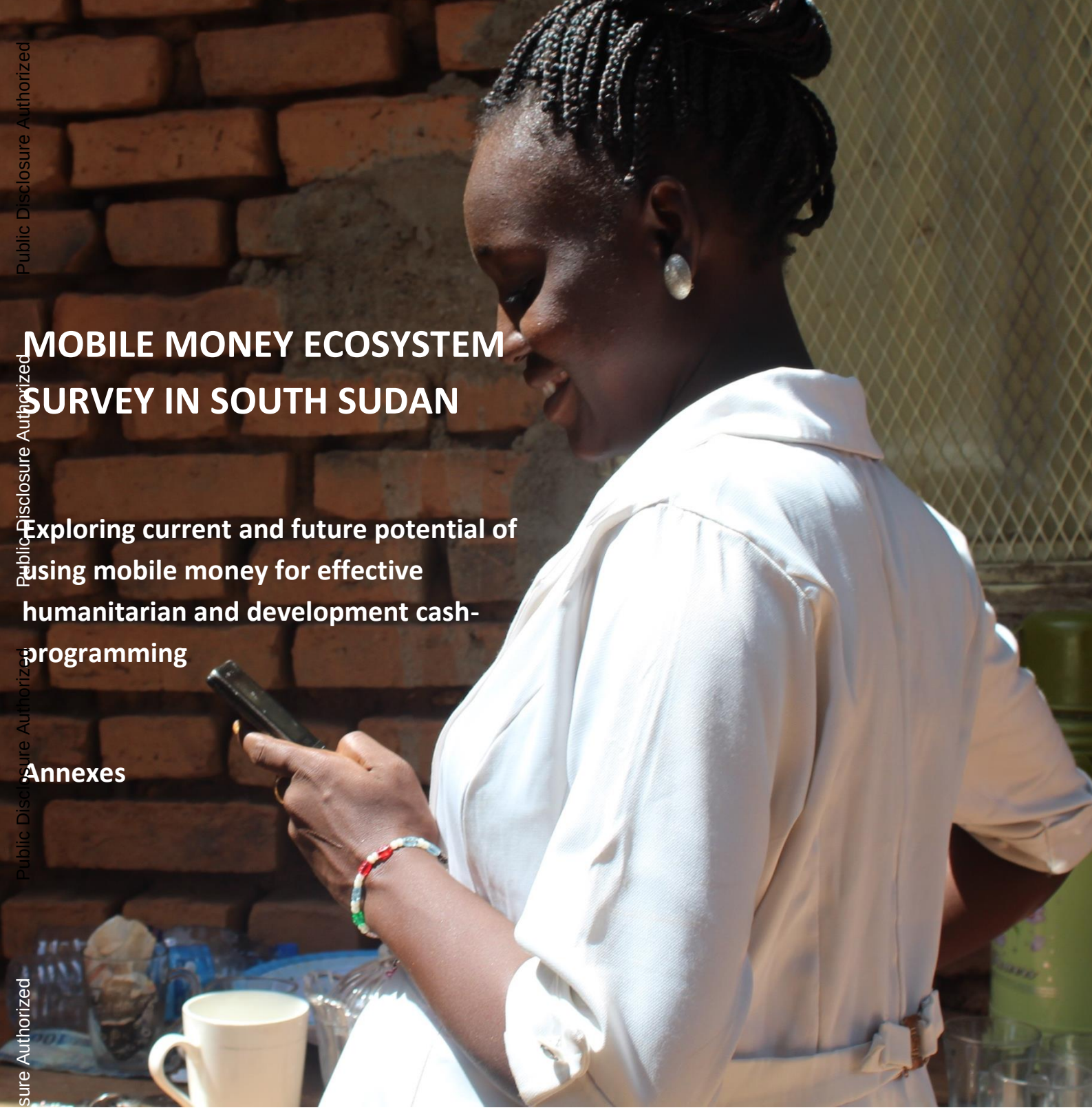

MOBILE MONEY ECOSYSTEM SURVEY IN SOUTH SUDAN

Exploring current and future potential of using mobile money for effective humanitarian and development cash-programming

Annexes

Prepared by Altai Consulting for the World Bank | South Sudan – May 2019

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CONTENT

TABLES

FIGURES

FOCUS BOXES

ABBREVIATIONS

CSRF	Camp Coordination and Camp Management
EA	Enumeration Area
FGD	Focus Group Discussions
GDI	Gender Development Index
GRSS	Government of the Republic of South Sudan
ID	Identification Document
IDI	In-Depth Interview
IDP	Internally Displaced Persons
KII	Key Informant Interview
MNO	Mobile Network Operator
NBS	National Bureau of Statistics
POC	Protection of Civilians
PPS	Probability Proportional to Size
SNSDP	Safety Net and Skills Development Project
WB	World Bank

1. RESEARCH METHODOLOGY

1.1. RESEARCH QUESTIONS

The research undertaken has been focused around the following research questions:

