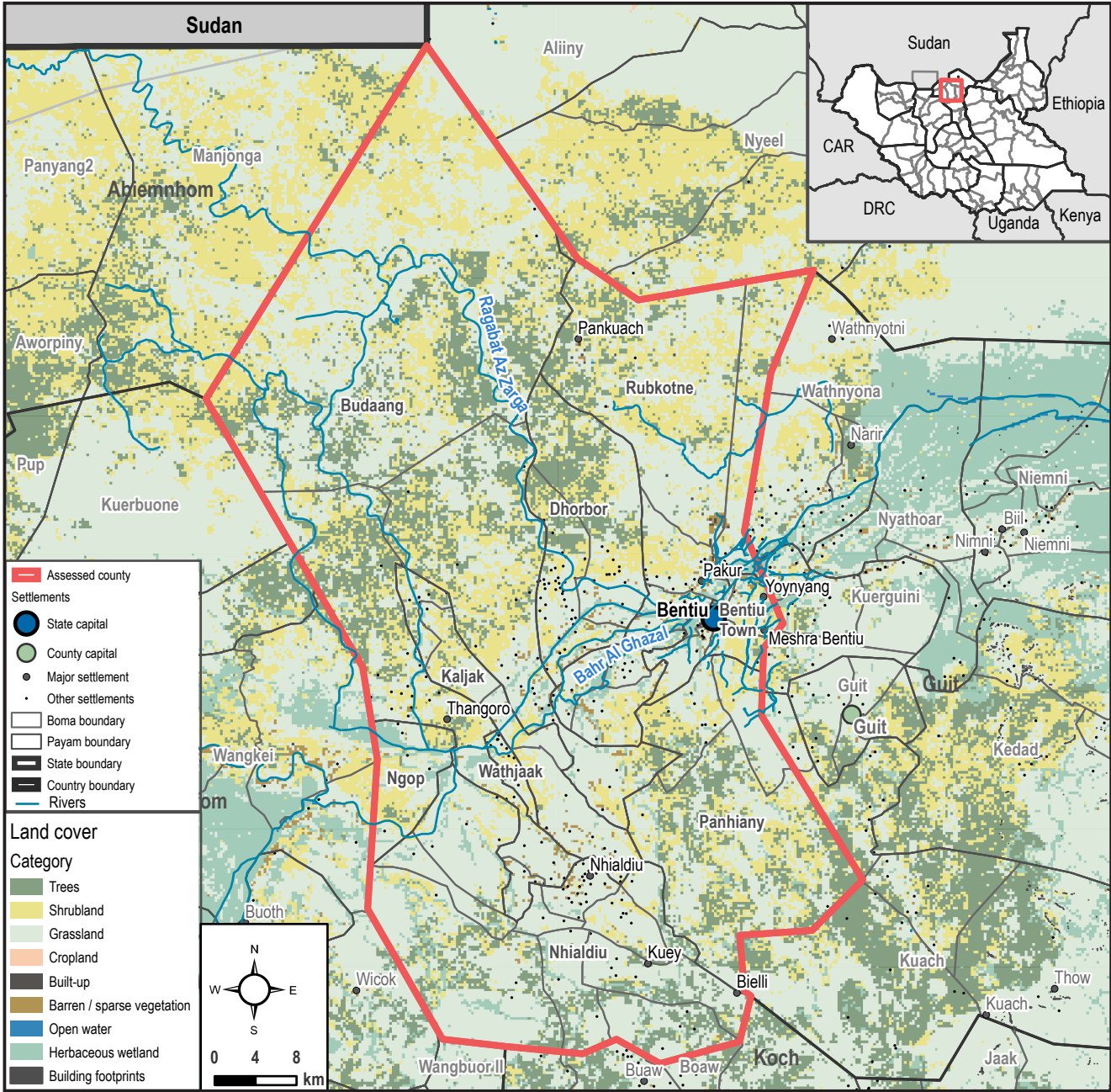
As with other parts of South Sudan, the county receives a large amount of rainfall, totaling 866 mm/year on average (Graph 1.1). There are two distinct seasons, with the rainy season generally lasting between May and October. August is the wettest month, whilst December to February are the driest months, receiving almost no rainfall on average.[8]

Graph 1.1. Average monthly precipitation and temperature, Rubkona County (1981 - 2021)[9,10]

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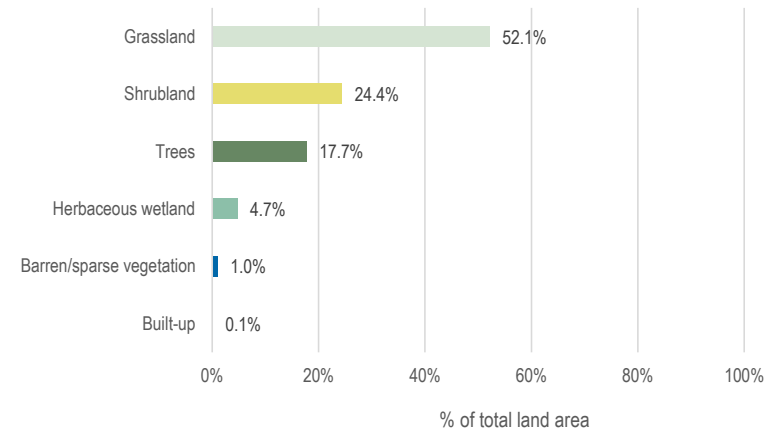
2

Map 2.1. Land use and land cover map, Rubkona County[12]

Land cover in Rubkona County is relatively diverse. **Grassland is the most common land cover type across the county (52% of the county area), followed by shrubland (24%), and trees (18%).** Shrubland and trees are concentrated north of the Bahr al Ghazal river and towards the southeast of the county, with tree cover roughly aligning to areas of marginally higher ground. There is a narrow strip of herbaceous wetland following the Bahr al Ghazal river channel, becoming wider to the east of the county as it nears the Sudd wetland.[11]

The wetlands around the Bahr al Ghazal river in Rubkona are influenced by seasonal expansion between July and November. Although situated upstream from the Sudd, the largest wetland system in Africa, high water levels in the Sudd and upstream on the Nile may have also contributed to higher flows in the Bahr al Ghazal basin. See section 3 for more details.
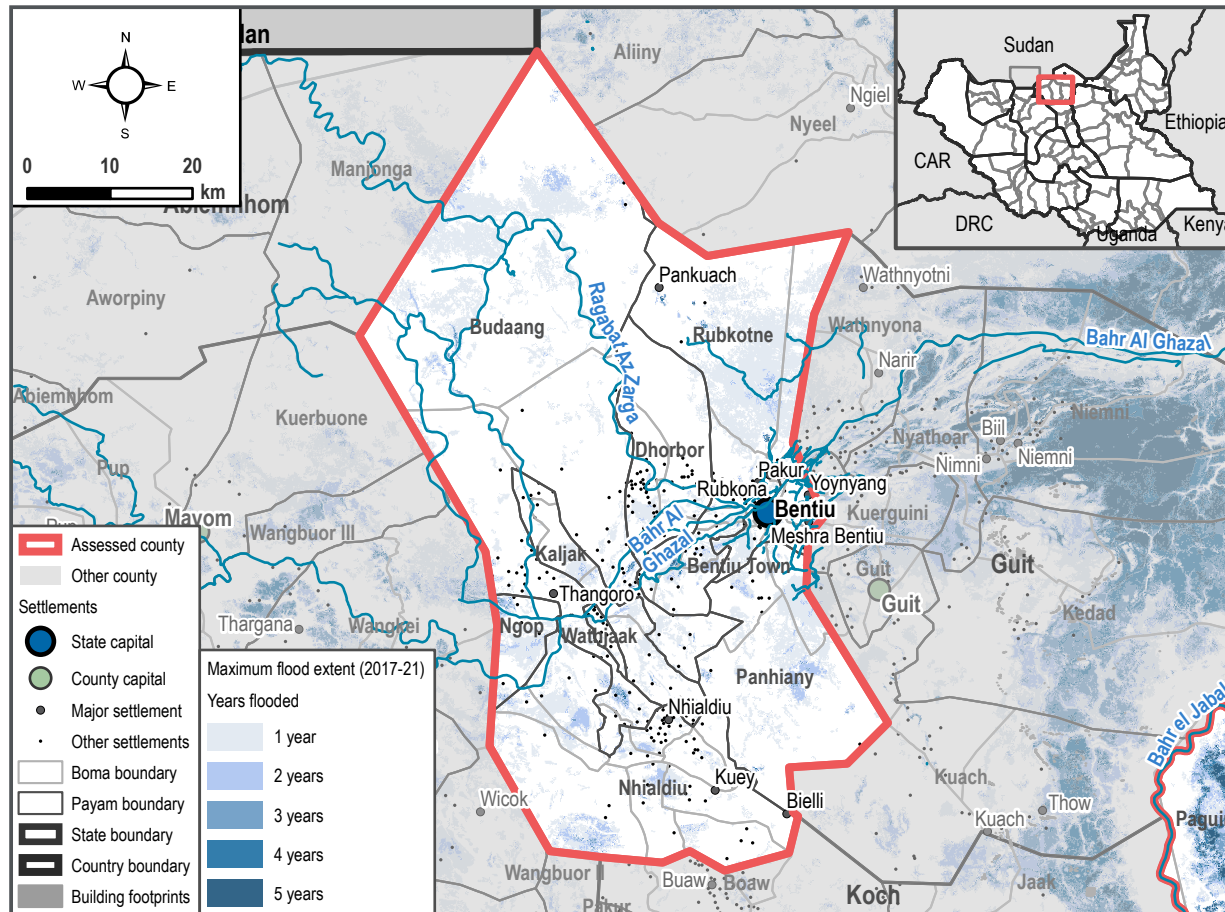
41,556 identified buildings in Rubkona County[13]

