Audrey Price Dublin Coffman High School Dublin, OH, United States South Sudan, Infrastructure

South Sudan: Forging Connections in the World's Youngest Country

South Sudan is a Sub-Saharan African country torn apart by conflict. To the North lies Sudan, from whom the country seceded in 2011 following a 22 year war- the longest war in African history. President Salva Kiir, who began as the South Sudanese rebel leader in the Sudanese War, was elected into office following South Sudan's independence in 2011. However, internal unrest led to yet another conflict –a Civil War- in 2013. The South Sudanese government and opposing interest groups engaged in a Civil War which would carry all the way into 2020. Operating under an almost totalitarian form of government, President Salva Kiir has the ability to fire state governors and dissolve legislature, all without facing any repercussions, such as impeachment. With such a focus being on the politics in South Sudan, the needs of the people are going unaddressed (Freedom House, 2022).

According to the World Bank, the population of South Sudan stands at 11.1 million. South Sudan has been deemed the "youngest country" for two reasons: no new country has been founded since its independence in 2011, and over 70% of the population is under the age of 30 (USAID, 2023). Considering that such a large proportion of the population is under the age of 30 brings into question the circumstances which prevent those people from living into adulthood. This statistic is certainly supported by an alarming life expectancy of only 57 years, the fifth lowest in the world (Worldometers, 2023). With an infant mortality rate of 98.7 deaths per 1000 live births (UNICEF, 2021), nearly 10% of infants don't live to see their first birthdays.

In South Sudan, families benefit from having multiple children: there are more people to help with chores, provide income, and care for older family members. Due to the likelihood of a child surviving into their teenage years or beyond being so slim, mothers will have many children in hopes that multiple will survive into adulthood. The average South Sudanese family consists of seven people: however, households tend to contain more than a single family, with up to three or four generations living together. South Sudanese family members live in extremely close proximity to each other, creating non-ideal living spaces. With an average daily income of \$1.90, housing options are limited (WorldData, 2022). In 2018, 91% of urban residents were living in grass-thatched homes. In cities, where housing is expensive, grass-thatched housing is the most economically viable option for those living off of less than \$2.00 a day. The majority of rural homes are made from naturally sourced materials. Round huts, known as tukuls, are prevalent in rural communities. Tukuls have thatched roofs made of grass, supported by millet stalks, wooden poles, and mud (CAHF, 2023).

The average family consists of seven people, with gender roles deeply rooted in patriarchy and paternalism. Men are the providers of the family, socializing, selling goods, and caring for livestock. Women are expected to handle domestic duties, such as household chores, cooking, and child-rearing. The average family follows a patriarchal system, with men being the figure of authority, and all assets being passed down to male relatives. A paternalistic attitude also tends to surround women. Marriage age for women differs between tribes, ranging from one's teenage years to later in adulthood. However, 52% of girls are married before age 18, and an estimated one-third of South Sudanese girls are pregnant before

their 15th birthdays (UNICEF, 2020). These pregnancies can be detrimental to mother and child alike. Young mother's bodies are not suitable for carrying and delivering a baby, while those children born by children are more susceptible to premature births and birth defects; which can cause life-long health problems. Marriage is viewed as the combining of two families, which can result in arrangements being made that benefit one's community. Ethnicity, occupation, and religion are all considerations made for marriage (Cultural Atlas, 2018). If the married couple live in different regions, the husband will generally bring his wife to his home state, thereby removing the bride from her family. Regardless, men are often protective of unmarried female relatives, for fear that they will bring shame upon their family. All females are burdened with responsibilities which begin at a young age and follow them into adulthood, leaving very little opportunity to receive an education, or pursue opportunities arising elsewhere. Those few girls who do attend school are less likely to marry or have children as teenagers than those who do not.

