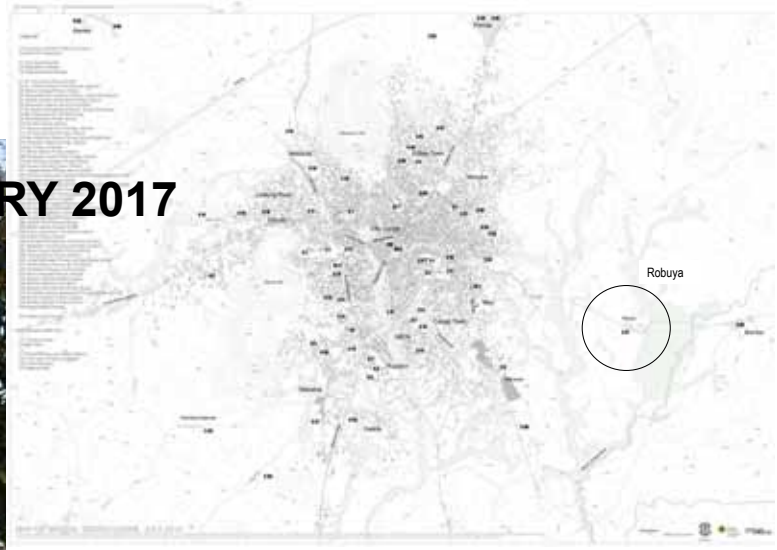
ROBUYA VILLAGE
MAKENI, SIERRA LEONE

NEIGHBOURHOOD UPGRADING PROGRAMME. JANUARY 2017



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Coordinator of the activity and report

January 2018

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The work introduced is the continuation of the urban planning process started by San Pablo CEU University (Madrid, Spain), University of Makeni-UNIMAK (Makeni, Sierra Leone) and the Makeni City Council. This process includes three participatory workshops in the city of Makeni (July 2013, January 2014 and January 2016) with another technical meetings in January 2017. The last step in the process has included different activities during the January 2017 trip of CEU University. The main one was the starting of a **Neighbourhood Upgrading Programme, developed in Robuya village.** From a participatory approach, lecturers and students from the University of Makeni and San Pablo CEU University with technicians of the Makeni City Council, worked with the local community detecting the main priorities of the neighbourhood. From a first meeting in the Community Center of Robuya, two groups were formed linking villagers, students, lecturers and professionals in three main tasks (Mapping, Data collection and Survey for detecting priority interventions).

The present document includes a brief summary of the works developed during the fieldwork (two sessions) and the main conclusions obtained. It has been completed later to obtain this Final Report, organized in the following topics:

1. Approach
2. Mapping
3. Data Collection and Quantitative Analysis. Key part of the report, based on 10 habitability topics, that summarizes the main issues in Robuya village
4. Survey
5. Conclusions
6. References

Acknowledgment
The CEU-UNIMAK interuniversity cooperation project is the enormous sum of many individual efforts. Since 2009, the year of its start, until the present moment (prior to a new trip to Sierra Leone), it is impossible to remember everyone who has gone through the project, always contributing their part with enthusiasm and humility. From Madrid, students, teachers, collaborators, friends, networks that integrate many people from other universities, institutions and collectives (special thanks to ICHaB group), ... so many people who, almost without them knowing it, give shape to a unique experience that grows and branches. In Makeni, UNIMAK, key university community. Fr. Joe, indefatigable thinking head, nothing without him seems possible. Sunkarie, mayor of a city that fights without stopping. William, Clara, MAT, Fr. Benjamin and many in Makeni, and friends after this tour. Victor, sadly remembered. A journey that only with this sum of energies is possible and makes sense. The gratitude extends and continues to grow.

Nothing would have been possible without the convinced support of the San Pablo CEU University, especially from the Department of Volunteering and Pastoral, but also from the Vice-Rector for International Relations and the School of Architecture.

For this work, I would like to specially give thanks to all Robuya community, who opened their village for us during some days. We really wish the best to all this people who are adressing serious challenges with the best energy.

Luis Perea

Coordinator of the activity and report
San Pablo CEU University (Madrid, Spain)

January 2018

Image 1 (Main page). Map of Robuya Village in Makeni
Source: HD_LAB

Image 2 (Main page). Main street Robuya
Source: HD_LAB

Image 3. First meeting in Robuya Village
Source: CEU group

1. APPROACH

The *Neighbourhood Upgrading Programme* is established within the urban planning process that began in 2013 among CEU University, UNIMAK and Makeni City Council. The interventions in the city have two main priority areas:
- The existing city
- The planned or future city
The aim is to create a long term programme working **on the existing city** that allows to approach different areas of the city of Makeni. The work is carried out together with the local community; professors and students from both CEU University and UNIMAK, and with the support of the Makeni City Council.

A. GOALS

- Collecting data and developing a technical report from each neighborhood. Working on analysis, mapping, collecting data and specific information together with the local population. Useful report for the neighbourhood, the Makeni City Council and UNIMAK
- Training. Knowledge acquired in the process by the population, the students and all the implied stakeholders.
- Detecting priorities and funding options. The analysis will define the priority actions and the alternative funding possibilities.

B. TASKS DEVELOPED

- **First meeting with the local community. Monday 23rd January 2017**. 14th people from different ages were selected in the Robuya Community (women and men) for working together with the Universities and the Makeni City Council technicians. Two groups were organized, dividing the village in two parts.
- Fieldwork. Two sessions were developed (Monday 23rd afternoon and Tuesday 24th in the morning). Mapping, data collection and survey about priorities were done with the very kindness support of the local community.
- Conclusions. After some working sessions between UNIMAK and San Pablo CEU teams, a first report were obtained, to be presented to the local community on a Final meeting on Friday 27th in the afternoon.
- Final meeting with the local community. Friday 27th January 2017. In a Final meeting were presented the results of the process, delivering information (Map of the village and a Preliminary Report) to the local Community, UNIMAK and the Makeni City Council, and a small action to be founded was defined (concluding the Health Center).
- Action founded. Based on the Survey and the works done, the last step was to define a small action fo be founded by CEU University (800 euros). The last meeting was the place for deciding to **complete the Health Center.** UNIMAK would control the works
- Completing the Health Center. Some doors, windows and other elements could be founded under the organization of UNIMAK. The local community should help with the installation of materials.
- Final report. With all the iformation, is developed a Final report (this document) that will be presented in the next January 2018 trip
- Evaluation and checking the task founded. The January 2018 trip will serve for monitoring the experience and for starting with another neighbourhood

The organization of the whole experience and the development of the materials (maps, documents, surveys,...) made before and after the fieldwork, has been coordinated by **HD_LAB (Habitability and Development Laboratory)**. HD_LAB is a multidisciplinary group of CEU San Pablo University (http://hdlabceu.wixsite.com/hdlabceu).

2. MAPPING

2. MAPPING

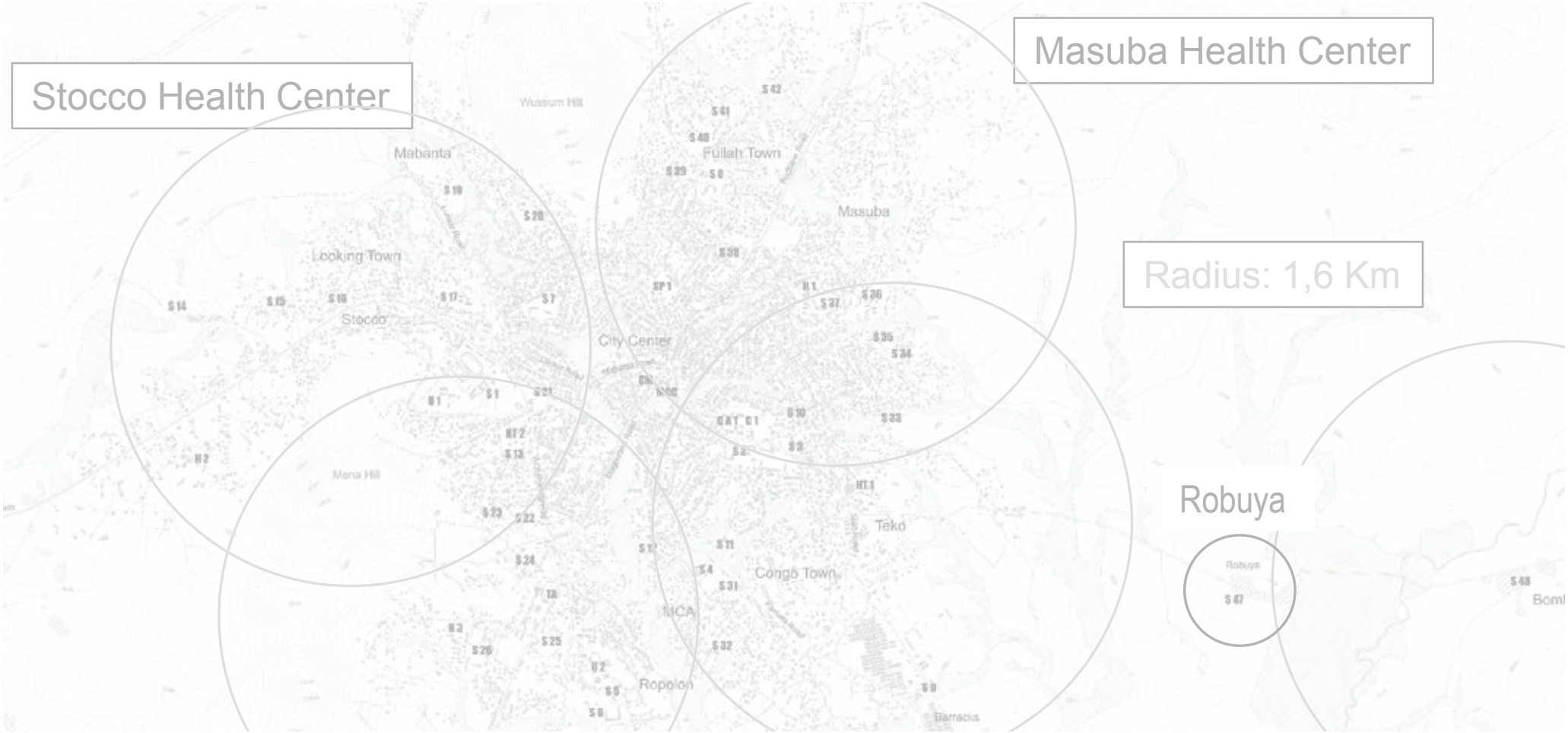
Its objective is the definition of the spatial component. In the absence of available cartography, an orthophoto of the area is used, on which the elements to be identified during the survey and the way of representing them are indicated. The delimitation of properties, buildings, basic urban infrastructures, equipment and land uses is documented, assessing their status and quality. The groups were moving around the village, talking with the people, understanding the different elements. The village was divided in two, for optimazing the time with two working groups. The image shows the right part of the village.

Image 4. Starting the fieldwork
Source: CEU group

Image 5. Aerial view of right part of Robuya. The key indicates the elements to map
Source: HD_LAB

Image 6. Map developed during the fieldwork. January 2017
Source: HD_LAB

3. DATA COLLECTION AND QUANTITATIVE ANALYSIS



3. DATA COLLECTION AND QUANTITATIVE ANALYSIS

The methodology includes an organized set of topics for understanding the main existing characteristics of the village. This approach is focused in getting a quantitative se-cuence of data for future monitoring and evaluation of the progress made. In a first step, the information has been digitalized, but just some of the quantitative data has been obtained. In this final versión of the document a more specific information is provided.

it is a simplification of the quantitative analysis proposed by L. Perea (2015, “Towards a quantitative analysis for the informal city.An approximation from basic habitability and experience in Makeni”) for the collection of basic data that allow the analysis and subsequent monitoring. It is structured into ten fundamental elements: Integration-coherence of the urban-territorial model, vulnerability forecast, access to basic infrastructures, access to basic equipment, minimal free space network and public-private relationship, basic communications system, access to employment, impact on the environment, building-habitability conditions and urban management.

The evaluation is made according to the elements of habitability, which include several indicators, according to the categories: **very high, high, medium, low and very low**

UPGRADING NEIGHBOURHOOD PROGRAMME **INDICATORS FOR EVALUATION AND MONITORING** **LOCATION** **ROBUYA NEIGHBOURHOOD**
BASIC HABITABILITY ELEMENTS
HaB 1. URBAN AND TERRITORIAL COHERENCE
HaB 2. VULNERABLE AND HAZARD AREAS
HaB 3. ACCES TO BASIC INFRASTRUCTURES (WATER, SANITATION AND SAFE ENERGY)
HaB 4. ACCES TO BASIC AMENITIES (HEALTH AND EDUCATION)
HaB 5. PUBLIC-PRIVATE LAND USE
HaB 6. BASIC COMMUNICATIONS NETWORK (CONNECTIVITY, TRANSPORT, COSTS,...)
HaB 7. ACCES TO EMPLOYMENT (ECONOMIC ACTIVITY, HOME-JOB RELATIONSHIP)
HaB 8. ENVIRONMENTAL IMPACT (DEFORESTATION, EROSION, ECOSYSTEM DAMAGE)
HaB 9. BUILDING CONDITIONS AND HABITABILITY (DWELLING-PLOT, CONSTRUCTION, OVERCROWDING)
9.1. BASIC FACILITIES
9.2. HOUSING
HaB 10. URBAN MANAGEMENT (LEGAL FRAMEWORK, TECHNICAL CAPACITY, PARTICIPATION,...)

Image 7. 10 main groups of Basic Habitability elements that organize the indicators
Source: HD_LAB

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 1. URBAN AND TERRITORIAL COHERENCE

Goal	To evaluate territorial context, logic and urban precariousness
Explanation	Distance to services, urban densities and habitability conditions are analyzed in this topic. Precarious settlements are those that do not guarantee acceptable living conditions for their inhabitants, according to UN-Hábitat 5 conditions (acces to water, sanitation, durability of dwellings, overcrowding and security of tenure)
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village (Considered as a Makeni neighbourhood)	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Connections with important production centers (cities, airports, transport nodes, ...)**	**Low**	It is valued the proximity to urban, productive nodes, ...	Km, milles, time walking, vehicle	**4,3 km; 2,7 miles; 53 minutes walking; 9 minutes vehicle**	To be less than 30 minutes away (walking) from an urban, productive, transport node, ... This reference is adapted for the case of Robuya, considering the village as a Makeni neighbourhood
2	**Total population living in slums**	**Very Low**	Total area and total population of slums or precarious settlements, in the area of study, and percentage of the total area.	Population, Area (Has), %	**1.500 people ; 7,8 Has; 100%**	Maximum: 40% for Sub-Saharan Africa, 20% for Asia, 10% for Latin America and Oceania, 5% for North Africa
3	**Gross Urban Densities**	**Low**	The density of population and dwellings reflects the degree of urban concentration per unit of gross area (urbanized total surface including roads and public facilities)	Dwellings / Ha and Inhabitants / Ha	**10 dw/Ha; 192 Inhabitants/Ha**	Depending on the context. and as long as the proposed ranges do not exceed twice the current density. Small urban environments (less than 25,000 inhabitants): Minimum 15 dwellings/Ha (50 inhabitants / Ha approx).
4	**Population with access to basic neighborhood services**	**Very Low**	It is the distance in meters to acces health (basic care), primary education, water, sanitation, market and local commerce, mainly.	(%)	**0%**	Minimum population with access to basic services (urban environments, 1,000 meters and 15 minutes): 9 0%. rural environments, 4,000 meters and one hour): 70%

Other considerations	The situation of Robuya is quite singular, comparing to other urban areas. It is a village, but is part of the Makeni dynamics. In the chiefdom context, Makeni belongs to Bombali-Seborah chiefdom, while Robuya is in Makari-Gbanti. For the population living in slums (poor living conditions), it has been considered the 5 items provided by UN-Habitat, that are also disaggregated in the corresponding topics (vulnerable land, acces to infrastructure, housing,...). Densities shows a very low housing densities, but a quite high population ones, what means overcrowding
Global evaluation	**LOW - VERY LOW**
Observations	The future expansion of Makeni will change completly the situation of Robuya village in the urban-territorial considerations.
Recommendations	It is key to consider the future expansion of the city in the Robuya area, reserving land for public equipments, markets, agriculture, new roads,... The main road, when paved, will provide a better connection with Makeni, and new building typologies (row and/or collective housing) would improve living conditions. Also, little by little, it is important to improve acces to sanitation, drainage system, acces to water and improvements in buildings.

MAKENI CITY

1

SIERRA LEONE COUNTRY PROFILE

Population (2016)	7,076,641
Urban population	4,187,016
	41%
Area (km2)	71,840
Density	98,5
HDI rank (/188)	179

Socioeconomic profile

GDP per capita, PPP	US$ 1,474
Human Development Index	42.0
Access to improved water source	62.6%
Improved water source, piped (% of urban population)	11.5%
Access to improved sanitation	13.3%
Access to electricity	13.1%
Universal Health Coverage	63.6%
Life expectancy at birth	51.3
Literacy rate	51.4%
Literacy rate of 15-24	67.4%
Expected years of schooling	3.3
Tenure: ownership	71.1%
Average people/house	8.8

National Urban Policies

xx

MAKENI TERRITORIAL CONTEXT

Makeni is the fifth largest city of Sierra Leone, the capital of Bombali District and the economic center of the Northern Province. It lies around 137 km (85 miles) away from Freetown, the capital city. It has a current population of 125,970 people, which means a 10 time increase in the last 50 years.

Legal framework

Sierra Leone is a constitutional parliamentary republic with three spheres of government: central government, local councils and chiefdom councils.

Makeni constitutes one of the six City Councils and Municipalities of Sierra Leone.

Administrative organization

Province	Northern
District	Bombali
Chiefdom (Makeni + 7 mile radius)	Bombali Sebora, Makari Gbanti, Safroko Limba, Paki Masabong

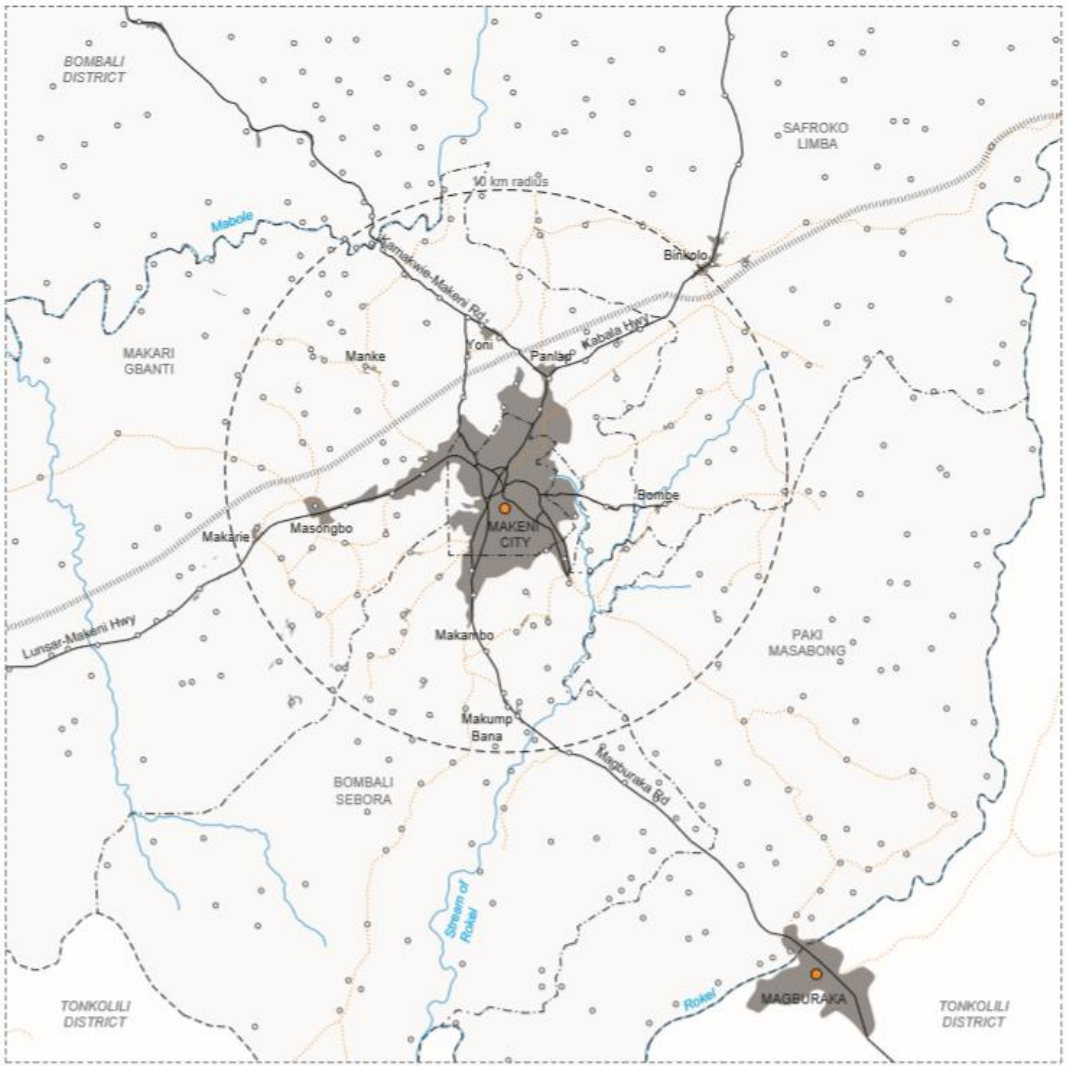
Socioeconomic profile

Population (2016)	125,970
Urban population	124,634
Population growth rate	3.5%

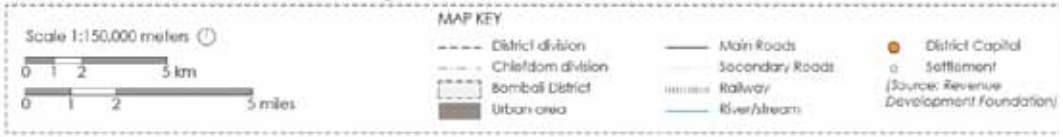
Urban policy tools

- **2 year Local Development Plan**
- **Strategic Urban Plan for Makeni**

A long term proposal among Makeni City Council, Unimak (University of Makeni) and San Pablo CEU University



MAKENI Territorial context. Administrative organisation. Urban areas and settlements.



Sources: World Bank, UN Habitat, Statistics Sierra Leone, census 2015, Local Government Act 2004

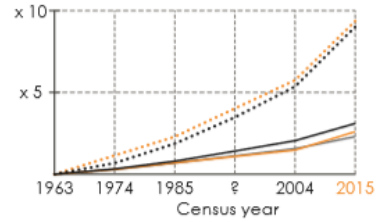
URBAN GROWTH

Urban population

Makeni´s population is growing at a rate of around 3,5 %, meaning that in 2050 the urban population will be more than triple.

	Sierra Leone	Makeni	
1963	2,180,355	12,304	Population growth rate
1974	2,735,159	26,781	
1985	3,515,812	40,038	
2004	4,976,871	82,840	
2015	7,092,113	125,970	
2025*		177,693	3,5%
2050*		419,932	

Comparative population growth



Makeni
Sierra Leone
World urban population
Sub-Saharan Africa
Sub-Saharan Africa urban population

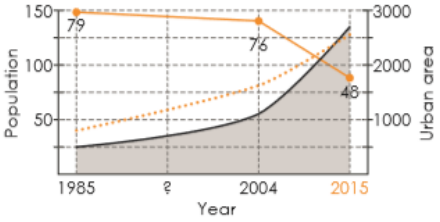
Urban extent

The unplanned growth of the city is leading to disperse urbanisation patterns with low density occupancy.

	Urbanised area (Ha)	Density people/Ha
1985	505	79
2004	1,086	76
2015	2,608	48
2025*	4,000	45*

** estimated values*

Population and urban area



Population (thousands)
Urban area (Ha)
People/Ha

URBAN STRUCTURE

Central area

15-20 dwellings/Ha

scale 1:7,000 meters

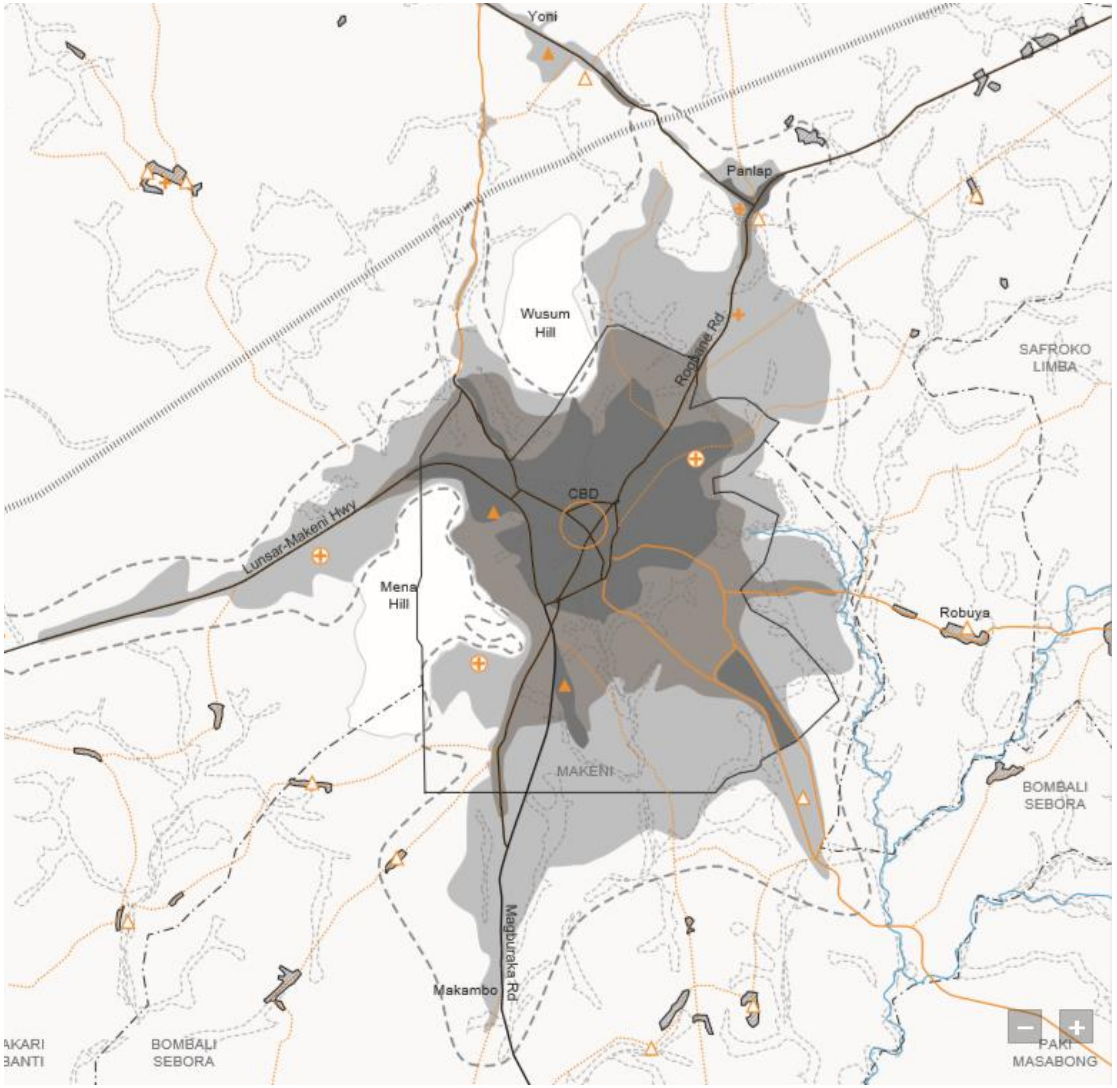
Private land	77%
Public land / street area	5% / 10%
Average plot size	30 x 20
Average house size	10 x 10
Average people/dwelling	6-8

Growing area

5-10 dwellings/Ha

0 100 500 m

Private land	80%
Public land / street area	2% / 5%
Average plot size	30 x 20
Average house size	10 x 10
Average people/dwelling	6-8



MAKENI urban growth. Main infrastructures and facilities.