Chart 2.1. Land cover as proportion of Rubkona County area

Land cover	% of total land area
Grassland	52.1%
Shrubland	24.4%
Trees	17.7%
Herbaceous wetland	4.7%
Barren/sparse vegetation	1.0%
Built-up	0.1%

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Map 3.1. Estimated maximum annual flood extent (2017-2021), affected settlements and key infrastructure[i]

Legend:
- Assessed county
- Other county

Settlements
- State capital
- County capital
- Major settlement
- Other settlements
- Boma boundary
- Payam boundary
- State boundary
- Country boundary
- Building footprints

Maximum flood extent (2017-21)
Years flooded
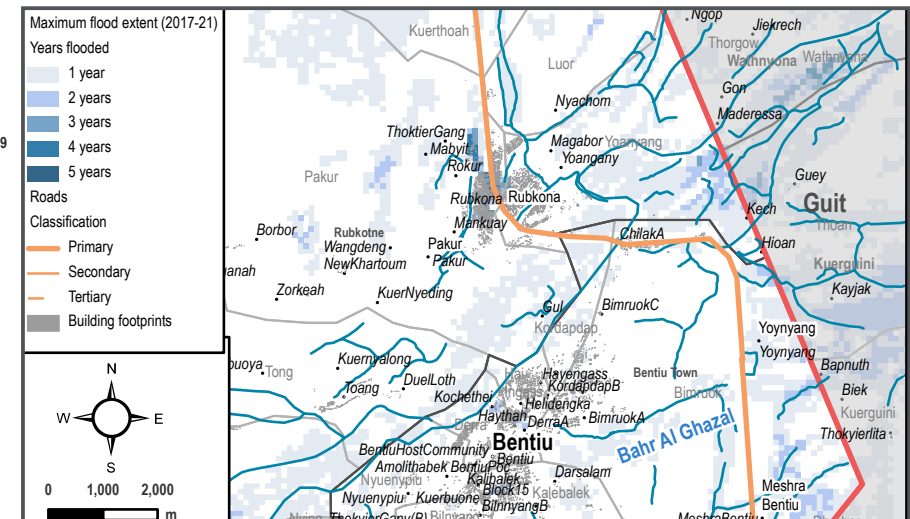- 1 year
- 2 years
- 3 years
- 4 years
- 5 years

FLOODING

Over the past five years, **flooding has occurred across Rubkona County, in particular towards the centre of the county, in and around the wetland areas near to the Bahr al Ghazal basin** indicated in Map 1.1. Map 3.1 and 3.2 show the maximum estimated flood extent in the past five years in Rubkona County and around Bentiu and Rubkona towns respectively. Note that the maps only indicate open floodwater and may underestimate the total flooded area due to the persistence of flooded vegetation in the county, which may not be detected by the flood detection analysis. **Around Bentiu and Rubkona towns, flooding has occurred very close to, and within the main urban areas.**

Whilst seasonal flooding is normal across many parts of the Nile Basin in South Sudan between July and November, **exceptional flooding was observed in 2021, resulting in largescale inundation and shelter damage.[14]** Dykes were built in response, although the towns remained surrounded by floodwater into 2022 and into the current rainy season.[15]

KIs in the majority of assessed settlements interviewed in REACH's November 2021 Area of Knoledge (AoK) assessment reported **some people had left the county in the past month as a result of flooding.[16]** See p.7 for more details on flood-induced displacement.

Graph 3.1 indicates that in the past five years, **flooding in Rubkona County was most extensive in 2021, peaking in October.** The flooding also extends into 2022. In addition to heavy rainfall, water levels increased significantly upstream on the Nile in 2020 and into 2021, leading to **greater influx of water into the Sudd wetlands.[17] This was likely a major contributing factor to the flooding during these years.**

Graph 3.1. Area of flood extent vs rainfall (2017-21)[18]

Graph 3.2. Changes in water levels[ii] upstream, Nile Basin[19]

- Lake Albert
- Victoria Nile

i Estimated flood extent calculated based on analysis of *Sentinel 1 data in Google Earth Engine*. Data is indicative only and has not been validated in the field.
ii. Water level change calculated from *DAHITI* altimetry data for Lake Albert (ref. 85) and Victoria Nile (ref. 2264). Shows change in water level in metres from first year of data availability.

Map 3.2. Estimated maximum annual flood extent (2017-21), Bentiu and Rubkona

Maximum flood extent (2017-21)
Years flooded
- 1 year
- 2 years
- 3 years
- 4 years
- 5 years

Roads
Classification
- Primary
- Secondary
- Tertiary
- Building footprints

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Map 4.1. Vegetation condition index (VCI), indicator of drought severity, in August 2021 - a detected drought period[i]
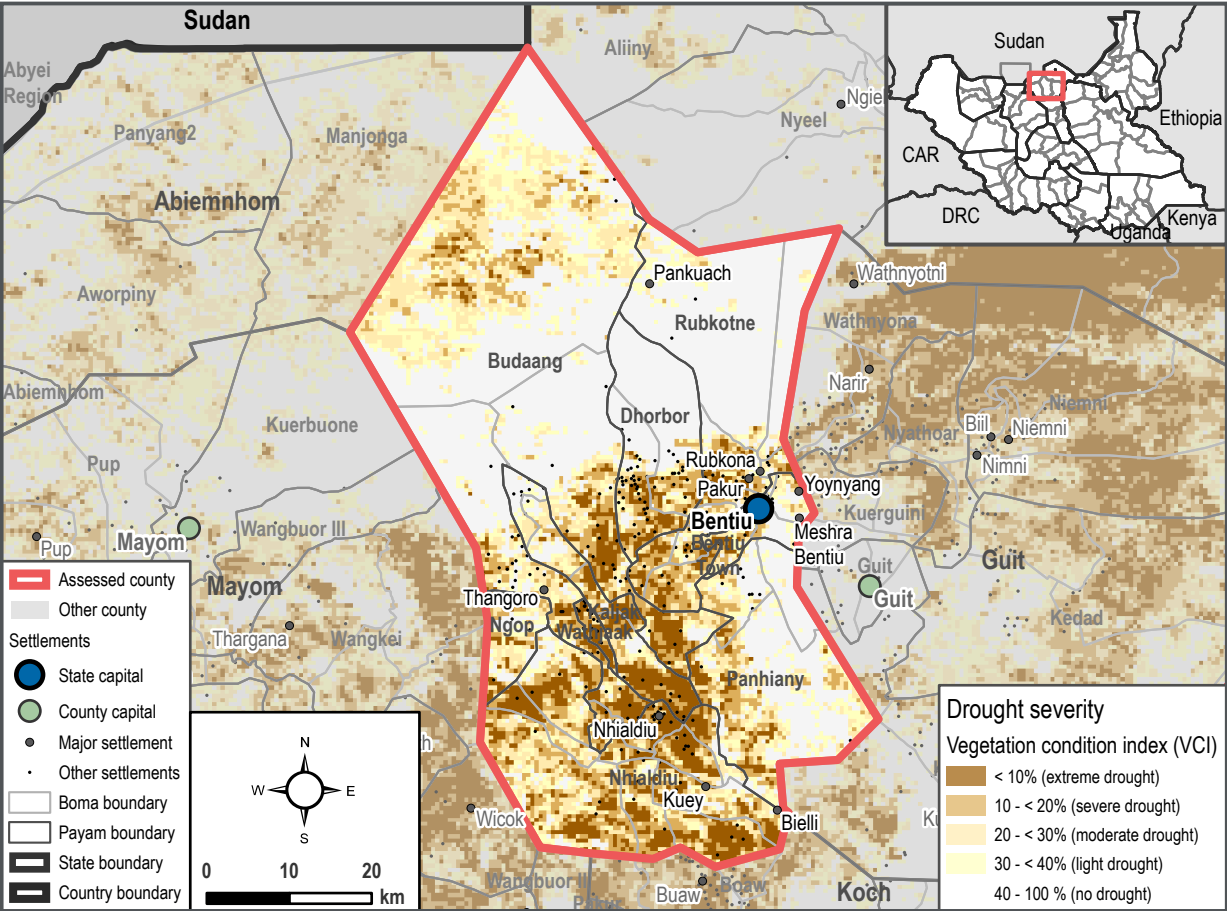
Graph 4.1. VCI (2000-2021) - drought index