Table 1: Research questions

Research Questions
1. What does the mobile money landscape in South Sudan look like?
▪ Are there formally recognized mobile money services on offer in the South Sudanese market? And, if so, how do they function? Are services interoperable?
▪ Are there informal proxy services for mobile money in South Sudan? And, if so, how do they work and how commonly are they used?
▪ Who are the key actors within South Sudan's mobile money ecosystem? What is their market coverage, size, shareholder structure, and business model?
▪ What is the relationship between telecommunications and financial sector actors (i.e. formal actors such as banks, as well as informal actors such as informal value transfer systems) in South Sudan?
▪ How are distribution networks structured in both urban and rural areas of South Sudan, and what commission schemes are in place?
▪ Which sectoral and political characteristics currently constrain the development or scale-up of the mobile money ecosystem in South Sudan?
2. What is the current state of regulations governing the mobile money sector and the financial sector in South Sudan?
▪ What are the current licencing arrangements for Mobile Network Operators (MNOs) and mobile money operators?
▪ What are the regulations governing financial transactions, including related to exchange rates and the existence of a parallel exchange rate market?
▪ What regulations are in place around "Know Your Customer" processes and identification for registration of SIM cards and mobile money services?
▪ What regulations are in place to protect customers? For instance, are there mechanisms in place to ensure online/offline parity and to ensure the safety of mobile floats?
▪ What regulations are in place around fraud, money laundering, and illicit financial flows?
▪ What are the primary regulatory barriers to the supply of mobile money services?
3. To what extent is there demand for formal mobile money transfers within South Sudan?
▪ What are the primary unmet needs for financial services in South Sudan?
▪ If there are formally recognized mobile money services on offer in the South Sudanese market, what are current penetration levels and usage patterns?
▪ Considering local-market functionality, exchange-rate and commodity-price volatility, and the broader local economy: is mobile money relevant in the South Sudanese context?

- Is mobile money adequate for meeting the needs of low-income and vulnerable beneficiary groups (e.g. when considering the level of banking-system development and displacement)?
- What is the demand for formal mobile money services among the general public (including the most vulnerable households) in South Sudan?
- What is the demand for formal mobile money services among humanitarian and development partners with respect to cash-based assistance and social-protection initiatives?

4. What are the primary barriers to adoption of mobile services and mobile money in South Sudan?

- What are the structural barriers to adoption of mobile services and mobile money in South Sudan?
- What are the infrastuctural barriers to adoption of mobile services and mobile money in South Sudan?
- What are the socioeconomic barriers to adoption of mobile services and mobile money in South Sudan?
- What are the cultural barriers to adoption of mobile services and mobile money in South Sudan?
- Which population groups are typically more prone to being excluded from the mobile money system? And, what are the specific barriers that these groups face, or could face, more acutely when accessing or using mobile money?

5. What are the potential benefits of mobile money for the general population, including low-income and vulnerable groups in South Sudan?

- What benefits could mobile money provide in facilitating payments to the population and in easing transfers?
- What role could mobile money transfers play as a form of informal social safety net?
- What additional benefits could the population derive from enhanced usage of mobile money (e.g. expanded financial inclusion for the unbanked, increased access to services, greater resilience to shocks)?
- What benefits could mobile money provide to the development of local economies?

6. What are the risks associated with the adoption of mobile money?

- Given the current political climate, regulatory environment, and operational structure, what are the risks associated with customer protection?
- What are the risks connected to the injection of large sums of cash into the local economy?
- What are the risks affiliated with fraud, money laundering, and illicit financial flows?

7. What role could mobile money play in the delivery of humanitarian assistance and social protection schemes in South Sudan?

- Can mobile money be leveraged to improve delivery of cash-based programming and social-protection schemes by both humanitarian and development actors?
- To what extent is there compatibility between existing approaches to, and modalities for, cash-transfer programming and the introduction of mobile money services?
- To what extent can mobile money optimize efficiency and cost-effectiveness, while alleviating operational challenges associated with cash-transfer programs in the South Sudanese context?

- To what extent can mobile money decrease some of the operational risk of cash-based programming (e.g. risk of leakage, security incidents, and the push-and-pull effect associated with aid distribution points)?
- What additional operational or system risks could be associated with the introduction of mobile money into the humanitarian response or development initatives?

8. How can the potential of mobile money in South Sudan be unlocked?

- What opportunities could be leveraged to foster uptake of mobile money services?
- What actions can be taken to tackle current barriers and support future readiness for mobile money adoption?
- What would be needed to engender an enabling and conducive environment for the development and rollout of mobile money services?
- What policy and program interventions would support mobile money uptake and leverage mobile money to support resilience and financial inclusion?
- What measures might be necessary to both optimize aid delivery through mobile money and to mitigate associated risks?

1.2. Overall Approach

The rest of this section details the methodological approaches that were applied to qualitative and quantitative data collection, including sampling strategy and tool development, which were used to respond to the research questions identified (and detailed above). The approach adopted leveraged a combination of descriptive and advanced statistical techniques, as well as qualitative analysis.

1.2.1. Research Components and Specific Activities

The research team leveraged a mixed-method research methodology and organized the research around four research components (detailed in the next section) to provide a complete picture of the landscape, looking at both the supply- and demand-side of the mobile money ecosystem. The research provided demand-side data by consulting households representing potential or existing consumers of mobile money services, and supply-side data by consulting a comprehensive range of stakeholders and market players, including regulators, mobile money service providers, agents, and so on.