Scale 1:50.000 meters

0 0.5 1 2 3 km

0 0.5 1 2 miles

MAP KEY

Chiefdom boundary
Section boundary
Main Roads 1985
Main Roads
Secondary Roads
Railway
River/stream
Hills
Swamp
Central Business District
University
School
Hospital
Health center
Urban area
1985
2004
2016
2025*
*estimated growth

HAB 1. URBAN AND TERRITORIAL COHERENCE

For this section, we use information from digital viewers (mainly Google Earth) and CAD format mapping prepared from the CEU University (HD_LAB). The data obtained during the fieldwork is the base for getting the final indicators. In this topic (Urban and territorial coherence) are included aspects related to territorial context, living habitability conditions and urban effectiveness. Linking all these issues, the topic gives a general idea of the urban and territorial situation of the settlement. A brief explanation of each indicator is provided:

Indicator 1. Connections with important production centers (cities, airports, transport nodes, ...)

This indicator is commonly used for understanding the situation of relative isolated settlements. The case of Robuya village is quite singular, as can be considered as a village or as an urban neighbourhood. Comparing to other villages, Robuya is in a very good position very close to Makeni. But as a Makeni neighbourhood the distance to the center, must be considered as negative. Also transport cost (bike) should be considered (10.000 leones). A minimum salary per month is around 500.000 leones, so the connection is very expensive for the Robuya population.

The 4,3 km (2,7 miles) is a distance that takes 53 minutes walking (the most common way in Robuya) to acces the Makeni city center. There is also a distance of 1 mile to Bombe village in the east. So, for any issue (administrative, market, ...) the people need to spend many time. So the evaluation of the indicator is Low.

Considering the urban expansion of Makeni, Robuya will be soon part of the city. In this process, is important for the City Council to create productive areas for employment and commerce in the periphery of the current city. Related to that, the proposal of a Ring Road (CEU, HD_LAB), would be close to Robuya and it can be an opportunity for organizing these new needs.

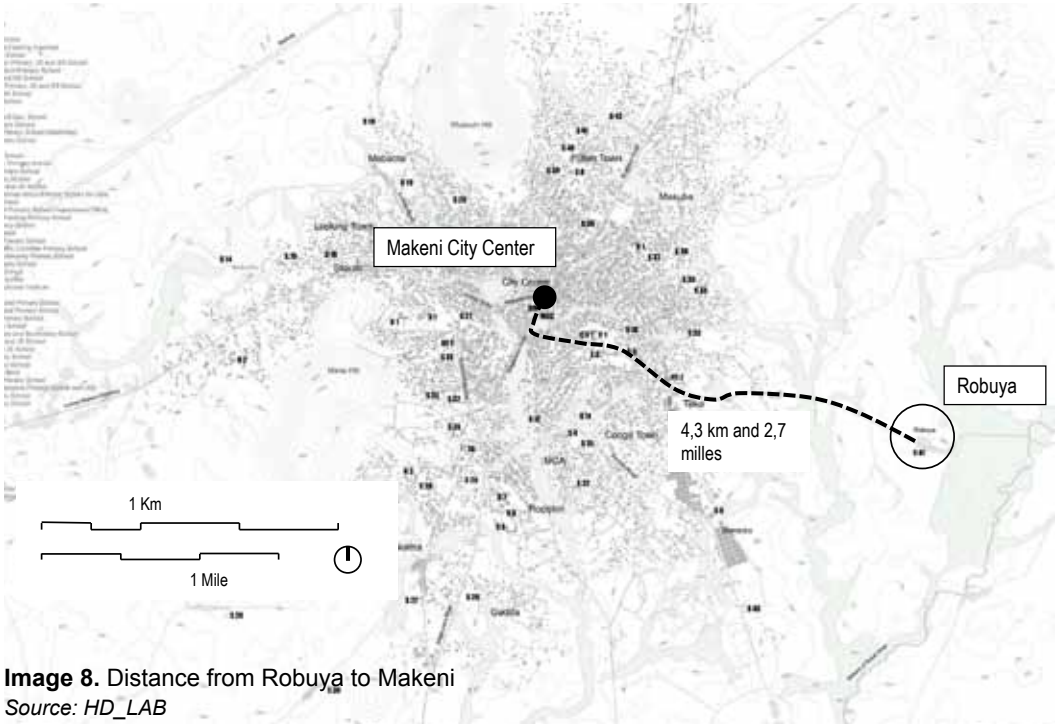


Image 8. Distance from Robuya to Makeni
Source: HD_LAB

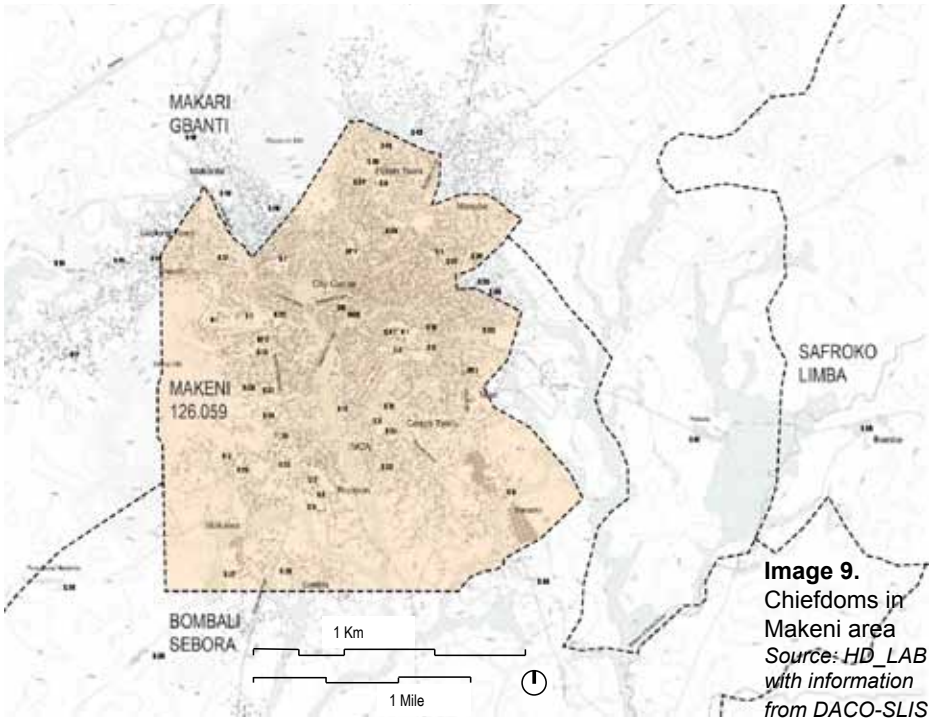


Image 9. Chiefdoms in Makeni area
Source: HD_LAB with information from DACO-SLIS

Indicator 2. Total population living in slums

According to the UN-Habitat 5 living conditions (acces to water, sanitation, durability of dwellings, overcrowding and security of tenure), all of the Robuya village is a slum. With one or more of the conditions, it is enough for considering a slum. According to the security of tenure, for instance, all the village belongs to the Tarawalli family, what cannot be considered as secure tenure. Acces to sanitation is another poor condition, as overcrowding as well. About overcrowding it is important to notice that UN-Habitat consider overcrowding 3 people sharing a room. In all Sierra Leone, this is something too common. Here in Robuya, the data obtained from the surveys indicates a ratio of 5 people per room. All of these elements are analyzed later in the corresponding topic, but according to the data, 100% of the population in Robuya village are living in a slum.

Indicator 3. Gross Urban Densities

The densities in Robuya shows something interesting. While the housing densities are very low (10 Dw/Ha), the population densities, according to the information from the surveys, is quite high (192 people/Ha). Obviously, this is cause the high number of people per dwelling, but shows again situations that are between urban and rural as is the case of Robuya. In terms of the urban fabric, the image of Robuya is far from being overcrowded. There are too many people per dwelling (20 people, according to the data given during the fieldwork of aproximate 1.500 total people in Robuya village. The last disagregated data (2004, Census), shows that in Makeni, 20% of the housholds have 10 persons or more. Far for the data in Robuya. Here we can confirm the number of dwellings (74) with the digital maps and fieldwork, but not the 1.500 people.

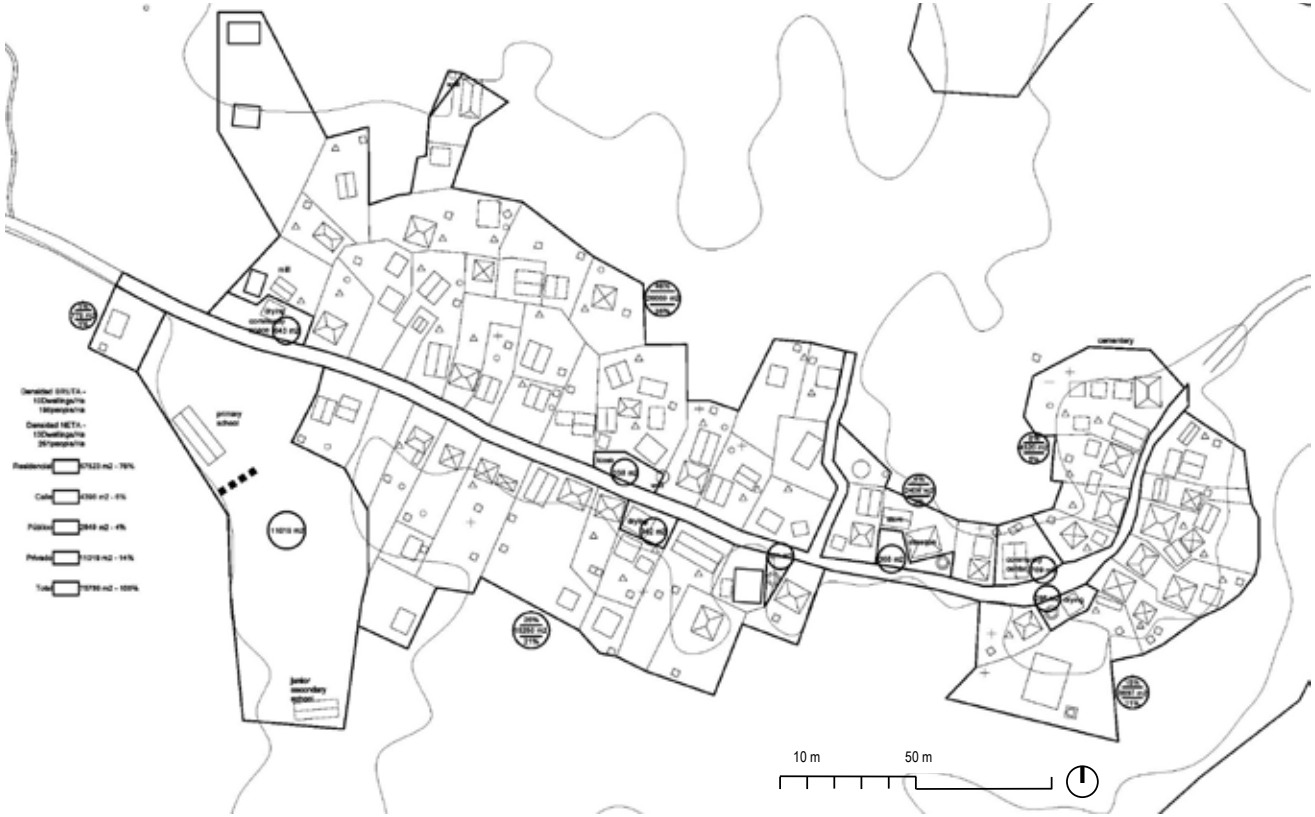


Image 10. Digital map of Robuya village
Source: HD_LAB

In the next future, the area will grow and new building typologies can help the population demand. Row housing, collective housing (just 2 stories), incremental solutions, can be a good option to the only current typology (single unit 1 story).

Indicator 4. Population with access to basic neighborhood services

Access is defined according to certain uses and for different distances and times depending on whether they are urban or rural areas. Here we must again distinguish between urban and rural environments. As the Robuya location is intermediate, we consider here that acces to neighbourhood services is not achieved for the whole village. Following the interviews with the local population during the fieldwork, there are no shops in the village (just a small one of basic products). People selling in the street. Robuya population moves to Makeni for basic services.

Image 11. Spaces for commerce in Robuya. Just selling small products
Source: CEU group

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 2. VULNERABLE AND HAZARD AREAS

Goal	Analysis and detection of vulnerable spaces that should not be occupied and measures to prevent the risks derived
Explanation	The detection of vulnerable areas is one of the critical tasks in relation to Habitability. The risks that threaten certain locations compromise the living conditions and the future of its inhabitants. It is essential to delimit the spaces that should not be occupied and avoid such occupation. Often, in the context of accelerated urban growth and low resources, controlling population settlements in vulnerable areas is impossible. In many places, in the absence of specific regulations, at least some basic guidelines can help to define a framework for decision-making by local authorities.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	**Origin of the data**	**Priority**
Village (Considered as a Makeni neighbourhood)	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	**Evaluation**	**Descripción**	**Unit**	**Data**	**References. Adequate dimensions**
1	**Population and area at risk (flooding, landslide, close to infra-structures,..)**	**High**	The total population living in hazard areas, the total area in Has and the% of the total area of study are computed. Different indicators can be included according to the type of risk. Here in Robuya, as there are no any risk, the informa-tion is summarized	Population affected, Has and %	**0 people, 0 Has and 0%**	0%
2	**Measures taken to cope with risks**	**Low**	Sufficient measures are taken to prevent or mitigate the ef-fects of the risks in each area	High, Medium, Low	**Low**	As observed in each place, the integration of measures to mitigate risks in plans, policies, projects and actions is valued.

Other considerations	Although the Robuya village is not in hazard areas (flooding, landslides, infrastructures,...), there are no any documentation available about future risk and measures to take. The future expansions must take care about proximity to flooding areas. Also, climate change is affecting all places and the effects should be considered for the local authorities. Waste management is very important problem in Robuya and the accumulation in the limits of the village is another challenge to consider.
Global evaluation	**MEDIUM**
Observations	The future growth around Robuya must consider the possible risks (climate change, waste management, floodings around, topography,...)
Recommendations	Obtaining a delimitation of hazard areas is key for the medium term. For that, it is necessary to get a topopgraphic map with enough definition. At the same time, is crucial to get feasibility studies for managing the future growth from an integral approach. These studies, should provide clear delimitation of risky areas, integrating new urban expansions, road network, employment, agricultural land, natural areas, markets, health, edu-cation,... This information can be integrated in a broader scale considering the whole Makeni area and environs. Two scales are recommended: Neighbourhood scale (Robuya village and areas around) and Territorial scale.

HAB 2. VULNERABLE AND HAZARD LANDS

The topic is key and must be the first critical aspect detected related to Basic Habitability.

Indicator 1. Population and area at risk (flooding, landslide, close to infrastructures,..)

In all the Robuya village and close surroundings, there are no hazard areas for flooding, landslides, proximity to infrastructures (highway, railway, dump site,...), just swamps that should be considered for future expansions. Climate change and waste management are also risks for the future. People of Robuya use the borders of the village for dumpling rubish, what can be critical in a next future.

Indicator 2. Measures taken to cope with risks

As explained before, there are no measures taken. The situation is not critical nowadays, as there are no immediate risks, but technical studies must analyse in detail all the elements integrating the hazard components with the infrastructure, facilities, environmental, natural, and other fields. The lack of urban planning is a challenge that will increase with the rapid urban growth of Makeni. So, the clear delimitation of the vulnerable areas should be a priority in Robuya and other Makeni expansion lands.

The role of the Makeni City Council (MCC) is key, trying to connect the short-medium term needs (included in the Makeni Development Plan (2017-2019), with a long term vison, including spatial information. In this issue, we should mention here the Strategic Spatial Urban Plan for Makeni, that has been coordinating by CEU University, with the participation of UNIMAK and the MCC. Understood as a process, some technical information has been developed and could be a good way to keep moving forward.

Image 12. Robuya and swamps beside
Source: HD_LAB in google earth picture

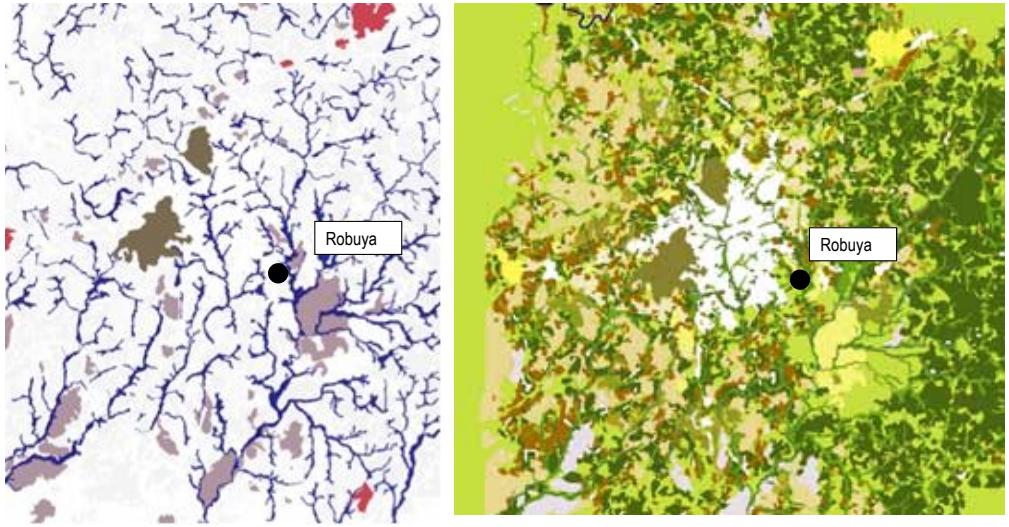


Image 13. Vulnerable lands (floods and hills) in Makeni and surroundings (left). Land uses (right). Previous global analysis for the whole territory. Detailed studies are need in expansion areas as Robuya

Source: Adela Salas y Natalia García, coordinated by HD_LAB

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 3. ACCESS TO BASIC INFRASTRUCTURE

Goal	Measure the degree of access to drinking water, sanitation, energy, drainage, lighting and waste management
Explanation	Acces to basic infrastructures is one the key issue for an acceptable living conditions. Acces to water and sanitation are part of UN-Habitat elements to measure a slum household. But energy, drainage system, lighting and waste management are also critical for providing Basic Habitability.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Population with acces to safe water**	**Medium-Low**	Population of the study area that has access to drinking water according to the defined international criteria	Population and % of the total	**1050 (70%)**	20 liters/people/day, cost less than 10% familiar income, less than one hour to get it, close to 200 m, enough quality
2	**Population with acces to improved sanitation**	**Very Low**	Population of the study area that has access to improved sanitation according to the international criteria defined	Population and % of the total	**150 (10%)**	Improved sanitation: Pit latrine with slab and durable materials, VIP, toilet connected to a septic tank, toilet connected to a sewage system. System shared for less than 30 people
3	**Population with acces to safe energy**	**Very Low**	Safe energy is energy that does not use sources harmful to health or the environment	Population and % of the total	**0 (0%)**	Kitchen with gas or biomass (wood and coal) with improved systems (avoiding environmental damage with deforestation and diseases associated with damage to the respiratory tract)
4	**Population with drainage system**	**Very Low**	Both in the housing environment and at the urban level, the correct evacuation of rainwater implies key decisions for the habitability of people.	Population and % of the total	**150 (10%)**	100% in areas vulnerable to flooding. See complementary Information
5	**Population with access to public lighting**	**Very Low**	The existence of lighting in urban public spaces is essential to ensure the functioning of human activities beyond the hours of natural light	Population and % of the total	**0 (0%)**	100% in main streets
6	**Population with access to waste collection and / or disposal**	**Very Low**	The management of solid waste is another essential factor of habitability in urban areas.	Population and % of the total	**0 (0%)**	Depending on each context. Minimum: one collection point per 5,000 inhabitants (with weekly collection as the minimum frequency) and a landfill with the necessary conditions

Other considerations	Acces to basic infrastructures is one of the main challenges to adress in developing countries. The City Council of Makeni is developing projects of piped safe water and waste management in a big scale.
Global evaluation	**VERY LOW**
Observations	The situation of Robuya is similar than in other Makeni neighbourhoods. Worse in some of the aspects (sanitation, lighting, drainage, waste) and better in others (water). Problems related to the short distances between water wells and latrines, are not present in Robuya
Recommendations	Improving acces to infrastructures in Robuya is a priority. We consider key planning Robuya and the surroundings jointly with the Makeni urban expansions. The main street is a good opportunity to improve the different infrastructures. The future paving will be the chance for improving drainage, lighting, water, ... In sanitation, as is mentioned at the end of this chapter, it should be analyzed the options for sharing septic tanks replacing latrines. Storage rainwater is also a good alternative for the future, that can be connected to the dranaige system.

HAB 3. ACCES TO BASIC INFRASTRUCTURES

Indicator 1. Population with acces to safe water

The village has 3 community boreholes. 1 of them with safe water (World Hope NGO). Some people tell that they drink from the three boreholes. They get the water three times a day. Women and children collect the water. The school has no well and they need to collect the water from the closest one (200-250 meters) with significant slope (the one that does dries during the dry season). The water is free.

The indicator shows how difficult is to get the information to define acces or not access. In the case of Robuya, according to all the information given, we consider that 70% of the total population (1050 people) have access to safe drinking water. With the information of the people drinking in two of the not safe water wells, the access in the school and other considerations, we decided this final data.

As complementary information, according to the Makeni 2004 Census, 89.1% of Makeni's population obtains water from wells. Also, we must consider that currently the city is undertaking the pipeline water supply project to the entire Makeni, with the intention of giving coverage to the entire population in the following years. For accesing Robuya it will take more time.

Image 14. Three boreholes in Robuya
Source: Group CEU

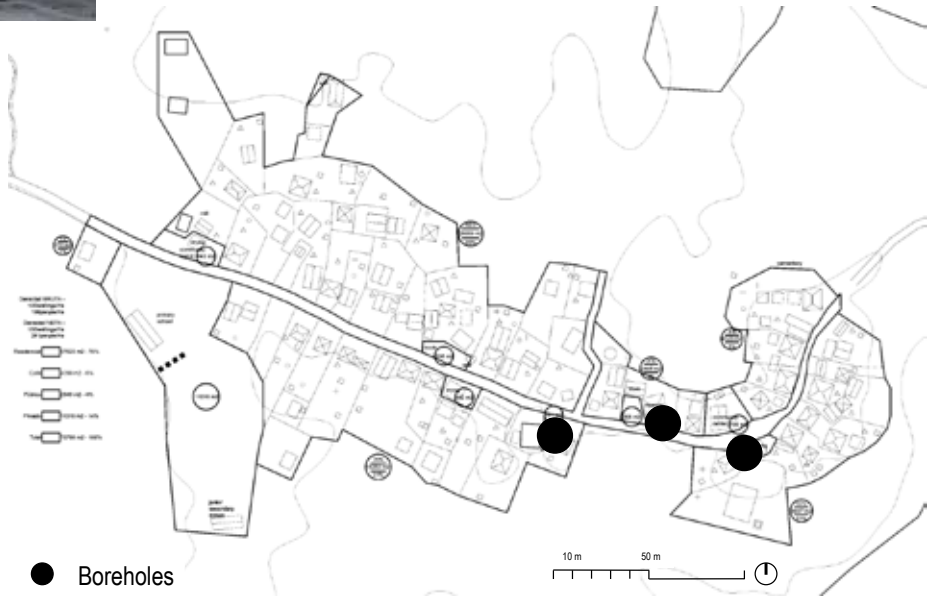


Image 15. Location of boreholes in Robuya
Source: HD_LAB

Indicator 2. Population with acces to improved sanitation

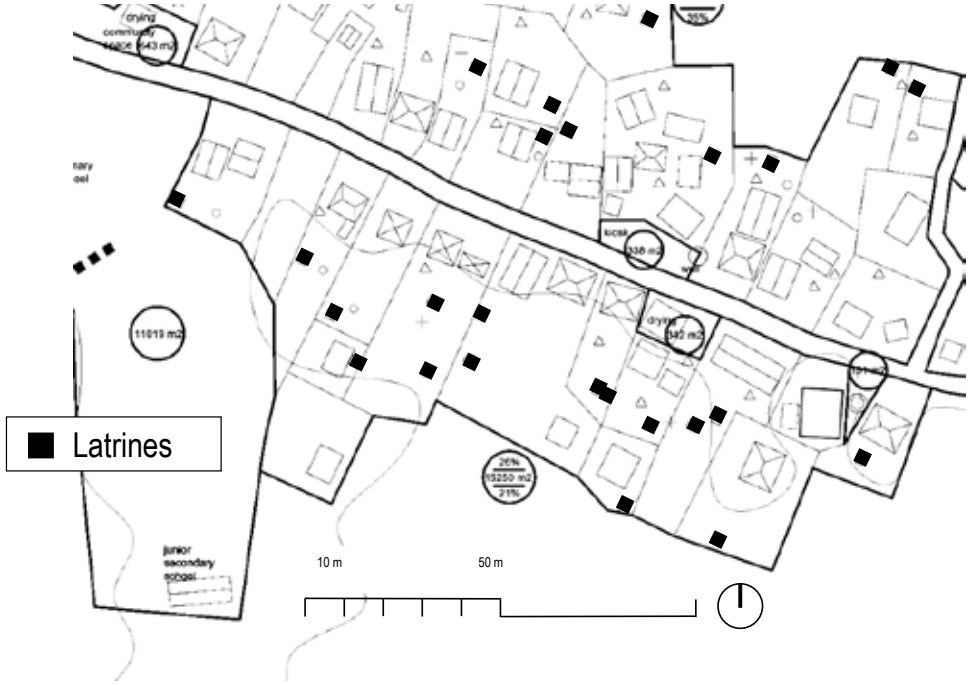
Different definitions of what is considered improved sanitation can be found (UN-Habitat, WHO, UNICEF,...). According to the report “Indicators for Sustainable Development Goals. Preliminary Draft for Public Consultation (until 14 March) “, in relation to what are considered improved facilities (shared by less than 5 households), it is specified that they are:
- Pit latrine with enclosure and a platform or slab, built with durable materials (compost, siphon, etc.)
- Toilet connected to a septic tank
- Toilet connected to sewage system (conventional or small)

In the case of Robuya village, the situation is very poor. During the fieldwork, the information obtained revealed that the sanitation system is almost always a basic pit latrine. Not ventilated. 55% of the households have their own latrine, the others share it. People consider very important to improve it. Ebola toilets, built for UNICEF during the outbreak are not deep enough. Some holes are 6 meters depth. With all this information we can consider that around 10% of the population in Robuya (150 persons) have access to improved sanitation.

