

CAMP MAPPING AT UNHCR



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The case of Lugufu I and II, Tanzania

- Use Satellite imagery, GPS points, and information from our partners to map Lugufu
- Develop a set of best practices for using satellite imagery
- Link existing ProGres/registration data to GIS
- Develop a capacity and system for continually updating the maps and databases

Lugufu I and II

- Population 60 000 in Lugufu I;
35 000 in Lugufu II.
- Refugees of Congolese nationality (DRC).
- Implementing partners
 - Tanzanian Red Cross
 - World Vision
 - Care International



Facts - Camp structure

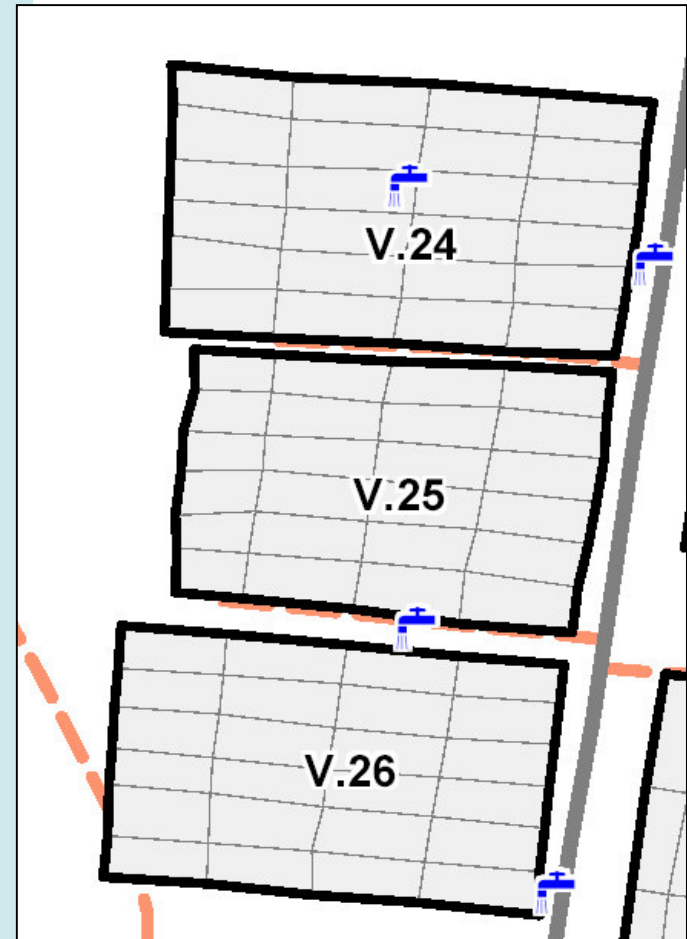
The structure in Lugufu I is

- Village (32) – admin 1
- Block (768) – admin 2
- Plot (approximately 18 250) – admin 3

The structure in Lugufu II is

- Zone (7) – admin 1
- Cluster (60) – admin 1*
- Block (approximately 360) – admin 2
- Plot (approximately 6 500) – admin 3

In total approximately 25 000 plots!



