

Nzara County, South Sudan & the Local Villages of:

Wenepai, Nadari, and Naziragbe

Household Water, Sanitation, and Hygiene Survey

February-March 2024

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I. Introduction

During February 28, 2024, through March 4, 2024, Mabior Wantok Acouth, the Executive Director of Aqua-Africa, traveled to Nzara, South Sudan to assess the water, sanitation and hygiene (WASH) needs of the community and its surrounding villages. Mr. Acouth was accompanied by a team from the Great Ruaha Drilling Company of Juba, South Sudan who performed routine maintenance on the Nzara community's water tower during the visit, that included flushing of the tank, cleaning, and painting. A hydro geologist from Ruaha also accompanied the team to perform geophysical survey tasks.

Aqua-Africa maintains a one-acre fenced compound in Nzara and employs three people in the community that supervise, secure, and maintain the compound grounds. Here, the organization grows pineapples, plantain bananas, and other fruits and vegetables. Because of this local community presence, Aqua-Africa has well-established relationships with local Boma and Payam Chiefs, the County Commissioner, the surrounding churches, and local WASH representatives.

Prior to Mr. Acouth's visit to Nzara, Aqua-Africa's Nzara Compound Supervisor, Mr. Taban Beneai Ruba, met with South Sudan Relief and Rehabilitation Commission (RRC) County officials and local Nzara County leaders to identify areas in the county that were underserved regarding water supply. The villages of Wenepai, Nadari, and Naziragbe were identified as those with the greatest water needs. Mr. Ruba also gathered the following population data:

	Wenepai	Nadari	Naziragbe
Number of Residents	6,860	7,431	6,328

Executive Director Acouth and Mr. Ruba visited each of these villages and conducted face-to-face interviews with 10 residents from each community, preparing two survey questionnaires for each person interviewed. One survey gathered data related to household WASH practices. The other survey gathered data related to the usage of, and payment for, basic services.



Conducting Interviews in Wenepai and Nadari

The survey questionnaire gathered “baseline” data about household family composition, head of household work occupation, level of schooling attained by the head of household, as well as data about annual household income and savings. In addition to this demographic and socio-economic data, other data was gathered regarding household drinking water, sanitation facilities, health, and education. A copy of the survey questionnaire is included as an attachment to this report (Attachment A).

It is Aqua-Africa’s intention to repeat these surveys following completion of the water and sanitation development projects it has planned for Nzara County during 2024 and 2025. By completing the review a second time the organization expects to demonstrate a positive, measurable impact on the communities’ quality of life.

While in Nzara, the team also completed detailed geophysical survey mapping in each of the three underserved villages, as well as the area around St. Peter’s parish in Maziazia to assess likelihood of groundwater availability.



Geophysical Survey to Identify Groundwater Likelihood

II. Background

Nzara is a town in South Sudan, located in the country's Western Equatoria state. It has a population of around 20,000 people. The town has experienced significant challenges due to the civil war in South Sudan, including displacement of residents and disruption of basic services.

Before the conflict, Nzara was known for its agricultural activities, particularly the cultivation of crops such as cassava, maize, rice, and groundnuts (peanuts). The town also has a hospital, which serves not only the local population but also patients from surrounding areas.

Despite the challenges, efforts are being made to rebuild and improve conditions in Nzara. Organizations such as non-government organizations (NGOs) and the local government are working to provide humanitarian assistance, rebuild infrastructure, and support the local economy.

III. Family Composition

	Wenepai	Nadari	Naziragbe
Mean Average Household Size	12 people	14 people	10 people
Head of Household (of surveyed households)	100% male	90% male; 10% female	90% male; 10% female

In the villages around Nzara, family units interviewed were very large. On average, households consisted of 10 to 14 family members living together in the village. A male was the head of household in over 90 percent of the families; less than 10 percent were led by female heads of household.

Households are often comprised of immediate family and relatives who share multiple temporary shelters (Tukuls) of about 2-3 per household accommodating 5-15 individuals.¹

IV. Head of Household Education and Occupation

Generally, the village residents around Nzara are well-educated in relation to the rest of South Sudan's population. Most of those interviewed had attended primary school, with nearly 1/3 having completed some secondary school and college education, as shown in the table below.

¹ Shelter Cluster South Sudan (December 2018) NFI and Emergency Shelter Assessment

Education Level

Education Level Attained	Wenepai	Nadari	Naziragbe
None	10%	10%	10%
Primary 1-4	20%	10%	10%
Primary 5-8	20%	60%	30%
Secondary 9-12	40%	20%	40%
College/University	10%	0%	10%
Ave Years of Schooling	7.9 years	7.2 years	8.3 years

No significant variances were noted between male and female children education levels or their hours/week of school attendance.