At the city level, also with the most recent information available (2004 census), 62.7% have access to community services. 59.8% of these are unventilated basic latrine. The same 34.9% of private. This means a total of 95% of the population without access to ventilated sanitation (VIP). Given that according to UN-Habitat, the latrine with slab is considered in the last definitions as improved sanitation, we could consider that part of those 95% have latrine with slab, but we do not have data. Considering the access to sanitation at the strictest level, such as the one that includes a toilet with cistern and a ventilated improved pit latrine (VIP), whether shared or private, the% population with access to improved sanitation would be (for the 2004 data) of 1, 9% shared and 2% private, with which there would be a total of 3.9% of the population with access to improved sanitation.

Image 16. Types of Latrine in Robuya
Source: CEU Group

Image 17. Location of latrines in a part of Robuya (at the back side of the plots)
Source: HD_LAB



Indicator 3. Population with acces to safe energy

Gas supply networks are still very scarce in developing countries and even more so in rural areas, and expensive in gas cylinders. Therefore, the source most used as cooking energy is biomass, in the form of wood or coal. It is estimated that the traditional fuel biomass energy amounts to almost a tenth of the current total of human energy demand (more than hydraulic and nuclear energy combined).

From the massive use of this source there are two serious implications:
- Deforestation. Significant environmental impact in areas where forest management is not sufficiently developed
- Diseases associated with the respiratory tract. In poor households in developing countries, firewood, charcoal and other solid fuels (mainly agricultural waste and coal) are often burned in open hearths or malfunctioning stoves. Incomplete combustion releases small particles of other components whose harmfulness to human health in the home environment has been demonstrated. In low-income countries, these diseases are, by far, the leading cause of death, with 90 deaths per 100,000 inhabitants per year, well above HIV / AIDS, with 65, which is the second (Infobae with data from The WHO).

In the case of Robuya, from the surveys, 100% of the people use wood and charcoal. No gas, no solar. Wood is free from closests trees. There are common cooking areas (shared) and different fireplaces per family. The place is always in open spaces not inside buildings. Even as biomass is the only way for obtaining energy in places as Robuya, the assesment cannot be good.

Image 19. Location of kitchens in a part of Robuya (at the back side of the plots)
Source: HD_LAB

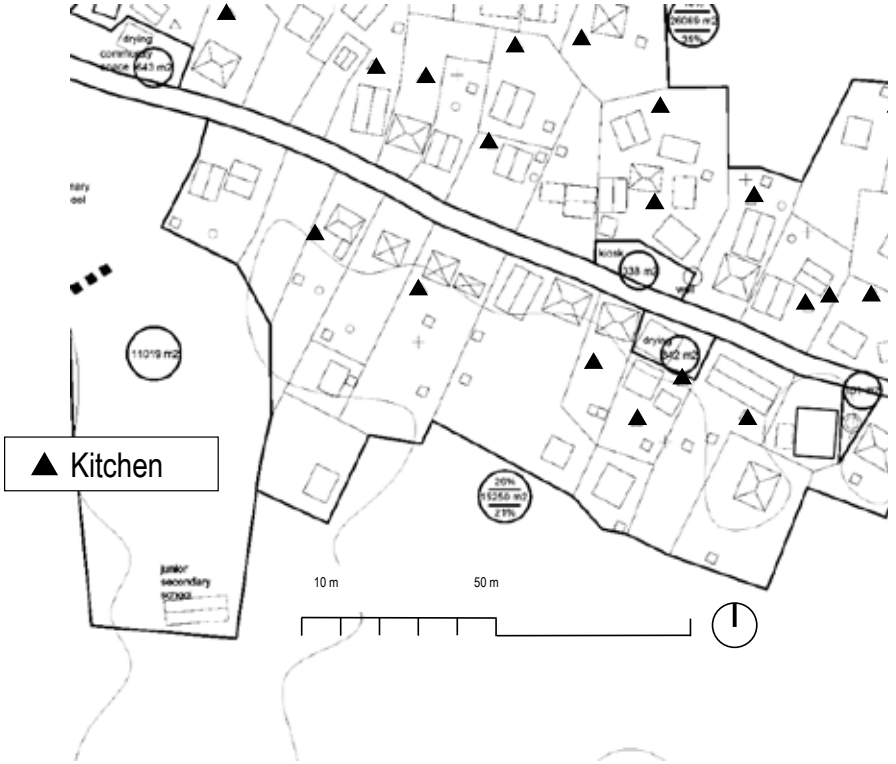


Image 18. Types of kitchens
Source: HD_LAB

Indicator 4. Population with drainage system

The indicator seeks to quantify the provision of stormwater drainage systems in the analyzed environments. Both in the housing environment and at the urban level, the correct evacuation of rainwater implies key decisions for the habitability of people. Especially in tropical climates of seasons with heavy rainfall, it is necessary to exert efforts to avoid floods and other negative effects.

The drainage network is closely linked to the road network, where it circulates, requiring good planning and maintenance. In low-resource settings, problems associated with poor drainage often accumulate. On the one hand, the lack of planning hinders the coherent continuity of the network and the links between the private and public spheres. On the other, insufficient waste management and lack of maintenance, causes frequent bottlenecks and clogs in the network, which can be very harmful in times and contexts sensitive to flooding. And finally, the cost in the networks of circulation-drainage of pluvial, are the highest of all the infrastructures. On the positive side, they are also the ones that have the most margin of savings with a good design, being also labor-intensive, which favors the adjustment of costs in low-resource contexts.

In the case of Robuya, there are no paved roads, so the drainage is just provided by soil ditches in both sides of the main street. Very few buildings have drainage around them. So, in the case of Robuya, just 10% (150 persons) have drainage. The slightly slope of the village is a positive factor for avoiding problems during the rainy season.

The future improvement of the village will pave the main street, and it will be a chance for connecting with the housing drenaige system. Also, dranaige is key for rainwater storage, that should be a future element to improve in Robuya, both at the household and village level.

Image 20. Dranaige system in Robuya
Source: CEU Group

Indicator 5. Population with access to public lighting

The existence of lighting in urban public spaces is essential to ensure the functioning of human activities beyond the hours of natural light. Without public lighting, commerce is reduced, crime increases and traffic becomes more insecure, at night. And it is key, precisely, it is in poor areas where the population moves frequently walking on roads and dark streets, subject to the risks of low visibility. Vulnerability that affects women and children to a greater extent. The use of luminaires served by solar energy has been a huge advance in certain contexts of developing countries. In Africa, several countries have opted for these systems, which can also supply electricity to households in more remote areas. This is the system in the main Makeni streets, but not yet in Robuya.

Robuya has no any public lighting system, and people use chinese lamps with battery.

Indicator 6. Population with access to waste collection and / or disposal

The management of waste should consider specific points for home collection, as well as the installation of landfills for unloading, in areas cleared from the urbanization. It is considered a hierarchy in the use of waste (UN-Habitat, “Urban Planning for City Leaders”): “Reduce, reuse, recycle and recover is the cornerstone of most waste minimization strategies. The waste hierarchy classifies the waste management strategies in order to obtain the maximum benefits of the products while generating a minimum amount of waste. The reduction (ie, prevention and minimization) includes practices such as the manufacture of products with a longer lifespan. Although a city can promote responsible consumption, enforcing production patterns is generally outside the legal reach of local policies. Reuse promotes products that can be used more than once; recycling processes convert materials used in new products; and energy recovery, which includes technologies such as methane capture, which takes advantage of waste or by-products to generate usable energy. “

Together with the problems related to hygiene and the environment, unmanaged waste can end up clogging channels, ditches, drainage ditches, causing other associated negative effects.

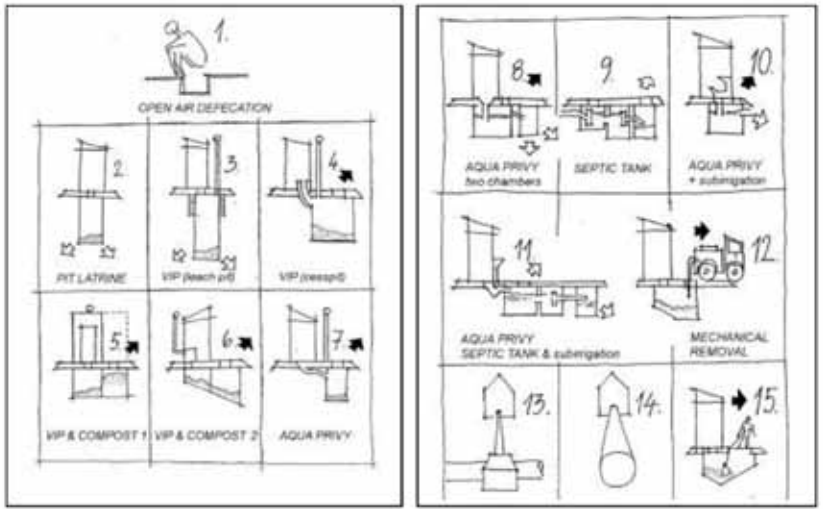
In Robuya, the lack of waste collection is critical. People throw rubish to the bush in the back of the plots, dig a hole or burn it.

Image 21. Rubish at the back of the plots in Robuya
Source: CEU Group

Conclusions and progressive approach for infrastructures

Related to infrastructures, conclusion and recommendations for the future must include two approaches: On one hand, improving the existing elements, little by little with up-grading actions; on the other hand, designing future networks in advance, considering the future growth of the existing settlements. As an example for both, future actions can consider the incremental approach. The image below shows a reference in incremental sanitation included in the Freetown Estructural Plan.

Improved sanitation is a great challenge all over the world. In the case of Makeni, the City Council is building a sludge treatment plant (south area far to Makeni city) inside a very important waste management project. In the field of sanitation, communal septic tanks can improve seriously habitability conditions and can be proposed as new step forward the basic pit latrine.



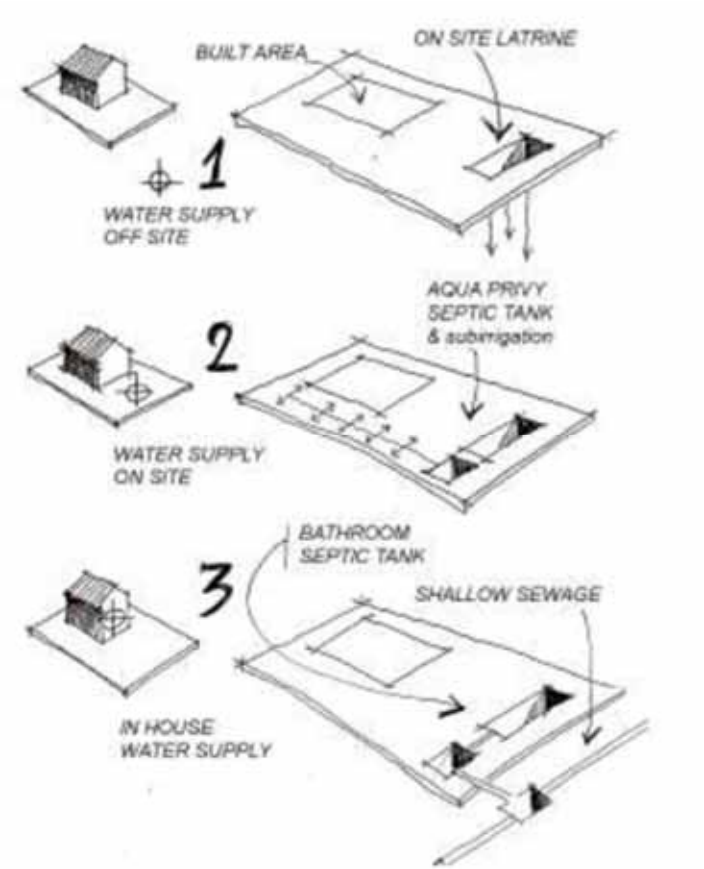


Image 22. Sanitation systems and progressive development
Source: Freetown Structural Plan (2014)

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 4. ACCESS TO BASIC FACILITIES (HEALTH, EDUCATION)

Goal	Quantify the degree of coverage of basic health and education services in the area studied
Explanation	In this section, the coverage of health and education services is valued. Although distances to equipment are not the only condition (it is also essential to consider the cost, the level of services, the provision of beds and doctors per inhabitant, students per teacher, etc.), accessibility to equipment is an element fundamental in the provision of Basic Habitability and is the one considered here, fundamentally.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	**Origin of the data**	**Priority**
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	**Evaluation**	**Descripción**	**Unit**	**Data**	**References. Adequate dimensions**
1	**Population with acces to basic health facilities (PHU and Hospital)**	**Very Low**	As the first step of health care, the PHU is the essential neighborhood-scale treatment equipment. The population with access according to maximum distances is valued, completed with the level of attention	Population, % and level of attention	**- 0 (0%) Primary** **- 1500 (100%) Hospitals** **- Level of attention: Very Low**	- Primary Health Unit: 1.600 meters maximum - Hospital: 5.000 meters maximum
2	**Population with acces to school (primary, secondary, university)**	**Medium**	This indicator evaluates the coverage of accessibility to primary, secondary and university education in each area (by population and%), measuring the maximum admissible distances	Population, % and level of attention	**- 100% Primary** **- 100% Secondary** **- 100% University** **- Level of attention: Low**	- Primary: 800 meters maximum - Secondary: 1.600 meters maximum - University: 5.000 meters maximum

Other considerations	For a better understanding, the indicators have been summarized in just 2. It is possible to distinguish the different levels of health attention and the different levels of education. This information is added in the complementary text. The level of attention is a subjective information to complete the distance coverage, including costs, accessibility, real distance (more than being inside the radius,...). The village has a Primary Health Unit under construction, what was finally the action to fund. The last information (3rd January 2018) indicates that windows and doors requiered for the Health Center in Robuya were built and taken to the village. But the support of the people in Robuya for installing them (as requiered) was not achieved. In education, the level of attention has to do with some information that should be obtained in a deeper analysis.
Global evaluation	**LOW**
Observations	It is really difficult to consider all the elements that affects health and education (cost, quality of attention, quality of facilities,...). Also, is important to understand the links between health and other habitability aspects (sanitation, water, cooking with biomass,...).
Recommendations	To finish the Health Unit in Robuya is key, but is important to understand well the problems with the conclusion of the works. In education, the school facilities should be improved, with better spaces for classes, cooking, etc. A detailed study can provide better information about both fields (health and education) in Robuya and surroundings.

HAB 4. ACCESS TO BASIC FACILITIES

First of all, for the coverage of Public Facilities, we must consider the scale of the area. In Robuya, with a population around 1.500 inhabitants, we are in a quite small unit, in this situation between urban and rural, that is singular. We cannot have the same access than in a central neighbourhood and, at the same time, Robuya is in a very good situation comparing to other villages further away from Makeni.

In relation to access to basic equipment, the scale of the area to be studied is fundamental. In regard to the urban area, and following José A. López Candeira, in “Urban Design, Theory and Practice”, the population steps according to the study “Study for a City” for the creation of a new city in Central Lancashire, England, are:

- Neighborhood Unit. Population of 4.000 to 5.000 inhabitants. Characteristic equipment: Local commerce and primary school
- Neighborhood. Population of 15.000 to 18.000 inhabitants, equivalent to four neighborhood units. Characteristic equipment: Secondary school, shopping center or market, library, medical ambulatory and small sports center
- District. Population of 60.000 to 80.000 inhabitants, equivalent to four neighborhoods. Characteristic equipment: Department stores and recreational, social services, etc. (located in the District Urban Center)
- City. Population of 300.000 to 500.000 inhabitants. Characteristic equipment: Concert hall, exhibitions and theater, technical school, industrial re-education center, zoo, botanical garden, regional park, sports stadium, commercial and administrative center and other specialized facilities.

Robuya is smaller than the first Unit considered above, that, even with 4.000-5.000 people, does not have any health facility. Following UN-Habitat (“Urban Planning Manual for Somaliland”), the diagram below is quite clear to understand the range of distances depending on the type of facility.

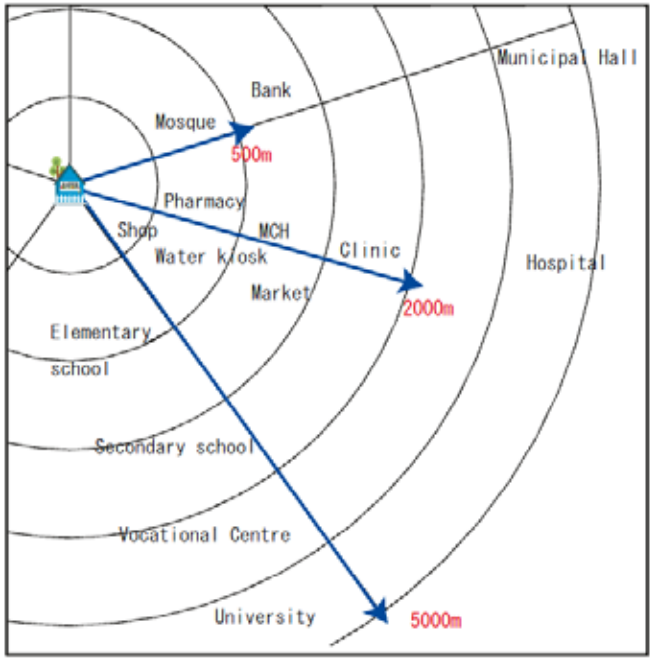


Image 23. Location of services
Source: UN-Habitat, “Urban Planning Manual for Somaliland”

Indicator 1. Population with acces to basic health facilities (PHU and Hospital)

As mentioned, health care has to consider many factors, beyond distance. The cost, the training of the personnel, the frequency of attention, the quality of the construction, the sensitization, are some additional critical factors. The MDGs during the review process, hardly came to assess the quality, cost, proximity or accessibility of health care. In this sense, the draft of the Post-2015 Agenda (Sustainable Development Solutions Network, “Indicators for Sustainable Development Goals, Preliminary Draft for Public Consultation”), goes into these aspects to a greater extent.

An indicator that quantifies the “Percentage of population with access to basic primary services including emergencies and obstetrics” appears in the draft proposal. It defines this access to primary health care as physical access to basic services, including emergencies and obstetrical facilities. It complements the indicator with another indicator related to economic capacity (Pocket expenditure on health as a percentage of total health expenditure).

For all that reasons, we complete the coverage in distance with the “level of attention” considering the degree of the health access. The first consideration about coverage is that Robuya has a Primary Health Unit under construction. This was at the end ot the activity, the action to be founded: the conclusion of the Health Unit.

According to the 1,6 km as maximum distance to Health Center, Robuya has coverage with the Health Unit in Bombe. It takes 22 minutes walking (2.000 leones by motor bike), for very primary attention. Considering the level of attention, we consider a very low one.

Considering hospitals, the maximum distance requiered, according to different analysis, is 5.000 meters. In the case of Robuya, the Holy Spirit Hospital is inside the 5 km radius. But also, it must be considered the cost of attention and access. Motor-bike from Robuya to Makeni center costs 10.000 leones (fieldwork).

Finally, we haven´t include here information about tradicional medicine, but should be important to consider.

Image 24. Health Centers coverage
Source: HD_LAB

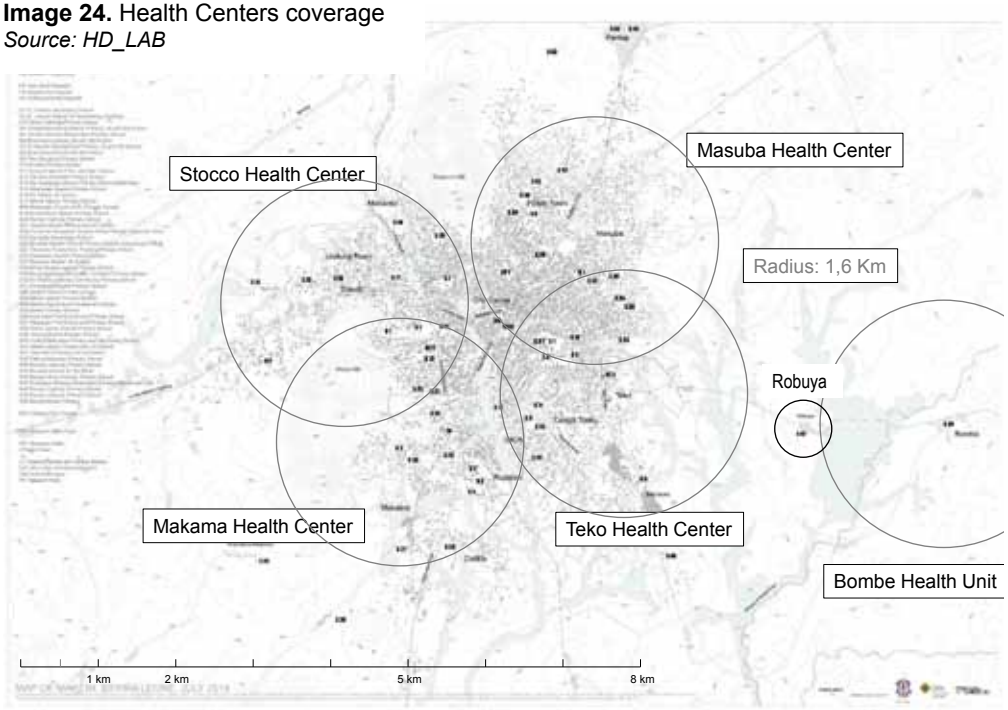


Image 25. Hospitals coverage
Source: HD_LAB

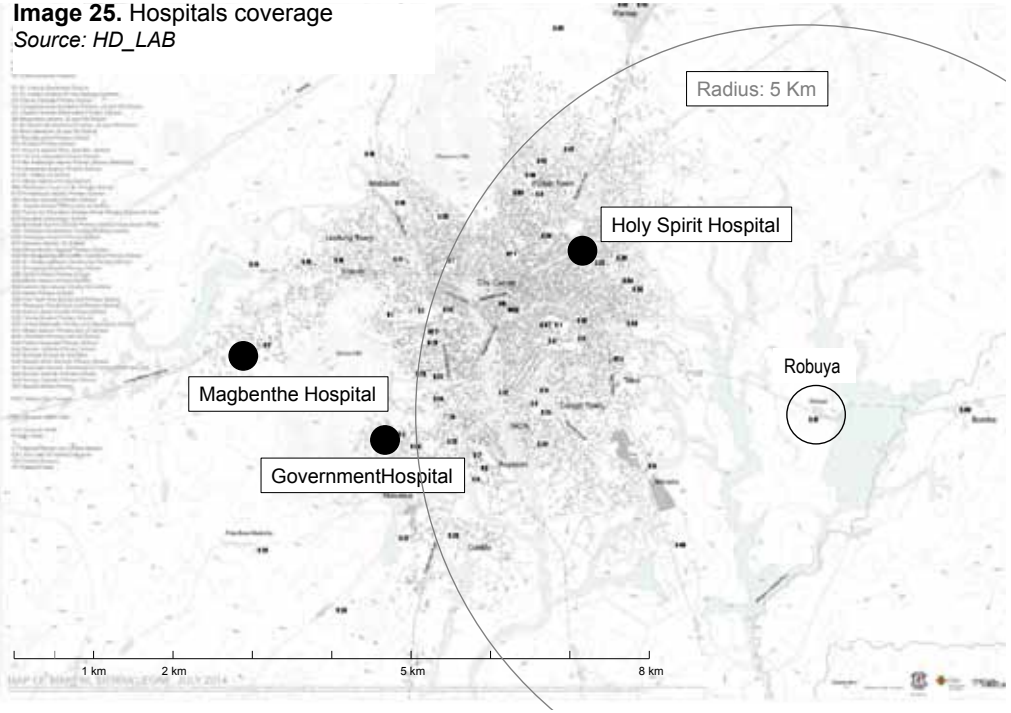


Image 26. Robuya Health Center (under construction)
Source: CEU Group

Indicator 2. Population with acces to school (primary, secondary, university)

This indicator evaluates the coverage of accessibility to education (primary, secondary and university) in each area, measuring the maximum admissible distances to educational centers. In developing countries, poverty is presented in a multidimensional way and several factors add up to hinder development. In this sense, there are numerous cases of children who are forced to miss school because they have to help in domestic tasks (go for water, firewood, etc.). The provision of schools in each neighborhood is an essential requirement to continue supporting the accessibility to universal education.

In all urban planning manuals, the primary school is the central equipment in the neighborhood scale (neighborhood unit, neighborhood, community, ...). From the first studies of Clarence Perry and the application of C. Stein and H. Wright to Radburn, the primary school (together with playing fields) is the basic element that even includes the population of the neighborhood units (depending on of the number of students in the school). The school is conceived as a nucleus of fusion and community encounter, where adults can also receive training. Also UN-Habitat, in the population and land standards for equipments of the Strategic Plan for Masaka, suggests that the primary school can be combined with a public space.

In Makeni, according to the Makeni Development Plan, the city has the following basic equipment of educational facilities:
- Pre-school: 6 private schools and 19 Government
- Primary: 6 private, 50 from the Government and 2 from the community
- Secondary (high school): 5 private, 16 from the Government and 11 from the community.
- Universities: There are two universities (Northern Polytechinic and University of Makeni) and two specialized training centers (College of Management & Administration and the Institute of Public Administration & Management).

The cartography developed from the CEU University and completed by the author of the report locates a large part of the educational facilities, thanks to the information coming from a web page that included the schools of the workers in the educational field. In relation to the space coverage and the 800 meter radius, 99% of the population has access to primary education. The circles of all schools have not been reflected cause overlapping.