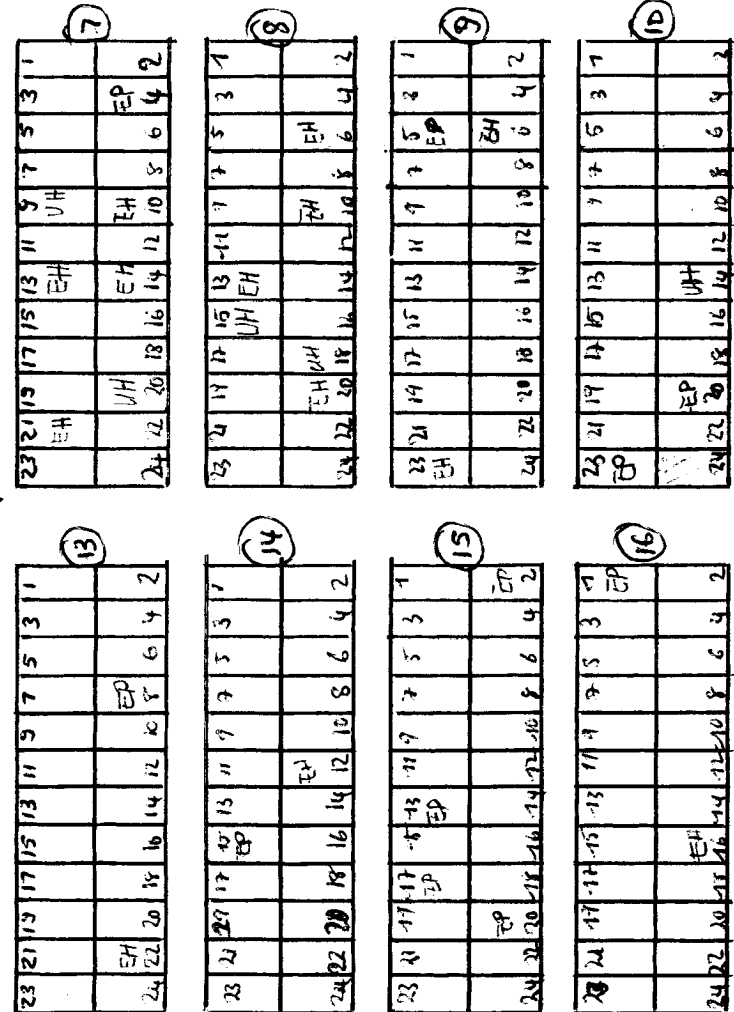
Available data

1. QuickBird satellite image from July 2003 (0.6 m resolution).



Available data

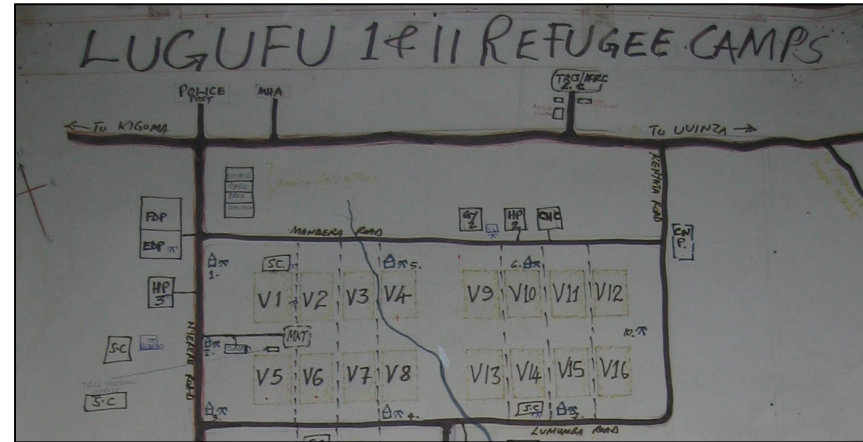
- World Vision sketches of camp layout.
- Well organized address system.



Available data

4. Sectoral Data:

- Water
 - Tanzanian Red Cross hand-drawn water map.
 - GPS measurements of many water points, not in standard system WGS 84.



- Education
 - Data about schools in Excel.

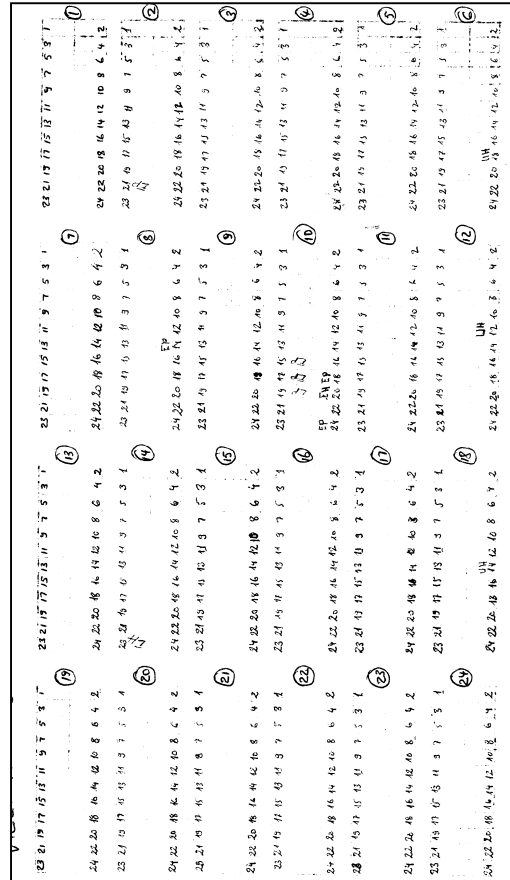
	A	B	C	D	E
1	The Lugufu Water Initiative		II. Compound Water		12.08.04
2	Under contract of Spanish Red Cross for Tanzania Red Cross				Santiago Arnalich
3					
4	Annex 3.4 GPS Points for Cloud Comparison				
5					
6					
7	Grid	UTM			
8	Datum	ARC 1950			
9					
10	Name	Description	Position	Altitude	Symbol
11		145	36 M 193781 9432833	1080 m	Flag
12		146	36 M 193781 9432833	1080 m	Flag
13	2W/P1 !!	Pressure Problem	36 M 193929 9431906	1056 m	Drinking Water
14	2W/P10		36 M 194439 9431387	1072 m	Drinking Water
15	2W/P11 !!	Pressure problem	36 M 194749 9431441	1070 m	Drinking Water
16	2W/P12		36 M 194611 9431086	1068 m	Drinking Water
17	2W/P13		36 M 194651 9430811	1073 m	Drinking Water
18	2W/P14		36 M 193437 9432754	1067 m	Drinking Water
19	2W/P15		36 M 194269 9432293	1071 m	Drinking Water
20	2W/P16		36 M 194244 9432556	1070 m	Drinking Water
21	2W/P17		36 M 193915 9430831	1068 m	Drinking Water
22	2W/P18 !!	Pressure problem	36 M 194298 9430472	1084 m	Drinking Water
23	2W/P19		36 M 195153 9431523	1064 m	Drinking Water
24	2W/P20		36 M 195378 9431028	1069 m	Drinking Water

