UNHCR The UN Refugee Agency

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SAMUEL HALL.

Methodological Note

Evaluating the absorption capacity of infrastructure and service

Piloted in South Sudan, 2024

Introduction

This document aims to support UNHCR and partners by outlining a scoring methodology for assessing absorption capacity for South Sudan's returnee population the subnational level. This methodology is designed to address two main research questions:

1. What are the infrastructure quality and services gaps in meeting the immediate local population's needs (including the displaced already living there); and,
2. To what extent could existing infrastructure support additional service demand from returnee and other displaced populations in the future?

We divide this document into two sections: assessing 1) Quality (e.g. service delivery today); and 2) Absorption (service delivery tomorrow). Each section outlines methods by which we adapt humanitarian and national standards to sets of quality and absorption indicators. We then describe a methodology by which we use these indicators to produce meaningful and policy-relevant assessments of subnational (payam) regions and aggregate Pocket of Hope areas in South Sudan.

Quality assessment

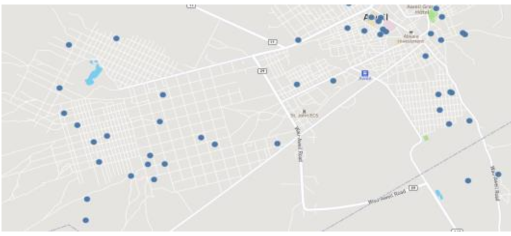
We acknowledge a close relationship with a facilities quality and capacity to contribute to absorbing inflows of population. This section first presents an index methodology to aggregate facility features into a meaningful overall quality indicator. We synthesize this methodology with absorption capacity and the extent that infrastructure could support additional service demand from returnee and other displaced populations in the next section.

To highlight the current quality of service delivery in South Sudan, we give each facility a score based on several indicators. **These indicators are presented in full in the Codebook here: Scoring Infrastructure / Services Absorption Capacity Indicator Codebook.** In general, scores closer to zero represent non-functioning measures of facility quality and scores closer to 100 represent ideally functioning facility quality. We also generate a facility average score, which averages the scores from all the top-level quality indicators.[1] We cover quality scoring for each of the following infrastructure types (with links to the codebook):

Infrastructure Type	Indicator #[2]
Educational Institutions	Q2.0
Health Facilities	Q3.0
Law Enforcement and Judicial Infrastructure	Q4.0
Markets	Q5.0
Water Points	Q7.0

Below, we present an example of the quality scoring methodology for waterpoint facilities mapped in Aweil Town payam.

Each waterpoint is given a score based on the quality assessment indicators presented in the codebook.



[1] The facility average score does not include sub-indicator quality measures, which are already aggregated in top-level indicators.

[2] We reserve some indicator numbers for additional infrastructure types, which are not yet presented in this version of the codebook. For example, "Protection Spaces", "Law Enforcement and Judicial Infrastructure", "Public Buildings."

Waterpoint Facility ID: abc60555-33b0-403e-9610-3cfd59bf076e Latitude:9.154095, Longitude: 27.5745044	
Waterpoint Facility Quality Indicator	**Facility Score**
Q7.1 - Consistency	0
Q7.2 - Water Quality	100
Q7.3 - Facility Safety	100
Q7.4 - Conflict Incidents	100
Q7.5 - Wait Time for Water Access	50
Q7.6 - Water Point Sufficiency	0
Facility Average Quality Score	58

Our location-based facility scoring means that we can present quality scores at varying geographic aggregates. See for example the payam-level aggregates for Education facilities in Yei/Morobo below. We also present aggregate quality values for an overall quality indicator (averaged across all indicators), and present an aggregate of the Pocket of Hope, as a whole at the bottom of the table.

	Yei / Morobo			
Education Facility Quality Indicator	Gulumbi	Mugwo	Panyume	Yei
Q2.1: Facility Water	50	80	0	100
Q2.2: Facility Toilets	57	40	33	57
Q2.3: Facility Building Condition	100	90	100	98
Q2.4: Facility Safety	86	80	100	89
Q2.5: Assessment Methods	100	100	100	100
Q2.6: Chalkboard/Blackboard Availability	57	80	33	93
Q2.7: Cleanliness	96	70	100	100
Q2.8: Electricity Access	0	0	0	54
Q2.9: First-Aid Kits	0	0	0	64
Q2.10: First-Aid Staff	0	0	0	61
Q2.11: Hand Washing Facilities	29	20	33	75
Q2.12: Hygiene Initiatives	14	40	0	89
Q2.13: Learning Support Services	86	80	100	96
Q2.14: Library Availability	0	0	0	57
Q2.15: Power Outage Frequency	.[3]	.	.	67
Q2.16: Recreational Facilities	29	40	0	36
Q2.17: School Fees	43	20	67	7
Q2.18: Special Needs Classes	14	20	0	68
Q2.19: Stationery Availability	50	30	33	36
Q2.20: Student Attendance	54	20	50	71
Q2.21: Student Commute Time	54	40	50	63
Q2.22: Student Feeding Programs	4	0	0	46
Q2.23: Student Seating Adequacy	0	0	0	29
Q2.24: Textbook Availability	43	30	50	57
Q2.25: Textbook Provision	0	80	0	86
Payam Quality Average	40	40	35	68
Country / Area Quality Average	46			