In Robuya, there is a Primary and Junior Secondary school. According to the surveys during the fieldwork, 100% of children attends primary school (just problems with 50 cause the school uniform). In the case of Secondary, the information obtained indicates that the attendance is around 60-70%.

The distance coverage is enough (less than 800 meters for Primary and 1.600 for Secondary). So the issues related to education deal more with quality of school, number of teachers, costs,... The cost is quite higher for Secondary. Primary is 5.000 leones per year for each kid, while Secondary is 110.000 leones, according to surveys during the fieldwork. As Secondary is just Junior, for Senior Secondary School, the children in Robuya must move to Makeni or to Bombe.

There are 245 primary students and 110 junior secondary. 8 teachers in primary and 11 in secondary with a ratio of 30 students / teacher in primary and 10 in secondary. It is important to highlight that the secondary school is not officially aproved by the Government.

Image 27. Primary Schools coverage
Source: HD_LAB

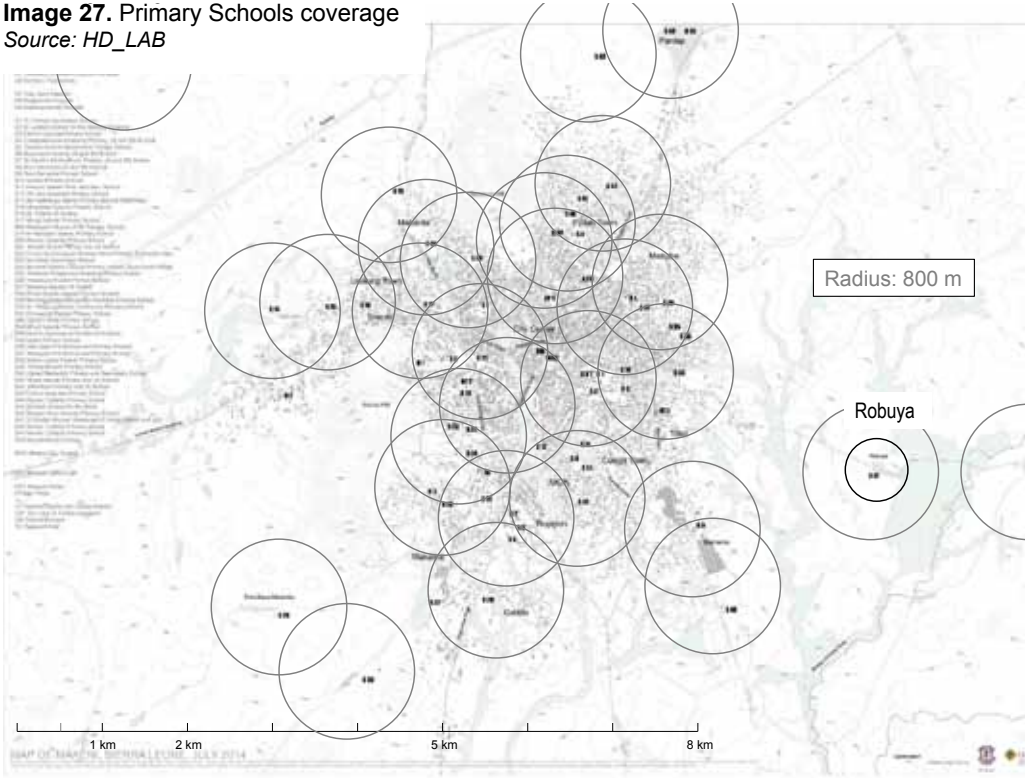


Image 28. Secondary Schools coverage
Source: HD_LAB

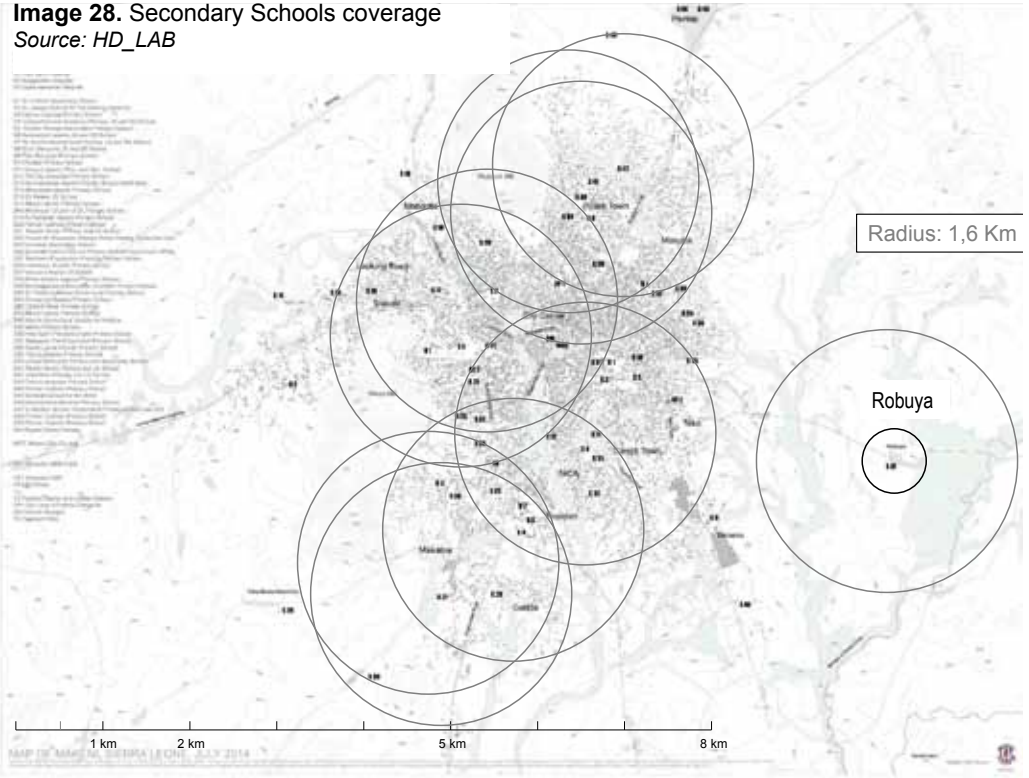


Image 29. School of Robuya
Source: CEU Group

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 5. PRIVATE-PUBLIC LAND USE

Goal	Assess the distribution and the relationship between the main land uses, in the analyzed area
Explanation	The separation of the land in public and private is one of the major constraints in the process of construction of the city. This relationship will determine, to a large extent, the functioning and life of the inhabitants in the future.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Public -Private land use rate**	**Very Low**	This indicator measures a basic relationship between private, public and semipublic	%	**- Private land: 75,90%** **- Public land: 9,56%** - Streets: 5,8% - Public Space: 3,76% **- Semipublic land: 14,54%**	**- Private land: 45-60%** (Housing, comercial, offices, industrial) **- Public land: 30%-45%** - Streets: 20-30% - Public Space: > 10% **- Semipublic land: 10-20%** (Schools, health centre, social,…)
2	**Streets area**	**Very Low**	The indicator measures the rate of land for circulation	%	**5,8%**	20-30%
3	**Public spaces**	**Very Low**	The indicator measures the rate of land for public areas (parks, squares,...)	%	**3,76%**	> 10%
4	**Residential plot area**	**Medium**	The indicator measures dimensions of plots, according to residential typologies	% of good dimensions and typologies	**50%**	1. Minimum plot: 65 m2 and minimum front of 6 m 2. Maximum plot: depending on the context. No more than 50% of the area or sector with plots greater than 1.000 m2 3. Integration of typologies is evaluated as positive
5	**Other plot areas (artisans, taylors, commercial, urban agricultrure …)**	**Medium**	This indicator includes the integration of small-scale uses that may appear associated in residential areas.	High / Medium / Low	**Medium**	Good integration of activities in the neighbourhood

Other considerations	The situation of Robuya, between urban and rural, is singular. The recommended rates are based on urban areas, so it is important to consider that. At the same time, are references for the future where Robuya will be in fact a Makeni neighbourhood.
Global evaluation	**LOW-VERY LOW**
Observations	The village is working as a community, so all the considerations of this topic, that are related to properties, must take that into account
Recommendations	Although is not a priority now, a clear delimitation of private and public realm, considering the right dimensions is key for the future, mainly considering the future growth of the village and surroundings, reserving land for. The information developed can be useful for the Makeni City Council as a pilot project to get a graphic cadastral registration, that can be replicated in other Makeni neighbourhoods. The plot subdivision should be clearly confirmed.

HAB 5. PRIVATE-PUBLIC LAND USE

As an initial comment, in the case of Robuya (and other parts of Makeni and Sierra Leone), the distinction between public and private is not integrated as a real thing. Issues related to customary law, traditions, customs and others, provide a scenario where this elements are not clearly defined. At the same time, for getting rates of each type of space, we need a defined boundary, what we dont find it here. All Robuya village can be treated as a single space with different elemens. That afirmation is also in line with the fact that the whole land of the village, belongs to one single family (Tarawalli).

But considering these introductory reality, is very interesting to understand as well as possible, how all the different areas are used by different activities considering a changing context, where these topics will be more and more important.

Indicator 1. Public -Private land use rate

A simplification brings us back to reality and is that in Makeni there are no public spaces. Or not as we find them in occidental cities. Where they appear they do it in corners, small-scale recesses, almost residual areas that can end up functioning as meeting or appointment elements, often in intersections.
This consideration must be fine-tuned based on two contextual realities:

- The weather. Very hot in the dry season and torrential rain in the rainy one, does not favor the search for public spaces
- Community life of the Sierra Leonese people. Specifically the inhabitants of Makeni, live in private spaces but very occasionally delimited with fences. Social life is concentrated in these spaces, sometimes on the street, sometimes in the back areas of the housing yards.

In any case, it is essential to promote public areas of relationship and leisure. They are demanded in the participatory meetings held. And in essence, social life takes place outside, in the shaded areas of the plots, in the access verandas to the houses.

The analysis of Robuya village shows the following numbers:
- Residential (Private): 57.523 m2 (75,90%)
- School (Semi-Public): 11.019 m2 (14,54%)
- Total blocks (Private + Semi-Public): 68.542 m2 (90,44%)
- Street: 4.398 m2 (5,8%)
- Public spaces: 2.849 m2 (3,76%)
- Total Public: 7.247 m2 (9,56%)
- Total Robuya village area: 75.789 m2

As mentioned before, the reality in Robuya is very far from the idea of getting very few public spaces. People moves along the village with open areas among buildings. Also, the surroundings of the village are agricultural lands that can be accesible for anyone. The community life takes place around the houses, without any subdivision between what is public or not.

But here, we are just representing the technical analysis obtained, what is also important considering future dynamics. Separation between public and private was not considered in the pre-colonial era. But nowadays, is something accepted and it is key, in order to guarantee security of tenure and for avoiding land disputes. Having enough space reserved for public pruposes is critical and should be integrated in the future expansions and existing areas in Makeni. This experience in Robuya, can serve as pilot project for understanding well these kind of issues reinforcing the pedagogical approach in urban planning and land management.

Another interesting element is the productive land. In Robuya, over 90% of the population works in agriculture, in the fields around the village. The land subdivision here, dont include agriculture and the references are defined for urban areas. But even here, Robuya will be part of Makeni in a close future, and all these considerations must be taken

into consideration. At the same time, the recommended rates here can be understood as too restrictive for a village. The subdivision of private-public, in Robuya, is far from the recommended rates according to technical information:

- Private land: 45-60% (Housing, comercial, offices, industrial)
- Public land: 30%-45%
    - Streets: 20-30%
    - Public Space: > 10%
- Semipublic land: 10-20% (Schools, health centre, social,…)

So, in order of these references, the assesment in this topic is very low in Robuya, even understanding the different ways of using the land for the inhabitants. Having good public-private relationship is also important for the future conditions of inhabitants and their own rights.

If we add the private land to the semipublic (facilities) land, a good relationship should be close to 60% Private (residential + equipments + industry + offices), and 40% Public (streets + parks + squares,...). In Robuya, adding Semipublic, what is the school and the mosque, to Private (residential), goes over than 90%. It is true (and recommended in some technical documents for develping contexts) that the school field can work as a public space for sports and other uses out of the school time. The social center of Robuya, can be considered as semipublic also, but has been included in public, casuse the area around is one of the most clear open spaces of the village.

Image 30. Private-Public land
Source: HD_LAB

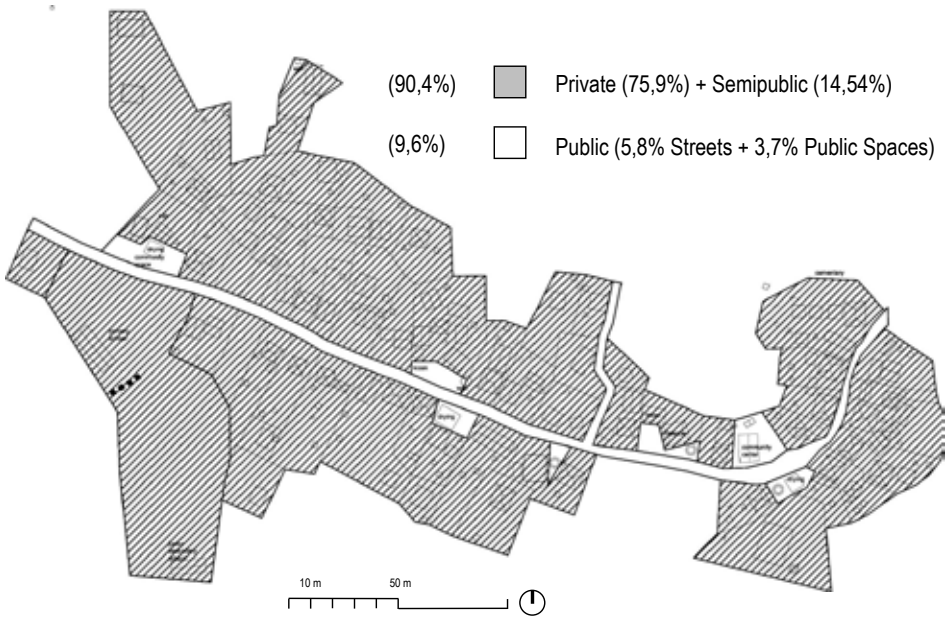


Image 31. Semipublic and Residential land
Source: HD_LAB

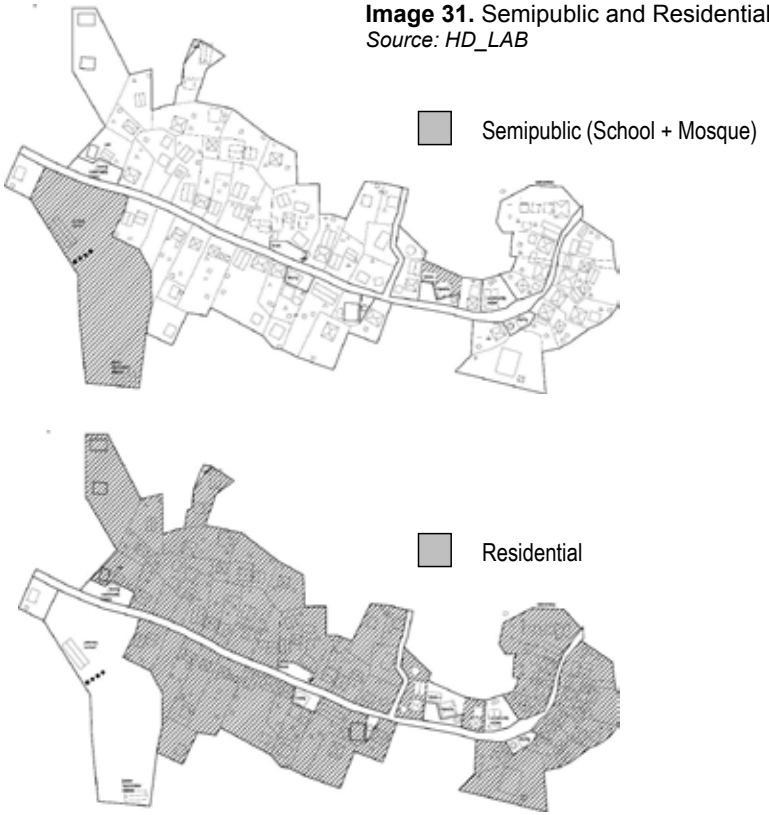


Image 32. Robuya and surroundings. Here is easy to understand that right now, public space is not a priority for Robuya village, as forest, agriculture and other open spaces are around. But reserving adequate lands for public areas should be a critical component of future urban planning proposals.
Source: HD_LAB

Image 33. Open spaces in Robuya
Source: HD_LAB

Indicator 2. Streets area

Both in the actions of neighborhood improvement, as in the planned city, the public space, and specifically the streets, play a critical role. In Africa, the street is the blood of the city, the place of social relation, commerce, activity, communication, movement, ... The street is more than the road space that surrounds the blocks. It should be especially as a pattern to guide urban developments in direct relation to the typological models considered, and also as a critical element for the improvement of precarious neighborhoods (See “Streets as tolos for urban transformation in slums.” UN-Habitat, 2014).

The street is the pattern for organizing the village in Robuya, as in most villages in all Sierra Leone. Just one central street and small paths for accesing the agricultural areas. The street area is 4.398 m2, a 5,8% of the total and under the recommended rates. According to the 2014 MDG Report, cities must allocate 25% -30% of space to the streets, with cities in low-income contexts significantly below (10% in Dar es Salaam, 12% in Nairobi , 15% in Abuja, 16% in Bangkok, ...).

Related to the streets, it is also key to differentiate the space for vehicles (roadways) and for walking (sidewalks). In some developed contexts, the recommended rate is 75% for pedestrians and 25% for vehicles. In the case of Makeni, and thinking in future areas, reserving 50% for sidewalks it could be enough. Of course, nowadays, the use of streets as the Robuya one, does not needs to separate pedestrians from vehicles. But once again, planning is to anticipate the future and these rates must be taken into consideration,

Image 34. Main street of Robuya village and connection with Makeni
Source: HD_LAB

Image 35. Image of main street in Robuya village
Source: CEU Group

Indicator 3. Public spaces area

The indicator measures the total area that is allocated to public open spaces, including plazas, parks, gardens, children's play areas, riverbanks, playgrounds, etc. This set of spaces, understood as a network, configures what was recently called in certain technical areas, "Green Infrastructure". And it is precisely this concept of network, which gives the whole a particularly relevant role in the configuration of the city. The network of the public, from its conception as the fundamental structuring element of the city, must correctly connect the different scales, from the natural elements of the landscape, to the general and local systems.

In relation to the quantitative analysis, the orientations are:
1. City 9 m2 of green area per inhabitant less than 15 minutes away
2. Sector: Public free spaces (Gardens, parks, games, squares, ...): minimum of 10% of the total area of each sector
The continuity to the green network must be propitiated and the public spaces must have a minimum of 70% of the total of its wooded surface

Of course, the real public space that has been found in Robuya is realy scarce, with a 3,76% of total Robuya. Are spaces beside de main street, that are used for the social center, driying cereals, and other communal activities. Some of the public spaces includes some activities (driying rice, covered areas as baffa, areas around boreholes,...).

As mentioned before, social life in Robuya and Makeni happens around the dwellings, in shadow spaces where people stay around. So, these areas (private land from a technical approach) are playing the role of public spaces. Also the countryside around Robuya is part of a natural network that can work as public open spaces. But thinking in the future, the settlements and neighbourhoods must include specific and adequate public areas, completing all the different gradients of uses and complexity that the communal

life in Robuya, Makeni and Sierra Leone, is providing. New proposals should integrate these issues as part of the projects: preserving space for public land and integration of community areas for relationship around buildings.

The public spaces for Robuya and Makeni, should be designed considering climate, where trees, shadows and covered areas must be part of the projects. The dimensions depends on each case. Following C. Alexander (1973, Previlima), is interesting the suggestion of public space as “small active nuclei” (15x20 meters) near public facilities, as well as the concept of “walled gardens” that seeks intimacy and contact with vegetation in public spaces. So, integrating public facilities (boreholes, social center, ...) with the public open spaces can improve the activity and use of them.

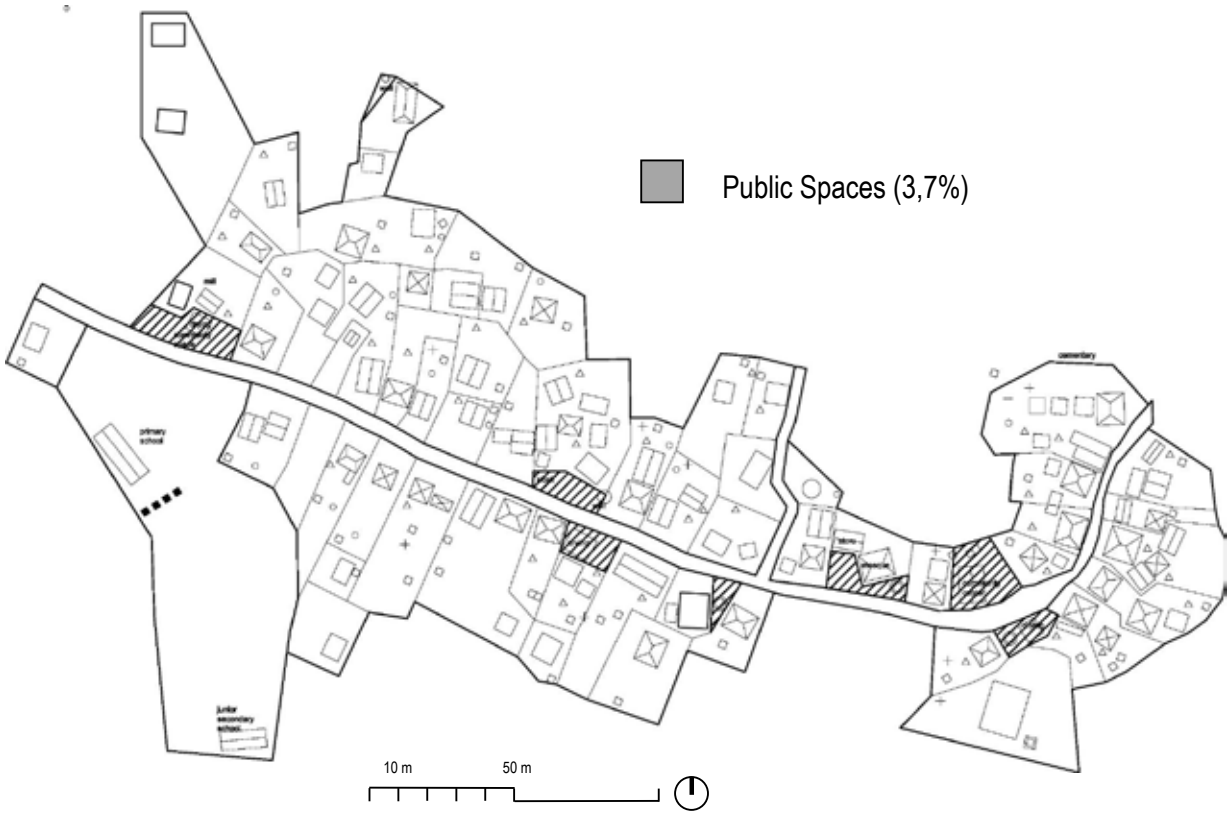


Image 36. Public space in Robuya village
Source: HD_LAB

Image 37. Image of public-communal spaces in Robuya.
Up: Baffa or covered space
Medium: Space for drying rice
Down: Social center (the center is equipment, but the open space around is public)
Source: CEU Group

Indicator 4. Residential plot area

Plots in Robuya village and in general in Makeni town, are quite big as a result of rural origins. According to some surveys obtained by the CEU group in 2013, the types of plot dimensions in the city are 53 x 34 (1.836 m2), 30 x 20 (600 m2) and 23 x 23 (529 m2). Inside the plots, from a first building, new constructions are often built little by little in a densification process.

In the case of Robuya, the plots were dimensioned with the support of the local community, in a process that took time as the properties are not demarcated. During the fieldwork, an important part of the mapping process was to draw the plot boundaries. The fieldwork reveals no clear patterns with a great variety of shapes, areas and dimensions. The people said that average dimensions of plots in Robuya were 100 x 70 feets (30 x 21 meters). But according to the mapping, what we can observe is that there are no similar plots in shape or dimensions. As can be seen in the map below (a zoom of the village) the variety is huge. The smaller plot of the sector is 618 m2, while the biger one is 2.447 m2. Buildings are organized along the street and new constructions are often built in the back side of plots. We must agree that the information of the dimensions provided for the villagers does not correspond to the reality obtained from the mapping. Obviously, the need for delimitate the plots does not exist in Robuya, nowadays. But having a clear demarcation of boundaries is key for the future, that should be part of a cadastre with registration of properties and inhabitants. It is also important to note, that according to the graphic information obtained, there are some plots with no direct access from the street.