Mapping of Basic Structures

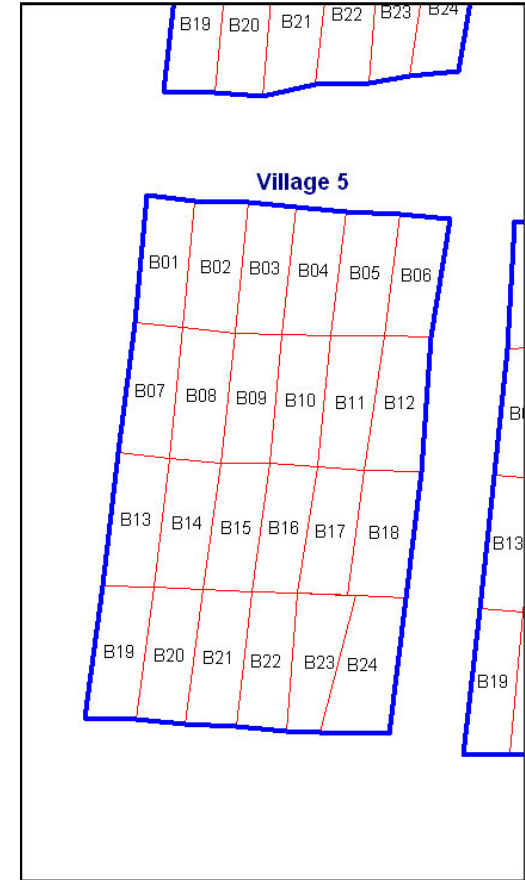
- Digitize the administrative structure of the camp.



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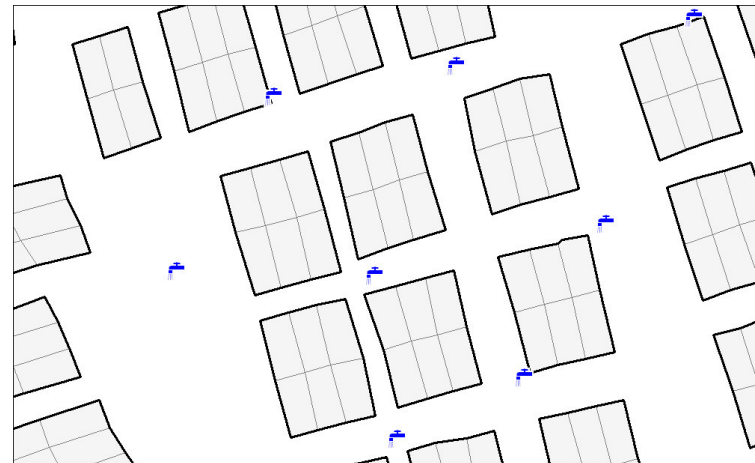
Mapping of Basic Structures

- Digitize the road network of the camp.