Farming is the most reported occupation for both men and women. The following table shows reported head of household occupations for each of the surveyed communities:

Head of Household Occupation

Occupation	Wenepai	Nadari	Naziragbe
Teacher	10%		10%
Farmer	70%	90%	60%
Student	0%		0%
Trader	10%		20%
NGO Worker			10%
Coffee Co Employee	0%	10%	
Teac Co Employee	10%		

V. Household Income

Household annual income data was collected in Aqua-Africa's survey. All respondents who chose to share this data (approximately half), reported household income in South Sudan Pounds (SSP).

As of January 31, 2024, the exchange rate for the South Sudan Pound was approximately 1,100 SSP per U.S. Dollar (USD).

Average **annual** household income in USD ranged from \$106 in Naziragbe to \$254 in Wenepai. Nadari's average household income was \$231.

The months of July, August and September were reported as the months with highest household income. Most households averaged savings between \$25 and \$40 for their emergency needs.

VI. Sources of Drinking Water

The community of Nzara owns and maintains a solar-powered Village Supplier Utility System (VSUS) that was constructed by Aqua-Africa in 2018. The VSUS consists of a borehole to the aquifer, a solar array

and submersible water pump, a 30-foot elevated water storage tank with a capacity of 20,000 liters (appx. 5,000 gallons), and six water distribution points (tap stands) throughout the community.

Both Naziragbe and Wenepai each have only one functional hand pump well. These often develop long waiting lines and queues of jerricans. Nadari had two hand pump wells, but both are presently broken. Therefore, the community must travel to Nzara water points or revert to usage of surface water.

In Maziazia where St. Peter's Catholic Parish is located, there is one hand pump well. But, it is also no longer working.

The table below shows the sources of drinking water that were identified by the surveyed residents:

Main Source of Drinking Water	Wenepai	Nadari	Naziragbe
Piped water into dwelling			
Piped water to yard/plot			
Public tap/standpipe			
Borehole	60%	60%	90%
Protected dug well	10%	5%	
Unprotected dug well	30%	5%	7%
Protected spring			
Unprotected spring			
Rainwater collection			
Bottled water			
Cart with small tank/drum			
Tanker-truck			
Surface water (river, dam, lake, pond, stream, canal, irrigation, channels)		30%	3%
Other (specify)			
Totals	100%	100%	100%



Chief of Naziragbe Village, Bande Edward, shows the only handpump well in the community and demonstrates how little water it produces.

VII. Water Collection Time and Responsibilities/Burden for Collection

	Wenepai	Nadari	Naziragbe
Average Water Collection Time (Single Trip to Source)	56 minutes	40 minutes	130 minutes
Water Collection Responsibilities	Wenepai	Nadari	Naziragbe
Adult Women	42%	37%	33%
Girls (under age 15)	28%	25%	38%
Adult Men	5%	17%	5%
Boys (under age 15)	25%	21%	24%

As reported in prior studies, nearly 70% of the burden for collection of water for household use is borne by women and girls, with boys under the age of 15 carrying an added 25% of the collection burden. On average, the water collection times in Wenepai and Nadari are under 1 hour. However, in Naziragbe water collection times swell to over 2 hours and 10 minutes. The one handpump well in Naziragbe is no longer sufficiently productive, so residents must walk, bicycle or motorbike to Nzara to accomplish their water collection.

VIII. Water Treatment

The Nzara County households interviewed follow limited water treatment practices. There is some boiling that takes place (appx. 10 percent), some addition of chlorine (appx. 10 percent), and some filtering with cloth (appx. 5 percent). The most reported treatment practice was “letting water settle.” Naziragbe seemed to have the best overall water treatment practices of the surveyed communities.

IX. Household Toilet Facilities

Household toilet facilities are extremely limited in the villages around Nzara. However, open defecation is not commonly practiced. Nearly all households rely on some form of pit latrine that is often shared among multiple households.

X. Frequency of Stomach/Intestinal Illness

Between 80 and 100 percent of households had one or more family members who suffered stomach or intestinal illness in the past 12 months. The average number of family members stricken with such illness varied by community. In Wenepai the average was 3 family members/household; in Nadari 7 family members/household; and in Naziragbe 3 family members/household. Only one death was attributed to stomach/intestinal illness over the same period (in Naziragbe)..

XI. Education Investments in Male/Female Children

The community seems to understand the importance of education and are making a strong commitment to schooling. 85 percent of both boys and girls under age 15 are attending school on a regular schedule. The commitment to education of boys is somewhat larger. On average, boys attend school 32 hours per week; girls 25 hours per week. This difference is likely related to domestic chores such as water collection duties.

