THE INFRASTRUCTURE MAPPING EXERCISE

AND THE LINK WITH HOUSEHOLD ESTIMATES

IN SOMALIA

Shelter Cluster Somalia
ShelterCluster.org
Coordinating Humanitarian Shelter

INTRODUCTION TO SHELTER CLUSTER AND INFRASTRUCTURE EXERCISE

The Shelter Clusters' main target population in Somalia are the internally displaced populations. There remain an estimated 1.1 million protracted IDPs in Somalia, a figure that has remained static for the last three years. The needs of different categories of IDPs, i.e., people who have been displaced for nearly two decades and those displaced more recently, vary. Due to the forced and voluntary returns from respectively Yemen and Kenya, the Shelter Cluster is looking at an equal approach where IDPs, refugee returns and urban poor population groups are embedded within an overall integrated strategy. The Shelter cluster strategy has three main objectives: Emergency, Transitional and Durable Solutions. A strong capacity building/coordination component has been embedded within all of the pillars.

DATA AND INFORMATION ANALYSIS IN SOMALIA

The overall context of Somalia has been dominated by a nutrition and food security context. FSNAU and Swalim[1] are the dominant sources of information used to provide direction to the overall humanitarian strategy in Somalia. Although IDPs have been a main priority within the Humanitarian Response Plan and that more than 50% of the target population is urban, it has only remained a priority for education, shelter, protection and Wash. To improve advocacy on the overall conditions of IDPs in Somalia, the Shelter Cluster started to build on-top of a project that was initiated in Somalia by the Norwegian Refugee Council, called Settlement Information Management Systems. It was an attempt to collect inter-sectorial data on IDP settlements in a systematic way. The project was started in a couple of settlements in Bossaso, but remained too rigid and time-consuming. In 2014, the Shelter Cluster picked up this initiative and worked with all other clusters to come up with a systematic approach. With the support of its network of partners in Somalia and the use of mobile technology, this pilot was scaled up to collect more than 110.000 GIS points in 900 settlements in 21 urban cities[2] in Somalia with more than 500 different enumerators within 3 years. The Shelter Cluster replicates this exercise in locations where evictions are the main cause of displacement. On average, it takes around 3 teams (consisting of 4 people) to map out 60.000 IDPs in 10 days time.

THE INFRASTRUCTURE MAPPING EXERCISE

The objective of the infrastructure mapping exercise is to provide a useful and timely 'snap-shot' of the IDP settlements[3] at a specific time and in a specific location (or urban centre) in Somalia. The main aim of the exercise is to map out all the basic services that IDPs access in and surrounding their respective settlement. General data on the IDPs are also collected through Key Informants combined with a perimeter and density checks. Due to 'assessment fatigue', budget restrictions and the need to replicate this exercise, the data is not as in-depth as what you would like to get like from an IDP profiling exercise. In a Somalia context, where IDPs are subject to multiple displacements within a couple of years, it made a lot of sense to have an exercise that is easily replicable in time. The data sets provide useful statistical data on IDPs for the humanitarian needs overview and helps to provide evidence based data to donors for project proposals. Each exercise provides a public 'baseline' data set which provides a 10 page factsheet and on-line maps.

[1] FSNAU and SWALIM: Food Security and Nutrition Analysis Unit and Somalia Water and Land Information Management

[2] Hargeysa, Berbera, Bossaso, Qardho, Garowe, Gaalkacyo North, Gaalkacyo South, Beletweyne, Maxaas, Bulo Burto, Jowhar, Mahadey, Marka, Mogadishu, Baidoa, Doolow, Luuq, Dhobley, Diff, Afmadow and Kismaayo.

[3] Settlements in Somalia generally are divided into numerous 'umbrellas'. Each umbrella is made up of multiple IDP settlements. Umbrella leaders are responsible for the oversight and management of the settlements. Each of the settlements generally have an elected leader or 'gatekeeper' responsible for multiple IDP settlements and landowner engagement. Settlements in Somalia are often divided by natural land boundaries belonging to one or more landowner.