Research activities included:

- **Conducting background research and a desk review of South Sudan's telecommunications and financial services sector**, benchmarking both the regulation and use of mobile money in South Sudan against other emerging economies;
- **Conducting qualitative supply-side research** through:
  - Interviews with the government, the regulator(s), and key actors from the financial services (e.g. banks) and telecommunications sectors (e.g. MNOs) to collect information on the current status of mobile money in South Sudan within the broader political and regulatory environment, and to explore barriers to and opportunities for scaling up;
  - Interviews with humanitarian and development actors engaged in cash transfers in the social protection sector to inquire into the role that mobile money services and mobile money infrastructure play, or might play, in the provision of cash-based assistance;

- **Conducting a demand-side quantitative household survey** to collect baseline data on the current demand for—and potential penetration level of—mobile money services, as well as on the perceived benefits, barriers, and risks associated with usage;
- **Collecting qualitative demand-side data** to complement household-survey findings and to further understand reasons behind the demand for mobile money (or lack thereof), and the drivers and barriers to adoption across different vulnerable groups.

Qualitative supply-side research took place early on and was thus able to inform the analytical framework and research-tool designed to undertaken remaining research components.

1.2.2. Focus on the Most Vulnerable Households

The effects of continued conflict coupled with sustained economic decline in South Sudan have increased the vulnerability of local communities and diminished households' capacity to face shocks. Vulnerable groups continue to suffer the brunt of conflict and economic pressures.

The research team thus adopted a gender-sensitive research approach and focused on issues affecting vulnerable groups by exploring specific access or usage constraints. The following groups—referred to as *vulnerable groups* in the report—were targeted:

- **Internally Displaced Persons** (IDPs) are defined as persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, particularly as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights, or natural or human-made disasters, and who have not crossed an internationally recognized state border;[1]
- **Urban poor** are particularly vulnerable given their heavy market dependence and limited access to alternative coping strategies. Urban poor can be defined as individuals living in urban areas whose housing structures are of visibly poor quality and who lack one or more of the following: i) durable housing of a permanent nature that protects against extreme climatic conditions; ii) sufficient living space, with no more than three people sharing the same room; iii) easy access to safe water, in sufficient amounts at an affordable price; iv) access to adequate sanitation, in the form of a private or public toilet shared by a reasonable number of people; and/or v) security of tenure that prevents forced evictions;[2]
- **Rural residents** are vulnerable as well, given the lack of economic opportunities and low access to social services available in areas outside urban centers. As part of this study, rural residents were defined as individuals living in rural enumeration areas (EAs), according to the sampling frame provided by the National Bureau of Statistics (NBS) (see section 1.5.2).
- **Women** are often also deemed to fall under the same *vulnerable* umbrella term, even though they are not vulnerable in all contexts (though are more likely to be so than men). South Sudan ranked 169th out of 188 countries in the UN Gender Development Index (GDI) in 2015, which signals important disparities between women and men related to the three basic dimensions of human development: health, knowledge, and living standards.[3]

[1] United Nations Guiding Principles on Internal Displacement, accessed at: https://emergency.unhcr.org/entry/250553/idp-definition

[2] UN Habitat definition as per the "*UN Habitat: State of the World's Cities 2006/2007*", accessed at: https://unhabitat.org/books/state-of-the-worlds-cities-20062007/. For the analysis, the research team chose to abide by the definition of "extremely urban poor" indicated in this report, i.e. only individuals who were lacking at least three of the five criteria mentioned were defined as urban poor.

[3] United Nations Development Programme (2015). Human Development Reports: Gender Inequality Index. http://hdr.undp.org/en/composite/GII

The research team is cognizant that this list of vulnerable groups is neither exhaustive nor comprehensive. Some groups may, for instance, be marginalized due to their ethnic identity. Other vulnerability factors identified by the humanitarian community include health status and disability, number of dependents, housing and food security status, as well as age (e.g. elderly, child-headed households and unemployed youth).

To the extent possible, the research team disaggregated the analysis, highlighting sub-group-specific usage patterns, barriers, risks and benefits.

1.2.3. Synergies with the Mobile money research in Somalia

The approach and methodology adopted for this research project drew on Altai's recent experience exploring mobile money in Somalia for the WB: first, in 2016-2017, when Altai was appointed to collect supply- and demand-side data on the mobile money ecosystem in Somalia to shed light on the use of mobile money and on the wider state of the mobile money industry in Somalia; and, then in 2018, when Altai was commissioned to conduct a thematic extension, aimed at analyzing how mobile money had been used by drought-affected communities, exploring how the mobile money ecosystem functions in crisis mode, and how it could be further strengthened to build resilience.

1.3. Component 1: Background Research and Desk Review

Objectives of Component 1: Provide insights on South Sudan's telecommunications and financial ecosystem, benchmarking the regulation and use of mobile money in South Sudan against other emerging economies (e.g. Uganda or Kenya); provide secondary research and detailed context to allow for further refinement of the research tools applied.

Formative research was undertaken during the initial stages of the project to add depth to the analytical approach adopted, and to inform research tool design. This formative research drew on a comprehensive literature review and meta-analysis of relevant existing data and reports. This included reviewing previous pertinent work completed by the WB and its partners within the domestic telecommunications sector, and any preliminary research undertaken by humanitarian and development partners on cash-programming in South Sudan, including the one recently undertaken by the Conflict Sensitivity Resource Facility (CSRF).