i Vegetation condition index calculated in [Google Earth Engine based on MODIS EVI data](#)
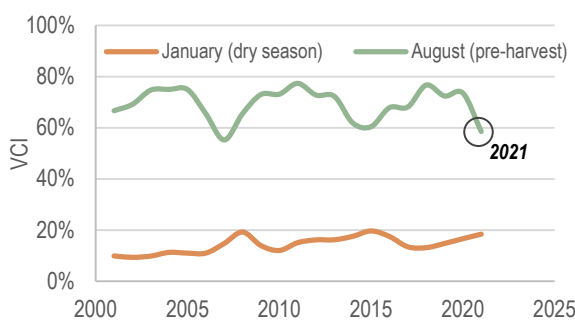
Projected climatic trends by 2060 based on ssp370 scenario, Rubkona County[25]

Projected change in precipitation in wettest month by 2060

+66mm/month

Projected change in max temperature in warmest month by 2060

+2.3°C

Much of South Sudan is exposed to droughts and dry spells driven by erratic rainfall and climate change. Graph 4.1 shows the vegetation condition index (VCI) in January (dry season peak) and in August (pre-harvest) in Rubkona County. VCI indicates vegetation health compared to the long-term mean, with values <40% generally indicating drought conditions.[20] **Variation is not as pronounced as in some other counties but there are several troughs, especially in the pre-harvest season, which could indicate potentially drier than usual conditions.**

The August 2021 VCI suggests possible drought conditions, which directly preceded the onset of atypical flooding across the county (Map 4.1). **The succession of flooding immediately following drought can exacerbate flood impacts by reducing soil permeability, and in some parts of South Sudan, has reportedly led to crop damage.**[21] Unfortunately, data on drought occurrence and impacts in Rubkona is limited and further assessments of its impact on livelihoods and agriculture is required. This dry period may have been partly driven by lower than average rainfall around this time, with a -10% and -20% rainfall anomaly in July and August 2022.[22]

As Graph 4.3 indicates, **temperatures have been steadily increasing in Rubkona County in recent decades, whilst precipitation appears to have been relatively erratic with no clear long-term trend.** However, increasing temperatures could lead to droughts becoming more common in future due to reduced moisture availability. Future climate projections (based on the Shared Socioeconomic Pathway 370 emissions scenario[ii]), suggest that **precipitation in the wettest month across the county could increase by up to 66/mm per month by 2060, whilst temperatures in the warmest month could increase by 2.3°C.** These increases in extreme conditions will likely lead to more intense and frequent climatic shocks, including droughts and floods, in future.

CLIMATE CHANGE

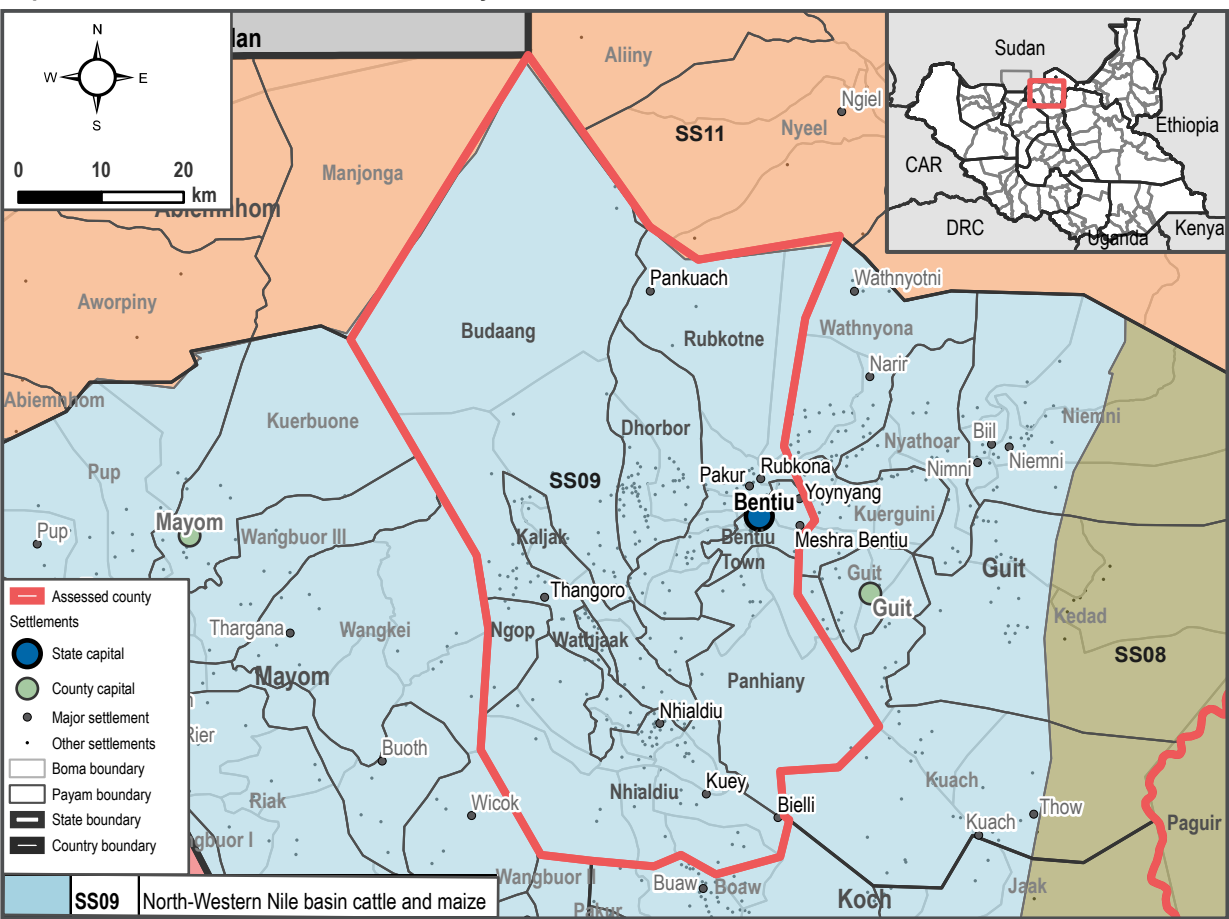**Graph 4.3. Long-term climatic trends (1981-2021), Rubkona County[23,24]**
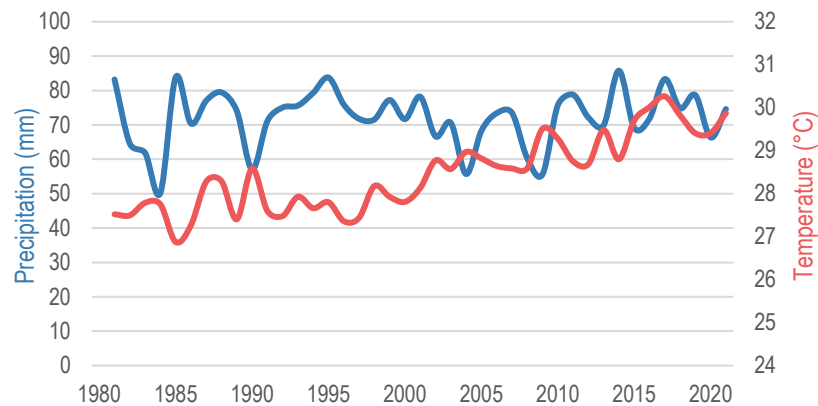
ii. Middle-estimate greenhouse gas emission scenario based on various socioeconomic assumptions.