The data collected through the Shelter Cluster infrastructure IDP mapping exercise in 21 different urban centers since mid-2014, shows the alarming situation of many of the IDPs. 824 settlements were assessed (sometimes multiple times):

- *45% of all settlements are categorized as un-planned*
- *64% of all the settlements did not have any formal land tenure agreement*
- *17% of all settlements openly reported to be paying rent.*
- *78% of all shelters were categorized as buuls or tents. 44% of all shelters were still considered as the worst category 'buuls with one layer'.*
- *56% of all shelter had a door of which 74% were lockable from the inside.*
- *There is a strong need to provide NFIs to protracted IDPs as many have received their last NFIs more than 2 years ago (mats 42%, plastic sheeting 20%, and blankets 18%)*
- *36% of all the IDPs is Somalia reside in Mogadishu, of which 55% live in informal settlements in Daynille and Kaxda districts located in the outskirts of city.*

DENSITY CHECKS AND HOUSEHOLD ESTIMATES

Donors have shown a lot of interest in the exercise as it could potentially be linked to an IDP population estimate. One of the main problems in humanitarian data remains always the estimation of number of people that are targeted. The mapping exercise incorporated the density checks in a second phase of the exercise to achieve a double goal: to have direct household level data on shelter and Non-Food itmes, but also an attempt to link the exercise to a household estimate. In total, 6 different methodologies were identified, but only 3 seemed to make sense to be rolled out in a high-risk environment where remote management is key to success.

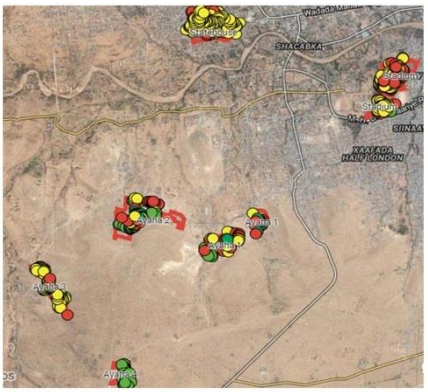
1. Sub-settlement approach: by splitting up settlements with the use of existing satellite imagery and data collected in the first part of the mapping exercise, sub-settlements are randomly sampled and a full enumeration is done of the HHs living in that section of the settlement[4].
2. Shelter Density classification: through random sampling and full enumeration of case studies, a quick turnaround household assessment provides data that helps to calculate average surface areas per household depending on their shelter-density classification[5].
3. Random Rope methodology: through random sampling of circular surface areas (a rope of 100m[6]) within settlements, a quick turnaround household assessment helps to calculate average surface areas per household.[7]

[4] See mapping exercise page on website: 2014 (Bossaso, Mogadishu, Kismaayo, Gaalkacyo…)

[5] Definition of Shelter Density classification: households are classified into low/medium/high shelter density. The following parameters were taken into account: free space around the shelter, width of the access roads, average space in-between the shelters… For more information see mapping exercise 2014 December (Baidoa, Kismaayo, Jowhar, Marka…) and 2015.

[6] A circle with a circumference of 100 meters, has a diameter of 32 meters and a surface area of 800m2. The rope-methodology ensures an accurate calculation of surface area per household for each sampled density check.

[7] Random sampling will be done by dividing the settlement into 6 sections. By throwing a dice, a random quadrant is taken for sampling. Starting from the centre of the quadrant, the enumerators will randomly walk three times 20 meters in a random direction (spinning the bottle). See further mapping exercises 2015.



1. HARGEYSA

2. BURAO

3. BOSSASO

GENERAL DATA

According to data collected during the KII, it was reported that there are 173474 **households**[11] living in **694 settlements.** On average, 8% of the households were reported to be from the host community.

In determining the **place of Origin** of the Displaced Population, the KIIs suggest that the majority of IDPs in the 14 targeted locations are from Banadir, Lower Shabelle and Bay region.

When asking the key informant on **past emergencies**, it was reported that 25% reported a fire-outbreak in the past, 60% reported a disease outbreak and 17% reported flooding in their respective settlement.