1.4. Component 2: Qualitative Supply-Side Research

Objectives of Component 2: Document the ecosystem's supply-side and gain an in-depth understanding of the domestic mobile money market, sectoral constraints, and possible applications of mobile money within humanitarian and development programming. The module was split into the following sub-objectives:

- Document the status of mobile money services offered, whether there exist formally recognized and regulated mobile money services (with separate mobile money wallets) – and, if so, what services are in use? Or, whether or not only proxy offerings of airtime trading are available;
- Map the ecosystem: key actors, relationships, and practices;
- Describe the regulatory framework (e.g. licensing of MNOs providing mobile money services) and regulatory constraints, adopting a political-economy lens and considering the economic-reform agenda within the broader political and regulatory environment;
- Pinpoint the risks of fraud and risks to potential customers;
- Capture humanitarian and development stakeholders' perceptions on the current and potential role of mobile money platforms in cash-based programming;

- If relevant, understand the role played by mobile money agents, and appreciate what would be required for agents to facilitate greater consumer understanding and mobile-payment uptake;
- Identify policy and program interventions that would support mobile money uptake, and that would leverage mobile money to support resilience and financial inclusion.

Information was captured in a multi-dimensional way through i) Key Informant Interviews (KIIs) with government institutions, MNOs, other key actors from the financial and telecommunications sectors, as well as humanitarian and development actors, and ii) In-Depth Interviews (IDIs) with mobile money agents, airtime resellers, informal money-transfer institutions and local traders.

Ultimately, this review found that formal domestic mobile money services were not yet available, which meant that later component would focus on potential demand, un-met financial needs and enabling factors for adoption and uptake.

1.5. Component 3: Quantitative Demand-Side Research

Objectives of Component 3: Implement a demand-side household survey—representative across selected counties—with a sample of around 1,500 households, to collect primary quantitative data on the demand for and/or current use of mobile money services. In the end, the survey collected information from a total of 1,648 households.

1.5.1. Questionnaire

The questionnaire investigated the role that mobile money or airtime-credit transfers play as a form of informal social safety net.

The questionnaire also sought to understand which groups that are typically less prone to using mobile money or more prone to being excluded from the mobile money system. For instance, the questionnaire explored the barriers that are or could be faced by different groups (e.g. IDPs, women) when accessing or using mobile money.

Additional aspects were explored:

- **Financial literacy** related to the tracking of income and expenses, loans and debt repayments, and savings. This is critical in mobile money deployment and uptake, even if the households do not have prior experience with digital/formal financial services.
- **Cost/ease of access to operators that serve/could serve as mobile money agents**.
- **Digital/National IDs** would be crucial in the context of cash-based programming, in order to prevent misuse of money and funding of warring parties.

The unit of analysis was the individual, as individual usage patterns and individual perceptions are being studied. The final analysis based on the quantitative household survey presents disaggregated indicators related to gender, age, education, literacy, income level, geography (county and urban versus rural areas), and whether or not respondents have been internally displaced or otherwise affected by conflict.

The questionnaire also drew on the one developed for the Mobile Money Ecosystem Research undertaken in Somalia, yet was fully tailored to the South Sudan context. It featured close-ended questions and comprised several modules, sub-sections of which were administered depending on respondents' answers to certain questions.

The questionnaire was pilot-tested (through cognitive and field testing) among at least 30 respondents with diverse profiles to refine the questionnaire before rollout. The objective of the pilot test was to ensure that all topics were adequately covered and, most importantly, that the questionnaire was tailored to the local culture and language of the target audiences, including vulnerable groups with varying levels of literacy.

1.5.2. Sampling Strategy

Sampling Design

The design adopted for this survey was a stratified four-stage cluster sample. While counties were purposively selected, the selection was randomized at the second, third, and fourth levels. The resulting sample is representative for each strata of interest (resident households in urban and rural areas, as well as IDPs), and by gender, and ensures ethnic diversity.

Figure 1: Sampling methodology summary for urban areas, rural areas and IDP camps

	Sampling Strategy	Selection Stages
Stratification Type of residence	Counties	1st stage Purposive
	Enumeration Areas	2nd stage PPS
	Households	3rd stage Random walk
	Respondents	4th stage Randomization tool

Based on existing access and security constraints, the survey encompassed the seven counties currently targeted by the World Bank's Safety Net and Skills Development Project (SNSDP), where Enumerators had guaranteed access and benefited from the support of local authorities, based on goodwill created by the project. However, the survey did not exclusively target beneficiaries from the SNSDP, and the sampling frame comprised all households living in these counties. Two more counties (Wau, Malakal) were added to enhance representation of conflict-affected households. Table 5 presents the list of counties selected for the household survey.

While the survey is only representative at the county level, it should also provide a comprehensive snapshot of the country as a whole, as it i) covers the three greater regions in South Sudan, including both urban and rural areas, ii) includes IDPs, iii) includes ethnically diverse households, and iv) covers some areas that have been severely impacted by the conflict, including more recent waves of displacement following the uptick in violence throughout the country after July 2016 when clashes re-erupted in Juba.

Table 2: Preliminary counties selected for the household survey

Counties
Kapoeta East
Pibor

Torit
Malakal City
Juba City
Gogrial West
Wau
Tonj South
Bor

Sample Size Calculations

The household survey originally targeted some 1,440 households, or 480 households in each strata (i.e. for urban and rural populations, as well as IDPs). This target was exceeded, as 1,648 households were ultimately interviewed. While the overall sample size was decided based on budget considerations, this sample size optimizes the margin of error and guarantees that, with a 95% confidence level, the margin of error of estimations is less than 5% both at the strata level and at the gender level. It also guarantees that estimations at the strata x gender level (e.g. female IDPs) yield a margin of error inferior to 7% (6.33%). As such, robust analysis can be derived from comparisons between different groups.