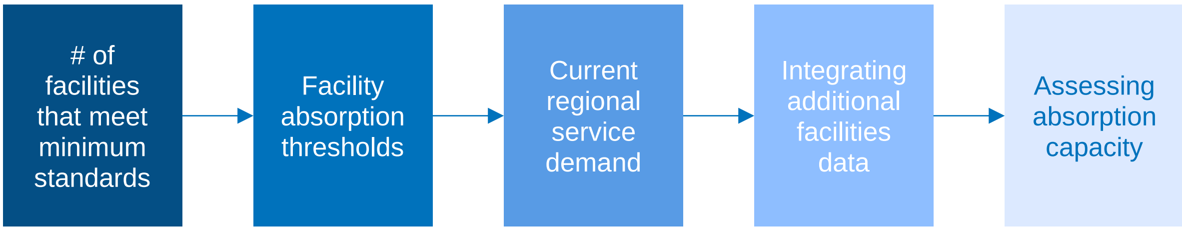
Absorption capacity assessment

Not all infrastructure types have clear relationships with the population in the region. In this exercise, we focus on estimating absorption capacity for the infrastructure types with more clear relationships to the service needs of the local population. These are Water Points, Health Facilities, and Educational Institutions.

[3] Some indicator measurements were not able to be determined by survey teams. Missing values are excluded from average calculations.

Estimating the absorption capacity from our facility mapping has several steps:

1. Establishing minimum quality for facilities to be considered functioning (i.e. contributing to absorption)
2. Estimating facility absorption thresholds
3. Estimating current regional service demand
4. Merging additional facility mapping from unmapped regions
5. Evaluating absorption capacity against local service demand to assess regional absorption capacity



Minimum Standards Criteria for Absorption

To determine whether facilities can sufficiently contribute to the absorption capacity of a region, we first evaluate each facility along a basic in/out criteria of minimum standards. In other words, does the facility perform its basic function to a minimum standard? It is assumed that, if a facility cannot provide services to a minimum disaster response standard, it should not be considered fit to absorb more displaced persons. A large influence in our thinking was basic humanitarian standards as a minimum benchmark. We also make consideration for facility conditions, sanitation, and physical safety. Literature notes also guide the evaluation of responses to each criterion. The indicators and their individual scoring methodologies are presented in full in the associated codebook for this methodology here: Scoring Infrastructure / Services Absorption Capacity Indicator Codebook. The indicators that are considered for identifying minimum standards are presented in the table below:

Facility Type	Indicator	Disqualifying Criteria
Water Points (MP1.0)	MP1.1 - Consistency	*Water is rarely available, with frequent shortages or extended periods without water*
	MP1.2 - Water quality	*The water quality is below acceptable standards and poses potential health risks*
	MP1.3 - Facility safety	*There are security concerns or incidents related to walking to / queuing, especially for women, at this water point*
Healthcare Facilities (MP2.0)	MP2.1 - Facility safety	*Often (Regular incidents, indicating a concerning pattern) incidents of violence affecting the health facility in the recent past?*
	MP2.2 - Facility building condition	*The building infrastructure is in very poor condition, with severe damage, decay, or disrepair. There are multiple safety hazards, structural weaknesses, or critical maintenance issues that render the facility unsafe or unusable.*
	MP2.3 - Facility toilets	*There are no toilets in this health facility*
	MP2.4 - Facility water	*There is no access to water in this health facility*
	MP2.5 - Reserve stock of medical supplies	*Very Low Stock (expected to last less than a week)*
	MP2.6 - Doctor/Patient Ratio	*More than 50 patients per physician per day*

Education Facilities (MP3.0)	MP3.1 - Facility safety	*Often (Regular incidents, indicating a concerning pattern) violent incidents outside of this school?*
	MP3.2 - Facility building condition	*The building infrastructure is in very poor condition, with severe damage, decay, or disrepair. There are multiple safety hazards, structural weaknesses, or critical maintenance issues that render the facility unsafe or unusable.*
	MP3.3 - Facility toilets	*There are no toilets in this school*

**Note that the codebook outlines a 0,1,2 scoring for these criteria to enable deeper analysis for service quality.*

If a facility does not meet the minimum standards criteria for any of these indicators it is excluded from the facilities considered in the absorption calculations.

