MASUBA NEIGHBOURHOOD
MAKENI, SIERRA LEONE

NEIGHBOURHOOD UPGRADING PROGRAMME. JANUARY 2018

Masuba

Luis Perea
Coordinator of the activity and report

December 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, January 2016 and January 2017) with another activities in January 2018. The last step in the process has included different activities during the January 2018 trip of CEU University. The main one was the continuation of a **Neighbourhood Upgrading Programme, in Masuba Neighbourhood.** 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 Masuba, three groups were formed linking dwellers, students, lecturers and professionals in three main tasks (Mapping, Data collection and Survey for detecting priority interventions). The report follows the previous document generated for Robuya village in 2017.

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 Maasuba neighbourhood
4. Survey
5. Conclusions
6. References

Luis Perea

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

January 2018

Image 3. Meeting in Masuba
Source: CEU group

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

Image 2 (Main page). A street in Masuba
Source: HD_LAB

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 22 January 2018**. Close to 15 people from different ages were selected in the Masuba Community (women and men) for working together with the Universities and the Makeni City Council technicians. Three groups were organized, dividing the neighbourhood in two parts.
- **Fieldwork.** Two sessions were developed (Monday 22nd morning and Tuesday 23rd 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 26th in the afternoon.
- **Final meeting with the local community. Friday 26th January 2018**. In a Final meeting were presented the results of the process, to the local Community, UNIMAK and the Makeni City Council, and a small action to be founded was defined (extension of electricity in the neighbourhood).
- **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 **extend the electricity.** UNIMAK would control the works
- **Final report.** With all the iformation, is developed a Final report (this document) that will be presented in the next January 2019 trip
- **Evaluation and checking the task founded.** The January 2019 trip will serve for monitoring the experience and for starting with another neighbourhood

The Neighbourhood Upgrading Programme tries to give useful information of the areas analyzed, for decision makers, researchers, students, teachers and other interested people in the field of Habitability. Althougt the documentation generated is broad, technical and participative, is not possible to include the level of analysis that some of the topics needs. Also, we must apologize for the mistakes and forgotten issues.

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. Preparing the fieldwork
Source: CEU group

Image 5. Aerial view of central part of Masuba. The key indicates the elements to map
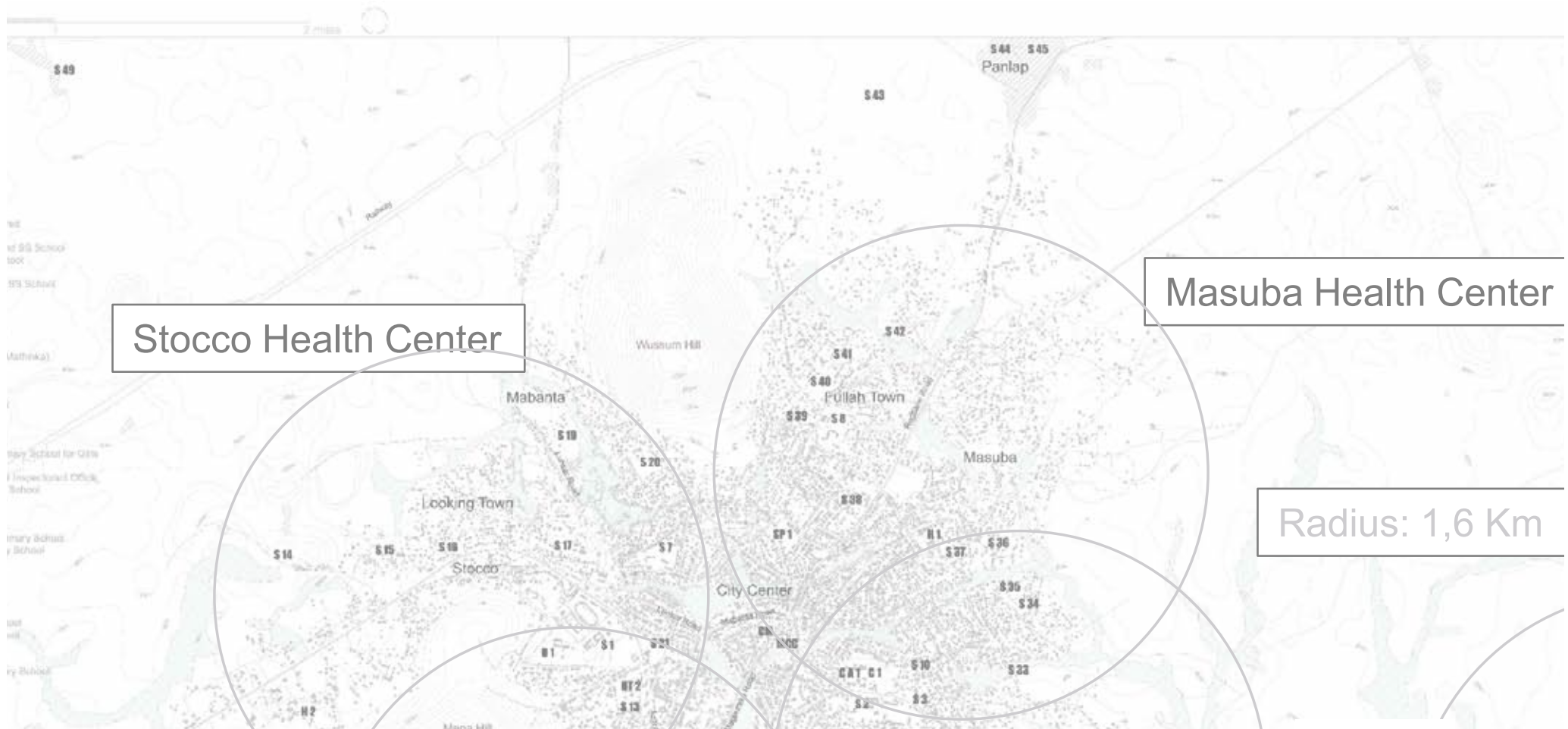*Source: HD_LAB*

Image 6. Map developed during the fieldwork. January 2018
Source: HD_LAB

3. DATA COLLECTION AND QUANTITATIVE ANALYSIS

Stocco Health Center

Masuba Health Center

Radius: 1,6 Km

3. DATA COLLECTION AND QUANTITATIVE ANALYSIS

The methodology includes an organized set of topics for understanding the main existing characteristics of the neighbourhood. This approach is focused in getting a quantitative secuence 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**. Some explanations are added to the evaluation. The Sustainable Development Goals are also considered and must be checked complementary to the report.

UPGRADING NEIGHBOURHOOD PROGRAMME
INDICATORS FOR EVALUATION AND MONITORING

LOCATION
MASUBA NEIGHBOURHOOD

BASIC HABITABILITY ELEMENTS

HaB 1. URBAN AND TERRITORIAL COHERENCE
HaB 2. VULNERABLE AND HAZARD AREAS
HaB 3. ACCESS TO BASIC INFRASTRUCTURES (WATER, SANITATION AND SAFE ENERGY)
HaB 4. ACCESS TO BASIC AMENITIES (HEALTH AND EDUCATION)
HaB 5. PUBLIC-PRIVATE LAND USE
HaB 6. BASIC COMMUNICATIONS NETWORK (CONNECTIVITY, TRANSPORT, COSTS,...)
HaB 7. ACCESS 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: Luis Perea

Masuba neighbourhood boundaries

In the case of Masuba, but also in the different Makeni areas, to understand a clear division of limits is a challenge. The definition of wards, neighbourhoods and urban areas is not mapped, so conflicts about boundaries are always part of the discussion. In the case of Masuba, many consultations were done before the trip to Makeni, in order to prepare the cartographic information for the mapping task. Considering the difficulties in getting clear information, the maps covered a great extension of land around the previous indications about what Masuba neighbourhood was.

As it happens in various areas around Makeni city, some older villages were growing little by little to finally get part of the urban boundaries. The same ocurred in Masuba, located in the north east part of Makeni, very close to the administrative boundaries of Makeni City, inside the Bombali Sebora Chiefdom. But the recent expansions of the area are already in Makari-Gbanti Chiefdom (see map below). In the aerial view (Image 9), it is easy to find the initial Masuba area, surrounded by swamps.

To understand the recent boundaries of the neighbourhood was finally an impossible task. To complete the previous consultations, some interviews were made on site, to key persons of Masuba, including the local chief and older people. The map below shows the findings about the complex definition of areas, in the Masuba area. Former Masuba
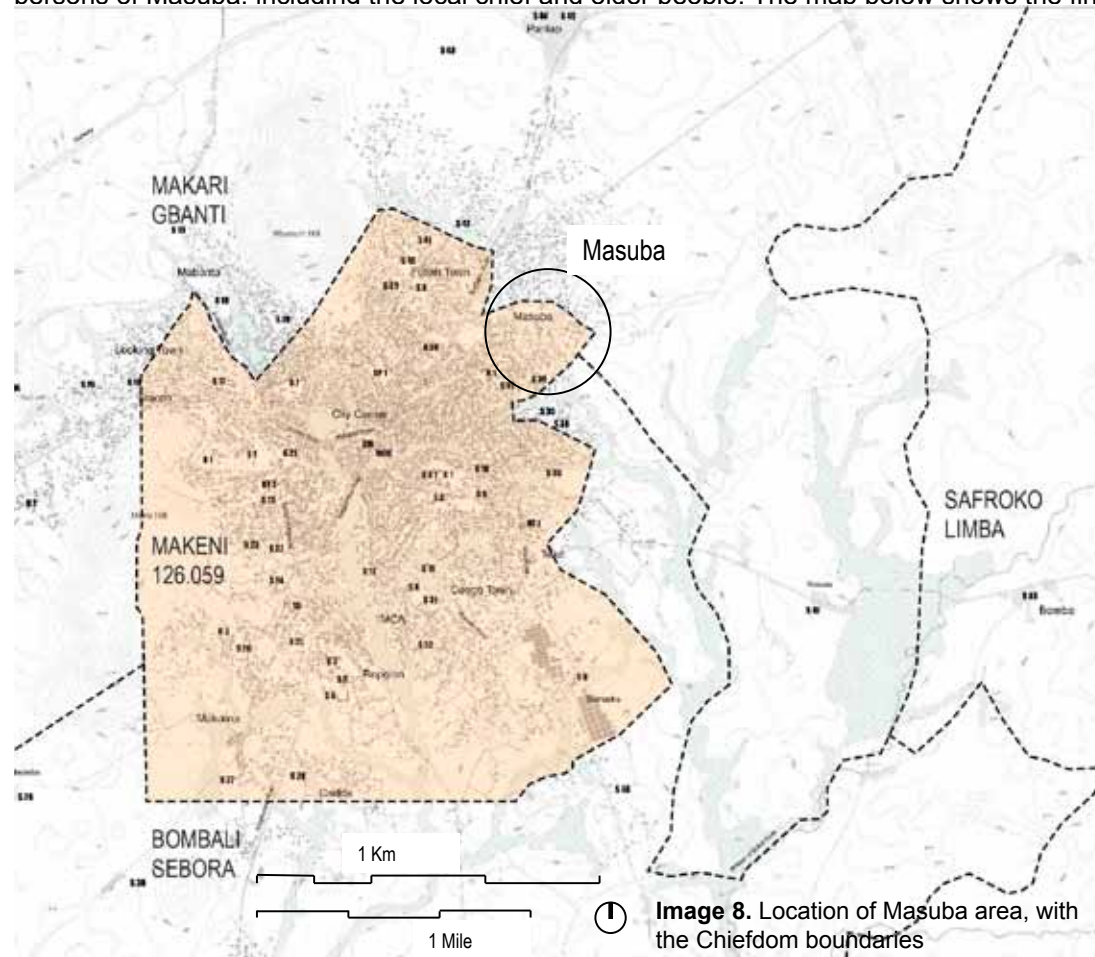
Image 8. Location of Masuba area, with the Chiefdom boundaries
Source: HD_LAB

Image 9. Central Masuba area
Source: HD_LAB

was the first area (indicated in the previous page also), but Masuba 1 and Masuba 2 are other urban areas of the whole neighbourhood.

Appart of being a problem in the fact of finding clear boundaries, understanding the complexity of the urban growth process in Makeni is a very interesting learning. The case of Masuba shows a set of situations that combined social, cultural, economic, phisical and other key issues that generates a specific reality. Understanding deeply this process, is key to start with urban planning proposals at neighbourhood level. At the same time, it provides key information about what an African city involves in their urban growth process. What is also important for including some learnings in the western Urbanism usual ways of action. The drawing below shows the information provided during the January trip for some focal people of the Masuba neighbourhood. The shaded area is the one where the detailed mapping work was done.
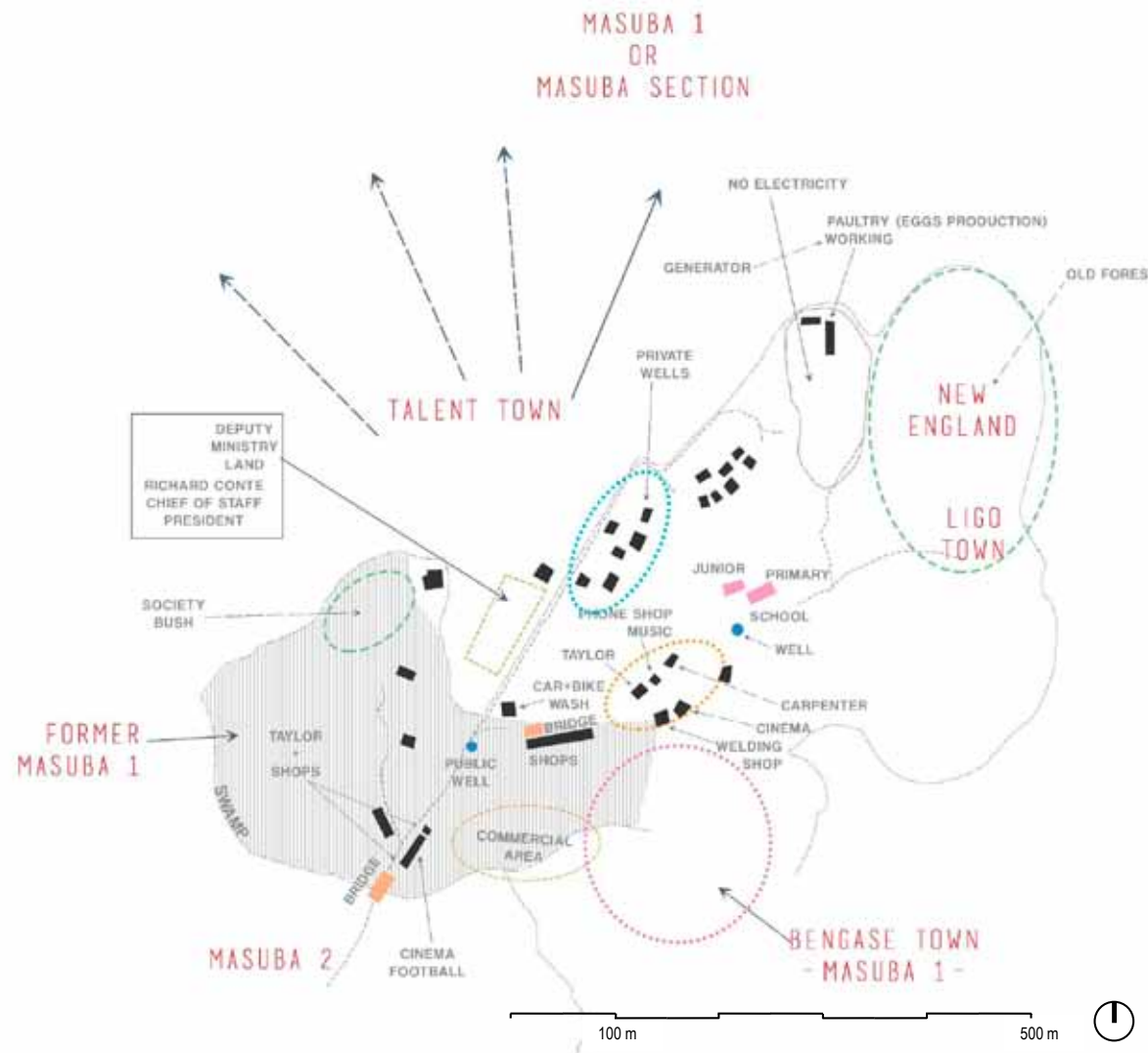
Image 10. Masuba. Different areas and uses around, according to on site interviews, during the January 2018 trip
Source: HD_LAB

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

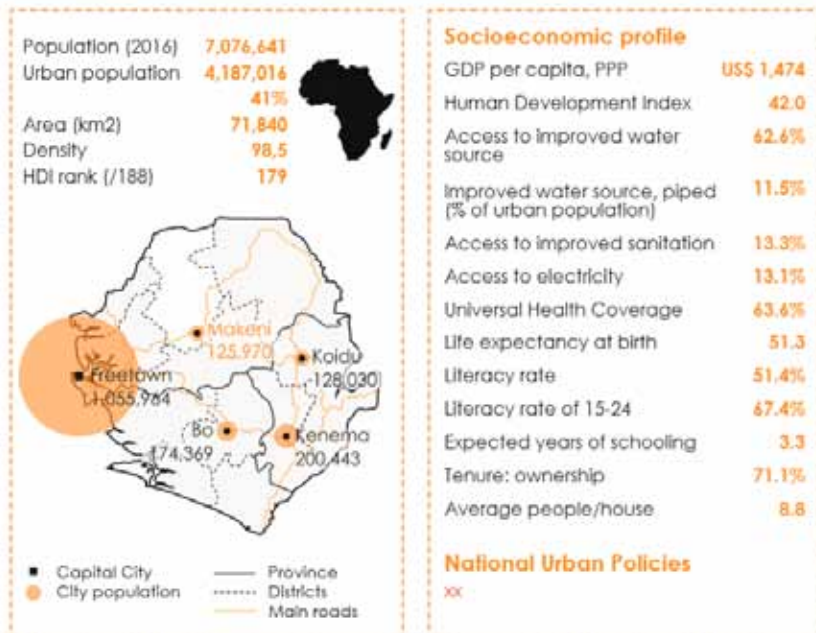## HaB 1. URBAN AND TERRITORIAL COHERENCE

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 elements (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 aditional documentation available. The information has been organized and digitalized in Madrid, after the fieldwork in Makeni.