Map 5.1. Livelihood zones[32] in Rubkona County

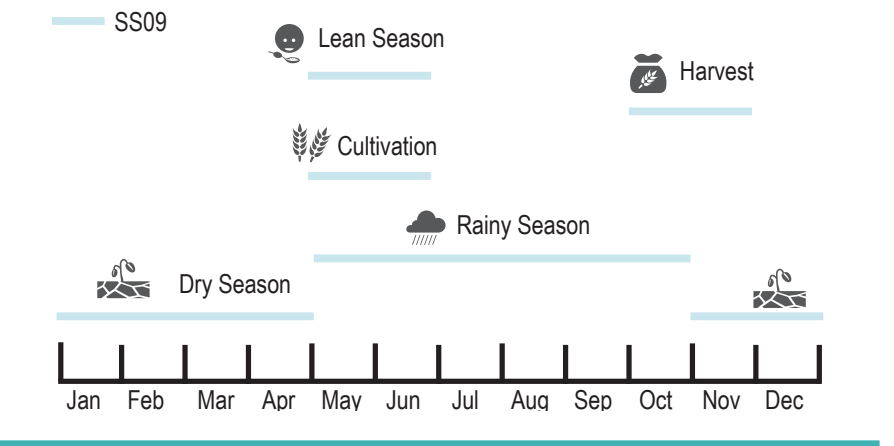|	
SS09	North-Western Nile basin cattle and maize

According to the Famine Early Warning Systems Network (FEWSNET), **Rubkona County falls entirely within the Northwestern Nile Basin Cattle and Maize livelihood zone** (Map 5.1).[26] This zone is charcterised by agro-pastoral livelihoods, with more focus on livestock rearing than cropping. Livelihoods are generally supplemented by fishing, as well as collection of naturally occuring foods and products. Since 1978, the area has been a **hotspot for commercial oil production, although this has been repeatedly disrupted by conflict.[27]** Maize is the dominant staple cereal grown in the county. Fig. 5.1 shows the cultivation calendar for this livelihood zone. Farming is mostly subsistence and generally, this livelihood zone has a **cereal deficit, relying on trade with Sudan to import staple cereals, as well as other foods.[28]** Net cereal production is shown in Graph 5.1, indicating a fall in production between 2020-2021, likely due to the 2021 flooding.
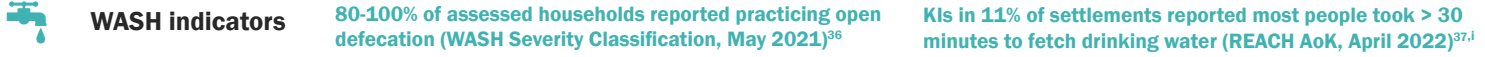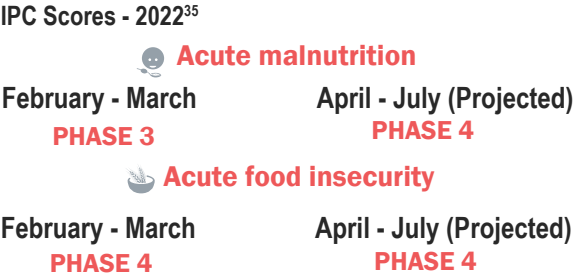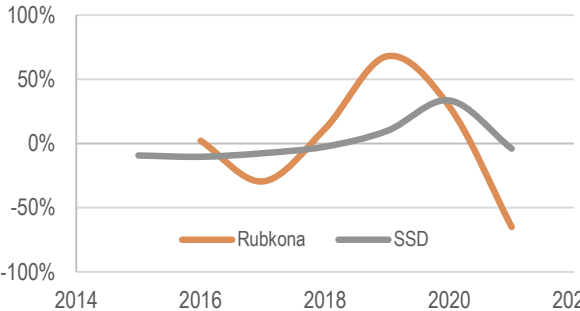
The Integrated Phase Classification (IPC) March 2022 analysis indicated the county was in **Phase 4 for acute food insecurity and Phase 3 for acute malnutrition in Feb - March 2022, with these scores projected to July 2022.** Food insecurity was predicted to deteriorate at the time of the March 2022 IPC due to large cereal deficits, increases in prices and poor accessibility to markets due to flooding.[29]

Regarding WASH, open defecation is widely practised and the **WASH Severity Classification flagged the county as in Phase 4 (Critical) in May 2021.[30]** In terms of water access, KIs in 11% of assessed settlements reported most people took over 30 minutes to fetch water according to the REACH AoK in April 2022.[31]

Figure 5.1. Cultivation calendar for Northwestern Nile Basin cattle and maize livelihood zone[34]

Graph 5.1. Year on year change in net cereal production (CFSAM)[33]

IPC Scores - 2022[35]

🙁 **Acute malnutrition**

February - March	April - July (Projected)
PHASE 3	PHASE 4

🥣 **Acute food insecurity**

February - March	April - July (Projected)
PHASE 4	PHASE 4

🚰 **WASH indicators** — 80-100% of assessed households reported practicing open defecation (WASH Severity Classification, May 2021)[36] — KIs in 11% of settlements reported most people took > 30 minutes to fetch drinking water (REACH AoK, April 2022)[37,i]

i REACH AoK AoK data is collected at settlement-level and is based on reports by KIs. The methodology provides indicative data on the humanitarian situation including in hard-to-reach settlements. Only counties with 5% ccoverage of settlements are reported on.

Map 6.1. Population density[39] across Rubkona County (2020)

