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**Appendices for D4.2 and D4.3:**

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<b>Authors Site reports Cameroon:</b>	Chrétien Ngouanet and Aristide Yemmafouo
<b>Authors Site reports Ghana:</b>	Martin Oteng-Ababio
<b>Authors Site reports Tanzania:</b>	Robert Kiunsi and Daniel Hekel
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**Cameroon: Douala and Bafoussam settlement data on urban residents' access to water, sanitation, electricity & transport and the acceptability of services**

Author: Chrétien Ngouanet and Aristide Yemmafouo

Settlement	<b>Deido</b>
City	<b>Douala</b>
unplanned v. semi-planned/planned	planned
low-income v. middle/high income	Middle income
History	Old Native
Rate of population growth	Stable overall
central / periphery location	City centre, Central part of the town
settlement with recent arrivals/established inhabitants	Old natives
Any other key characteristic of settlement or Remarks	moving from residential to commercial settlement, need of renovation/restructuring
<b>Access to Services</b>	
water supply	In general, CDE supply system for households, whoever, low income has a well for either relay or complement with the CDE water supply, For high income, private boreholes and bottled drinking water to alleviate the deficit in the availability and quality of CDE water supply, Tenants establish sub-contract, cost can be fixed or share
sanitation	People used improved toilets and toilets with flush, Hysacam collect garbage even in isolated areas out of the principal streets, it's more household behavior that is the problem in the management of domestic waste in Deido: instead of waiting for the passage of Hysacam trucks to dump household garbage, some inhabitants prefer to pour it at the roadside or in the drains of drainage. unimproved toilets are mentioned in low income areas, No difference when renting or tenants
electricity	Dominated by formal connection to electricity network (ENEO <sup>o</sup> , but also a large numbers of sub-contract by tenants, cost can double
urban transport	Dominated by taxi (formal public transport), Motorbike taxi are strictly forbidden in Deido,
<b>Quality of Services</b>	
water supply	Good quality in general looking for the situation in others settlements
sanitation	Good quality in general looking for the situation in others settlements
electricity	Good quality in general looking for the situation in others settlements
urban transport	Good quality, road mostly tarred
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	1th (need of renovation/restructuring)
sanitation	2th (need of renovation/restructuring)
electricity	3th (need of renovation/restructuring)
urban transport	4th (need of renovation/restructuring)
other	Under land pressure coming from the city and under the obligation to protect minorities, Deido plots have become some homesteads

	prohibited for sell. At least, the renting is admitted
other	
Key findings	disconnect between availability and accessibility - restricted access, payment required, intermittent supply

Settlement	<b>New Bell</b>
City	<b>Douala</b>
unplanned v. semi-planned/planned	unplanned
low-income v. middle/high income	Low income/middle
History	Old spontaneous settlement put in place during colonial period
Rate of population growth	Stable overall
central / periphery location	City centre, Southern part of the Centre
settlement with recent arrivals/established inhabitants	Old migrants
Any other key characteristic of settlement or Remarks	the first spontaneous neighborhood of Douala, establish during german colonial (1913), It's ressetle area, highest density in the city, moving from residential to commercial settlement, New Bell neighborhood has a reputation for all the ills of Douala, need of renovation/restructuration
<b>Access to Services</b>	
water supply	The majority of people are not connected to the CDE water supply and uses well water, Tenants establish sub-contract, cost can be fixed or share
sanitation	Unimproved, improved toilets, and toilets with flush, No difference when renting or tenants
electricity	Majority are connected to ENEO (national electricity compagny), but use alot of fradulent connection to reduce their monthly bill
urban transport	The mobility in New-Bell is mainly provided by the motorcycle taxis although taxis and public bus can move in the secondary streets. Inhabitants, men and women, children and old, prefer motorcycles taxi for it efficiency despite the accidents and daily attacks.
<b>Quality of Services</b>	
water supply	It claims that they treat well water before use, but this does not happen continuously
sanitation	Sanitation is the biggest problem in New-Bell because of he flat site, some households do not have toilets. The excreta are collected in pots and dumped in the gutter in the early morning, some rent toilets, New-Bell is a center of water-borne diseases and the permanent risk of cholera in Douala
electricity	The illegal and fraudulent connections to the electricity network often cause transformer failures
urban transport	Poor, Motorbike taxi is commonly use despite accidents and theft attacks,
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	3th (to reduce water borne deseases)
sanitation	1th (For young and old men: sanitation)
electricity	4th
urban transport	2th (For young, roads maintenance)
other	Young also want a game center, old men want more security
other	
Key findings	there has been observed a recent emergence of a small middle class, which is the result of process of a slow movement of social renewal of population. Indeed, young inhabitants who has economically successful come back to retrofit their homesteads by building modern and height. It also identifies a significant proportion of Nigerian and Malian emigrant traders since the Biafran war (1967-1970). Some have become owners.

	New-Bell is also infamous for the fact that hosting the largest prison in Cameroonian cities.
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Settlement	<b>Cité Beige (Village Bloc 11)</b>
City	<b>Douala</b>
unplanned v. semi-planned/planned	unplanned
low-income v. middle/high income	Low income
History	New spontaneous settlements built in mangrove ecosystem
Rate of population growth	Growing rapidly
central / periphery location	Peri-urban, Southern part of the town
settlement with recent arrivals/established inhabitants	newly established residents, migrants
Any other key characteristic of settlement or Remarks	Around the airport, mangrove ecosystem
<b>Access to Services</b>	
water supply	Private: well water, for all (tenants or owners)
sanitation	individual: unimproved latrines, lack of latrine, no difference according to land tenure
electricity	illegal/individual/subcontract, mostly sub-contact for tenants, the bill is share or a fixed amount, depending on the relationship or level of electricity fraud
urban transport	motorbike and special 4*4 vehicle
<b>Quality of Services</b>	
water supply	very poor - sporadic treatment
sanitation	very poor - excreta discharged into water and coming into contact with inhabitants
electricity	fair - frequent low voltage due to illegal connections and materials
urban transport	poor - single entry to neighbourhood and route in poor condition all seasons
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	4 (men, women and youth )
sanitation	3 (men, women and youth )
electricity	2 (men, women and youth )
urban transport	1 (men, women and youth )
other	health center, game center
other	
Key findings	

Settlement	<b>Bonendale</b>
City	<b>Douala</b>
unplanned v. semi-planned/planned	unplanned
low-income v. middle/high income	Low income/middle
History	New spontaneous settlements area
Rate of population growth	Growing rapidly
central / periphery location	Peri-urban, Northern part of Bonaberi
settlement with recent arrivals/established inhabitants	settlement with recent arrivals/established inhabitants, migrants more numeros
Any other key characteristic of settlement or Remarks	Land disputes among chief soon's' (sub-chiefdoms land disputes) solidarity among households
<b>Access to Services</b>	
water supply	up to 3km to get drinking water near the main road tarred of Bonaberi. Water for other household tasks came from wells. Governments have at certain moments offered furnished well, Some Middle/high income households with drilling water offered free or against payment. Since 2013, the extension of the CDE water supply network reaches the secondary road and allows households subscribed to use and sell water to others despite frequent interruptions. No difference when tenants,
sanitation	Households in Bonendale have mostly semi-modern individual toilets. Some modern toilets were planned long before the connection to the CDE water supply network, but have been not functional. The toilets on stilts are only in mangrove urbanization fronts. No difference with land status, when tenants, the contrat take in consideration the state of toilet, water supply type, electricity, etc, depending on the living standard of the tenant,
electricity	The first inhabitants of the secondary roads has used storm lamps at the beginning. Then they took the electricity informally from the main road (spider web). Since the mid-2000s, residents are organizing themselves to install the formal network in their neighborhoods. sub-contract with tenants, cost can double
urban transport	No public transport service, only motorbike taxi, Secondary roads are usually built from money raised in the development committees. Recent arrivals are invited to pay their contribution to the maintenance of these roads. For example FCFA 25,000 per house built, which equal to the cost of a truck of mud needed for the maintenance of the road.
<b>Quality of Services</b>	
water supply	Poor quality (dominated by well water), frequent interruptions, high cost for low income
sanitation	The formal waste collection (HYSACAM) to Bonendale is limited to the main road. On secondary roads, households dump their waste mostly on the roadside and in the farms. Households in flood zones flow directly into the water.
electricity	Regarding the quality of the offer, residents deplore electricity shortage in the evening. However, the majority of households are still connected informally and usually with very low quality of materials.
urban transport	Only one main entrance, Lack of the maintenance of roads that become impassable in some places, and thus isolates the inhabitants of this part of the neighborhood of others. Occasionally, sporadic human investments are held to unlock parts of road that became completely impassable to all

	users.
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Curiously water supply is not a priority
sanitation	3th (women)
electricity	2th (women)
urban transport	1th (According to men an women Bonendale is need most road improvements)
other	the creation of health centers and schools.
other	
Key findings	The difficulties of mobility require households to restrict their movement by doing weekly shopping or by commissioning their neighbor for their purchases once a week for each. The people living in those areas are almost socially connected and united among themselves. Phone numbers are exchanged to serve in case of possible emergencies especially at night. Those who have a motorcycle or a car can be called at any time to bring a sick or pregnant woman in a health center or to welcome a friend coming back from a trip out of city at late night.

Settlement	<b>Nkolbong</b>
City	<b>Douala</b>
unplanned v. semi-planned/planned	planned
low-income v. middle/high income	Middle/high
History	New planned area
Rate of population growth	Growing slowly
central / periphery location	Peri-urban, Eastern part of the town
settlement with recent arrivals/established inhabitants	Households are land owners, very few tenants, migrants more numeros
Any other key characteristic of settlement or Remarks	Settlement with owners, occupied after the year 2000
<b>Access to Services</b>	
water supply	drilling with free or paid access since 2002, connexion to public water supply (CDE) since 2012
sanitation	individual toilets, semi-modern (improved latrine) and modern (with flush)
electricity	before 2009, only few had electricity from nearly 4 km from their home. Hence brownouts so disparaged.
urban transport	Public transport did'nt served the settlement because roads are untarred, thus it's motorbike taxi opportunity to serve the settelement
<b>Quality of Services</b>	
water supply	Poor quality and frequent shortage for CDE water network and good quality of drilling water
sanitation	Smoot hilly topography facilitated water circulation despite the lack of gutters on some roads
electricity	Today, there is a serious risk of overload the transformer feeding the neighborhood. Since 2009 most households are connected to ENEO electricity network.
urban transport	road size regular (planned roads) but lack of maintenance
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	1st (quality to be improve and frequent shortage to be solve)
sanitation	3th (the materialization of gutters and densification of trash bins)
electricity	2nd (shortage and low voltage)
urban transport	4th (the tarring of secondary roads to facilitate internal mobility)
other	growing insecurity, Inhabitants insist on a security post or self-defense organization
other	
Key findings	

Settlement	<b>Tougang ville</b>
City	<b>Bafoussam</b>
unplanned v. semi-planned/planned	unplanned
low-income v. middle/high income	Low
History	Old spontaneous settlements
Rate of population growth	Stable overall
central / periphery location	Central part of the town
settlement with recent arrivals/established inhabitants	Today, there are no more native inhabitants. The principle is the same as Kouougou'o: displaced invade a neighboring sparsely populated area near the city.
Any other key characteristic of settlement or Remarks	Obsolescence rather than absense of services
<b>Access to Services</b>	
water supply	The water network CDE is present in the area, but only a few privileged people are connected. Households prefer to dig wells (for free water) that they combine with the purchase of water to drink from the CDE
sanitation	The majority of toilets are semi-modern improved pit latrine, that is to say set on a slab hole.
electricity	The majority of households have formal electricity connections.
urban transport	People organize themselves to maintain their roads. Motor bike
<b>Quality of Services</b>	
water supply	The wells are not adequate because they are found close to septic tanks. Only children are fetching drinking water that is why it is not always sure of the quality of the water they bring home.
sanitation	Behavior of the inhabitants exacerbates sanitation problems; Wastewater is discharged into the drains. Waste following three directions as determined by the household: in the gutters mid slope, below the bridge near the valley or in the landfill of Hysacam on the main axis.
electricity	However, fraudulent connections and sublets, explain the level of brownouts related to transformer overload in the neighborhood. Street lighting is defective, however, residents are free to replace the bulbs or install where they need it.
urban transport	Only the main roads are accessible by car; winding tracks that barely bike. Since it's motorbike-taxis that easily serving the neighborhood, when it rains heavily, the slope becomes unstable and requires walking.
	SWM- ditches are often clogged with garbage and it creates ponds that produce mosquitoes.
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	2nd
sanitation	4th
electricity	5th
urban transport	1st roads
other	education & security ranked 3rd;
other	health 6th
Key findings	

Settlement	<b>Kamkop</b>
City	<b>Bafoussam</b>
unplanned v. semi-planned/planned	Semi-planned
low-income v. middle/high income	Middle/High income
History	Developped bewteen 1980 and 1990
Rate of population growth	Stable overall
central / periphery location	central / periphery location
settlement with recent arrivals/established inhabitants	Established residents mixed with tenants.
Any other key characteristic of settlement or Remarks	The syte of Kamkop was originally planned for Bafoussam airport, but it was too close to town. Once a replacing site was found in Bamougoum, it was decided to parcel the Kamkop site for the urban need.
<b>Access to Services</b>	
water supply	Most of households are connected to CDE water network, but wells are always to face shortage. Generators are prent in many household to face shortage.
sanitation	Presence of modern latrines with flush in most of households. HYSACAM is presen and collect solid waste evenryday.
electricity	All the households are connected to electricity, even renters have their own ENEO counter
urban transport	Taxis to the main road, motorbikes, private crars ad rent taxis
<b>Quality of Services</b>	
water supply	poor water water quality and shortage
sanitation	Sanitation is a problem due tthe prensce og two soap companies with noises,
electricity	Frequent energy shortage as in other towns and quater
urban transport	No road maintenance
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	2) Reduce water shortage
sanitation	1) Elimination of pollution from soap companies
electricity	
urban transport	Ensure road maintenance
other	Health center to reduce distance to main hospital,
other	Public lighting to reduce insecurity
Key findings	

Settlement	<b>Kouogouo-village</b>
City	<b>Bafoussam</b>
unplanned v. semi-planned/planned	Unplanned
low-income v. middle/high income	Lowincome
History	Developped bewteen 1970 and 1990
Rate of population growth	Growing rapidly
central / periphery location	central / periphery location
settlement with recent arrivals/established inhabitants	Native mixeded with migrants
Any other key characteristic of settlement or Remarks	Kouogouo'o is originally a field dotted with termite mounds that were exploited by the Bamougoum native. First settlers were granted plots as gift. The spontaneity of "Kouogouo'o ville" was simply transposed to "Kouogouo'o village".
<b>Access to Services</b>	
water supply	Mostly wells, only few people have access to CDE water network. Most people have to pay per bucket to have drinking water from drills.
sanitation	Toilets are usually semi-modern and modern. proximity of toilets, pigsties and well. Sanitation is deeply flawed despite the slope that facilitates runoff. HYSACAM collects garbage only in accessible areas
electricity	All the households are connected directly or indirectly.
urban transport	Only bykes and 4 weel drive after rain. Inaccessible for public transport
<b>Quality of Services</b>	
water supply	Poor and expensive
sanitation	Poor hygienic conditions because of absence of sanitation system
electricity	<load voltage due to overload of transformers and shortage
urban transport	insufficiency of road and lake of maintenance of exinsting ones and frequent shortage
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	2) CDE water extension
sanitation	4) construction of gutters and extension of Hysacam connecting network
electricity	3) Installation of new transformers
urban transport	1) Road creation and road maintenance
other	
other	
Key findings	

Settlement	<b>Banengo</b>
City	<b>Bafoussam</b>
unplanned v. semi-planned/planned	Old planned
low-income v. middle/high income	Middle/high income
History	Developped since 1980
Rate of population growth	Stable overall
central / periphery location	central location
settlement with recent arrivals/established inhabitants	Mostly migrants
Any other key characteristic of settlement or Remarks	Settlement developed to decongest the administrative center , mostly Tamdja.
<b>Access to Services</b>	
water supply	Satisfactory, most of households are connected
sanitation	HSACAM collects three times par week
electricity	Effective
urban transport	Secondary roads not accessible for taxis
<b>Quality of Services</b>	
water supply	Frequent shortage
sanitation	Insufficient number of collecting passage per week
electricity	Energy shortage as in general
urban transport	Road maintenance, road condition is aggravated by the fact that the garbage clogging the gutters
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	
sanitation	
electricity	3) Public lighting
urban transport	1) Road maintenance
other	2) Insecurity
other	
Key findings	

Settlement	<b>Ngouache (Kamkop spontaneous)</b>
City	<b>Bafoussam</b>
unplanned v. semi-planned/planned	New spontaneous
low-income v. middle/high income	low/middle income
History	Developped since 1990
Rate of population growth	Growing rapidly
central / periphery location	Periphery
settlement with recent arrivals/established inhabitants	Mostly migrants
Any other key characteristic of settlement or Remarks	Ngouache is a spontaneous neighborhood sprawling towards West of Bafoussam. It is the spontaneous extension of Kamkop on the slopes bowls more or less steep. This area had no economic interest until the early 1990s. Urbanisation intensified from the 2000s when water and electricity were installed.
<b>Access to Services</b>	
water supply	Access to water is a catastrophe to Ngouache. The geomorphology of the site does not permit to dig wells at all levels. Only sources are used
sanitation	Difficult to have deep toilets due to rocks
electricity	Electricity is largely failed. The transmitted power is far below the demand in this neighborhood.
urban transport	Serious problems of accessibility
<b>Quality of Services</b>	
water supply	No drinkable water for most households
sanitation	No good toilets system.Hysacam collecting garbage from 2 to 3 times a week, but but due to distance between house and gabage bins, the trend is for the conservation of waste for agriculture or discharge into ditches and steep slopes.
electricity	Permanent low voltage
urban transport	Lack of good roads, access is possible only by motorbikes most of the time
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	1) access to water
sanitation	
electricity	2) More energy transformers
urban transport	3) Road creation and maintenance
other	Insecurity
other	
Key findings	

## Cameroon: Douala and Bafoussam settlement data on urban residents' access to mobile phones and phone networks

	Settlement/city (Douala)	Settlement specific stories	Settlement/city (Bafoussam)	Settlement specific stories
<b>Coverage</b>				
Access to network	Generally good access to network, but trouble due to saturation and absence/insufficient coverage in enclave areas like mangrove settlement	Example of Cite Beige which is near the airport	Orange, MTN, Camtel and Nexxtel have good access to network for inner city, but at the periphery there is difference according to the location of the wireless station; in Bafoussam with hilly topography, confined valleys are disadvantaged.	Tougang and Kouogouo face network failure in low area and valley
Electricity supply for charging	Good in general, but frequent shortage, oblige to take precaution by having two battery, constantly charging when electricity available	Recent low income settlement has special charging point, example, shops with generator, paying charging point (100 CFA/charge)	Good in general, but frequent shortage, oblige to take precaution by having two battery, constantly charging when electricity available	
<b>Access to MPs</b>				
Ownership	each city dwellers have a phone, even teenagers, the only difference is on the quality of the phone, the number of function that has the phone: multimedia, digital camera resolution, internet service, social network, etc, adolescent and women usually have phone as gift		each city dwellers have a phone, even teenagers, the only difference is on the quality of the phone, the number of function that has the phone: multimedia, digital camera resolution, internet service, social network, etc, adolescent and women usually have phone as gift	For much women, children and elders, phone is usually a gift
Multiple phones/ SIMs	Actual tendency is to use multiples SIMs (2 or 3 SIMs). Around 2000, it was multiple phones, particularly high income have 02 phones with only 01		Actual tendency is to use multiples SIMs (2 or 3 SIMs). Around 2000, it was multiple phones, particularly high income have 02 phones with only 01	

	SIM each, it's commonly known that phone with one SIM is best quality in terms of network coverage		SIM each, it's commonly known that phone with one SIM is best quality in terms of network coverage	
Other means of access	call boxes are commonly used by low income because of low cost		call box are commonly use by low income because it's cheaper to call	More use of call box in low income areas
<b>Uses of MP facilities</b>				
Calls, text, data	permanent promotion campaigns facilitate call, particularly during week-ends and public holidays. Young people (student) prefer SMS service and free calls	Douala customers call more	permanent promotion campaigns facilitate call, particularly during week-ends and public holidays. Young people (student) prefer SMS service and free calls	Bafoussam customers receive call more
<b>Affordability</b>				
Hand sets	only young people are fond of hand sets		only young people are fond of hand sets	
Network connections	saturation (MTN, Orange Camtel operators)		saturation (MTN, Orange Camtel operators)	
Other costs	Maintenance, accessories, devices and charger renewal		Maintenance, accessories and charger renewal	
<b>Payment methods for MPs</b>				
	prepaid airtime card is now less used, airtime is recharged directly from call box, post-paid airtime is used by enterprises and high income		prepaid airtime card is now less used, airtime is recharged directly from call box, post-paid airtime is used by enterprises and high income	
<b>Opportunities &amp; benefits for livelihoods offered</b>				
Social/family connections	permanent contact with family: parental control, husband and wife control	but it also creates some social problems	permanent contact with family: parental control, husband and wife control	but it also creates some social problems