Water Sector

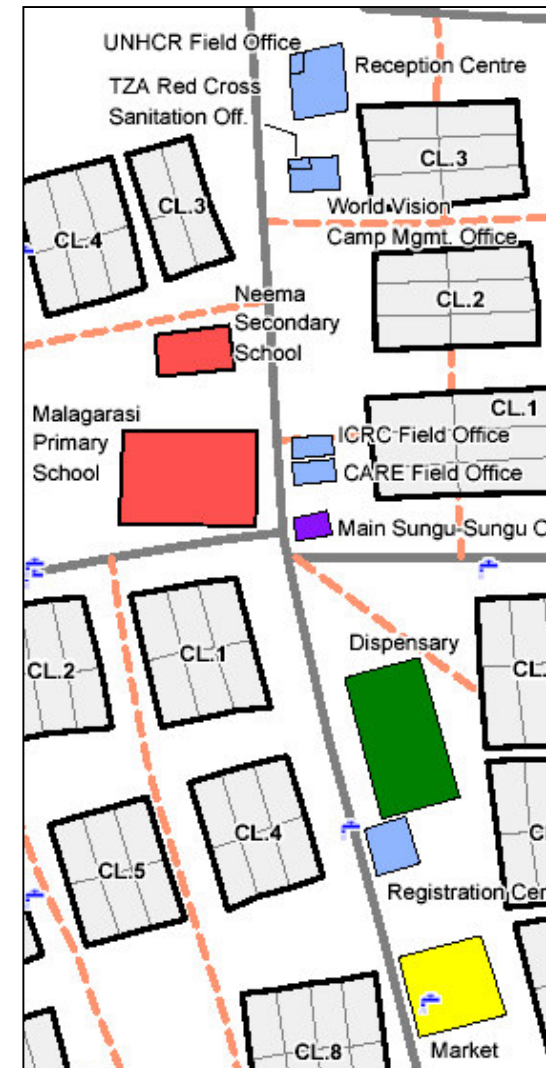
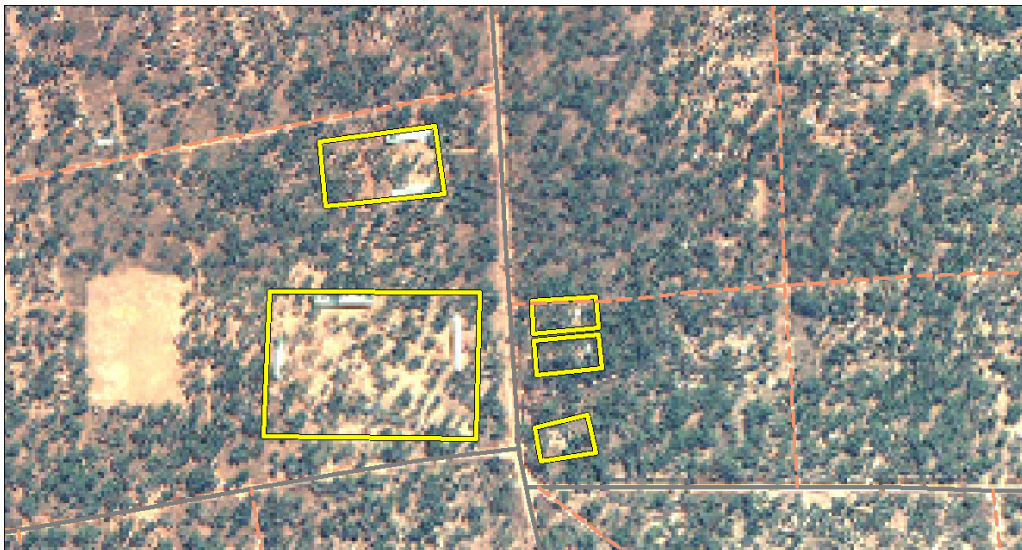
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NAME	SECTOR	TYPE	POTABLE	OPERATING	AGENCY
6C	Water	Public Water Tap	T	F	TZA Red Cross
6B	Water	Public Water Tap	T	F	TZA Red Cross
5C	Water	Public Water Tap	T	F	TZA Red Cross
5B	Water	Public Water Tap	T	F	TZA Red Cross
1B	Water	Public Water Tap	T	F	TZA Red Cross
1C	Water	Public Water Tap	T	F	TZA Red Cross
2B	Water	Public Water Tap	T	F	TZA Red Cross
4F	Water	Public Water Tap	T	F	TZA Red Cross
4C	Water	Public Water Tap	T	F	TZA Red Cross
4D	Water	Public Water Tap	T	F	TZA Red Cross
4B	Water	Public Water Tap	T	F	TZA Red Cross
12B	Water	Public Water Tap	T	F	TZA Red Cross
12A	Water	Public Water Tap	T	F	TZA Red Cross
13C	Water	Public Water Tap	T	F	TZA Red Cross
13B	Water	Public Water Tap	T	F	TZA Red Cross
Chlorination	Water	Treatment	T	T	TZA Red Cross
Lugufu Intake	Water	Pumps	T	T	TZA Red Cross
BH 1A	Water	Borehole	T	T	TZA Red Cross
BH 5	Water	Borehole	T	T	TZA Red Cross
1	Water	Public Water Tap	T	T	TZA Red Cross
10	Water	Public Water Tap	T	T	TZA Red Cross
11	Water	Public Water Tap	T	T	TZA Red Cross
12	Water	Public Water Tap	T	T	TZA Red Cross

Education, Health, Security, Environment, etc.

- Traveled in camp with the Implementing partner for each sector to identify each facility in their sector as well as collect attribute information.
- Facilities were digitized using the satellite image or with GPS points collected in the field.