XII. Willingness to Pay for Various Services

As stated in the Introduction Section of this report, the village residents were surveyed on their usage of, and payment for, basic services. These basic services included: water, cell phone charging, rechargeable lighting, and refrigeration. A copy of this second survey is included as an attachment to this report (See the last page of Attachment A).

Surprisingly, many of the residents of these communities were already receiving and paying for some of these basic services, including their water. This is a significant development, and it supports the “theory of change” Aqua-Africa desires and has described in its strategic plans. Payment for water demonstrates the communities’ recognition and understanding of the significant economic and health benefits associated with clean drinking water. Payment of such services increases the likelihood of thier sustainability and availability.

The following table shows, by village, the percentage of the population receiving each service and the average cost being paid in U.S. Dollars. The second table shows, by village, the services they “desire” to receive and the average cost they are “willing” to pay for each service.

The survey team noted that when available, Rechargeable lighting is typically financed by the wealthier residents, with other residents making smaller contributions for its provision. Presently, these communities have no desire (and perhaps need) for refrigeration services.

Present Usage/Cost of Basic Services

Services	Wenepai		Nadari		Naziragbe	
	% Paying For	Ave/Mo. Cost in USD	% Paying For	Ave/Mo. Cost in USD	% Paying For	Ave/Mo. Cost in USD
Water	90%	\$.82	60%	\$.91	100%	\$.88
Cell Phone Charging	100%	\$ 1.97	100%	\$ 3.15	100%	\$ 2.91
Rechargeable Lighting	100%	\$ 23.73	0%	\$.00	20%	\$ 55.00
Refrigeration	0%	\$.00	0%	\$.00	0%	\$.00

Desired Usage/Cost of Basic Services

Services	Wenepai		Nadari		Naziragbe	
	% Paying For	Ave/Mo. Cost in USD	% Paying For	Ave/Mo. Cost in USD	% Paying For	Ave/Mo. Cost in USD
Water	100%	\$.81	100%	\$.95	100%	\$ 1.41
Cell Phone Charging	100%	\$ 2.05	100%	\$ 1.82	100%	\$ 2.27
Rechargeable Lighting	100%	\$ 14.04	50%	\$ 1.44	50%	\$ 23.36
Refrigeration	0%	\$.00	0%	\$.00	0%	\$.00

XIII. Geophysical Survey

The Great Ruaha Drilling Company's (Ruaha) team produced geophysical surveys for each of the 3 locations it reviewed in late February. These locations included: Wenepai, Naziragbe, and Maziazia. Copies of these reports are attached.

In November 2023, Ruaha completed a geophysical survey for Nadari. At that time a borehole was drilled that will serve Nadari. The well was tested and capped, awaiting arrival of tower, solar and piping components. The well can produce 3,000 to 10,000 liters of water per hour. The borehole drilling report is also attached.

Aqua-Africa has gathered GPS locations of Wenepai, Naziragbe, Maziazia, and Nadari critical infrastructure. This infrastructure includes schools, churches, hospital/clinics, markets, and existing water points.

Soon Aqua-Africa will be coordinate with these communities' leaders and with civil engineers to produce topographical maps that will include proposed drilling sites, Village Supplier Utility System (VSUS) tower locations and water distribution points.

XIV. Conclusions & Recommended Priorities

Aqua-Africa places the highest priority on community health, and reliable access to clean drinking water. Based on survey results, Nadari has had the highest occurrences of stomach and intestinal illness. This disease frequency is likely the result of the Nadari community's continued reliance on surface water sources for their drinking water, with nearly 30% gathered from rivers and streams. We recommend Nadari receive water infrastructure development first among the targeted communities.

Naziragbe is recommended as the second site for development, because of the economic opportunity that is available there. Naziragbe's water collection times are more than two hours. Reducing this transportation time will free residents to pursue education or other productive pursuits that will benefit the community.

Wenepai and Maziazia are lowest in recommended implementation priority.

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Household Water, Sanitation, and Hygiene Survey
Aqua-Africa Village Supplier Project
Nzara County, Western Equatoria State, South Sudan

Interview Identification:

Questionnaire number	
Payam Name	
Boma Name	
Village Name	
Date of Interview	
Interviewer Name	

Introductory Questions:

What is your name?	
What is your relationship to the head of the household?	
What is the respondent's sex? (<i>answer by observation</i>)	
What is the sex of the head of the household?	
What is the occupation of the head of the household?	
What is the occupation of the respondent?	

How many people usually live in the house?	
How many family members live and work elsewhere?	
What level of schooling did the head of the household receive?	
What level of schooling did the respondent receive?	