Table 3: Sample size calculation for urban residents, rural residents, and IDPs

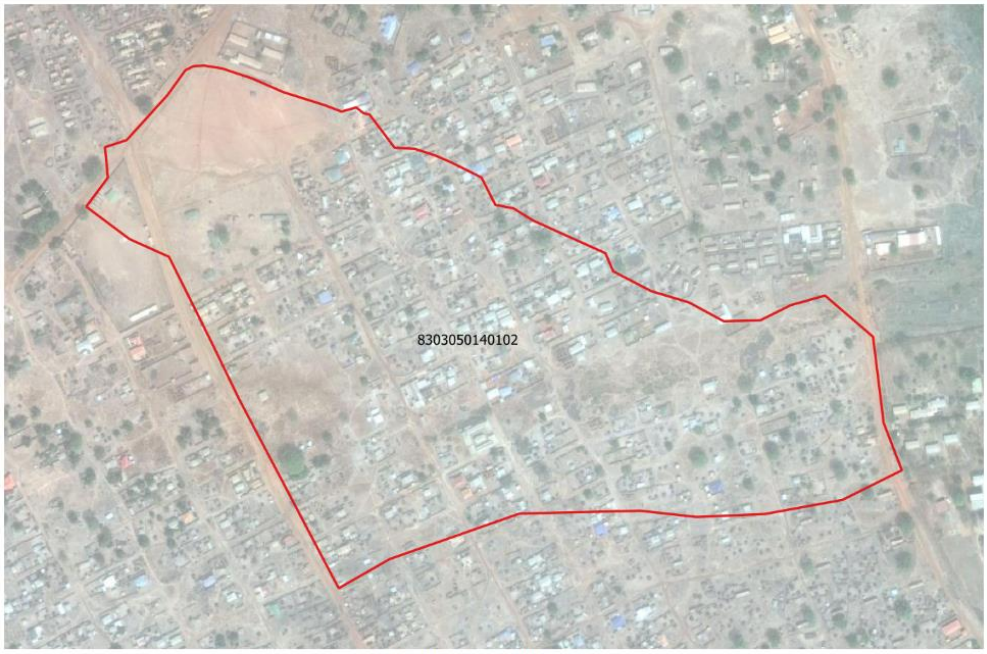
Parameter	Value	Result	Value
Confidence Interval	95% (standard)	**Total Sample Size**	**1,440**
Statistical Power	80% (standard)	Number of Counties	9
Margin of Error	5%	EA Size (Number of individuals per EA)	12
Expected Proportion	50% (conservative)	Total Number of EAs	120

Enumeration Areas Selection

The sampling frame was refined with the help of the NBS, which acts as the depositary of the latest 'Census of Population and Housing' and thus has access to data that provides a comprehensive sampling frame for South Sudan. The NBS provided the research team with outlines of urban versus rural areas. These outlines were laid over recent satellite imagery to verify whether they appeared to be correct. A list of EAs – or selection lists, were then prepared for both urban and rural areas, in all target locations.

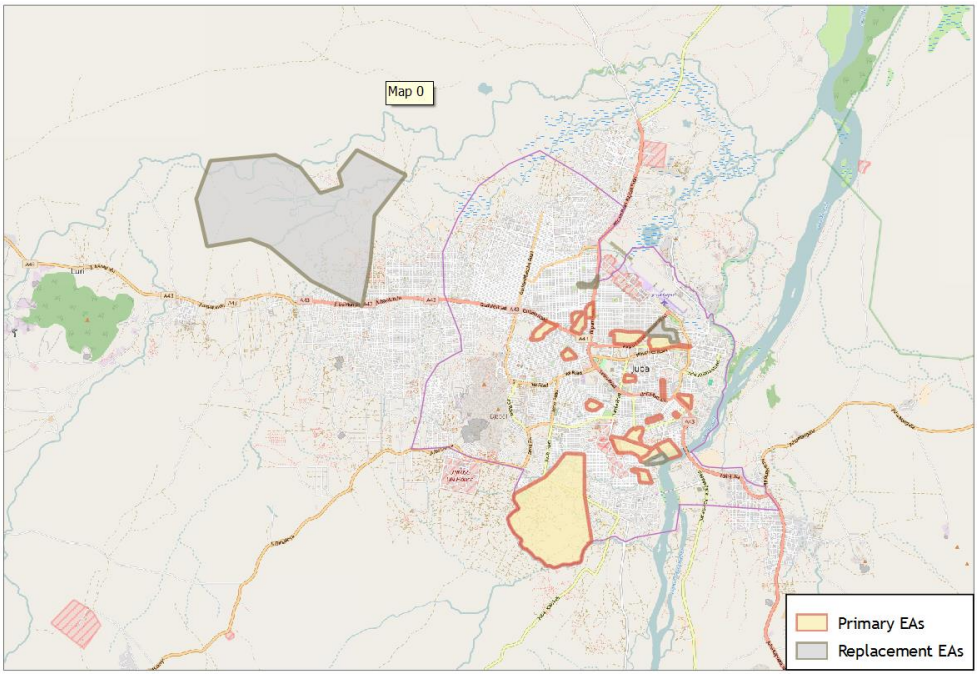
From the selection lists, the NBS extracted and ordered a list of EAs, selected at random with a probability proportional to size (PPS). Outlines of these EAs were given to Altai as georeferenced PDF-documents, which were then digitized into GIS-shapefiles and laid over satellite imagery for inspection. EAs which were empty, or had too few households, were discarded and replaced. Building on Altai's experience in Somalia, where drought-related displacement had also compromised the sampling frame, this project employed remote sensing and satellite imagery to check the EAs ahead of fieldwork. This led to the replacement of several EAs, which were randomly selected to preserve the sample's statistical robustness.