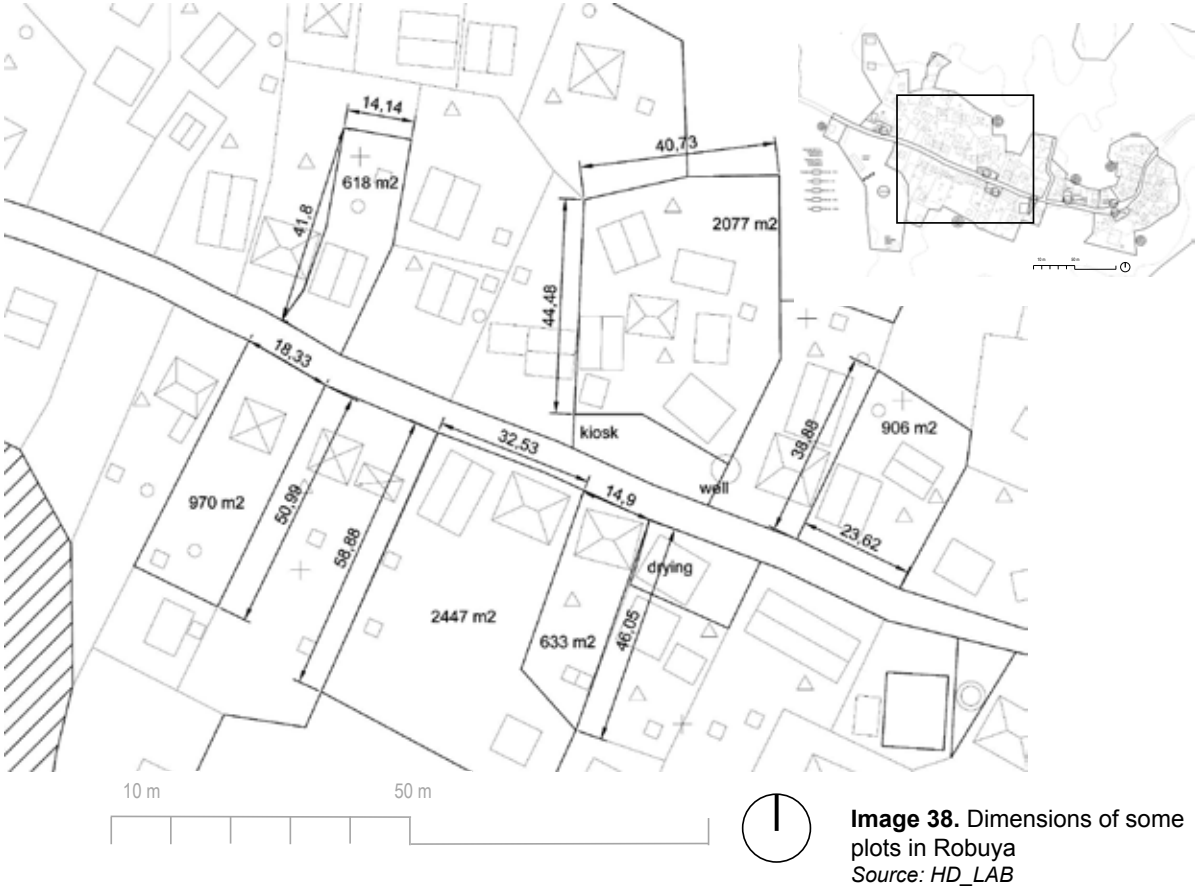


Image 38. Dimensions of some plots in Robuya
Source: HD_LAB

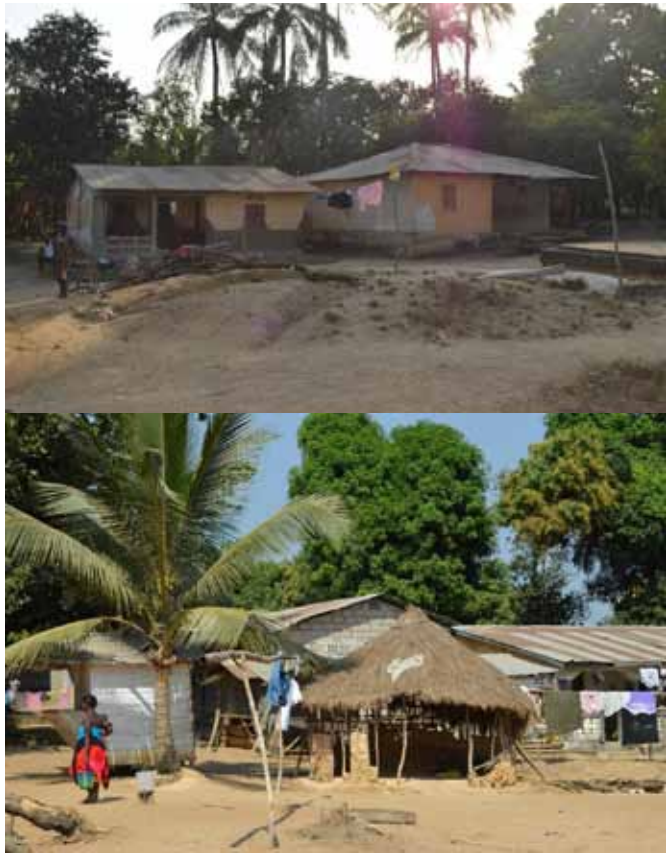


Image 39. Residential areas in Robuya
Source: CEU Group

The considerations in this topic have to take into account the fact that the whole Robuya land belongs to one family and the fact that most plots includes more than one household with different families. So, the common relationship between property, familiy and plot dimensions are singular here in Robuya. But again, in the comming years Robuya will be part of Makeni and all these rates and dimensions can be useful for possible improvements and new projects. Also, readjustment of land is nowadays one of the most interesting ways for improving slums and poor neighbourhoods, and can be a possible option for the future in Makeni and Robuya.

The evaluation here is quite complex. On one hand, according to the current situation of the village the plot dimensions and building typologies can be considered good. Big plots with enough area for urban agriculture, common spaces, etc. On the other hand, the proliferation of constructions are reducing the open spaces and this process can generate a problem for the following years. No alternatives to the single family house is a constraint for providing new ways of living (apartments, rent, young people,...). Considering all these issues, the final assesment consider that 50% of the plots are in better conditions in terms of dimensions, according to the buildings inside and the other factors explained before.

For future alternatives, some considerations about plot dimensions and typologies are:

1. Minimum plot: 65 m2 and minimum front of 6 m
2. Maximum plot: depending on the context. No more than 50% of the area or sector with plots greater than 200 m2
3. Integrate the incremental component in the developments
4. Integrate trade or workshop alternatives
5. Encourage the use of plots of little front and a lot of depth (1: 4)
6. Promote the typological mix with collective housing solutions. Row housing as alternative for familiar solutions
7. Promote renting apartments
8. To include communal spaces between buildings, promoting the traditional way of life in Sierra Leone
9. To consider possible subdivision of plots to improve living conditions

Indicator 5. Other plot areas (artisans, taylors, commercial, urban agricultrure …)

This indicator is focused on understanding the opportunities for other activities that can be integrated or not, with the residential ones. Fieldwork in Robuya reveals some community land for dry rice, a building for storage of agricultural products, cattle in some areas, carpenter workshop in a plot, and small scale agriculture. It is key to find the best integration of these activities in the urban fabric. Even with no clear organization, the space in Robuya is enough and the problem seems to be more the lack of jobs than the space for working. So the evaluation here is positive. Some of the problems detected deals with the overlapping of functions. for instance, cattle, agriculture, kitchens, latrines, ... are so close in the same space.

As useful references, somo dimensions of different uses are:

Industrial
1. Single industrial use, minimum plot: storage / small industry 500 m2, 10 m medium industry front 1,000 m2, 20 m. front. 2. Industrial use integrated in the home, no minimum space is defined. It is considered necessary, when this use appears, that it be linked to a private free space (patio or open area) of at least 10 m2.

Commercial
1. For the cases in which they appear in parcels of commercial exclusive use, 250 m2, 10 m front.
2. For small neighborhood markets (neighborhood unit): minimum 2,000 m2
3 It is suggested to reserve land for neighborhood markets in strategic places and well connected with transportation: minimum 1 Ha
4. In residential plots it is suggested to locate the commerce towards the main street, propitiating spaces of mattress in the public-private transition

Urban Agriculture
1. Subsistence agriculture in residential plots: minimum 20 m2 of open space on a plot
2. Communal urban gardens: minimum 1 Ha
3. Promote the reservation of agricultural land in both cases, in urban areas that allow it

Image 40. Space for drying rice (left) and relationship between buldings and street for integrating activities (right)
Source: CEU Group

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 6. BASIC COMMUNICATIONS NETWORK

Goal	Assess access to basic services and the public transport network
Explanation	Access to affordable and operational public transport network is a huge support for the most disadvantaged households, which directly affects the improvement of their Habitability.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Population with acces to safe public transport**	**Very Low**	The indicator assesses the proportion of people over the total area analyzed, with access to safe transport (distance to the network, cost and service)	%	**0%**	1. For urban environments, 90% of the population a: - Distance home-access point, less than 800 meters - Cost less than 10% of the budget for average family consumption - Service of sufficient frequency, safe and comfortable. Included are the licensed motorcycle taxis and helmet for the passenger 2. For rural environments, 70% of the population: - Distance less than 1 km (15 minutes walking) to paved road
2	**Paved streets**	**Very Low**	This indicator measures the percentage of paved roads, over the total area analyzed.	%	**0%**	Minimum: 50% in urban areas and 20% in rural areas

Other considerations	The future expansions around Robuya, should take into account the importance of communication, reserving enough land for this prupose.
Global evaluation	**VERY LOW**
Observations	Paving the main road was one of the priorities detected during the fieldwork
Recommendations	The improvement of the communication is very key in Robuya. Paving the road taking advantage of this action for integrating other issues (drainage, lighting, storage rainwater,...) will improve a lot the living conditions of the people. For the transport system, using bicycles can be also a good alternative when all the road to Makeni will be paved. Looking at the future, it is critical to get a plan of the whole area to organize the future expansions, linked with the transport and communication aspects.

HAB 6. BASIC COMMUNICATIONS NETWORK

The fundamental communication system is a substantive element and backbone of the organization and functioning of the city. It can also be the skeleton on which to sustain urban development strategies. In this sense, especially in the contexts of accelerated growth and low resources, the anticipated construction of infrastructures can have a double critical, fundamental function:
- Ensure adequate global operation by reserving land for key connectors in the future territorial model
- To guide the territorial model by promoting new developments in well-connected areas, and thus decongesting the central areas

Indicator 1. Population with acces to safe public transport

It is considered safe public transport the bus (large buses, small vans, ...), tram, rail and also the moto-taxis (if they have a license and helmet for the passenger). The assessment takes into account the cost, quality of service, security, frequency, distances to access points, mainly.
The ranges proposed are:

1. For urban environments, 90% of the population a:
- Distance home-access transport point less than 800 meters
- Cost less than 10% of the budget for average family consumption
- Service of sufficient frequency, safe and comfortable. Included are the licensed motorcycle taxis and helmet for the passenger
2. For rural environments, 70% of the population:
- Distance less than 1 km (15 minutes walking) to paved road

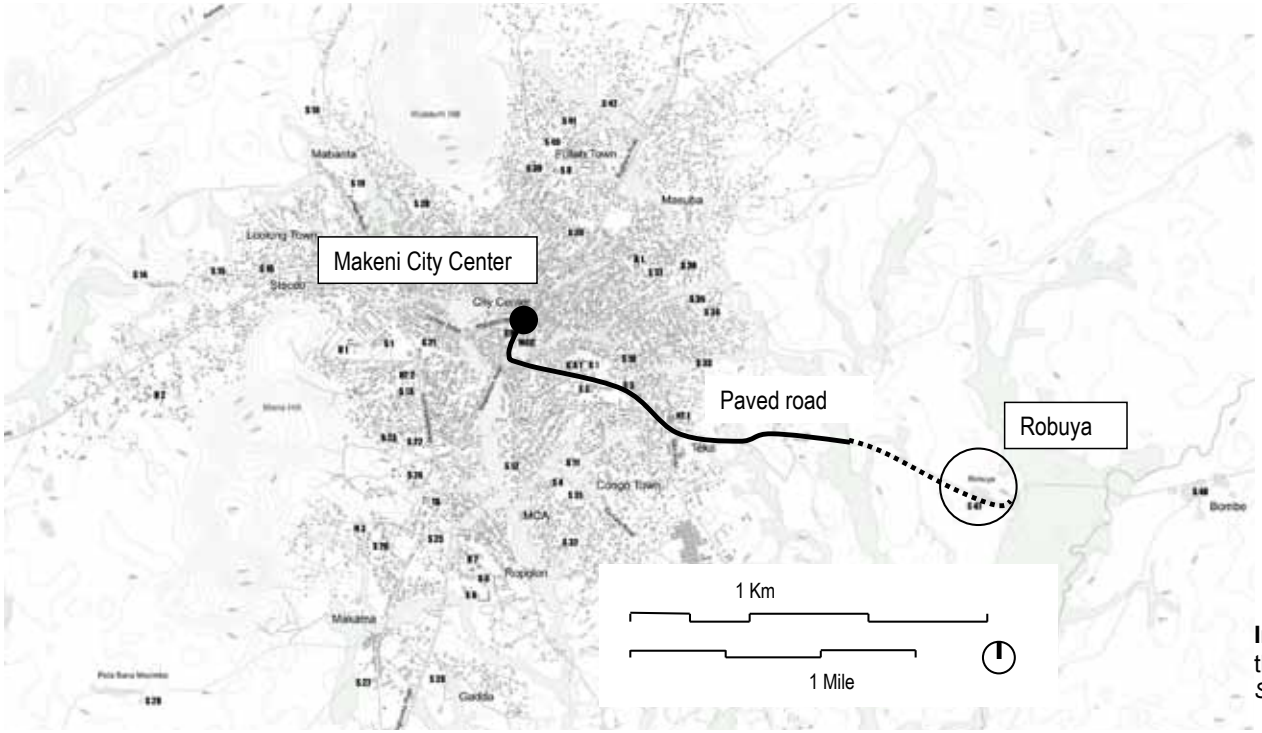


Image 41. Connection Robuya Makeni. There is 1 Km aprox. dirt road to the existing paved road
Source: HD_LAB

Robuya is 4,3 km (2,7 miles) far from Makeni, as was mentioned before. The main road that connects with Makeni is paved till a distance of 1 Km to Robuya. Here again, the situation between urban and rural is something key to consider. According to the fieldwork, there are 3 bikers in the village. No bus stop and no specific places for the bikes to stop. The cost of taking a motor bike to Makeni varies from 3000 leones to10.000 leones, according to the surveys. Considering an intermediate cost of 6.000 leones, and 1 trip per day (12.000 leones round trip), the total ammount per month would be 240.000 leones (considering 20 days). As a minimum salary is around 500.000 leones, the cost is close to 50% of a salary. Considering two salaries (wife and husband), the total family income would be 1.000.000 leones per month. In this case, transport cost for one member of the family would be 24% of the total family budget. A very bad rate over the 10% minimum considered. So, the evaluation is very low in this topic.

Indicator 2. Paved roads

This indicator measures the percentage of paved roads, over the total area analyzed. In developing countries, cities and rural environments still have a large number of un-paved roads. The implications on the mobility of people, both in daily trips to work or school, as in the occasional to health centers and services, are huge.
According to the World Bank, in 2009, the% of paved roads in sub-Saharan Africa accounted for 18.85% of the total.

The case of Robuya is simple, as the only road is not paved. As mentioned before, the City Council is paving the road in Makeni that give access to Robuya, but it takes 1 Km (15 minutes walking) from Robuya to the begining of the paved road. The importance of paving the road is huge for the Robuya inhabitants.

Image 42. Main street in Robuya
Source: CEU Group

According to the dimensions of street width, the following basic road hierarchy is proposed (Perea, 2015), that can be useful for future road actions in new urban expansions:

1. High capacity roads between cities. 3.5 meters per lane. Preferably 2 lanes per direction. Maximum slope 6%

2. Main arteries and avenues. 3.5 meters per lane (3 for light traffic). Preferably 2 lanes per direction. 4% recommended slope (7% in short sections)
For this type of pathways (always depending on the specific context), two types of basic sections are suggested, adaptable according to two possible situations with variants:

2.1. Urban avenue with strong passing traffic. In this case, it is recommended to separate the traffic from the premises with service roads for access to residential or commercial areas. This type of road is still very common in low cost contexts in which the circumvallation of urban environments has not yet been implemented. Traffic with trucks and high speed, poses a risk to people and makes it difficult to coexist with urban life. A section of 2 lanes per direction is proposed, an area for parking on the service road and tree-lined sidewalks measuring 5 meters separating the central and lateral lanes. Two alternatives could be proposed:

- With central boulevard. We propose a width of 12 meters that can accommodate passage of bicycles, trade, etc. Total width between block boundaries: 50 meters
- No central boulevard. I would keep the rest of the spaces. Total width: 38 meters.

Both solutions can be adjusted, reducing pedestrian spaces, making the section asymmetric as needed in each territory, or even decreasing some lane in one of the directions.

2.2. Urban avenue with little passing traffic. As it is not necessary to separate traffic, the avenue becomes important as an urban space, and does not require auxiliary side roads. This type of avenues should especially promote trade and urban activity. The two variants are proposed:

- With central boulevard
- Without central boulevard

3. Local roads. 3 meters per lane. 1 lane in each direction 4% recommended slope (7% in short sections, 10% can be accepted in short stretches of restricted traffic).
There are two situations:

- Medium-sized local roads. This type of road may be more or less wide depending on the context. A minimum of 21 meters is proposed. It is suggested to incorporate flexible spaces that can be integrated into pedestrian or road traffic as required.
- Local roads of small size.

In rural contexts, for villages and settlements, it is proposed to follow the Fry-Drew guidelines in “Village Housing in the Tropics”, for the main roads. In these, a total width of 21 meters is proposed, with 2 rolled lanes of 3 meters, sidewalks of 1.5 m and expandable spaces of 1.5 and 3 meters on each side of the central lanes.

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 7. ACCESS TO EMPLOYMENT

Goal	Assess the relationship between households and employment centers
Explanation	This section aims to assess the relationship between housing and work. Long distances between homes and employment, imply loss of a lot of time per day, pollution, cost, etc. Together with the aspects of sustainable mobility that are also linked to the urban model (compact or dispersed, of greater or lesser density, etc.), the truth is that in low-resource contexts, the implications of excessive distances are even greater in the living conditions of people.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Population with acces to agricultural lands (rural, periurban or urban agriculture)**	**High**	This indicator assesses the connections between the residence and the productive areas linked to agriculture, calculating the percentage of the population that, over the total, is considered to have access to these spaces	%	**100%**	Less than 4,000 meters (one hour walking), 80% of the population. See Complementary Information
2	**Population with acces to commercial areas (markets, commercial streets, vendors,...)**	**Very Low**	This indicator assesses the connections between the residence and commercial spaces of different types, calculating the percentage of the population that, over the total, is considered to have access to these spaces.	%	**0%**	Less than 2,000 meters (half an hour walking), 100% of the population. See Complementary Information
3	**Population with acces to industrial areas (production centers, artisans, carpenters)**	**Low**	This indicator assesses the connections between the residence and the industrial spaces of different types, calculating the percentage of the population that, over the total, is considered to have access to these spaces	%	**10 %**	Less than 4,000 meters (one hour walking), 50% of the population. See Complementary Information
4	**Population with acces to other jobs (mining, fishing, ports, administration, education,...)**	**Low**	This indicator assesses the connections between the residence and other employment centers, calculating the percentage of the population that, over the total, is considered to have access to these spaces.	%	**5%**	Less than 4,000 meters (one hour walking), 25% of the population. See Complementary Information

Other considerations	In this topic, the % of population is refered to the productive population, what is the population over 16 years who can be employed and work.
Global evaluation	**LOW**
Observations	Subsistence agriculture is the main activity for over 90% of Robuya workers, so it must have a special consideration
Recommendations	Urban Planning should consider seriously the integration of agriculture within the existing and new urban expansions in the Makeni surroundings as the land where Robuya is located. Preserving agricultural areas for productive activity is key for providing food security to the inhabitants. The strategies linking employment and housing are needed, and in agriculture, the opportunity of creating green belts with rural areas, natural, forests, rivers, swamps,.. must be incorporated to the future urban and territorial proposals. Forming cooperatives should also be considered.

HAB 7. ACCESS TO EMPLOYMENT

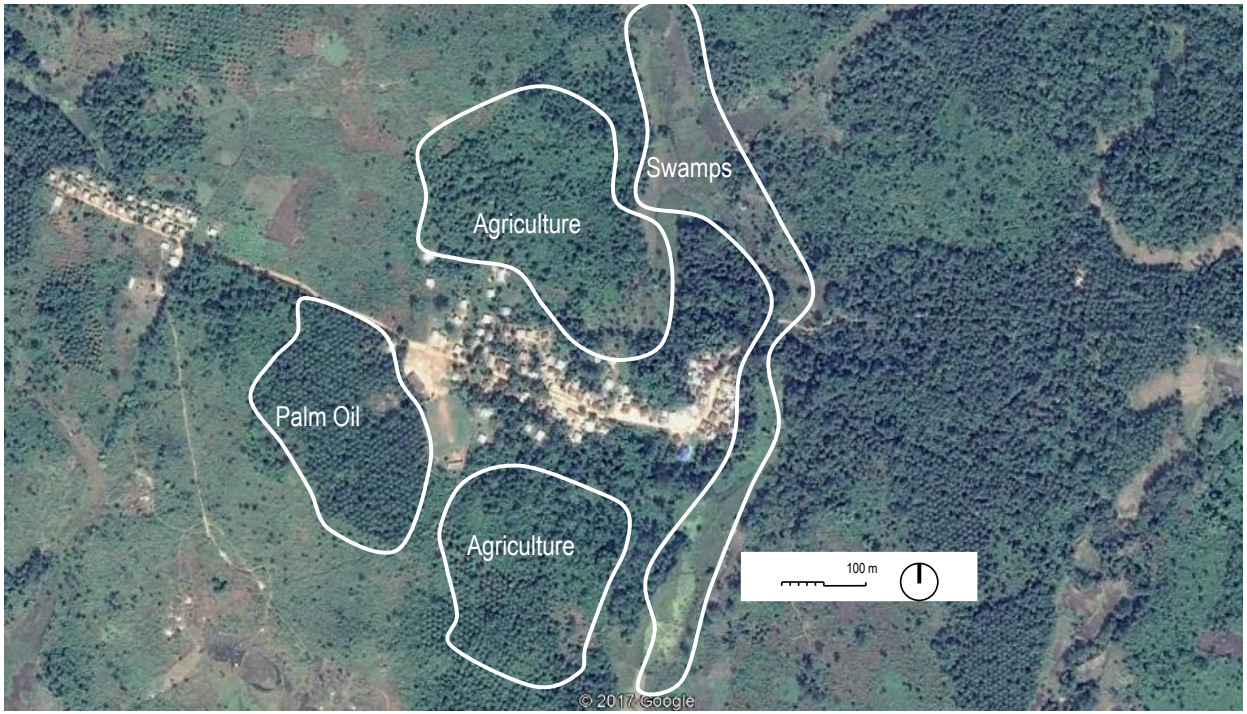
This section aims to assess the relationship between housing and work. Long distances between homes and employment, imply loss of a lot of time per day, pollution, cost, etc. Together with the aspects of sustainable mobility that are also linked to the urban model (compact or dispersed, of greater or lesser density, etc.), the truth is that in low-resource contexts, the implications of excessive distances are even greater in the living conditions of people. In general, the productive component has often been left aside in the elaboration of urban plans and strategies.

In developing countries, on the rural pattern in which the population sits near their farmland, the exodus to the cities breaks this logic. People look for shelter where they can and from home, they will find job opportunities in very different locations. Employers who manage to link employment and housing, even if they are desired, are not easy to obtain even from the most advanced planning. Often, it is the urban pattern, on which we have insisted so much on other sections, that will favor these relationships. Robuya, as a rural village, has a very high dependence on agriculture and the lands for this activity are around.

It has been considered higher the minimum distance to industrial areas (4.000) than commercial ones (2.000), as usually industry is far away from urban areas. But the case in Makeni is that the small industry (artisans, carpenters,...) are close and overlaped with the commercial areas, in the city center.

Indicator 1. Population with acces to agricultural lands (rural, periurban or urban agriculture)

Agriculture is the most widespread activity in the city and throughout Sierra Leone. A productive soil, which is used for palm oil, cassava, rice, banana, peanuts, ... Almost all the rural environment of the city is suitable for agriculture, which is developed on a very small scale. According to the Sierra Leone 2015 Census, close to 60% of the total employed population works in the agricultural sector. 25,8% of this total are in the Northern Province (17,1% Eastern, 14,6% Southern, 3,6% Western).



Almost all the people in Robuya (over 90%) works in agriculture land around the village. Rice, cassava, fruits, leaves, sweet potato are the main products. Working groups are organized for getting crops, and they sell the products in the market in Makeni. A NGO built construction to storage the products.

In Robuya, people is fishing in a river half mile and there is some livestock activity.

In this topic the evaluation is high, as the agriculture is just around the village. This is a subsistence agriculture in a very small scale. Introduction of cooperatives with new mechanic tools would improve productivity.

For the future, it is key to preserve specific agricultural land in close relationship with the housholds, considering the urban growth. Urban planning must ensure a good management of land, providing food security to Makeni inhabitants, well integrated to other activities.

Image 43. Agriculture around Robuya
Source: HD_LAB in google earth picture

Urban Planning is critical in this topic. The proposals given by the CEU University group (Strategic Spatial Plan for Makeni), are focused on the idea of a linear city around Makeni, linked by a Ring Road and reserving agricultural and natural areas along this main road, for the integration of agriculture and housing in the future city. Designing a green network with agriculture, forests, swamps, rivers, streams, hills, ... is a critical aspect in urban planning for Makeni and similar contexts in Sierra Leone and Africa. New communities can be organized around the intersections between the Ring Road and the radial existing streets that came from the city center. Planning the African cities should take agriculture into account as a key element in a short-medium term.

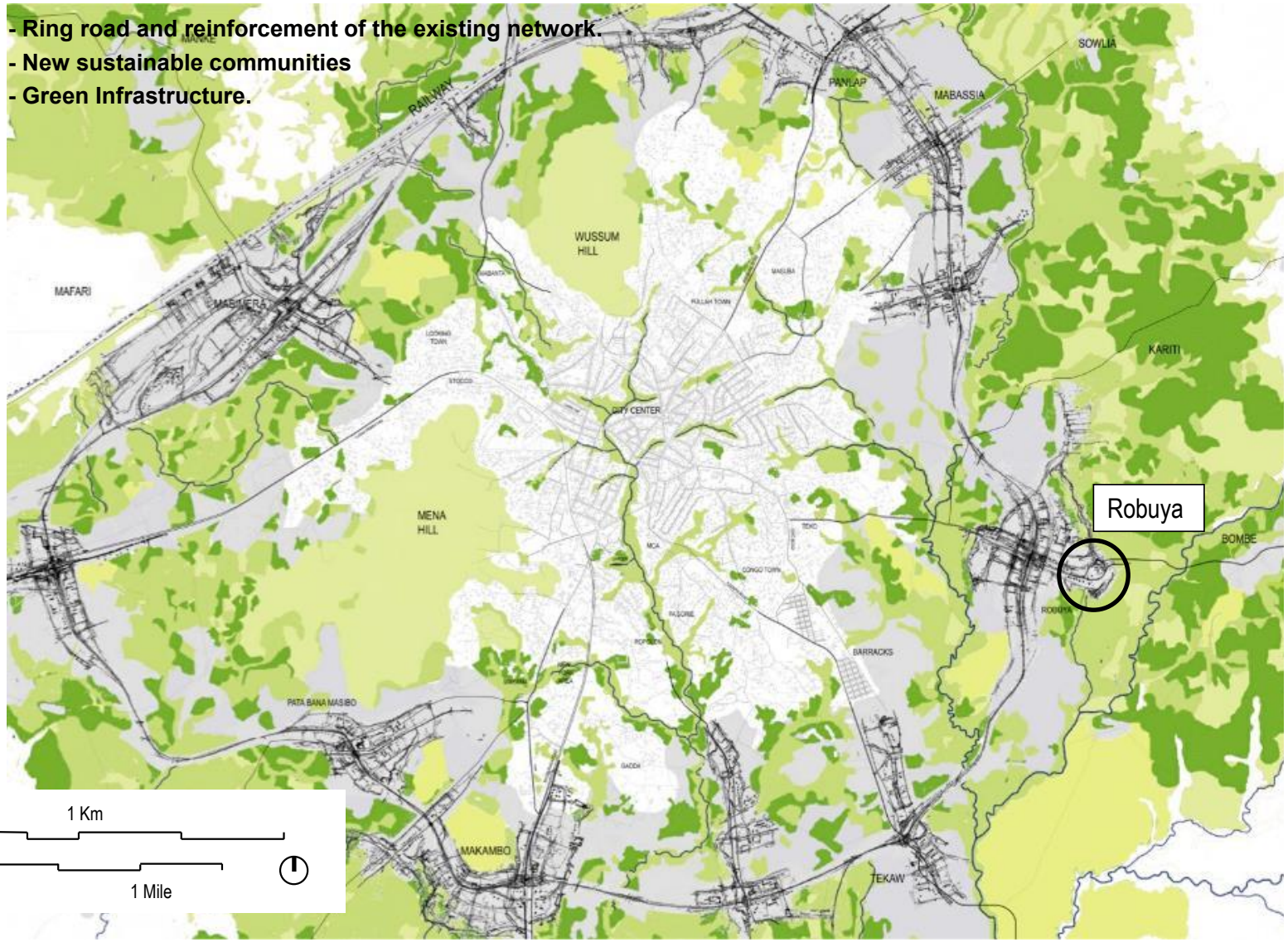


Image 44. Proposal of a linear city. The proposed Ring Road is the main element for connecting and organizing the future growth.