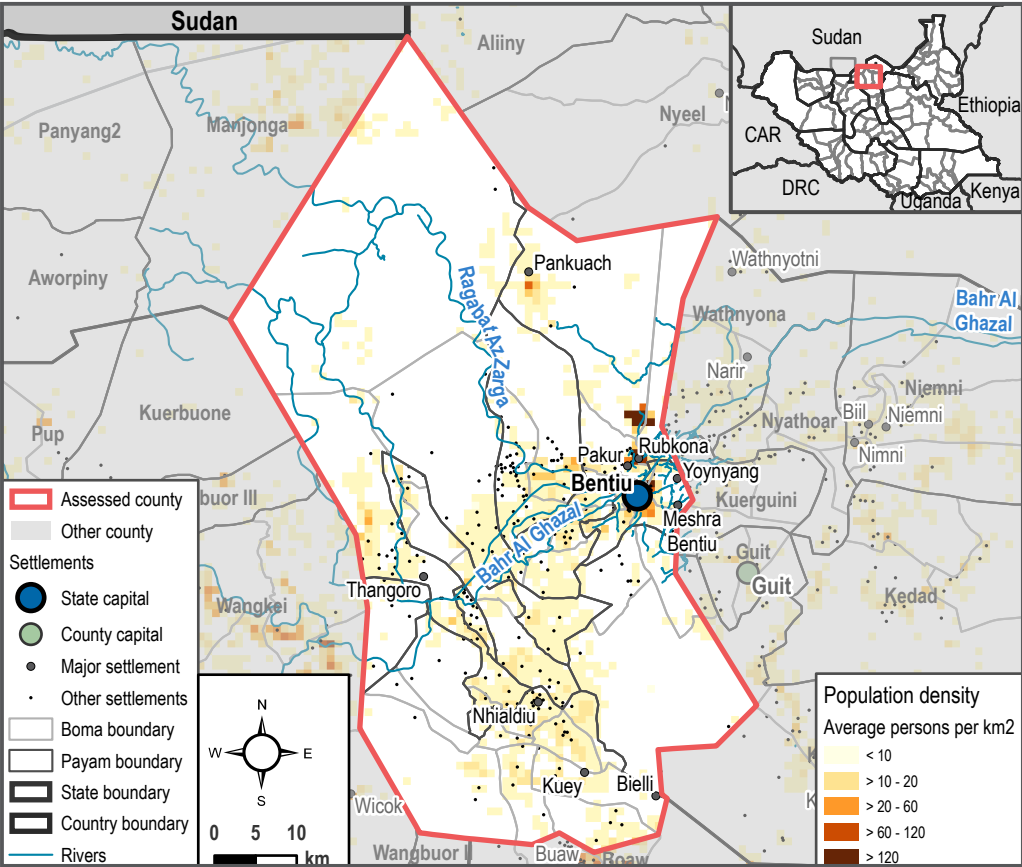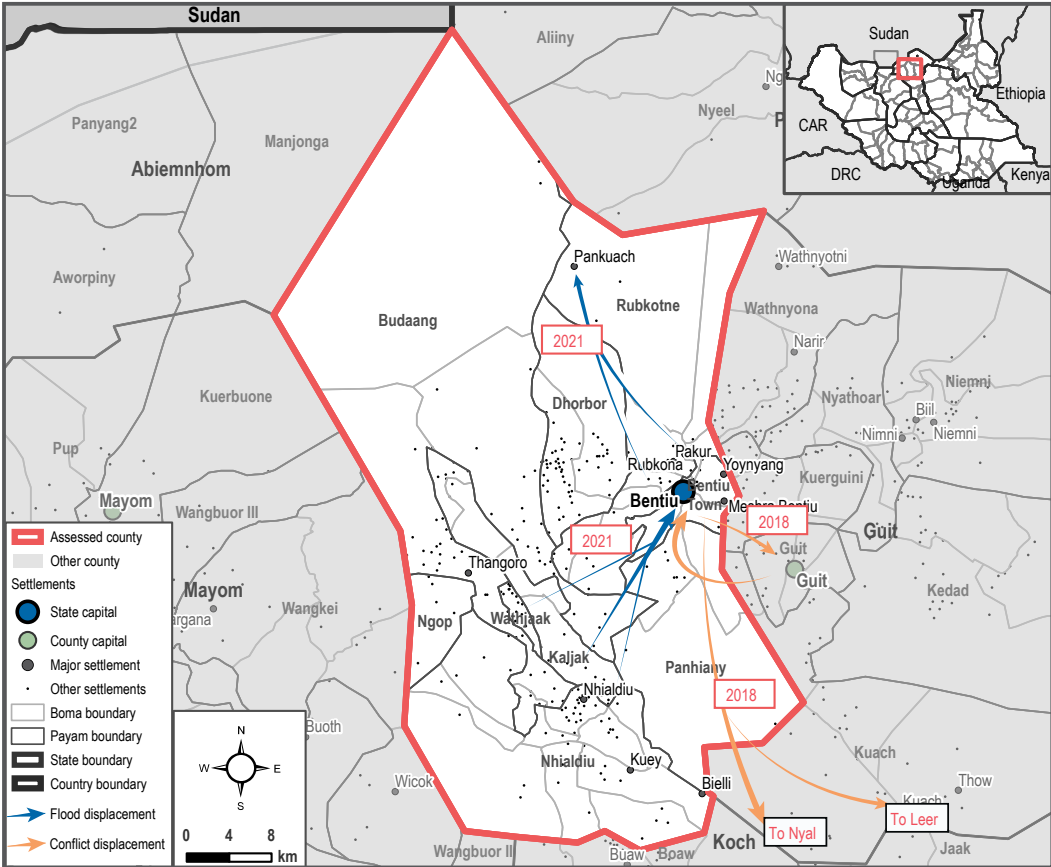**Map 6.2. Significant population movements in Rubkona County over the past five years (2017-21)**

Table 6.1. Est. no. of displaced persons by payam (2022)[38]

Payam	IDPs	Returnees	Relocated	Total
Bentiu	52,963	16,368	3,042	72,373
Budang	3,741	3,156	582	7,479
Dhor Bor	6,828	4,068	2,388	13,284
Kaljak	2,670	2,202	2,778	7,650
Ngop	5,376	4,164	1,242	10,782
Nhialdiu	2,221	780	348	3,349
Rubkona	120,625	7,256	810	128,691
Wathjak	1,254	912	654	2,820
Total	195,678	38,906	11,844	246,428

Population is concentrated in the centre of the county, predominantly around the Bahr al Ghazal river, as well as in the south of the county (Map 6.1). The most densely populated areas lie around the towns of Bentiu and Rubkona, as well as around Pankuach.[40] The densely populated area immediately north of Rubkona is the **Bentiu PoC camp, home to 113,000 individuals as of November 2021.** Other parts of the county are relatively sparsely populated. Table 6.1 shows that, according to a 2022 IOM-DTM Baseline Survey, the **majority of internally displaced persons (IDPs) in the county are concentrated in Rubkona followed by Bentiu payams. This is because of the PoC and multiple IDP camps that are located here.** The highest number of returnees meanwhile are found in Bentiu payam.
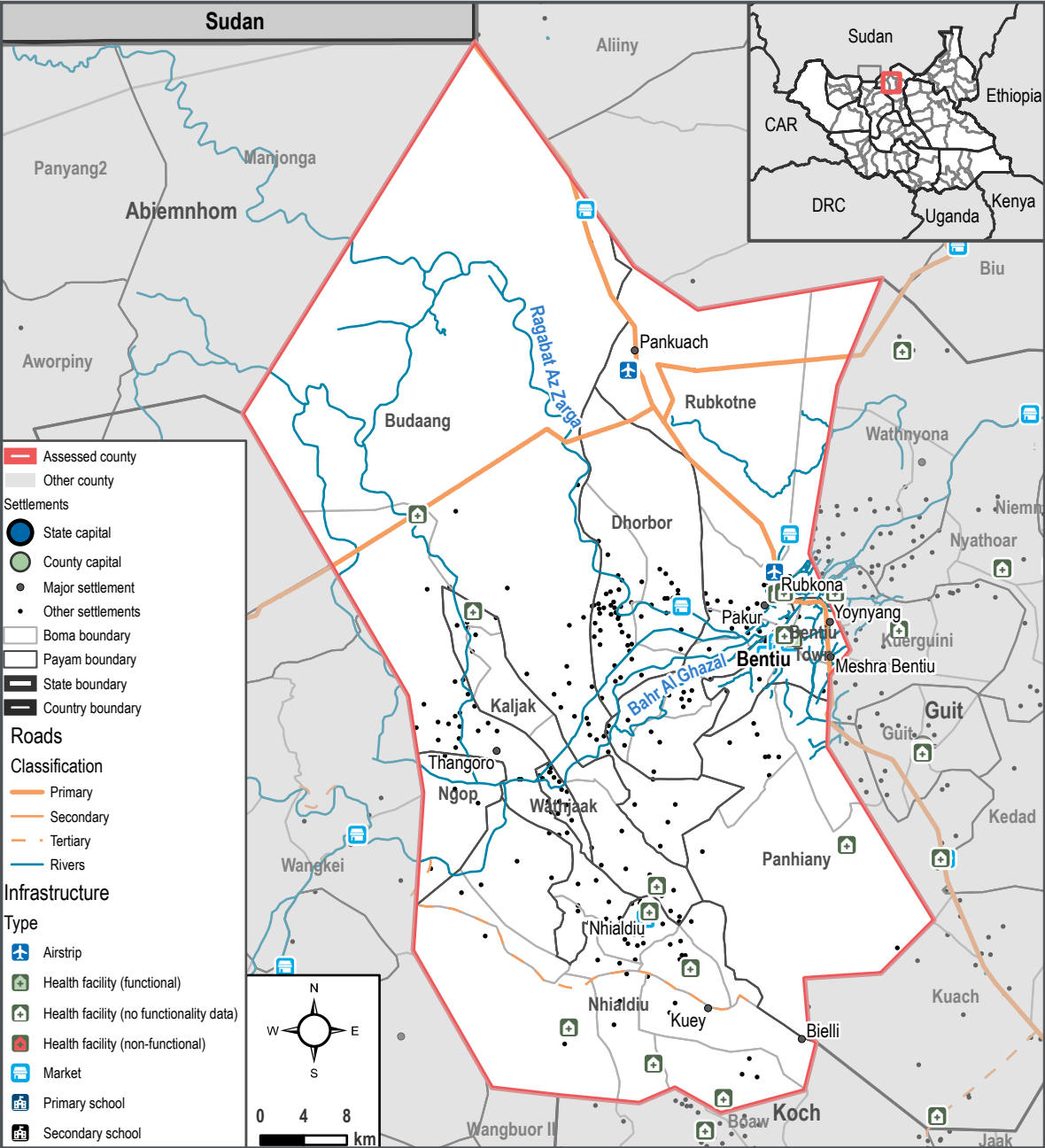
Map 6.2 indicates major population movements in recent years in Rubkona County. In **April 2018, renewed insecurity across Unity State led to the displacement of thousands of civilians,** in particular from Rubkona to Leer, Guit and others to Nyal, Panyijiar County.[41] **Further insecurity in 2020 caused displacement from Guit into Rubkona County,** and also from rural areas within Rubkona to displacement sites, including Bentiu PoC.[42] In **August 2021, flooding caused displacement within the County,** from Nhialdiu Payam to Bentiu Payam.[43] **Further flooding in early 2022 resulted in displacement of around 6,000 people within Rubkona County**, from Ding, Tondol, Kurchala, Boryian, Biel, Chuor, Kaljak and Turkiel to Panakuach.[44]