When determining the **type of settlement**, it was concluded that 19% of IDPs live in a planned[13] settlement **while 47% lives in an un-planned settlement.**

Table: Activities reported at the com centre

Activity	%
Community support	57%
Nutrition programmes	10%
Learning opportunities	15%
Recreation	20%
Entertainment	35%

127 **community centres** were mapped out with 43% having access to latrines. Community support activities were reported at 57%.

112 **garbage collection** points in 694 settlements were mapped out. It was reported that 43% of all garbage collection had been done in the past month.

SHELTER/NFI

In total, 23702 density points were taken during the exercise. On average, there are **5.62 persons per household** and each household occupies **1.81 buuls**. In total, 56% of all the structures are fixed with **doors,** of which 74% are **lockable**. In total, 73% of all shelters are categorized as buuls.

In general, the IDP population has 45% access to **mats**, 70% access to **jerry cans**, 18% access to **blankets** and 90% access to **cooking pots**.

Table: Shelter typologies *(Data was analysed in 598settlements)*

What	%
Buul with 1 layer	43%
Buul with 2 layers	15%
Buul with >2 layers	14%
Vernacular Buul	1%
Tents	6%
Timber frame / plastic sheeting	6%
Timber shelter	%
Corrugated Iron Sheet	13%
Solid house	2%

Table: Access to NFIs *(Data was analysed in 598settlements. The analysis is based on a multi-select question and therefore totals can be more than 100 %)*

Time-period	%
Mats	45%
Plastic Sheeting	19%
Blankets	18%
Jerry can	70%
Washbasin	46%
Knives	79%
Cooking pots	90%

PROTECTION

59% of KII reported that they were residing on **privately owned land**. 56% reported there was No Land Tenure Agreement, 17% of KII responded that they were currently paying rent.

When discussing access to protection services, 67% of KII reported the existence of **persons with specific needs**[15] living in the settlement.

Regarding **evictions**, it was reported through the KII, that 25% had received an eviction notice. *(Data was analysed in 609 settlements)*

54% of settlements reported having **committees.** 51% of all committees reported security concerns. *(Data was analysed in 609 settlements)*

21% of all KII reported they did not believe in **Durable Solutions**. Of those that believed in a durable solutions, 22% opted to locally integrate, 7% was willing to resettle, while 32% preferred to return.

16% of KII reported access to psychological counselling. 23% of KII reported access to legal counselling. *(Data was analysed in 609 settlements)*

Table: % of different security concerns addressed by the committee. *Data was analysed in 609 settlements. The analysis is based on a multi-select question and therefore totals can be more than 100%.*

Security concern	%
Evictions	39%
Disputes with host community	47%
Conflict with police	16%
Conflict with local militia	10%
GBV	26%
Conflict with Amisom	1%
Discrimination	11%
Violence against children	11%
Other	3%
None	1%

Table: % of groups of Refugees reported in the settlements. *(In total 29% of KII reported having refugees in their settlement)*

Group	%
Ethiopia	24%
Kenya	76%

29% of KII reported having refugees in their settlement. 66% of all KIIs reported to have new arrivals.

Table: different land tenure agreements (LTA)[14]

(LTD=land title deed)	%
No LTA	56%
Informal LTA, clan consent	5%
Individual permanent LTD	2%
Communal permanent LTD	3%
2-5 year LTA	17%
5-10 year LTA	6%
>10 year LTA	4%
Don't know	7%

Table: Vulnerable populations *Data was analysed in 609 settlements in Hargeysa, Jawhar, Marka, Baidoa, Mogadishu, Kismaayo, Dhobley, Diff and Afmadow. The analysis is based on a multi-select question and therefore totals can be more than 100%*

Time-period	%
Disabled	27%
Elderly_living_alone	25%
Female_Headed_HH	23%
Child_Headed_HH	10%
People_with_chronic_illness	7%
People_with_mental_health_problems	10%
Traumatized_survivors_of_violence	%
Other	%

In total, 238 **solar lighting posts** were mapped out, with a functionality rate of 83% . Only 16 settlements out of 694 settlements reported having solar lighting.