Socio-economic Questions

1. What were the main sources of your cash income of all your family members in the last 12 months?
2. How much was the household's total income for the past 12 months?
3. In what months do you have the highest income?
4. In the household, how often is money put aside for savings?

Drinking Water Questions

1. What is the main source of drinking water for members of your household?

	Piped water into dwelling	>>Q4
	Piped water to yard/plot	>>Q4
	Public tap/standpipe	>>Q2
	Borehole	>>Q2
	Protected dug well	>>Q2
	Unprotected dug well	>>Q2
	Protected spring	>>Q2
	Unprotected spring	>>Q2
	Rainwater collection	>>Q2
	Bottled water	>>Q1A
	Cart with small tank/drum	>>Q2
	Tanker-truck	>>Q2
	Surface water (river, dam, lake, pond, stream, canal, irrigation, channels)	>>Q2
	Other (specify)	>>Q2

- a. What is the main source of water used by your house-hold for other purposes, such as cooking and hand washing? **Only use for those who answer “bottled water” above.**

	Piped water into dwelling	>>Q4
	Piped water to yard/plot	>>Q4
	Public tap/standpipe	
	Borehole	
	Protected dug well	
	Unprotected dug well	
	Protected spring	
	Unprotected spring	
	Rainwater collection	
	Cart with small tank/drum	
	Tanker-truck	
	Surface water (river, dam, lake, pond, stream, canal, irrigation, channels)	
	Other (specify)	

2. How long does it take to go there, get water, and come back?

	Number of minutes:	>>Q3
	Water on premises	>>Q4
	Don't know	>>Q3

3. Who usually goes to this source to fetch the water for your household?

	Adult woman	>>Q4
	Adult man	>>Q4
	Female child (under 15 years)	>>Q4
	Male child (under 15 years)	>>Q4
	Don't know	>>Q4

4. Do you treat your water in any way to make it safer to drink?

	Yes	>>Q5
	No	>>Q6
	Don't know	>>Q6

5. What do you usually do to the water to make it safer to drink?

	Boil
	Add bleach/chlorine
	Strain it through a cloth
	Use a water filter (ceramic, sand, composite, etc.)
	Solar disinfectant

	Let it stand and settle
	Other (specify)
	Don't know

Sanitation Questions

1. What kind of toilet facility do members of your household usually use?

	Flush/pour flush to:	>>Q2
	piped sewer system	>>Q2
	septic tank	>>Q2
	pit latrine	>>Q2
	elsewhere	>>Q2
	unknown place/not sure/don't know where	>>Q2
	Ventilated improved pit latrine (VIP)	>>Q2
	Pit latrine with slab	>>Q2
	Pit latrine without slab/open pit	>>Q2
	Composting toilet	>>Q2
	Bucket	>>Q2
	Hanging toilet/hanging latrine	>>Q2
	No facilities or bush or field	>>Q4
	Other (specify)	>>Q2

2. Do you share this facility with other households?

	Yes	>>Q3
	No	>>Q4

3. How many households use this toilet facility?

	2 or less
	3 or more
	Don't know

4. Would you be interested in having access to an improved toilet facility such as a latrine for your household?

	Yes
	No
	Don't know

Health Questions

1. In the past year, have you or a family member been sick with stomach or intestinal (diarrheal) illness?

	Yes	>>Q2
	No	

2. How many family members were affected by this sickness?

3. In the past year, have you had a family member die from stomach or intestinal (diarrheal) illness?

	Yes	
	No	

Education Questions

1. Do you have male children (under age 15) living in your house?

	Yes	>>Q2
	No	>>Q3

2. How many hours per week does each boy attend school?

3. Do you have female children (under age 15) living in your house?

	Yes	>>Q4
	No	

4. How many hours per week does each girl attend school?

Ability and Motivation to Pay for Services Survey

Nzara County, W.E.S., South Sudan

February 2024

1. Which of the following services do you presently pay for:

- a. Water
- b. Cell Phone Charge
- c. Rechargeable lighting
- d. Refrigeration

2. How much do you pay each month for each service?

- a. Water
- b. Cell Phone Charge
- c. Rechargeable lighting
- d. Refrigeration

3. Which of the these services do you desire to have?

- a. Clean water
- b. Cell Phone Charge
- c. Rechargeable lighting
- d. Refrigeration

4. How much would you be willing to pay each month for?

- a. Clean water
- b. Cell Phone Charge
- c. Rechargeable lighting
- d. Refrigeration

Choose 96 adults over age 18 totally at random from different sections of the community.

Also choose 30 people who offer these services in the market place

Adult Name _____ or

Marketer Name _____