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Map 7.1. Key infrastructure in Rubkona County (2021-22)[i,45,46,47,48]

Sudan

Map 7.2. Community infrastructure, Bentiu and Rubkona towns, Rubkona County (June 2022)[49]

Infrastructure data from IOM (2021) and REACH survey (June 2022). Health and education functionality information provided by partners including WHO and Windle Trust. Dyke layout data from IOM (2022). Note that dyke layers are drafts developed for operational purposes, final validation ongoing hence not final approved IOM material. Road data from OSM (2020) and REACH (2020).

i Information on month of data collection is not available for county-wide health and education facility infrastructure data; airstrip data from September 2022; market data from August 2022; infrastructure data in Bentiu and Rubkona towns from June 2022.

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Figure 8.1. Satellite images showing change in built-up area in Bentiu and Rubkona area.

Bentiu and Rubkona, 2010 (24 November 2010, WorldView 2)

Bentiu and Rubkona, 2022 (21 January 2022, Geo Eye 1)

Figure 8.2. Change in urban area (2010-2020)[50]
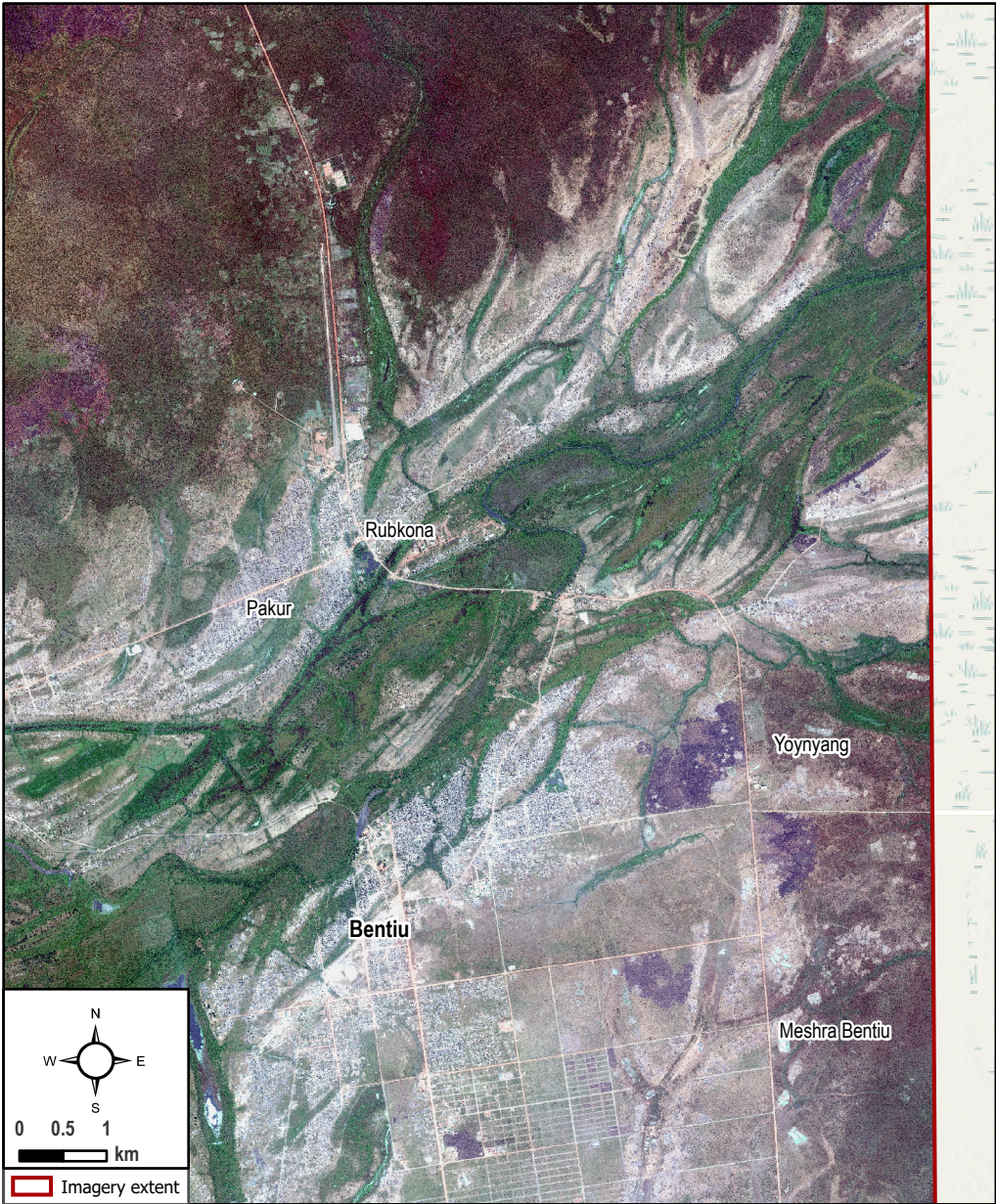
Satellite imagery: WorldView 2 from 24 November 2010. Copyright: ©2010 DigitalGlobe. Source: US Department of State, Humanitarian Information Unit, NextView License
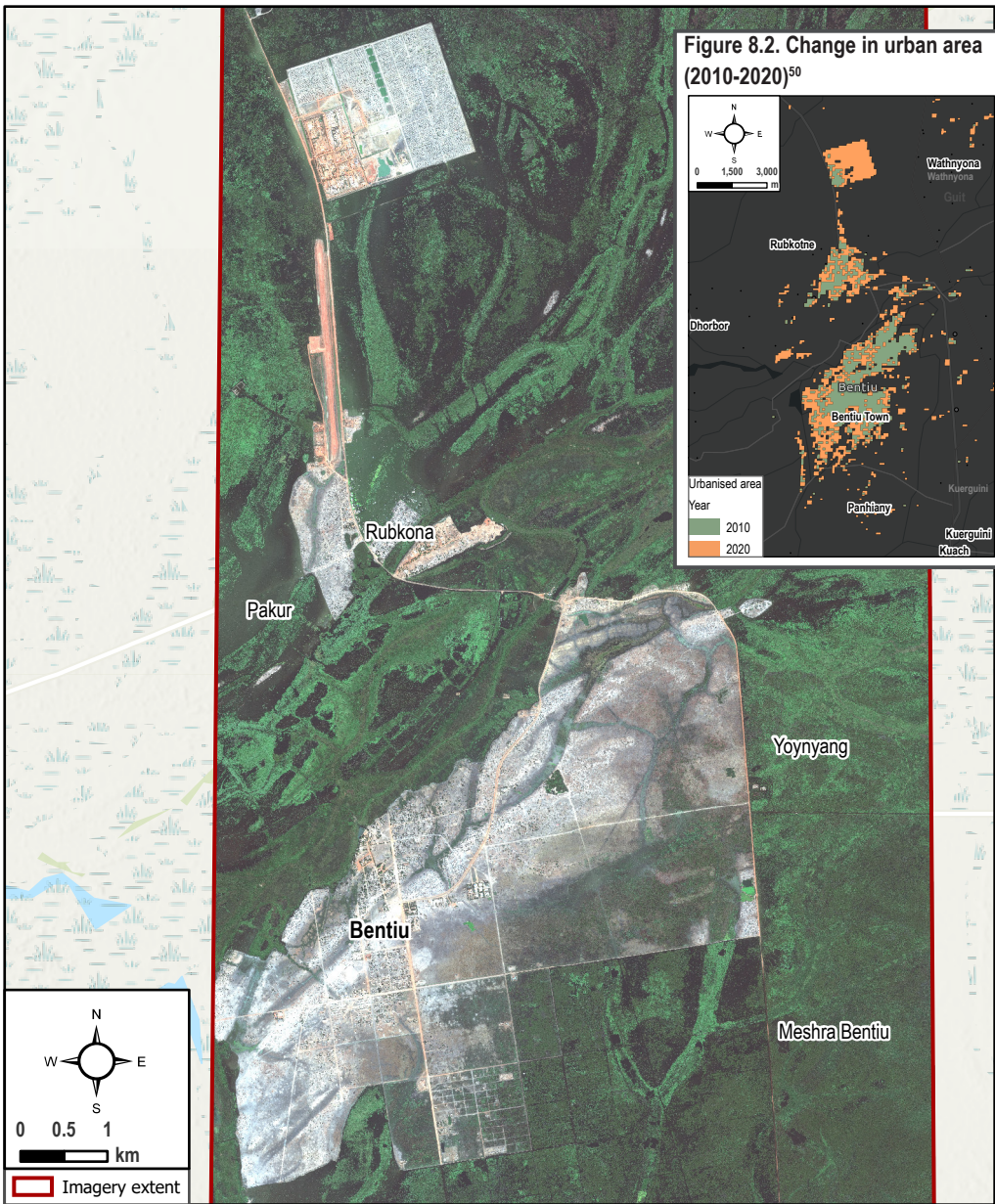
Satellite imagery: Geo Eye 1 from 21 January 2022. Copyright: ©2022 DigitalGlobe. Source: US Department of State, Humanitarian Information Unit, NextView License