As it shows the drawing, the green network (agriculture, forest, natural lands, swamps, hills, rivers,...) are integrated in the global framework proposed. In terms of agriculture, this is key for provinding food security as part of the urban planning global project.

In the case of Robuya and other areas in the Makeni surroundings, preserving agricultural land close to the existing and future inhabitants, should be a critical decission for the authorities involved.

Source: HD_LAB

Indicator 2. Population with acces to commercial areas (markets, commercial streets, vendors,...)

The market in Makeni, and the main commercial areas are concentrated in the city center. The distance to Robuya is 4,3 Km (2,7 miles). In this area the artisanal activity is concentrated, the small industry of manufacture of furniture, carpentry, weavings, local crafts, ... It is also the area of concentration of general trade (construction materials, pharmacies, products for housing, ...), place of concentration of financial and administrative activity.

The distance is too high for Robuya inhabitants, as at least should have 2.000 meters for accessing commercial areas, so the evaluation is very low. There are some vendors who came from Makeni and one small shop close to the school in Robuya. Also a kiosc for charging mobiles

Indicator 3. Population with acces to industrial areas (production centers, artisans, carpenters,…)

There are no industrial zones in Makeni, beyond those that are more or less dispersed in the city. Yes quarries appear for the extraction of stone for construction (mainly gravel). These zones are located within an approximate radius of 5-8 km from the center of the city. As mentioned before, there are some small industry (artisans, carpenters,..) in the city center. In the future, it is essential to reserve land for industrial and logistical spaces, well connected to the main roads.

Indicator 4. Population with acces to other jobs (mining, ports, administration, education,...)

The companies African Minerals, Dawns and London Mining provided work to a significant number of inhabitants, also attracting new settlers to the city. The decline of London Mining and the Ebola crisis have left an uncertain landscape that is essential to study in detail. 2 teachers works in Makeni, and there are also security people and a worker for the Ministry of Agriculture.

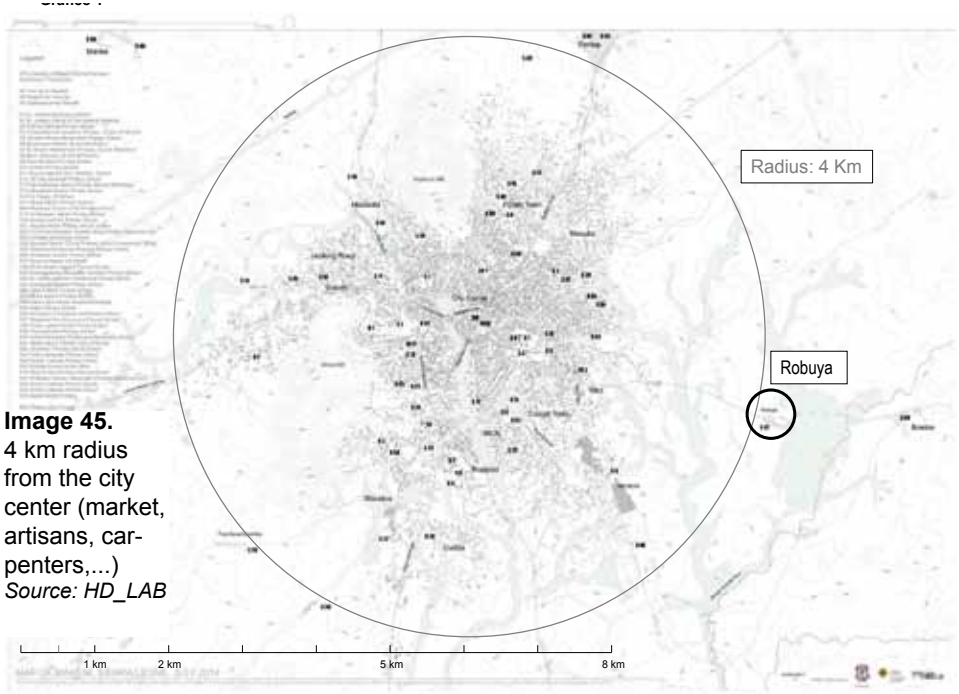


Image 45.
4 km radius from the city center (market, artisans, carpenters,...)
Source: HD_LAB

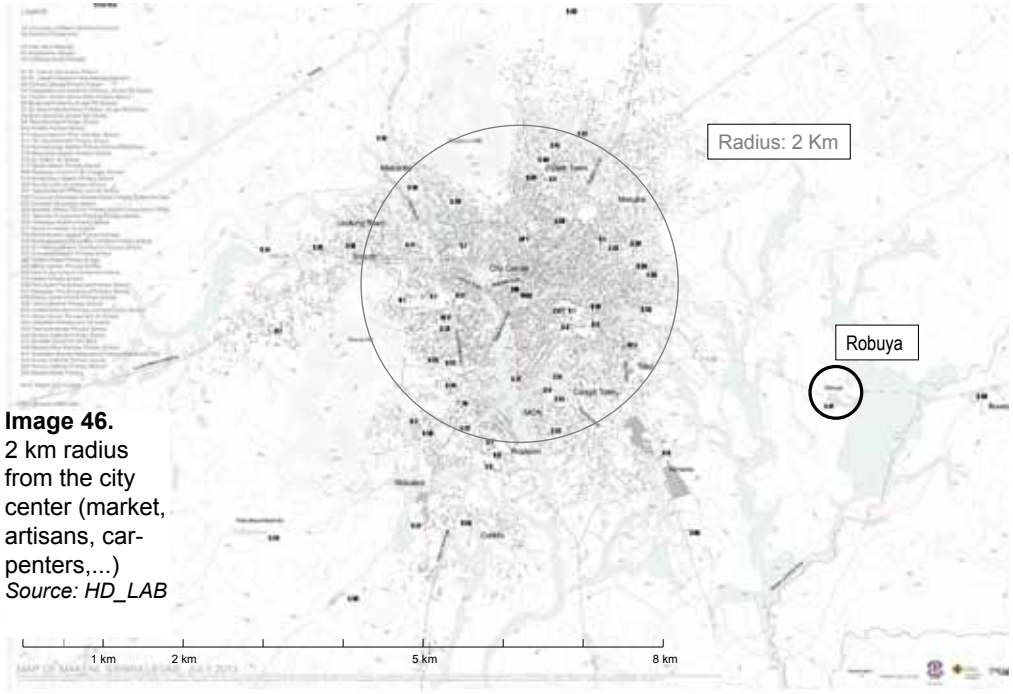


Image 46.
2 km radius from the city center (market, artisans, carpenters,...)
Source: HD_LAB

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 8. ENVIRONMENTAL IMPACT

Goal	Quantify the impacts on the environment in the analyzed area
Explanation	Impacts on the environment have negative effects related to the habitability of people, mainly in the medium and long term. It is necessary to quantify these impacts and adopt the precise measures to mitigate them
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Urbanized area in high value ambiental lands**	**High**	The indicator aims to measure the impact of urbanization on areas of high environmental value. The total area of urbanization that occupies these areas and its percentage over the total area analyzed is valued.	Has and %	**0%**	0%
2	**Erosion and deforestation areas**	**Low**	The indicator aims to measure the impact of erosion and deforestation on the analyzed territory. The total area and its% over the total area analyzed is assessed	Has and %	**Erosion in some areas of Robuya. 0% deforestation (according to surveys), 10% deforestation (according to dynamics)**	0% of areas with risk to habitability for erosion 0% without forest management strategies for deforestation
3	**Erosion and deforestation growth**	**No value**	This indicator aims to assess the growth of erosion and deforestation. Its progress in Has / year is quantified.	Has / year	**No data, but it must be considered a high risk**	No growth in areas with risk to habitability for erosion No growth without forest management strategies for deforestation

Other considerations	Deforestation is not understood as a problem in the village, but it is in the whole area. Both, deforestation and erosion will be growing problems to address in the coming years. So, as the final evaluation of this topic is medium, it must be considered seriously in the future
Global evaluation	**MEDIUM**
Observations	To analyze these issues a more detailed and technical study from a dynamic approach is needed
Recommendations	Preserving from urbanization natural and value lands is key. Strategies should be promoted for the integration and connection of natural (and agricultural-productive) spaces on a larger scale with other peripheral and urban spaces (concept of green infrastructure). Urban planning is key to guarantee a good management of natural and agricultural land. The area between Robuya and Makeni needs an urgent plan for the coming years in the context of a very rapid urban growth. Reforestation strategies should be implemented. Relationship between deforestation and biomass for cooking must be analyzed in detail.

HAB 8. ENVIRONMENTAL IMPACT

Already at the United Nations Summit on Sustainable Development, Rio + 20, held in June 2012, twenty years after the “Earth Summit” of 1992, it raises the principles for the elaboration of the Sustainable Development Goals within the report “ The future we want. “ In particular, there is a need for a coordinated and coherent approach between the environmental agenda and that of economic and social development.

The importance given to the environment and sustainability is reflected in the formulation of the new objectives. If in the 8 MDGs, mainly reflected in Goal 7 (ensure environmental sustainability), in the 17 Objectives of the draft Open Working Group on Sustainable Development of the United Nations (OWG), there are three more (the indicators of the old Goal 7 linked to biodiversity go to 15):
13. Adopt urgent measures to combat climate change and its effects
14. Conserve and sustainably use oceans, seas and marine resources for sustainable development
15. Protect, restore and promote the sustainable use of terrestrial ecosystems, effect sustainable management of forests, combat desertification, halt and reverse land degradation and curb the loss of biodiversity

Indicator 1. Urbanized area in high value ambiental lands

No precise information is available that identifies the environmental assessment zones. From the knowledge of Makeni from a global scale, it is considered important to preserve:

- Mena and Wusum hills. A line of urbanization must be established and the occupation of the slopes must be restricted
- Swamps. The flood line should be fixed and should not be exceeded in the new developments. Drainage, sanitation and actions in the margins should also be promoted
- Nearby rivers, streams and riparian and vegetation spaces. They have, together with the fragility of their own ecosystems, the potential to function as elements of connection with other valuable areas.
- Forested areas or of singular vegetation
- Agricultural lands

Strategies should be promoted for the integration and connection of natural (and agricultural-productive) spaces on a larger scale with other peripheral and urban spaces (concept of green infrastructure mentioned before).

In the case of Robuya, the surveys reveals no occupation of high value ambiental lands. It is still something not present around the village. But looking at the satellite photos, it is possible to observe the urban expansion of the city, growing with the obvious sustitution of natural and rural lands. The right management of planning the future Makeni city and surroundings must deal with the integration of natural and agricultural lands, as well as preserving vulnerable areas from urbanization, as was mentioned before.

Indicator 2. Erosion and deforestation areas

The indicator aims to measure the impact of erosion and deforestation on the analyzed territory. Erosion is the degradation of the soil by water (floods and flash floods), ice, wind or thermal changes. In sloping areas, erosion can cause very important degradation effects. Deforestation is the loss of plant surface, almost always due to man (urbanization and large-scale agriculture are the main causes). In low resource contexts, there is a direct relationship with the use of fossil fuels for cooking.

In Robuya, erosion can be seen in the roots of some trees and other places. Deforestation is not conceived as a problem, but all the villagers (and the great majority in Makeni) uses biomass (wood and charcoal) to cook.

Indicator 3. Erosion and deforestation growth

The reality shows an indiscriminate advance in the occupation of the territory. It is essential to pace urban development with conservation actions and sustainable management. All the area between Makeni and Robuya is suffering a very important growth that must be taken into account for the coming years. For the quantitative analysis, there are no available information about the real growth of erosion and deforestation.

Image 47. East part of Makeni city and Robuya area.
The satellite images show the advance of the city of Makeni towards the east, where Robuya is located. It is critical, facing the future, to integrate urban expansion with a good balance of natural areas and agricultural areas, avoiding the occupation of swamps and other vulnerable areas
Source: Google Earth

Image 48. Aerial view of Robuya and eastern Makeni
Source: Google Earth

Image 49. Erosion in areas along the main Robuya street
Source: CEU Group

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 9. BUILDING AND HABITABILITY CONDITIONS (DWELLING-PLOT, CONSTRUCTION, OVERCROWDING)

9.1. BASIC FACILITIES

Goal	Quantify the constructive quality and the processes related to construction
Explanation	Building must integrate elements of quality, adapted to the context. The costs, the integration of local materials, climate adaptation, measures against risks, training in construction, are some key features that should try to be incorporated into the constructive processes, especially in those with the lowest resources. In this section, educational, health and community facilities are valued
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**School. Construction quality and process: durability and eficiency of the construction system**	**Very Low**	The indicator assesses the quality of the construction, adaptation to local regulations, efficiency and integration of the selected method in relation to climate, appropriation capacity, self-construction, processes, etc.	High / Medium / Low	**Low**	According to quality construction and methods used. See Complementary Information
2	**Built up school area by student**	**Very Low**	This indicator quantifies equipment area ratios (m2 built) according to the number of users.	m2 built / student	**- 1,10, primary - 1,45, secondary**	For schools, a minimum of 10 m2 built / student
3	**Health Center. Construction quality and process: durability and eficiency of the construction system**	**Medium-Low**	The indicator assesses the quality of the construction, adaptation to local regulations, efficiency and integration of the selected method in relation to climate, appropriation capacity, self-construction, processes, etc.	High / Medium / Low	**Medium-Low**	According to quality construction and methods used. See Complementary Information
4	**Built up health center area by inhabitant**	**Medium-Low**	This indicator quantifies equipment area ratios (m2 built) according to the number of users.	m2 built / inhabitant	**0,04 m2 b /inhabitant**	For healthcare centers, a minimum of 0.05 m2 built / inhabitant
5	**Social Center. Construction quality and process: durability and eficiency of the construction system**	**Medium-High**	The indicator assesses the quality of the construction, adaptation to local regulations, efficiency and integration of the selected method in relation to climate, appropriation capacity, self-construction, processes, etc.	High / Medium / Low	**Medium-High**	According to quality construction and methods used. See Complementary Information
6	**Built up community center area by 100 inhabitants**	**Very Low**	The management of solid waste is another essential factor of habitability in urban areas.	m2 b / 100 inhabitants	**12 m2 b /100 inhabitants**	For communal center, a minimum of 15 m2 built / 100 inhabitants

Other considerations	Detailed information is required in some of the indicators
Global evaluation	**VERY LOW - LOW**
Observations	The capacity to establish measures that optimize the response to floods, climate, rainwater recycling and others, is highly conditioned by the economic capacity of the context
Recommendations	Carry out a detailed study of the operation, constructive quality and demands of educational, health and social facilities in Makeni. Development of regulations on quality and safety and health in construction. Promote cross ventilation, ventilation of the roof, covered corridors connecting buildings, perimeter drainage connected to the global network. Promote rainwater recycling systems. The aproval of the Senior Secondary School in Robuya, by Government is needed.

HAB 9. BUILDING AND HABITABILITY CONDITIONS

9.1. BASIC FACILITIES

In Makeni, obviously, the construction quality varies a lot and there are high-level buildings in the finishes and construction in general, with buildings of a certain precariousness. We must comment here what was stated in the Development Plan, about the poor adaptation of the classrooms in secondary schools. The heat conditions the need to establish cross ventilation in all spaces. This is something that is fulfilled in almost 100% of the buildings observed. Although in the wet season it rains torrentially and in the dry the water is scarce, there are hardly any examples of rainwater recycling in schools, health centers and communal premises. Climate is an essential condition and often covered galleries (sun and rain) are integrated, which work very well. The usual problem is that these galleries do not usually have continuity between different buildings.

Indicator 1. School. Construction quality and process: durability and eficiency of the construction system

The indicator assesses the quality of the construction and its adaptation to local regulations, as well as the efficiency and integration of the selected method in relation to climate, appropriation capacity, self-construction, processes, etc. Both buildings, primary and secondary schools, presents similar characteristics. Mud blocks with plastic cement, wooden trusses, zinc roof, no ceiling. Poor quality in general. No windows in the primary school., and quite dark for classes. Classes not well isolated. The secondary school is not officially aproved by the Government. There is no senior secondary school, so they go to Makeni or Bombe. The community built the school. As it is ahown in the pictures, primary students do not have a suitable space for having lunch. The latrines are ventilated.

Image 50. Robuya primary and secondary schools.

- Up, left. Classroom of primary
- Up, right. Lunch time in primary school
- Down, left. Secondary school
- Down, left. Ventilated Pit Latrines

Source: CEU Group

Indicator 2. Built up school area by student

There are 245 primary students and 110 junior secondary. 8 teachers in primary and 11 in secondary with a ratio of 30 students / teacher in primary and 10 in secondary. The built-up area of the primary is 270 m2 and 160 m2 in secondary, what gives the following rates:
- Primary school: 1,10 m2 built / student
- Secondary school: 1,45 m2 built / student

The evaluation is proposed, based on the publication “Evaluating Basic Habitability” (Coordinators: Belén Gesto and Luis Perea), and the reference is a minimum of 10 m2 built / student. So in both cases the situation is really bad.

Indicator 3. Health Center.Construction quality and process: durability and eficiency of the construction system

There is a small Health Center under construction in Robuya. The works (self-helped) didn´t finish cause lack of funds, what is necessary for the Government to provide medical assitance. To support the construction was finally the action to fund, detected during the fieldwork and meetings with the local community. 800 euros were given by CEU University to help the works. Some doors and windows were made, waiting to the community to install them, as part of the agreement.

The construction quality is very similar to other buildings in Makeni. Very basic, but as it is not finished, is not possible to define it clearly.

Indicator 4. Built up health center area by inhabitant

Considering 60 m2 built (information to be confirmed), and the 1.500 inhabitants of Robuya, the ratio is 0,04 m2 built /inhabitant. According the same publication mentioned before, for healthcare centers, is needed a minimum of 0.05 m2 built / user.

Indicator 5. Social Center.Construction quality and process: durability and eficiency of the construction system

In Robuya there is a Social Center for the community that was the place for the two meetings developed during the initiative. There is another, small circular one (baffa), in another part of the village.

The construction quality is good, with wooden trusses, zinc roof with pilars and cement-sand blocks. It is very well covered and very open to combat the heat. It hasn´t a dranaige system.

Indicator 6. Built up community center area by 100 inhabitants

According to the surveys, the center is used a lot and people need another social area. The existing one has 176 m2 built, what gives a ratio of 12 m2 built / 100 inhabitants. Following the references (Gesto-Perea), for communal center, the minimum of 15 m2 built / 100 inhabitants.

Image 51. Robuya community center. Picture at the bottom, first meeting with a selected group of the local community.

Source: CEU Group

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 9. BUILDING AND HABITABILITY CONDITIONS (DWELLING-PLOT, CONSTRUCTION, OVERCROWDING)

9.2. HOUSING

Goal	Know and quantify the basic characteristics of housing and habitability conditions
Explanation	As the last step in the provision of HaB, access to housing remains one of the greatest challenges facing the planet, mainly in low-income contexts. In this section, issues related to construction, processes, with the participation of the population, the use of local materials and technologies, land tenure, etc. are analyzed in this section.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	**Origin of the data**	**Priority**
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	**Evaluation**	**Descripción**	**Unit**	**Data**	**References. Adequate dimensions**
1	**Housing. Construction quality and process: durability and eficiency of the construction system**	**Low**	The indicator assesses the quality of the construction, adaptation to local regulations, efficiency and integration of the selected method in relation to climate, appropriation capacity, self-construction, processes, etc.	High / Medium / Low	**Low**	According to quality construction and methods used. See Complementary Information
2	**Suitability according to the families and users (family dimensions, origin, uses, open spaces,…)**	**Low**	This indicator aims to assess how housing in the area analyzed, respond to the conditions of families in the area.	High / Medium / Low	**Low**	According to different parameters. See Complementary Information
3	**Overcrowding**	**Very Low**	This critical indicator is one of the determining factors for the quantification of UN-Habitat slums. It seeks to set a limit to the number of people who share a dwelling or room.	Persons / room	**5 persons / room**	Less than 3 people per room, qualifying according to contexts. See Complementary Information
4	**Security of Tenure**	**Very Low**	The legal support to ownership over land ownership is valued	Yes / No	**No**	1. Documentary evidence 2. Protection to evictions 3. Guarantees equal access to land
5	**House price to income ratio**	**No value**	Ratio of the median free-market price of a dwelling unit and the median annual household income	Dwelling price/ annual income	**No data**	According to UN-Habitat average rates by region (12-10)
6	**Rent price to income ratio**	**No value**	Ratio of the median annual rent of a dwelling unit and the median annual household income of tenants	%	**No data**	According to UN-Habitat average rates by region (35-30)

Other considerations	Detailed information is required in some of the indicators, mainly about real affordability and management of housing
Global evaluation	**LOW - VERY LOW**
Observations	
Recommendations	Promote programs for the development of new types of collective and row housing (increasing density), in coexistence with the traditional types. Evaluate the alternatives of programs of sites and services. Recover the street as a model of urban development and basic grouping. Include in the new typologies areas of public-private relationship, cross ventilation, ventilated roof, outdoor covered spaces, common areas, workshop spaces, commerce and community gardens. Also to promote older models and the integration of training and community participation programs. Involvement of people in the exploration of new typological alternatives. Promote the development of a cadastre with spatial information and review of the situation in relation to property. Integrate housing programs for the most disadvantaged sectors into planning

HAB 9. BUILDING AND HABITABILITY CONDITIONS

9.2. HOUSING

Of the 5 conditions used by UN-Habitat to measure the precariousness of slums (Access to water and sanitation, durability of housing, overcrowding and secure tenure), the last 3 have their reflection broken down in this section. In Makeni city and surroundings, the construction of the house responds, to an almost single typological model of detached house on a plot. The plots, 23x23 and 30x23 meters, with multiple variations according to the zone and the fit in the plot, allow open spaces for the development of different activities. On the one hand, on the plot are located, outside the house, kitchens, bathrooms and toilets. On the other hand, it is the space of community social relation. The plots are rarely fenced (it is considered anti-social) and spaces of neighborhood coexistence or groups of families are generated. At city scale (Makeni 2004 Census), 98.3% live in one-family single-family homes. Of these, 75% have a single unit per plot and 25% with multiple units.

As mentioned before, the case in Robuya is quite similar, although the dimensions and shape of plots does not follow any clear pattern. Land belongs to Tarawalli family, so delimitation of properties is not necessary. This reality is, in fact, a very important conditioning for all the conclusions that can be obtained and for future possible improvements.

Indicator 1. Housing. Construction quality and process: durability and eficiency of the construction system

Dimensions of dwellings are similar to other Makeni areas. The house usually has a dimension of 10-13x10-13 meters, which sometimes goes to 10-13x15-18. It separates about 3-5 meters from the boundary line of the property and towards the main street develops a covered vearnda. This veranda works as a transition space between public and private space, it is a shaded area and a viewpoint of the street, where the population spends a lot of time. In many cases it is dedicated to hairdressing, trade and other complementary activities. Smaller dwelling units are often built in the back side of the plot. Internally the houses usually have about 4 rooms, connected by a corridor that joins two doors, one in each façade. This arrangement favors cross ventilation.

The survey in Robuya shows that most of dwellings are constructed with mud blocks and plastic cement. Zinc roof is the most common and some are palm tree roof. Poor quality in general has been observed. They prefer cement blocks cause the mud blocks cracks and they detect problems with termites. Some have foundation of concrete, and some have no enough windows, according what was seen during the fieldwork. The community built the houses, in the land of the Tarawalli family, usually with 5 rooms.

According to the previous information, the durability of dwellings is quite low, as mud requieres often reparation. But there are no important risks cause the construction system. Very few houses have dranaige system around, what will give problems during the rainy season, don´t detected as the fieldwork was done in the dry season. But considering the possibilities of the people in this low resource environment, the eficiency can be well considered. People find the only way for getting a household thanks to the self-construction and the use of local materials. Also, it is important to highlight that there are a variety of situations, with houses of a very good quality and others very poor.

Image 52. Different type of residential units in Robuya
Source: CEU Group

Indicator 2. Suitability according to the families and users (family dimensions, origin, uses, open spaces,…). Incremental alternatives

For the evaluation of this indicator we will use the following questions:

1. The house is appropriate to the size of the family.
We consider that is not enough appropiate, as 5 persons per room would need another bigger solutions. But also here, we should understand that the families are big units in Robuya and Sierra Leone. So, maybe there are no easy solution to accomodate the variety of granparents, parents, cousins,... who are sharing the same space.

2. The distribution of housing is adapted to the basic needs of the family.
As it is organized for optimizing space, is well adapted, but with the same problem than in the first point.

3. The house and its exterior spaces are adapted to the daily habits of the family (recreation, bathroom, toilets, ...).
Yes, as it provides open spaces for social interaction in the external areas. Latrines are normally at a sufficient distance and kitchens are organized in the open areas of the plots.

4. Housing is integrated into the neighborhood unit promoting community life.
Yes. There is a good relationship between houses and the other elements of the neighbourhood, organized along the main street.

5. Housing includes incremental possibilities.
The plot gives the opportunty, as growth is ocurring by the construction of other buildings in the same plot. But almost never the are additions to the previous building. So the process by building new houses, sometimes too close to the existing ones, it can be a problem in the future. Designing incremental housing that can integrate future growth, is nowadays one of the most interesting ways of proposals for low income resources.

6. There are different typologies.
No. All the solutions are almost the same type, with single one story unit. There is one recent construction of quite high level with two stories, but it seems to be a big family house. New alternatives of 2 story buildings, aparments, collective and row housing should be analyzed, here and in general in Makeni. It is important to consider the changes in society. Renting options, small aparments for young people, and other solutions will be needed in the future. Having different alternatives will improve the future living conditions of the people.