Business connections	circulate information, price negotiation, meeting planification, movement of employees and goods control		Price negotiation, food crops price negotiation, meeting arrangement, movement of employees and goods control	
Income generation	Proliferation of call boxes, accessories/devices shops, repair shops, Airtime wholesalers, etc.		call box, accessories shops, repair shops, Airtime wholesalers, etc.	
Time/travel savings	for family or business use		family meeting, business meeting	
Mobile banking including SMS on transactions and account status	Only for middle and high income (civils servants and businessmen to control and confirm financial transaction		Only for middle and high income (civils servants and businessmen to control and confirm financial transaction	difference between Douala and Bafoussam is only at the level of the number of customers involve in the services
Mobile payments of bills through phone operators	Since 2014, MTN and Orange operators offer opportunity to pay electricity bill, taxes, school fees for students, post-paid airtime		Since 2014, MTN and Orange operators offer opportunity to pay electricity bill, taxes, school fees for students, post-paid airtime	
Money transfer to others through phone operators	since 2014 MTN and Orange operators offers possibility to transfer money from a prepaid account,		since 2014 MTN and Orange operators offers possibility to transfer money from a prepaid account,	
Other	mobile phone usually replaces watch, alarm-clock, calendar, office service, GPS, etc,			

**Ghana: Accra and Sokondi-Takoradi settlement data on urban residents' access to water, sanitation, electricity & transport and the acceptability of services**

Author: Martin Oteng-Ababio

Settlement	<b>Korle-Gonno</b>
City	<b>Accra</b>
Size of city (2010)	<b>4,010,054</b>
Size of settlement (2010)	<b>30,555</b>
unplanned v. semi-planned/planned	Well planned area
low-income v. middle/high income	Low-income
History	Indigenous/traditional settlement
Rate of population growth	Stable
central / periphery location	Western edge of centre, along Accra's coastline and next to the Korle Lagoon
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers, new immigrants more as tenants.
Any other key characteristic of settlement or Remarks	Stable population size but movement in and out. Poor access to services.
<b>Access to Services</b>	
water supply	In-house pipe water but with erratic supply. Mostly rely on private vendors, sachet water, and rainwater. Landlords lock taps and tenants pay before access
sanitation	Public toilets (KVIP, WC) and open defecation in polythene bags and along the beach.
electricity	Houses are connected albeit some illegal. Pre-paid meters are expensive and less user-friendly
urban transport	Public transport; trotros, taxis, and motorbikes (okada)
<b>Quality of Services</b>	
water supply	Piped water is foamy in nature and emits unpleasant odour. Treated before usage
sanitation	Emptying and leachate problems. Beach has become an outlet for the city's liquid waste sludge
electricity	Power supply is unreliable (without warning) with frequent light off (though a countrywide problem).
urban transport	Congestion slows down travel. Okada is expensive and cannot carry huge load
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Toilet/Sanitation
	2. Water
	3. Electricity
	4. Local transport
	5. Mobile phone signal
Key findings	Availability does not mean accessibility or affordability. Yet, access to services are not causing people to move out of Korle Gonno

Settlement	<b>North Labone</b>
City	<b>Accra</b>
Size of city (2010)	<b>4,010,054</b>
Size of settlement (2010)	<b>17,675</b>
unplanned v. semi-planned/planned	Planned area built by colonial administration in the 1950s.
low-income v. middle/high income	Middle/High income
History	Traditionally a middle income residential area
Rate of population growth	Stable
central / periphery location	North western edge of central Accra
settlement with recent arrivals/established inhabitants	Growing in size with considerable infilling taking place by the newcomers.
Any other key characteristic of settlement or Remarks	Mixed use with residential being converted to commercial
<b>Access to Services</b>	
water supply	In-house pipe water with private storage in polytanks.
sanitation	In-house private toilet facilities. Door to door garbage collection
electricity	Houses are connected to power. Prepaid is expensive but its not an issue of concern
urban transport	Private car ownership
<b>Quality of Services</b>	
water supply	Water is of good quality and supply is reliable.
sanitation	Water closets with well connected sewer systems
electricity	Power supply is erratic (similar to national level energy supply) though with a followed load-shedding schedule
urban transport	Good roads with easy accessible routes to the city
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Electricity
	2. Toilet/Sanitation
	3. Water
	4. Mobile phone signal
	5. Local transport
Key findings	Residents are able to afford services and as a result they enjoy better and improved services.

Settlement	<b>Accra New Town</b>
City	<b>Accra</b>
Size of city (2010)	<b>4,010,054</b>
Size of settlement (2010)	<b>31,363</b>
unplanned v. semi-planned/planned	Formerly planned but now spatially disorganised
low-income v. middle/high income	Low/ Middle income
History	Migrant settlement established in the 1940s, mainly Muslim
Rate of population growth	High population density though population is declining.
central / periphery location	Northern edge of centre
settlement with recent arrivals/established inhabitants	Newly established residents, intense infilling with movement in and out
Any other key characteristic of settlement or Remarks	Mixed use with residential being converted to commercial.
<b>Access to Services</b>	
water supply	In-house pipe water but with intermittent supply. Landlords lock taps and tenants pay before access. Mostly rely on private vendors, sachet water, and rainwater.
sanitation	Public toilets (KVIP, WC) and open defecation in buckets and polythene bags.
electricity	Houses are connected albeit some illegal. Pre-paid meters are expensive though supply is relatively good (as likened to other parts of Accra).
urban transport	Public transport; trotros, taxis, and motorbikes (okada)
<b>Quality of Services</b>	
water supply	Pipe water is foamy in nature and emits unpleasant odour. Other sources are costly with quality concerns
sanitation	Public toilets are unkempt and smelly. Long waiting queues and night closure, with leachate problems.
electricity	Power supply is intermittent though a countrywide problem, and this affects income generating activities.
urban transport	Good transport links to the city. Congestion and long waiting times
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Water
	2. Toilet/Sanitation
	3. Electricity
	4. Mobile phone signal
	5. Local transport
Key findings	Availability does not equate to ability to access or afford as landlords lock facilities and tenants access them at a cost.

Settlement	<b>Gbawe</b>
City	<b>Accra</b>
Size of city (2010)	<b>4,010,054</b>
Size of settlement (2010)	<b>67,998</b>
unplanned v. semi-planned/planned	Planned area developed by the middle class
low-income v. middle/high income	Low/Middle/High income
History	Indigenous and newcomers, growing rapidly since 1990s
Rate of population growth	Growing very rapidly
central / periphery location	Peri-urban, located on the Western periphery
settlement with recent arrivals/established inhabitants	Indigenes are predominant at the old core with recent arrivals at the new site
Any other key characteristic of settlement or Remarks	Well-functioning land market with astute chief.
<b>Access to Services</b>	
water supply	In-house pipe water, rarely unavailable (Gbawe is located near the Weija dam). Communal water sources. Mechanised boreholes in recently built properties.
sanitation	Private-public toilets (KVIP, WC). Private in-house toilets in newly built properties
electricity	Houses are connected albeit some illegal. Pre-paid meters are expensive and less user friendly
urban transport	Private car ownership. Public transport; trotros, taxis, and motorbikes (okada).
<b>Quality of Services</b>	
water supply	Announced disruption by water provider. Pipe water stored for longer periods develop 'oily' impurities.
sanitation	Toilet facilities are clean with fans, and soap and water. Long queues and night closure lead to open defecation
electricity	Acceptable current quality. Intermittent power outages as part of the national level energy supply.
urban transport	Good transport links to the city. Poor roads and worn-out vehicles. Short interchanges double travel cost
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Local transport
	2. Toilet/Sanitation
	3. Electricity
	4. Water
	5. Mobile phone signal
Key findings	Availability of services does not equate to ability to access as underprivileged majority pay more to access services

Settlement	<b>Ashale Botwe</b>
City	<b>Accra</b>
Size of city (2010)	<b>4,010,054</b>
Size of settlement (2010)	<b>17,107</b>
unplanned v. semi-planned/planned	Semi-planned
low-income v. middle/high income	Low/Middle/High income
History	Indigenous and newcomers, growing rapidly since 1990s
Rate of population growth	Growing rapidly
central / periphery location	Peri-urban, located on the North Eastern periphery
settlement with recent arrivals/established inhabitants	With recent arrivals, arable lands are converted to residential properties
Any other key characteristic of settlement or Remarks	Caretaker chief, some land disputes. Poor access to services
<b>Access to Services</b>	
water supply	Water stresss, residents rely on privately owned, large storage containers filled by commercial tankers, sachet water and rainwater.
sanitation	Private-public toilets (KVIP, WC). Private in-house toilets outside the indigenous core
electricity	Houses are connected albeit some illegal. Pre-paid meters are expensive and less user friendly
urban transport	Private car ownership. Public transport; trotros, and taxis.
<b>Quality of Services</b>	
water supply	Water from private vendors is drinkable but impurities become visible after 3 days
sanitation	Facilities are poorly ventilated with unpleasant odours. Long queues lead to open defecation
electricity	Current is unstable, power supply is intermittent though a countrywide problem.
urban transport	Good transport links to the city. Poor roads and long waiting times with unpredictable journey times
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Water
	2. Toilet/Sanitation
	3. Local transport
	4. Electricity
	5. Mobile phone signal
Key findings	Improvements to the availability and access to services has been a gradual process. Underprivileged majority spend more to access services

Settlement	<b>New Takoradi</b>
City	<b>Sekondi-Takoradi</b>
Size of city (2010)	<b>2,376,021</b>
Size of settlement (2010)	<b>20,204</b>
unplanned v. semi-planned/planned	Well planned area
low-income v. middle/high income	Low-income
History	Indigenous/traditional settlement
Rate of population growth	Growing rapidly
central / periphery location	Central, east of the Takoradi Harbour
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers, new immigrants more as tenants.
Any other key characteristic of settlement or Remarks	Coastal erosion and oil find is affecting fishing activities. Poor access to services.
<b>Access to Services</b>	
water supply	In-house pipe water but with erratic supply (better in Lower town than Upper town). Residents rely on private vendors, and sachet water.
sanitation	Public toilets (KVIP, WC, pit latrine) and open defecation in polythene bags and along the beach. Community skip is used for garbage disposal
electricity	Houses are connected albeit some illegal. Pre-paid meters are costly and less pro-poor
urban transport	Public transport; trotros, and taxis
<b>Quality of Services</b>	
water supply	Piped water is foamy in nature and emits unpleasant odour. Treated before usage
sanitation	Long waiting time, night closure and high user fees lead to open defecation and dumping along the beach.
electricity	Power supply is unreliable (without warning) with frequent light off (though a countrywide problem), resulting in disputes among household members
urban transport	Good transport links to the city. Long walking distance due to location of the trotro station. Inadequate vehicles, higher fares, and long waiting times.
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Water
	2. Electricity
	3. Toilet/Sanitation
	4. Local transport
	5. Mobile phone signal
Key findings	Availability does not mean accessibility or affordability. Yet, access to services are not causing people to move out of New Takoradi

Settlement	<b>Kwesimintsim</b>
City	<b>Sekondi-Takoradi</b>
Size of city (2010)	<b>2,376,021</b>
Size of settlement (2010)	<b>47,211</b>
unplanned v. semi-planned/planned	Semi-planned area
low-income v. middle/high income	Low-income/mixed
History	Migrant community established in the 1930s.
Rate of population growth	High population density. Growing rapidly
central / periphery location	Western edge of centre
settlement with recent arrivals/established inhabitants	Growing in size with intense infilling taking place by the recent arrivals.
Any other key characteristic of settlement or Remarks	Mixed use with residential being converted to commercial. Poor access to services
<b>Access to Services</b>	
water supply	In-house pipe water but with intermittent supply. Landlords keep taps locked for tenants to pay before use. Mostly rely on bore holes, private vendors, sachet water, and rainwater.
sanitation	Public toilets (KVIP, WC) and open defecation in buckets and polythene bags. In-house toilets are often locked by landlords.
electricity	Houses are connected albeit some illegal. Pre-paid meters are expensive and less pro-poor
urban transport	Public transport; trotros, and taxis.
<b>Quality of Services</b>	
water supply	Pipe water is foamy in nature and emits unpleasant odour. Boreholes and other sources are costly with quality concerns
sanitation	Public toilets are unkempt and smelly. Long queues, night closure and high user fees lead to open defecation and dumping
electricity	Power supply is intermittent though a countrywide problem, and this results in disputes at the household level and affects income generating activities.
urban transport	Good transport links to the city. Congestion in inner alleys. Long walking distances, and inadequate vehicles. Taxi drop-in is costly
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Water
	2. Toilet/Sanitation
	3. Electricity
	4. Local transport
	5. Mobile phone signal
Key findings	Availability of services does not equate to ability to access or afford as landlords place locks on facilities and tenants have to pay to access them

Settlement	<b>Anaji</b>
City	<b>Sekondi-Takoradi</b>
Size of city (2010)	<b>2,376,021</b>
Size of settlement (2010)	<b>30,397</b>
unplanned v. semi-planned/planned	Well planned area developed by the middle class
low-income v. middle/high income	Middle/upper income
History	Indigenous and newcomers, growing rapidly since 1980s
Rate of population growth	Growing rapidly
central / periphery location	Northern edge of centre
settlement with recent arrivals/established inhabitants	Newly established residents. Intense infilling with movement in and out
Any other key characteristic of settlement or Remarks	Mixed use with residential being converted to commercial. Includes estate houses and flats
<b>Access to Services</b>	
water supply	In-house pipe water with private storage in polytanks and large containers. Also rely on private vendors, sachet water and rainwater.
sanitation	In-house private toilet facilities, and door to door garbage collection. Public toilets (KVIP, WC), and few detached in-house toilets in the Old town
electricity	Houses are connected to power. Prepaid is costly but its not an issue of concern.
urban transport	Private car ownership. Public transport; trotros, and taxis.
<b>Quality of Services</b>	
water supply	Pipe water is of good quality. Other water sources are costly with quality concerns when left for longer periods.
sanitation	Water closets with connected sewer systems. Long walking distances and waiting times to access public toilets.
electricity	Power supply is erratic (similar to national level energy supply) though with a followed load-shedding schedule
urban transport	Good roads with easy accessible routes from the estates to the city. Roads in the Old town are untarred with a lot of potholes.
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Water
	2. Local transport
	3. Electricity
	4. Toilet/Sanitation
	5. Mobile phone signal
Key findings	Residents in the middle-class are able to afford services and as a result they enjoy better and improved services.

Settlement	<b>Assakae</b>
City	<b>Sekondi-Takoradi</b>
Size of city (2010)	<b>2,376,021</b>
Size of settlement (2010)	<b>9,139</b>
unplanned v. semi-planned/planned	Unplanned formerly. Now semi-planned
low-income v. middle/high income	Low/Middle income
History	Indigenous and newcomers, growing rapidly since 2000s
Rate of population growth	Growing rapidly
central / periphery location	Peri-urban, located on the Western periphery
settlement with recent arrivals/established inhabitants	Growing in size with considerable infilling taking place by the recent arrivals.
Any other key characteristic of settlement or Remarks	Functioning land market with astute chief. With recent arrivals, arable lands are converted to residential properties
<b>Access to Services</b>	
water supply	In-house pipe water with unreliable supply. Communal water sources; wells and treated (boiled) pipe water. Mechanised boreholes in recently built properties.
sanitation	Private-public toilets (KVIP, WC). In-house detached toilets are often locked by landlords. In-house toilets in the newly built houses
electricity	Houses are connected albeit some illegal. Pre-paid meters are costly and less pro-poor
urban transport	Public transport; trotros, and taxis. Private car ownership.
<b>Quality of Services</b>	
water supply	Pipe water stored for longer time develops 'oily' impurities. Other water sources are expensive with quality concerns
sanitation	Public toilets are unkempt and smelly. Considerable queues and night closure result in open defecation and dumping .
electricity	Acceptable current quality. Intermittent and unannounced power outages as part of the national level energy problems
urban transport	Easy transport links to the city but no route to the farming areas. Untarred roads and worn-out vehicles. Unnecessary interchanges double travel cost
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Local transport
	2. Toilet/Sanitation
	3. Water
	4. Electricity
	5. Mobile phone signal
Key findings	Availability of services does not equate to ability to access as underprivileged majority in the indigenous core pay extra to access services

Settlement	<b>Kojokrom</b>
City	<b>Sekondi-Takoradi</b>
Size of city (2010)	<b>2,376,021</b>
Size of settlement (2010)	<b>37,722</b>
unplanned v. semi-planned/planned	Planned
low-income v. middle/high income	Low/middle income
History	Indigenous, migrants and newcomers since 2000s
Rate of population growth	Growing very rapidly
central / periphery location	Peri-urban, located on the Eastern periphery
settlement with recent arrivals/established inhabitants	Indigenes are predominant at the old core with recent arrivals at the new site
Any other key characteristic of settlement or Remarks	Commercial area, railway, infilling, densification. With recent arrivals, arable lands are converted to residential properties
<b>Access to Services</b>	
water supply	In-house pipe water with unreliable supply. Residents rely on community reservoir, private vendors, rainwater and sachet water. Mechanised boreholes in recently built properties.
sanitation	Private-public toilets (KVIP, WC). In-house detached toilets are often locked and used under the landlords' supervision. Private in-house toilets outside the Old town
electricity	Houses are connected albeit some illegal. Pre-paid meters are costly and less user friendly
urban transport	Private car ownership, public transport; trotros, and taxis.
<b>Quality of Services</b>	
water supply	Water from community tank and private vendors is drinkable but only if used shortly after being sourced
sanitation	Facilities are poorly ventilated with unpleasant odours. Long queues and higher user fees result in open defecation and dumping
electricity	Current is unstable. Interrupted and unannounced power supply, though a countrywide problem this leads to disputes and damages of appliances
urban transport	Good transport links to the city. Poor roads (untarred with deep potholes). Long waiting times with unpredictable journey times. Taxis are reliable but costly.
<b>Respondents' Priority for Improvement (Rank)</b>	
	1. Water
	2. Toilet/Sanitation
	3. Local transport
	4. Electricity
	5. Mobile phone signal
Key findings	Improvements to the availability and access to services has been a gradual process. Underprivileged majority spend more to access services

## Ghana: Accra and Sekondi-Takoradi settlement data on urban residents' access to mobile phones and phone networks

	Settlement/city- Accra	Settlement specific stories	Settlement/City- Sekondi	Settlement specific stories
<b>Coverage</b>				
Access to network	(75% having network challenges)- Dziwornu, 2013	Users in Accra experience high call congestion in most localities irrespective of the network. The most severe call congestion is at Achimota, Dome, and Kwabenya on all the networks (NCA, 2010)		
Electricity supply for charging				
<b>Access to MPs</b>				
Ownership	75.7% (GSS, 2013)		67.3% (GSS, 2014)	
Multiple phones/ SIMs	91.5% with multiple phones (Dziwornu, 2013); 51% with multiple SIMs Bentil, 2012)			
Other means of access				
<b>Uses of MP facilities</b>				
Calls, text, data	Calls; 22% Text;17% Data; 19% (IhubResearch, 2012)		Calls; 21% Text; 16% Data; 19% (IhubResearch, 2012)	
<b>Affordability</b>				
Handsets				
Network connections		Getting a number in (Ghana) is quick, easy and cheap. The cost is amazingly insignificant at ghc1.00 generally and some free credit may be included		
Other costs				
<b>Payment methods for MPs</b>				
<b>Opportunities &amp; benefits for</b>				

livelihoods offered				
Social/family connections		Mobile phones are particularly important as they are critical in maintaining contact with families and obtaining information on jobs.		
Business connections		Phones save me from making unnecessary trips to communicate with customers and suppliers in person		
Income generation		"Due to the amount of revenue I generate at the end of every month, I have virtually stopped selling phone cards to concentrate on the phone charging" (dialyexpressonline.com)		
Time/travel savings		Whenever you send money from Accra to Kumasi, you have to sit on the bus, and there is the tendency for armed robbers. But if you transfer it on the phone, it is much easier and convenient		
Mobile banking including SMS on transactions and account status				
Mobile payments of bills through phone operators	MTN(mobile money; 20%)-Nyame-Mensah, 2013			
Money transfer to others through phone operators	MTN(mobile money; 92%)-Nyame-Mensah, 2013			
Other				

**Tanzania: Dar es Salaam and Arusha settlement data on urban residents' access to water, sanitation, electricity & transport and the acceptability of services**

Authors: Robert Kiunsi and Daniel Hekel

Settlement	<b>Br. Mwinyi</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	completely unplanned
low-income v. middle/high income	Low
History	Old: Development started in 1980s
Rate of population growth	KilaKala ward, where Br Mwinyi is located has experienced quite rapid growth 2002-2012: 6%/annum.
central / periphery location	City centre (south-west)
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers, new immigrants more as tenants.
Any other key characteristic of settlement or Remarks	High density - 29K/km in 2012 for Kilakata.
<b>Access to Services</b>	
water supply	Mixture of private and communal deep wells - communal wells drilled with help of municipality
sanitation	No public sanitation - either private flush or pit latrine with slab.
electricity	Covered by electricity network and network present throughout, but some cannot afford or are still constructing.
urban transport	Accessible mainly from large ring road, but also others.
<b>Quality of Services</b>	
water supply	Danger of contamination from sanitation. Also wells not meeting demand, and people complain of standing in line. Some wells provide brackish water. Some pay for well water - by the bucket or monthly according to consumption or hh size.
sanitation	Emptying is a problem, with faecal sludge flowing out during rainy season (partly as means of emptying)
electricity	Problems in recent past, but not so evident now.
urban transport	Congestion and bad road conditions make travel slow, despite central location. Inner roads rough and unsuitable for cars, and only partly passible in rainy season.
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	4? Residents say improvements needed
sanitation	5? Local leaders say concerned with contamination of water
electricity	Not mentioned
urban transport	1? Residents say improvements badly needed
other	2? Health and education & 3? solid waste also priorities.