Example Minimum Standards Scoring Matrix

The table below presents a facility by facility example of three water points in Imorok Payam located in Torit County. The example presented here shows that, out of the three waterpoints, one of the waterpoints (Waterpoints C) fails to meet the minimum standards standards as it fails one of the minimum standards indicators. As a result, Waterpoint C is not considered to contribute to the region's absorption capacity in future calculations.

Waterpoint A	Waterpoint B	Waterpoint C
Lat: 4.3410374 Long: 32.4388333 	Lat: 4.2769645 Long: 32.3856 	Lat: 4.3098362 Long: 32.4259615 

Location	Location Scoring		Scoring Assessment
Waterpoint A	MP1.1 - Consistency	*Always - Water is consistently available throughout the day without interruptions.*	The scoring suggests that this is a well-functioning water point which can contribute to an assessment of total absorption capacity.
	MP1.2 - Water quality	*Good - The water generally meets safety standards but may have occasional minor issues.*	
	MP1.3 - Facility safety	*No security concerns or incidents related to walking to / queuing, especially for women, at this water point*	

Waterpoint B	MP1.1 - Consistency	*Sometimes - Water availability is inconsistent, with frequent shortages or interruptions.*	The scoring suggests that this is a functioning water point, which while quality is strained, can be considered in total absorption capacity.
	MP1.2 - Water quality	*Fair - The water quality is acceptable but may require some improvement or treatment.*	
	MP1.3 - Facility safety	*No security concerns or incidents related to walking to / queuing, especially for women, at this water point*	
Waterpoint C	MP1.1 - Consistency	*Rarely - Water is rarely available, with frequent shortages or extended periods without water*	The scoring suggests that this is not a well-functioning water point, which while has strained, and **cannot be considered** in total absorption capacity.
	MP1.2 - Water quality	*Poor - The water quality is below acceptable standards and poses potential health risks.*	
	MP1.3 - Facility safety	*No security concerns or incidents related to walking to / queuing, especially for women at this water point*	

Working Assumption: We note that quality is an important component of service capacity. The first stage of the absorption capacity calculations (covered below) performs a separate assessment of minimum standards quality. Beyond that, the absorption capacity indicator is meant to be considered alongside the quality scores developed above.

Facility Absorption Capacity Thresholds

For each infrastructure theme, three absorption capacity thresholds are defined based on the local population demand that the facility can support under different conditions. These thresholds are:

1. **Ideal absorption capacity**: The level of demand the facility can comfortably handle under normal conditions without stress.
2. **Strained absorption capacity**: The level of demand the facility can manage, but with noticeable strain on resources and performance.
3. **Maximum absorption capacity**: The highest level of demand the facility can support before reaching its absolute limit, beyond which it may no longer function effectively.

Quantitatively, these thresholds are informed by recommended humanitarian standards and national standards. These thresholds help in understanding the facility's capability to accommodate varying levels of population demand.

Working Assumption: Using humanitarian and national standards, we note that we make assumptions about effective and fair *distribution* of facility services in the threshold estimations. These figures are meant to be guiding estimates and are best triangulated with household survey data.

Water Points

The table below presents the absorption capacity thresholds for water point facilities. We make reference specifically to the water supply and consumption estimates adapted from Water supply standard 2.1: Access and water quantity - *SPHERE Handbook 2018* 2018, page 107.

The table is meant to provide estimates for how many people each waterpoint type (handpumps or motorised pumps) can support. For example, a motorised pump is estimated to support 500 people per day, based on the provision of total water needs - 15L per person per day (pp/day). That same motorised pump is estimated to provide water needs for 3,000 people, based on 2.5L survival quantities pp/day.