Figure 2: Dummy - Verifying suitability of an enumeration area in Wau



WBG, Wau, Wau South, Nazare
8303050140102

Figure 3: Dummy – Map with primary and replacement EAs in Juba



Household Selection

Within a suitable EA, the selection of respondents was randomized using a random walk protocol:

- Each EA was covered by two Enumerators, supervised by one Field Coordinator.
- Starting points (usually road intersections) were selected at random within the EA.
- The Enumerator initiated a walk from the starting point, stoping at every fifth house on one side of the road to conduct interviews.

- At the end of the road, or when the EA limit was reached, the Enumerator relocated to a new starting point.
- The method was repeated with a new starting point until the requisite number of interviews had been collected.

IDPs Selection

To interview IDPs, Altai got in touch with the Camp Coordination and Camp Management (CCCM) cluster and UNITAR (United Nations for Training and Research) to obtain a list of Protection of Civilians (PoC) sites in the target locations. The Enumerators then followed the same random walk protocol within these sites.

Respondent Selection

The selection of the respondent within the household was randomized at the beginning of the interview, through a randomization formula within the encoded questionnaire. The Enumerator started by introducing the survey to the household. He/she then recorded the number of adults present above the age of 16 and their names. Adults present at the time of the interview (and within the eligible age range) were then randomized to select a respondent. Altai decided to do the randomization based on household members present at the time of the interview (rather than among all household members) because selecting a respondent based on all household members would have sharply increased the number of needed follow-up visits and time spent in a specific EA, which would have significantly increased the required fieldwork budget.

Non-response and Replacements

Measures were put in place to ensure that non-responses were properly referenced and that follow-up visits were respected in cases of 'no one' or 'no eligible adult' present. Any replacements were recorded:

- To account for non-responses, a form was finalized and completed for the households/respondents that did not give their consent and/or refused to answer the survey. All non-responses were thus properly referenced.
- Each replacement at the EA-level (for example, due to security concerns for the Enumerators or logistical reasons (leading to the inability to operate) were decided by the Project Manager, and the specific reason for their replacement were recorded.
- At the household level, Enumerators were asked to reschedule two follow-up visits to all households where eligible respondents were not present, prior to replacing the household.

Focus Box 1: Reasons for household replacement

A household was replaced if:

- The respondent refused to give his/her consent to complete the survey.
- The household was found to be empty after three visits.
- An adult above 16 was not available - even after three visits to the household.
- The interview that was conducted with that household was incomplete (e.g. the respondent stopped the interview in the middle).

Sampling Weights Calculation

Sampling weights were calculated at the household-level and at the respondent-level. The weights are equal to the sampling fraction employed to select the number of sampled respondents in each

stratum. The selection probability was calculated based on the most precise data available regarding the population distribution and number of households in each stratum[4].

Sampling weights were calculated using the following formula:

$$W_{rhij} = \frac{1}{P_{rhij}}$$

$$P_{rhij} = P_{ij}\ x\ \ P_{hi}\ x\ P_{rh} =$$

$$= \left(EA_j\ x\ \frac{P_i}{P_j}\right)\ x\ \frac{HS_i}{H_i}\ x\ \frac{1}{R_h}$$

Where:

1. W_{rhij} is the sampling weight
2. P_{rhij} is the probability of selecting respondent r in household h in EA i in strata j
3. P_{ij} is the probability of selecting EA i in strata j (Probability-Poportional-to-Size methodology)
4. P_{hi} is the probability of selecting household h in EA i (Equiprobability-of-Selection methodology)
5. P_{rh} is the probability of selecting respondent r in household h (Equiprobability-of-Selection methodology)
6. EA_j is the number of EAs selected in stratum j
7. P_i is the population of EA i
8. P_j is the population of stratum j
9. HS_i is the number of households selected in EA i
10. H_i is the total number of households in EA i
11. R_h is the total number of eligible members (>16 years old) in household h

Computation of EA_j: The number of EAs selected in each stratum[5] was driven by the sampling design chosen. A breakdown of EAs selected is provided in the table below.

Table 4: Number of EAs per stratum

	Rural	Urban	PoC site	Total
Juba City	5	7	7	19
Bor	5	6	6	17
Pibor	5	6	0	11
Torit	5	6	0	11
Kapoeta East	4	6	0	10

[4] Source were *Population projections for South Sudan by County: 2015-2020 (NBS, March 2015)* and *Southern Sudan Counts: Tables from the 5th Sudan Population and Housing Census (SSCCSE, November 2010).*

[5] A stratum is the level of county x zone of residence (i.e. urban/rural/PoC). An example is Kapoeta East rural. There are in total 22 strata.

Gogrial West	4	6	0	10
Tonj South	4	6	0	10
Wau	4	6	6	16
Malakal	4	6	6	16
Total	40	55	25	120

Calculation of P_j:

PoC strata

For PoC strata in Bor, Wau, Malakal and Juba, population estimates were extracted from the following sources:

- Bor PoC site: *Bor Poc Site (Jonglei) Biometric Registration* (IOM DTM, Oct 2018)[6].
- Wau PoC site: *Wau PoC site profile* (reliefweb, May 2018)[7];
- Malakal PoC site: *Malakal Combined Assessment* (IOM DTM, Feb 2018)[8];
- Juba PoC site: *Protection of Civilian sites, Juba Biometric Registration* (IOM DTM, Jan 2019)[9].