Level of analysis	Origin of the data	Priority
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, ...)**	**Medium**	It is valued the proximity to urban, productive nodes, ... In this case, as a Neighbourhood, the Makeni city center is the place considered to take distances	Km, milles, time walking, vehicle	**1,5 km; 1 mile; 25 minutes walking; 2 minutes vehicle**	To be less than 30 minutes away (walking) from an urban, productive, transport node, ...
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), %	**990 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	**8,3 dw/Ha; 125 Inhabitants/Ha**	Depending on the context. The proposed ranges should 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**	**Low**	It is the % of population with acces to services, considering the distance in meters to acces health (basic care), primary education, water, sanitation, market and local commerce, mainly.	(%)	**50% (very general estimation)**	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 location of Masuba is quite close to the Makeni City Center (1 mile), but at the same time is in the border of the Makeni Town boundaries, that is also the limit between Bombali-Seborah and Makari-Gbanti chiefdoms. Related to 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 higher considering the population, what means overcrowding
Global evaluation	**LOW**
Observations	The future expansion of Makeni will affect the situation of Masuba in the urban-territorial considerations, mostly considering the north-east direction
Recommendations	It is key to consider the future expansion of the city in the Masuba expansion areas, reserving land for public equipments, markets, agriculture, new roads,... 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 improvement in buildings. Incremental housing solutions for the consolidated areas can be also considered

MAKENI CITY

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

Legend:
- Capital City
- City population
- Province
- Districts
- Main roads

Makeni 125,970
Koidu 128,030
Freetown 1,055,964
Bo 174,369
Kenema 200,443

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

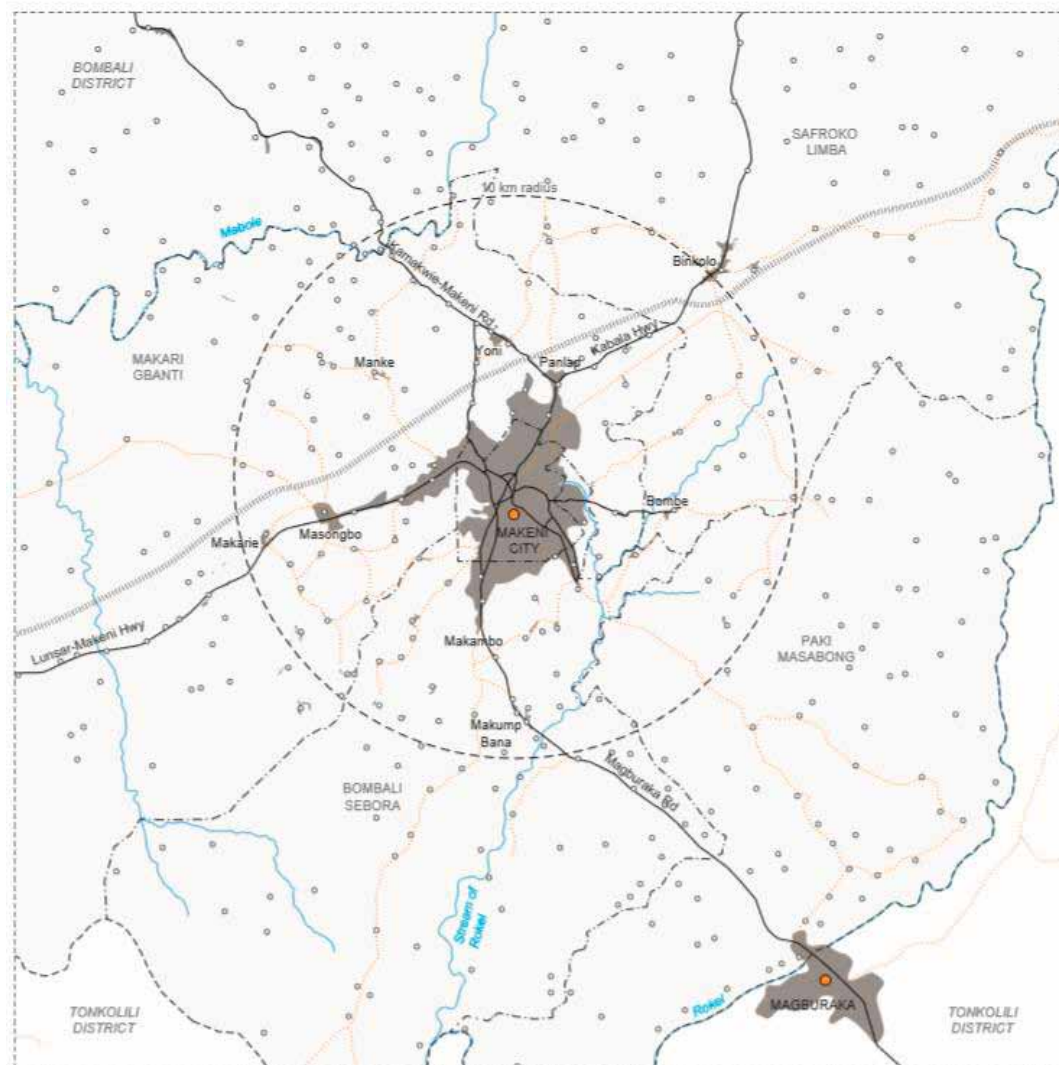|	
Province	Northern
District	Bombali
Chiefdom (Makeni + 7 mile radius)	Bombali Sebora, Makari Gbanti, Safroko Limba, Paki Masabong

Socioeconomic profile

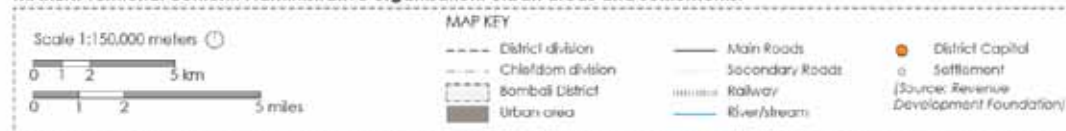|	
Population (2016)	125,970
Urban population	124,634
Population growth rate	3,5%

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

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

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

Scale 1:150,000 meters

0 1 2   5 km
0 1 2   5 miles

MAP KEY
- District division
- Chiefdom division
- Bombali District
- Urban area
- Main Roads
- Secondary Roads
- Railway
- River/stream
- District Capital
- Settlement

(Source: Revenue Development Foundation)

**Image 11.** Makeni in the national and territorial context
Source: HD_LAB

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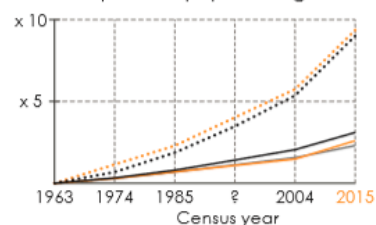
- .... Makeni
- —— Sierra Leone
- —— World urban population
- —— Sub-Saharan Africa
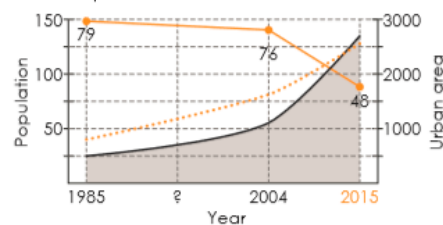- .... Sub-Saharan Africa urban population

Urban extent

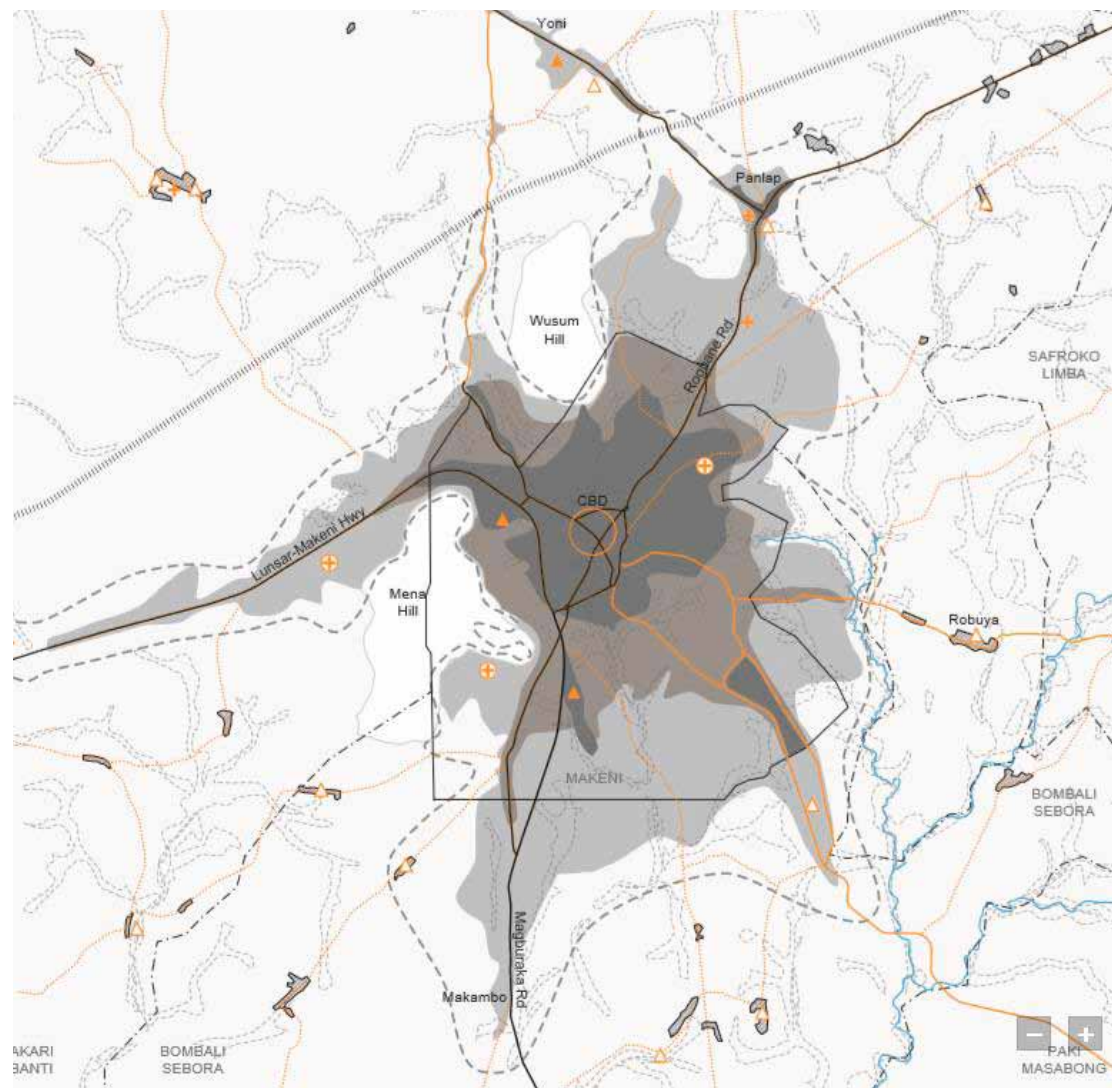The unplanned growth of the city is leading to disperse urbanisation patterns with low density occupancy.

	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.

**Image 12.** Makeni urban growth and basic type neighbourhoods data
Source: HD_LAB

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 overall idea of the urban and territorial situation of the settlement or neighbourhood. In the two previous pages, information about the national and territorial context is provided. Makeni is a growing city, and these dynamics must be taken into account in all the analysis. 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. As a neighbourhood, Masuba is part of the city and all the main connections must be considered with Makeni. The distance to the center, is the key reference, but the Holy Spirit Hospital, as important infrastructure is very close to Masuba (will be detailed in "access to basic amenities" topic. Also transport cost (bike) should be considered (2.000 leones aprox). A minimum salary per month is around 500.000 leones, so the connection is expensive for the Masuba population. The 1,5 km (1 mile) is a distance that takes 25 minutes walking (the most common way in Masuba to acces the Makeni city center. So the evaluation of the indicator is Medium. In bicycle, it takes just 5 minutes, so it is suggested using this transport system, that should be integrated in the Makeni urban fabric for the future.

Considering the urban expansion of Makeni, Masuba is agrowing area. In this process, is important for the City Council to create productive areas for employment and commerce in the periphery of the current city, trying to create new central nodes with main amenities. Related to that, the proposal of a Ring Road (CEU, HD_LAB), would be close to Masuba and it can be an opportunity for organizing these new needs. In that sense, key main roads must be paved and open creating good accesses for future northeast expansions (see map below, right).
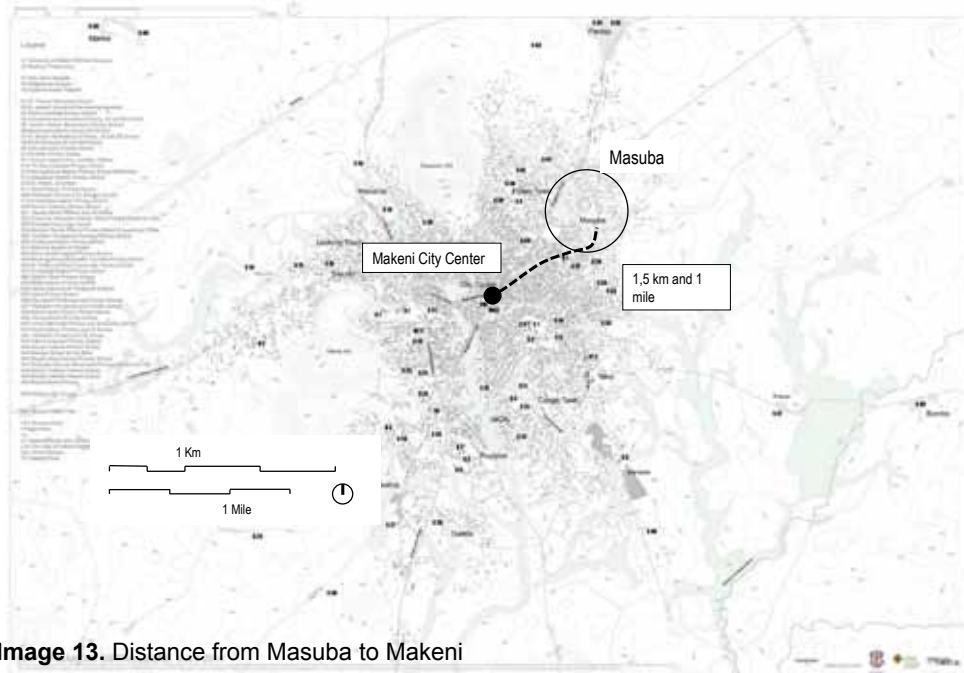
Image 13. Distance from Masuba to Makeni
Source: HD_LAB
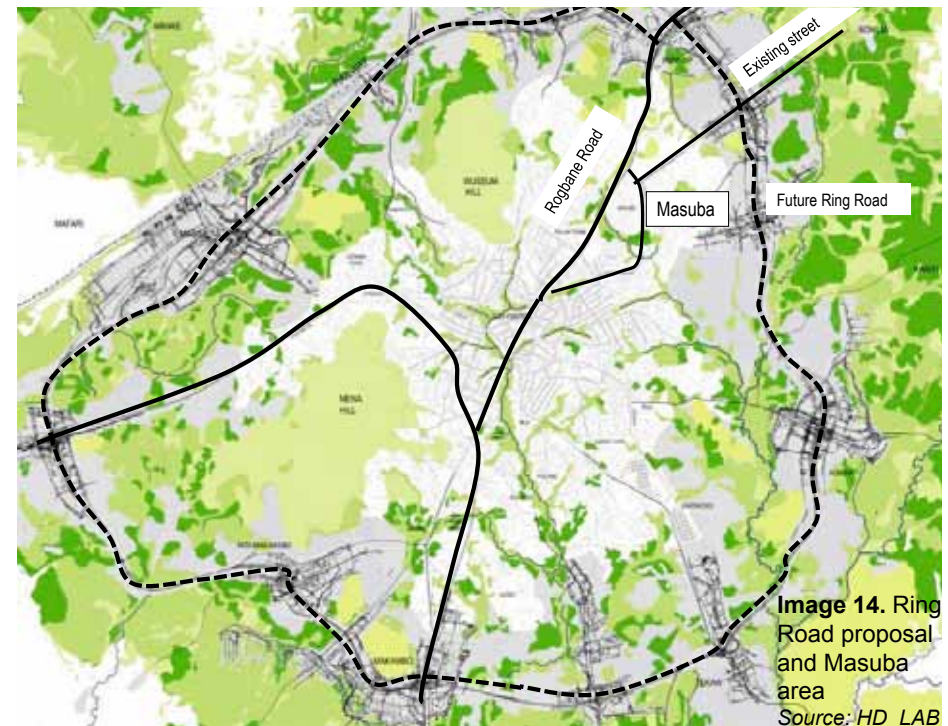
**Image 14.** Ring Road proposal and Masuba area
Source: HD_LAB

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 Masuba neighbourhood 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, the main part of the area belongs to the Koroma family, what cannot be considered as secure tenure. Acces to sanitation is in a very 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 Masuba, the data obtained from the surveys indicates a ratio of 4-5 people per room. All of these elements are analyzed later in the corresponding topic, but according to the data, 100% of the population in Masuba are living in a slum.