Absorption Capacity Thresholds	Total water needs (15L pp/day)	Survival needs and basic hygiene (4.5L pp/day)	Survival needs (2.5L pp/day)
Handpumps	250	832	1,500
Motorized Pump	500	1,665	3,000

Healthcare Facilities

For determining the absorption capacity for healthcare facilities, we make reference to the following resources:

- Ideal capacities adapted from Health systems standard 1.1: Health service delivery - SPHERE Handbook 2018 2018, pg 299.
- Maximum absorption capacity and strained absorption capacity determined from consultations with UNHCR

Absorption Capacity Thresholds	Ideal absorption capacity	Strained absorption capacity	Maximum absorption capacity
Primary health care unit	10,000	25,000	50,000
County/District Hospital	100,000	250,000	300,000

Note: Additional indicators considered include the following:

- *Number of inpatient beds - Ideal service capacity: 18 beds per 10,000 people.*
- *Number of skilled birth attendant personnel (doctors, nurses, midwives) - Ideal service capacity 23 per 10,000 people.*

These indicators are deprioritized for this pilot in favour of the more general facility-based figure (as opposed to beds-based), but pilot testing revealed that they would not greatly influence the scoring results for the sample of this study.

Education Facilities

For determining the absorption capacity for education facilities, our consultations with UNHCR generated the following thresholds:

Service Capacity Thresholds	Ideal service capacity	Strained service capacity	Maximum service capacity
Teacher/student ratio at each school	50 students per teacher	94 students per teacher	138 students per teacher

Regional Facility Mapping

To estimate regional service capacity, all facilities within a region must be included. Unmapped facilities may result in underreporting. To address potential gaps, we triangulate the current mapping with previous regional data.

This process involves harmonizing administrative boundaries[4], mapping facilities with GPS coordinates, and applying a 250-meter proximity test to avoid double counting. We then aggregate data from Samuel Hall and other sources and use a regional multiplier to estimate capacity, factoring in missing facilities.

Working Assumption: We note that we are making an assumption, that Samuel Hall and other mapping exercises combined do, in fact, cover ALL extant facilities.

The table below presents an example of the coverage of Samuel Hall's mapping in Magwi and Torit, the combined facilities dataset, and the proportion of Samuel Hall's mapping against the total facilities dataset (which serves as the threshold multiplier).

Facility Type	Region	Facilities Mapped by Samuel Hall	Regional Service Capacity Multiplier
Waterpoints	Hiyala	18	1.78
	Imurok	17	1.29
	Magwi	46	2.65
	Pageri	26	2.42
	Torit	67	1.21
Healthcare	Hiyala	6	1.17
	Imurok	2	1.00
	Magwi	4	2.75
	Pageri	2	1.50
	Torit	3	1.33
Schools	Hiyala	9	1.00
	Imurok	7	1.00
	Magwi	27	1.41
	Pageri	4	1.25
	Torit	31	1.13

Regional Service Capacities

We calculate regional service capacity by aggregating the capacity thresholds of each facility mapped by Samuel Hall that meets the minimum performance criteria. As noted earlier, this method would undercount unmapped facilities. To adjust for this, we apply the regional service capacity multiplier outlined in the previous section. The table below provides a simplified example of how three water points in the same region are aggregated to determine the adjusted service capacity thresholds.

[4] We use OCHA's South Sudan - Subnational Administrative Boundaries dataset to harmonize the facilities to the South Sudan administrative level 3 boundaries.

<table>
<tr><th>Region</th><th>Waterpoint / Type</th><th>Meets minimum standards criteria</th><th colspan="2">Service Capacity Thresholds</th><th colspan="2">Aggregated Service Capacity Thresholds</th><th>Regional Service Capacity Multiplier</th><th colspan="2">Adjusted Regional Service Capacity Thresholds</th></tr>
<tr><td rowspan="9">Torit</td><td rowspan="3">Waterpoint A

Handpump</td><td rowspan="3">Yes</td><td>Ideal service capacity</td><td>0-250</td><td></td><td></td><td rowspan="9">1.21</td><td></td><td></td></tr>
<tr><td>Strained service capacity</td><td>251-832</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Maximum service capacity</td><td>833-1500</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="3">Waterpoint B

Handpump</td><td rowspan="3">No</td><td>Ideal service capacity</td><td>-</td><td>Ideal service capacity</td><td>0-750</td><td>Ideal service capacity</td><td>0-907</td></tr>
<tr><td>Strained service capacity</td><td>-</td><td>Strained service capacity</td><td>751-2497</td><td>Strained service capacity</td><td>908-3021</td></tr>
<tr><td>Maximum service capacity</td><td>-</td><td>Maximum service capacity</td><td>2497-4500</td><td>Maximum service capacity</td><td>3022-5445</td></tr>
<tr><td rowspan="3">Waterpoint C