Settlement	<b>Maji Matitu B</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	completely unplanned
low-income v. middle/high income	Low
History	New: early 2000s
Rate of population growth	growing rapidly
central / periphery location	South of the city center
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers, new immigrants more as tenants.
Any other key characteristic of settlement or Remarks	Medium population density
<b>Access to Services</b>	
water supply	Not adequate served by only private communal wells, ground water salty
sanitation	No public sanitation - either private flush or pit latrine with slab.
electricity	Connected to national grid but electricity supply unreliable and too expensive to connect
urban transport	Inssufiecent public transport due to limited small and wornout buses
<b>Quality of Services</b>	
water supply	Inadequate as there the area is not connected to central water supply system
sanitation	Inadequate as a the area is not connected to the central sewerage system. Pit latrines are the dominant excreta disposal syetem
electricity	Poor as only few residents are conneted to the national grid
urban transport	Poor due to insufficient buses that are small, wornout and overcrowded
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Improvement needed second priority
sanitation	Not mentioned
electricity	Not mentioned
urban transport	Improvement needed third priority
other	Health and education (first priority)

Settlement	<b>Mjimwema</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	Unplanned with small pockets of planned areas
low-income v. middle/high income	Mixed
History	New settlement early 2000s
Rate of population growth	growing rapidly
central / periphery location	South east of the city center
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers, new immigrants more as tenants.
Any other key characteristic of settlement or Remarks	Very low population density
<b>Access to Services</b>	
water supply	Private communal wells, ground water salty
sanitation	No public sanitation - either private flush or pit latrine with slab.
electricity	Difficulty to be connected to the national grid
urban transport	Good connection to public transport but traffic congestion and ferry crossing
<b>Quality of Services</b>	
water supply	Inadequate as there the area is not connected to central water supply system
sanitation	Inadequate as a the area is not connected to the central sewerage system. Pit latrines are the dominant excreta disposal system
electricity	Poor as only as it is very difficult to be connected to the national grid
urban transport	Relatively good as the area is well connected to the city center
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Improvements of water supply services given a second priority by residents
sanitation	
electricity	Not mentioned
urban transport	Improvements of ferry services and local public transport within the settlement
other	Health and education (first priority)

Settlement	<b>Mzinga</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	Unplanned with small of planned areas
low-income v. middle/high income	Mixed
History	Relatively new, subdivision started in late 1990s
Rate of population growth	Growing rapidly
central / periphery location	South west of the city center
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers, new inmigrants more as tenants.
Any other key characteristic of settlement or Remarks	Low population density
<b>Access to Services</b>	
water supply	Main swater sources is ground water exploted through shallow and bore holes
sanitation	No public sanitation sysyem - either private flush or pit latrine with slab.
electricity	Only a few residents are connected to the national grid
urban transport	Good connection to other parts of the city including the airport but internl transoprtation is poor
<b>Quality of Services</b>	
water supply	Satisfactory even though the area is not connected to central water supply sysystem
sanitation	Inadequate as a the area is not connected to the central sewerage system. Pit latrines are the dominant excreta disposal syetem
electricity	The area is connected to the national grid but not all households have electricity services
urban transport	Well connected to othe rparts of then city but poor within the settlelement
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Not mentioned
sanitation	Not mentioned
electricity	
urban transport	Improvements required (second priority)
other	Health and education (first priority)

Settlement	<b>Ununio</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	Completely surveyed
low-income v. middle/high income	High
History	Relatively new raid subdivision started in 1990s
Rate of population growth	Growing rapidly
central / periphery location	North of the city center
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers
Any other key characteristic of settlement or Remarks	Low
<b>Access to Services</b>	
water supply	DAWASCO water services
sanitation	On site sanitation systems by using flush toilets connected to septic tanks
electricity	Connected to national grid but the electricity supply is not reliable
urban transport	Depend on small mini buses, which are not adequate
<b>Quality of Services</b>	
water supply	Sufficiency
sanitation	Satisfactory even though not connected to the central sewerage system
electricity	Not satisfactory due to frequent power cuts
urban transport	Poor due to limited number of mini buses
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Not mentioned
sanitation	Not mentioned
electricity	
urban transport	Improvement of public transport (second priority)
other	Health and education (first priority)

Settlement	<b>Ununio</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	Completely surveyed
low-income v. middle/high income	High
History	Relatively new raid subdivision started in 1990s
Rate of population growth	Growing rapidly
central / periphery location	North of the city center
settlement with recent arrivals/established inhabitants	Established residents as owner occupiers
Any other key characteristic of settlement or Remarks	Low
<b>Access to Services</b>	
water supply	DAWASCO water services
sanitation	On site sanitation systems by using flush toilets connected to septic tanks
electricity	Connected to national grid but the electricity supply is not reliable
urban transport	Depend on small mini buses, which are not adequate
<b>Quality of Services</b>	
water supply	Sufficiently
sanitation	Satisfactory even though not connected to the central sewerage system
electricity	Not satisfactory due to frequent power cuts
urban transport	Poor due to limited number of mini buses
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Not mentioned
sanitation	Not mentioned
electricity	
urban transport	Improvement of public transport (second priority)
other	Health and education (first priority)

Settlement	<b>Muriet Subward</b>
City	<b>Arusha</b>
unplanned v. semi-planned/planned	Not surveyed
low-income v. middle/high income	Low income
History	Initially established in 1948 as a Maasai settlement but rapid subdivision of land started in 1974 after a police post was established
Rate of population growth	growing slowly
central / periphery location	8kms South of city center (periphery)
settlement with recent arrivals/established inhabitants	Recent arrivals are owner occupiers
Any other key characteristic of settlement or Remarks	
<b>Access to Services</b>	
water supply	Mostly from wells and to a limited extent from ARUWASA
sanitation	The majority of households use improved pit latrines and a few use flush toilets.
electricity	Only a few houses are connected to the national grid
urban transport	The roads in the neighborhood are in poor condition and are inadequate. The buses operating in the area are a few and not reliable
<b>Quality of Services</b>	
water supply	Inadequate water services as only a few households are connected to ARUWASA water supply
sanitation	Poor as majority of households use on pit latrines
electricity	Not satisfactory as only a few households are connected to TANESCO
urban transport	Not adequate due to bad roads and few buses operating in the area
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Needs to be improved (third priority)
sanitation	Not mentioned
electricity	Not mentioned
urban transport	Local roads need to be improved
other	Education and health facilities (top priority)

Settlement	<b>Olmatejo Subward</b>
City	<b>Arusha</b>
unplanned v. semi-planned/planned	Not surveyed
low-income v. middle/high income	Mixed
History	Small Maasai vaillage before 1960s. After independence there was a rapid increase in population
Rate of population growth	Shrinking
central / periphery location	3 kms from the city centder
settlement with recent arrivals/established inhabitants	Most of resent arrivals are tennants while established inhabitants are landlords and bussiness people
Any other key characteristic of settlement or Remarks	Most of the houses are designed to accommodate tennants
<b>Access to Services</b>	
water supply	Water in the settlement to a very large extent is supplied by ARUWASA)
sanitation	The majority of households use improved pit latrines and flush toilets.
electricity	Majority of house are connected to TANESCO eelectricity power. Some houses are not connected due to high connection costs
urban transport	The area is well served by public transport mainly duet to its proximity to city center
<b>Quality of Services</b>	
water supply	Satisfactory but quantitave improvement in water supply required
sanitation	Not satisfactory, can be improved by increasing the number of flush toilets and introducing the sewerage system
electricity	Good but can be made better by increasing reliability
urban transport	Access roads are poor and they need to be improved
<b>Respondents' Priority for Improvement (Rank)</b>	
water supply	Not mentioned
sanitation	Not mentioned
electricity	Not mentioned
urban transport	Acess roads
other	Storm water and solid waste management

Settlement	<b>Kilakala</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	Unplanned area
low-income v. middle/high income	Low income in general
History	New ward - created in 2010 from a part of Yombo Vituka, some people moved here from Kurasini due to development of the port
Rate of population growth	2002-2012: over 10%/annum
central / periphery location	City centre (south-west)
settlement with recent arrivals/established inhabitants	Large amount of transience with new arrivals as rent is very cheap.
Any other key characteristic of settlement or Remarks	High density
<b>Access to Services</b>	
water supply	There are private and community managed deep boreholes. Electricity shortage can cause problems with water access when pumps no longer work.
sanitation	No public sanitation. Sharing latrines is very common. Poor solid waste management
electricity	Most of the community is connected to the electricity network, but it is unreliable at times. Costs are also high for a small number of people
urban transport	Very limited number of mini buses. Challenges with transportation during the rainy season. Access for cars is difficult in many parts of the ward. High costs can limit people from using mini buses
<b>Quality of Services</b>	
water supply	Some water user associations manage boreholes in the ward. Private wells are common. Basic water needs are met for most people.
sanitation	The overwhelming majority of latrines are shared. Many people are not satisfied with the sanitation due to challenges with faecal sludge management and the majority of people have to use pit latrines..
electricity	Electricity is widely available but at times power cuts will happen in the ward.
urban transport	Very poor roads and topography makes travel more difficult for mini buses. People are very disappointed with the condition of the roads and the negative effect this has on their livelihoods.
<b>Respondents' Priority for Improvement (Rank)</b>	
	First priority: urban transport
	Second Priority: sanitation
	Third Priority: Water
	Fourth priority: electricity
	Fifth priority: phone network

Author: Daniel Hekel

Settlement	<b>Charambe</b>
City	<b>Dar es Salaam</b>
unplanned v. semi-planned/planned	Unplanned area
low-income v. middle/high income	Low
History	Charambe is an older ward
Rate of population growth	2002-2012: over 10%/annum
central / periphery location	South of the city centre
settlement with recent arrivals/established inhabitants	There is a mixture of tenants who rent and are new arrivals and people who own houses and have lived there for a longer time.
Any other key characteristic of settlement or Remarks	High Density
<b>Access to Services</b>	
water supply	The majority of wells are private and many people buy water from their neighbours. Very small number of people use DAWASCO water which comes from small wells and not the utility's main network. It also is not reliable. This would need to be verified in a better manner
sanitation	No public sanitation. Poor solid waste management which is a major issue due to the nearby market at Mbagala
electricity	The ward is connected to the main electricity network. There are regular power shortages and electricity is too expensive for many people.
urban transport	Charambe is located next to Kilwa Road, the major road leading south out of the city centre. There is a large bus station near Charambe. Due to the unplanned nature of the ward, it is difficult for vehicles to access most of the interior part of the ward.
<b>Quality of Services</b>	
water supply	Private wells are very common. Water is somewhat unreliable but has improved after community development after a drought in 1997. There also are major concerns over water quality and Charambe is a very important groundwater recharge area for Dar es Salaam.
sanitation	The vast majority of people use latrines, but many people share latrines. A small percentage of people use plastic bags when they defecate. Faecal waste management is done by digging another hole and having the waste seep into either the open environment or another open hole. Trucks are not able to remove faecal sludge due to lack of access and cost also would be prohibitive.
electricity	It has improved, but problems are still common due to cuts and it is somewhat satisfactory for the majority of people.
urban transport	Charambe is located next to Kilwa Road, the major road leading south out of the city centre. There is a large bus station near Charambe. Due to the unplanned nature of the ward, it is difficult for vehicles to access most of the interior part of the ward.
<b>Respondents' Priority for Improvement (Rank)</b>	
	First priority: water supply
	Second priority: sanitation
	Third priority: electricity
	Fourth Priority: Urban transport
	Fifth priority: phone network

Author: Daniel Hekel

**Emmanuel Twarabamenye & Alban U. Singirankabo**  
**University of Rwanda**

**December 2015**

**Draft report on Kigali City and Muzanti Town:**  
**City dynamics: mobility and livelihoods of urban residents**  
**&**  
**Urban residents' access to water, sanitation, electricity and transport, and**  
**acceptability of services.**

## **1. Introduction**

As stated in the RurbanAfrica project, " The overall objective of the African Rural-City Connections (RurbanAfrica) project is to explore the connections between rural transformations, mobility, and urbanization processes and analyze how these contribute to an understanding of the scale, nature and location of poverty in sub-Saharan Africa. The RurbanAfrica project will advance the research agenda on rural-city connections in sub-Saharan Africa by addressing a range of crucial components: agricultural transformations, rural livelihoods, city dynamics, and access to services in cities. In this respect the project will challenge a number of generally accepted 'truths' about rural and city development, and the importance and implication of migration in shaping these. It will thereby question the overall negative interpretations of the economic role of rural-urban mobility and migration in sub-Saharan Africa and generate new insights into the relationship between rural-city connections and poverty dynamics".

Work Package 3 and 4 focuses on providing a comprehensive understanding of 'City Dynamics', and access and acceptability of public services in selected urban areas. The urban dynamics is explored through the mobility patterns and urban-rural connections while the access and acceptability of services is analysed through the access to land, housing, water, sanitation and mobile telephone.

This report is based on extensive data collected in 6 sites in the city of Kigali and 3 in Musanze town in August 2015. The report is divided into 10 main sections. The first section focuses on the methodology, and the remaining sections presents in details findings for each research sites.

## 2. Methodology

### 2.1 Selection of cities and villages

In Rwanda, two cities were selected as fieldwork sites: the largest city, city of Kigali, and a rapidly growing intermediate-sized town Musanze, formerly called Ruhengeri. The selection of two different sites was motivated by the fact that it is important to understand the dynamics and access to services as their acceptability by the population as well in the largest city but also in the secondary cities, Musanze being one of the six secondary cities<sup>1</sup>. Carrying out a similar study in both urban areas, using the same methodology allows better understanding of urban dynamics and access to services. Indeed, the capital city is more attractive since more equipped than secondary cities but it may experience different challenges as the ones observed in secondary cities. Six villages in the city of Kigali and three villages in Musanze town were selected for field data collection (see table 1).

Kigali, is the capital city of Rwanda. It is located in the centre of the country. Kigali was founded in 1907 by Richard Kandt under German colonial rule. It remained a small administrative and business centre up to 1962 when it became the capital. The city has undergone several enlargements since. Currently the total surface of city of Kigali is of 730 km<sup>2</sup> but only 70% is urbanised. Initially the city was totally located on a hilly site, but with successive enlargements, the city has spread over flat terrain in the North and the East parts. Kigali accommodates 1,135,428 inhabitants (NISR, 2012), and this is 48% of the total urban population of Rwanda. Kigali has a growth rate of 9%, while the national average urban growth is 4.5% (MININFRA, 2013). The city has experienced rapid growth after 1994 and the majority of its population are immigrants from different parts of the country and from outside. According to Rwanda Vision 2020, Kigali is expected to become the hub of the central Africa, and to accommodate more than 3,000,000 persons by 2020 (Vision 2020, 2000). The city is made of three districts: *Gasabo, Kicukiro and Nyarugenge*.

Musanze town is located in Musanze district, Northern Province. It accommodates the headquarters of Musanze district. Musanze is the gateway town to Volcanoes National Park which hosts the Mountain Gorillas which attracts many tourists from all over the world. It is connected with Uganda at 25.5 km in the north-east. The town is crossed by the paved road Kigali-Rubavu, Rubavu being contiguous with the city of Goma in the Democratic Republic of Congo. Musanze town is built on a flat site with some steep terrain especially towards the South. Musanze was created in 1903 as a German colonial military post (Sirven, 1985). The total surface area of Musanze town covers 61.97 Km<sup>2</sup>. In 2012, the town accommodated 102,082 inhabitants (NISR, 2012). As the city of Kigali, Musanze town has experienced high growth after 1994 when thousands of returnees settled in the town but also many indigenous joined the town for search of

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<sup>1</sup> Six towns are classified as secondary cities. These are *Musanze, Muhanga, Rubavu, Huye, Rusizi and Nyagatare*. In the *Urbanization and Rural Settlement Sector Strategic Plan 2012/13-17/18*, those towns are expected to receive more public and private investment to enable to become development regional poles.

security. Musanze is the second largest city of the country and is one of the six secondary cities that are to be developed in coming years (MININFRA, 2013).

**Table 1: Villages studied in the city of Kigali and Musanze town**

City/ Town	Village <sup>2</sup>	History	Location	Income level	Rate of population growth
<b>Kigali</b>	<i>Iwacu</i>	Old informal settlement early 1960s, highly densely populated	Central	Low-income	The population decreases since the area is expected to be redeveloped in near years and a portion of the village has been already cleared down
	<i>Kibiraro I</i>	Established 2000s, settled by people from the upper zone occupied by high -income	North	Low income	Stable population as the area is very highly populated
	<i>Kanyinya</i>	Established after 2005	Central	Low-income	Population growth since 2000 but now stable as there is no space left
	<i>Muhabura</i>	Established around 1997-1998	South-West	Low and medium	The village is settled mostly by returnees. Building plots were allocated by the city of Kigali. Population is stable
	<i>Byimana</i>	Rural settlement integrated in the city in 1990	Peripheral East	Low	Initially settled by migrants from rural areas from 1970s. Currently the area is under development
	<i>Nyakabungo</i>	The area was developed by the city of Kigali in 2007-2008 to accommodate people relocated from an informal settlement located downtown and which under redevelopment	North	Medium	The population is stable
<b>Musanze</b>	<i>Nyarubande</i>	Totally rural until 1997 when middle- and high income	Periphery North	Low for native/middle	Rapidly growing. Rich people are moving in

<sup>2</sup> Rwanda is divided in 4 provinces and the City of Kigali. Each province and the City of Kigali is subdivided into districts, districts are subdivided in sectors, sectors in cells and cells in villages.

		started to move in		and high income for new comers	while poor people are selling them their land and consequently moves out.
	<i>Mugara &amp; Nduruma</i>	Was rural until 2010 but now is being settled by people evicted from Ibereshi	Peripheral South	Low-income	Very quickly growing. The occupation is occurring in haphazard manner.
	<i>Rukoro</i>	Established in the colonial period	centre	middle income and high-income	Rich people are moving in while poor people are selling them their land and consequently moves out.