Unfortunately, the odds of any child –male or female– receiving an education are slim. While South Sudan has a public primary education system, it is not feasible for many children to attend school, as their families require them at home. Location heavily influences the availability of public education, as children living in remote areas are unable to make long commutes to school. As a result, some children are taught by family members or tribal leaders, receiving an education heavily centered around religion or traditional beliefs. An estimated 36% of primary-aged children attend school (UNICEF, 2022)– a statistic that decreases as the child becomes older. Boys become occupied with providing food and a source of income for their families, while girls are expected to take care of older relatives, or even their own children, if they have any. As of 2020, only 48% of South Sudan's youth are literate (World Bank, 2020). The literacy rate for older generations is even lower, signaling a recent increase in the availability of public education in South Sudan is undeniably an issue, there are other epidemics affecting the people more directly.

Malnutrition, and especially undernutrition, affect the majority of the population. A typical South Sudanese diet consists of cereal crops– sorghum, maize, millet– and meat– chicken, mutton, or chevon. Families in rural areas grow their own crops, and either raise their own livestock or buy local meat. Farm plots average from only 1-4.2 acres (AFDB, 2013). Urban residents rely on rural farmers for produce: however, rural communities struggle to produce enough food to support themselves. Many families participate in subsistence farming, a practice in which a family only grows enough food to feed themselves. While this may work under some circumstances, unpredictable weather conditions, such as floods and droughts, can ruin harvests. To rural communities, who have not established trade networks, a poor harvest could be detrimental. A reliance on subsistence farming has resulted in adverse economic consequences as well. Any opportunities for expanding markets to urban communities are stifled simply by the amount of food that is being grown. Therefore, not only individual rural communities are being negatively affected, but urban communities as well.

Healthcare services in South Sudan are severely lacking. Insufficient funding inhibits the government from providing nationwide healthcare. In fact, South Sudan's healthcare allocation in the fiscal year 2019-2020 dropped from 2.15 billion dollars to 663 million (VOA, 2019). The majority of services being provided are independently initiated and run by nongovernmental organizations. Not only are hospitals understaffed, but violence has severely hindered healthcare workers from supporting people living in rural communities. Resistance from ethnic groups on the roads poses a threat to the lives of healthcare workers, who in return are unable to help save the lives of others. Certain ethnic groups who do not wish to receive aid will raid vehicles or force them to turn around. Inadequate services only exacerbates the nation's health crisis. Maternal care is highly inaccessible for expecting mothers, resulting in death on part of the mother and child. Neonatal conditions in infants account for the majority of deaths in South Sudan, while

childbirth is the seventh leading cause of death for women (WHO, 2020). Poor sanitation results in an abundance of waste and other pathogens contaminating drinking water and transmitting disease, which is especially detrimental to pregnant women, who are more sensitive to foodborne and waterborne diseases. Diarrhoeal diseases are the fourth leading cause of death for adults in South Sudan, and the primary cause of death for children (WHO, 2020). Other diseases, such as HIV/AIDS, malaria, and tuberculosis are large contributors to high mortality rates in South Sudan. Unfortunately, unestablished and inaccessible road systems prevent healthcare workers from providing necessary services to people in need.

Government expenditures towards the nation's infrastructure are being used very inefficiently. The lack of existing infrastructure and the government's inability to improve it will continue to hinder the country's development as the population increases. Public sanitation services are severely lacking, especially in rural communities, in which latrines are almost non-existent– 60% of the overall population practices open defecation (UNICEF, 2020). As many South Sudanese are not aware of the health consequences of open defecation, the practice will be continued unless there is an intervention. The isolated communities of South Sudan are disconnected due to absence of weather-resistant roads. While there are 20,000 kilometers of roads, only 400 are paved (WFP, 2022), creating a system that is completely unusable during the flood season. Flooded roads significantly delay travel times, inhibit citizens from receiving timely medical care (especially pregnant women), and result in road-side robberies. Resistance from certain ethnic groups in receiving aid has resulted in delays, theft, and even death. In July 2023 alone, there were 18 reported incidents of violence against humanitarian crews, and 12 reported incidents of operational interference during transit (OCHA, 2023). Madagascar used to suffer from a similar issue; fortunately, thanks to a new road system financed by the International Development Association (IDA), crime has declined and trade has prospered.