Indicator 3. Gross Urban Densities

The densities in Masuba shows something interesting, that was detected in the previous analysis of Robuya village, and is common in whole Makeni. While the gross housing densities are very low (8,3 Dw/Ha), the population densities, according to the information from the surveys, is in a higher level (125 people/Ha). Obviously, this is cause the high number of people per dwelling (an average of 15 has been considered, according to cases of 10, 15,17, 20 and even 40 in the surveys made). The last disaggregated data (2004, Census), shows that in Makeni, 20% of the housholds have 10 persons or more. Far for the data in Masuba, we can confirm the number of dwellings (66 in the studied area) with the digital maps and fieldwork, but not the 990 people (that cames considering the average 15 people per dweeling).
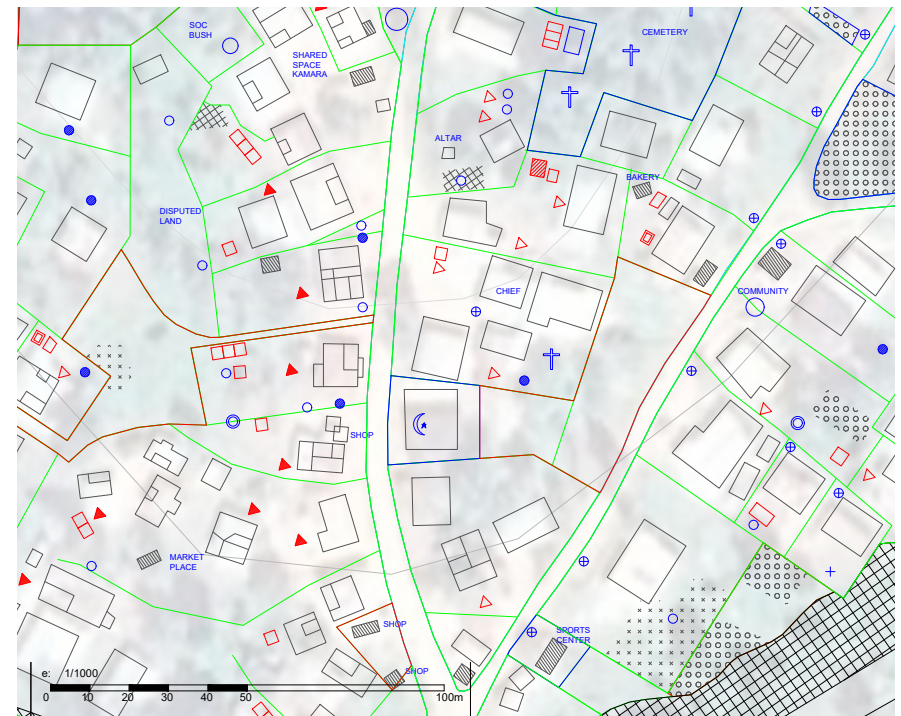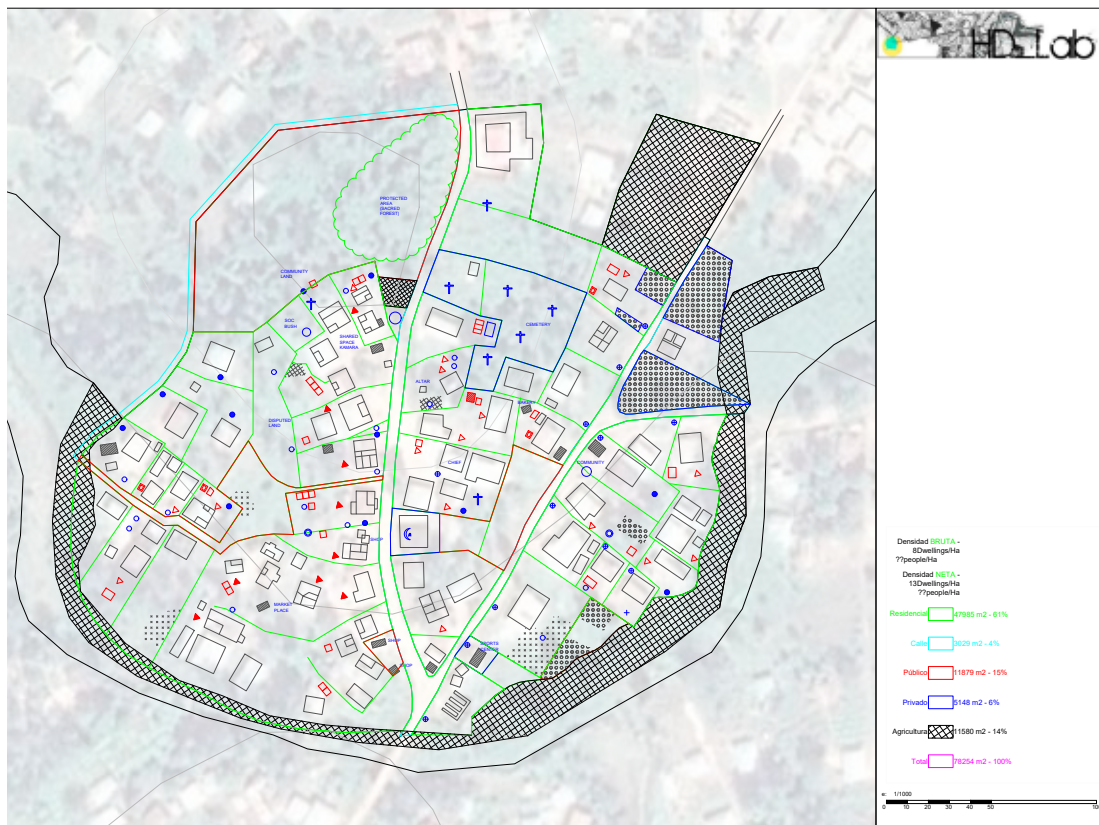
Image 15. Digital map of Masuba neighbourhood. Left, area mapped. Above, detail of the area mapped.
Source: HD_LAB

In the next future, the area will keep growing and new building typologies can help the population demand. Row housing, collective housing (2 stories), incremental solutions, can be a good option to the only current typology (single unit 1 story). Increasing density in the consolidated urban areas can help, but should be well planned.
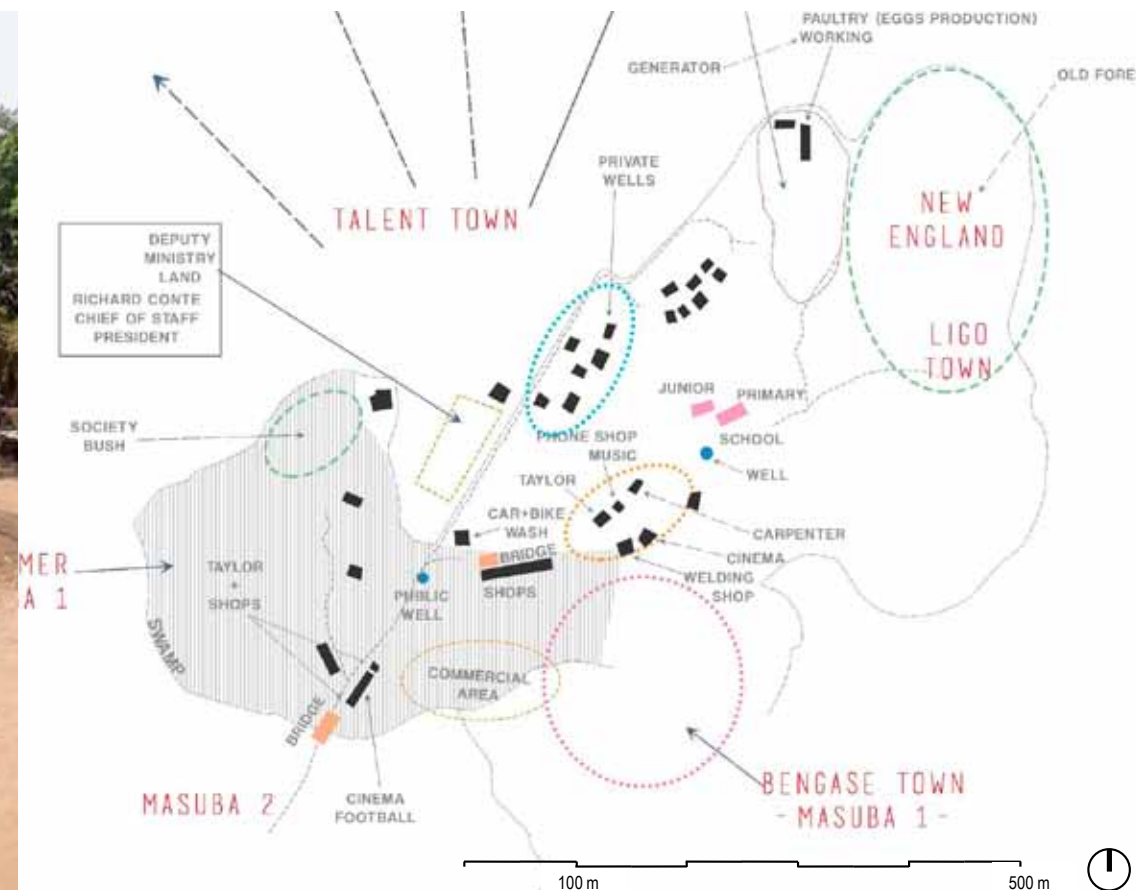
Indicator 4. Population with access to basic neighborhood services

Access is defined according to certain uses and for different distances and times depending on whether they are urban or rural areas. This indicator consider health, education, commerce, and all the main daily needs. But, as health and education are analyzed in other topics, here the considerations are more related to daily uses such us food, pharmacy, basic products,... In that sense, in Masuba there are just small shops for drinks and other products. For the main needs in basic neighbourhood services, the inhabitants move to the central area of Makeni and the market. The map below shows some different areas in Masuba where some uses and shops are located.

The reference in this indicator shows that in urban areas, at least 90% of the population of the area studied should have access to basic services. That depends on a distance of 1 Km. For Masuba, the market is 1,5 Km far, but considering there are some services closer, a general estimation of 50% population with access has been finally defined, what is Low evaluation.

Image 16. Spaces for commerce in Masuba
Source: CEU group

Image 17. Location of main uses in Masuba area
Source: CEU group

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 very difficult. In many places, in the absence of specific regulations, at least some basic guide-lines 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
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,..)**	**Medium**	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 Masuba, flooding is the main risk. 25% has been considered as estimation	Population affected, Has and %	**247 peo-ple, 1,9 Has and 25%**	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	Masuba neighbourhood is surrounded by swamps, but there are no any documentation available about future risk and measures to take. The constructions close to swamps are in risk of flooding. At same time,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 Masuba and the accumulation in some places is another challenge to consider.
Global evaluation	**MEDIUM**
Observations	Construction close to swamps bust be avoided. The future growth around Masuba must consider the possible risks (climate change, waste mana-gement, 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 (Masuba 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,..)

The main risk observed in Masuba is flooding. Swamp areas are surrounding the central part of Masuba, disconnecting the school and other parts of the neighbourhood, also with a bridge to connect with central Makeni. According to the surveys, part of the population does not perceive floods as a risk. Other interviewed inhabitants perceived the risk. So, the estimation about this indicator was to consider 25% of Masuba in risk, with the information of surveys, fieldwork and maps. This 25% is a global estimation, to take the 1,9 Has and 274 inhabitants (25% of a total 990 inhabitants in the mapped area of Masuba). Climate change and waste management are also risks for the 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 Masuba 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 18. Masuba and swamps around
Source: HD_LAB in google earth picture

100 m   500 m

Image 19. Vulnerable lands (floods and hills) in Makeni and surroundings (left). Land uses (right). Previous global analysis for the whole territory. Detailed studies are needed in expansion areas as Masuba
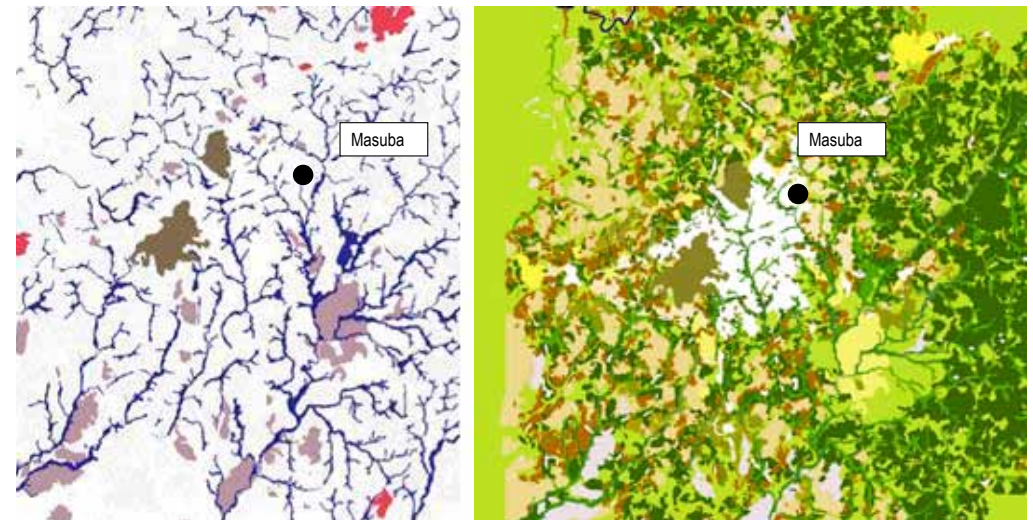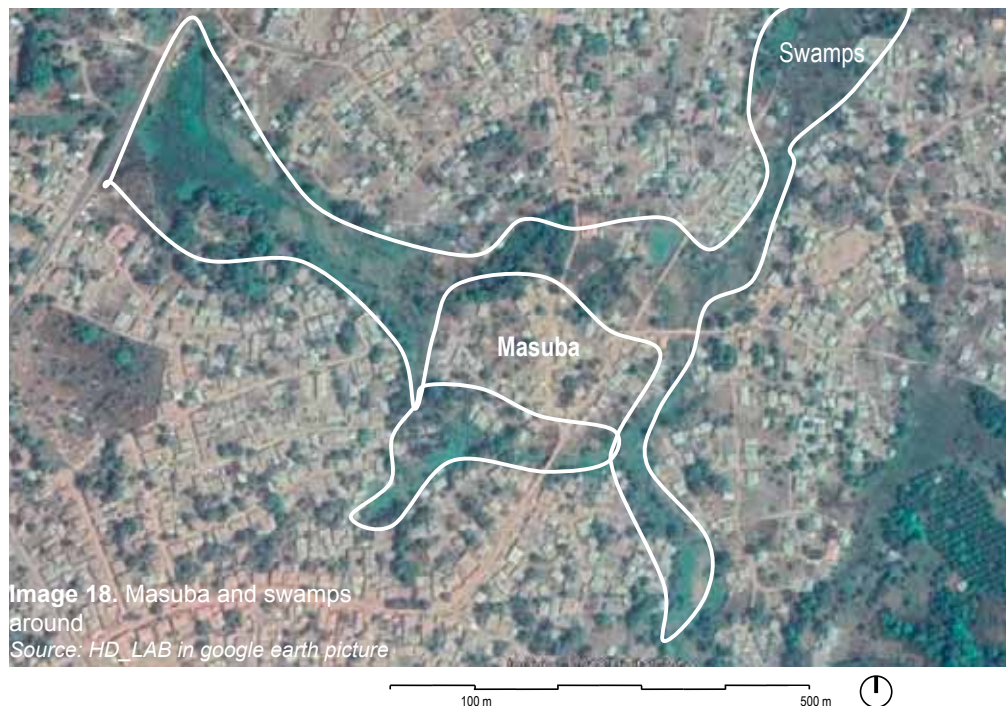
Source: Adela Salas y Natalia García, coordinated by HD_LAB

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 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
Neighbourhood	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**	Population of the study area that has access to drinking water according to the defined international criteria	Population and % of the total	**990 (100%)**	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	**100 (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	**100 (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 at big scale. It is key to follow the evolution of these projects
Global evaluation	**VERY LOW**
Observations	The situation of Masuba is similar than in other Makeni neighbourhoods. Problems related to the short distances between water wells and latrines, are present in Masuba. To explore the water quality in boreholes and wells must be done by experts in WASH
Recommendations	Improving acces to infrastructures in Masuba is a priority. All considerations must take into account the future expansions of the area and the possible internal growth. The future paving of main roads 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. ACCESS TO BASIC INFRASTRUCTURES

Infrastructures are key in developing context. Following the Sustainable Development Goals (In 2015, countries adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals), infrastructures are included in Goals 6 (Clean Water and Sanitation), and 7 (Affordable Clean Energy), but are also directly connected with Goal 3 (Good Health and Well Being) and Goal 11 (Sustainable Cities and Communities).

Indicator 1. Population with access to safe water

The neighbourhood has 2 community boreholes. 1 of them with safe water (YMCA NGO). Other with bad taste. Considering 200 m distance, all the area analyzed have access to safe water., but it is a precarious access that requires loading heavy water buckets, long waits and other conditions. Women and children usually collect the water. The water is free. Althought the coverage in the minimum standards is achieved, we consider "medium" the evaluation of this indicator according to the previous comments.

The indicator shows how difficult is to get the information to define acces or not access. There are also private wells with no safe water, but it is difficult to know if the people is drinking from that sources. 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.

Image 20. Image of public borehole
Source: Group CEU

Image 22. Location of borehole in Masuba
Source: HD_LAB

● Boreholes

Image 21. Private well
Source: Group CEU

Indicator 2. Population with access 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 Masuba, the situation is really poor. During the fieldwork, the information obtained revealed that the sanitation system is almost always a basic pit latrine. Not ventilated. There are households with no latrine. Field work showed also cases of more than 30 persons sharing the same latrine. Close to 5% of houses have toilets with septik tank. With all this information we can consider that around 10% of the population in Masuba (100 persons of the 990 in the mapped area) have access to improved sanitation. Another level of analysis is sanitation in the Masuba School. This is more than precarious with just two latrines for close to 500 children in the Primary level.

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, what means a total of 3.9% of the population with access to improved sanitation.

Image 22. Types of Latrine in Masuba
Source: CEU Group

Image 23. Location of latrines in a part of Masuba
Source: HD_LAB

■ Latrines

10 m   50 m

Indicator 3. Population with access to safe energy

Gas supply networks are still very scarce in developing countries 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 Masuba, according to the surveys, 100% of the people use wood (most common) 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 Masuba, the assesment cannot be good. Reforestation strategies and improved kitchens should be developed.

Image 24. Types of kitchens
Source: HD_LAB

Image 25. Location of kitchens in a part of Masuba
Source: HD_LAB

▲ Kitchen

10 m   50 m

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 Masuba, there are no paved roads, so the drainage is just provided by soil ditches in both sides of the streets. Very few buildings have drainage around them. So, for that indicator, the estimation is just 10% (100 persons) have drainage. The slightly slope of the area is a positive factor for avoiding problems during the rainy season. Improving rainwater evacuation to the swamp areas can be an important action to implement.

Paving streets is a priority that will help a lot the integration of drainage system and it will be a chance for connecting with the housing system. Also, dranaige is key for rainwater storage, that should be a future element to improve in Masuba, both at the household and village level.

Image 26. Dranaige system in Masuba
Source: CEU Group

ndicator 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, in poor areas where the population moves frequently walking on roads and dark streets, with 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 Masuba. Masuba has no any public lighting system.

Appart of public lighting, having energy for private lighting and electricity connection in housholds is a priority. As we will see later, to extend the electricity in the neighbourhood was the action funded in the Programme.

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 Masuba, the lack of waste collection is critical. People throw rubish in some areas at the back of the plots, dig a hole or burn it. There are no trucks or bins, so no proper collection can be done.