79% of solar posts are reported to improve **night activities** and 83% was reported to improve **the security**. In 47% of all cases, the community committee takes care of the maintenance.

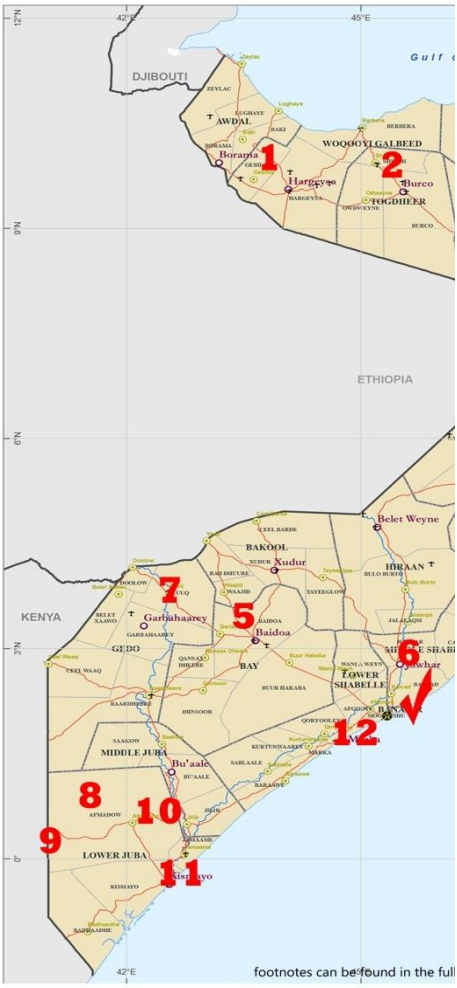
Table: Maintenance of solar posts

Who	%
NGO/INGO	46%
Community Committee	47%
Unknown	8%

Table: Reasons of non-functionality reported *The analysis is based on a multi-select question and therefore totals can be more than 100 %.*

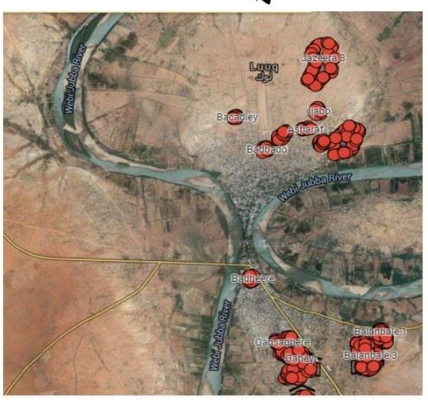
Reason	%
Battery broken	25%
Parts stolen	7%
Lamp broken	40%
Other	15%
Unknown	22%

INFRASTRUCTURE M



footnotes can be found in the full

7. LUUQ



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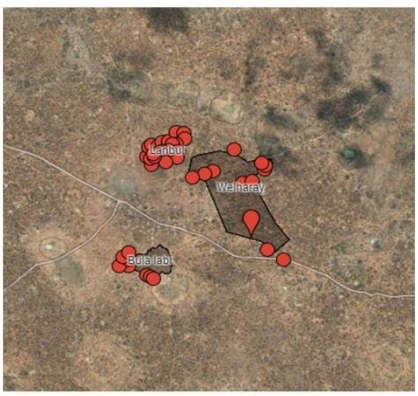
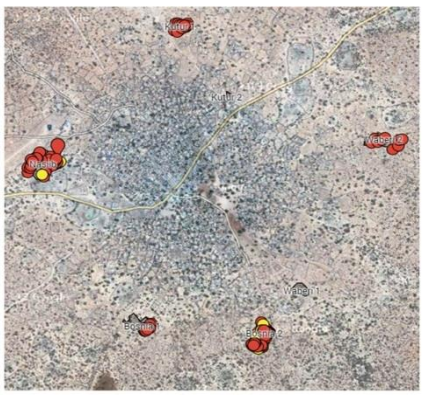
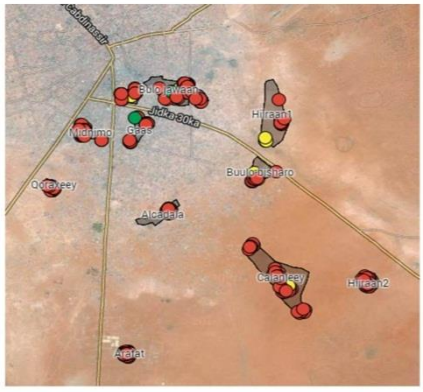
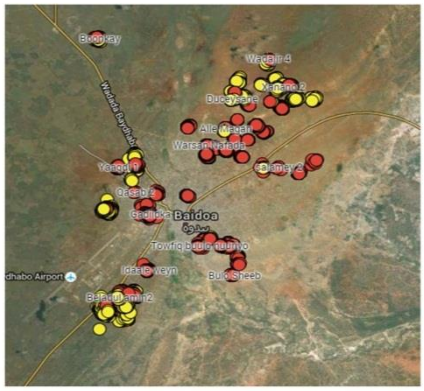