Prior to IDA's intervention, Madagascar had one of the least developed road networks in the world– those roads which had been established were in poor condition. In 2020, main roads and feeder roads were rehabilitated, and digital kiosks installed periodically to provide farmers with current market prices and demands on produce. By 2022, after only two years of its institution, communities reaped the benefits of improved infrastructure, connectivity, and access. Commute times decreased, schools and hospitals became more accessible, farmers sold produce to more markets at a higher price, and less burglary occurred along the roads. The previous bad road conditions required drivers to move at slower speeds, resulting in break-ins; however, improvements allowed for vehicles to travel faster, making it harder for burglars to break into vehicles while in-transit, therefore lowering crime.

While Madagascar's road project has proven to be a success, significant alterations would have to be made in order for it to be effective in South Sudan. While existing economic hardships, food insecurity, and crime would be lessened through increased infrastructure, there are other more pressing issues that affect the people more directly. Young mothers are dying in childbirth, infants are passing from diarrheal diseases, and receiving an education is coming second to survival. Any substantial solution to South Sudan's poor sanitation, infrastructure, and hygienic regiment must by nature be a multi-faceted plan to account for a multitude of problems. For example, a solution involving roads and roads only would be insufficient. Without goods to sell, they are an economic burden rather than a source of income. When used properly, septic tanks and latrines would help lower the amount of pathogens in drinking water, under the assumption that the people are educated and willing enough to end their current practices. Providing infrastructure may contribute to half of the solution– but without an understanding amongst the people as to how they can benefit from solutions, the root of the problem remains. Therefore, infrastructure, sanitation services, and education are the three key components in developing a plan for South Sudan.

Infrastructure is the first focus of this project. Developing a usable road system requires repairs to current routes, the addition of new ones, and year-round use. Existing paths are focused around large cities and the nation's capital, Juba, located in the southernmost part of the country. Juba is located in the Central Equatoria region, which is advantageous for a variety of reasons- foremost, the soil in this region contains high concentrations of nitrogen and clay compared to its neighboring Western and Eastern Equatoria regions (IFDC, 2022). During the dry season, the clay causes the soil to harden and crack, increasing the permeability during the growing season. Unfortunately, this region is also highly susceptible to flooding, which has resulted in the deterioration and eroding of the roads, making them nearly inaccessible by humanitarian organizations during the rainy season. If not inaccessible, vehicles are severely delayed by the flooding, inhibiting communities from receiving timely aid. Although Juba is located in the south, the majority of people live along the White Nile River, with the highest population density being in the northernmost part of South Sudan, in the Northern Bahr El-Ghazal, Warap, Unity, and Lakes regions. While existing roads in Juba are strategically placed, they are unpredictable, and the focus should be on installing roads in the northern regions of the country. This way, those people living in northern cities and rural communities are connected to the nation's capital, expanding markets both ways. Although installing roads may appear to be a daunting task, the World Food Programme (WFP) has already begun breaking new grounds in South Sudan.