Image 27. Rubish in Masuba
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.
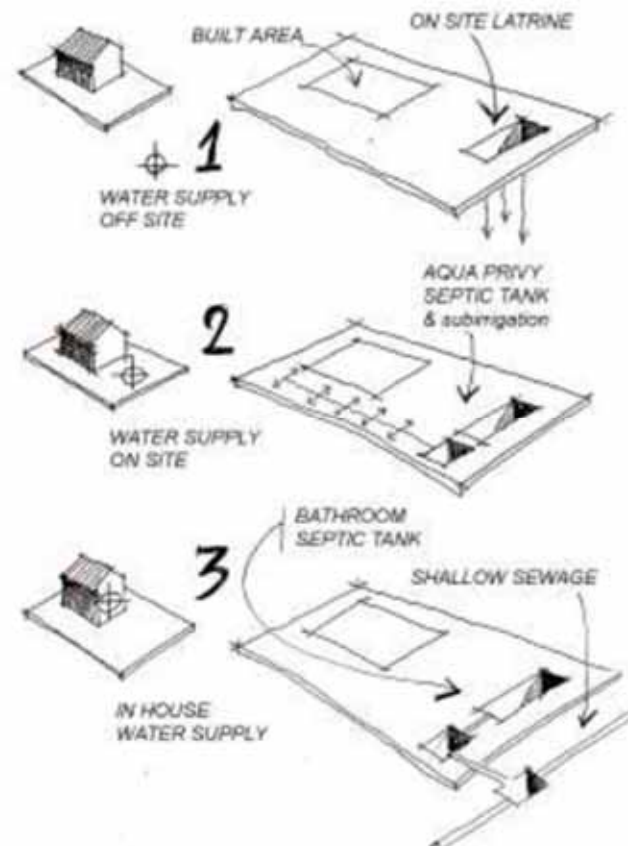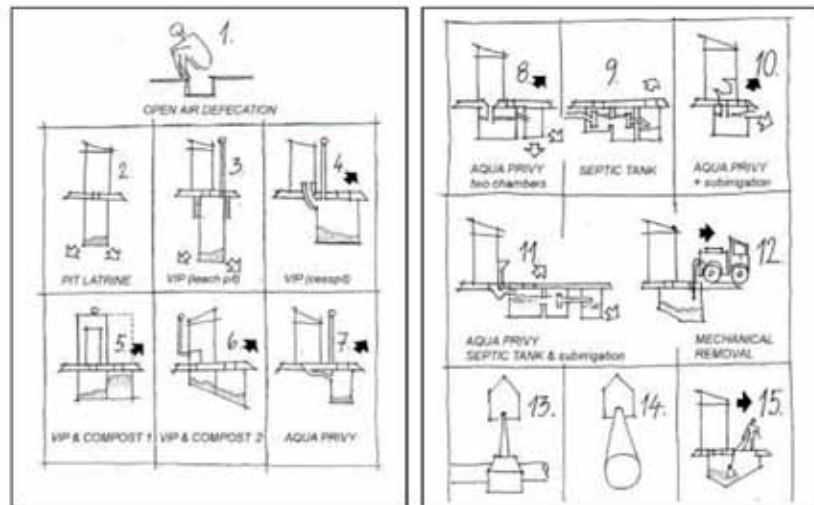
Image 28. Sanitation systems and progressive development
Source: Freetown Structural Plan (2014)

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

Goal	Quantify the degree of coverage in 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 amenities is key in the provision of Basic Habit-ability 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
Meighbourhood	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Population with ac-ces to basic health facilities (PHU and Hospital)**	**Medium-Low**	As the first step of health care, the PHU is the essential neighborhood-scale treatment equipment. The popula-tion with access according to maximum distances is valued, completed with the level of attention	Population, % and level of attention	**- 490 (50%) Primary** **- 990 (100%) Hospitals** **- Level of attention: Very Low**	- Primary Health Unit: 1.600 meters maxi-mum - Hospital: 5.000 meters maximum
2	**Population with acces to school (primary, secondary, university)**	**Medium-Low**	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** **- 50% 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,...). Masuba has a Primary Health Unit, but outside the mapped area. And the Holy Spirit Hospital is very close to the neighbourhood. In education, the level of attention has to do with some information that should be obtained in a deeper analysis.
Global evaluation	**MEDIUM-LOW**
Observations	It is really difficult to evaluate 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	A deeper analysis of the Masuba Health Unit must be develped, as well as the real access for the people to the Holy Spirit Hospital. In education, the school facilities should be improved, with better spaces for classes, sanitation, cooking, etc. A detailed study can provide better information about both fields (health and education) in Masuba and surroundings.

HAB 4. ACCESS TO BASIC FACILITIES

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.

Masuba is smaller (the area mapped) 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.

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.
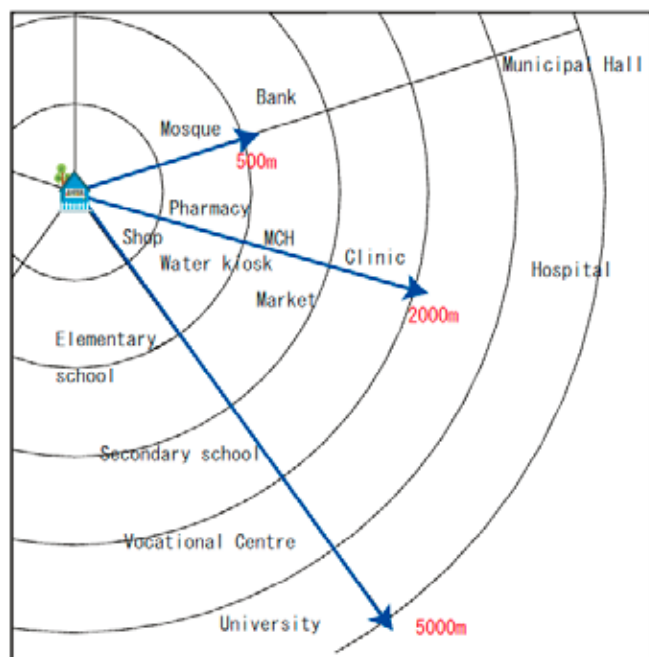
Image 29. Location of services
Source: UN-Habitat, "Urban Planning Manual for Somaliland"

The 3rd Sustainable Goal (Good Health and Well Being) includes as Target 3.8 "Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all". This broad definition of health coverage helps to understand access as more than just distances.

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 Masuba has a Primary Health Unit, that is not located in the analyzed area. So we haven´t visited the building and we don´t have information about it. We can just know that, according to the 1,6 km as maximum distance to Health Center, Masuba has coverage with the Health Unit (see map below). They need to cross the bridge.

Considering hospitals, the maximum distance requiered, according to different analysis, is 5.000 meters. In the case of Masuba, the Holy Spirit Hospital is inside the 5 km radius, in a distance of 1 Km aprox. But also, it must be considered the cost of attention and access. In the sruveys, the people found the Holy Spirit Hospital attention very expensive. Most of the Masuba population cannot afford that Hospital.

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

For all the information given, the final levaluation is Medium-Low, including the good position of Masuba in terms of distances to health amenities, but also the difficulties for the people to have these services. As in many other topics, deeper analysis should be conducted.

Image 30. Health Units coverage
Source: HD_LAB

Stocco Health Center
Masuba Health Center
Masuba
Radius: 1,6 Km
Makama Health Center
Teko Health Center
Bombe Health Unit
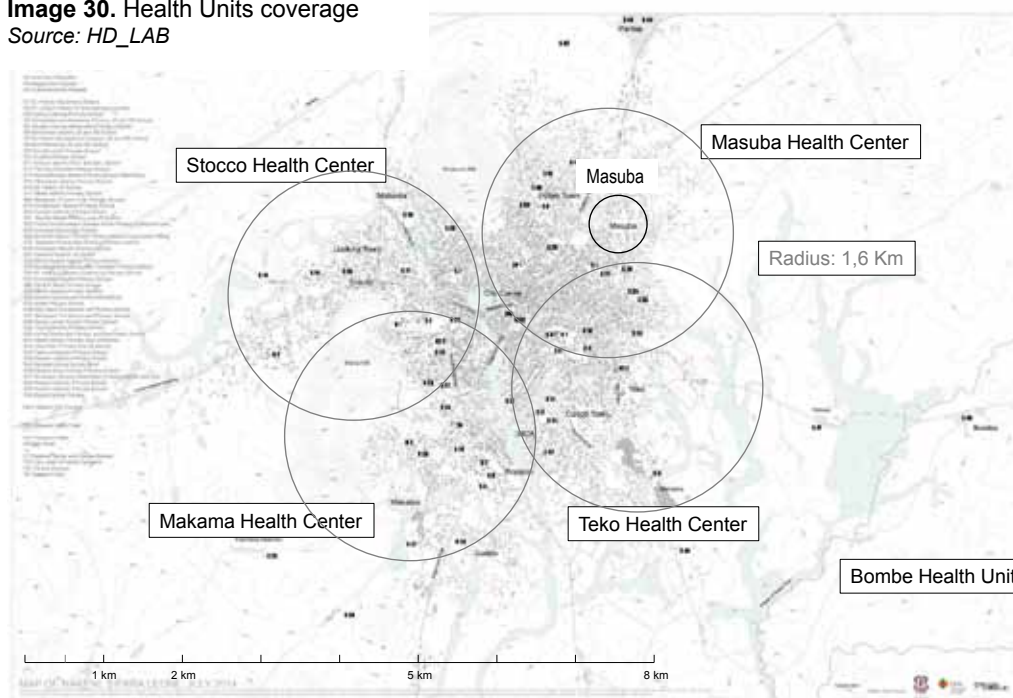
Image 31. Hospitals coverage
Source: HD_LAB

Radius: 5 Km
Masuba
Holy Spirit Hospital
Magbenthe Hospital
GovernmentHospital
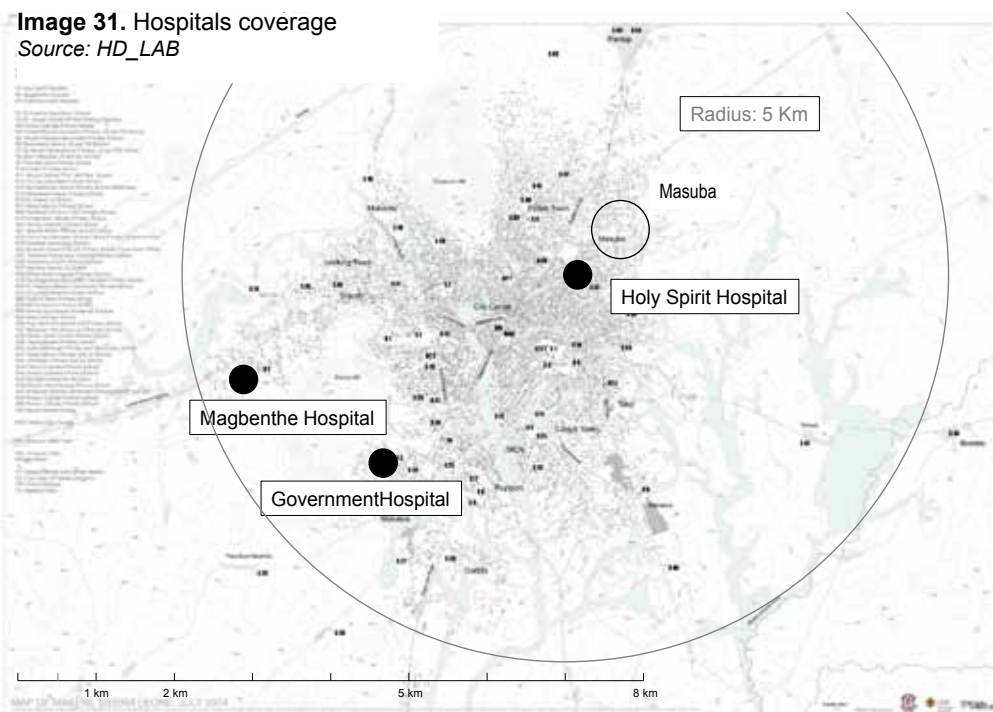
Indicator 2. Population with acces to school (primary, secondary, university)

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.

It should be also considered the Sustainable Development Goals, Goal 4 specially (Quality Education). Here, we can read the following: "The reasons for lack of quality education are due to lack of adequately trained teachers, poor conditions of schools and equity issues related to opportunities provided to rural children. For quality education to be provided to the children of impoverished families, investment is needed in educational scholarships, teacher training workshops, school building and improvement of water and electricity access to schools". Target 4.1., says "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes".

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. We must say that not all schools have been founded as, for example, the case of Masuba School.

In Masuba, there is a Primary School called Kankaylay Islamic School (two buildings with 6 classes) and a Junior Secondary School (one building with 3 classes and another one under construction). Both Schools are located in the same part, outside the area mapped and disconnected to the city.

The classes in Masuba School are overcrowed (more than 50 children in most cases) and the students lack enough teaching materials. Also, the desks were in a very bad conditions. At the end of the fieldwork, 500 euros of the CEU University budget were dedicated to improve desks with the support of a local artisan.

The building conditions are very very poor. One of the Primary buildings lack ceilings and the water come inside during the rainy season. It will be explained in the 9th topic (Building conditions and Habitability).

According to sanitation the situation is more than precarious. The Primary School have more than 400 students, with just two toilets.The Junior Secondary have 260 srtudents, with just one toilet for girls and one for boys.

All these issues are also part of the education quality.

The distance coverage is enough (less than 800 meters for Primary and 1.600 for Junior Secondary), but not for Senior Secondary. So the issues related to education deal more with quality of school, number of teachers, costs,... Masuba lack of Senior Secondary School and the closest one is 2 miles away according to the surveys. Attendance seem to be high in the Primary case and lower for Secondary, but we have no especific data.

Target 4.3. recognizes the importance of tertiary education: "By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university". Althougt the priority in developing context must be Primary and Secondary education, is also key to understand the importance of universities in development. The main University in Makeni is the University of Makeni (UNIMAK), that is also key part of the Upgrading Neighbourhood Programme through the collaboration with San Pablo CEU University of Madrid, Spain. Considering the 5.000 m radius of the minimum coverage, Masuba is inside this distance and some of its inhabitants are stuying in UNIMAK.

Image 32. Primary Schools coverage
Source: HD_LAB

Masuba

Radius: 800 m
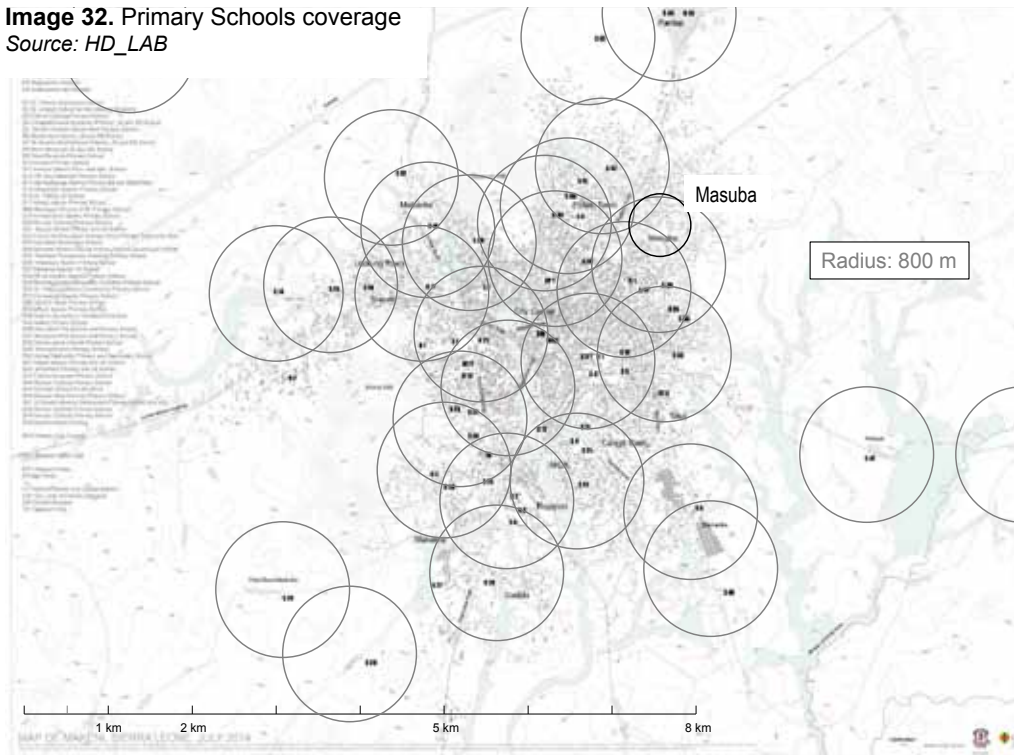
Image 33. Secondary Schools coverage
Source: HD_LAB

Masuba

Radius: 1,6 Km
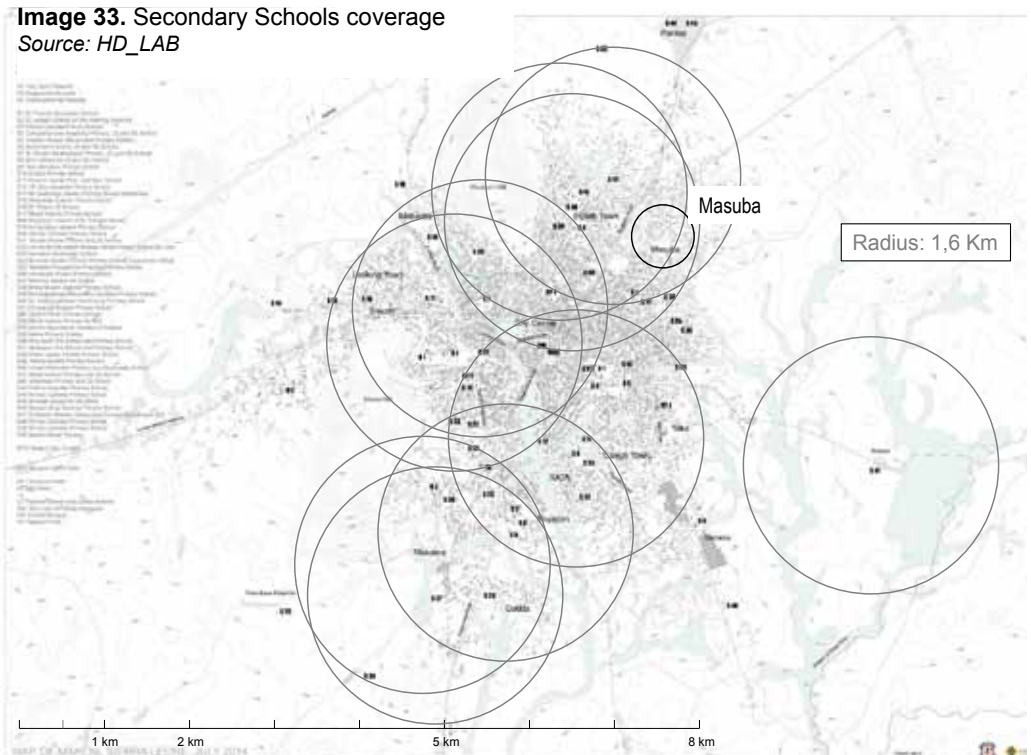
Image 34. School of Masuba
Source: CEU Group