Urban and rural strata

Population projections (2015 – 2020) are available at the level *county x gender*, but not at the *county x urban/rural* level. Even from the 2008 census data, urban/rural population distribution is only available at the state level[10].

As such, the urban/rural population distribution at the state level from 2008 Census data[11] is used to interpolate the urban/rural population distribution at the county level, and the derived percentages are applied to 2019 county-level population projections[12].

Calculation of P_i and H_i:

Urban/rural strata

For enumeration areas in urban and rural strata, population and number of households' estimates were provided by the NBS.

PoC strata

From the shapefiles of PoC sites in Malakal, Juba and Bor, the team was provided with information related to the number of structures (i.e. buildings, shelters, tents) contained in each EA. From that:

[6]https://reliefweb.int/sites/reliefweb.int/files/resources/20181003%20IOM%20DTM%20SSD%20Bor%20PoC%20Registration_.pdf
[7] https://reliefweb.int/sites/reliefweb.int/files/resources/20180517_wau_pocaa_site_profile_may_2018.pdf
[8] https://www.iom.int/sites/default/files/dtm/south_sudan_dtm_201802.pdf
[9]https://reliefweb.int/sites/reliefweb.int/files/resources/20190119%20IOM%20DTM%20Juba%20PoC%20Sites%20BMR%20SSD.pdf
[10] See note 1 for data sources.
[11] *Tables from the 5th Sudan Population and Housing Census (SSCCSE, November 2010).*
[12] *Population projections for South Sudan by County: 2015-2020 (NBS, March 2015).*

- The total number of households per EA (H_i): The team estimated the average number of households per structure and multiplied it by the number of structures in the EA;[13] [14]
- The total population in the EA (P_i): The team estimated the average number of household members per household and multiplied it by the number of households in the EA (H_i).

Calculation of HS_i: HS_i is equal to the number of interviews conducted per stratum.

Calculation of R_h: R_h is equal to the variable nhhm_eligible (number of household members eligible to be interviews, i.e. older than 16 years old).

1.5.3. Technology

Quantitative data was collected on smartphones equipped with the SurveyCTO application, allowing it to be directly transferred to a central database directly managed by Altai. Using electronic data collection methods introduced higher levels of efficiency, eliminated the need for data transcription from paper to electronic form, and allowed for more sophisticated data collection monitoring to be used that collectively increased data reliability.[15]

Each interviewer's smartphone was pre-loaded with the final version of the questionnaire, as well as GeoPDF maps of his/her enumeration areas. The GeoPDF map allowed the interviewer to see his/her GPS location on a map, displaying the boundaries of the target enumeration area (for geo-fencing) as well as the starting points and directions to be used in the random walk protocol. As GPS coordinates were recorded for each interview, the implementation of the household selection protocol was monitored, in detail.

1.5.4. Community Engagement

When engaging with communities, the Field Coordinators and Enumerators employed a clear and consistent communications strategy, and explained that the survey would not provide individual benefits (no money, no food or water supplies etc.) to avoid raising expectations of monetary gain or additional assistance among the surveyed communities, which could both skew the survey results and increase grievances or spur mistrust in development actors. Instead, they clarified the objectives of the survey - i.e. that the collected information would be used to inform humanitarian and development policies aimed at improving the lives of people in South Sudan. Similarly, to avoid raising suspicion among respondents, the Field Coordinators and Enumerators explained that households had been randomly selected to take part in this study, that the participation was voluntary, and that all shared information would be confidential.

1.6. Component 4: Qualitative Demand-Side Research

Objective of Component 4: Incorporate qualitative insights into the demand-side research to fully understand and contextualize the data, allowing researchers to gain a deeper understanding of the target populations' needs and behaviours. The qualitative analysis also provided valuable insight into the local socioeconomic and cultural context, and as to whether or not local markets were functioning and could feasibly absorb an injection of cash via mobile money.

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[13] We took the average number of HH/structure across the three PoC sites for which this information was available (Malakal, Juba and Bor) to limit the fact that households and structures might be counted differently across different PoC sites. As for Wau we do not have the information of the number of structures per EA, we take the average number of HH/structure across the three PoC sites as the number of HH/structure for Wau PoC site.

[14] Using the population estimates for the four PoC sites, see foonotes,6,7,8 and 9.

[15] Note that the real-time monitoring functionality is dependent on a presence of 3G data connection in order to upload interview data directly from the phone to an online server.

1.6.1. Focus Group Discussions (FGDs) and Field Visits

FGDs and field visits were included to allow the research team to collect primary qualitative and observational data on the demand side. This module sought to aid the research team to gain a more in-depth understanding of mobile money ecosystem and unmet financial service needs, as well as drivers of behavioural change (e.g. what would be required to move from cash to digital, elements that would attract or dissuade consumers). Levels of financial literacy were also investigated with a view to identifying areas where additional knowledge and awareness would be needed to support increased uptake of mobile money services. In addition, the FGDs also interrogated the impacts of fluctuating exchange rates and the parallel exchange market on people's financial behaviors, while exploring the context-specific decisions people make around financial services in rural versus urban areas. FGDs were implemented after the household survey, allowing the research team to probe issues highlighted by the survey in greater detail.