Recording events



Refugee Status Determination



Assistance



Protection



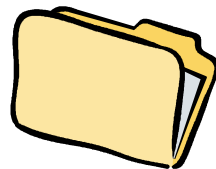
Registration



Documentation



Resettlement



Physical file



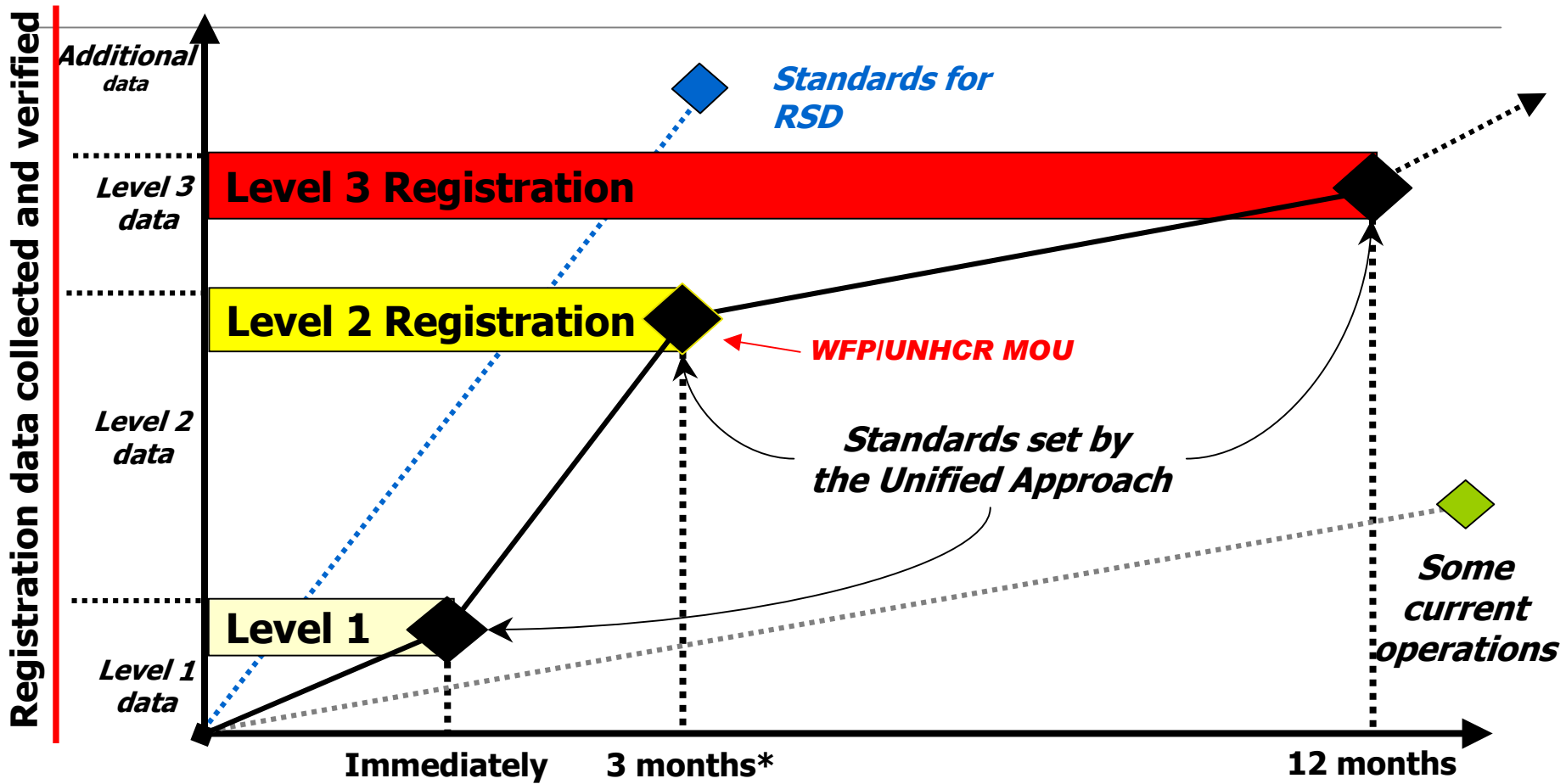
Local integration



Voluntary repatriation



Registration Levels Standard data sets

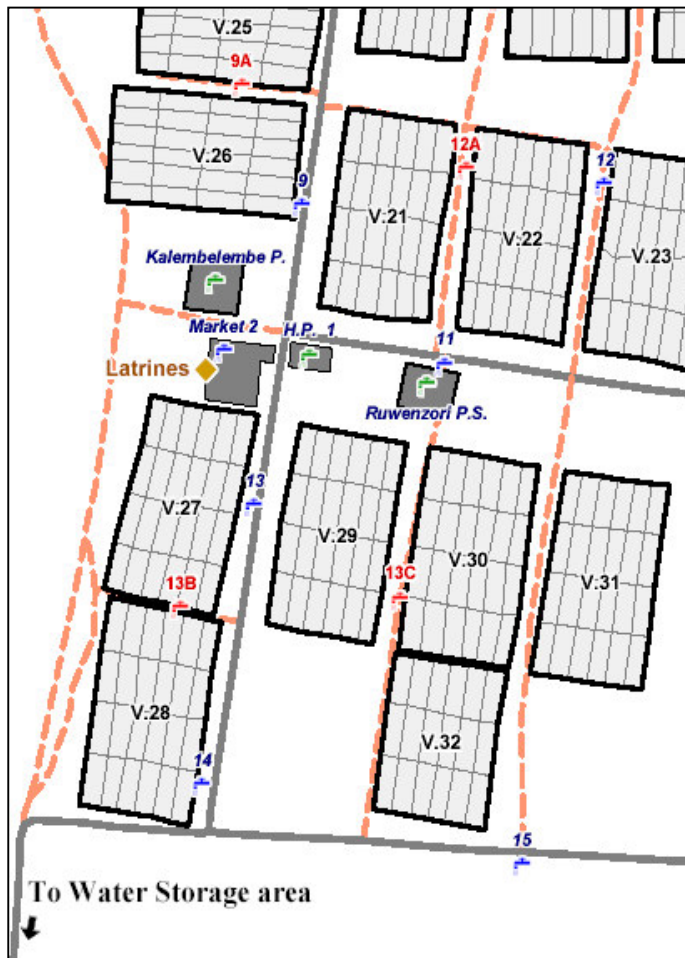