MASUBA 1
OR
MASUBA SECTION
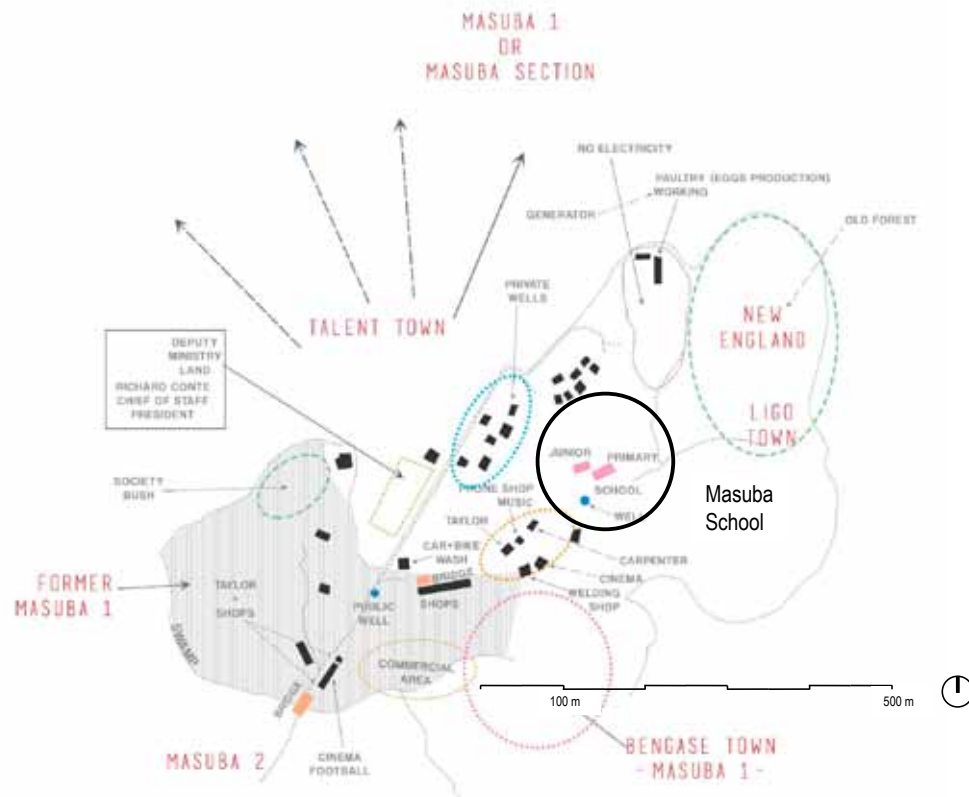
Image 35. Location of Masuba School in the Masuba context
Source: CEU Group

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 building cities 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
Neighbourhood	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	Public -Private land use rate	Low	This indicator measures a basic relationship between private, public and semipublic	%	**- Private land: 61,83%** **- Public land: 32,8%** - Streets: 5,5% - Public Space + swamps: 27,3% **- Semipublic land: 5,37%**	**- 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	%	**5,5%**	20-30%
3	Public spaces	High	The indicator measures the rate of land for public areas (parks, squares,...)	%	**14,14%** Including communal land and sacred forest	> 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 Masuba is similar than other peripheral neighbourhoods of Makeni The recommended rates are based on urban areas, so it is important to consider the external location of Masuba
Global evaluation	**MEDIUM**
Observations	As the area analyzed is part of other biger neighbourhood, the boundaries have been limited including a part of the surrounding swamps in the total area. This issue can distort the rates, but it is also a relevant characteristic of the average Makeni neighbourhood
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 area and surroundings. The information developed can be useful for the Makeni City Council as 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 Masuba (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. The land is owned by some families and all the situations related to properties are quite singular. Land issues are a real challenge in Sierra Leone, and the Land Policy Reform conducted by the Ministry of Lands, Country Planning and the Environment can be a tool to improve the situation.

But accepting this reality, is very interesting to understand as deep 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. At the same time, moving to good land rates (in terms of private-public, open spaces, streets, amenities,...) can be key for the future. Both in improving the existing city and planning the new expansions.

It is also very important to highlight the fact that the Masuba area analyzed is a part of a broader community. So, for example, the School is not included and it is a key element in all neighbourhood. So, the rates and data given must be take into account these considerations.

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 Leonean 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 Masuba shows the following numbers in land coverage:
- Residential (Private): 48.350 m2 (61,83%)
- Semi-Public (Cemetery, Social center, Mosque, Sports center): 4.203 m2 (5,37%)
- Total blocks (Private + Semi-Public): 53.553 m2 (67,20%)
- Streets: 4.303 m2 (5,5%)
- Public spaces (Public spaces + swamps): 21.345 m2 (27,3%)
- Total Public: 25.648 m2 (32,8%)
- Total Masuba (area analyzed): 78.201 m2

As mentioned before, the reality in Masuba is very far from the idea of lacking in open spaces. People moves along the village with open areas among buildings. Also, the surrounding swamps 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. In Masuba we understand well these kind of issues reinforcing the pedagogical approach in urban planning and land management.

Although Masuba is part of Makeni city, the environment is very rural with high presence of agriculture in swamp areas and in many places around the neighbourhood. We have included swamps as part of public (as in other Sierra Leonean cities), cause these type of lands rarely are divided in properties. In the case of Masuba, the interviews showed that there are especific owners of the swamps. Also, sacred forest and an area of communal land have been included in the public realm. The subdivision of private-public, in Masuba, is not 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,…)

But we have to take into account the previous considerations about public areas, as well as the fact that the Masuba School is not located in the analyzed area. 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 Masuba, adding Semipublic, what is the mosque, social center, cemetery and sports center to Private (residential), goes over than 67,2%. 32,8% Public.

Image 36. Private-Public land
Source: HD_LAB

(67.2%) ▣ Private (61,8) + Semipublic (5,4%)

(32,8%) ☐ Public (55, % Streets + 14,14 % Public Spaces + 15,15 % Swamps)

▣ Semipublic (Mosque + Cemetery + Social + Sports)

▣ Residential

Image 37. Semipublic and Residential land
Source: HD_LAB

10 m   50 m

Image 39. Open spaces in Masuba
Source: HD_LAB

Image 38. Former Masuba, the analyzed area surrounded by swamps. Here is easy to understand that right now, public space is not a priority for Masuba, as forest, agriculture and other open spaces are around. But reserving adequate lands for public areas should be a critical component of future actions in the existing and new lands.
Source: Google earth

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 considered as a pattern to guide urban developments in direct relation to housing typologies 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 Masuba, as in most villages in all Sierra Leone. There are two main streets crossing the bridge that connects with central Makeni. The buildings are organized along these roads. On the other parts of the area analyzed, the urban fabric turns into a more chaotic pattern with the swamps as limits in the southern area. The street area is 4.303 m2, a 5,5% of the total. Very low 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. Apart of the main two roads, there are some paths crossing residential areas. It is not possible to know where these paths are without the kind help of the Masuba inhabitants. It is interesting the fact that the people are reserving these lands for future connections.

(5,5 %) ☐ Streets

10 m   50 m

Image 40. Streets of Masuba. The streets in the left part are just reserved areas located thanks to the inhabitants of the neighbourhood
Source: HD_LAB

Image 41. Street in Masuba
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.

According to the quantitative analysis, some usuful references are:
1. City: 9 m2 of green area per inhabitant less than 15 minutes away
2. Sector: Public open spaces (Gardens, parks, games, squares, ...): minimum of 10% of the total area of each sector
The continuity to the green network must be ensure and the public spaces must have a minimum of 70% of the total as arborized surface

As was mentioned before, swamp areas have been included in the public spaces, as well as the communal land and the sacred forest beside. These areas, not used as conventional open spaces. There are also in Masuba some voids that have been considered as public, cause they were not limited as private during the surveys. But these areas seem now extensions of the residential plots. Some of the public spaces includes some activities (driying rice, covered areas as baffa, areas around boreholes,...).

Social life in Masuba (in Makeni in general) occurs 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 (at least communal) 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 Masuba, 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 Masuba 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.

This indicator has a good evaluation, but we must remember that the area mapped is just a small part of the whole Masuba area. And this part includes the Sacred Forest and the communal area beside. This can distort in positive the total amount of public land.

☐ Open Spaces

☐ Communal land + Sacred Forest

☐ Swamps

Image 42. Public space in Masuba. The total area including open spaces, communal land, sacred forest and swamps accounts 27,3% of total area.

The open spaces seem more to be vacant land than areas for public pruposes. Anyway, Masuba is at time of reserving those spaces that can finally work as parks, recreational areas, etc.
Source: HD_LAB

Image 43. Image of public-communal spaces in Masuba. Swamp areas and other type of lands that can be considered public
Source: CEU Group

Indicator 4. Residential plot area

Plots in Masuba 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. The reality varies a lot, depending on each situation and due to informal processes.

In the case of Masuba, 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. As can be seen in the map below (a zoom of the area) the variety is huge. Dimensions goes from plots biger than 1.000 m2 to the smaller ones around 300 m2. In the main road, buildings are organized along the street and new constructions are often built in the back side of plots. In other areas, as the zoom shown not clear pattern can be identified and houses turn the main façade depending on other issues (slope, swamps, proximity to other constructions,...).The need to delimitate with fences the plots does not seem to be a priority in Masuba, 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 main streets. Here, the paths commented before can serve as accesses. The fieldwork revealed also a disputed land
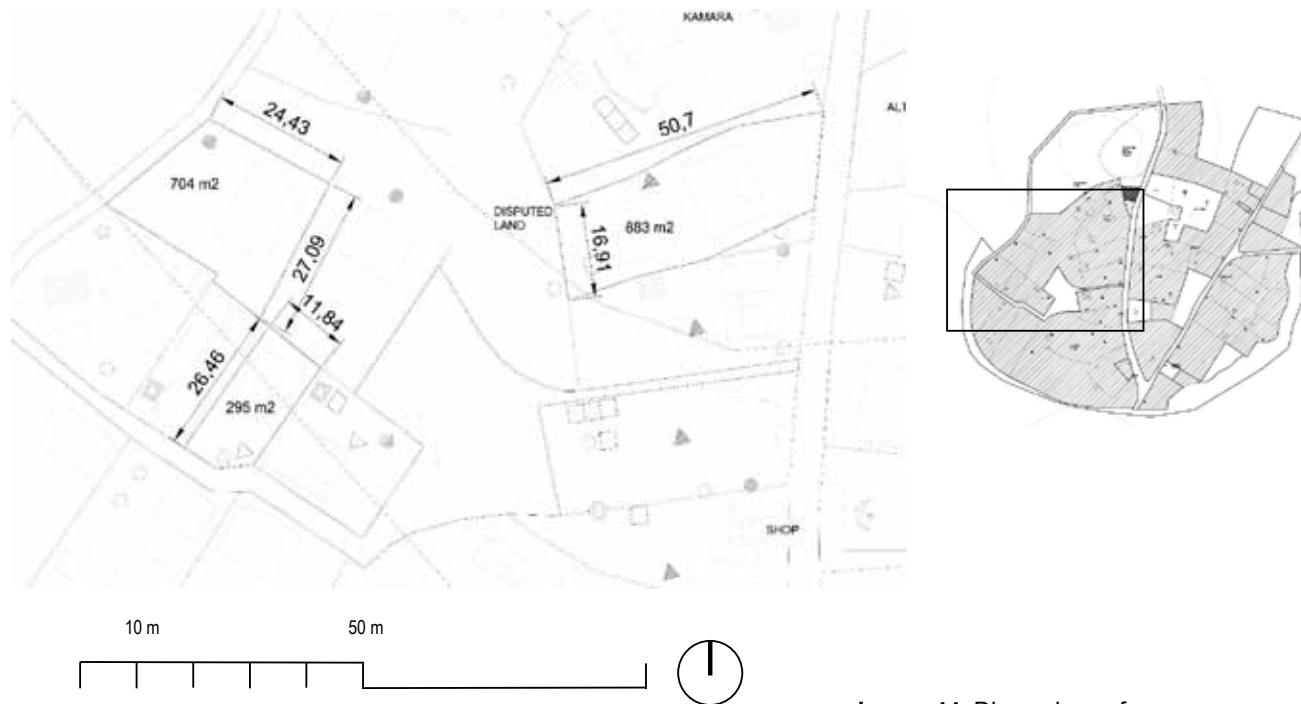
Image 44. Dimensions of some plots in Masuba
Source: HD_LAB

Image 45. Residential areas in Masuba
Source: CEU Group

The considerations in this topic have to take into account the the land ownership, with some families (Koroma in one of the mapped areas) as owners of the land. So, the common relationship between property, familiy and plot dimensions are quite singular here in Masuba and in most Makeni city.

The evaluation here is quite complex. On one hand, according to the current situation of the area, 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 Masuba reveals some community land for dry rice, communal agricultural works, cattle in some areas, carpenter workshop, and other activities. It is key to find the best integration of these activities in the urban fabric. Even with no clear organization, the space in Masuba is enough and the problem is the lack of jobs far more 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.

Outside the main area analyzed, some different activities were found, in the road to the School, that will be analyzed later in the employment topic.

As useful references, some 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 46. Activities in Masuba
Source: CEU Group

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
Neighbourhood	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evaluation	Descripción	Unit	Data	References. Adequate dimensions
1	**Population with acces to safe public transport**	**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)	%	**20%**	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 Masuba should take into account the importance of communication, reserving enough land for this prupose.
Global evaluation	**LOW-VERY LOW**
Observations	Paving the main roads was one of the priorities detected during the fieldwork
Recommendations	The improvement of the communication is very key in Masuba. Paving roads 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. 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
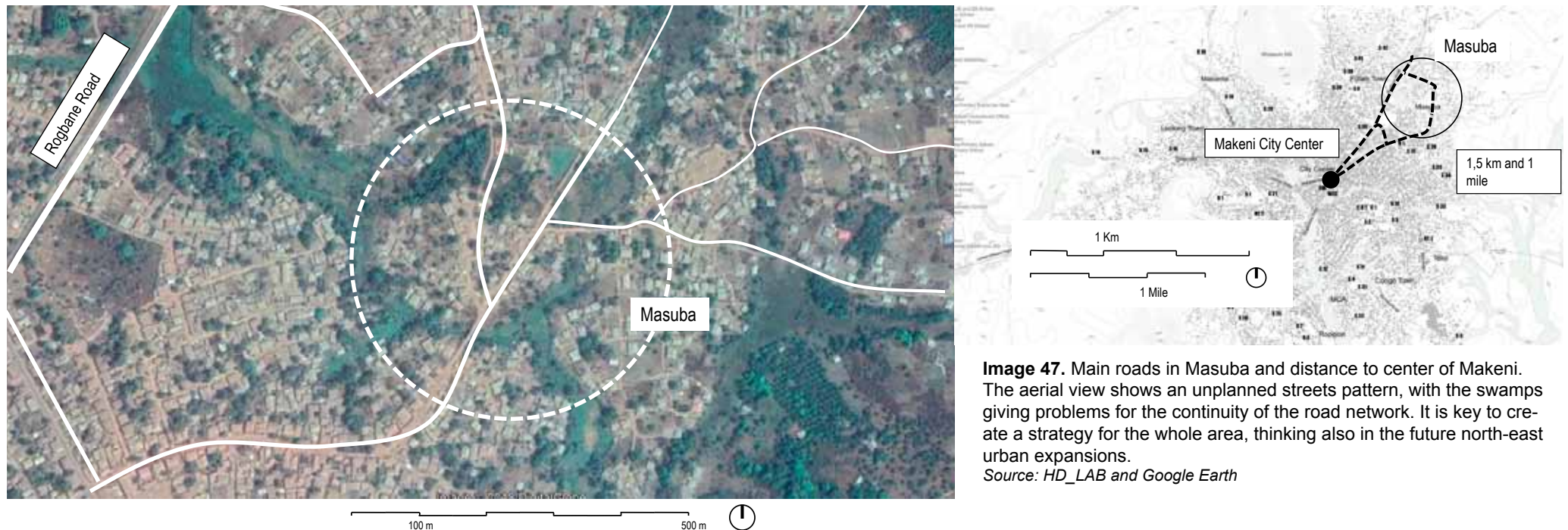
Image 47. Main roads in Masuba and distance to center of Makeni. The aerial view shows an unplanned streets pattern, with the swamps giving problems for the continuity of the road network. It is key to create a strategy for the whole area, thinking also in the future north-east urban expansions.
Source: HD_LAB and Google Earth

Masuba is 1,5 km (1 mile) far from Makeni, as was mentioned before. The access in vehicle can be done through Rogbane Road, that is paved, and then turn right and cross the brige by an unpaved road. The most common transport system are walking and motor bikes (around 2.000 leones to the city center). There are no bus stop and no specific places for the bikes to stop. Considering an intermediate cost of 2.000 leones, and 1 trip per day (4.000 leones round trip), the total ammount per month would be 80.000 leones (considering 20 days). A minimum salary is around 500.000 leones. Considering two salaries (wife and husband), the total family income would be 1.000.000 leones per month. In this case, transport cost for just two members of the family would be 16% of the total family budget, over the 10% minimum considered. As Masuba is not far from the Makeni city center, the alternatives of bycicle (5 minutes to the city center) and walking (25 minutes to the city center) are good options. According to all the different aspects, the evaluation is low in this topic with an estimated 20% of the population with good access.

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 unpaved roads. The implications on the mobility for the 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 Masuba is simple, as the few roads of the neighbourhood are not paved. According to the mapping, the real width of the main Masuba road is 5,5 m, what is very narrow. The setback of the buildings along the street generates the perception of a wider reality. But considering the possibility of fences in the future, the dimensions of streets in Masuba are too small.