9. DHOBLEY

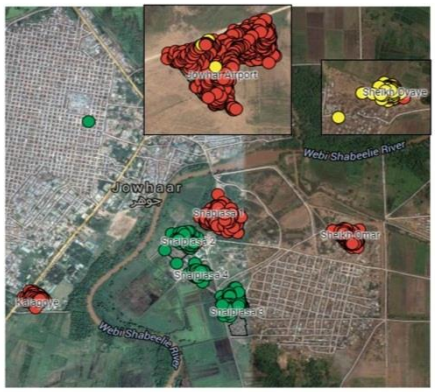




4. S/GAALKACYO



5. BAIDOA



6. JOWHAR

APPING EXERCISE

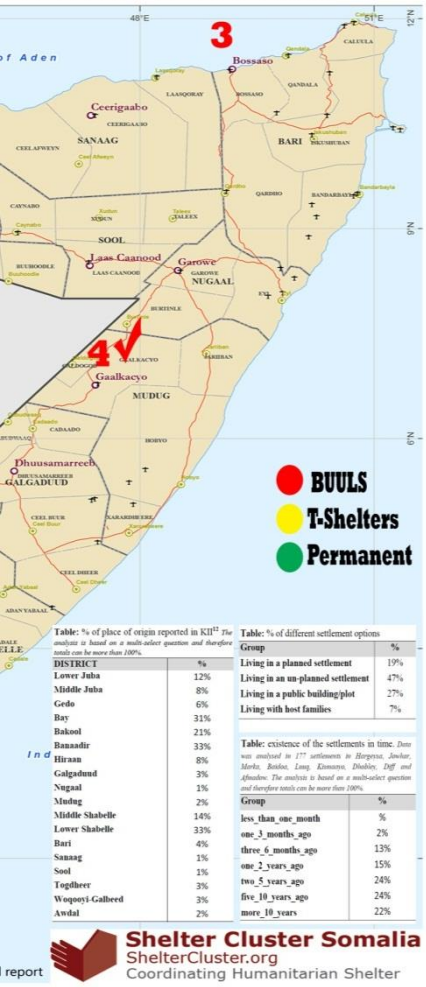


Table: % of place of origin reported in KII[12] *The analysis is based on a multi-select question and therefore totals can be more than 100%.*

DISTRICT	%
Lower Juba	12%
Middle Juba	8%
Gedo	6%
Bay	31%
Bakool	21%
Banaadir	33%
Hiraan	8%
Galgadund	3%
Nugaal	1%
Mudug	2%
Middle Shabelle	14%
Lower Shabelle	33%
Bari	4%
Sanaag	1%
Sool	1%
Togdheer	3%
Woqooyi-Galbeed	3%
Awdal	2%

Table: % of different settlement options

Group	%
Living in a planned settlement	19%
Living in an un-planned settlement	47%
Living in a public building/plot	27%
Living with host families	7%

Table: existence of the settlements in time. *Data was analysed in 177 settlements in Hargeysa, Jowhar, Marka, Baidoa, Luuq, Kismaayo, Dhobley, Diff and Afmadow. The analysis is based on a multi-select question and therefore totals can be more than 100%*

Group	%
less_than_one_month	%
one_3_months_ago	2%
three_6_months_ago	13%
one_2_years_ago	15%
two_5_years_ago	24%
five_10_years_ago	24%
more_10_years	22%

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HEALTH

KII stated that the closest **health** facility that IDPs/host community have access to is on average a **39** minute walk from their place of residence.