In Torit, located in the Western Bahr el Ghazal state, the WFP contributed to a project in which communities built roads between them and to the region's market. Locals were employed to clear roads of vegetation, then rake, level, and pack down soil. Since the installation of these roads in 2022, more than 5,000 smallholder farmers have been connected to the region's main market (WFP, 2022). An extension of this project, with a focus being on connecting northern and southern regions, and making the roads flood resistant would be highly beneficial nationwide. First, strategic routes between small communities, cities, and state markets would have to be identified. Second, government representatives could communicate with those who are willing to participate in the project and supply them with the tools and skills needed to create these roads. With the goal being to create long-lasting roads, the application of weather-resistant chemicals is vital for preventing erosion. This makes for less frequent road maintenance, and year-round access- even during the rainy season. Soils in the Equatoria states tend to have high clay percentages. During floods and heavy rains, these high porosity, clayey soils take on large amounts of water, resulting in a plastic consistency. Plasticity and high pliability causes vehicles to become stuck in the roads, leaving ruts that harden and crack once the soil has dried out. Fortunately, new chemical applications are being developed to increase the longevity of dirt roads. Perma-Zyme is an enzyme-based chemical developed by Substrata, which claims to stabilize dirt roads by bonding together clay particles, resulting in a concrete-like substance that is resistant to weathering. This treatment can be applied during the raking stage of road-building, ensuring equal distribution of the product throughout the soil. As Perma-Zyme is expensive (\$3,000 per mile), those areas most susceptible to flooding must be identified so it is administered strategically. Connecting with the European Union, who funded the 2022 initiative covered by the WFP, would help to secure necessary economic resources. The European Union has already set aside \$22 million dollars to fund similar projects in the next two years. Additionally, the South Sudan Ministry of Roads and Bridges could request an evaluation of current government expenditures towards roads and suggest that those funds be redirected.

The implications of this project would address a variety of present challenges in South Sudan. The creation of roads would provide citizens with opportunities to form bonds outside of their local communities, allowing for expanded trade. Establishing new markets for trade will incentivize farmers to move away from subsistence farming, as they can sell produce outside of their homes. According to Peter

Okue, a farmer who was involved in the WFP's road project, "I have been cultivating a small portion of my big land just to provide food for my family, but now I will produce more, because I can sell it in the market in Torit and even Juba" (WFP, 2022). This illustrates the waterfall effect that will ensue following the road project, ultimately trickling down to the nation's capital, and revitalizing the economy as a whole. Rural communities will benefit economically from the advancement of markets, while urban communities will have expanded access to fresh produce, potentially making for healthier diets and tackling malnutrition. As families move away from subsistence farming, more help will be needed outside of the home to cultivate crops. Marginalized demographics, specifically women, would benefit from these opportunities outside of the home. While the eradication of a misogynistic attitude towards women will not be solved solely through involvement outside of the home, it could help to lessen the current burdens imposed upon girls and women. Accessibility to education, healthcare, and humanitarian aid will also grow in relation to increased road access. As transportation time decreases, receiving an education will be more feasible for children who are also required at home. This access to education will contribute to the fostering of a new generation of South Sudanese children who are well-educated. Additionally, it has been proven that girls who are in school are less likely to marry and have children young, which allows for additional possibilities outside of their traditional domestic duties. As teenage mothers tend to have the most complications during childbirth, the maternal death rate and neonatal disorder rates will decrease. Regardless, healthcare service availability will become more prompt following the installation of roads. Once again, this will be especially advantageous for mothers, as they can receive maternal care during their pregnancies. Infants, children, adults, men, and women will benefit from increased accessibility to healthcare and humanitarian aid. Although building weather-resistant roads will require a larger initial investment, maintenance costs will be minimal, as the roads will be less susceptible to weathering.

In order to fund this operation, current government expenditures would have to be redirected through the South Sudan Ministry of Roads and Bridges. Federal involvement in a project such as this will not only provide proper financial support, but will also bring to their attention the dire conditions rural roads are in. The monetary effects of expanded markets and the ability of humanitarian groups to administer more aid will benefit the people and the nation's economy alike. Additionally, the World Bank, European Union, and the African Development bank helped to fund the road project in Madagascar, and would potentially fund something similar in South Sudan. Lastly, the World Food Programme is already involved in building roads in South Sudan, and could offer valuable advice on how to connect with the people and facilitate such a project.