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SETTLEMENT STRUCTURE

The **county headquarters are located in Bentiu Town, which also serves as the headquarters for Unity State.** Other population centres in the county include Rubkona, as well as the Bentiu PoC.

The **rakooba was the main reported shelter type used by host communities in 46% of assessed settlements** in REACH's April 2022 AoK assessment, followed by improvised shelters (29%) and tukuls (23%).[51] Findings suggest significant **shelter destruction occurred as a result of flooding in 2021,** and by November 2021, KIs in almost all assessed settlements (>90%) reported shelter destruction due to flooding in the month prior to data collection. **By April 2022, this number remained the same, suggesting further damage and/or limited reconstruction.**[52]

🏠 **Shelter indicators - REACH AoK***

KIs in 46% of assessed settlements reported that the main shelter type used by local communities was the rakooba, followed by improvised shelters in 29% (April 2022)[53]

KIs in more than 90% of assessed settlements reported that at least some shelters had been damaged in the month prior to data collection due to flooding (Apr 2022)[54]

TRANSPORT

A primary road runs from the Sudan border at Panakuach through Bentiu Town to Rumbek via Mayendit. There is also a road branching northeast to Pariang. To the west, a road runs to Mayom, but as of September 2022, this road, along with south-bound routes were not functional due to flooding.[65] **Whilst a proportion of the revenue from oil extraction was earmarked for infrastructure development in the county, construction was disrupted due to the conflict.**[66]

Road transport can be challenging during the rainy season. However, the county is served by an airstrip which provides a vital supply route for goods and humanitarian assistance to the county (Map 10.1). See section 10 for more information.

REACH AoK AoK data collected at settlement-level and based on reports by KIs. The methodology provides indicative data on thumanitarian situation including in hard-to-reach settlements. Only counties with 5% ccoverage of settlements are reported on.

INFRASTRUCTURE

Thirteen health centres[55] and 76 schools (of which 3 are secondary)[56] are located in the county.[i] This infrastructure is concentrated in and around the towns of Bentiu and Rubkona, with a **lack of services in the north and west of the county.**

There is limited information on the functionality of education and health facilities in the county. However, a June 2022 REACH assessment found that **almost 30% of assessed schools and many health centres were no longer functioning in Bentiu and Rubkona towns because of flood damage.**[57] Temporary infrastructure had been set up to serve the large displaced communities located in the four IDP camps within the towns.[58]

According to the REACH AoK survey, KIs in all assessed settlements reported that most people had access to either a public health centre (PHC), mobile NGO clinic, or hospital in June 2021.[59] However, by December 2021, **following the peak of the 2021 flooding, no healthcare access was reported in 32% of assessed settlements**, with long distances, destroyed facilities, or lack of staff being the most reported barriers.[60]

Regarding education, whilst KIs in 60% of assessed settlements in the June 2021 REACH AoK reported that people had access to facilities,[61] this had **dropped to 8% by December 2021, reportedly in most cases because facilities had been destroyed or were too far away.**[62] In terms of communication, during the most recent communication assessment (June 2020), **KIs in most (>75%) assessed settlements reported people had access to a functional cellular network**.[63]

SETTLEMENT CHANGE

From the 2010 and 2022 satellite images (p. 9), a noticeable change is the development of the PoC camp to the north of Rubkona Town. Figures 9.1 - 9.3 show some of the other major settlement changes. This includes **destruction of property in Bentiu Town (Figure 9.1) due to conflict in 2014,**[64] followed by **extensive flooding in 2021, leading to the development of dykes and concentration of the population within these dyke-protected zones (Fig. 9.2), and into IDP camps (Fig. 9.3).**

[i] Information on the month of data collection is not available.

Figure 9.1. Destruction of property in Bentiu Town due to conflict

Figure 9.2. Change in urban structure of Rubkona Town due to flooding and development of dykes

Figure 9.3. Development of IDP camps within Bentiu Town in response to flooding.

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Map 10.1 Markets in Rubkona County, indicating supply routes

The primary markets in the county are located in Bentiu and Rubkona towns.[67] These markets are served directly from Sudan by road, and from Juba by air. Additional markets are located in Bentiu PoC, Nhialdiu and Rotriak, which are served from these primary markets.[68] However, **access can be an issue in the rainy season due to flooding**, as mentioned in Section 9 and Section 3.

According to REACH Joint Market Monitoring Initiative (JMMI) data, market **prices for sorghum and the Multi-Sector Survival Minimum Expenditure (MSSMEB) Food Basket appear to be relatively similar to national median prices.**[69] However, prices did experience relatively large increases in 2021, at a greater magnitude than the national median (Graph 10.1). Note that the graph shows the average prices recorded at Bentiu and Rubkona markets.

In August 2022, REACH Joint Market Monitoring Initiative (JMMI) data indicated that both **Bentiu and Rubkona markets were running with reduced functionality, meaning that many items were not available at the time of assessment.**[70] As mentioned in section 5, there was a fall in cereal production between 2020 and 2021 in the county, which may have been a contributing factor to the reduced availability of goods.
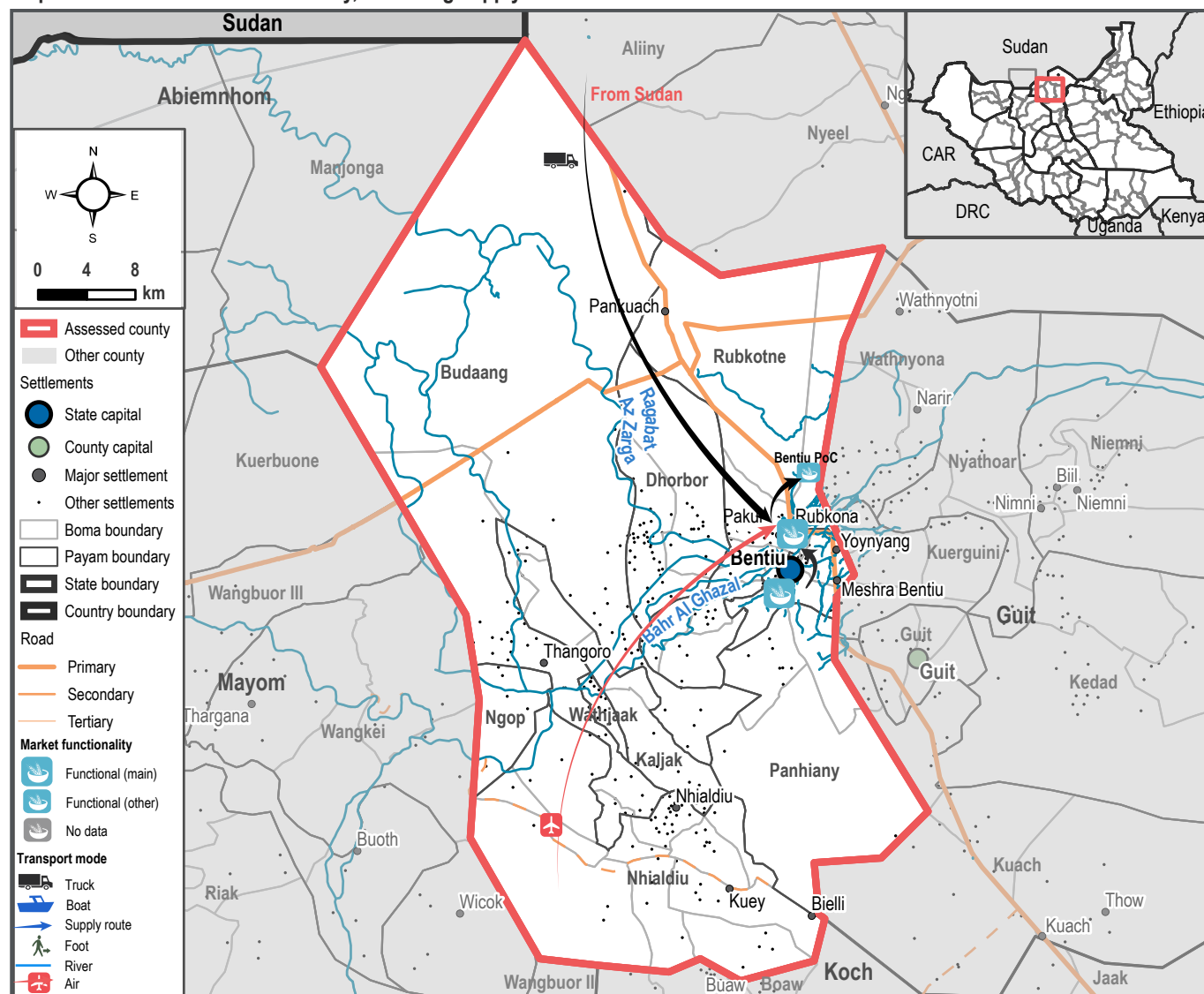
Table 10.1. Key market supply routes, Rubkona County