50 **Health facilities** were captured in all 694 settlements.[20] Of this 82% of them are **functioning** and 72% of health facilities reported to have a **lockable room**. In total, 153 **rooms** were reported in all the health facilities.

76% of health facilities reported having access to **water**. 50% % of the health facilities reported having access to **electricity**.

In total, there are 30 **nurses**, 20 **community health workers**, 11 **doctors** and 24 **midwifes** employed in the health facilities.

In 12% of the KII, it was reported that the population had access to **nutrition** programmes. 21% of KII reported the existence of **Child Friendly Spaces**.

Table: Typologies of Health Facilities

Typology	%
Health Centres	50%
Primary Health Care Unit	30%
Mobile clinics	2%
Hospital	4%
Other	12%

Table: Running of the health facility

Services	%
INGO	23%
LNGO	20%
Private	23%
Public	34%

Table 15a: Services available *(The analysis is based on a multi-select question and therefore totals can be more than 100 %.)*

Services	%
Maternal health services	36%
Vaccination services	32%
Paediatric services	30%
Outpatient services	48%
Inpatient services	24%

EDUCATION

248 schools were mapped out in all 694 settlements[21] of which 86% were functioning. In total, 569 classrooms were reported. 50% of all schools reported having a school committee.

The closest **school** where IDPs have access to is reported to be (on average) a **29** minute walk.

The number of schools with access to **latrines** was reported at 50%. Of these 90% are **functioning**, and 47% are **segregated** male/female.

15% of all schools reported being connected to the municipal water system.

In total, 12,696 **male** students and 9,616 **female** students are enrolled in the schools. 17,092 **IDP children** have access to these schools.

In total, there were 294 female and 574 male teachers reported respectively 62% and 59% being paid incentives. 4% of the schools were categorized as religious.

Table: What kind of school is it? *Data was analysed in 98 schools.*

Reason	%
Primary	57%
ECD Primary Adult	0%
ECD Primary	1%
ECD Adult	1%
ECD	0%
Koranic	41%

Table: Who runs the school? *Data was analysed in 98 schools.*

Who	%
Private	8%
Community	52%
Government	6%
Imam	34%

Table: Access to services in the school *The analysis is based on a multi-select question and therefore totals can be more than 100 %.*

Services at schools	%
Access to municipal water	15%
Rainwater harvesting	6%
Access to borehole	2%
Access to watertank	9%
Access to shallow well	3%
Other	6%
None	87%

WASH

Data regarding latrines was analysed in 694 settlements.[17] 6% of all settlements didn't have access to any latrines. 47% of all settlements didn't have access to any water point within their settlement.

In total, 8322 **latrines** were captured in all settlements and in total 11972 **dropping holes** were reported[18]. 89% of latrines were categorized as **functional**.

According to the data collected, 63% of all latrines were categorized as **communal** and 37% categorized as individual. 78% were reported **as lockable**. In total, 67% of all latrines are reported to be **maintained**.

11% of the latrines had **hand washing** next to it. 9% of hand washing stations had soap. Most of the latrines that had hand washing, were functional with taps. *(Data was analysed in 177 settlements in Hergeysa, Jowhar, Marka, Baidoa, Luuq, Kismaayo, Dhobley, Diff and Afmadow)*

In total, 2,528 **water points** were captured in all settlements, with a total of 2,739 taps. 30% are connected to the **municipal water system**.

88% of all water points were categorized as **functional**. 22% of the surrounding communities had said that the price of water had increased.