The second component to the plan is the installment of, education on, and management of safe sanitation practices. Specifically, the use of septic systems and latrines. Currently, 60% of South Sudanese practice open defecation (UNICEF, 2020)- in doing so, fecal coliform bacteria finds its way into drinking water through runoff. Unfortunately, some people are largely unaware of the ways in which open defecation is affecting their health, and many are unable to do otherwise. Only 10% of South Sudanese have access to adequate sanitation services (USAID, 2019), meaning that for many, there is no other choice. Giving them the choice will help to alleviate some of the effects of drinking contaminated water. Using the newly constructed road system, septic tanks can be installed for the safe disposal of human waste. Schools and churches, community centers, or other easily accessible public places would be priority for receiving septic tanks. In order to accommodate large amounts of waste, Small Flow On-site Sewage Treatment Systems (SFOSTS) would be used. As opposed to household septic tanks, these sewage treatment systems have larger leach fields, allowing them to take in more waste. The predominant soil type in South Sudan is a silty clay, which makes SFOSTS and large leach fields preferable, as the chance of a backflow happening is reduced. Along with the installation of septic systems, providing education on proper hygiene is essential for minimizing open defecation. In the Northern Bahr El Ghazal State, Marol Aken built a latrine for her family. Since then, she has observed that her children are much healthier. Aken was

inspired after UNICEF and the Mentor Initiative began raising awareness on the importance of using latrines. If families switch to using latrines, the amount of feces, and therefore fecal chloroform, in drinking water would be reduced, making for healthier communities. Additionally, practices such as personal hygiene, protecting clean water, food safety, and women's hygiene are being taught by Water for South Sudan. As a part of their program, four women and three men are identified from each village, and participate in a three-day session in which they are educated on the benefits of proper sanitation. Their model focuses on "training the trainer". This way, villagers can be educated by people whom they trust, without fear of doing away with their cultural identities through secular education. Moreover, Water for South Sudan has drilled 628 wells to date– through connecting this organization with new communities, more wells could be drilled to provide the people with clean drinking water. With the involvement of UNICEF, the Mentor Initiative, and Water for South Sudan, the sanitation aspect of the plan can be funded, enforced, and maintained.

The use of latrines and septic systems will help to reduce the amount of fecal chloroform in drinking water, as less people will be practicing open defecation. Additionally, receiving an education on safe hygienic practices will help to limit pollutants from being consumed even further. Clean drinking water means less disease, and as it affects children the most, there will be a lower infant mortality rate. With a lower infant mortality rate, mothers won't need to have as many children, which will reduce the amount of maternal deaths. Additionally, pregnant women are sensitive to foodborne and waterborne diseases, and sanitation services will help in lowering the amount of complications during and after pregnancy.

The involvement of as many ministries, organizations, and investors is vital for ensuring the success of this plan. The South Sudan Ministry of Roads and Bridges, World Bank, European Union, African Development Bank, and the World Food Programme all have expressed interest in supporting the revitalization of South Sudan's roads, or in other countries. Additionally, the Mentor Initiative and Water for South Sudan have already provided sanitation services for the South Sudanese, and may be interested in applying their programs nation-wide. Aside from infrastructure, a future where education is more attainable and girls have opportunities outside of the home may be possible. USAID is focused on providing universal education in South Sudan, which would be more accessible through functioning road systems. UNICEF's goal is to end child marriage and empower women– expanded opportunities outside of the home will discourage girls from marrying young, allowing them to pursue their interests and pave a way for future generations of women.

South Sudan is the youngest country in the world, making now the perfect time to intervene and control the causes of food insecurity rather than deal with the effects. In an ever-changing world, new solutions are required to address new challenges. Through the implementation of roads and sanitation services, South Sudan may just receive the head start it needs to become a thriving country. Roads will provide necessary infrastructure for installing sanitation services and educating the people on hygienic practices. From tackling malnutrition to education to empowering women, the implications of this project are limitless.

Works Cited

"Agricultural Land (% of Land Area) - South Sudan | Data." *Data.worldbank.org*, data.worldbank.org/indicator/AG.LND.AGRI.ZS?locations=SS.