Time after arrival on territory of asylum

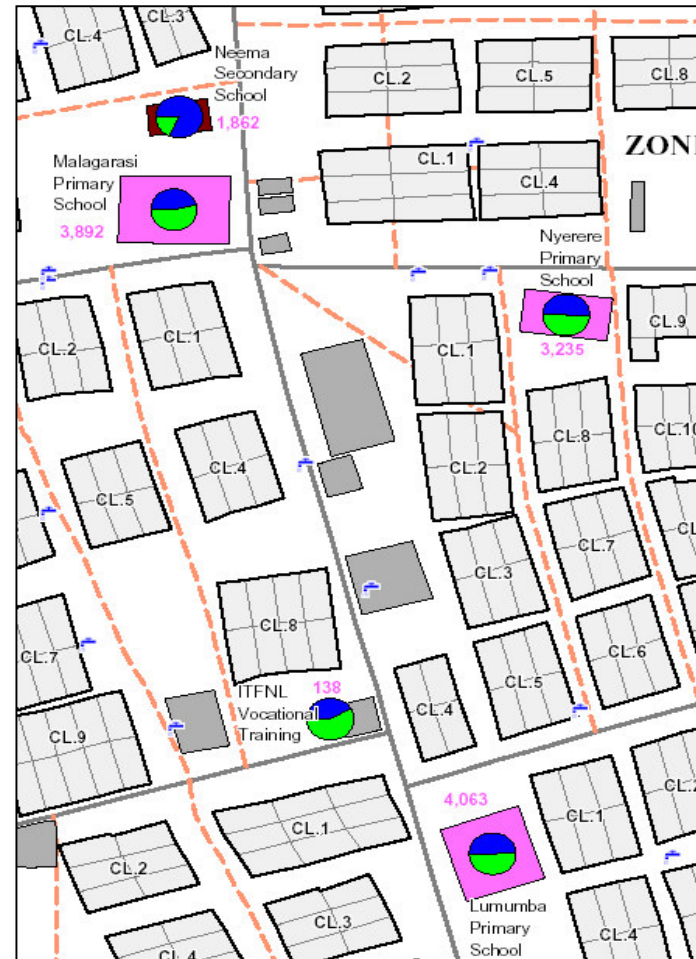


Mapping and Analysis

Wat/San

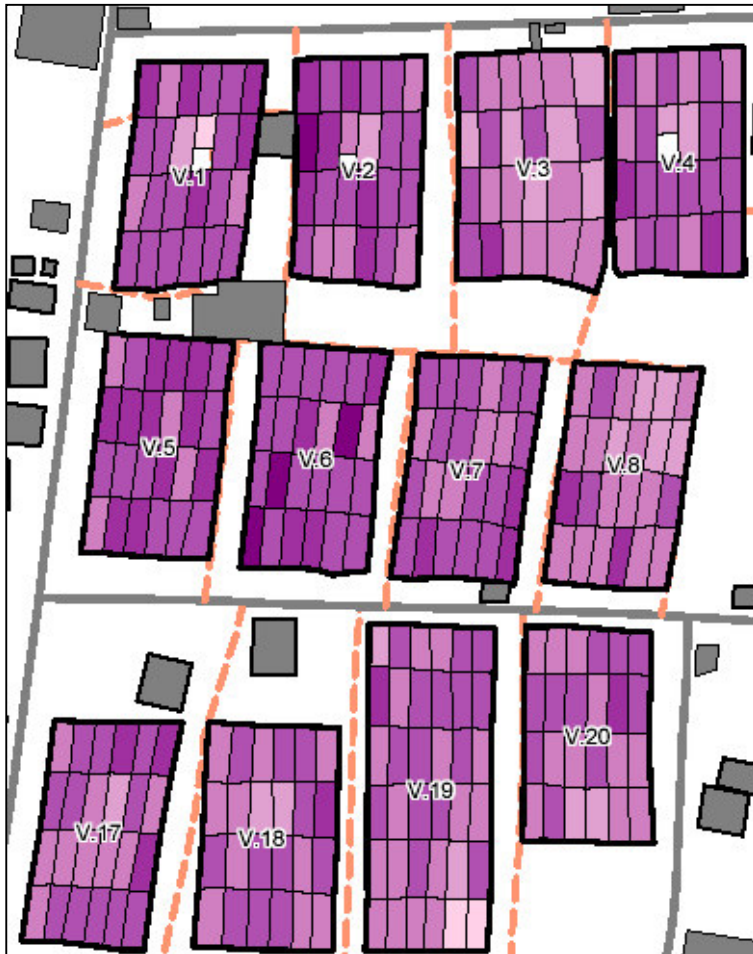


Education

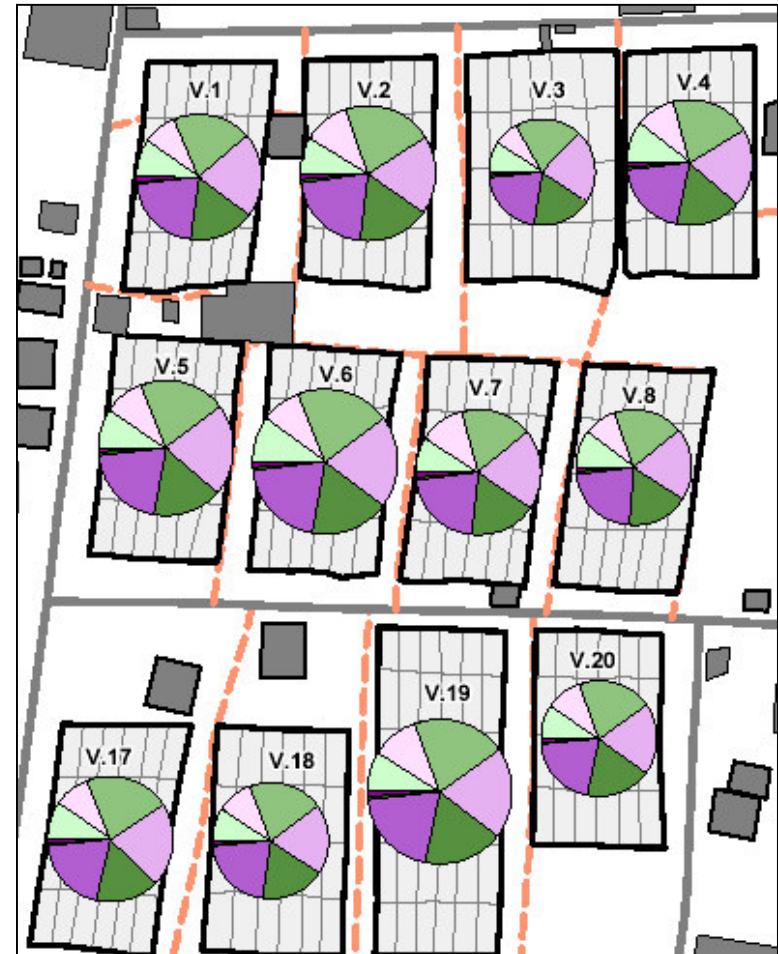


Mapping and Analysis

People per Block

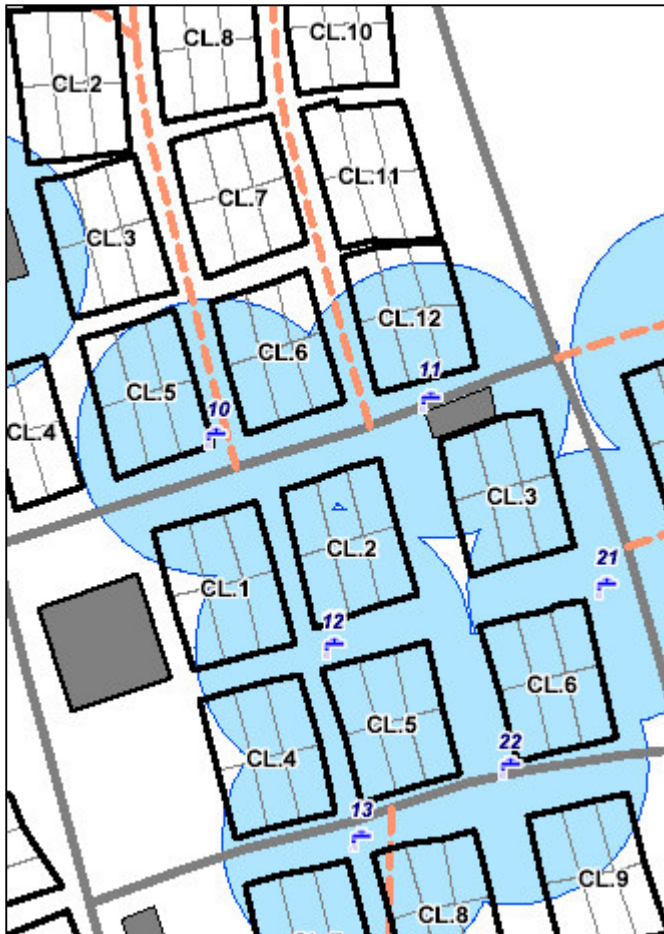


Age/Sex breakdown per Village