Table: Reasons of non-functionality latrines *(Data was analysed in 694 settlements. The analysis is based on a multi-select question and therefore totals can be more than 100 %)*

Time-period	%
Pit is full	82%
Super structure cracked	18%
Security	%
Septic tank not connected	4%
Other	8%
Unknown	4%

Table: Reasons of non-functionality water points reported. *Data was analysed in 569 settlements. The analysis is based on a multi-select question and therefore totals can be more than 100 %.*

Time-period	%
Storage tanks broken	33%
Taps broken	27%
Water contaminated	9%
Water trucking stopped	25%
Connection to municipal is broken	%
Insecurity	%
Dominated by host comm.	%
Pump or generator broken	1%
Unknown	14%
Other	8%

Table: Typologies of water points

Time-period	%
Burkad	28%
Water tank	28%
Tank and tap	8%
Water-trucking	1%
Water Kiosk	15%
Other piped systems	10%
Protected well w/o pump	2%
Protected well with pump	3%
Unprotected well	1%

FOOD SECURITY

In total, 144 **markets** and 1,385 **kiosks** were mapped out. The data collection was done in all 694 settlements. In 54% of all settlements, there were no kiosks reported. 78% of the markets and

Table: typology of the Kiosk. *Data was analysed in 2538kiosks.*

Reason	%
Corrugated Iron Sheet	34%
Kiosk in durable materials	3%
Local sticks + cloth + CGI	18%
Local sticks and plastic (fixed location)	14%
Local sticks and plastic (moveable)	31%

Table: Items for sale at kiosks. *Data was analysed in 2538kiosks. The analysis is based on a multi-select question and therefore totals can be more than 100 %.*

Reason	%
Grains	83%
Vegetables	84%
Pulses	60%
Meat	9%
Fish	9%

Table: price of Sorghum (according to KII) *Data was analysed in 177 settlements.*

Reason	%
Much cheaper than normal	11%
Cheaper than normal	5%
Normal	42%
Higher than normal	40%
Much higher than normal	3%

Table: Price of Maize (according to KII) *Data was analysed in 177 settlements*

Reason	%
Much cheaper than normal	10%
Cheaper than normal	4%
Normal	34%
Higher than normal	46%
Much higher than normal	7%