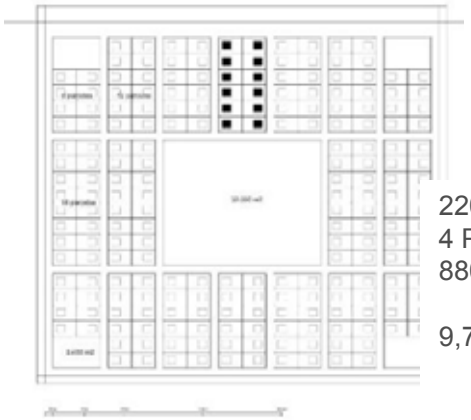
In general, the considerations about suitability depends on different elements, including customs, family size, type of relationships between members of the family, economic resources, climate,... It is not realistic to think in a big change in the built environment. And also, there is no the need now for that. But the process of urban growth is seriuosly rapid in Makeni surroundings.

Would be interesting to have a clear legal framework, a building code to define solutions, incremental alternatives, etc. Following the study developed by Perea (“Towards a quantitative analysis of informal city”, 2015), looking at the next image it is clear to understand how new housing typologies can improve land use. Moving from the single detached unit solution (the most common in Makeni) to other possibilities (row housing or two story apartments), will save in a period of 10 years and following the current rate growth in Makeni, close to half land in the case of 2 story apartments.

These more compact patterns need to deal also with the family size, that as we saw before is an important condition in the case of Robuya and Makeni.

Example of saving urban land with more compact models

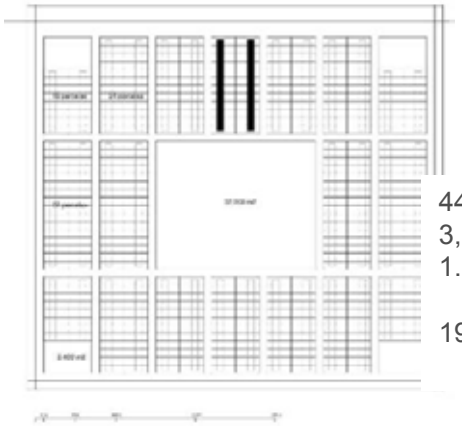
Settlement: 500x450 m (22,5Has)



220 dwellings
4 Per/dw
880 people

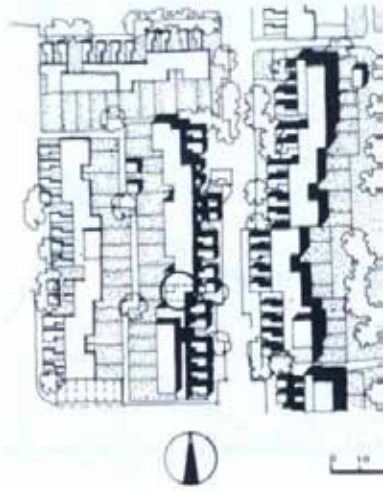
9,7 dw/Ha

1. Makeni single family house



440 dwellings
3,5 Per/dw
1.540 people

19,5 vdw/Ha



2. Row houses

From single family house to row houses
Land area saved 10 years: **822 Has** (1907 to 1084 Has)

872 dwellings
3 Per/dw
2.616 people

38,75 dw/Ha

3. Collective 2 levels houses with common area

From single family house to collective 2 level houses

Land area saved in
10 years: **958 Has**

half land ocupation!!

Image 53. Land consumption with different housing solutions
Source: Luis Perea (using projects of Inbo office and Ralph Erskine)

Indicator 3. Overcrowding

This is a critical condition, since it is one of the characteristics to define precariousness in settlements according to UN-Habitat. It is perhaps one of the most questionable too. The fact that there are 3 or more people sharing a room is already overcrowded, which is very restrictive. And especially in contexts such as the Sierra Leone, where the coexistence of several brothers in the same room is a way to promote family ties and is actively promoted.
In any case, according to the 2004 census, 41.1% of the homes in Makeni had more than 3 people per room. Perhaps the most significant is that of that 41.1%, 44.7% included more than 7 people per room and a very high 18% to more than 10.

As mentioned before, surveys provided the information that households in Robuya have often 5 people per room, what is significantly higher than the average in Makeni. So, even as the reference of 3 persons/room is too restrictive for contexts as Sierra Leone, overcrowding is a critical factor in Robuya.

Indicator 4. Security of Tenure

Frist of all, it is important to understand that the situation in Robuya is part of the traditions and customs that are present in the Sierra Leonean land tenure system. A new land policy reform process is being developed in the country (by the Ministry of Land, Country Planning and the Environment), dealing with all these kind of problems.

According to the Final Document of the National Land Policy for Sierra Leone (2015), there are tenures under different legal regimes (general law and customary law). “The **general law** recognizes two main types of tenure:
- Freehold
- Leasehold

The following are the main tenures that currently exist in respect of land held under **customary law** in Sierra Leone:

a) Communal Tenure. The main feature of communal tenure is that title to lands in a chiefdom or parts of chiefdom are claimed by or on behalf of the community as a whole
b) Family Tenure. Family tenure can be defined as the system of customary tenure in which title to certain lands within chiefdom is claimed by various descent groups, each with a common ancestor. The title is vested in the family as a unit. Such family lands should be distinguished from lands held by family groupings (Clans) as members of a community under communal tenure. Under family tenure, the family’s title is paramount and not dependent on or derived from that of any superior entity.
c) Statutory Leases. A lease granted under the provisions of the Provinces Land Act, Cap 122, is a creature of both the general law and customary law.
d) Customary Tenancie. Under the broad heading of customary tenancies fall various forms of grants made under customary law where the intention of the grantor is to convey to the grantee an interest much less than the absolute title to the land in question. Such tenancies (or customary leasehold arrangements) may be classified according to their duration”.

This part of the Land Reform document shows the complexity of the land tenure system. In case of Robuya village, the situation is between the case of family tenure and communal tenure under clans. This is cause the land in Robuya belongs to one family, but although part of the villagers are from Tarawalli family, others not, and no title is available according to the surveys conducted.

As in whole Sierra Leone, in relation to land, the problems in Makeni emanate from the overlaping of general and customary laws, whose coverage is confusing and complex. The owners of the land in Makeni, a few families that inherit the land generation by generation, play an essential role and condition the open access of the population. Since there is no cadastre with a spatial registry, property disputes are frequent and certain insecurity is generated. This situation contrasts with the fact that the owners in Makeni feel their situation supported.

This is the situation in Robuya, where Tarawalli family is the owner of the all land in the village and surroundings. There is no title, no rent and the people cannot buy the land.

When they go to the City Council for any administrative issue, they say they live in Robuya village. At same time, people haven´t had the need of buying land and just give some compensation to Tarawalli family (not clearly defined during the survey).

According to UN-Habitat, security of tenure needs to adress:

1. Documentary evidence that can be used legally. Although Robuya inhabitants dont need any document nowadays, the situation is insecurity in general.
2. Protection perceived or in fact, to evictions. This is something that depends on Tarawalli family. A lot of Robuya people are part of this family, but we cannot be sure about the internal decisions that can be taken. So, the legal support is not enough.
3. If the tenure system guarantees equal access to land. We can consider that this is not achieved in the case of Robuya. Acces to land depends on the family who own the land.

As a conclusion, security of tenure is a major issue in all Sierra Leone. Following the Final Document of the National Land Policy, “Customary land tenure remains a complex system which is not always capable of precise definition. Rights in land held under customary law are invariably not documented except where the grant is one under the Provinces Land Act, Cap 122, or the transaction involves a grant made in a form known only to the general law, an attempted conversion from a customary tenure, such as a family tenure, to a freehold under the general law. Invariably, this absence of any documentary title is not only the main reason for insecurity of tenure under customary law but it is a factor that impedes development as it fails to facilitate the easy transfer of land rights under customary law. This has always been the case and is likely to remain that way because customary land rights, being trans-generational are protected by rules of allocation and transmission designed to keep land resources within communities, lineages and families.”

Indicator 5. House price to income ratio

Following UN-Habitat (*Urban Indicators Guidelines*, 2009), “In a responsive and efficient housing market, the range of housing prices and rents have to be such that they respond to all sections of the population and reach the lowest segments. This indicator is based on the assumption that, for households, access to adequate housing means that housing expenditures do not take up an undue portion of their income”.

“This information is usually collected using several indirect sources collected through public housing boards, housing finance institutions, real-estate agencies, non-governmental organisations. Results should be obtained as per the following definitions and methods:

- Median housing price: Housing price is defined as the price at which a house would sell if placed on the market for a reasonable length of time by a seller who is not under pressure to sell. The medianpriced house in the urban area is that house which has 50% of the houses priced below it, and 50% of the houses priced above it. The calculation of the price of the median-priced house should, therefore include all housing, both new and old, and both formal and informal. If, for example, the majority of the housing stock is informal, and the informal housing stock is generally cheaper than the formal housing stock, then the median priced house will probably be an informal unit. For blocks of apartments or multiple-family dwellings which are usually sold as a single building, the value of one dwelling unit should be estimated as a pro rata share of the total sale price. This is particularly relevant for countries in Africa where the majority of housing is of this type.
- Median household income: Household income is defined as the gross income from all sources,which include wages, salaries, incomes from businesses or informal sector activities, investment income, and where information is available, income in-kind such as consumption of agricultural produce which might have been sold”.

The case of Robuya, as mentioned before, does not deal with housing prices, as people lives thanks to the Tarawalli family. During the surveys, people of Robuya give the information that the ones who belongs to Tarawalli family, they pay 150.000 leones. Each person must also pay 5.000 leones per year in taxes. For this topic, more detailed information is requiered.

Indicator 6. Rent price to income ratio

According to the same previous reference (UN-Habitat, *Urban Indicators Guidelines*, 2009), this indicator measures, in %, the relationship between annual rent cost and annual family income. The document gives the following information:

"- Median rent: Rent should be contract rent or the amount paid for the property alone and not for utilities such as electricity, heating etc. If median rent data cannot be located, then an estimation procedure has to be used, with ranges of rents estimated separately for different categories such as public housing, controlled rents, one bedroom and two bedroom furnished and unfurnished apartments, and single family houses of different types. The median price will be part way up the price ranges of the median dwelling types.
- Median household income: Household income is defined as the gross income from all sources,which include wages, salaries, incomes from businesses or informal sector activities, investment income, and where information is available, income in-kind such as consumption of agricultural produce which might have been sold. For the calculation of the rent to income ratio, incomes should be median gross income of private and public renter households. Where renter household income data do not exist, median income of all households can be used."

No renting in Robuya village, so this indicator and the previous one haven´t been evaluated.

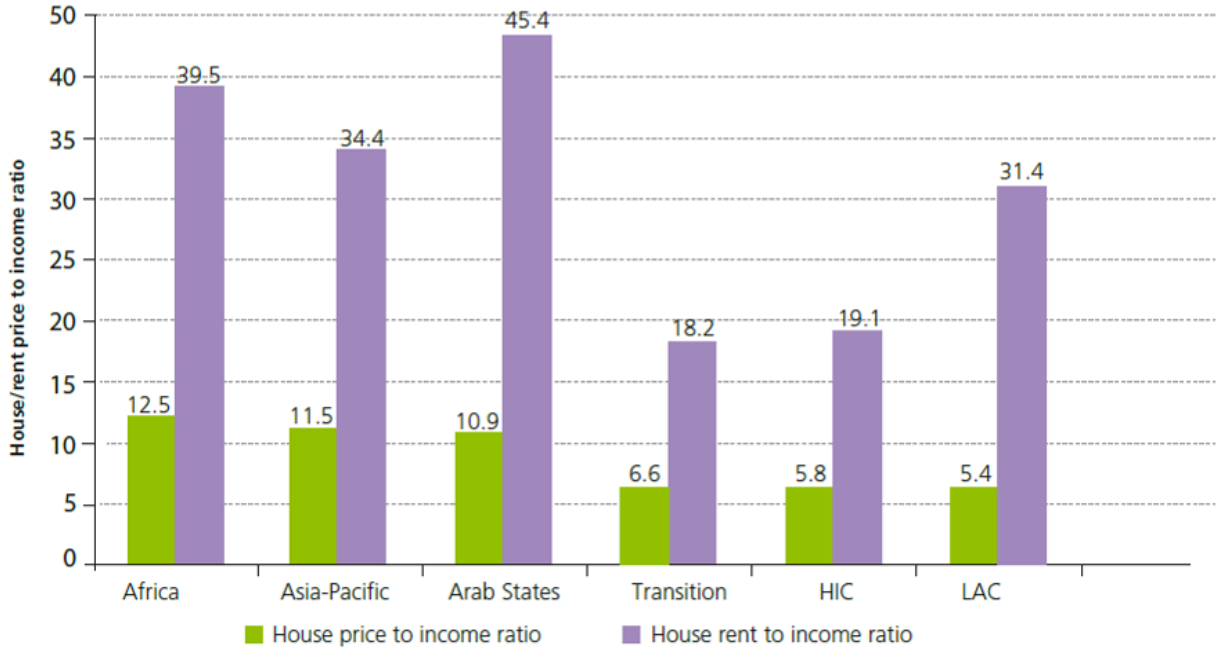


Image 54. House price to-income-ratio and rent to income ratio, in cities in various regions
Source: "Affordable land and Housing in África", UN-Habitat. 2012

UPGRADING NEIGHBOURHOOD PROGRAMME. INDICATORS FOR EVALUATION AND MONITORING
ROBUYA VILLAGE, MAKENI (SIERRA LEONE)

HaB 10. URBAN MANAGEMENT (LEGAL FRAMEWORK, TECHNICAL CAPACITY, PARTICIPATION,...)

Goal	This set aims to evaluate the level of participation, the relationship with local authorities and the existing legal and regulatory framework
Explanation	This topic tries to analyze those aspects of local management that condition the functioning of the territory. It involves issues related to the level of State-municipal de-centralization, the institutional initiative, the participation of local actors, economic resources, technical equipment and land management.
Methodology	The information includes fieldwork, mapping, technical analysys, surveys, for getting the data of each indicator. The evaluation is considered more or less optimal based on the reference data provided by the indicators and the rest of the documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	**Origin of the data**	**Priority**
Village	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	**Evaluation**	**Descripción**	**Unit**	**Data**	**References. Adequate dimensions**
1	**Community participation (relation with Local Government)**	**High**	The indicator assesses the level of citizen involvement in decisions that affect urban issues (mainly) in the analyzed area. The degree of associationism, the participative channels, the fluency in citizen-administration relations, determines a level of effective participation.	High / Medium / Low	**High**	According: 1. Assistance of civil population to participatory events and processes linked to the city and community 2. Number of civil associations
2	**Gender inclusion**	**Low**	This indicator assesses the participation of women in community decision-making, as well as non-discrimination for any reason	High / Medium / Low	**Low**	According to different parameters. See Complementary Information
3	**Management (land, infrastructures, legal framework,…)**	**Very Low**	The aim is to know the normative context linked to urban planning. Legislation is the basis that safeguards urban decisions.	High / Medium / Low	**Very Low**	Rate according to 3 levels: 1. Low: There is no regulatory framework to guide urban planning and the construction of the city 2. Medium: There is legislation, but does not contain spatial indications (that can be mapped) on urban planning, nor parameters to buildings 3. High: Exists legislation with clear indications of urban planning, which involve a spatial reflection in plans and with criteria for building

Other considerations	A process of reform of the National Land Policy is being developed by the Ministry of Lands, Country Planning and the Environment
Global evaluation	**LOW**
Observations	Land tenure is a major challenge for urban management, but it is a national issue. Complete the decentralization process to give more autonomy to City Councils is key
Recommendations	It would be key to organize a Workshop focused on urban planning in the Robuya surroundings, as it is a clear expansion area of Makeni. The involvement of traditional authorities (Paramount and local chiefs, councillors,...) is critical. In the framework of the interuniversity collaboration CEU-UNIMAK, with the support of the Makeni City Council, the Workshop can be a good way for a participatory experience in organizing the future Robuya and surroundings, linked with other areas of Makeni. The participation of the civil society and other levels of local and regional administration is needed. Although is something broader than what concerns just Robuya village, training in urban planning is really important for the different levels of the society in Makeni, in all the issues related to habitability.

HAB 10. URBAN MANAGEMENT (LEGAL FRAMEWORK, TECHNICAL CAPACITY, PARTICIPATION,...)

Indicator 1. Community participation (relation with Local Government)

The indicator assesses the level of citizen involvement in decisions that affect urban issues (mainly) in the analyzed area. The degree of associationism, the participative channels, the fluency in citizen-administration relations, determines a level of effective participation.

Based on what was observed during the years of work, Makeni's society seems very participatory. We understand that it derives from a common dynamic in the villages and in relation to the secret societies, which prints an assembly or group character of constant community decisions. Despite the fact that democracy in town councils takes just over 6 years, this participatory culture seems to permeate the different spheres.

The process in Robuya reveals that participation is very strong in the local community. It was also told during the surveys by the inhabitants. But the relation with the City Council is not very fluent, as the people said.

Indicator 2. Gender inclusion

In Sierra Leone, women still suffer very clearly from widespread discrimination. This falls in the areas of decision and in the family. At the political and technical level, the female presence is still very minority. In the domestic space, they are responsible for the main tasks that involve long walks to water, house management, kitchen, etc. Polygamy, common in the Muslim population, does not favor development for women to take a more relevant role. Female Genital Mutilation is practiced generally in Sierra Leone, with about 90% "reach". On the contrary, Makeni has a mayor and vice mayor, which is an unequivocal sign of a positive evolutionary process.

In Robuya, women and children collect water and women cook. They said that there are no differences or any kind of gender discrimination. During the fieldwork, the teams formed included men and women of Robuya, and people from different ages, giving the idea of a good gender inclusion. But considering the tasks observed and the traditional customs in Robuya and Sierra Leone, gender inclusion is far from being considered achieved.

Related to gender inclusion, it is key to consider access to land, what is a real challenge in all Sierra Leone. Most women and young, are often discriminated, as shows the proposed document of the National Land Policy for Sierra Leone, especially in the Provinces and under customary law: "However, in the Provinces it is important to know-whether the land is held under communal tenure or family tenure. A native who is a member of a community where a piece of communal land is located or is a member of the family owning the land can, and is ordinarily entitled to have that piece of land allocated to him or be appropriated by him if the communal land is in a virgin forest. However, as discussed more fully below, because of certain traditions and cultural restrictions prescribed by the rules of succession under customary law, women are often denied acess to such communal or family land. In addition, a native who is not a member of any landowning community or family can only acquire customary tenure, if he can afford to purchase land, otherwise he has to be content with some lesser customary interest, such as a seasonal tenancy to be used for subsistence farming or remain landless. This as shown below is the fate of young persons and most women , especially those who are unmarried and poor".

Indicator 3. Management (land, infrastructures, legal framework,…)

As it was mentioned before, land management is a critical challenge in Sierra Leone. The weakness and legal complexity, restricts the administrative autonomy to promote urban planning processes. While land and land policy reform is underway, it is essential to strengthen relations with local actors and involve them directly in decision-making. In the absence of a clear regulatory framework, all decisions regarding land, and therefore planning, are limited. In any case, the Local Government Law (2004 Act), defines that municipalities have the responsibility for the creation and improvement of human settlements and are responsible for the creation of development plans (Williams 2006). The Makeni City Council has a bi annual Development Plan, focused on the critical aspects of the city. The last one covers the 2017-19 period. It is a very important document, but lack of spatial and graphic information, as well as long term urban proposals. It is very understandable in the Makeni context, with huge short-term priorities. This is the reason why the CEU-UNIMAK collaboration project is providing a Strategic Spatial approach, that completes the local plan vision.

It is also important to remind that Robuya is part of Makari-Gbanti Chiefdom, different to the Bombali Seborah one, where most of Makeni city belongs to. Involving Paramount Chiefs and local leaders of both Chiefdoms is key to move forward in a best land management. This is what was developed during the Workshops organized by CEU, UNI-MAK and MCC in 2013, 2014, 2016 and 2017 in Makeni, in the Strategic Spatial Plan for Makeni process. It would be key to organize a new Workshop more focused on the Robuya surroundings, as it is a clear expansion of Makeni area. Also, it is key to highlight that the process of the Neighbourhood Upgrading Programme, is a way of planning the city with a bottom-up approach but, as this report shows, providing information, training, tools for the decision making.

The community of Robuya seems well organized with a representative responsible of infrastrucure.

Image 55. Participatory fieldwork for data collection in Robuya. January 2017. The teams included people from both Universities (CEU and UNIMAK), villagers of different sex and ages and technicians of the Makeni City Council
Source: CEU Group

MAKENI CITY COUNCIL

BOMBALI DISTRICT,

MAKENI

REVISED MEDIUM TERM DEVELOPMENT PLAN 2017-2019

- Construction of a VIP Toilet in the main market
- Construction of Internal roads with stronger support from central government
- Increase the revenue generating capacity of Council by implementing Income generating projects thereby increasing our capacity to deepen & increase the scope of our service delivery
- Promoting private sector investment to bolster the local economy and tackling the rising rate of unemployment
- Providing affordable, accessible and improved education services
- Support the beautification of the City.
- Good Governance & participatory development
- Increase recreational facilities
- Improved canalization of swamps within the city to cub flooding

Key issues of the local Development Plan (Luis Perea evaluation)

Positive Aspects:

- Participative. Constant links with the civil society
- Good diagnosis with priorities by ward
- Realistic budget to implement actions
- Well connected to the real context
- Clear structure of needs and proposals

Constraints:

- Short term approach
- Lack of spatial information
- Lack of qualified personel in urban planning
- Lack of key urban proposals
- Rapid urban growth
- Lack of legal urban framework and overlapping (formal-customary)

Image 56. Main actions of the Makeni Development Plan 2017-2019. Some key ssues as evaluation from Luis Perea
Source: HD_LAB

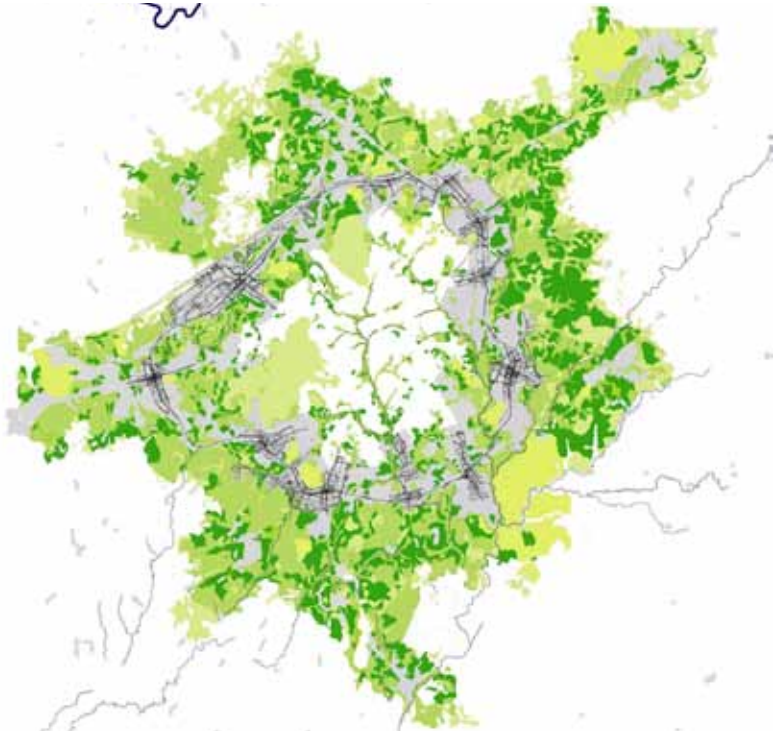


Image 57. Global framework for Makeni and surroundings. Strategic Spatial Plan for Makeni. HD_LAB
Source: HD_LAB

Image 58. Different Workshops and meetings in the CEU-UNIMAK-MCC project
Source: HD_LAB

SUMMARY EVALUATION. OBSERVATIONS AND RECOMMENDATIONS

BASIC HABITABILITY ELEMENTS	EVALUATION	OBSERVATIONS AND RECOMMENDATIONS
HaB 1. URBAN AND TERRITORIAL COHERENCE	LOW-VERY LOW	In the chiefdom context, Makeni belongs to Bombali-Seborah chiefdom, while Robuya is in Makari-Gbanti. Densities shows a very low housing densities, but a quite high population ones, what means overcrowding. It is key to consider the future expansion of the city in the Robuya area, reserving land for public equipments, markets, agriculture, new roads,... The main road, when paved, will provide a better connection with Makeni, and new building typologies (row and/or collective housing) would improve living conditions.
HaB 2. VULNERABLE AND HAZARD AREAS	MEDIUM	Although the Robuya village is not in hazard areas (flooding, landslides, infrastructures,...), there are no any documentation available about future risk and measures to take. The future growth around Robuya must consider the possible risks (climate change, waste management, floodings around, topography,...). For that, it is necessary to get a topopgraphic map with enough definition. At the same time, is crucial to get feasibility studies for managing the future growth from an integral approach. These studies, should provide clear delimitation of risky areas, integrating new urban expansions, road network, employment, agricultural land, natural areas, markets, health, education,... This information can be integrated in a broader scale considering the whole Makeni area and environs. Two scales are recommended: Neighbourhood scale (Robuya village and areas around) and Territorial scale.
HaB 3. ACCES TO BASIC INFRASTRUCTURES	VERY LOW	The City Council of Makeni is developing projects of piped safe water and waste management in a big scale. The situation of Robuya is similar than in other Makeni neighbourhoods. Worse in some of the aspects (sanitation, lighting, drainage, waste) and better in others (water). Improving acces to infrastructures in Robuya is a priority. We consider key planning Robuya and the surroundings jointly with the Makeni urban expansions. In sanitation, it should be analyzed the options for sharing septic tanks replacing latrines. Storage rainwater is also a good alternative for the future, that can be connected to the dranaige system.
HaB 4. ACCES TO BASIC FACILITIES	LOW	The village has a Primary Health Unit under construction, what was finally the action to fund. In education, the level of attention has to do with some information that should be obtained in a deeper analysis. It is important to understand the links between health and other habitability aspects (sanitation, water, cooking with biomass,...). To finish the Health Unit in Robuya is key. In education, the school facilities should be improved, with better spaces for classes, cooking, etc. A detailed study can provide better information about both fields (health and education) in Robuya and surroundings.
HaB 5. PUBLIC-PRIVATE LAND USE	LOW	The village is working as a community, so all the considerations of this topic, that are related to properties, must take that into account. Although is not a priority now, a clear delimitation of private and public realm, considering the right dimensions is key for the future, mainly considering the future growth of the village and surroundings, reserving land for. The information developed can be useful for the Makeni City Council as a pilot project to get a graphic cadastral registration, that can be replicated in other Makeni neighbourhoods. The plot subdivision should be clearly confirmed.
HaB 6. BASIC COMMUNICATIONS NETWORK	VERY LOW	The future expansions around Robuya, should take into account the importance of communication, reserving enough land for this prupose. Paving the main road was one of the priorities detected during the fieldwork. Paving the road taking advantage of this action for integrating other issues (drainage, lighting, storage rainwater,...) will improve a lot the living conditions of the people. For the transport system, using bicycles can be also a good alternative when all the road to Makeni will be paved. Looking at the future, it is critical to get a plan of the whole area to organize the future expansions, linked with the transport and communication aspects.
HaB 7. ACCES TO EMPLOYMENT	LOW	Subsistence agriculture is the main activity for over 90% of Robuya workers, so it must have a special consideration. Urban Planning should consider seriously the integration of agriculture within the existing and new urban expansions in the Makeni surroundings as the land where Robuya is located. The strategies linking employment and housing are needed, and in agriculture, the opportunity of creating green belts with rural areas, natural, forests, rivers, swamps,.. must be incorporated to the future urban and territorial proposals. Forming cooperatives should also be considered.
HaB 8. ENVIRONMENTAL IMPACT	MEDIUM	Both, deforestation and erosion will be growing problems to address in the coming years. So, as the final evaluation of this topic is medium, it must be considered seriously in the future. To analyze these issues a more detailed and technical study from a dynamic approach is needed. Strategies should be promoted for the integration and connection of natural (and agricultural-productive) spaces on a larger scale with other peripheral and urban spaces (concept of green infrastructure). Urban planning is key to guarantee a good management of natural and agricultural land. The area between Robuya and Makeni needs an urgent plan for the coming years in the context of a very rapid urban growth. Reforestation strategies should be implemented. Relationship between deforestation and biomass for cooking must be analyzed in detail.
HaB 9. BUILDING		
9.1. BASIC FACILITIES	LOW - VERY LOW	Carry out a detailed study of the operation, constructive quality and demands of educational, health and social facilities in Makeni. Development of regulations on quality and safety and health in construction. Promote cross ventilation, ventilation of the roof, covered corridors connecting buildings, perimeter drainage connected to the global network. Promote rainwater recycling systems. The aproval of the Senior Secondary School in Robuya, by Government is needed.
9.2. HOUSING	LOW - VERY LOW	Promote programs for the development of new types of collective and row housing (increasing density), in coexistence with the traditional types. Evaluate the alternatives of programs of sites and services. Include in the new typologies areas of public-private relationship, cross ventilation, ventilated roof, outdoor covered spaces, common areas, workshop spaces, commerce and community gardens. Involvement of people in the exploration of new typological alternatives. Promote the development of a cadastre with spatial information and review of the situation in relation to property. Integrate housing programs for the most disadvantaged sectors into planning
HaB 10. URBAN MANAGEMENT	LOW	Complete the decentralization process to give more authonomy to City Councils is key. It would be key to organize a Workshop focused on urban planning in the Robuya surroundings, as it is a clear expansion area of Makeni. The involvement of traditional authorities (Paramount and local chiefs, councillors,...) is critical. The participation of the civil society and other levels of local and regional administration is needed. Although is something broader than what concerns just Robuya village, training in urban planning is really important for the different levels of the society in Makeni, in all the issues related to habitability.