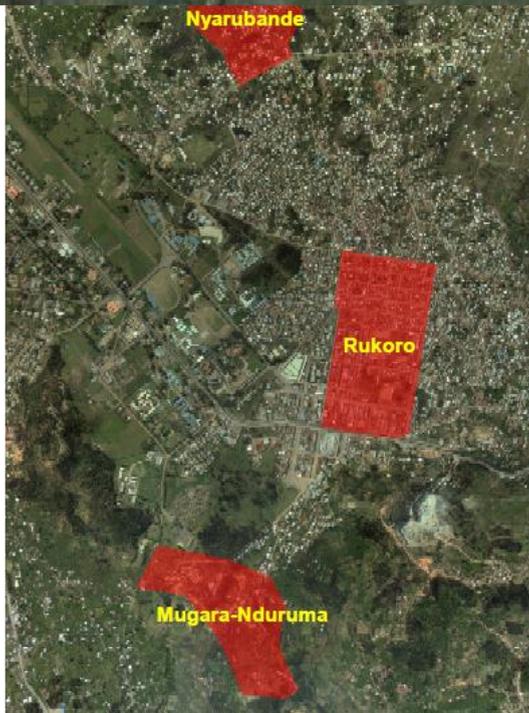
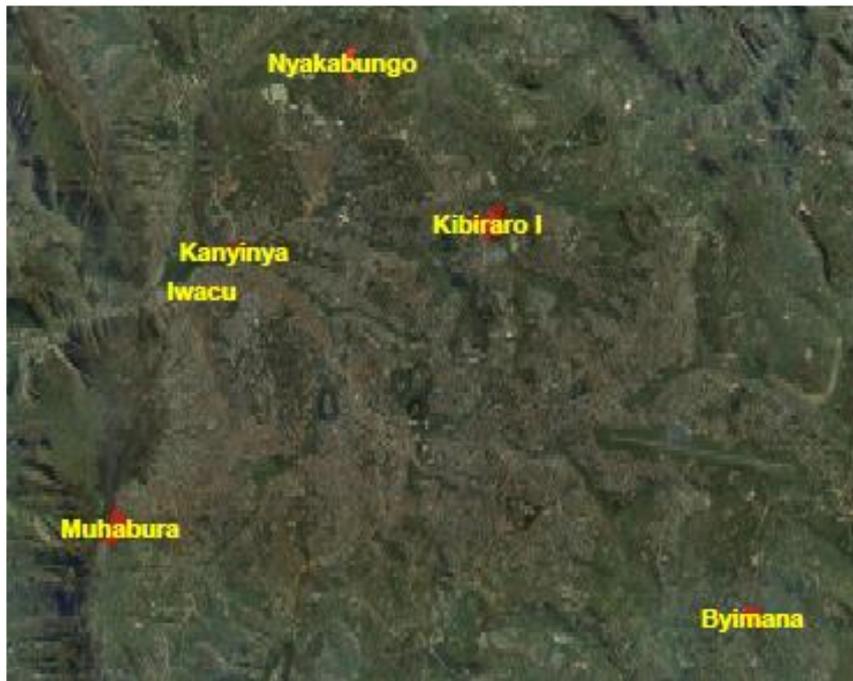


Figure 1:

Villages studied in the city of Kigali

*Figure 2: Villages studied in Musanze Town*

## *2.2.Methods*

In order to achieve the project's objectives, data used were collected primarily through a qualitative methodology based on Focus Group Discussion and In-depth interview. Both techniques were preferred to survey because “*focus groups can reveal a wealth of detailed information and deep insight. When well executed, a focus group creates an accepting environment that puts participants at ease allowing them to thoughtfully answer questions in their own words and add meaning to their answers*”(Guidelines for Conducting a Focus Group. Online. Available at [https://assessment.trinity.duke.edu/documents/How\\_to\\_Conduct\\_a\\_Focus\\_Group.pdf](https://assessment.trinity.duke.edu/documents/How_to_Conduct_a_Focus_Group.pdf)). In addition, “In-depth interviews are useful when you want detailed information about a person’s thoughts and behaviours or want to explore new issues in depth. [...] they offer a more complete picture of what happened in the program and why” (Boyce and Neale, 2006). The two techniques were then used in combination.

As it was very difficult to conduct ourselves the FGDs and in-depth interviews in all sites, we recruited four research assistants, trained in conducting FGDs and interviews. All of them are BSc holders in Geography, and therefore have basic knowledge of such methods and topics under analysis. Exploratory visit had been conducted in June 2014 but due to administrative difficulties to access research funds, FGDs and in-depth interviews were conducted from 3<sup>rd</sup> to 31<sup>st</sup> August 2015. In field data collection, we were helped by community gatekeepers who were mostly village leader, but they did not participate neither in FGDs nor interviews. All people who participated in FGDs and interview were ground population of both sexes and without any administrative responsibility. All of them were consenting, no coercion was exerted over them.

In all sites, the FGDs and interviews were held in *Kinyarwanda*, and taped using digital recorders. Later the talks were translated in *English* and transcribed. Since this task was very demanding and time-consuming, six clerks were recruited to conduct this exercise. Those are students in Geography department.

### *2.2.1. Focus group discussions*

In total, 252 persons participated in FGDs. Every FGD was made of 7 persons. In each site, four FGDs were conducted: one with elder males, one with elder females, one with young males and one with young females. In total 36 FGDs were held: 24 in Kigali and 12 in Musanze. The discussion took place in various places: classrooms, cell and sector meeting rooms. To avoid bias from the discussants and interviewees, no administrative authority attended the FGD or the in-depth interview. Every participant had opportunity to express his/her view freely as the aim was to explore the topics under discussion from members' perspectives. There were consensuses on some questions but for others, responses varied from individual to another. In average, one FGD lasted for 75 minutes. The FGDs were centred on the description of built environment/land, mobility/livelihood, services and future plans while the in-depth aimed at collecting individual appreciation on the same items.

### *2.2.2. In-depth interviews*

In-depth interviews were conducted with 180 male and female residents in all 9 selected villages. In each village, 20 heads of households or their representatives (usually spouses) were interviewed. The interview was held at the respondent's home. The interviews aimed at collecting individual information on the background of the village and housing quality, availability, accessibility, affordability and acceptability of public services. Information on livelihood/mobility and future plans were also captured. The in-depth interviews were conducted simultaneously after the FGDs.

### *2.2.3. Data processing*

To make views of all participants in FGDs and in-depth interviews understandable and analysable, instead of using the traditional method that consisted of cutting different entries, categorising them by sticking responses onto separate sheet of paper labelled with broad headings, Excel software was used as it is deemed to provide more credible synthesis (Taylor-Powell & Renner, 2003). Below is the process we went through:

1. All responses have been cleaned up and stripped off non-essential words;
2. An Excel spreadsheet has been created for every FGD and individual interviewee;
3. All responses were analysed to depict idea conveyed by the respondent, and then each idea/process was assigned a code, a capital letter (A,B,C,D, etc.) in the corresponding following cell. This exercise was conducted for each response and was done by the researchers themselves.
4. Thereafter, the column of responses (with capital letters) was sorted in ascending order. With this process, it was possible to observe the most prevailing response for each group.
5. The summation of all groups enabled to have a general picture on the village

The exercise was conducted for all FGDs and in-depth interviews. Such counts allowed to write the report highlighting the main findings.

### 3. City of Kigali site reports

In the city of Kigali, the study was conducted in the following six villages: *Byimana*, *Iwacu*, *Kanyinya*, *Kibiraro I*, *Muhabura* and *Nyakabungo*. As already mentioned, each village has its particularities in terms of city dynamics, services availability and acceptability as well, that will be developed in the following specific sections.

#### 3.2. *Byimana* village

##### 3.2.1. Background

*"I was born in this village. According to what I heard from my parents, this areas was wooded. People were fearing to settle in this place, but with development, from 1960s, things have changed gradually. When I started primary school in 1969, a great part of this village was still covered by a natural forest. The village was named Byimana (place of God) for its good agricultural productivity and safety. We had no clean water, we used water from stream in the valley. There was no electricity, we used firewood and paraffin lamps for lighting. Most of houses were covered with grass (especially hyparrhenia grass). But since 1975s some people started constructing houses covered with iron sheets. The number of houses covered with iron sheet increased gradually as people were getting more financial capacity but also because grass-covered houses were considered substandard by many residents. People later constructed more larger houses. Since 1998s and 2000s this village has changed, some migrants constructed more adequate houses than indigenous. In-migrants bough land at low price. By then, a big parcel of land was sold RWF<sup>3</sup> 200,000.*

*In 2008 this village was developing and some of village's residents could get connected to electricity grid. In 2009 the electricity was availed to the entire village but people had to pay to have their houses connected. This was possible thanks to the good leadership. Following electricity supply, the land price has considerably increased, a building plot (20/30m) was sold 2 million of RWF, even more. In present days, a building plot costs between 3 million and 4 million of RWF. And with a good local leadership, we started to have some small roads in village and that has affected positively the value of land parcel. It is in that way development came and by now we are really developed." (A indigenous male interviewed, 53 years old).*

*Byimana* village is located in Karama Cell, Kanombe Sector, Kicukiro District, near Kigali International Airport. The village develops over a hilltop. Until mid-1960s, the area was a wooded savannah with very sparse dwellings. The predominating type of house was a small thatched, with the main house and the annexe, all fenced with edge plants as this was the case in other rural parts

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<sup>3</sup> RWF 1000 equal around € 1.25, or \$ 1.34

of the country. The colonisation of the area was done by the government under the *paysannat*<sup>4</sup> program in the late 1960-early 1970s. With the development of Kigali, many people also migrated to the area contributing to the increase of population density. Despite the huge flow of in-migrants, Byimana remained totally rural until early 2000s, of course some changes had occurred in terms of housing especially.

With the rapid development of the city of Kigali, and the great number of people in search of land, in-migrants were attracted to *Byimana* because it was possible to purchase land at a relatively low price. Some people who settled the area before the 1994 Genocide perpetrated against the Tutsi wanted to sell their land and settle in other parts of the city of Kigali or the country. In addition, old case returnees were given land through land sharing policy. In that framework, according its size, a family landholding could be divided into 2, 3 or more farmland. The previous owner had right to keep one land parcel while other were given to old case returnees. This resulted in a rapid increase of the resident population and the improvement of housing. In the policy of improving population's living conditions, the area was provided with public services namely electricity, water, roads, and public bus line transport. In turn, these services attracted more people, some modern houses were built in the village and *Byimana* area became semi-urban. It is important to note that the village was integrated in urban area in 2002, before the village as the large part that area was *de jure* rural though it the urban footprint was visible.

### **3.2.2. Land, Housing and Services**

As in any developing urban area, there is always people in search of land for various purposes. The native people acquire land through inheritance. Parents used to allocate land to their male heirs. At the time of the colonisation, migrants who settled in *Byimana* under the *paysannat* program were given 2 Ha of land by the Government. Following in-migrants acquired land through purchase. Old case returnees were given land by the government through land sharing policy. As above stated, land price was still low in early 2000s. A build plot (20/30 m) was sold around RWF 200,000. Then some perspicacious people, anticipating the future land value increase purchase lager plots of land which were sold at a price 3 or 4 time higher.

The price of building plots has been increasing over time because of the continuous high demand. In 2014, the price of a building plot of 600 m<sup>2</sup> was estimated around 3.5 million (approximately \$ 5,000). Land price is influenced by the plot size and the closeness to public services. At the time of the research, Rwanda Housing Authority (RHA) was conducting expropriation as the place is planned to become a medium residential area in accordance with Kigali Conceptual Master Plan passed in 2008. Some residents were already expropriated and compensated, their houses already

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<sup>4</sup> *Paysannat* refers to the relocation programme initiated by the Government in the colonial period where peasants from highly densely populated areas were offered land in the regions least densely populated especially in the low land located along a line Kagitumba-Kigali-Akanyaru. The programme started early 1950s near Akanyaru valley and was closed early 1980s because there was anymore no free land to allocate to people.

demolished and the previous house owners had moved to other places. According to the respondents, RHA was paying around RWF 4,000 for 1m<sup>2</sup> of bare land. In this context, no individual will be interested to acquire building plots in that area since they cannot be granted construction permit, except of course property developers. Furthermore RHA will have a strict control that it would be very difficult even near impossible to erect unauthorised house, expecting to be compensated later.

In general, the type of house mostly found in *Byimana* is of low quality. Some few houses of medium quality are found along the main access road and have small frontage shops. The natives and well established migrants occupy low standard houses with wall of wood/mud<sup>5</sup> or mud bricks, and shed or gable roofs covered with simple corrugated iron sheets. The number of sleeping rooms varies between two and three, the smallest houses having one room. Most of houses still have plant fences and have relatively large courtyard and gardens where banana trees and some vegetables are grown (see Photo 1). Houses are connected by narrow earth paths. No thatched house was observed in the area. Most of houses are occupied by their owners. This is understandable because of poor quality of houses and the peripheral position of the village. The influence of the city was still moderate. Currently the attractiveness of *Byimana* has decreased since the area is planned to be redeveloped by RHA. In such conditions, people are no longer interested in acquiring building plots in *Byimana* as they cannot develop them.



*Photo 1: (a) One type of house in Byimana, and (b) Demolished house after the owner was expropriated by RHA*

*Byimana's* dwellers stated that local climate has changed. This is perceived through local weather warming and more frequent unusual heavy rains. They also declared that indoor temperature has increased. Trees clearing may have contributed to the local climate change since some parcel of land are populated trees most of them being fruit trees.

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<sup>5</sup> The term “wood-mud” house with walls made of wood filled in with earth. The wall can be roughcasted with cement and even painted. The term was used by in the Fourth Population and Housing Census, Rwanda, 2012 census.

## *Water*

The prevailing water supply mode in *Byimana* is the collection of water from public taps recently installed by Water and Sanitation Corporation (WASAC), the only public utility in charge of producing and supplying piped water in urban areas. So far, no private has invested in piped water production and distribution. Each tap is assigned a manager who operates it on behalf of WASAC. The cost per m<sup>3</sup> is set according to the consumption: the higher the consumption the higher the price. The minimum cost is RWF 381 per m<sup>3</sup>. A jerrycan of water is paid RWF 10 at public tap. There are some families who have piped water in their premises, but they are all located along the main access street. Some of them their premises and sell it RWF 30 per jerrycan. Such people are not professional water vendors, they offer the service mostly to their close neighbours or when there is no water at the public taps. At public taps, children and young people have to queue for long time before getting water as shown on Photo 2.



*Photo 2: Children and young people waiting to collect water from a public water tap*

Piped water supply is erratic especially during the long dry season (June - October). In case of severe water shortage, a jerrycan of water is paid between RWF 300 and 400 transport included. Transporting water is a business for unskilled young people.

*"It is really difficult in this dry period, we wake up early morning around 2am and we go to fetch water down there chez Mubirigi where there is a tap but water is available only up to 5am." (A women, 30 years old)*

When the village is not supplied with water, people rush to the valley where they collect water for free from water ponds and stream. Then a great number of load-carriers are hired for supplying households with water. Naturally, such water is not potable and needs to be filtered or boiled before people use it but apparently very few households do it. According to the group of young females, to overcome use especially drinking non potable, the government has provided water filters to every three close families.

Interviewees and FGDs discussants ranked regular water provision as the first public service that needs improvement. According to them, frequent water shortage results in the raise of water price, this reduces the household's meagre income that has to be used to meet various needs. The raise of water price is very critical to the poorest households. Moreover people spend much time to collect water, time can be used for other lucrative activities. In dry season using water from water ponds and stream is detrimental to people's health. The poorest people are the most affected since they cannot afford piped water especially in the long dry season.

### ***Power used for lighting and charging mobile phones***

*Byimana* village is connected to the national electricity grid managed by Rwanda Electricity Group (REG). REG is the sole public utility in charge of providing electricity countrywide. There is no private who have invested in electricity distribution, private are more interested in electricity generation, and the electricity generated is injected in the national grid managed by REG. Electricity is the main source of energy used for lighting in *Byimana*. Most of households of the village have manage to get connected starting the time REG accepted the payment of connection in three instalments for households located near a low voltage line in 2010.

Before the introduction of the prepaid system, *Byimana's* residents used to pay electricity on a monthly basis as the rest of the country. On average a household used to pay between RWF 1,500 and 2,000. But now with the prepaid system, they do not how much they spend monthly for electricity because top-upping is done when needed. The prepaid system is well appreciated because everyone can the electricity according the money available and any time. Interviewees and discussants are satisfied because the staff of REG cannot disconnect their dwellings as it used to be when people had to pay on a monthly basis. Concerned people had then to go to REG office several times, pay the transport of the technician from the office to the dwelling, and sometimes to get re-connected could take some days after payment of arrears.

The village faces frequent electricity outages as other parts of the city of Kigali. When there is electricity outage, connected households torches and candles are used for lighting as do households that are not connected to the electricity grid. Consequently, *Byimana* residents wish to have a more regular electricity supply.

Electricity is also used for charging mobile phones. Near all households have at least one mobile phone. *Byimana's* residents are satisfied with the mobile phone signal coverage since they always access services provided by all the three operators (MTN, Tigo and Airtel). But they complain that their services are expensive. Mobile phone is used for mostly for calling, text messaging, transferring money, listening to radio and music and for lighting. Other uses are less frequent.

According to *Byimana's* residents, local climate change has affected service provision especially water and electricity. It has contributed to water shortage in rivers and decrease of underground water, and this has led to water shortage, irregular water supply, decrease of electricity generation and frequent electricity power outages. The population increase has also led to the intensive tree clearing in the village.

### ***Fuelused for cooking***

The most used fuel for cooking is charcoal, but some families still use firewood. A sack of charcoal costs around FRW 7,500. Those who cannot afford to pay the whole sac can buy small quantity for immediate use. Local tree clearing and adoption of urban lifestyle by the residents resulted in the shift from use of firewood to charcoal. The continuous increase of charcoal price follows the general trend observed in the country. The village is supplied by wholesalers who criss-cross the city of Kigali. No use of modern energy sources (biogas, solar energy) was reported. This is understandable since the village is settled mostly by low-income families.

### ***Toilet/Sanitation***

Access to toilet facilities is not a major problem in *Byimana* village. All households have private latrines. Most of them are pit latrines with walls and wood slab, both cemented. Some houses located along the main access road are equipped with flushing toilets. Pit latrines are not always adjoining the houses, frequently there are built apart because most of the residents of *Byimana* still have huge building plots that even comprise gardens with avocado and banana trees. No public toilets were found in the village. There is free access to toilets except the ones built in few compounds found along the main access road.

There is no problem of sanitation in *Byimana*. Waste water is thrown in gardens or on roads to reduce dust spread especially in dry season. Domestic solid waste are removed by a private company that uses a truck that takes them to *Nduba dumping site*, located around 20 Km far. The monthly subscription is RFW 1,000. Families that have huge gardens are not required to the system since they dispose solid wastes in dumping composts, and later they are used as fertiliser. The group of young females reported that there is a sanitation club that sensitises the population

on the importance of domestic hygiene, therefore all adult people do their best meet local standards of sanitation.

### **3.2.3. Livelihood and mobility**

*Byimana* is mostly populated by cultivators (not really farmers), few informal workers and civil servants. Farmers settled the area before 2000 have sold parts of their land and now simple cultivators. With infrastructure development and farmland miniaturisation some of farmers them have embraced new informal jobs such construction works, petty trade, etc. The majority of the residents have low-income since they are subsistence farmers or casual workers. In recent past years, the area has attracted an increasing number of migrants from other areas of the city of Kigali searching building plots. In present days, the village is no longer attractive as it is planned for redevelopment into a medium residential housing neighbourhood.

#### ***Income generating activities***

The main economic activity in the village is subsistence farming. Farming activities are done on very small pieces of land and are mostly carried out by women. They grow cassava, beans, maize, banana trees, etc. Following the planned redevelopment, they are no longer authorised to grow perennial crops except the existing banana trees. The produce is mostly for family consumption. Men have embraced other activities to diversify the household's sources of income. Unskilled males search for casual jobs in construction in the surroundings. Initially, the livelihood was based on farming activities. With time, new activities have emerged such as petty trade, hairdressing salons, renting wedding clothes, street selling food stuff for some females etc. Hairdressing salons are run by young people. Petty trade is done in small frontage shops where food stuffs and other basic products are sold. Civil servants rely on monthly salary.

*"Living in this rapidly urbanising city of Kigali is not easy for everybody. In past years I used to grow all plants: cassava, maize, sorghum, beans, coffee, etc. But now this is no longer possible. Our landholding has been drastically shrunk because we sold it. Now to cope with life, I sell fresh foodstuffs near the road in the centre, there near the military barrack and the military hospital and my husband does casual works as I told you. We also lend a small house. Those are our sources of income"* (A woman, 26 years old).

#### ***Services availability and income generating activities***

Provision of public services has contributed to the creation of income generating activities in *Byimana* village that were not available there before. These include stationery stores, hairdressing salons, water vending, cyber cafe, bars, mobile phone services, etc. Without electricity none of such activity could be found there. Now you can buy MTN, Tigo or Airtel airtime easily in the village. People do no longer go to *Kanombe* for hair cut.



*Photo 3: Residential house adjoined with frontage small shop*

As far as electricity is concerned, the frequent and unannounced blackouts interrupt business activities especially in hairdressing, cyber café, copying services, etc. Owners of such businesses often leave the village and establish their business in places with more reliable electricity supply. It is not worthy for them to acquire generator because of low demand.

### ***Urban transport, mobility and income generating activities***

As stated earlier, *Byimana* village is located at the edge of the city. The main access road crossing the village was being tarred at the time of field data collection. Road construction works have not interrupted the existing public transport that is offered by one uncomfortable 18-seats minibus, locally called *Twegerane*. The group of males was satisfied with local transport while the females were not. Indeed, females compare *Twegerane* with comfortable Toyota coaster minibuses (30 seats) that are used on main paved roads of Kigali. Transport is considered expensive as they pay RWF 300 while in general, the fare to move within the city in minibus is RWF 200. The situation will surely improve after completion of the road construction. The village is also accessible with bicycle and motorbike taxi, but there are more expensive than public transport by minibus.