Motorized Pump</td><td rowspan="3">Yes</td><td>Ideal service capacity</td><td>0-500</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Strained service capacity</td><td>501-1665</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Maximum service capacity</td><td>1666-3000</td><td></td><td></td><td></td><td></td></tr>
</table>

The regional service capacities for each facility type in Magwi andTorit are presented as an example below:

Facility Type	Payam	Adjusted Service Capacity Thresholds			
		Total Facilities	Ideal service capacity threshold	Strained service capacity threshold	Maximum service capacity threshold
Waterpoints	Hiyala	32	0-6,222	6,223-20,720	20,721-37,333
	Imurok	22	0-3,235	3,236-10,774	10,775-19,412
	Magwi	122	0-28,511	28,512-94,941	94,942-171,065
	Pageri	63	0-12,721	12,722-42,361	42,362-76,327
	Torit	81	0-24,481	24,482-81,523	81,524-146,888
Healthcare	Hiyala	7	0-23,333	23,334-101,409	101,410-179,487
	Imurok	2	0-20,000	20,001-86,922	86,923-153,846
	Magwi	11	0-82,500	82,501-358,553	358,554-634,615
	Pageri	3	0-15,000	15,001-65,192	65,193-115,385
	Torit	4	0-80,000	80,001-162,581	162,582-254,777
Schools	Hiyala	9	0-1,493	1,494-2,875	2,876-4,256
	Imurok	7	0-680	681-1,309	1,310-1,938
	Magwi	38	0-11,880	11,881-22,869	22,870-33,858
	Pageri	5	0-1,440	1,441-2,772	2,773-4,104
	Torit	35	0-2,080	2,081-4,004	4,005-5,928

Current Regional Service Demand

Previous discussion has focused on estimating the absorption capacity for the facilities within a region. The next step to evaluating absorption capacity is to estimate this absorption capacity against the current regional service demand. To do this, we use regional population data as a proxy for local service demand.

Working Assumption: This embeds an assumption of regionally homogeneous service demand.

While the facilities mapping data provides a relatively recent dataset, we acknowledge that few up-to-date population figures are available at the subregional level (administrative level 3). Consideration has been given to using the most up-to-date data and accurate estimates from various population sources. For general population data we use the WorldPop and Meta/Facebook High Resolution Population Density Map. We use this population data in our considerations of current regional service demand for Waterpoints and Healthcare Facilities. For education facilities we generate an estimation of the population demographic that comprises children, adolescents and youth aged 3-17 years old. We generate a school age proportion (of total population) from the most recent census, the Sudan Population and Housing Census, 2008. The population estimates for each region are presented below.

Area	County	Payam	Population Estimate	School age Proportion
Aweil	Aweil Centre*	Aweil Town	65,103	0.359
		Nyalath	41,263	0.359
	Aweil East	Baach	54,086	0.368
	Aweil North	Malual North	26,543	0.383
	Aweil West	Gomjuer East	14,972	0.384
Magwi and Torit	Magwi	Magwi	116,602	0.431
		Pageri	44,453	0.431
	Torit	Hiyala	31,916	0.406
		Imurok	20,820	0.406
		Torit	119,759	0.406
Raja	Raja	Raga	23,428	0.365
Yei and Morobo	Morobo	Gulumbi	37,452	0.416
		Panyume	17,792	0.416
	Yei	Mugwo	11,874	0.395
		Yei	206,222	0.395