SUMMARY EVALUATION. CRITICAL INDICATORS

BASIC HABITABILITY ELEMENTS	EVALUATION	CRITICAL INDICATORS BY GROUP
HaB 1. URBAN AND TERRITORIAL COHERENCE	**LOW-VERY LOW**	**2 Total population living in slums- Very Low** **3 Gross Urban Densities- Low** **4 Population with access to basic neighborhood services- Very Low**
HaB 2. VULNERABLE AND HAZARD AREAS	**MEDIUM**	1 Population and area at risk (flooding, landslide, close to infrastructures,..)- High **2 Measures taken to cope with risks- Low**
HaB 3. ACCES TO BASIC INFRASTRUCTURES	**VERY LOW**	1 Population with acces to safe water - Medium-Low **2 Population with acces to improved sanitation - Very Low** **3 Population with acces to safe energy- Very Low** **4 Population with drainage system - Very Low** **5 Population with access to public lighting - Very Low** **6 Population with access to waste collection and / or disposal - Very Low**
HaB 4. ACCES TO BASIC FACILITIES	**LOW**	**1 Population with acces to basic health facilities (PHU and Hospital) - Very Low** 2 Population with acces to school (primary, secondary, university) - Medium
HaB 5. PUBLIC-PRIVATE LAND USE	**LOW**	**1 Public -Private land use rate - Very Low** **2 Streets area - Very Low** **3 Public spaces- Very Low** 4 Residential plot area - Medium 5 Other plot areas (artisans, taylors, commercial, urban agricultrure …) - Medium
HaB 6. BASIC COMMUNICATIONS NETWORK	**VERY LOW**	**1 Population with acces to safe public transport - Very Low** **2 Paved streets- Very Low**
HaB 7. ACCES TO EMPLOYMENT	**LOW**	1 Population with acces to agricultural lands (rural, periurban or urban agriculture)- High **2 Population with acces to commercial areas (markets, commercial streets, vendors,...) - Very Low** **3 Population with acces to industrial areas (production centers, artisans, carpenters) - Low** **4 Population with acces to other jobs (mining, fishing, ports, administration, education,...) - Low**
HaB 8. ENVIRONMENTAL IMPACT	**MEDIUM**	1 Urbanized area in high value ambiental lands- High **2 Erosion and deforestation areas- Low** 3 Erosion and deforestation growth - No value
HaB 9. BUILDING AND		
9.1. BASIC FACILITIES	**LOW - VERY LOW**	**1 School. Construction quality and process: durability and eficiency of the construction system - Very Low** **2 Built up school area by student - Very Low** 3 Health Center. Construction quality and process: durability and eficiency of the construction system - Medium-Low 4 Built up health center area by inhabitant - Medium-Low 5 Social Center. Construction quality and process: durability and eficiency of the construction system - Medium-High **6 Built up community center area by 100 inhabitants - Very Low**
9.2. HOUSING	**LOW - VERY LOW**	1 Housing. Construction quality and process: durability and eficiency of the construction system Low **2 Suitability according to the families and users (family dimensions, origin, uses, open spaces,...) - Low** **3 Overcrowding - Very Low** **4 Security of Tenure - Very Low** 5 House price to income ratio - No value 6 Rent price to income ratio - No value
HaB 10. URBAN MANAGEMENT	**LOW**	1 Community participation (relation with Local Government) - High **2 Gender inclusion - Low** **3 Management (land, infrastructures, legal framework,...) - Very Low**

4. SURVEY

Upgrading Neighbourhood Questionnaire

Makeni City Council – Unimak- CEU University

Questionnaire Nº:

The goal of the questionnaire is complementary information for improvements within the Upgrading Neighbourhood Programme coordinate Unimak, CEU University and the Makeni Council

1- IDENTIFICATION											
AGE:		**GENDER:**		Male		Female	**OCCUPATION**				
LEVEL OF EDUCATION:		Iliiterate		Primary School		Secondary School		Uni			
Neighbourhood:											

2- HOUSING

2.1. What is the main problem of your house? (Consider the construction, the land, the legal issues...)

2.2. What investments do you consider a priority to improve your household?

2.3. Which type of household would you prefer to live in? SINGLE HOUSE COLLECTIVE HOU

Upgrading Neighbourhood Questionnaire

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1- IDENTIFICATION

AGE:		**GENDER:**		Male		Female	**OCCUPATION**		
LEVEL OF EDUCATION:		Iliiterate		Primary School		Secondary School		University	
Neighbourhood:									

2- HOUSING

2.1. What is the main problem of your house? (Consider the construction, the land, the legal issues...)

2.2. What investments do you consider a priority to improve your household?

2.3. Which type of household would you prefer to live in? ____SINGLE HOUSE ____COLLECTIVE HOUSE
WHY? (photographs)

2.4. Would you agree to live in a collective house? ____YES ____NO

2.5. What are the most important things you would include in the design of a collective house in Makeni?

2.6. Would you agree to live in a rented house? ____YES ____NO

2.7. According with your own incomes, how much would you pay for renting?

3-NEIGHBOURHOOD

3.1. Why did you come to live in this neighbourhood?

3.2. Since you arrived, what are the main changes in the neighbourhood?

3.3. What are the main basic infrastructure deficits in the neighbourhood? (Basic infrastructures: electricity, sanitation systems, water supply...)

3.4. Which infrastructure action do you consider a priority to improve the neighbourhood? Choose one

	Improved sanitation		Water supply	Others:
	Electricity		Waste managment	

4. SURVEY

One of the main goals of the experience is obtaining information about priority actions for the community in the future. A questionnare was designed with some few questions, including an open question about main priorities. In this report is included a brief conclusión of the results, adding possible strategies for being discussed with the local community. The questionnaire is added in this page:

3.5. In an initial phase of infrastructure improvement in your neighbourhood, which basic infrastructures would you be willing to share?

	Safe Water collection point		Public bathroom (Separated men of women)
	Improved sanitation (Separated men of women)		Laundry area
	Electricity access area		Cooking area
	Waste managment area		Other:
	Bus Stop		Other:

3.6. Would you be willing to do community-works (NOT paid) for community management of basic infrastructure?

3.7. What are the main basic service deficits in the neighbourhood? (Basic services: Health , Education, Transport, Market, Social and Cultural)

3.8. Which basic service action do you consider a priority to improve the neighbourhood? Choose one.

	Health		Transport		Market
	Education		Social & Cultural		Others >>

4- MAIN PRIORITY ACTIONS IN YOUR NEIGHBOURHOOD. Make a list ordered from higher to lower priority

The results were organized according to the age groups (15-30, 30-40 and more than 40), distinguising men and women answers. The organization of the results provided by the survey was developed by UNIMAK´s students, coordinating the tasks with CEU Group.

DATA

Age		15-30					
Gender							WOMEN
Questionnaire number		1	17	14	13	4	9
Question Number	**Question**						
	Level of education	Sec. sch	Illilterate	primary sch.	primary sch.	Illilterate	secondary school
	Occupation	Field worker	Trading	family worker/ trader	Trading	Farmer	petty trading
2. HOUSING							
2.1.		need cement	bad construction, mud	unfinished	No land	too old	zink roof too old
2.2.		need repair	improve	finished	space inside house	Rehab.	cement for floor, basement of house
2,3	**single**	single	single	single	collective	collective	collective
	reason	no facilities		easier to live & play	big and fine		big family
2,4	**can you live in collective**	yes	yes	yes	yes	yes	yes
2,5	**things in collective house**	steel,doors,electricity,fence,toilets, kitchen	water, toilet, electricity, kitchen	nill	Funiture	selfcontained	furniture,
2,6	**rent house**	No	No	No	No	No	no
2,7	**rent payment**	No rent	Le 40000	nill	No rent	No rent	

Age		30-40			>40						
Gender		MEN	WOMEN		MEN					WOMEN	
Questionnaire number	12	2	5	11	6	7	15	8	16	3	10
Question Number											
	University	Sec. sch	Illilterate	illiterate	illiterate	degree	degree	secondary sch		Illilterate	illiterate
	Tailor	Field worker	Farmer	farming	farmer	farmer	teacher	farmer		Farmer	family care
2. HOUSING											
2.1.	Bad roof	too old	mud house	roof	mud house	poor construction	big house	poor construction, small land	too old, out side toilet, small land	mud house	roof and doors
2.2.	repare roof	rebuild	rebuild	improve roof	electricity, improved toilet	zink	big house	zink	light, funiture	zink to roof	roof
2,3	single	collective	single	collective	collective	collective	collective	collective	collective	collective	collective
	big family			big family	because of the facilities	big family	biger	big family	big family		big family
2,4	yes	No	yes	yes	yes	yes	yes	yes	yes	yes	yes
2,5	space for tailoring	modern furniture	steel, doors, electricity, fence, toilets, kitchen, water	furniture	electricity, toilet, water, steel door, fence	electricity	toilet, light, kitchen	electricity	toilet and kitchen inside house, light	steel, doors, electricity, fence, toilets, kitchen	shop,
2,6	No	No	No	no	no	no	No	no	No	No	no
2,7	no money	not going to rent	not paying rent		le 15,000/20,000 monthly		nill		nill	No rent	

Age		15-30					
Gender							WOMEN
Questionnaire number		1	17	14	13	4	9
Question Number	**Question**						
3. NEIGGHBOURHOOD							
3,1	**Reason for staying**	family village	place of birth	Marriage	home town	Home town	place of birth
3,2	**any change**	No change	nill	Nice buildings	big and nice houses	There are Changes	school, com centre, water supply, toilet
3,3	**deficit inf.**	Hospital, electricity, drainage and school	sanitation electricity, hospital	Electricity	water supply	Electricity, good roads and sanitation	electricity, sanitation, good roads, transport
3,4	**priority**	roods	Electricity	Electricity	roads	Education	good roads
3,5	**shared inf.**	water,electricity, waste mgt,bus stop, laundary,roads	waste mgt, bus stop,	water improve sanitation, electricity,	water improve sanitation, electricity,	Roads, schools	electricity, improved sanitation, water
3,6	**unpaid cum. Wk**	yes	Yes	yes	yes	yes	yes
3,7	**main deficit inf.**	Health, market, school	hospital, electricity, education, transportation, markets	Market and transport	education health	Health, market	transport, health, education
3,8	**basic service for inproved**	Education	Health	Health	Education	Education	transport

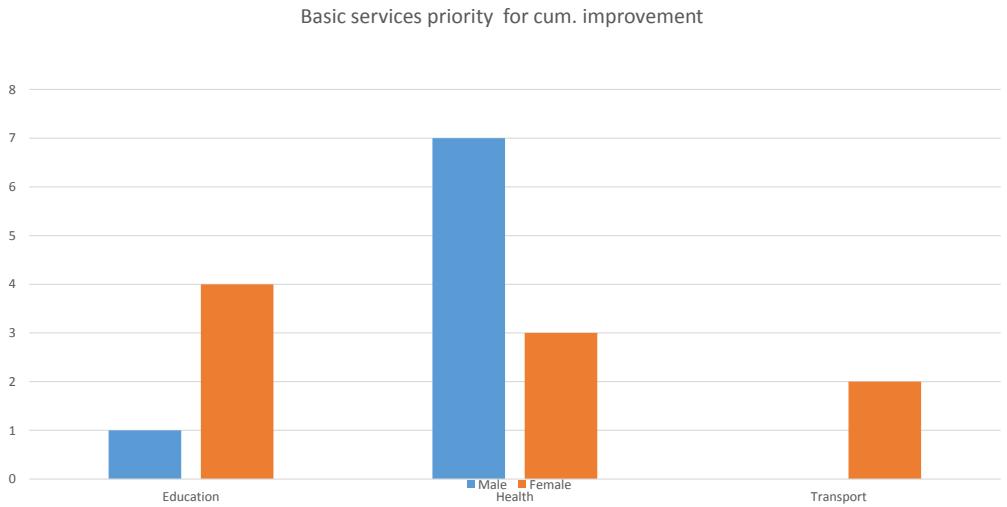
Age		30-40			>40						
Gender		MEN	WOMEN		MEN					WOMEN	
Questionnaire number	12	2	5	11	6	7	15	8	16	3	10
3. NEIGGHBOURHOOD											
3,1	comfortable	Home town	Home town	place of birth	family village	easy to live	birth place	less expensive	marriage	Home town	marriage
3,2	weter well and to	life is better	water wells, schools, comm. Centre, beautiful houses	water wells, toilet	water wells, schs, comm. Centre	change in the way of building the roof	road	new school	nill	Changes	community centre, water wells, toilet
3,3	Electricity	Electricity	good roads, health centre, schools, electricity	electricity	hospitals, electricity, private water system, good roads, beter toilet, drainages, waste management	electricity, toilet, water supply	hospitals, electricity, private water system, good roads, beter toilet, drainages, waste management	electricity, water supply	water, electricity, toilets	Good sch. Roads hospitals	electricity
3,4	inprove sanition	Roads	water supply	hospital	improved sanitati	improved sanitation	electricity	electricity	waste mgt	Roads and sch.	hospital
3,5	water, electricity and inprove sanition	Electricity	water, electricity, waste, bus stop, pulic birthroom, laundry, park	hospital, electricity, safe water	water, electricity, waste, bus stop, laundry	safe water, electricity, cooking area	water, electricity,	water, electricity, cooking area	water,sanition, electricity	Electricity	electricity, water, improved sanitation
3,6	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3,7	health education	Markets	market, health, transport	market, school, hospital	health, transport, market	health, secondary sch, market, road network	health	hospital, sec. school, market	health education transport	Markets, sch. Health centers	hospital, secondary school
3,8	education	Health	health	health	health	health	health	health	transport	Education	health

GROUPING BY CATEGORY

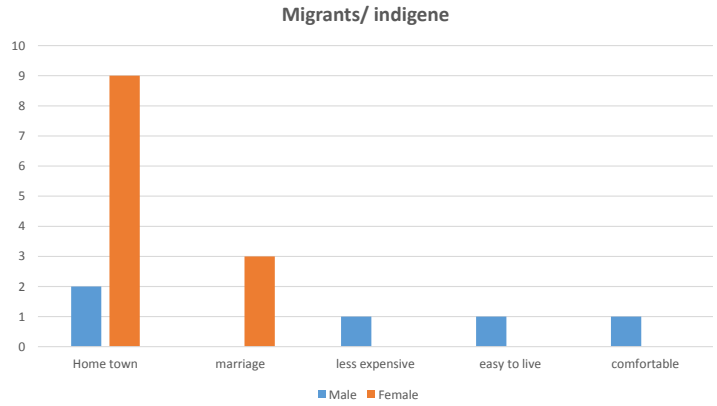
	Age 15-30		31-40		>40			
	male	female	male	female	male	female	total male	total female
illeteracy		2		2	1	2	1	6
occupation								
Farmers	0	1	0	2	3	1	3	4
Tailor	0	0	0	0	1	0	1	0
Traders	1	2	0	0	0	0	0	2
Field worker	1		1	0	0	0	2	0
teachers	0	0	0	0	1	0	1	0
Family worker	0	0	0	0	0	1	0	1
							0	0
willingness to live in collective house							0	0
Yes	0	6	1	2	4	3	5	11
No	0	0	1	0	0	0	1	0
							0	0
Migrants/ indigene								
Home town	0	5	1	2	1	2	2	9
marriage	0	1	0	0	0	2	0	3
less expensive	0	0	0		1		1	0
easy to live	0	0	0		1		1	0
comfortable	0	0	1	0	0	0	1	0
basic service as priority for inproved cum.								
Education	0	3	1	0	0	1	1	4
Health	0	2	3		4	1	7	3
Transport	0	1	0	0	0	1	0	2

SOME KEY ASPECTS

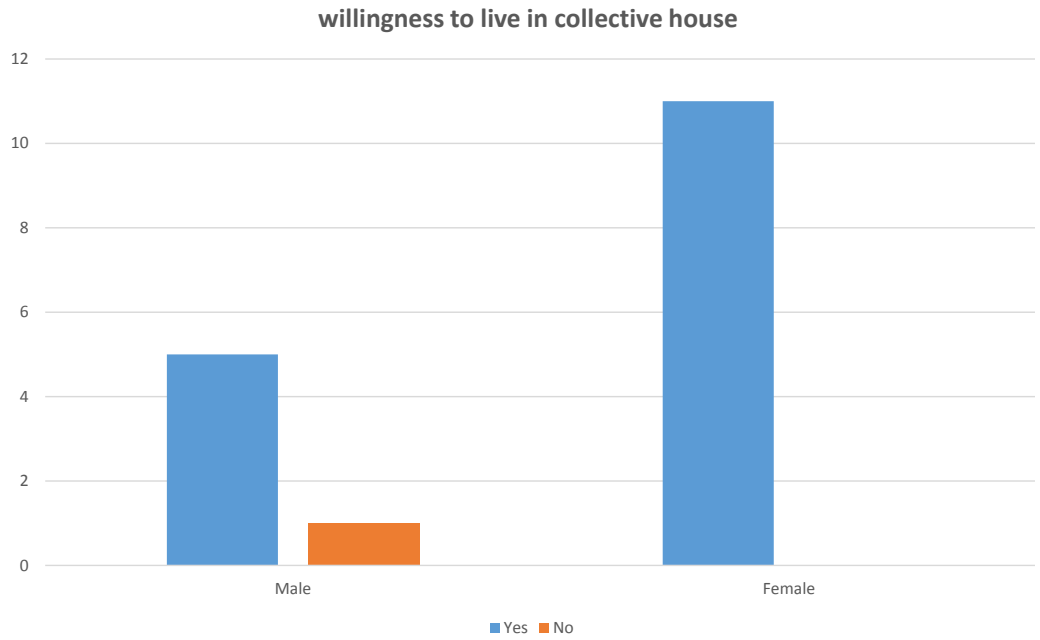
basic service as priority for improved cum.	Male	Female			
Education	1	4			
Health	7	3			
Transport	0	2			



Migrants/ indigene	Male	Female			
Home town	2	9			
marriage	0	3			
less expensive	1	0			
easy to live	1	0			
comfortable	1	0			



willingness to live in collective house	Male	Female			
Yes	5	11			
No	1	0			



occupation	Male	Female			
Farmers	3	4			
Tailor	1	0			
Traders	0	2			
Field worker	2	0			
teachers	1	0			
Family worker	0	1			

PRIORITY NEEDS-STRATEGIES

After looking at the map, data collected and questionnaires, we then focus on the immediate needs of the people and evaluated and came up with some strategies. From the questionnaires the following analysis is what we came up with and some will be long term and others short term.

PRIORITY NEEDS	STRATEGIES SUGGESTED
HEALTH	○ Complete the hospital building ○ Scout out the equipments ○ Ensure that medical personnels will be available ○ Improve access to the health centre ○ Provide electricity ○ Maintenances of the health centre ○ Construction of a water well at the hospital
EDUCATION	○ Approval of the junior secondary school, also involve the City Council ○ Establish a senior secondary scho ol ○ Transportation to convey students to Makeni ○ Building of toilets in the schools ○ Isolation of classes so that it will be easy for the students to concentrate ○ Scholarship for children to ensure that they go to school ○ Construction of water well in the schools
ROADS AND TRANSPORT	○ Improve the road by pavement ○ Provision of public transport ○ Construct a bus stop halt

PRIORITY NEEDS	STRATEGIES SUGGESTED
ELECTRICITY	○ Solar energy for public use (street, water well, hospitals etc) ○ Ensure that the electrical materials are in place (poles, cables etc) ○ A generator for stand by use say in the hospital
SANITATION AND WATER	○ Provide safe water ○ Construction of toilets ○ Proper collection and disposal of waste ○ Improving the drainage system ○ Distancing the construction of toilets from water well and kitchen ○ Maintenances of toilets ○ Sceptic tanks
IMPROVING OF FARMING	○ Offer farming education for the farmers ○ Use of solar energy to pump water ○ Use of animals such as cows to plough

These different strategies can be understood as short-term proposals, coming from the surveys and direct interviews with the local population. This level of information, is complemented with the medium-long term, mostly indicated in the strategies and recommendations in point 3 (Data collection and quantitative analysis), providing a very complete global vision.

5. CONCLUSIONS

5. CONCLUSIONS

First of all, as conclusiones of all the experience, it is important to summarize the **main results**, that were:
Intangible results:
- Empowerment, feeling of belonging and local involvement. According to the Participatory Action Research, potential is built from the collective knowledge of the community. The action is part of the research and analysis, involving the active participation of the community. Thus, the villagers organize themselves to solve the issues that the tool requires and deepen in the collective vision of their territory.
- Training in UNIMAK students and professors, City Council technicians and other participants.
- Confidence in the institutions that promote actions for the improvement of the neighborhoods, counting on the participation of the neighbors.

Tangible results:
- Documentation generated. Cartographic survey of the village of Robuya that includes the delimitation of plots and allows to be possible base of a future cadastre, at the same time that it provides a current vision of the state of the community. The tool combines the subjective diagnosis of the needs identified by the inhabitants, with the objective data of the technical data sheet, whose quantitative information supports the future monitoring of the aspects evaluated and the results of the policies and actions implemented.
- This report is, itself, an example of how useful the initiative can be, giving a lot of information that can be shared, used and even be questioned or revised
- Improvement identified and financed. Among the priority needs, the CEU finances the completion of the works of the village health center. This illustrates the transition from research to action through participation, giving coherence to the project at all scales.

The **general conclusion** is that the Neighborhood Upgrading Programme is a truly key initiative for Makeni. The experience in Robuya demonstrates the essential role that the University can play by supporting real tasks and providing knowledge. The joint work between Universities, in turn, promotes mutual cooperation and is an essential element for the future. The methodology, in the union of the 3 lines (mapping, data collection and survey), allows to obtain a very complete vision of the neighborhood in a truly agile fieldwork. It is part of the strategic vision that completes the actions of the City Council. It also completes the global approach of Strategic Urban Planning mentioned before, under the CEU-UNIMAK collaboration. Thus, the Upgrading Programme is focused on the existing city, allowing to understand in a very detailed approach the local reality, what is also very useful for the proposals in the bigger scale and for planning the future city.

The Programme can serve as a tool that continues to replicate in other neighborhoods of the city, allowing a detailed view of local reality, providing a pedagogical component, generating useful information for decision making and contributing with a small demonstration action. In relation to this, we must remember that in the case of Robuya it was possible to finance with 800 euros, the tasks that will support the finalization of the Health Center. This action was agreed with the local community in the last meeting held after the field work. It was also decided that UNIMAK would manage the work, contributing the amounts according to the progress of the material items.

With that small amount of money, it was agreed, after a detailed study conducted by the Spanish architect and UNIMAK professor, Clara Abella, that some metal doors and windows would be made with security bars. These pieces were taken to the place manufactured, with the idea that the local community of Robuya supported the installation of the same. This, according to the latest information available, is still pending. The next step will be another experience to be developed in January 2018, in another area of Makeni, and will serve also to evaluate the action proposed for Robuya.

The Neighbourhood Upgrading Programme is seen as a very simple and operational analysis and action tool for local government, which allows obtaining disaggregated information at the neighborhood level, being key to defining the real priorities in this scale (Satterthwaite, 2017). The work with the local community, together with the development of the specific actions planned, generates a very direct interaction between people that enhances trust and collective involvement.

Despite the limits of training gaps in local technicians, the methodology is very agile, having required only two days of field work, for a population of 1,500 inhabitants and 75,789 m2. This reinforces its potential replicability in other neighborhoods and contexts, justifying its origin and covering chronic deficits in the territory.

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