On the impact of public services availability on people's decision to move in the village, the group of elders had no opinion. For them, it looks like land availability is the only factor that attracts people in the village. Yet, the groups of young people consider that availability and quality of

public services influence people to settle in *Byimana*. For instance, people with cars search for building plots or houses accessible by road. Moreover, people are attracted also by piped water and electricity provision. Rich people do not like to buy building plots that are far from the pipe water and electricity lines.

Despite being semi-rural, *Byimana* village interacts with neighbouring and remote rural and urban areas. People from rural areas come to the village searching for jobs or visits. According to interviewed residents, visits last around five days on average. *Byimana* dwellers also go to their respective native areas for occasional visits. Those who still have land properties in rural areas use to go back to exploit them or collect rent. The travel is always done by public transport except for the very nearby villages.

It is important to emphasize that the area is not attractive anymore at least for common ground population because of the ongoing expropriation by RHA. Most of residents expropriated move to *Rwamagana* district and others head to non-specified places. *Rwamagana* is one of neighbouring districts which is still predominantly rural and where it is still possible to purchase land farm at reasonable price, especially after expropriation. Expropriated residents move out the village because they cannot afford to proposed housing scheme and no individual housing development is accepted. They stated they were not happy to move out of the village, however they have to comply with the Kigali conceptual master plan. Some of them said they are distressed since they have been living in the village for many years. Moreover, they blame the city of Kigali for the long delays in developing expropriated lands. Such land become stronghold of malefactors while they could be used for farming activities as far as planned projects are not started. The example they use to give is *Kiyovu cy'Abakene* (*Kiyovu* settled by low-income people) that was expropriated in 2006-2007 and very few buildings have been constructed. They also mention *Gahanga* which was planned to host the new national stadium. People were expropriated two years ago but nothing has been done over the land so far.

#### **3.2.4. Future challenges**

*Byimana*'s residents have raised a certain number of concerns that need to be addressed in the future:

- Though they have short time to live in the village, they deem that the village should be regularly supplied with electricity and piped water, and adequate public transport to make dwellers' life of neighbouring villages more comfortable.
- Given the long distance to the nearest open market, *Byimana*'s dwellers suggest the construction of a market in the village.

- According to *Byimana* dwellers, in 10 years' time, their village will be modernised with multi-storeyed residential and commercial buildings and dense paved road network. Indeed, they are already aware of the current development since some of them have been already expropriated. Therefore, most of them will inevitably move out the village.
- The group of elder females wish the government to stop expropriating people in the way that affect them, because many people experience harsh new living conditions after expropriation. They said: "... we cannot fight against the development, but the government should also think about fair treatment of people who are expropriated". The group of young females was more explicit: "*the government gives tentative date around which compensation will be paid. In general, the announced deadline for payment is never respected and is done some months later even years. They wish the government or RHA should respect the communicated date of compensation payment and does not prevent the land owner cultivate their land until they are paid.*"
- The group of elder females reported that conversion of agricultural land into built-in space will contribute to the reduction of air quality

### **3.3. *Iwacu* village**

#### **3.3.1. Background**

*Iwacu* village is located in Tetero Cell, Muhima Sector in Nyarugenge District. It is an old slum adjoining the city centre. The village develops over a moderate slope between downtown and the main road from Nyabugogo to the central main roundabout.

Before the independence *Iwacu* village was forested and very few people resided there. It is even said that wild animals such as hyenas were living there. When the country got independence in 1962 many Rwandans working for the newly established administration settled there. Other people from all parts of the country headed to Kigali searching for paid jobs. As there were no regulations on urban development, most of them established haphazardly in *Iwacu* village and other parts of Muhima creating one of the oldest informal settlements of the country. As migrants moved in, the forest was cleared and small houses thatched were erected. Until mid-1970s, such houses were still found *Muhima* Sector. In meantime the area had been provided with piped water, electricity and earth road network. Such developments attracted more and more migrants leading to the high density of constructions now observed. *Iwacu* village is a slum. House owners are not authorised to upgrade their houses as the area is planned to become part of the new CBD. At the time of field data collection, a part of the village was already cleared down.

Photo



4:

*Expropriated area in Iwacu village fenced with wire mesh waiting for redevelopment*

The village is mostly settled by trade people, retailers, civil servants and people working in the private sector who occupy low or middle positions, and load carriers. Many informal workers are also found in the area.

Dwellers of the neighbourhood came from all parts of the country but mostly from the South, Western and North Provinces. *Iwacu* village is an slum characterised by high density of old constructions. Living conditions are said cheap compared to other informal settlements in Kigali. The village is attractive as it is located near Nyabugogo main taxi park and fresh foodstuffs market, and the city centre of Kigali. In addition, the area is very close to the City centre, to *Muhima* hospital and schools.

### **3.3.2. Land, Housing and Services**

In early 1960s, as there was still plenty vacant land, some people could get land through gifts by native. However, as the city developed, the migrants acquired building plots through purchase. Nowadays, due to high density of construction, anyone who is interested in acquiring building plot must imperatively buy a property.

Given the haphazard development of the area, on average, the houses found in *Iwacu* village are of low quality. Most of them are old and small, with two or three small sleeping rooms, have walls made of wood-mud or mud bricks, gable or shed roofs covered with old corrugated iron sheets. In some cases, stick trees and small stones are placed on the roof to maintain iron sheets in place. Recently, house owners were instructed to paint the roof in red for hiding rusty iron sheets and given more homogeneous appearance to the area. The instruction applied for all houses covered with simple iron sheets in the city of Kigali. Some houses have been improved by recovering

lower parts of walls with carved stones or cooked bricks. Because of high density of construction, very few houses are fenced. Compound houses found in the village have the same characteristics and are mostly occupied tenants. Sometimes, landlords live in the same compound with their tenants. The density of construction has been increasing over time to the point that the area is seriously congested, but there was no modernisation. Because of high density of construction, one accesses his/her home after meandering through other houses. There is a high mixture: residential houses adjoin commercial houses and many of residential houses have frontage shops. People who have their income increase following of their business or the change in the working position in the public or private sector tend to move out the village for more comfortable neighbourhoods.

Interviewees and FGDs discussants said that the local climate has changed. The village is perceived hotter than in the past. This is quite understandable as the number of constructions have been considerably increasing and at the same time all trees were cut down. Heavy rains now cause damage to the houses. The risk can be higher since houses are old and made of non-durable materials.

### ***Water***

The village is provided with piped water by the national water utility, WASAC. Near all of houses in the village are connected water network. The very few ones without water in their premises buy it from public taps constructed by WASAC or from their neighbours. A jerrycan of water is normally paid RWF 20 at WASAC's. Individuals sell a jerrycan at RWF 50. The village is regularly served with piped water, however, in the long dry season (June - October), the village can experience water shortage for some hours a day. Water shortage of one day is considered as extreme, while other parts of Kigali can spend three weeks or even more without any drop in their taps. As water shortage is not a critical problem in the village, none of the residents have installed water tank. Rather they use to stock water in 200 l plastic tanks, and jerrycans. It is also common to collect rainwater that is used for domestic hygiene.

### ***Power used for lighting and charging mobile phones***

All houses in *Iwacu* are connected to the electricity grid. Indeed the village is one of the oldest area to have been provided with electricity and any new house was connected because the connection increases the values of the house either when selling or renting it. Electricity is used by all people for operating radio receiver and television, charging mobile phones and lighting sincemost of households are connected to the electricity grid. The monthly electricity bill varies largely depending on the electrical appliances used, the number of rooms and people living in the households. Each house in the same compound is equipped with its own meter. This was adopted by landlords to avoid disputes between tenants over top-up arrangements. Because of the prepaid system, people have difficulties in determining how much they pay for electricity since they can buy many times a month and do not keep records. Blackout are very rare compare to other parts

of Kigali. The mobile phone signal coverage is very good.

### ***Fuel used for cooking***

Charcoal is the most used fuel for cooking, however there are very few households who still use firewood. Charcoal has been in the village since early 1970s because it was considered as cleaner than firewood but also one sign of urban life style. Price of charcoal and firewood has been increasing. In present days, a sack of charcoal cost between RWF 7,000 and 8,000. In early 2000s, a sack of charcoal was sold around RWF 3,000. Poor households which cannot afford to buy a sack, usually buy small quantity when it is time to prepare meals. Restaurants use mostly firewood. Some people have specialised in charcoal vending business: they buy hundreds of sacks of charcoal and retail them. Sacks of charcoal are kept outside (see photo 5).



*Photo 5: Pile of sacks of charcoal in Iwacu*

### ***Toilet/Sanitation***

Near all houses in the village have a toilet. The most common type of toilet found is a pit latrine with paved slab. However, some very few houses are equipped with flushing toilets. People living in compound frequently share the same pit latrines. Houses with flushing toilets and the ones with pit latrines face the same problem when they are full because of high congestion. Since there is no free space, when a pit latrine is full, it is filled in with earth and stones, paved and converted into a new room. Consequently, a new pit latrine is dug in one of the existing rooms. This is a very

difficult task as the dug earth is the one to be used to fill in the used toilet. The high density of constructions and toilets creates incommodes residents as bad smell invades houses and frequently attracts flies. Access to adequate toilet is a crucial problem for the majority of Iwacu dwellers. This was acknowledged by all FGDs participants.

Due to the high density of constructions, waste water is generally evacuated through a network of rivulets, mixes with rain water and ends in Nyabugogo River. When there is heavy rain, the rivulets network spill over and water sometimes enters dwellings, and is source of disputes between neighbours. The group of elder females expressed the problem in the following statement:

*"Houses are very closed each other, we do not have space to dig sumps. Waste water passes in front of our houses, frequently deposits rubbish there, which creates disputes between neighbours. Then local leaders intervene and instruct us to better manage waste water. However, this is not possible because there is no free space."*

Iwacu dwellers are also annoyed by the open channel that drains waste water from Kigali central prison. This is critical especially in dry season when there is no water to sweep the wastes into Nyabugogo River.

Domestic solid wastes are put in used sisal sacks and removed by a private company. The monthly subscription to benefit from such service varies between RWF 1,000 and 3,000 depending on the household's *Ubudehe* category<sup>6</sup>. Restaurants owners and other trader peoples pay normally RWF 10,000 but they consider such amount very high. No solid wastes are found in along the paved road, because it cleaned on a daily basis.

All the groups acknowledge that sanitation is a serious problem in the area and that it should be addressed by the government.

*"The money we pay is too much. If the government could pay that company it will help people. We pay for waste and security it is really too much. You see that we have to pay for everything. In addition we have to pay for electricity and water."* (A man, 55 years old)

### **3.2.3. Livelihood and mobility**

#### ***Income generating activities***

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<sup>6</sup>*Ubudehe* Categorisation: All Rwandan households are classified into categories based on household's wealth. Currently, there are 4 categories: Category 1 comprises households that can hardly afford basic needs while the category 4 include those who own large-scale business, individuals working with international organisations and industries as well as public servants.

The main source of income in *Iwacu* village is petty commerce. This includes frontage shops, small bars and restaurants, foodstuffs and charcoal vending, small home-based enterprises (doughnuts, samosa and ball meat making) etc. Casual workers offer washing and ironing services and load carrying. Currently, retailers are grouped in cooperatives and their small businesses are now run in small shops rather than on the street as it used to be in past. Load carriers search for daily job in the *Quartier commercial* and *Nyabugogo* business centre where most of wholesaler shops are, and *Nyabugogo* main taxi park. Civil servants and workers in private sector rely on monthly salary.

### ***Services availability and income generating activities***

The village is well provided with public services: most of them are available, and the ones not found in *Iwacu* are easily accessible in the neighbouring villages. This is the case of banks, health centres, hospitals, schools, markets, taxi park, etc. The availability of public services attracts many people especially the ones with low and moderate income to settle in the village. For instance, electricity provision has contributed to the development of various activities such as restaurant services, welding, beauty salons, ironing services, etc. However residents said that ironing services has drastically declined because the market that used to sell used clothes has been demolished. Many of the traders who used to ask for ironing services have moved their business to other places. The closeness to *Nyabugogo* main taxi park has allowed young people to work as load carriers, selling soft drinks and snacks, guiding passengers, etc.

### ***Urban transport, mobility and income generating activities***

*"In this village, transport is not a problem, not at all, provided that you have money. Suppose when you are going to shop in the "quartier commercial" (the main commercial district of the city), you don't need a vehicle. A load carrier transports your goods at home or shop and you pay him, the same when it is from or to Nyabugogo market. It is easy for us. Moreover it is very easy to get a public bus or even a motorbike taxi"* (A woman, 33 years old)

Local transport is not a problem at all as the village is closer to *Nyabugogo* main taxi park. Moreover, public bus line that connects the main taxi park to the city centre passes nearby. Motorbikes are also available for use day and night. Load-carriers are also found in all corners of the village.

In terms of mobility, two aspects can be identified: one concerns regular commuting within the city and the other one is between Kigali and other places. For the regular commuting within the city, *Iwacu* dwellers use various means of transport. When they move around the village, they usually walk or in case of emergency, use a motorbike taxi. To travel to distant neighbourhood for work, friend visits or leisure, they use public buses. The fare varies according to travelled distance. It is on average RWF 200. *Iwacu* dwellers use public transport to travel outside the city. The fare

also depends on the travelled distance and is fixed by Rwanda Utility Regulation Agency (RURA) as it is done for the entire country.

*Iwacu*'s dwellers, especially the most recently established, still have strong ties with rural areas. There are some men who came in the village searching for casual jobs and leave their families in rural areas. When they gain money, they send some to their families or go back in their family for a week or some days to see how the family is coping with their absence. Relatives living in rural areas can also visit the person who came to the city. The duration of the visit varies considerably depending on the age of the visitor and the host's capacity to house the visitor. Children and young people can stay longer while usually spouses spend a week-end or four days. A wife's longer stay usually indicates that she is willing to stay in the city. Well-established families also still pay visits to their friends and relatives living in rural areas. Indeed the first generation of urban dwellers does not constitute the majority of the urban population.

Trade people from *Iwacu* also buy foodstuffs on rural markets and retail them in Kigali. Those who carry out such small business are mostly people freshly established in the city. Most People from neighbouring rural districts like *Rulindo* and *Kamonyi* also supply the village with fresh vegetables, sweet potatoes, chicken, etc. On the other way, retailers from *Iwacu* sell some products especially used clothes in rural markets (*Nkoto* in *Kamonyi* District, *Rwahi* and *Shyorongi* in *Rulindo* District, etc.).

Climate change has impacted on livelihood because, foodstuff price have been increasing because the climate change has resulted in the decrease of agricultural production. Of course where the climate has been normal, the variation of food stuff is not considerable.

#### **3.2.4. Future challenges**

*Iwacu*'s residents of have different views on the future of their village:

- All FGDs discussants and interviewees stated that, in 10 years' time, their village will be part of the new planned central business district (CBD) according to Kigali Conceptual Master plan. It will be occupied by multi-storeyed commercial buildings.
- Since the area will be business-oriented, all FGDs discussants and interviewees are convinced that the current dwellers will be compensated and instructed to move out. However, according to their say, they fear that the compensation will not be fair as it was observed in other similar cases. They would be happy if the government could substantively raise the expropriation tariff. The one currently applied does not allow expropriated people with small properties to acquire new land and dwellings. One member of the group of elder females complained in these terms:

*"I know we will be chased out the village. What we wish is that they (the Government or the city of Kigali) respect us and our properties, and then we move from here without any problem. As we call the compensation paid (for our belongings) 'ticket money', we wish that they pay us sufficient ticket".* (In other words, she is advocating for raising the compensation tariff).

Another woman interviewed said:

*"We are happy with this research, [...] I live here in Muhima cell, city of Kigali since more than 20 years. I agree with the re-development of the city, but what we need is to be well compensated in order to get other land parcels out of Kigali. Living conditions here in the city are very expensive and it is difficult to feed children and meet other basic needs"* (A woman interviewed, 46 years old)

- If the government or the city of Kigali cannot pay a fair compensation, the other preferred alternative would be the relocation of expropriated people in finished houses as it was the case for residents of *Kiyovucy'Abakene* (Kiyovu settled by low-income, a zone of *Ubumwe* cell in the same sector of *Muhima*). The poorest with very small properties were allocated new finished houses in *Batsinda*, a settlement developed by the city of Kigali.
- Asked in which neighbourhoods they would like to stay if this opportunity was offered to them, most of interviewees responded that they would like to live in well planned settlements like *Kibagabaga*, *Nyarutarama*, *Kicukiro*, etc. but they all recognised that it was not possible because of low financial capacity.

### 3.3. *Kanyinya* village

#### 3.3.1. Background

*Kanyinya* village is located in Ruhango Cell, Gisozi Sector, in Gasabo District. The village is built on a steep slope. The zone that was investigated extends from the paved segment road Kigali Independent University (ULK)-*Kinamba* to *Rwezangoro* valley. In front of the village is Muhima sector. Before early 2000s, the area was totally rural with few scattered households occupied by mostly by indigenous. Houses were small, old and occupied by aged people. The dominant activity was agriculture.

*"The settlement of this village is recent, it dates back 5 or 6 years. It is that time that the area has attracted many people. Even me, when I came to settle here the area was still rural. This zone is settled mostly by immigrants, indigenous are very few. Present residents originated from Cyangugu, others from Gitarama, others from Butare."* (The group of elders males).

Though the city was expanding quickly, people were not attracted to the village, because it was said that the office of the President was planned to be built on the top of *Gisozi*. When people came to know that this was not true, then they started to move in. The densification started after the construction of *Kigali Genocide Memorial Centre* in 2004. New migrants came then from rural areas and other parts of the city of Kigali that were expropriated for redevelopment such as *Kiyovu*, *Muhima* and *Kimicanga*. From since, the village was provided with infrastructures such as roads, electricity and piped water. The provision of those services attracted in-migrants but also some people from other parts of the city of Kigali. The village was not safe because it was not densely populated. The situation has improved over time with the continuous densification and tree clearing. The settlement developed in a haphazard way since construction was not controlled. The village is a recent slum under consolidation. According to the group of young females, for them, *Kanyinya* is still rural because there are many children per household. *"There are even women who have like 8 children and they are all still in primary schools"*. Indeed, the great number of children is one of the characteristics of rural families in Rwanda.

The village is as a slum built on a steep slope site, densely constructed dominated by houses of poor quality, poor sanitation and poor street network. *Kanyinya* is settled mostly by in-migrants.

#### 3.3.2. Land, Housing and Services

Until early 2000s, land was owned by indigenous. When migrants moved in, indigenous sold to them parcels of land over which small houses were erected. Gradually, agricultural land was converted in building plots sold to new comers. In early 2000s, it was possible to buy a building plot (20/30m) between FRW 300,000 and 400,000. By 2010, a plot of same size could be sold

more than 1 million RWF. Nowadays, the area is very densely constructed and anyone interested in acquiring building plots must purchase property that they can develop later. The price of the property is influenced by the size of the property, the building materials of the construction, the closeness to the road, etc. The price of property decreases more and more as one from the top to the valley.

The construction of houses has started near the main access road. After the first row of houses, a new row of houses was added by new arrivals, and so forth. Now construction have reached *Rwezangoro* valley. All trees have been cut down and all the slope is densely built. and progressively. The construction is done at very high pace, because parts that were not built in 2014 when we visited the area for the first time, was fully built in August 2015. The slum developed without problem though the area is visible from the city centre.

Most of the houses found in the village are of very low and low standards. They are constructed hastily with non well dried mud bricks as they are unauthorised. House owners start by building one or two rudimentary small room houses and occupy them before completion. The house is then extended later. The development of the slum is done by infiltration. Most of the houses found in the village are very small. Very few have more than 60 m<sup>2</sup>, even houses of less than 20 m<sup>2</sup> can be found near the valley. In such conditions, houses with more than two sleeping rooms are very few. They have walls are made of mud bricks or wood mud and shed roof covered with corrugated iron sheets. Many of them especially the unfinished ones, have earth floor and no ceiling. Though most of the houses have metallic windows and door frame, those with wooded doors and windows can be found. There are small compounds that have three or more houses. Such houses are mostly occupied by renters. The quality of houses decreases towards the valley. The area is so densely constructed that accessing one's house necessitates meandering between houses. Access paths are very narrow and eroded.



*Photo*

6:

*Overview of housing in Kanyinya*

In terms of housing development, the major change has been the eradication of thatched houses in 2010. Vulnerable living in such houses were provided iron sheet, and local leaders organised the fabrication of mud bricks and construction works. The density of construction has considerably increased and new small houses are being constructed near the valley because the upper zone is already completely built. As current regulations prevent illegal construction, new houses are built in hurry and their durability is not guaranteed as many of them have foundation made of mud bricks.