** Incl surrounding area*

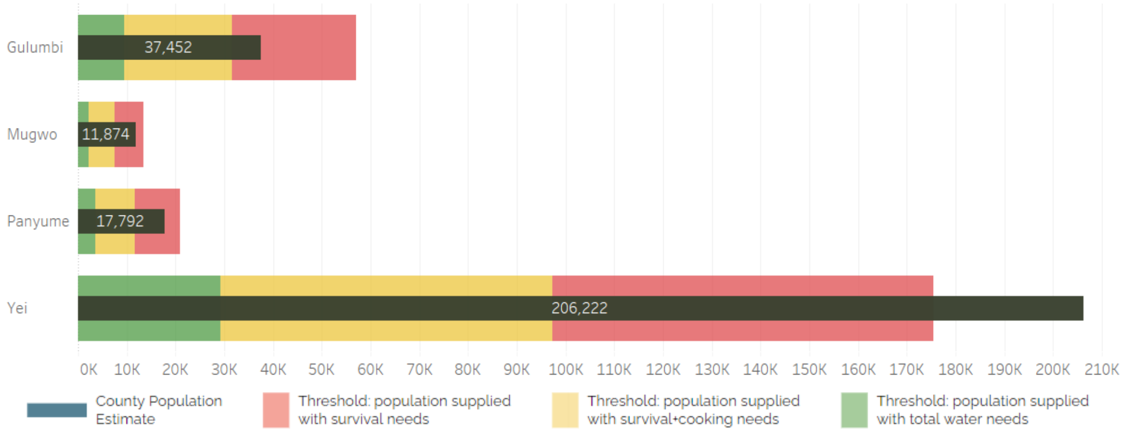
Absorption Capacity Assessment

To assess absorption capacity, we compare the elements of regional service capacity thresholds, and regional service demand, which were developed in the previous sections. We use the data from Morobo and Yei to demonstrate this evaluation. The table summarises these figures and presents an assessment in the last column of which service capacity threshold the current service demand falls into.

Facility Type	Region	Service Demand (relevant population)	Ideal absorption capacity threshold	Strained absorption capacity threshold	Limited absorption capacity threshold	Current Absorption Assessment
Waterpoints	Gulumbi	37,452	0-9,500	9,501-31,635	31,636-57,000	Limited absorption capacity
	Panyume	17,792	0-3,500	3,501-11,655	11,656-21,000	Limited absorption capacity
	Mugwo	11,874	0-2,250	2,251-7,493	7,494-13,500	Limited absorption capacity
	Yei	206,222	0-29,250	29,251-97,403	97,404-175,500	Beyond limited absorption capacity
Healthcare	Gulumbi	37,452	0-30,000	30,001-43,902	43,903 - 81,818	Strained absorption capacity
	Panyume	17,792	-	-	-	No facilities with absorption capacity
	Mugwo	11,874	-	-	-	No facilities with absorption capacity
	Yei	206,222	0-256,667	256,668-375,610	375,611-700,000	Ideal absorption capacity
Education	Gulumbi	15,580	0-4,600	4,601-8,648	8,649-12,696	Beyond limited absorption capacity
	Panyume	7,401	0-750	751-1,410	1,411-2,070	Beyond limited absorption capacity
	Mugwo	4,690	0-1,700	1,701-3,196	3,197-4,692	Limited absorption capacity
	Yei	81,458	0-20,050	20,051-37,694	37,695-55,338	Beyond limited absorption capacity

This table can be more helpfully visualised to highlight the population difference between the thresholds, using the example of waterpoints:

Example Waterpoints Regional Absorption Thresholds and Population for Morobo and Yei



The charts above illustrate that with respect to water availability, while most of the payams are operating at a limited absorption capacity threshold, Yei payam is beyond the capacity to minimally absorb more population to the region. Considering this, Gulumbi is *marginally* better placed to absorb more people.

Limitations and considerations

The absorption capacity methodology outlined above makes several simplifying assumptions to meet the requirements of regional intervention programming, technical requirements for replicability, and descriptive/prescriptive objectives. This section highlights the key methodological considerations and possible limitations when applying the absorption capacity methodology.

The link between quality and service capacity

The methodology acknowledges the relationship between the quality of public infrastructure and service capacity. For instance, a high-quality health facility is likely part of a well-distributed health system. To integrate this quality-service relationship, we perform an initial evaluation of minimum quality standards for each facility before assessing the aggregate contribution of facilities to local absorption capacity. While this minimum quality standards approach is believed to sufficiently capture the quality-service relationship for an absorption capacity assessment, we recognize that "quality" may still be a critical factor for policymakers. Therefore, we propose dividing the assessment into two components: a "Quality Assessment" and an "Absorption Capacity Assessment." Both can be presented together for a more nuanced analysis or used independently for a snapshot of absorption capacity.

Homogeneous facility reach and service demand

The methodology assumes that facilities within a region are spatially distributed and provide a homogeneous level of service. In reality, some facilities may perform better or worse than others, be more or less optimally located, or provide services of varying quality. To address this, we balance these complexities probabilistically, assuming that each facility, in aggregate, performs with an average capacity relative to the local population.

Additionally, the distribution of facilities does not always match the population distribution within a region. For larger or sparsely populated areas (e.g., Nyalath), the outputs of the methodology may require cautious interpretation due to a mismatch between facility distribution and local access.