Bank, African Development. "Infrastructure Action Plan in South Sudan: A Program for Sustained Strong Economic Growth." *African Development Bank - Building Today, a Better Africa Tomorrow*, 29 Mar. 2019,

 $www.afdb.org/en/countries/east-africa/south-sudan/infrastructure-action-plan-in-south-sudan-a-program-for-sustained-strong-economic-growth \ensuremath{\#:\sim:text=The\%20IAP\%20proposes\%20a\%20major.}$

- "CDC Global Health South Sudan." *Www.cdc.gov*, 19 Feb. 2019, www.cdc.gov/globalhealth/countries/south-sudan/default.htm.
- "CORDIS | European Commission." Europa.eu, 2021,

cordis.europa.eu/article/id/415837-new-technology-provides-clean-water-in-africa.

"Earth Day 2023: Studying Soil Fertility and Farming Systems in South Sudan – IFDC." International Fertilize Development Center, 21 Apr. 2023,

ifdc.org/2023/04/21/earth-day-2023-studying-soil-fertility-and-farming-systems-in-south-sudan/. Accessed 2 Dec. 2023.

- "Education | South Sudan." U.S. Agency for International Development, 21 Feb. 2023, www.usaid.gov/south-sudan/education#:~:text=Only%2048%20percent%20of%20South. Accessed 6 Sept. 2023.
- Evason, Nina. "South Sudanese Culture Family." *Cultural Atlas*, 2018, culturalatlas.sbs.com.au/south-sudanese-culture/south-sudanese-culture-family.
- ICBA. Soil and Water Characterization in the Selected Site of South Sudan. 2016, www.biosaline.org/sites/default/files/Project-Report-4-Published.pdf.
- "Life Expectancy by Country and in the World (2023) Worldometer." *Www.worldometers.info*, 2023, www.worldometers.info/demographics/life-expectancy/#google_vignette.
- Mahadi, Musa. "South Sudan's Road out of Hunger | World Food Programme." *Www.wfp.org*, 2022, www.wfp.org/stories/south-sudans-road-out-hunger.

"Malakal, South Sudan." *Energy Peace Partners*, 2019, www.energypeacepartners.com/malakal#:~:text=One%20of%20the%20least%20electrified. Accessed 5 Oct. 2023.

- ME, Yuga, and Wani J. "Soil Fertility and Farming Systems Assessment in Productive Areas of Western, Central and Eastern Equatoria State, South Sudan." *SunText Review of Arts & Social Sciences*, vol. 03, no. 02, 2022, https://doi.org/10.51737/2766-4600.2022.038. Accessed 2 Dec. 2023.
- OCHA. "South Sudan: Population Density by County (November 2020) | OCHA." Www.unocha.org, 16 Nov. 2020,

www.unocha.org/publications/map/south-sudan/south-sudan-population-density-county-novembe r-2020. Accessed 9 Dec. 2023.

- Ranganathan, Rupa, and Cecilia M. Briceño-Garmendia. "South Sudan's Infrastructure: A Continental Perspective." *Policy Research Working Papers*, The World Bank, 2011, https://doi.org/10.1596/1813-9450-5814.
- Robert, Lominsuk. "From Bush to Bathroom." *Www.unicef.org*, 2020, www.unicef.org/southsudan/stories/bush-bathroom.
- Royal. "Create Long Lasting Dirt Roads." *Www.substrata.us*, 2022, www.substrata.us/blog/creating-long-lasting-dirt-roads. Accessed 2 Dec. 2023.
- Solomon, Onen Walter. "South Sudan's Health Care Remains Inadequate, Officials Say." VOA, 5 July 2021,

www.voanews.com/a/africa_south-sudans-health-care-remains-inadequate-officials-say/6207877. html.

"Some Things Are Not Fit for Children – Marriage Is One of Them." *Www.unicef.org*, 2020, www.unicef.org/southsudan/press-releases/some-things-are-not-fit-for-children.

"South Sudan." *CAHF* | *Centre for Affordable Housing Finance Africa*, 21 Sept. 2016, housingfinanceafrica.org/countries/south-sudan/.