Local climate change is strongly perceived by *Kanyinya* dwellers. They said that their village is warmer than the time they settled. Springs located downhill have dried up meaning that the replenishment of underground water is no longer possible due to the increase of runoff and shorter rainy seasons. Excessive tree clearing has contributed to the change of the local natural environment.

### ***Water***

Water supply mode is dominated by purchase from very few households connected to WASAC piped water network. Several arrangements are possible: either households choose to share the monthly water bill or they pay each time they collect water from their neighbour. The normal price is RWF 20-30 per jerrycan. When there is water shortage, a jerrycan of water is sold RWF 500 transport included especially in the long dry season. Water from marshland is also used for washing clothes and cleaning houses. This contributes to lower down the water bill especially for poor families. *Kanyinya's* residents would like to see the area provided with a dense piped water network. In case this is not possible, they wish to have at least one public tap.

### ***Power used for lighting and charging mobile phones***

Most of households are connected to electricity grid and therefore, electricity is the main source of energy used for lighting and charging mobiles. The only houses not connected to the electricity grid are houses under construction. The area is regularly supplied with electricity, power outages are not frequent because the village is served by the power line that feeds *Kigali Genocide Memorial Centre*.

The mobile phone network coverage is very good and residents can access all services offered by all the three mobile phone operators. Mobile phone is used for calling, text-messaging, listening to radio and music, taking photos, and transferring money. Other uses are less frequent.

### ***Fuel used for cooking***

Charcoal is the most used fuel for cooking though some very few poor households still use firewood. The price of a sack of charcoal varies between RWF 7,000 and 8,000. Poor people

usually buy small quantity of charcoal, the unit of measurement being a small plastic bucket that cost RWF 200 or 300. The price of charcoal and firewood has been increasing over time. In early 2000s, people used also parched skin coffee beans from coffee factories and residues from carpentry as they were free. Since some years, those residues are now sold to artisanal bricks factories and therefore households cannot afford them anymore.

### ***Toilet/Sanitation***

The most common type of toilets found in *Kanyinya* are pit latrines. Most of them are rudimentary (See *Photo 7a*). They are very small and built with non-durable materials. Slab is frequently made of wood and earth, not cemented. Most households be in compound or not, share latrines and some have padlocks to avoid free access to strangers. Some families with moderate income and nice houses have indoor toilets. There are no public toilets in the village. In the lower part close to the wetland, the depth of pit latrines cannot exceed 3 m without reaching the underground water table. Digging pit latrines near the wetland is a serious problem since it contributes to water resources pollution. In general, there is no system to collect waste water. They are thrown in courtyard and flows naturally downhill in ravines (See *Photo 7b*).



*Photo 7: Sanitation: (a) an outside pit latrine (b) a ravine draining wastes*

There is a company which removes domestic solid wastes two times a week. Solid wastes are piled in sacks and carried to the main road where the company truck collects them. The monthly subscription is between RWF 1,000 and 1,700.

### **3.3.3. Livelihood and mobility**

#### ***Income generating activities***

*Kanyinya* is settled mostly by poor people who depend upon small businesses (petty commerce including small bars, cheap restaurants, selling cooked beans, charcoal retailing...) and casual jobs such as construction works, load carrying, street vending, etc. Owners of compounds rely greatly on monthly housing rental. Indeed, since the village is an informal settlement occupied by low income earners, housing rental price is very low compared to well-established neighbourhoods. Casual works are mostly found in mud brick making, and construction, but most of the casual workers search for job out of the village. Farming activities totally have been abandoned because the area has been fully constructed. The few employees working in public and private sector rely on monthly salary.

### ***Services availability and income generating activities***

Services like piped water, sanitation, electricity, and local transport are available in *Kanyinya* but no banks or financial institutions and health facilities are found in the area. The quality of public services affects decision to live in *Kanyinya*, even nearby. Residents have to go to the city centre, *Nyabugogo* or to a place called *Kinamba* (20 minutes walking-distance) to benefit from such services.

Certainly, provision of water and electricity have contributed to the attractiveness of the village. Availability of public transport and the closeness to the city centre also attracts people to settle in the area. Cheap living conditions (low rental housing price, low price of food) attract poor people to settle in *Kanyinya*. Because the village developed in a haphazard manner, it does not attract wealthy people who are looking for well planned settlements. The group of young people acknowledged that the availability of public services affects income generating activities. Thanks to electricity provision, new activities have been created in the village. These include beauty salons, milk selling, bars, grain milling, etc.

### ***Urban transport, mobility and income generating activities***

Reaching *Kanyinya* village is not difficult since a public bus line connects the area to the *Nyabugogo* main taxi park. The bus line is operational from 5:00 am to 10:00 pm. One-way fare is RWF 150. There is also a private investor who offers a shortcut to *Nyabugogo* via an improved natural water channel using small boats. The one way fare is also RWF 150. Young students in primary school and old people are transported free of charge. Young dauntless children also use rough wood raft to join *Muhima* and vice-versa via the waterway. People can also use motorbike taxi from or to the village.



*Photo 8: The shortcut water way to Nyabugogo Taxi Park*

As the village was established recently and mostly occupied by low-income groups, residents of *Kanyinya* have strong ties with other urban villages of the city of Kigali, but also with neighbouring and remote rural areas. Actually petty traders from the villages buy fresh foodstuffs either from *Nyabugogo* market or rural areas. Indeed there are some trade people who come to sell fruits, vegetables and condiments such pepper, tomatoes, etc to the vegetable market place located near *Nyabugogo* main taxi park. Some ladies from *Kanyinya* village also use to buy on rural markets foodstuffs that they resell in the city. There are also friend visit from rural to *Kanyinya* and vice-versa because people freshly established in the still have their properties and relatives in their native areas. Most of the casual workers daily move out the village to search for job as job there is no job opportunities in *Kanyinya*. people can walk for joining nearby villages, otherwise they use mostly public transport that is the most accessible mode of transport.

According to the interviewees and FGDs discussants, climate change has impacted on the *Kanyinya's* residents livelihood. The group of old males said:

*"For example last year people (2014), heavy rain have caused flooding of Nyabugogo and Rwezangoro wetland. Consequently all crops that had been grown in the two valleys were severely affected. People who have cultivated yielded very little quantity. This year (2014), people did not cultivate as they were afraid to experience the same damages. This is a big loss".* They also mentioned that *"climate change contributes to decrease of agricultural production in rural areas and consequently people from rural areas (relatives or others) come to search for job in the city. This affects Kanyinya dwellers because their arrival increases the number of job seeker, and when they decided to stay, housing rental price augments."*

Young females stated that climate change has contributed to the irregularity in water supply. Wood clearing has also contributed to the rise of price of firewood.

#### **3.3.4. Future challenges**

Most of the *Kanyinya's* residents believe expect to stay longer in the village. They have no fear of expropriation because the area is not among the most suitable sites for urbanisation in the city of

Kigali. If they were to be expropriated they would have heard about in several meetings held with local leaders.

For elder people, in ten years, the neighbourhood will be developed. They expect to stay in the area. For the group females, *Kanyinya* will be a gentrified neighbourhood. More affluent people will be coming in and poor people will be chased out. There already signs of such evolution. New rich comers buy houses in the village and upgrade them. The previous house owners then head to rural areas especially the Eastern province or other places not yet urbanised in the city.

For their comfort, *Kanyinya* residents would appreciate if piped water supply was made permanent. Water shortage especially in the long dry season obligates them to use polluted water from *Rwezangoro* river. Regular water provision is considered as the first service that deserve priority for improvement because without water, adequate domestic sanitation is not possible. They would like also to have an adequate street network to enable to access easily their homes. But this will be hardly feasible since the village has developed in a haphazard manner, unless some houses are demolished. but who will compensated the house owners? They would also appreciate to have a drainage system for waste waters and rain water. But this also looks like near impossible as for the street network.

Most of interviewees asked where they would like to settle in the city of Kigali if there was no financial or administrative constraints, said they would settle in *Kimihurura* or *Kacyiru*, or the top of *Gisozi*. *Kimihurura* and *Kacyiru* are neighbourhoods with some parts well planned and served by an adequate street network. This shows that people aspire to live in better conditions, and the ones who live in slums live there because they have no choice.

### **3.4. *Kibiraro* I village**

#### **3.4.1. Background**

*Kibiraro I* neighbourhood is located in Remera sector, Gasabo district at the foot of Nyarutarama hill. The settlement develops from the bottom to the middle slope over 32 Ha. Before 2000, the area was fully rural with very sparse houses. People living there were relying on farming activities. There were no public infrastructure. The area was not accessible by motorised vehicles, people had to walk. There were cattle kraals in the lower part of the village, this why the area was named '*Kibiraro*' that simply means "the place where cattle kraals are found".

When wealthy people began to buy land on the upper *Nyarutarama* in 1999-2002, people who lived there were pushed downhill in *Kibiraro* where they bought land and started a small informal settlement. As many wealthier people were coming in the upper *Nyarutarama*, the movement downhill continued. When *Kibiraro* was provided with electricity, then people from various parts

of the city of Kigali and remote rural areas rushed to *Kibiraro I*. Most of the urban migrants from the city of Kigali came from from *Rugando*, *Kacyiru* near the ministerial zone, *Kibagabaga*, *Gacuriro* and *Kimicanga*, area that were under re-development. The people The area developed considerably to become a new urban informal settlement.

*Kibiraro I* is a slum, built on the lower part of *Nyarutarama*. Most of its residents originates from South-Western part of the country, and others came from other parts of the city of Kigali and other regions of the country.

### **3.4.2. Land, Housing and Services**

All new comers in *Kibiraro I* acquired land through purchase. In early 2000s, as there was plenty of unoccupied land, the price of a building plot (20/30m) was very low. According to one interviewed people the estimated between 30,000 and 50,000 RWF. People thought the urbanisation of the area would delay because of the distance separating *Kibiraro I* and the city centre. Very few people could believe that the upper *Nyarutarama* had to become upscale neighbourhood capable of attracting many people and business. Following the rapid modernisation of *Nyarutarama*, land price increased upward since as there were many people heading into *Kibiraro I*. The late comers have bought building plots near 1 million RFW even more for building plots located near the road. Currently, the settlement is totally occupied. Any individual now interested in acquiring land has to buy a property and eventually re-develop it.

*Kibiraro I* is a slum. Most of houses, except the ones located along the road segmented separating the village and the upscale *Nyarutarama*, are small single-storey houses and of very low and low quality. The smallest houses have between 10 and 30 m<sup>2</sup> and have 1 or 2 small sleeping rooms. They have walls made of mud bricks sometimes cemented and shed roofs covered with light corrugated iron sheets. Some roofs are made of makeshift and fixed with small stones. Iron sheets have been painted in red to hide rusty iron sheet and to give a homogenous appearance of new roofs as this was instructed by the city. Stones have been placed on roofs of some houses to maintain iron sheets in place. Door and window frames are metallic with white transparent glasses. Because the housing development was done in haphazard manner, accessibility of houses is very difficult. Continuous enlargement of the initial house or construction of new houses has congested building plots. Very few houses have kitchen, as most of households simply put their charcoal-stoves outside the house in front of the door.

As it appears on *Photo 9*, additional construction have permitted the creation of compact compounds over small building plots. Such compounds are occupied by tenants but sometimes the landlords live also in the compound. According to the interviewees, it is a small landlordism since house owners have three or four small rented houses. The area is very congested, and accessing one's home is only by meandering between houses. Small shops and frontage shops also adjoin residential houses. This extreme mix of commercial houses and residential houses also

disturbs residents especially when some shops sell beers. Bars are source of noise. On average, housing is not adequate. *Kibiraro* village contrasts with the upscale neighbourhood under development in the background of *Photo 10*.



*Photo 11: Overview of houses in Kibiraro I*

### ***Water***

*Kibiraro I* village is connected to WASAC piped water network. Some dwellers have water in their premises and households without water buy it to public taps. A jerrycan of water is sold normally RWF 20. Some poor dwellers use also water from the wetland. The first water tap constructed in *Kibiraro* was financed with RWF 600,000 given to the village under ‘*Ubudehe*’<sup>7</sup> programme. This is state money given to villages to solve some programmes they are facing. In this case, it was decided to use the amount received for a the installation of a public water tap. The neighbourhood is permanently supplied in piped water, water shortage is rare.

### ***Power used for lighting and charging mobile phones***

In *Kibiraro I*, all the houses are connected to the national electricity. The group of elder males

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<sup>7</sup> *Ubudehe* is a governmental poverty reduction initiative which provides communities with the skills and support necessary to engage in problem solving and decision making for their development. Usually a non refundable amount of FRW 600,000 is availed to each village to support the community project agreed upon. When there is no pressing need, the money is usually given to the poorest residents who are asked to invest the money received in income-generating activities.

reported that each household paid RWF 46,000 to get the low voltage power line in the village. *Kibiraro* dwellers are satisfied with electricity supply since blackouts are not frequent compared to the other places in Kigali. Therefore electricity is the most used source of energy for lighting and charging mobile phone.

The mobile phone signal coverage is very good as stated by interviewees and all FGDs discussants. They can always access services offered by all the three mobile phones operators. As in other parts of Kigali, mobile phone is used for calling, text messaging, transferring money, listening to radio and music, taking photos, etc.

### ***Fuel used for cooking***

Charcoal is the most used fuel for cooking. The charcoal retailed in *Kibiraro I* is brought from Western Province. A sack of charcoal costs around RWF 7,000-8,000. Some people buy huge quantity of charcoal and then sell to retailers. Households who cannot afford to buy the whole sack, purchase the small quantity needed to prepare their each meal. Usually charcoal is retailed using a small bucket and poor people buy according to their pocket.

### ***Toilet/Sanitation***

Almost all houses in *Kibiraro I* village have toilet. The most type of toilet found in the village is pit latrine. Compound have frequently one shared pit latrine. The latrines are very small and rudimentary: they have walls made of mud bricks not always cemented, and are covered with pieces of patched old iron sheets. The floor is made sometimes of bare timber. In the lower part close to the wetland, the depth of pit latrines hardly exceed 2 m since the underground table is not far deep from the surface. Latrines are generally of poor quality.

There is no system to collect and to proper channel waste water in the village. Waste water is routed through connected narrow channels from house to house until it reaches the wetland. The evacuation of waste water is very problematic especially during the rainy seasons, because of the huge quantity of rain water mixed with rain water, the rudimentary channels spill over and water frequently enters houses. Consequently, the absence of appropriate waste water drainage system contribute to disputes between neighbours.

*" Kibiraro village is a very congested slum settled in haphazard manner. We do not have a drainage of waste water. This creates disputes among neighbours when one throws water in front of the neighbour's house. And it is not hygienic by the way. So, we wish that the*

*government help us to construct modern sewerage that can enable us to better manage waste water and rain water." (The group of elder females).*



*Photo 12: (a) Channel for the evacuation liquid waste and rain water. (b) Solid waste piled in sacks waiting the truck that will transport them to Nduba dumping site*

Domestic and commercial solid wastes are collected and transported by a private. Each household and shop piles its waste in a sisal plastic sack and someone takes the sack to a grouping site. Then load-carriers of the company load the wastes in a truck company which transport them to *Nduba* dumping site. removes the domestic solid wastes. The monthly subscription varies between RWF 1,000 and 5,000 according to the household socio-economic status, while vulnerable households are exempted. However, those who live near the valley do not pay the monthly subscription. They throw their domestic wastes directly in the wetland, and this increase water pollution.

Sanitation has been ranked the first public service that needs improvement by all FGDs discussants and interviewees especially for evacuation of liquid waste and solid wastes. many households use to place sack of solid wastes near outside their premises while waiting the day of removal of solid wastes. They are then sources of bad smells that disturb residents and attract flies. In the second place comes water and electricity regular supply.

### **3.4.3. Livelihood and mobility**

#### ***Income generating activities***

*Kibiraro I* dwellers comprise mostly carpenters, casual construction workers, retailers, taxi and motorbike drivers, repairers of electrical appliances and other materials etc. Some dwellers also move around the city for vending fruits and vegetables on the street. The group of elder males mentioned that the village accommodates female sex workers who offer sex services in vibrant

corners of the city of Kigali. On average, most of *Kibiraro* dwellers are low income earners. Civil servant and people working in formal private sector are rarely found in the village.

### ***Services availability and income generating activities***

In the first place, *Kibiraro I* has become a congested slum because when public services were provided, people rushed to settle in the village. The availability of piped water and electricity has contributed to the creation of new income generating activities such as small beauty salons, small bars, water selling, DVD films/music burning and distribution etc.. This has attracted people with those small businesses to settle in the village.

### ***Urban transport, mobility and income generating activities***

*Kibiraro's* dwellers are satisfied with local transport. Indeed, the area is served with public transport bus line that operates from 5 am to around 10 pm. Motorbike taxi are also available. However, motorised transport inside the neighbourhood is not possible due to the constructions congestion. As stated earlier, there is no free space that can be used by a car nor even a motorbike. Therefore, repairing houses is very difficult as building materials have to be brought on head. Apart from the high in-migration occurred in past years when the village was put in place, the current mobility is dominated by people who sell their properties and head to neighbouring places such as *Kinyinya*, *Gasanze*, *Bumbogo* and *Gisasa*. All these destination places are in Gasabo district meaning that those who leave the village do not go far in the countryside but prefer to establish in the periphery of the city. This is perhaps because they do not want to lose the above mentioned subsistence activities.

Concerning interaction with rural areas, *Kibiraro I* village gets almost all of foodstuffs from rural areas particularly sweet potatoes, *Irish* potatoes, cassava and beans. People from rural areas use to bring foodstuffs to their relatives and friends but also there are residents who do it as a business. Indeed, foodstuffs sold in the village are brought mostly from the Eastern Province. However, the links with rural areas are also characterised by job searching. For example masons from *Kibiraro* look for construction jobs in nearby rural areas. There are also friend visits on both sides from and to rural areas.

#### **3.4.4. Future challenges**

*Kibiraro* dwellers have different views on the future challenges awaiting the village. Some of them are listed below:

- In 10 years, residents of *Kibiraro I* see the area modernised. In that time, most of them are convinced they will have been expropriated and will have moved out of the village. The group of elder females fear that they will not be able to acquire building plots in

neighbouring villages because they are also modernising quickly. Therefore, building plots will be very expensive and not affordable for them. According to *Kibiraro* dwellers, the only future destination would be remote rural areas, but it will be very tough for them to cope with rural lifestyle after having been exposed to the urban one for several years.

- Conscious that poor sanitation engenders discomfort for all the village residents and is source of pollution that leads to the spread of diseases, all the FGDs discussants emphasized that if no attention is given to solving problems linked with wastes removal and evacuation of waste water, the area can be very exposed to various diseases.
- They also reported the need to have a nearby nursery and primary school for their children given that they have to travel for long distances to reach such schools;

### 3.5. *Muhabura* village

#### 3.5.1. Background

*Muhabura* village is located in Kivugiza Cell, Nyamirambo Sector, in Nyarugenge District. The village is also commonly referred as Tent-Temporary-Permanent (TTP<sup>8</sup>) *Muhabura*. The village is a planned settlement which expands on a high steep slope of Kigali Mount facing the centre of the city of Kigali.

Before 1997, the area was forested with *Eucalyptus* mostly. It was not occupied and belonged to the State. In the programme TTP, that year, surveyors of the city of Kigali demarked building plots. There were no infrastructures and though roads were marked, they were not constructed. *Muhabura* TTP was established in 1997 by the government of Rwanda through the TTP program aiming at providing building plots to old case returnees<sup>9</sup>. Some of them had occupied houses left by those who fled the city after Rwanda Patriotic Front (RPF) took over Kigali on the 4<sup>th</sup> July 1994. When they came back massively from neighbouring countries, their houses were occupied and they had nowhere. To solve this problem, the government of Rwanda initiated the TTP program. Old case load returnees who benefited from TTP program were allocated building plots by the state free of charge.

The first settlers started by fixing tents that were provided by NGOs or the State. After six months, tents were replaced by rudimentary small shelters. Most of them had walls made of wood-mud and covered with corrugated iron sheets. The size of such shelter was around 45 m<sup>2</sup>. Therefore, they could plan the construction of the main house made of long lasting or semi-durable materials such as mud bricks, stabilised compressed earth blocks, cement bricks, cooked bricks, etc. All beneficiaries were instructed to have built permanent houses in 3-4 years' time. As some of the beneficiaries were vulnerable and could not finance the construction, the State helped old load returnees by providing some building materials such as timber, and iron sheets. In most cases, plots terracing and mud bricks making were done through the community works as well as the street network terracing. Later, TTP dwellers themselves improved and extended the road network.