10. AFMADOW

11. KISMAAYO

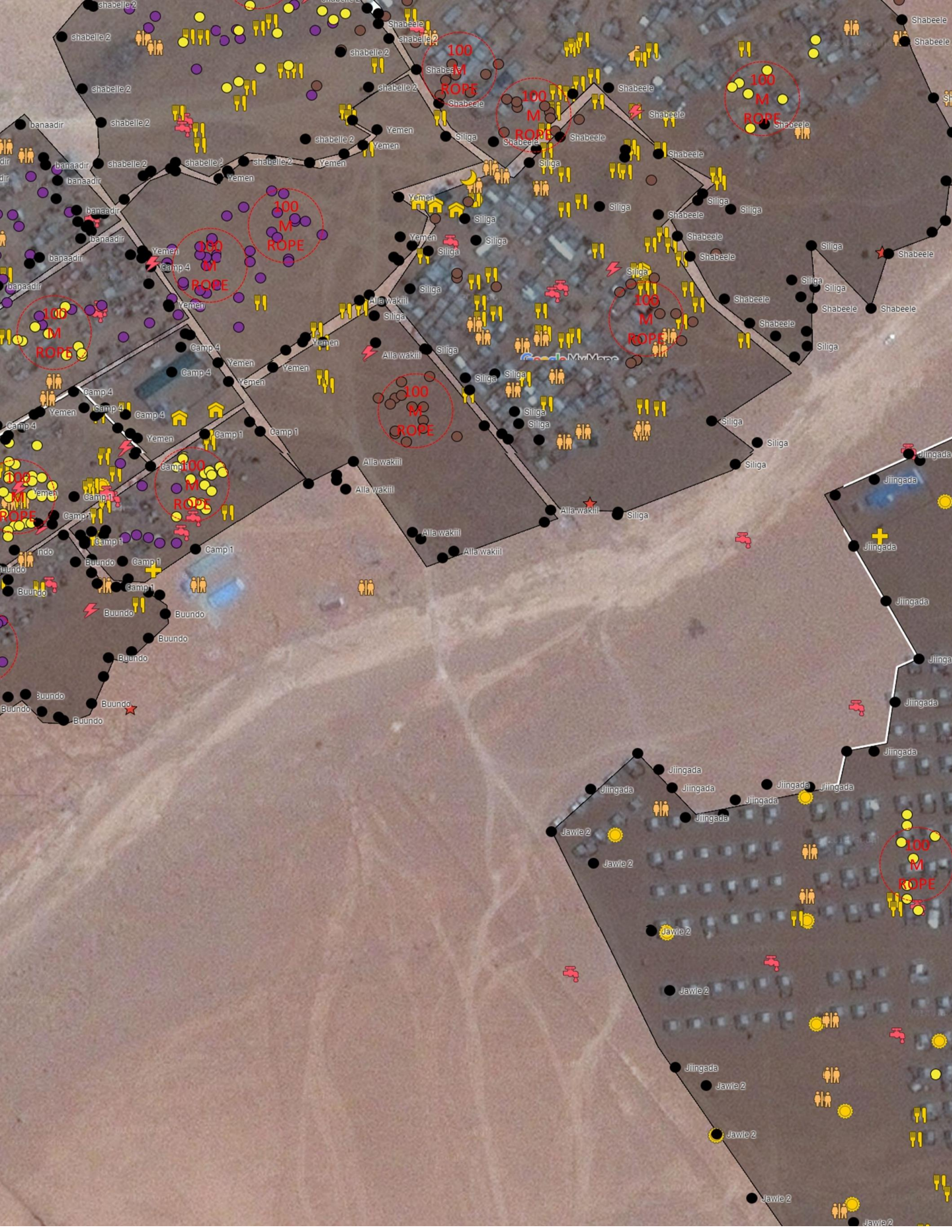
12. MARCA

LESSONS LEARNED FROM MAPPING EXERCISE AND DENSITY CHECKS

The collection of data is crucial in better understanding the needs of our population. Sadly enough, data collection and good analysis takes time and humanitarians always need to balance out time versus impact. The mapping exercise was therefore conceptualized to be a repetitive exercise taking into account the dynamic movement of IDPs in urban centres due to evictions, in-security and lack of services. The main aim of the exercise was to create a base-line data set that was public and time-bound with inter-sectorial data regarding IDPs and their access to basic services. The aim of the density checks was to conduct a quick turnaround household assessment with data that helps to calculate average surface areas per household and therefore could potentially provide a more accurate household estimate. The Shelter Cluster has taken some lessons learned and is constantly making improvements to the tool and methodology:

- *The accuracy of the perimeter remains key in linking this exercise to a HH estimate. Shelter Cluster has understood that perimeters in peri-urban environments are more accurate than in town due to the absence of a built environment. The perimeter in urban centres becomes more problematic as much of the built-up environment is damaged or un-safe. In this case, percentages of non-habitable space should be incorporated in the calculation.*
- *The sub-settlements approach was dependant on secondary good satellite imagery which is often not available. Therefore, it did not provide a very accurate and statistical approach to HH estimates.*
- *The Shelter Density classification provided interesting results, but were too subjective as the definition of low, medium and high density were not interpreted by the enumerators in different ways.*
- *The Random Rope methodology provided very interesting and accurate case studies within settlements. The methodology was very difficult to be used within a dense urban fabric.*
- *The exercise is also trying to map out all health centres in the wider urban area and not only linked to the IDP settlements as IDPs often visit health centres far away. This potentially could also be done for schools and other basic services that are not located in the direct vicinity of the settlements.*

Although the exercise provides a good base for further discussions on household estimates, the exercise acknowledges the limitations and constraints of the exercise. It has therefore recommended that the data collected regarding density could be triangulated with secondary and other primary data to validate any household estimate in close collaboration with all stakeholders. Further analysis and research needs to be done with the rope methodology to make it more statistical and scientific. Shelter Cluster is looking at working together with research centres and academic institutions to improve the methodology and the overall use of this mapping tool.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