Mapping and Analysis

Areas and populations >200m from a water point

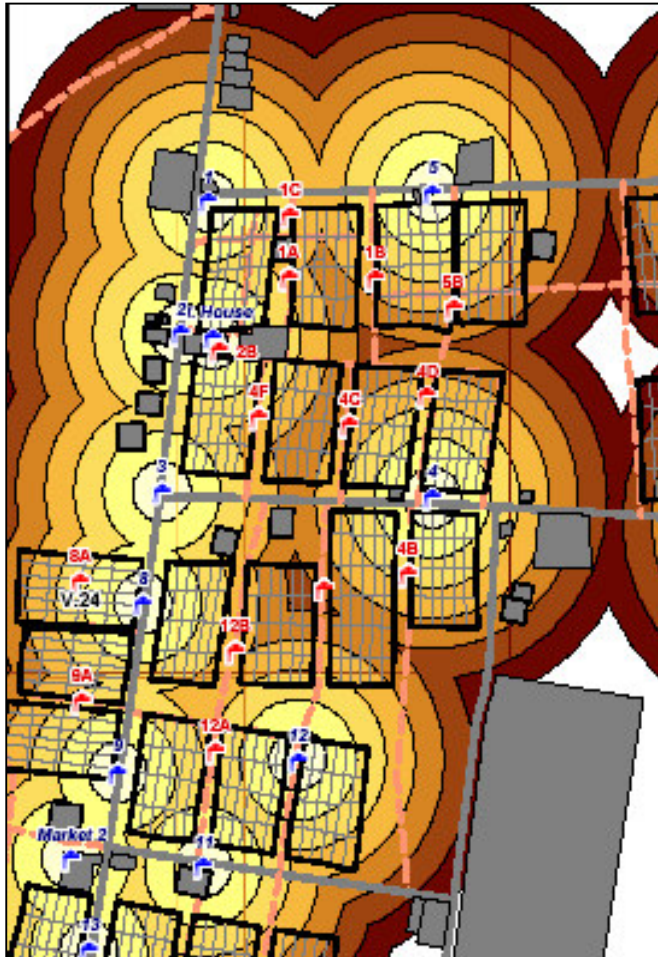


Square meters per person

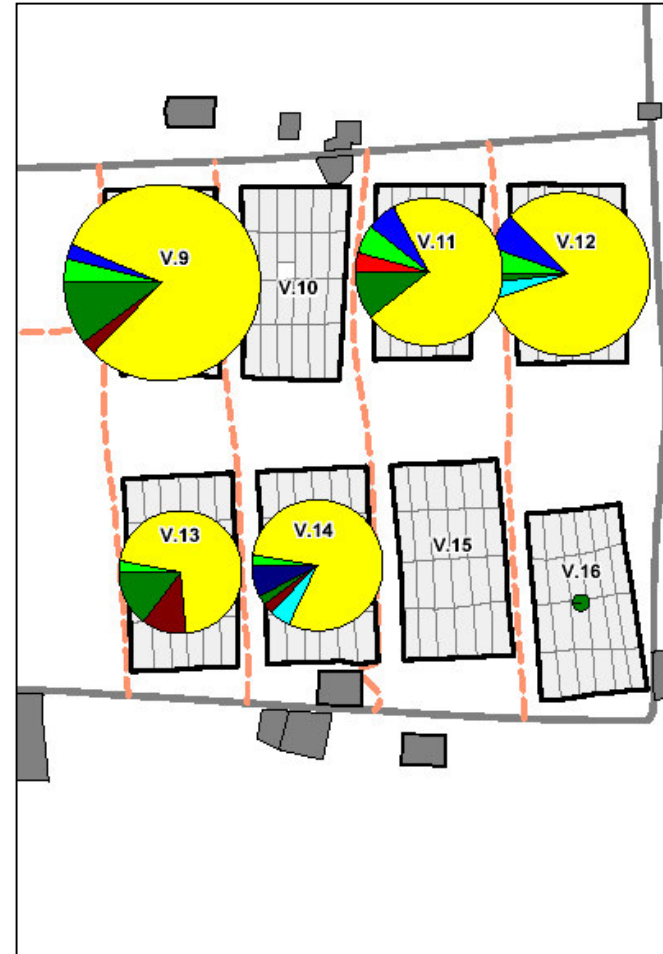


Mapping and Analysis

Calculating the average distance traveled to the nearest water tap



Number of "vulnerables", by type



Future Work

- **IDP**
 - **Where? How many? From and to?**
- **Emergencies**
 - **Rapid population estimates**
 - **Large scale (camp level) disaster management**
 - **Contingency planning**
 - **Efficient data exchange**
- **Environmental and socio-demographic impacts of displaced populations (incl. on host populations)**
- **Spatial analysis for return and integration opportunities**