*Muhabura* dwellers acknowledge that there is local climate change. This is perceived in through the decrease of rainfall and local weather warming. In addition, the conversion of the area into a residential village has contributed to deforestation as indeed, it was impossible to construct houses without cutting down trees. As a result, houses are exposed to wind force and some of them have cracks in the wall.

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<sup>8</sup> TTP is a Governmental programme that was aiming to provide building plots for old case returnees to enable them to establish in urban areas especially in the city of Kigali.

<sup>9</sup> The 'old case returnees' or the '1959 refugees', refers to the return of many Rwandans who had fled the country in 1959s and came back to Rwanda massively in 1994-1995.

### 3.5.2. Land, Housing and Services

In *Muhabura* village, all plots of land was officially allocated by the city of Kigali and land title registered. This did not prevent some dwellers who were settled by the state, after realising that they could not afford the urban lifestyle, to sell their properties to other people and then headed to the rural areas. As elsewhere, land price was influenced by the size of the plot and the closeness to services like access roads, water pipe and electricity.

Given the fact that the settlement was established through a state financed program, the three steps have seen construction of a medium standard house at the end. The process followed the following steps:

1. *Tent* : within around three months, residents who received building plots were asked to plant tents in their respective plots;
2. *Temporary*: Build an annex small building using non-durable materials within a period of six months;
3. *Permanent*: Construct the main house with durable materials that comply to the regulations of urbanisation within six following months (MINITERE, 2000, p.10).

On the average, houses in the area are medium standard as many of them have walls made of mud bricks roughcasted and sometime painted, and gable roof covered with light corrugated iron sheets. Nowadays, modern and large houses with wall made of cement blocks or cooked cements with cross-pitched roof covered with modern iron sheets are being built in the village. Plots are fenced with mud bricks, cement blocks or plant.

#### **Water**

*Muhabura* village is connected to the piped water network. However, residents reported that water supply is erratic. In fact, the area spends three weeks or even more without any single drop in the pipes especially during the long dry season. The rare cases the village is supplied with water, it is frequently in the late night hours and without any prior information. Therefore, people have to wake up time to time checking if there is water. Some families even leave the tap open with a container expecting to get water. When water comes, it never extend beyond two hours and flows with very low water pressure. This is partly understandable given that the village is situated at high altitude (1800 m above sea level) and on a very steep slope. Some residents have installed water tanks and sell the precious liquid to their neighbours, but they never secure enough water. At the end they also end by running after potable water when the tank is emptied.

When by any means water is over in the village, people fetch it far away. *Muhabura* dwellers frequently fetch water in lower parts of the city near the Kigali Regional stadium. When this area

is not served with water, people then travel farther to *Biryogo* or even *Rwampara* villages. Return travel takes more than three hours. It is very exhausting as those alternative sources of water are located downhill. There, water is also very costly as a jerrycan can cost between FRW 400 and 500 even more. This includes of course the price of water and the cost of transport.

*"... We wait for WASAC to supply water, otherwise when it is over in our tanks because of the toilets, we buy in town or from people who sell it RWF 200 or 400 jerrycan. Price has been increasing because when we came to settle here a jerrycan of water was sold only 50 RWF. Just to let you know how crucial this problem is, my neighbour who has a baby sometimes pays a jerrycan of water even RWF 800 when she need urgently to clean the baby "* (A woman interviewed, 43 years old).

Some households have engaged young load-carriers whose jobs are to supply water while in others, people use their cars to fetch water. Hence, regular water supply and public transport have been identified as the public service that need to be prioritised for improvement. Water supply is a serious problem in *Muhabura* and consequently, the population wishes to see that problem solved.

#### ***Power used for lighting and charging mobile phones***

The first residents who settled in *Muhabura* organised themselves to get the village connected to the electricity grid and now almost all houses are connected. Each household contributed financially. Therefore, most of households use electricity for lighting and charging mobile phones. The area faces sometimes power outages but it is not excessive. In case of electricity outage, people use lamps, candles and torches of mobile phones for lighting.

There is a very good mobile phone signal coverage in the village and the residents have permanent access to services offered by all the three mobile operators, provided that one has enough credit on his card. People use mobile phone primarily for calling and text-messaging but also to listen to radio and music, transferring money, lighting, etc. Young people use also mobile phone for playing games and watching movies.

#### ***Fuel used for cooking***

Charcoal is the most used fuel for cooking in *Muhabura* village, though some very few households still use firewood. When the settlement was established in 1997, firewood was the most fuel used for cooking because the area still forested, but following the continual deforestation, firewood has been decreasing and consequently gradually left out for the charcoal. A sack of charcoal costs between RWF 7,000 and 8,500 but people with limited financial capacity can also buy small quantity on bucket where they pay between RWF 250 and 350 depending on the size of the bucket. The price of charcoal has been rising up as in the rest of the city. This has of course impacted on the cost of life.

### ***Toilet/Sanitation***

In *Muhabura*, each household has its own latrine. Most of them are pit latrines, and as reported by participants in FGDs, having a flushing toilet is of no utility given that water supply is erratic. Waste water and rainwater are mostly channelled to the sump dug within the compound. This is in line with the city of Kigali's instructions according to which that all households should retain its water runoff in sumps to avoid damages to the next houses located downwards and minimise disputes between neighbours. For some households, waste water is also thrown in the garden.

There is a private company that removes domestic solid wastes, AGRONI. Usually there are filled in in sacks and kept in one corner of the plot waiting when the truck will pass to collect them. The monthly subscription to benefit services from the company varies between FRW 1,000 and 2,000 depending on the quantity of wastes produced. Domestic biodegradable waste that are not removed by the company are used as fertiliser in gardens.

### **3.5.3. Livelihood and mobility**

#### ***Income generating activities***

Apart from small frontage shops, almost all residents of *Muhabura* have their jobs outside the village. Most of them are civil servants working in different public institutions (mostly military and policemen), and others work for the private sector in the city centre and other neighbourhoods of the city. Public servants and employees of the private sector leave the village early in the morning for work and return late in the evening. Others, most of them young, are employed in small business outside the village. These work in beauty salons, retailing shops, etc. Most of women stay at home handling households' daily activities and for some, running small frontage shops.

#### ***Services availability and income generating activities***

The quality of public services affect decision to live in *Muhabura* village. For instance people are not keen to rent houses in the settlement because of erratic water supply, and lack of public transport. It was also reported that when people living in the area buy a car, and his house is not reachable by road, they move out even when they own their own houses. However, as there are very limited income generating activities within the village, the availability of public services has little impact on the livelihood of *Muhabura* dwellers. The only exception highlighted by all respondents was for the public transport. Indeed, people working in the city and elsewhere need public transport closer to the village, especially in morning and evening hours.

#### ***Urban transport, mobility and income generating activities***

The village is peripheral, on a steep slope and suffers from poor transport services. Though recently the area was provided with access roads, there is still no public bus line connecting the village to the city. It takes around 20 minutes for residents to reach the nearest terminal of public bus transport, therefore, they use private taxi cab and motorbike taxi that they call to pick them up from their homes. Many people prefer to take motorbike taxi as it is cheaper than the taxi cab.

#### **3.5.4. Future challenges**

As mentioned above, there are two major critical challenges for the development: these are erratic piped water supply and provision of public transport. The village is built at higher elevation and on steep slope and consequently is not easily supplied with piped water. Therefore, some residents leave the place for other neighbourhood better served with piped water supply. There is also a need of a public transport line that cross the village to enable the residents to connect easily with other villages.

*Muhabura's* residents expect their village to become the hub of tourism activities in Kigali because of the presence of *Fazenda Sengha Horse breeding and riding*, a private recreational establishment where visitors can ride horses, play badminton, *pétanque*, archery, trampoline, etc. The village can also take advantage of its elevation that allows a panoramic view of the city of Kigali and other parts of the country. Nonetheless, they call upon authorities to make plans for reforestation of the area where trees have be cut down so as to ensure fresh air and maintain cool weather.

Given the fact that the settlement was established with full support of the city of Kigali, residents have no fear to be relocated as it has been the case in other villages throughout the city.

### 3.6. Nyakabungo village

#### 3.6.1. Background

*Nyakabungo* village also commonly known as *Batsinda* settlement is located in Kagugu Cell, Kinyinya Sector in Gasabo District, about 15km from the city centre. The village is established on a moderate slope towards the northern part of the city of Kigali. The site was designated to accommodate people relocated from from *Kiyovu cy'Abakene* (Kiyovu informal settlement settled mostly by low-income people) zone<sup>10</sup> that is planned to become part of the new CBD. Between 2005 and 2008 some 362 households were given a choice of accepting compensation and moving elsewhere to a place of their choice; or investing their compensation payment in acquisition of a new house in *Batsinda* settlement. A total of 120 households chose to move to *Batsinda*, whilst others moved to other neighbourhoods within Kigali and a few relocated to rural areas.



*Photo 13: A typical house in Batsinda settlement*

The settlement was developed in an area that was formerly rural, but was *de jure* part of Kigali city. The village was dominated by farming activities with little infrastructure. The city of Kigali compensated the previous land owners and then built 250 houses for relocation low-income households to be removed from informal settlements located near the city centre. There was no electricity, no water pipe and very poor housing but nowadays, the built environment has changed.

According to the residents, the most distinctive characteristic of the area is that living conditions are affordable to the low-income earners in the city. A man interviewed (46 years old) said:

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<sup>10</sup> Kiyovu area: a former informal settlement adjoining the city centre. It has been expropriated in 2005 to give place to well-prepared construction plots planned mainly for commercial buildings.

*"The village is a cheap place, the food is cheap, and the housing is cheap. People can rent a small house at around RWF 8,000. Indeed there are of course expensive houses but for low-income renting a house is not a big challenge."*

Respondents consider that the village is developing given the changes in housing quality and infrastructure provision, and the fact that the area continues to attract more rich new comers.

Residents of the area consider that local climate has changed: weather is becoming hotter and dry season longer. Dust from the earth road invades houses causing indoor pollution. There is also dust deposit on houses' roof.

### **3.6.2. Land, Housing and Services**

With the modernisation of the city of Kigali that started by 2005, the city decided to start a Model House concept in *Batsinda* for relocating expropriated people from informal settlements, starting by the central ones. The city planned to construct around 1,000 low-cost homes using local materials including timber stabilised compressed earth bricks, but less houses were built. Most of the built houses were initially by low-income households relocated from *Kiyovu*, an informal settlement located near the city centre. Relocated households were given the property at a total cost of 3.5 million RWF. As most of the residents totalling much less than this, Kigali City Council facilitated the residents to have loans and reimburse banks in instalments. With time some of the beneficiaries have sold their houses and moved out from the village. The value of the property is currently estimated at 9 million RWF. In the village itself, it is not possible to purchase land. In the surroundings, the cost a building plot (20/30m) is around 4 million RWF.

As of housing quality, most of the houses if not all of them, are of the medium standard. First all of the size of the building plots and the house was small. The layout of the house adopted the typical Rwandan house. The house was composed of two parts: the main houses and the kitchen with a surface area of 36m<sup>2</sup> and 15m<sup>2</sup> respectively, this is a total of 61 m<sup>2</sup>. Secondly the building materials used are semi-durable: the wall is made of compressed stabilised earth bricks that were not roughcasted, the frame of the shed roof was made of timber and the roof is covered with corrugated white iron sheets. The floor was paved but houses had no ceiling. Thirdly, houses had wooded door and window frames while the general trend is to have the metallic. Fourthly, were the typical house had only two sleeping rooms, while beneficiaries wished to have more sleeping rooms that could accommodate the all family. Those are some physical characteristics of the initial houses that beneficiaries were not satisfied with. But this is some too much demanding as some of the people who benefited from the programme were not living in houses of the same quality, but also the house had additional equipment. According to the groups of elder participants, most of the houses are of the medium standard while young people consider them of low quality. This difference in perception might stem from the comparison elder people have with their former dwellings. Young people compare the neighbourhood with luxurious mushrooming houses in

many places of Kigali. Moreover, houses have been improving from the ones bought to the city of Kigali. Changes were observed in modernising the houses especially the roof and adding more rooms, constructing fences as well as provision of infrastructure such as water, electricity, roads, etc.

### ***Water***

In Nyakabungo village, most of the residents buy water from public taps and others have piped water in their houses. Piped water is provided by the public utility, WASAC. When the village experience piped water shortage, people fetch water in neighbouring villages or collect water from springs located downhill. It is important to note that most of the houses in planned Batsinda are equipped with plastic tanks for rain water harvesting that were provided by the city of Kigali at the time of the construction of the settlement. Piped water is irregularly supplied especially during the long dry season. Respondents reported that water supply by WASAC is uncertain as water can be supplied only once a week, the situation can even be worse. In such case water supply becomes a big problem since people can pay 200 Frw for a jerrycan of water.

In *Nyakabungo* as in all urban areas as well, climate change also has contributed to the increased water shortages because underground water is not replenished, leading to water scarcity and increase of water bill. In dry season, a jerrycan can cost up to FRW 400 while it would normally costs RWF 20.

### ***Power used for lighting and charging mobile phones***

All the houses are connected to the electricity grid, and therefore all of them use electricity for lighting and charging mobile phones. When there is power outage people use electrical torches and mobile phones to light. Solar energy, generators, candle, kerosene lamp, paraffin and biogas were not reported to be used in lighting or charging mobile phones. Most of the respondents are not satisfied with electricity supply because of frequent outages which can even last several hours.

The area is well served with mobile phone signal coverage. Residents acknowledge that they receive the signal of all the three mobile phone operators namely MTN, Tigo and Airtel. In household there is at least one person who owns a mobile phone. Mobile phone is nowadays considered as a basic need. The mobile phone is used for calling, text messaging, listening to radio and music, etc. Business people use also mobile to declare taxes due to Rwanda Revenues Authority (RRA).

### ***Fuel used for cooking***

With changes from rural to urban area, *Nyakabungo* dwellers have been shifting from using firewood for cooking to charcoal. However, some few residents are still using firewood. Charcoal

and firewood are both bought. According to participants in the FGDs, price of charcoal has been increasing over time, currently a sack of charcoal costs around RWF 8,000. In the planned area of *Nyakabungo*, houses are equipped with biogas system but the installation is incomplete and therefore not used.

### ***Toilet/Sanitation***

All households have private pit latrines. Very few have flushing toilets. The particularity of the houses built by *Batsinda* settlement program is that the hole is not directly under the toilet which necessitates the use of water even though they are not flushing as such. Latrines are attached to the same roof as the main house but their doors look the other side.

Most of households use either waste water channels or sumps to get rid of waste water. Houses in *Batsinda* settlement were equipped with sumps for waste water disposal but it was observed that some families throw waste water on courtyard and on the earth road to reduce the dust. Indeed, the morphology is that some houses' roof is situated at the same level as the access road which causes dust to be spread out. Domestic solid wastes are removed by a private company. To benefit of its service, each household pays RWF 2,000 per month. Solid wastes are removed two times a week and all participants in the FGDs convened that they are satisfied with the service rendered. However, few households dispose waste in their small gardens near their houses.

### **3.6.3. Livelihood and mobility**

#### ***Income generating activities***

As stated earlier, most of residents of *Nyakabungo* village came from *Kiyovu* and other areas within Kigali that have been redeveloped. Indigenous have been pushed out as they sold their lands to building plot seekers. Before the development of *Batsinda* site, the area was settled mostly by cultivators whose living conditions depended upon farming activities. Now, casual works in construction and retailing commerce are somehow the ones prevailing. In addition, some houses which were formerly residential have been converted in commercial for rent.

#### ***Services availability and income generating activities***

The availability of public services is very much linked with the establishment of *Batsinda* settlement. It is when all public services were provided because before, the area was completely rural and somehow isolated from the city. Nowadays all basic public services are found in the area namely piped water, electricity, and local transport. From then on, the availability of public services has been an important factor that attracts new dwellers in the village. It is important to mention that the city of Kigali's instructions do not allow commercial activities within *Batsinda* settlement, thus it is strictly for residential purpose. Nevertheless, the provision of public services

has contributed to the creation of income generating activities all around the settlement. These include beauty salons, welding, carpentry, grain milling, bakery, vending of mobile services, transport services, etc. However, irregular supply of some of public services hampers those activities. For instance, when there is power outage, salons, welding, carpentry, and grain milling activities are stopped.

### ***Urban transport, mobility and income generating activities***

As for the other public services in *Nyakabungo* village, transport services have been boosted by the establishment of *Batsinda* settlement. The main road was constructed especially to allow supply of the site in building materials but has then been maintained as main access road to the village. The road is not tarred, very dusty during the long dry season and muddy during the long rainy season. During the FGDs, apart from the group of elder males who were moderately satisfied with local public transport, other groups were fully satisfied. According to the later, buses are available all time of the day though they have to walk around 15 minutes to reach the terminus of the line bus. There is also a straight bus line to *Nyabugogo* main taxi park from where they can link up to any corner of the city and parts of the country. People use also motorbike taxi to move from or into the area. The village is mostly supplied in fresh foodstuffs from rural areas, but also people from rural areas purchase some products for their domestic daily use in *Batsinda*. Other movements include relatives and friend visits both from and to rural areas.

According to interviewees and FDGs discussants, climate change contribute to the decrease of agricultural production and consequently, people move from rural to urban areas where they are lodged by their relatives and friends. Therefore, they become a burden for the hosting families especially during the time they are looking for jobs.

#### **3.6.4. Future challenges**

Present problems that have been reported to worsen in the future if nothing is done to solve them are piped water supply and roads. The group of men mentioned water supply while for women, road should be tarred and widened so the dust and traffic jam can be alleviated. The village should be provided with playgrounds and entertainment places, schools and hospitals. Such infrastructures and amenities are missing in the village.

For most of the residents, in 10 years' time, *Nyakabungo* village will have been gentrified. The current residents are aware that given the observed trends observed, they will not stay in the village. There are already clues that show that multi-storeyed buildings will be erected in that area. The development of the city of Kigali is likely to be oriented in that direction because of flat terrain.

## **4. Musanze town reports**

## 4.1. *Mugara-Nduruma* villages

### 4.1.1. Background

*Mugara* and *Nduruma* villages are located in Muhoza Sector, on the South edge of Musanze town. The study area is composed of two villages: *Mugara* and *Nduruma*. A large portion of both villages is located on a steep slope with a good view over the town and volcanoes, and are close to Musanze taxi park. *Mugara* is still under development while *Nduruma* is well established.

Before 2010-2011, *Mugara* village was fully rural with scattered settlement and thatched houses were still found there. Farming activities were prevailing. Some houses were covered with light whitish iron sheets but there was still traditional hatched houses dispersed in family banana plantations. Dwelling units were connected each other by narrow and sinuous paths. Some residents of the village had planted *Eucalyptus sp* as a way of valuing their land because that *Eucalyptus* is a tree species that grows quickly, used in construction but also as firewood. The demand was assured since the town was nearby and was developing but in other directions. As the village was not equipped with any public infrastructure, it did not attract the in-migrants, and was therefore settled by native who had a rural lifestyle so far though located within *de jure* legal urban perimeter. Because of sparse settlement, cases of theft were frequently reported.

The settlement of *Mugara* started in 2010 - 2011 after the master plan of Musanze town was approved. From that time house owners were prevented to repair or upgrade their dwellings. Any improvement of the existing dwellings requires formal approval by the district. Some residents of informal settlements mostly *Ibereshi* were then convinced that they will be compensated and asked to move out. This fear was confirmed when substandard houses were red-marked "*Towa*", that means the house has to be demolished. Anticipating the implementation of the town master plan, house-owners of substandard houses in *Ibereshi* sold their properties to rich people, and in turn purchased land in *Mugara*.

*Mugara* was preferred to other peri-urban areas for three main reasons. First of all, *Mugara* was planned to become the site of a new village under the villagisation policy. Indigenous who were living in scattered settlements were instructed to move to that place. Relocation was also encouraged by officials for security reasons during the fight against rebels infiltrated from Congo. In their mind, *Mugara*' and Musanze town's residents had the conviction that, sooner or later, the area would be provided with basic infrastructure such as electricity, piped water, street network, etc. Secondly, there was plenty cheap land as the area had not been fully settled. Thirdly, because *Mugara* was the site of a new village, people could use construction materials they could afford without any fear to see their houses demolished by the district. Consequently, migrants from other parts of neighbouring sectors especially from *Rwaza* (Musanze district), *Vunga* (Nyabihu district), etc. acquired land in *Mugara* and settle there.

*Nduruma* village was also rural until early 1990 with the same characteristics as *Mugara* and was settled by native. But after 1994, because the village was sparsely occupied and there was much non built land, some of old case load returnees went to settle there. As usually, the price of building plot was negotiated between the landowner and the plot seeker. After the approval of the Musanze master plan, *Nduruma* also attracted residents from other urbanised neighbourhoods of Musanze, especially those who sold their properties to rich people interested in property development under Musanze master plan. Most of the people in *Nduruma* who sell their properties to new comers migrate to the Eastern province, where they can acquire wide land parcel for farming activities.