Image 48. Masuba street in the bridge connecting with Makeni
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 smaller 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.

As conclusion, communications are key and the road network must be planned inside an integral strategy. For the exiting city, in Masuba should be paved the main roads, trying to make them wider. At the same time, these main roads can be planned as axis to articulate the new expansion areas, giving them enough surface thinking in future needs (bycicle, buses, sidewalks,...).

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 households and employment, imply loss of a lot of time per day, pollution, money, 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
Neighbourhood	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,...)**	**Medium**	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.	%	**50%**	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)**	**Medium**	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	%	**50%**	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	**MEDIUM**
Observations	Subsistence agriculture is the main activity for over 70% of Masuba workers, with also importance in tayloring activities. Swamps surrounding the analyzed area are used for agriculture for the Masuba community
Recommendations	Urban Planning should consider seriously the integration of agriculture within the existing and new urban expansions in the Makeni surroundings as the Masuba area. 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. Masuba, as peripheral Makeni area, has a very high dependence on agriculture. Swamp areas plays a key role here.

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).
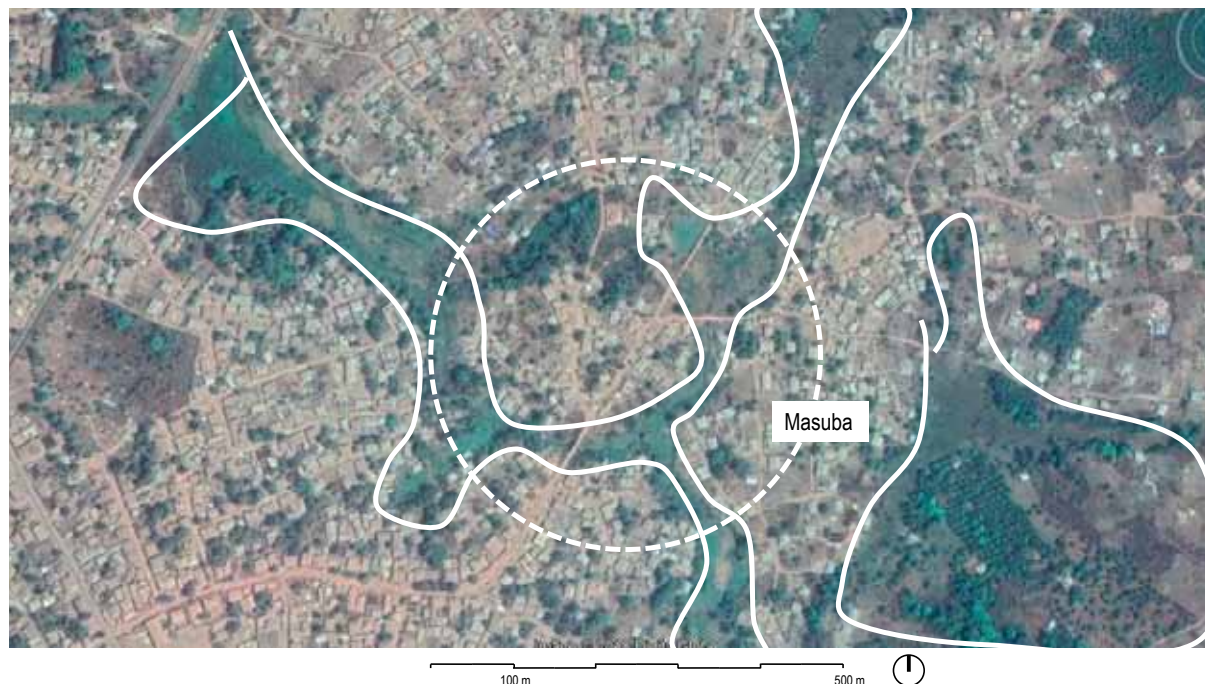
Most people in Masuba (over 70% according to surveys) works in agriculture land in swamps and fields close to the neighbourhood. Rice, cassava, fruits, leaves, sweet potato are the main products, and farming also. Working groups are organized for getting crops, and they sell the products in the market in Makeni. Swamp areas are owned by some specific persons.

In this topic the evaluation is high, as the agriculture areas are close. But some considerations must be taken into account. One one hand, this is a subsistence agriculture in a very small scale. Introduction of cooperatives with new mechanic tools would improve productivity. On the other hand, it should be analyzed the ownership of agriculture lands and its impact on people livelihoods.

For the future, it is key to preserve specific agricultural land in close relationship with the households, 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 49. Agriculture in swamps around Masuba
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.
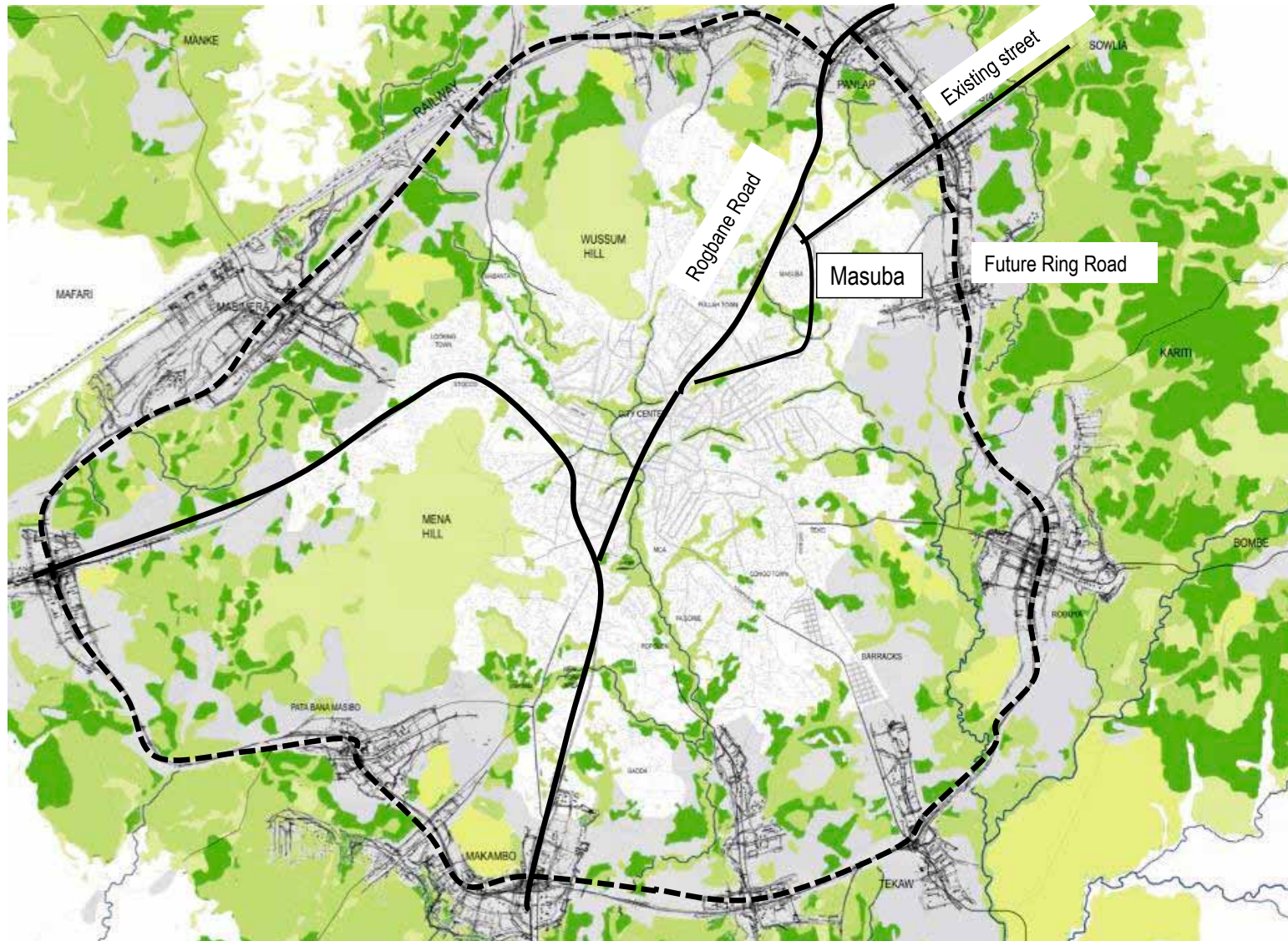
Image 50. Proposal of a linear city. The proposed Ring Road is the main element for connecting and organizing the future growth.

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 Masuba 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 Masuba is 1,5 Km (1 mile). 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 for Masuba inhabitants, is lower than 2.000 meters for accessing commercial areas, so the evaluation is medium, considering the communication and transport costs and the unpaved streets. Also, there are some activity areas in Masuba, that are shown in the image below.

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.
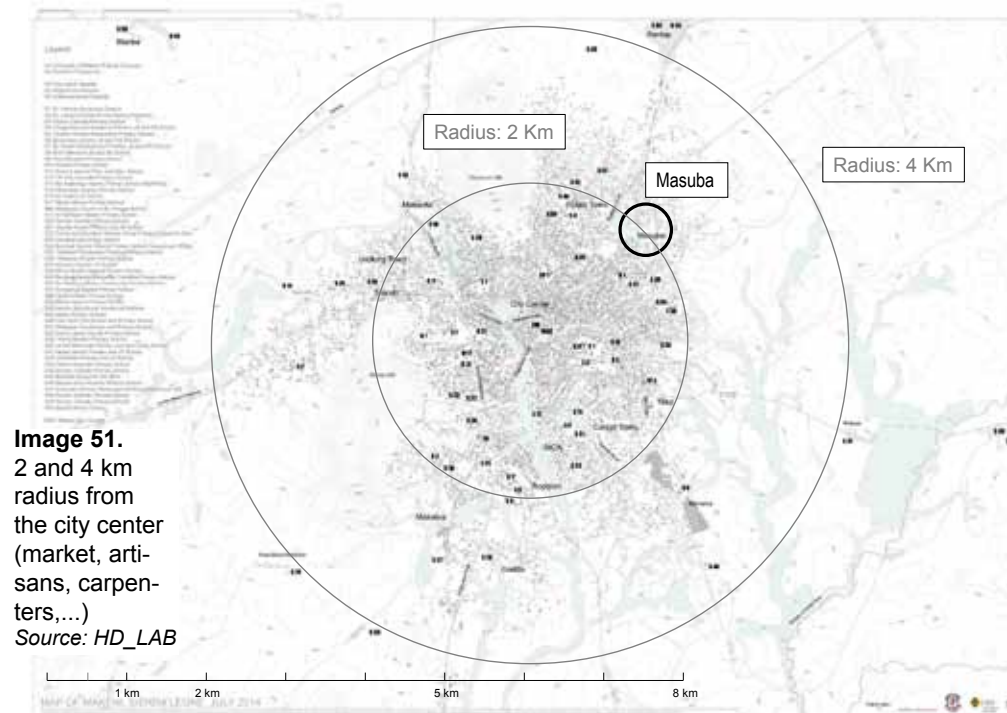
Image 51.
2 and 4 km radius from the city center (market, artisans, carpenters,...)
Source: HD_LAB
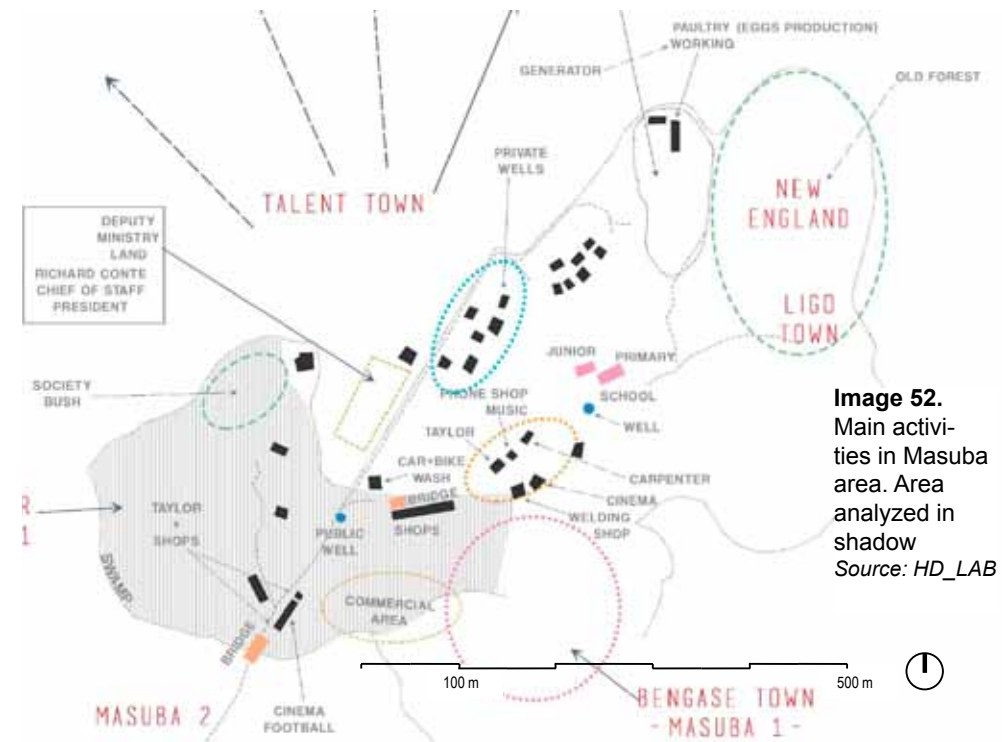
Image 52.
Main activities in Masuba area. Area analyzed in shadow
Source: HD_LAB

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
Neighbourhood	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 defor-estation areas**	**High**	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 %	**No erosion or defor-estation in Mauba 0% (according to surveys)**	0% of areas with risk to habitability for erosion 0% without forest management strategies for deforestation
3	**Erosion and defor-estation 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 defor-estation

Other considerations	Although are not a problem nowadays, deforestation and erosion will be growing challenges to address in the coming years. So, as the final evaluation of this topic is high, it must be considered seriously in the future
Global evaluation	**HIGH**
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 agricul-tural-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 Masuba area needs an urgent plan for the coming years in the context of a very rapid urban growth, considering strategies for the existing Masuba and for the new expansions. 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 Sustainable Development Goals, there are 3 directly linked with the environment:
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 Masuba the surveys reveals no occupation of high value ambiental lands. 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 Masuba, no important erosion can be seen and it is not told as a problem by inhabitants. Deforestation is not conceived as a problem as well, but all the people of Masuba (and the great majority in Makeni) uses biomass (wood and charcoal) to cook.

Indicator 3. Erosion and deforestation growth

The dynamic analysis shows a very rapid growth in the land occupation of the territory. It is essential to pace urban development with conservation actions and sustainable management. All the area around Masuba in north-east direction 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 53. Masuba area.
The satellite images shows the advance of the city of Makeni towards the north east, where Masuba 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 Former Masuba (the area mapped and analyzed in this document) is clearly the first settlement of the area in 2002. Nowadays, in 2019, The whole area has been growing with no clear pattern, avoiding swamps in this process. It is also interesting to notice that some trees has been growing close to the swamp areas in this period of time.
The 2019 image evidence the importance of planning and the need to get a structural public network (roads, amenities, agriculture and open sapaces) for the future urban expansions.
Source: Google Earth

Image 54. Aerial view of Masuba and north-eastern Makeni
Source: Google Earth
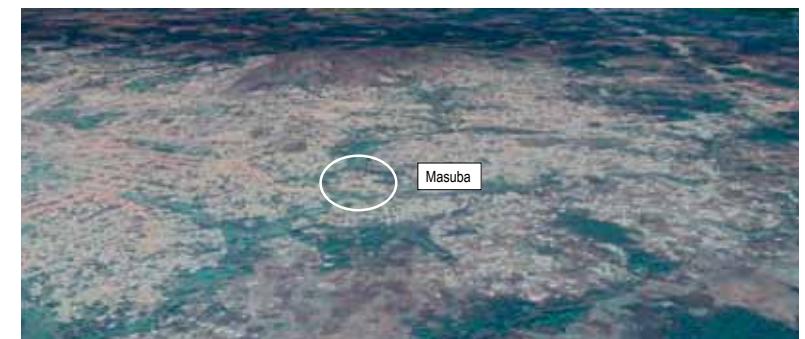
Image 55. Vegetation close to swamps. The picture shows a rich bio-diversity, but also the risks of rubish and houses too close to flooding areas
Source: CEU Group

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
Neighbourhood	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	- 1,12 primary - 0,58 secondary	For schools, a minimum of 10 m2 built / student
3	Health Center. Construction quality and process: durability and eficiency of the construction system	No value	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	No data	According to quality construction and methods used. See Complementary Information
4	Built up health center area by inhabitant	No value	This indicator quantifies equipment area ratios (m2 built) according to the number of users.	m2 built / inhabitant	No data	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	Low	The management of solid waste is another essential factor of habitability in urban areas.	m2 b / 100 inhabitants	17 m2 b /100 inhabitants (but just with 990 people)	For communal center, a minimum of 15 m2 built / 100 inhabitants

Other considerations	Detailed information is required in some of the indicators. The school is not in the area analyzed, but the evaluation has been included here. The Health Unit was not visited, so it couldn´t be evaluated
Global evaluation	**LOW**- **VERY 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. Critical situation in providing sanitation in the School
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.

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 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. The primary school have two buildings with similar characteristics. Mud blocks with plastic cement, wooden trusses, zinc roof, etc. But in one of them, there are no ceilings. Poor quality in general. No enough sunlight or artificial light and the classes are dark. Classes not well isolated. The junior secondary school is a more recent building with similar materials but better conditions. There is no senior secondary school, and the children need to walk a lot. A new building (for secondary school) is under construction. The school do not have a suitable space for cocking and having lunch. According to sanitation, the situation is dramatic. 2 latrines for more than 400 primary students and another recent 2 for the secondary students. The teachers and principal have another 2.This conditions are really critical, with serious implications in the students.

Image 56. Masuba School

- Up, left. Classroom of primary
- Up, right. Primary buildings
- Down, left. Classroom of primary
- Down, left. Primary buildings and latrines

Source: CEU Group

Indicator 2. Built up school area by student

There are more than 400 primary students and 290 junior secondary. The built-up area of the primary is 450 m2 and 170 m2 in secondary, what gives the following rates:
- Primary school: 1,12 m2 built / student
- Secondary school: 0,58 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 very poor. As mentioned, toilets are far for being enough as well.