Similarly, the methodology simplifies service demand by assuming equal need among all members of the population. For example, it assumes each school-age individual requires 1/40th of a teacher's time (with a threshold of 1 teacher per 40 children). However, in practice, some children may require more support than others. The methodology also assumes that the composition of populations (e.g., displaced vs. local) does not significantly affect local service delivery. This assumption may overlook the strain that large influxes of displaced populations can place on local resources.

Marginal effect of additional facilities and population

For each payam, the methodology uses a simplified count of facility types, multiplied by average capacity thresholds, to determine regional absorption capacity. We also assume that each additional facility contributes linearly to capacity, which may not always be the case. Additional facilities could either enhance capacity (e.g., in the case of schools) or strain centralized resources (e.g., medical supplies). Similarly, the methodology assumes a linear marginal effect for service demand as population increases. Each new individual in a region is assumed to place a similar demand on resources as the one before them. However, this simplification may not accurately capture extreme scenarios, such as infrastructure collapse or nonlinear service demands resulting from large population influxes.

The limitations and considerations outlined above highlight the techniques used by the methodology to manage the complexities of real-world data and hypothetical scenarios. The results generated by this methodology should be interpreted within the localized context.

Replicating the methodology

The methodology described above is adaptable and can be applied to additional humanitarian contexts, both inside and outside the South Sudan case study. The minimum requirement for successful implementation is the individual facility-based data needed for the assessments. This section discusses optimizations and alternative approaches to data collection to ensure the methodology can be replicated effectively.

Firstly, a key innovation in this methodology is the integration of service quality and facility counts, combined with a first-pass minimum quality standard assessment. While facility quality data might not always be available in other contexts, facility mapping data collection is a common practice in humanitarian settings. In cases where quality data is limited, a representative sample of quality metrics could be sufficient to estimate the aggregate capacity of facilities in a region. This approach allows the methodology to be flexible, as existing mapping data can be leveraged effectively, even without comprehensive quality assessments for all facilities.

Additionally, the methodology requires data to be collected across five types of facilities and more than 116 measures. However, this method can be modularly applied depending on the specific needs and resources available in different contexts. The following table presents the approximate number of metrics required for each part of the methodology, by facility type.

Number of indicators required for Assessments					
	Education facility	Health facility	Law enforcement and judicial	Markets	Water points
Absorption Capacity Assessment	3	7	-	-	3
Quality Assessment	22	48	17	9	3
Total	25	55	17	9	6

This table demonstrates that the absorption capacity assessment requires only a subset of metrics for its calculation. These metrics focus on establishing the minimum performance standards for the region's facilities. When combined with regional facility mapping and population statistics, the absorption capacity of the region can be assessed.

Service demand and population sources

A critical component of the absorption capacity methodology is the use of population data, which directly informs the estimation of service demand. The methodology calculates the absorption capacity of local facilities, while the complementary component of service demand relies primarily on external population statistics. Selecting the correct population data is crucial, as discrepancies can significantly affect the final assessment.

For example, in the South Sudan case study, challenges arose from outdated and inconsistent population data. The most recent payam-level census data for South Sudan dates back to 2008, and this outdated information often did not align with the actual boundaries on the ground. Furthermore, at the county level, population estimates varied significantly. For instance, Raja County had the following different population estimates: 108,344 from the 2021 National Bureau of Statistics (NBS) Population and Housing Census, 59,638 from the 2022 UN OCHA population estimate, and 42,956 from the 2023 Facebook/Meta population estimate. These variations present a challenge when deciding which data to use, as it can drastically impact the absorption capacity results for the region. Given these discrepancies, local sense-checking and expert consultations are recommended to validate the data and ensure more accurate results in new contexts.

Annexes

Annex 1: List of Quality Indicators

Minimum Performance indicators are marked with an asterisk.