FGDs took place across the different selected counties and targeted different segments of interest. By convening thematic FGDs, researchers were able to distil gender and group-specific benefits and barriers. In particular, FGDs took place with IDPs, urban poor, and rural residents, as these populations were more likely to face additional barriers when adopting/using mobile money services, and might have had different needs. Similarly, FGDs were conducted solely with women and elderly respondents in order to better understand any specific challenges they were facing, or may face, in accessing and using mobile money services, including possible protection risks.

1.6.2. Characteristics of the FGDs

The purpose of the FGDs was to allow for deeper exploration of key themes, thus complementing the quantitative survey results. The groups were limited to 8 participants, to ensure that productive discussion took place. The FGDs were implemented by dedicated National Consultants with the support of note-takers and lasted around two hours. Standardized tools and guidelines were developed for each group of interest to ensure completeness and comparability, and the National Consultants received specific training on how to conduct the interviews.

Table 5: Characteristics of the FGDs

	Description
Number of FGDs	~10
Quotas	Thematic FGDs – 2 for each group of interest: ▪ 2 FGDs with IDPs; ▪ 2 FGDs with urban poor; ▪ 2 FGDs with rural residents; ▪ 2 FGDs with women; ▪ 2 FGDs with elderly people.
Participants' selection	Purposive
Data collection method	Moderation among groups of 6 to 8 participants Note taking, full recording and picture

Length of FGD	~2 hours

2. VULNERABLE INDEX

A vulnerability index was developed, based on criteria identified in existing literature and aligned with international organizations' best practices. It rates respondents' vulnerability from 0 to 1, with 1 being minimum vulnerability and 0 maximum vulnerability. The rating captures respondents' scores based on four key indexes, which have been equally weighted, that take into account current food intake (in terms of both quantity and diversity), application of extreme coping strategies and livelihood conditions. Table 6 below describes how each index has been calculated.

Table 6: Methodology used for computing the vulnerability level of respondents

Vulnerability Index	
Reduced Coping Strategy Index (rCSI) **Food insecurity in terms of quantity of food**	How often over the past 7 days the household had to: • Rely on less preferred and less expensive foods? (limit_preferred) • Borrow food, or rely on help from a friend or relative? (help) • Limit portion size at mealtimes? (limit_portions) • Restrict consumption by adults in order for small children to eat? (limit_adults) • Reduce the number of meals eaten in a day? (limit_meals) **rCSI = limit_preferred + (help*2)+ limit_portions + (limit_adults*3) + limit_meals**
Food Consumption Score (FCS) **Food insecurity in terms of diversity of food**	How many days in the last 7 days the household ate: starches / pulses / vegetables / fruits / meat / dairy / fats / sugar **FCS = (starch*2)+ (pulse*3)+ vegetable + fruit + (meat*4)+ (dairy*4)+ (fat*.5)+ (sugar*.5)**
Livelihood coping strategy index (lCSI) **Extreme coping strategies that were adopted**	During the past 30 days, if because of lack of food or money the household had to: • Sell household assets or goods (stress) • Spend savings (stress) • Sell more animals (non-productive) than usual (stress) • Send household members to eat elsewhere (stress) • Reduce expenses on health and education (crisis) • Consume seed stocks that were to be saved for the next season (crisis) • Decrease expenditures on agricultural inputs (crisis) • Sell the last female animals (emergency) • Sell house or land (emergency) **lCSI is equal to the most extreme strategy that was adopted, 1 corresponding to the absence of**

	a coping strategy, 2 to a stress strategy, 3 to a crisis strategy and 4 to an emergency strategy
Livelihood condition index (LCI)	• Type of house • Main source of drinking water • Type of toilet • Type of material the roof of the house is made of **For each item, categories are assigned points. The livelihood condition index is the sum of points**

3. LIST OF STAKEHOLDERS INTERVIEWED

In total, some 34 stakeholder interviews were conducted.

Table 7: List of stakeholders interviewed for the supply-side research

Supply-side Research - Stakeholders
Government Bodies
1. **Project Implementation Unit (PIU) for the Safety Net and Skills Development Project (SNSDP)**
2. **National Communication Authority**
3. **Ministry of Finance and Economic Planning**
4. **Bank of South Sudan**
5. **Ministry of Gender, Child and Social Welfare**
6. **National Bureau of Statistics**
7. **Ministry of Humanitarian Affairs**
8. **Ministry of Agriculture and Food Security**
9. **Ministry of Information and Broadcasting**
Telecommunications Sector
1. **Zain**
2. **MTN**
3. **Trinity Technologies**
4. **Nilepay**
Financial Sector
1. **Equity Bank**
2. **KCB Bank**
3. **Alpha Bank**
4. **Cooperative Bank**
5. **Eco Bank**

6. **L.E.M International**

Humanitarian and Development Agencies

1. **European Commission's Humanitarian Aid Office (ECHO)**
2. **United States Agency for International Development (USAID)**
3. **Department for International Development (DFID)**
4. **United Nations Children's Fund (UNICEF)**
5. **Office for the Coordination of Humanitarian Affairs (OCHA)**
6. **Danish Church Aid (DCA)**
7. **Danish Refugee Council (DRC)**
8. **Norwegian Refugee Council (NRC)**
9. **Agency for Technical Cooperation and Development (ACTED)**
10. **Cooperative for Assistance and Relief Everywhere (CARE)**
11. **Mercy Corps**
12. **Oxford Committee for Famine Relief (Oxfam)**
13. **Charlie Goldsmith Associates**
14. **World Food Programme (WFP)**
15. **World Vision**

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