Indicator 3. Health Center. Construction quality and process: durability and eficiency of the construction system
Indicator 4. Built up health center area by inhabitant

There is a Primary Health Unit, according to the information of some previous reports, but was not visited during the fieldwork. It is not in the analyzed area, but we have no information to evaluate it. So, for these two indicators there are no evaluation.

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

The Masuba Social Center for the community was the place for the two meetings developed during the initiative. 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. It is a very common type of social center in Makeni.

Indicator 6. Built up community center area by 100 inhabitants

According to the surveys, the center is used a lot. The existing one has 175 m2 built, aprox. This social center covers a far bigger area than the former Masuba as analyzed area. Considering the 990 inhabitants of analyzed area the ratio is 17 m2 built / 100 inhabitants. Following the references (Gesto-Perea), for communal center, the minimum of 15 m2 built / 100 inhabitants. But we must consider that more than 990 inhabitants are using the center, so the evaluation can be consider low.

Image 57. Masuba community center. Last meeting with the local community. The chief of Masuba speaking about the work done and asking for a paricipatory decision about a small action to be funded by CEU
Source: CEU Group

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 (Basic Habitability), 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.
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
Neighbourhood	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	Very High

	Indicators	Evalua-tion	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	**4-5 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	Together with the physical aspects, there are key elements that must be analyzed very carefully, as land tenure, with a high impact in the population living conditions.
Recommendations	Promote upgrading programs with collective and row housing (increasing density), in coexistence with the traditional types. Evaluate the alternatives of programs of sites and services for new expansions. Involvement of people in exploring new typological alternatives. Promote the development of a cadastre with spatial information and review of the situation in relation to property. To ensure security of tenure for the most disadvantage groups. Follow the Land Policiy Reform process in Sierra Leone to understand impacts in land ownership

HAB 9. BUILDING AND HABITABILITY CONDITIONS

9.2. HOUSING

According to 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, housing typologies are, far more of cases, a single typological model of detached house on a quite big 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.

The case in Masuba is quite similar, although the dimensions and shape of plots does not follow any clear pattern. Land belongs to some families (Koroma and Kamara were mentioned during the surveys), what is a very important issue in security of tenure and other habitability conditions.

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 streets develops a covered veranda. 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 5 rooms, connected by a corridor that joins two doors, one in each façade. This arrangement favors cross ventilation. In the Msuba areas where there are no clear streets, the orientation of houses and verandas varies a lot.

The survey in Masuba shows that most of dwellings are constructed with cement blocks and plastic cement, with presence of mud blocks as well. Zinc roof is the most common. Poor quality in general has been observed. 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 owning families, usually with 5 rooms.

According to the previous information, the durability of dwellings is quite low. Mud requieres often reparation. But there are no important risks cause the construction system. Very few houses have dranaige around, what will give problems during the rainy season. Problems that couldn´t be clearly 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 58. Different type of residential units in Masuba
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 Masuba 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, promoting social life.

5. Housing includes incremental possibilities.
The plot gives the opportunty, as growth is ocurring through the construction of other buildings in the same plot. But almost never there are additions to the existing building. So the process of 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. We have mentioned before that Masuba neighbourhood can increase density in the existing consolidated area, but should be studied the way of doing it. Ideal would be to have rules at city level for these situations.

6. There are different typologies.
No. All the solutions are almost the same type, with single one story unit. 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.

In general, the considerations about suitability depends on different elements, including traditions, 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 in a short temr, but the process of urban growth is seriuosly rapid in Makeni and planning the future is key, both in the existing and new urban areas.

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 (following page) it is clear to understand how new housing typologies can improve land use occupation. 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 Masuba and Makeni.

Example of saving urban land with more compact models

Settlement: 500x450 m (22,5Has)

1. Makeni single family house

220 dwellings
4 Per/dw
880 people

9,7 dw/Ha

2. Row houses

From single family house to row houses
Land area saved 10 years: **822 Has** (1907 to 1084 Has)
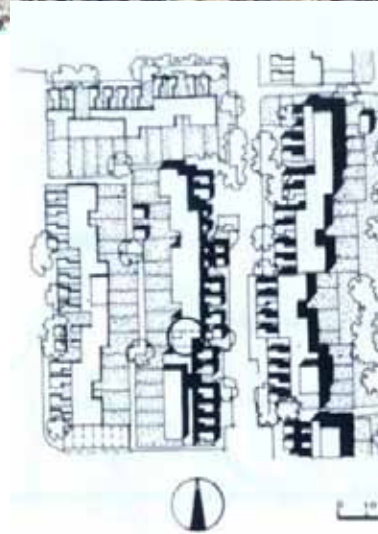
440 dwellings
3,5 Per/dw
1.540 people

19,5 vdw/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!!

872 dwellings
3 Per/dw
2.616 people

38,75 dw/Ha

Image 59. 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 really 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. 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 in this 41.1%, 44.7% include more than 7 people per room and a very high 18% to more than 10.

Surveys provided the information that households in Masuba have often 4-5 people per room, what is 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 Masuba. About people living in a house, some results from surveys were 40, 20, 17, 15, 10,...

Indicator 4. Security of Tenure

Frist of all, it is important to understand that the situation in Masuba and in most Makeni areas 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 Masuba, the situation is between the case of family tenure and communal tenure under clans. This is cause the land in Masuba belongs to some families but although part of the inhabitants are from the owning families, others not, and no title is available according to the surveys conducted. Some people own their houses, other are renting.

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.

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

1. Documentary evidence that can be used legally. Although Masuba 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 the owning families. A lot of Masuba 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 Masuba. 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".

No enough information was taken from the surveys in Masuba.

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."

There are people renting but no enough information was taken during the surveys, so this indicator and the previous one haven´t been evaluated.
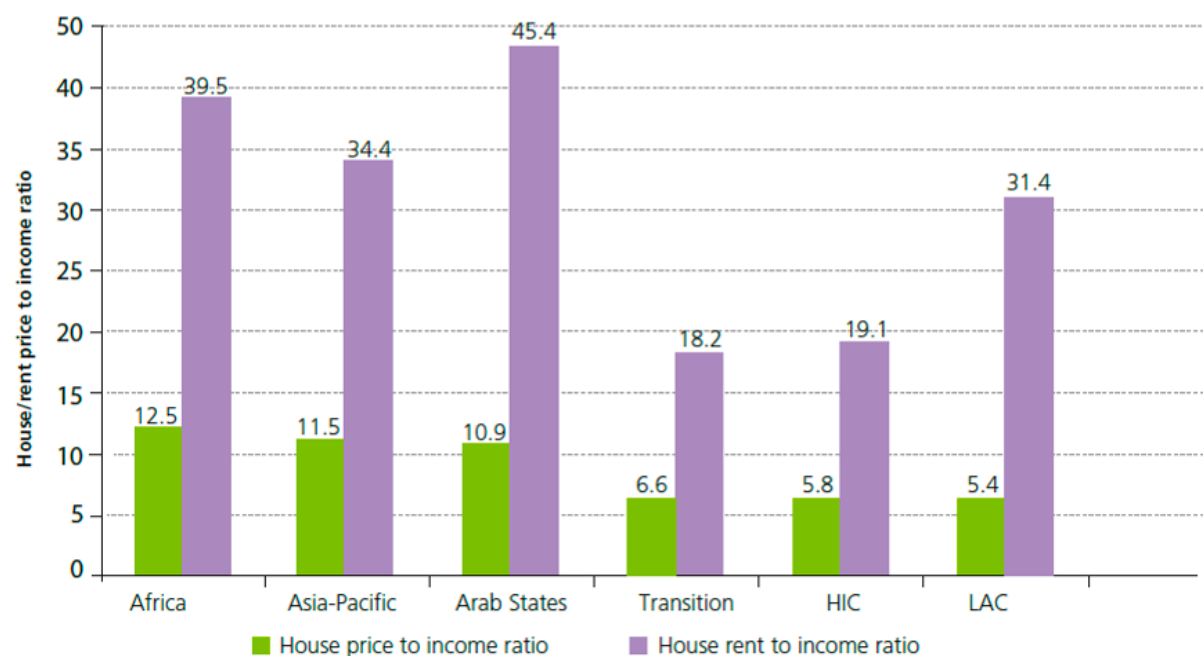
Image 60. House price to-income-ratio and rent to income ratio, in cities in various regions
Source: "Affordable land and Housing in África", UN-Habitat. 2012

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
Neighbourhood	Cartography, bibliography, censuses, surveys, professional analysis, fieldwork	High

	Indicators	Evalua-tion	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 associa-tionism, 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 Com-plementary Information
3	**Management (land, infrastruc-tures, legal framework,…)**	**Very Low**	The aim is to know the normative context linked to urban planning. Legis-lation 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 re-flection in plans and with criteria for building

Other considerations	A reform process 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 autho-nomy to City Councils is key
Recommendations	It would be important to organize a Workshop focused on urban planning in the Masuba area and 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 Masuba, 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 Masuba, 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 is 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 Masuba reveals that participation is very strong in the local community. It was also told during the surveys by the inhabitants.

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 Deputy Mayor, which is an unequivocal sign of a positive evolutionary process.

In Masuba, 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 Masuba, and people from different ages, giving the idea of a good gender inclusion. But considering the tasks observed and the traditional customs in Masuba 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 Masuba seems well organized with a local Chief who open consultation to the people.

Image 61. Participatory fieldwork survey. January 2018. The teams included people from both Universities (CEU and UNI-MAK), and inhabitants of different sex and ages
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

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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 61. Main actions of the Makeni Development Plan 2017-2019. Some key ssues as evaluation from Luis Perea
Source: HD_LAB
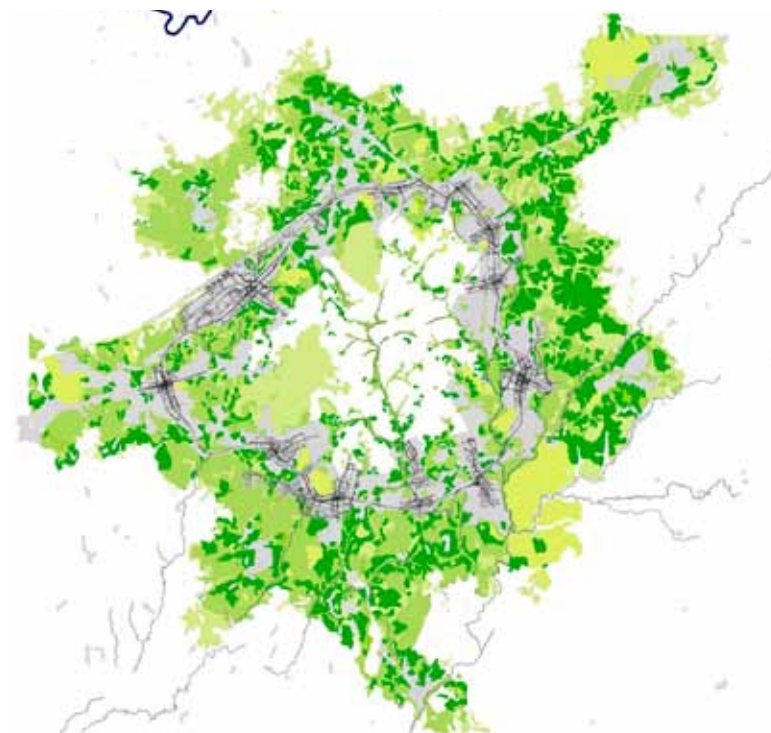
Image 62. Global framework for Makeni and surroundings. Strategic Spatial Plan for Makeni. HD_LAB
Source: HD_LAB

Makeni, July 2013

Makeni, January 2014

Makeni, January 2016

Madrid, June 2016

Makeni, January 2017

Image 63 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	The future expansion of Makeni will affect the situation of Masuba in the urban-territorial considerations, mostly considering the north-east direction It is key to consider the future expansion of the city in the Masuba expansion areas, reserving land for public equipments, markets, agriculture, new roads,... 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 improvement in buildings. Incremental housing solutions for the consolidated areas can be also considered
HaB 2. VULNERABLE AND HAZARD AREAS	MEDIUM	Construction close to swamps bust be avoided. The future growth around Masuba must consider the possible risks (climate change, waste management, floodings around, topography,...). 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, education,... This information can be integrated in a broader scale considering the whole Makeni area and environs. Two scales are recommended: Neighbourhood scale (Masuba and areas around) and Territorial scale.
HaB 3. ACCESS TO BASIC INFRASTRUCTURES	VERY LOW	The situation of Masuba is similar than in other Makeni neighbourhoods. Problems related to the short distances between water wells and latrines, are present in Masuba. To explore the water quality in boreholes and wells must be done by experts in WASH. Improving acces to infrastructures in Masuba is a priority. All considerations must take into account the future expansions of the area and the possible internal growth. The future paving of main roads 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 4. ACCESS TO BASIC FACILITIES	MEDIUM-LOW	It is really difficult to evaluate 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,...). A deeper analysis of the Masuba Health Unit must be develped, as well as the real access for the people to the Holy Spirit Hospital. In education, the school facilities should be improved, with better spaces for classes, sanitation, cooking, etc. A detailed study can provide better information about both fields (health and education) in Masuba and surroundings.
HaB 5. PUBLIC-PRIVATE LAND USE	MEDIUM	As the area analyzed is part of other biger neighbourhood, the boundaries have been limited including a part of the surrounding swamps in the total area. This issue can distort the rates, but it is also a relevant characteristic of the average Makeni neighbourhood. 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 area and surroundings. The information developed can be useful for the Makeni City Council as 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	LOW - VERY LOW	Paving the main roads was one of the priorities detected during the fieldwork. The improvement of the communication is very key in Masuba. Paving roads 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. 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. ACCESS TO EMPLOYMENT	MEDIUM	Subsistence agriculture is the main activity for over 70% of Masuba workers, with also importance in tayloring activities. Swamps surrounding the analyzed area are used for agriculture for the Masuba community. Urban Planning should consider seriously the integration of agriculture within the existing and new urban expansions in the Makeni surroundings as the Masuba area. 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 8. ENVIRONMENTAL IMPACT	HIGH	To analyze these issues a more detailed and technical study from a dynamic approach is needed. 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 Masuba area needs an urgent plan for the coming years in the context of a very rapid urban growth, considering strategies for the existing Masuba and for the new expansions. Reforestation strategies should be implemented. Relationship between deforestation and biomass for cooking must be analyzed in detail.
HaB 9. BUILDING AND		
9.1. BASIC FACILITIES	LOW - VERY LOW	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. Critical situation in providing sanitation in the School. 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.
9.2. HOUSING	LOW - VERY LOW	Together with the physical aspects, there are key elements that must be analyzed very carefully, as land tenure, with a high impact in the population living conditions. Promote upgrading programs with collective and row housing (increasing density), in coexistence with the traditional types. Evaluate the alternatives of programs of sites and services for new expansions. Involvement of people in exploring new typological alternatives. Promote the development of a cadastre with spatial information and review of the situation in relation to property. To ensure security of tenure for the most disadvantage groups. Follow the Land Policiy Reform process in Sierra Leone to understand impacts in land ownership
HaB 10. URBAN MANAGEMENT	LOW	Land tenure is a major challenge for urban management, but it is a national issue. Complete the decentralization process to give more authonomy to City Councils is key It would be important to organize a Workshop focused on urban planning in the Masuba area and 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 Masuba, 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 Masuba, 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	Questionnaire Nº:	The goal of the questionnaire is complementary information for improvements within the Upgrading Neighbourhood Programme coordinated
Makeni City Council – Unimak- CEU University		Unimak, CEU University and the Makeni Council

1- IDENTIFICATION

AGE:		GENDER:		Male		Female	OCCUPATION	
LEVEL OF EDUCATION:		Iliiterate			Primary School		Secondary School	Univ
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 **Makeni City Council – Unimak- CEU University**	**Questionaire Nº:**	The goal of the questionnaire is to obtain complementary information for possible improvements within the Upgrading Neighbourhood Programme coordinated by Unimak, CEU University and the Makeni Ciy Council

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. 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 CEU Group.