Market name	Primary supply route
Bentiu	From Sudan (by road) / from Juba (by air)
Rubkona	From Bentiu (by road)
Bentiu PoC	From Bentiu (by road)

🌾 **Sorghum price (Apr 2022)**
Same as South Sudan median

📈 **MSSMEB price (Apr 2022)**
15% above South Sudan median

Graph 10.1. Market price trends for sorghum and Multi-Sector Survival Minimum Expenditure Food Basket (MSSMEB).[71]
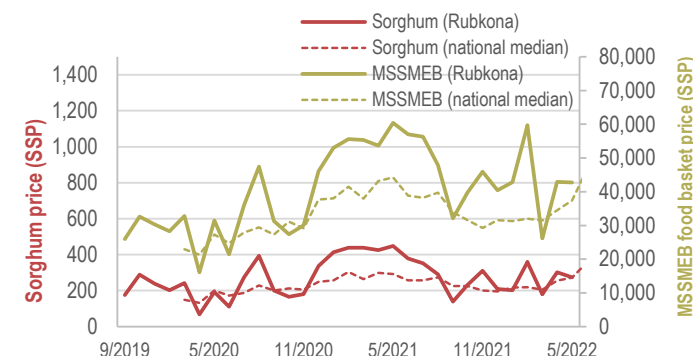
ENDNOTES

1   IOM. County Population data. 2022.

2   Google Earth Engine. WorldPop Global Project Population Data. 2021.

3   DTM South Sudan: Bentiu IDP Camp Population Count (November 2021).

4   Conflict Sensitivity Resource Facility (CSRF). Rubkona county profile.

5   Google Earth Engine. NASA SRTM Digital Elevation Model. 2000.

6   Britannica. Baḥr al-Ghazāl river, South Sudan.

7   Famine Early Warning Systems Network (FEWSNET). Livelihood Zone Map and Descriptions for the Republic of South Sudan. Issued August 2018.

8   Google Earth Engine. CHIRPS Daily Rainfall Data. 1981-2022.

9   ibid.

10   Google Earth Engine. ERA5-Land Monthly Average Dataset. February 2022.

11   Google Earth Engine. ESA WorldCover v100. 2020.

12   ibid.

13   Digitize Africa. Building footprints. 2017.

14   UN Audiovisual Library. South Sudan / Bentiu Floods Response. Aug 2022.

15   UNICEF. Worst flooding in Bentiu in 60 years washes away food and homes. November 2021.

16   REACH Area of Knowledge (AoK).

17   DAHITI. Altimetry data. 2002-2022.

18   REACH. South Sudan Shocks Monitoring Index (SMI). 2017-22.

19   DAHITI. Altimetry data. 2002-2022.

20   UN-SPIDER. Recommended Practice: Drought monitoring using the Vegetation Condition Index (VCI).

21   WFP. Hunger deepening in South Sudan as floods follow drought and unresolved conflict. December 2019.

22   Google Earth Engine. CHIRPS Daily Rainfall Data. 1981-2022.

23   Google Earth Engine. ERA5-Land Monthly Average Dataset. February 2022.

24   Google Earth Engine. CHIRPS Daily Rainfall Data. 1981-2022.

25   WorldClim. Bioclimatic variables.

26   Famine Early Warning Systems Network (FEWSNET). Livelihood Zone Map and Descriptions for the Republic of South Sudan. Issued August 2018.

27   Conflict Sensitivity Resource Facility (CSRF). Rubkona county profile.

28   ibid.

29   Integrated Food Security Phase Classification (IPC). South Sudan Acute Food Insecurity and Acute Malnutrition Analysis. Feb - July 2022.

30   REACH. South Sudan WASH Severity Classification. April 2021.

31   REACH Area of Knowledge (AoK). April 2022.

32   Famine Early Warning Systems Network (FEWSNET). Livelihood Zone Map and Descriptions for the Republic of South Sudan. Issued August 2018.

33   FAO/WFP. 2021 Crop and Food Security Assessment Mission (CFSAM) to the Republic of South Sudan. June 2022.

34   ibid.

35   Integrated Food Security Phase Classification (IPC). South Sudan Acute Food Insecurity and Acute Malnutrition Analysis. Feb - July 2022.

36   REACH. South Sudan WASH Severity Classification. April 2021.

37   REACH Area of Knowledge (AoK).

38   IOM - DTM Baseline Survey 2022.

39   Google Earth Engine. WorldPop Global Project Population Data. 2021.

40   Google Earth Engine. WorldPop Global Project Population Data. 2021.

41   OCHA. South Sudan: Humanitarian Snapshot (April 2018) .

42   IOM-DTM. Unity State Event Tracking Report. Publication date: 29 May 2020.

43   IOM-DTM. Bi-Weekly Event Tracking Update. 16-29 August 2021.

44   IOM-DTM Event Tracking dataset. South Sudan.

45   IOM. Education facilities. 2021.

46   WHO. Health facilities. 2021.

47   REACH. Joint Market Monitoring Initiative (JMMI). August 2022.

48   Humanitarian Data Exchange (HDX). Airports in South Sudan. 2022.

49   REACH. Bentiu and Rubkona Towns - Key infrastructure and estimated maximum flood exposure (2019-2021).

50   Pesaresi M., Politis P. (2022): GHS built-up surface grid, derived from Sentinel2 composite and Landsat, multitemporal (1975-2030)European Commission, Joint Research Centre (JRC).

51   REACH Area of Knowledge (AoK).November 2021..

52   REACH Area of Knowledge (AoK).April 2022.

53   ibid.

54   ibid.

55   WHO. Health facilities. 2021.

56   IOM. Education facilities. 2021.

57   REACH. Bentiu and Rubkona Towns - Key infrastructure and estimated maximum flood exposure (2019-2021).

58   ibid.

59   REACH Area of Knowledge (AoK).June 2021.

60   REACH Area of Knowledge (AoK). December 2021.

61   REACH Area of Knowledge (AoK). June 2021.

62   REACH Area of Knowledge (AoK).December 2021.

63   REACH. South Sudan Cellular Network Mapping: MTN SSD and Zain Access.

64   Conflict Sensitivity Resource Facility (CSRF). Rubkona county profile.

65   Logistics Cluster. South Sudan - Access Constraints Map, 1 September 2022.

66   Conflict Sensitivity Resource Facility (CSRF). Rubkona county profile.

67   REACH. Joint Market Monitoring Initiative (JMMI).

68   ibid.

69   ibid.

70   ibid.

71   ibid.

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