Education facility	*Q2.1 - Facility Toilets	Q2.13 - Learning Support Services
	*Q2.2 - Facility Building Condition	Q2.14 - Library Availability
	*Q2.3 - Facility Safety	Q2.15 - Power Outage Frequency
	Q2.4 - Facility Water	Q2.16 - Recreational Facilities
	Q2.5 - Assessment Methods	Q2.17 - School Fees
	Q2.6 - Chalkboard/Blackboard Availability	Q2.18 - Special Needs Classes
	Q2.7 - Cleanliness	Q2.19 - Stationery Availability
	Q2.8 - Electricity Access	Q2.20 - Student Attendance
	Q2.9 - First-Aid Kits	Q2.21 - Student Commute Time
	Q2.10 - First-Aid Staff	Q2.22 - Student Feeding Programs
	Q2.11 - Hand Washing Facilities	Q2.23 - Student Seating Adequacy
	Q2.12 - Hygiene Initiatives	Q2.24 - Textbook Availability
	Q2.25 - Textbook Provision	
Health facility	*Q3.1 - Facility Safety	Q3.11 - Availability of essential medicines and health supplies
	*Q3.2 - Facility Building Condition	Q3.11.1 - Analgesic
	*Q3.3 - Facility Toilets	Q3.11.2 - Anesthetics
	*Q3.4 - Facility Water	Q3.11.3 - Antibiotics
	*Q3.5 - Reserve Stock of Medical Supplies	Q3.11.4 - Antimalarials
	*Q3.6 - Doctor/Patient Ratio	Q3.11.5 - Antiretrovirals
	Q3.7 - Cleanliness	Q3.11.6 - Antituberculosis Drugs
	Q3.8 - Electricity Access	Q3.11.7 - Antivenom
	Q3.9 - Power Outage Frequency	
	Q3.10 - Female Medical Personnel	
	Q3.12 Availability of diagnostic tests and supplies	Q3.13 Availability of medical equipment
	Q3.12.1 - Autoclave	Q3.13.1 - Stethoscope
	Q3.12.2 - Blood Collection Supplies	Q3.13.2 - Surgical Instruments
	Q3.12.3 - Blood Pressure Monitors	Q3.13.3 - Sutures & Dressings
	Q3.12.4 - Contraceptive	Q3.13.4 - Thermometer
	Q3.12.5 - Delivery Beds	Q3.13.5 - Tuberculosis Test Kits
	Q3.12.6 - Examination Tables	Q3.13.6 - Ultrasound Machines
	Q3.12.7 - Glucometer	Q3.13.7 - Vaccine

	Q3.12.8 - HIV Test Kits	Q3.13.8 - Vaccine Refrigeration
	Q3.12.9 - Insecticide-Treated Nets (ITNs)	Q3.13.9 - Vitamin A Supplements
	Q3.12.10 - IV Fluids	Q3.13.0 - Wheelchair & Walking Aids
	Q3.12.11 - Malaria Rapid Diagnostic Tests (RDTs)	Q3.13.11 - Zinc Supplements
	Q3.12.12 - Microscopes	Q3.15 - Operating Hours
	Q3.12.13 - Oral Rehydration Salts	Q3.15.1 - Days of the week
	Q3.12.14 - Oxygen Concentrators	Q3.15.2 - Opening Hours
	Q3.12.15 - Pregnancy Test Kits	Q3.16 - Room Overcrowding
	Q3.14 Services Available	
	Q3.14.1 - Maternal Health	
	Q3.14.2 - Vaccinations	
	Q3.14.3 - Emergency Services	
	Q3.14.4 - Outpatient Services	
	Q3.14.5 - Inpatient Services	
	Q3.14.6 - Surgical Services	
	Q3.14.7 - Dental Services	
	Q3.14.8 - Mental Health Services	
Law enforcement and judicial	Q4.1 - Building Condition	Q4.10 - Privacy for Consultations
	Q4.2 - Cleanliness	Q4.11 - Service Wait Times
	Q4.3 - Community Accessibility	Q4.12 - Staff Qualifications & Training
	Q4.4 - Discrimination Observation	Q4.13 - Staff Workspace Adequacy
	Q4.5 - Electricity Access	Q4.14 - Toilet Availability
	Q4.6 - Facility Sufficiency	Q4.15 - Waiting Area Comfort
	Q4.7 - Incident Reports	Q4.16 - Water Access
	Q4.8 - Information Desk Availability	Q4.17 - Wheelchair Accessibility
	Q4.9 - Power Outage Frequency	Q5.6 - Access Road Condition
Markets	Q5.1 - Drainage System	Q5.7 - Sanitation Facilities
	Q5.2 - Food Spoilage Signs	Q5.8 - Safety
	Q5.3 - Cleanliness	Q5.9 - Running Water Availability
	Q5.4 - Packaged Food Integrity	
	Q5.5 - Power Outage Frequency	
Water points	*Q7.1 - Consistency	Q7.4 - Conflict Incidents
	*Q7.2 - Water Quality	Q7.5 - Wait Time for Water Access
	*Q7.3 - Facility Safety	Q7.6 - Water Point Sufficiency

Annex 2: Indicator Codebook

[Scoring Infrastructure / Services Absorption Capacity Indicator Codebook]

REINTEGRATION AND ABSORPTION CAPACITY ASSESSMENT

Methodological Note

South Sudan

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