"South Sudan Data | World Health Organization." Data.who.int, 2020, data.who.int/countries/728.

South Sudan Infrastructure Action Plan - a Program for Sustained Strong Economic Growth - Chapter 6 -Development of Agriculture in South Sudan. 2013, www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/South%20Sudan%20Infra

structure%20Action%20Plan%20-%20%20A%20Program%20for%20Sustained%20Strong%20E conomic%20Growth%20-%20Chapter%206%20-%20Development%20of%20Agriculture%20in %20South%20Sudan.pdf.

"South Sudan Map." GIS Geography, 22 July 2021, gisgeography.com/south-sudan-map/.

- "South Sudan: Freedom in the World 2022 Country Report." *Freedom House*, 2022, freedomhouse.org/country/south-sudan/freedom-world/2022.
- "South Sudan: Humanitarian Access Snapshot (July 2023) | OCHA." *Www.unocha.org*, 16 Aug. 2023, www.unocha.org/publications/report/south-sudan/south-sudan-humanitarian-access-snapshot-july -2023#:~:text=In%20July%202023%2C%2034%20incidents. Accessed 2 Dec. 2023.
- "South Sudan: UN Agencies Urge Immediate Action to Avert Deepening Food Crisis | UN News." *News.un.org*, 1 Aug. 2023, news.un.org/en/story/2023/08/1139332.
- Substrata. "Perma-Zyme: Soil Stabilization Solution for Unpaved and Paved Roads." *Www.substrata.us*, www.substrata.us/perma-zyme#:~:text=Using%20a%20special%20enzyme%20formula. Accessed 9 Dec. 2023.
- "Sudan Crop Trust." Www.croptrust.org,

www.croptrust.org/pgrfa-hub/crops-countries-and-genebanks/countries/sudan/.

- "Sudan Soils Flags, Maps, Economy, History, Climate, Natural Resources, Current Issues, International Agreements, Population, Social Statistics, Political System." *Photius.com*, photius.com/countries/sudan/geography/sudan_geography_soils.html#:~:text=The%20country. Accessed 7 Nov. 2023.
- The World Bank. "How Are Roads Changing Lives in Madagascar?" *World Bank*, 10 Feb. 2023, www.worldbank.org/en/results/2023/02/10/how-are-roads-changing-lives-in-madagascar#:~:text= Madagascar%20has%20one%20of%20the.
- ---. "Overview." World Bank, 2011, www.worldbank.org/en/country/southsudan/overview.
- UNICEF. "Hunger and Malnutrition Being Driven by Climate Crisis and Conflict in South Sudan." *Www.unicef.org*, 3 Nov. 2022,

www.unicef.org/press-releases/hunger-and-malnutrition-being-driven-climate-crisis-and-conflict-south-sudan.

---. "WASH in the New UNICEF." UNICEF, 2021,

www.unicef.org/media/119056/file/WASH%20in%20the%20new%20UNICEF%20Strategic%20 Plan Summary.pdf.

- United Nations. "United Nations in South Sudan." *Southsudan.un.org*, 2023, southsudan.un.org/en#:~:text=The%20UN%20Office%20for%20the. Accessed 7 Nov. 2023.
- USAID. "Education | South Sudan." U.S. Agency for International Development, 21 Feb. 2023, www.usaid.gov/south-sudan/education#:~:text=More%20than%2070%20percent%20of.

---. WATER RESOURCES PROFILE SERIES.

winrock.org/wp-content/uploads/2021/08/South Sudan Country Profile Final.pdf.

- "Water | South Sudan | U.S. Agency for International Development." *Www.usaid.gov*, 22 June 2022, www.usaid.gov/south-sudan/water#:~:text=Only%2041%20percent%20of%20the.
- Water for South Sudan. "Water for South Sudan." *Water for South Sudan*, 2008, www.waterforsouthsudan.org/.