DATA

Range		0-19	20-64								
Gender		MEN	MEN			WOMEN					
Age		16	56	28	20	50	35	30	42	29	38
Question Number	**Question**										
	Level of education	Sec. sch	Illiterate	Sec. Sch	University	-	Sec. Sch	Illiterate	Primary School	Sec. Sch	Illiterate
	Occupation	Student	Farmer	Tailor	Student	-	¿/BILDER/?	Agriculture	-	Business	Agriculture
2. HOUSING											
2.1.		No light/no toilet. Cockroaches/rats /bedbugs	Toilet+sanitation, water well, kitchen	Rent	NP facility	Lack of market, no water/electricity, toilet (5 children), roof	Waste, no toilet, no kitchen	No toilet facility	Toilet	Land. Surounded by swamp	No land
2.2.		N.P. light, water well	Rats and bedbugs	Water, light, food, health	NP facility	farm	Toilet (not to share)	Education, financial support	Toilet	Mosquitoes	Lack of money to build her own business
2.3.	type	collective	single	Single	Collective	single	single	single	Single	Collective	Single
	reason	self ¿contain?	-	Wants to live with his family and not being bothered	self ¿compan?	-	-	To live by themselves	-	To live with her family.	Don't want neighbours
2.4.	can you live in collective	yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes
2.5.	things in collective house	financial problem	-	¿?	-	-	-	-	-	Freedom to move and build her own business	-
2.6.	rent house	No	No	No	No	No	No	No	No	No	No
2.7.	rent payment	Le 600,000/year	-	¿?	Le 600,000	-	-	-	-	-	-

						>65	unknown						
						MEN	MEN			WOMEN			
37	24	36	27	22	40	80	-	-	-	-	-	-	-
Illiterate	Sec. Sch	Illiterate	Illiterate	Illiterate	-	illiterate	-	-	-	-	-	-	-
Business	Student	None	-	Sales	Farmer	No occupation	-	-	-	-	-	-	-
Sponsor education	¿They don't pump water?	No toilet, no electricity	Rent	Doesn't have a house	NP facility	No money to afford rent	Security	-	-	Not her home. Too expensive (Le 800,000)	Ceiling	Ceiling and rats	Improve the ground, change the door, leaking roof
Money to build own business	Money to send	No toilet, no electricity	Money	¿?	Finishings in the house	They need money	Infrastructure + toilet	Education for children	-	Electricity	-	Electricity	-
Single	Collective	Collective	Collective	Collective	Collective	Collective	Single	Collective	Single	Single	Single	Single	Collective
Financial support. Wouldn't mind collective, though.	To communicate	-	Modern building and services	Looks nice, wants to bring family	-	¿?		Love, but no means	-	Many children	-	-	They already share the house with other families
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
Toilet, business place	Toilet, kitchen	-	Kitchen	Bathroom, kitchen	-	Wants to bring family to Makeni		-	-	-	-	-	-
No	No	No	Yes	No	No	No		No	-	Yes	No	-	-
Not enough money	No	-	No	No	Le 800,000	No		-	-	-	-	-	-

|											
3. NEIGHBOURHOOD											
3.1.	**Reason for staying**	School (family house)	Family house	Neighbours are peaceful	Family, born there	Born there	Born there	Husband	Health issues	Family issues	Husband
3.2.	**any change**	Water weels + hand pump well	Increase of population (conflicts)	Community center, tap water	Improve building materials	Palm as material for the houses	No changes	Well, electricity	-	Electricity	Well
3.3.	**deficit inf.**	Road	-	Toilet area and place where waste is deposited	NP	No market, nothing	Electricity	Sanitation systems	Water supply, lack of food	Water supply	Electricity+sanitation
3.4.	**priority**	Electricity	Electricity	Water supply	NP	Water supply	Electricity	Improved sanitation	Waste management	Improved sanitation	Electricity
3.5.	**shared inf.**										
	Safe water	x	x	???	x	x	x	x		x	
	Sanitation		x	???	x	x					
	Electricity	x	x	???	x	x	x				
	Waste mgmt	x	x	???	x	x					
	Bus stop	x	x	???	x	x	x				
	Bathroom			???	x	x					
	Laundry	x	x	???	x	x	x				
	Cooking	x	x	???	x	x			x		x
3.6.	**unpaid cum. Wk**	yes	yes	Yes	Yes	yes	yes	No	-	No	No
3.7.	**main deficit inf.**	Education	Hospital	Education	Hospital	Health	Market	Education	-	Transport	Education
3.8.	**basic service for inproved**	Health	Health	Education	Health	Health	Market	Education	-	Education	Education
4	**Ranking priorities**	Health center, education SSS, electricity, good road, water supply, good toilets, business center			Health, education, market, transport, social/cultural				-		

|															
Husband	School	She doesn't want to live in a neighbourhood?	Doesn't know	-	Family, family house		-		Bought a house here	Born there	They didnt decide	Ebola	Father bought good land	Born there	Born there, meeting place, lots of land
Community center, electricity	¿?	No improvement	None	Electricity, water mill	Improve building materials		¿?		Improve education, road and electricity	-	-	-	Now: a neighbour community	-	-
Water supply	Lack of electricity, sanitation and water	No water supply, sanitation	Electricity and water supply	Electricity, water supply, sanitation	NP		Electricity, sanitation, water supply		Sanitation systems	Electricity	Electricity	-	-	-	Electricity
Water supply	Lack of electricity, sanitation and water	All	Electricity, waste management and water supply	Electricity, water supply, sanitation	NP		Electricity, sanitation, water supply		Water supply	Waste management	Electricity, water supply	Improved sanitation	Electricity, waste management	Electricity, water supply	Waste Management
x	x	x	x	x	x		x								
	x	x		x	x		x		x						
	x	x	x	x	x		x								
	x	x		x	x		x		x						
	x	x	x	x	x		x		x						
	x	x		x	x		x		x						
	x	x		x	x		x								
	x	x		x	x		x								
No	Yes. Teaching	No	Yes	No	Yes		yes		No	-	Yes	Yes	Yes	Yes, but they need a guided process	Yes
Education	Education	Water supply, sanitation		Electricity, water supply, sanitation	Hospital		Electricity, sanitation, water supply		No mobility, no education, no market	-	-	-	-	-	-
Education	All	-	Health, transport, market	Health, education, social/cultural	Health		health, transport, market, education		Education	-	-	-	-	-	-
Health, improved education, transport	Health, education, transport, market, social/cultural				Health, education, market, transport, social/cultural					-	-	-	-	-	-

SOME KEY ASPECTS

Basic service as priority for improved com.	Male	Female
Education	2	4
Health	3	3
Transport	1	1
Market	0	1
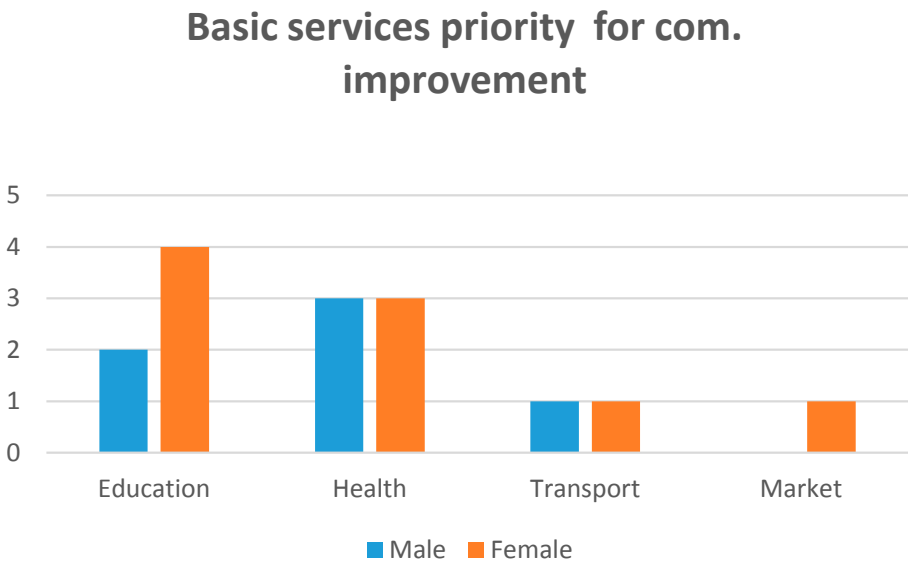
Migrants/ indigene	Male	Female
Home town	5	7
Marriage	0	3
Peaceful	1	0
Health	0	1
School	0	1

Basic services priority for com. improvement

Migrants/ indigene
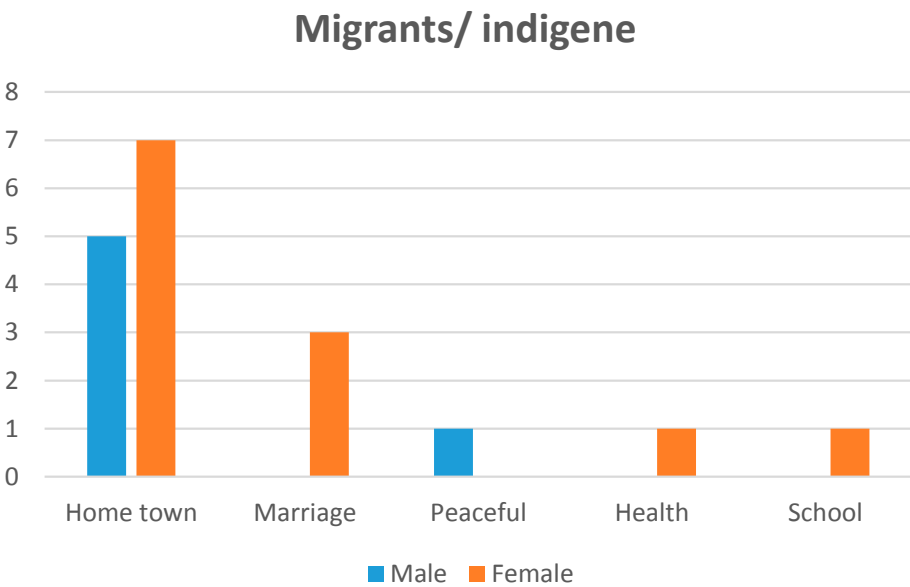
Willingness to live in collective house	Male	Female
Yes	5	12
No	3	4
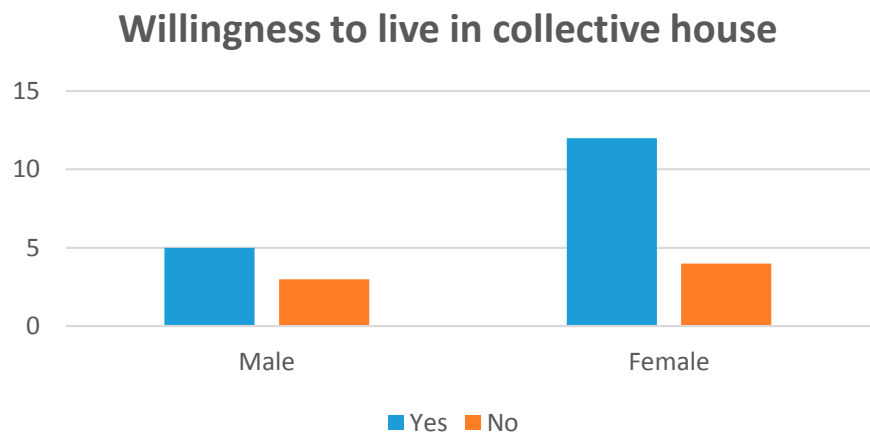
Occupation	Male	Female
Farmers	1	3
Tailor	1	0
Traders	0	1
Builder	0	1
Students	2	1
Business	0	2

Willingness to live in collective house

Occupation
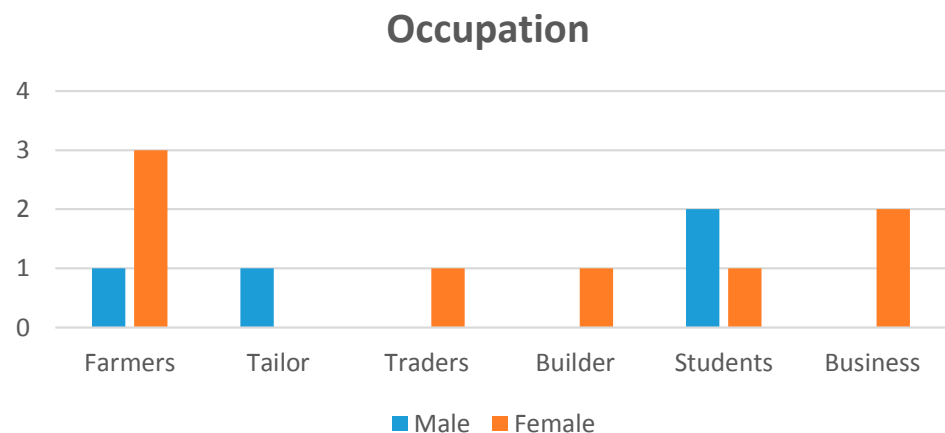
Willingness to share facilities	Male		Female		Total	
	Yes	No	Yes	No	**Yes**	**No**
Safe Water	4	1	10	2	14	3
Sanitation	4	1	5	7	9	8
Electricity	4	1	7	5	11	6
Water Management	5	0	5	7	10	7
Bus Stop	5	0	6	6	11	6
Bathroom	3	2	5	7	8	9
Laundry	4	1	6	6	10	7
Cooking	4	1	7	5	11	6
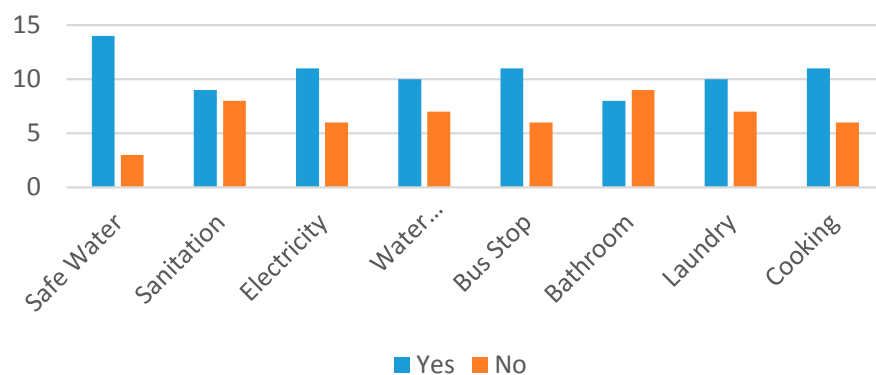
Infrastructure as priority for improved com.	Male	Female
Electricity	4	7
Water Supply	2	2
Improved Sanitation	0	3
Waste Management	1	2

Willingness to share facilities

Infrastructure priority for com. improvement
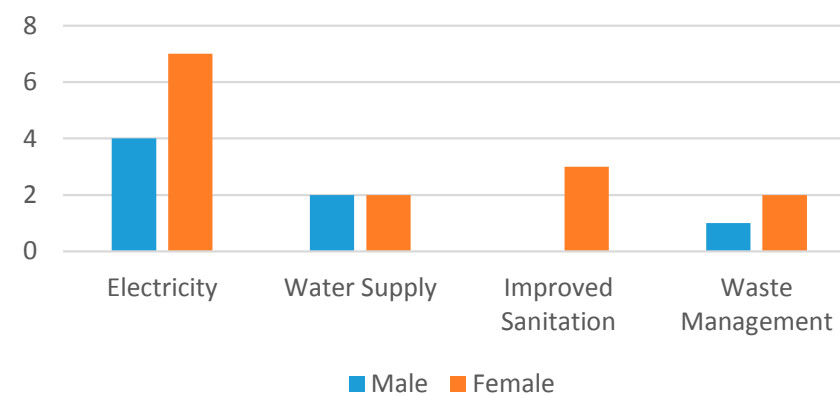
PRIORITY NEEDS-STRATEGIES

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	• Scout out the equipments • Ensure that medical personnel will be available • Improve access to the health centre • Provide Electricity • Deratization • Construction of a new water well for those who don't have access to water
EDUCATION	• Establish a senior secondary school • Transportation to carry students to Makeni • Building toilettes for the school • Isolation of classes so that it will be easy for the students to concentrate • Scholarships for children to ensure that they go to school
ROADS AND TRANSPORT	• Improve the road by paviment • Provision of public transport • Construction of a bus stop

PRIORITY NEEDS	STRATEGIES SUGGESTED
ELECTRICTY	• Solar energy for public use (street, water well, health buildings, etc.) • Ensure that the electrical materials are in place (poles, cables, etc.)
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 wells and kitchens • Maintenance 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 inhabitants 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 Masuba 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 Masuba has followed the previous one in Robuya village, demonstrating 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 to keep replicating it 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 Masuba it was possible to fund with 800 euros, the extension of elecricity in Masuba This action was agreed with the local community in the last meeting held after the fieldwork. It was also decided that UNIMAK would manage the work, contributing the amounts according to the progress of the material items.

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 990 inhabitants and 78.200 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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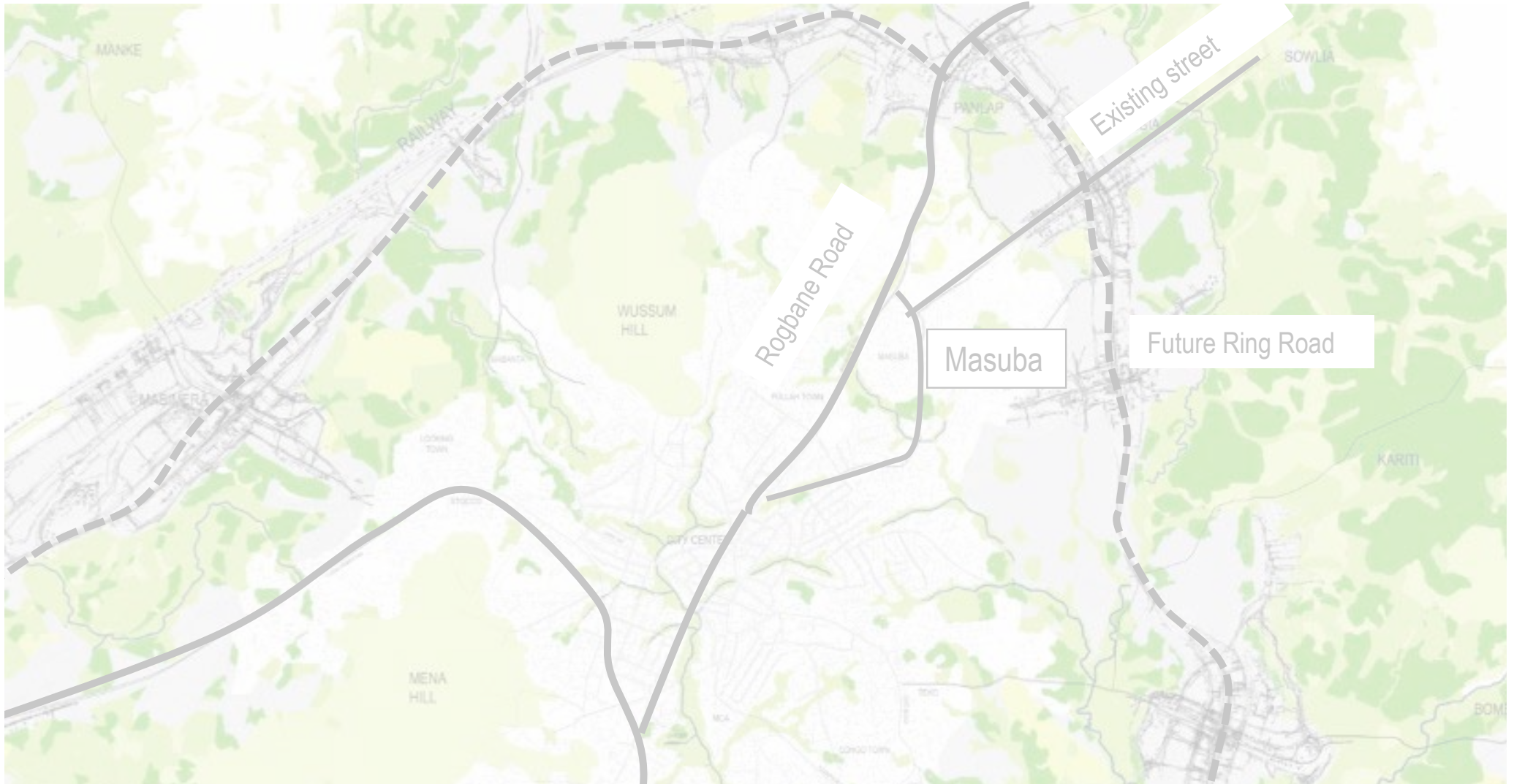
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