Currently, according to the residents of the two villages, the area has undergone tremendous good changes. First of all, thatched houses have been eradicated, houses covered with corrugated iron sheets and walls made of roughcasted mud bricks are the most dominant. Secondly, both villages have been provided with basic infrastructure such as electricity, piped water some access earth streets. Thirdly, there is also densification of construction in *Mugara* while *Nduruma* is fully constructed. Fourthly, the two villages are not longer settled only by farmers, but also trade people, construction workers, load carrier, etc are found there. Lastly because of the increase of population density, cases of theft has declined except in *Mugara* where some cases of robbery are reported.

The densification of population and constructions has contributed to the local climate and environmental change. According to the residents, the local climate is getting warmer than in the past. For them, the indoor temperature has increased to the point that in dry season they have to keep windows and doors open for cooling the house inside. The increase of the population has also led to the decrease of wooded area and considerable augmentation of built-in space.

#### **4.1.2. Land, Housing and Services**

Like in many other urban places, legal land ownership is a prerequisite to construct one's home in *Mugara* and *Nduruma* villages. Most of the current residents bought their building plots from the previous landowners. As for land, the price of building plots is always bargained between the land seeker and the landowner sometimes in the presence of two or three witnesses from each side. Once the settlement and the payment are done, the land right is recorded at the district land bureau. Indigenous continue to acquire building plots through the inheritance process but this has considerably declined as many of indigenous do not have land to subdivide anymore especially in *Nduruma* village that is very densely constructed.

In *Mugara*, the first indigenous settlers who joined the village site acquired the building plot through land exchange but later this practice was abandoned for land purchase to avoid that previous landowners ended with many small fragmented landholding. Currently, purchasing bare

building plots is still possible in *Mugara* while in *Nduruma* any land seeker has to buy property because there is no unbuilt land anymore. At the time of the study, a building plot (25/30 m) was cost around RFW 2,000,000.

In *Mugara*, most of houses are of low quality, but generally considered as acceptable. On average, most of the main houses have a surface area of around 60 m<sup>2</sup> while annexes are smaller. The main houses are rectangle-shaped and have gable or shed roofs. As more rich people move in the village, houses with cross-pitched roof are being constructed. Walls are made of mud bricks roughcasted and roofs are covered with simple light corrugated iron sheets, doors and windows frames are metallic. The floor is frequently cemented.

Most of the finished dwelling have also a separate annexe that is used mostly for cooking and sometimes have a bathroom. Annexes are also constructed mostly in mud bricks and are covered with iron sheets. To minimize cases of burglary in urban areas, metallic door- and window-frame are preferred to the wooded that easy to break. As the village is still under development, most of houses are unfinished and the area is served fresh earth narrow roads. Houses are frequently occupied before the complete finishing (See

*Photo 14*).



*Photo 14: Finished house and unfinished house already occupied*

In *Nduruma*, most of houses are of medium quality but building materials are quite similar to the those used in *Mugara*. It is however important to note that more compounds are found in *Nduruma* since the area is well established. Houses in the compound are mostly occupied by tenants. Both villages are not planned, accessing one's home, people have to meander between houses especially in *Nduruma* because of high density of construction.

In both villages the self-built construction is the only mode of housing production as in all other urban unplanned settlements. The construction cost of houses are said to be cheap in Musanze compared to Kigali. Indeed, building materials such as stones for foundation, cooked and mud bricks, building plots and block cements on one hand and the construction workers' wages are lower in Musanze. It would be very reckless to give average price of a house in both villages, since the price is function of the amount paid for the building materials, construction works and equipment found in the house. The cost construction is also by the price of the plot which depends on the size and the distance to public infrastructure and the willingness or the pressure of the house-/ land-owner to sell his/her property. Furthermore, very few Rwandans keep record of their expenditure even for expensive investment such as a dwelling especially when it is self-built. House price rental is also lower in the peripheral neighbourhood, especially *Mugara* and *Nduruma*.

### **Water**

*Mugara* village is characterised by a very loose piped water network, this is the case for other peri-urban areas. Some households are connected to the only WASAC water pipe that crosses the village. Households connected are those which are closer to the pipe. No illegal connection was reported. Residents said to have funded themselves the installation of the pipe. Thereafter, WASAC has generously installed one public water tap where households not connected to the pipe buy clean water. A tap caretaker, approved by WASAC, operates the public tap. A jerrycan is sold RWF 20. Unfortunately most of *Mugara's* residents find the price very high and would appreciate if it could be lowered to 10 RWF, but RWF 20 per jerrycan is the reference price fixed by WASAC all over the country. This is quite understandable as most of them, especially those who came from rural areas even first settlers who have free access to water from springs. *Mugara* dwellers complain about irregular water provision. The caretaker in turn pays WASAC monthly bill.

Water supply in the village is erratic. At the time of the study, *Mugara's* residents said that they have not had water for more than a month. The alternative is to collect water from *Mugara* stream which is approximately 20 minutes away, but its water is polluted. Consequently, *Mugara* dwellers would like WASAC to regularly supply the area with water.

Water supply in *Nduruma* village does not differ much which the situation above described. The village has been provided with piped water before *Mugara* because it was densely populated and is closer to the urbanised core. *Nduruma* also faces frequent water shortage mostly in the long dry season. The difference with *Mugara* is that *Nduruma*'s dwellers can collect water fetch to the very nearby police station which is more regular supplied. Otherwise, when there is no water at the police station, *Nduruma*'s dwellers have also to fetch it from *Mugara* stream, or then look for it in the city centre.

It is important to note that in both villages, there are no private water vendors. The little willingness or affordability to pay such service may be the causes of such situation. Low number of population and therefore low demand can also be one factor, since water vending implies big investment and a permanent person at the vending point. Residents of the two villages have not also installed water tanks.

### ***Power used for lighting and charging mobile phones***

In *Mugara* village, few houses are connected to the electricity grid. This is quite normal as the village is under development. However it is worthy to note that it is not necessarily to have the construction finished to get connected to the electricity grid. Anyone who is capable to pay the connection can be connected provided that the house under construction is built with semi-durable or long-lasting building materials. In *Nduruma*, most of the poor households who settle the upper zone are not connected to the electricity grid. No illegal connection has been reported. People fear to connect illegally their houses because REG has put in place a prohibitive fining system. It was also noted that none of the connected household has contracted fire insurance. The two villages face electricity outages frequently in long dry season. Power outage also happens every time it is raining. Electricity is considered expensive since the tariff was increased from RWF 134/Kwh to 158.

People without electricity use kerosene lamps, torches, paraffin, and dry cell system for lighting. In the last case, 2 or 3 dry cells are fixed in a wood box that is connected to a network of extreme thin wires (found on local markets) with a variable number of appropriate very small bulbs (found in electrical torches). Switching on lights requires simply to connect positive and negative terminals. This is system provides enough light to move easily inside the house the house but does not allow reading. It is also very simple and secure as it cannot cause electrocution and fire. An initial amount of around RWF 3,000 is needed to have the system installed.

Electricity is the only source used to charge mobile phones. People living in houses without electricity charge their mobile phones to their neighbours or in the town. When phone charging is offered by young people in town, the client has to pay RWF 100. Mobile phone is now considered as basic need, especially for young people.

Mobile signal coverage is very good and residents have access to services offered by all the three mobile phone operators. The most common use of mobile telephone is calling and text messaging via various applications. Young and educated people use the phone for sending and receiving money, listening to music, watching videos and taking photos, lighting, browsing internet, paying water and electricity bills, etc.

### ***Fuel used for cooking***

As expected, *Mugara* and *Nduruma* being peri-urban and settled mostly by low-income groups, firewood is the most used fuel for cooking. However there are some households which use charcoal mostly in *Nduruma* village. The two villages are supplied with firewood by people from neighbouring surroundings. Residents of the two villages said the price of firewood has considerably increased because of considerable deforestation. People use them because they still have rural lifestyle but the number of households which use charcoal goes down over time for charcoal.

Charcoal is used by well established households, rich migrants and some indigenous who have decided to shift to charcoal. On average, a household uses two or three sacks of charcoal per month. Charcoal is used cautiously because it has become very expensive. The price of a sack of charcoal has more than doubled from 2005 to 2015, shifting from RWF 3,000 to 7,500. Charcoal used in the two villages is transported by load-carriers from the town centre. The fare of the transport varies according to the distance travelled, but according to the residents, remote households can pay up to RWF 1,000. People whose houses are located near the access road pay motorbike taxis since it is rapid and there is no need to run after as it is when one has to hire a load-carrier. Poor households have problems to easily have charcoal since there are no charcoal retailers especially in *Mugara*.

### ***Toilet/Sanitation***

In the two villages, most of households have private latrines others share latrines. Most of the latrines found in the area are pit latrines, but there are some well-established households in *Nduruma* that own flushing toilets in *Nduruma*. Most of pit latrines are unfinished and constructed apart from the main house. Walls of latrines are usually made of mud bricks and most of them have slab made of timber, but are not cemented. Roofs of pit latrines of unfinished houses do not have a covered roof. Therefore, people face problem to use them in rainy seasons.



*Photo 15: Pit latrine under construction but already in use*

In *Mugara* that is under development and even in *Nduruma*, there is no special structural works done to collect waste water. Waste water is thrown in gardens or then is channelled along the slope. Solid wastes are also thrown in gardens or deposited in dumping composts and later used as fertilisers. Banana, *Irish* and *sweet potatoes* and fruit peelings are used to feed animals. There is no company in charge of removing solid waste.

Asked to rank the public services that need the most improvement, interviewees and FGDs discussants ranked them in the following order: (1) regular water supply, (2) regular electricity supply, (3) road network improvement and sanitation. Mobile phone was not reported since the mobile network signal coverage is excellent. Schools and market were not also considered as priority because the residents of the two villages can access them easily.

Regular water supply is ranked the first because of its multipurpose uses: cooking, drinking, body and domestic hygiene, etc. The group of aged females made the following statement:

*" ... This town is supplied with piped water comes from Mutobo stream. Its head is located far at the foot of the volcanoes near Gataraga. When the dry season is too long, there is shortage of water shortage in the town, and many neighbourhoods are not served. Yet water is needed in everyday home's activities".*

Electricity was ranked the second as it impacts on the people's well-being. Moreover, with electricity, there is possibility to start some income-generating activities. Improvement of the road network

was ranked third. It eases access to and within the neighbourhood. Finally improvement of sanitation was mentioned especially by interviewees from *Nduruma*. Indeed *Nduruma* is congested and faces more problems of sanitation especially the evacuation of waste water and the removal of solid wastes.

For *Mugara* and *Nduruma*'s residents climate change has affected the provision of public services. Climate change has contributed the decrease of water in hydropower dams and has led to frequent power outages especially in dry season. It has also impacted negatively piped water supply.

#### **4.1.3. Livelihood and mobility**

##### ***Income generating activities***

The range of income-generating activities found in the village is not wide. Farming activities, construction works and small selling activities are the main sources of income. Farming activities are no longer the most prevailing because people can make their money doing other activities. Some indigenous women have shifted from farming activities to small retail trade. They head to the city centre every morning and sell fresh foodstuffs such as tomatoes, fresh or cooked maize, banana, sweet potatoes, fruits and other fruits. Men now search for jobs in construction works, and load-carrying or small trade. The change was consecutive to the conversion of agricultural land into residential land. Previous landowners cannot stand the prices that are being paid by new comers, and who frequently are rich. Some well-established landlords collect money from house rental either in the two villages themselves or in other villages. The few public servants and workers of the private sector (trade, hotel, restaurants and bar, etc) rely on their monthly salary.

##### ***Services availability and income-generating activities***

For *Mugara* and *Nduruma*'s residents, water and electricity are not regularly provided to the both villages. Road network is also considered to be deficient. However, they believe that the quality of public services affects decision to live in this neighbourhood. For instance, *Mugara* did not attract migrants until it was provided with electricity. For most of residents, electricity and water provision in both villages have the most influential impacts. Unfortunately, provision of public services has not contributed to the creation of income-generating activities in the neighbourhood. This is maybe because the area is still under development and closer to the city therefore people rely mostly on services offered in the town. Indeed Musanze is a small town and connecting to any neighbourhood from the city centre is very easy even by walking.

##### ***Urban transport, mobility and income generating activities***

As stated earlier, *Mugara* and *Nduruma* has a loose earth road network. Entering *Nduruma* with car is not easy because the few existing streets are narrow and steep. As in the rest of the town, the two villages are not served by a line of public transport. When in hurry, people hire motorbike taxi to move to or from the neighbourhood, otherwise they walk. They cannot also use bicycle taxi but because of the steep. When *Mugara* and *Nduruma*'s residents have to travel long distance, they use public transport. As stated before, Musanze taxi park is not far from the two villages.

Both villages have connections with other urban areas and rural areas as well. Residents of the two villages go to the town nearly on a daily basis for various reasons: buying or selling various products, searching for job, health care services, attending schools for children, sharing drinks with friends, etc. They also use to move to other urban areas inside the country especially Kigali and *Rubavu*. They mostly use travel agency buses. Connections with rural areas are dominated by family and friend visits. Friends and relatives based in rural areas use bring gifts made of fresh agricultural products such as *Irish* and sweet potatoes, banana wine, fresh maize, etc. In return, those living in the two villages give them some money that is considered usually as "ticket money" even when it is far higher. Some people also come from to the town searching for job and to sell some products such as fresh foodstuffs, firewood, etc.

#### **4.1.4. Future challenges**

*Mugara* and *Nduruma*'s residents would like to see living conditions improved. The area is expected to modernise and be more provided with regular water and electricity supply, and the road/street network improved. Most of the respondents fear that they will no longer be living in the two villages in 5-10 years time as more rich people would be interested in developing the area following the town master plan. The area will be less wooded because tree cutting will be exacerbated by the rapid urbanisation. This will contribute to more local weather warming.

Most of the interviewees and the discussants would be happy if they could live in *Kizungu* and *Yaoundé* neighbourhoods. These are planned areas where adequate houses are found. They are equipped with road network, good schools, electricity, regular water supply. Most of wealthy people and civil servants in high positions live there. This statement shows that people living in informal settlements aspire better living conditions and when possible, to move to upscale neighbourhoods.

## **4.2. Nyarubande village**

### **4.2.1. Background**

*Nyarubande* village is a located in Rwebeya cellule, Cyuve Sector, Musanze district, on the periphery north-east of Musanze Town and is crossed by the paved road joining Musanze town to

*Gisoro* in Uganda. The site of *Nyarubande* is a flat and lava terrain. No stream crosses the village.

Before the urbanisation of *Nyarubande* village in 2000s, the area was rural, dominated by farming activities and settled by indigenous, most of them were living in houses of low quality, even traditional thatched houses were found there. *Nyarubande* was characterised by sparse settlement scattered in dense banana plantations. Electricity and piped water were found along the paved road where a row of small shops and bars were constructed. There were no entering street the village, households were connected each other by narrow and rocky paths. Some parts of the village were wooded with *Eucalyptus*. The area was not safe: it was infested by teams of thieves called "*Abanyarirenga*" who used to commit burglary or spoil travellers even residents. The town, however very nearby, exerted little influence on the village.

A radical change happened in early 2000s. Migrants from rural areas headed to the village, bought land, and started to erect modern houses. The first in-migrants were fleeing insecurity that was prevailing in their native area caused by infiltrated rebels from the Democratic Republic of Congo. Migrants headed to the village because land price was not high. In the initial phase, people were interested in land close to the main road because the area was more secure and more likely to be provided with piped water and electricity at low cost.

After the restoration of the security in 2003, *Nyarubande* village attracted more in-migrants. Even people from Kigali came to settle in the village. Gradually, more modern houses replaced old low quality constructions. The number of indigenous people then considerably reduced along the paved road. Most of them have sold their lands, migrated to remote areas or other neighbourhoods in the town. Currently, constructions are progressing rapidly northwards where land is still hold by indigenous and is still affordable compare to the zone closer to the paved road that it is fully constructed, and *per se*, expensive. As more people settled in the village, wooded area has considerably been reduced, banana plantations have been cleared, and the band of robbers "*Abanyarirenga*" was dismantled. Gradually the village has been provided with piped water, electricity, roads, schools, etc. The village is now attractive and it is being settled by rich people.

Currently, *Nyarubande* is a modern, attractive and rapidly urbanising neighbourhood, settled mostly by civil servants (medical doctors, military, police) and trade people, secondly by car, motorbike and electrical appliances repairers (who call themselves "technicians"), construction workers, and very few low-income earners. The neighbourhood is close to city centre and accessible by paved road. The village is equipped with piped water, electricity, roads, schools, and street lighting.

#### **4.2.2. Land, Housing and Services**

By 1990s, *Nyarubande* village was settled by native who had plenty of non-built land. Because the town was not expanding in that direction, people could negotiate land at very low price. Even some people who had relatively large plots could give pieces of land to their relatives or friends. Following the urbanisation of the area and the continuous huge influx of people interested in land acquisition, the land has become a commodity that is negotiated at high price. While it was possible to buy a bare building plot (20/30m) for less than 1 million RWF in early 2000s, a plot with the same size, is paid currently between 3 and 4 million RFW. Bare building plots are found on the fringe of the village. People interested in building plots in already urbanised area have to buy properties. The price of building plots depends on the size of the land and the property over it.

New comers generally buy old properties because they are less costly, demolish them and erect modern residential or commercial houses especially near the paved road. The previous landowner or property owners move in other peri-urban areas like *Kabaya* (in the south towards *Nyakinama* which is modernising because of the presence of a public high learning institution and a military academy), or *Karwasa* that is located about 3 km east but where it is still possible to acquire large land parcel. The price of building plots and properties is influenced by closeness to electricity low voltage line, piped water and roads.

In terms of housing, Nyarubande can be divided into two parts: the new and the old Nyarubande. In the new Nyarubande, the type of houses dominating is large or medium modern villa built in fenced plots with large metallic gates. Fences of properties are made of cooked bricks or cement blocks. Walls of houses are made of cooked bricks or cement blocks, and most of them are roughcasted and painted. Most of the house have cross-pitched roof covered with modern whitish or reddish galvanised corrugated iron sheets. Floor is cemented or covered with modern tiles. Such houses have wide metallic doors and windows frames with one-way window glasses of different colour. Most of the new houses have at least four bedrooms and two bathrooms, and have separate annexe for the servants (Photo 16 and Photo 17).

Construction is not expensive as in other parts of Musanze town since stones for foundation can be found in the plot, and sand and cooked bricks are found nearby. Lucky people even can find the sand in the plot. Construction workers are also paid less than in Kigali, for example, a mason is paid RWF 3,000 per day while he is paid 5,000 in Kigali. Assistants are also paid lower wages compare to the ones paid in Kigali.

Most of the houses are predominantly owner-occupier, but some house are rented to middle- and high-income earners, usually public servants or traders have not yet built their own houses in

Musanze town or in its surroundings. Though the village has developed spontaneously, near all house-owners have managed to have their plots served by narrow vehicle street. Access by car is always possible because streets are naturally paved with lava stone, and there is no risk of slipping in rainy season. Street lighting has been installed along the main access roads. All houses are connected to electricity grid and water piped network. The new *Nyarubande* is residential, commercial houses are found only along the paved road.



*Photo 18: General view of recently developed zone of Nyarubande village*



*Photo 19: Example of typical houses being constructed in Nyarubande*

Old houses of low quality, occupied mostly by indigenous or the first comers in the village, have been pushed to the periphery north. This is the old Nyarubande. Houses are small, built with cheap building materials (light corrugated iron sheets, mud bricks, doors and windows wood frames), and fenced with piled lava stones without any mortar (*Photo 20*). Because of little maintenance some of such fences are near falling down. Some of the houses are connected to the electricity grid.



*Photo 21: Old houses occupied by indigenous or first comers*

The rapid urbanisation of *Nyarubande* has contributed to the local environmental and climate change. The conversion of agricultural land in-built area, clearing banana and *Euclayptus* plantations, and waterproofing of huge space has increased the heat absorption by the bare ground. Heat absorption is exacerbated by the black lava that behaves as a blackbody which absorbs near all heat. Consequently, residents said that local weather is get warmer and indoor temperature has changed upwards.

### ***Water***

Residents of *Nyarubande* use water from WASAC piped water network, public taps, springs and *Mpenge* stream.

All households in the new *Nyarubande* are connected to WASAC piped water network while very few are connected in old *Nyarubande*. Piped water supply is irregular: residents said that they can spend more than three days without any drop of water in the pipe mostly in the long dry season (June-October). They said that collecting water from WASAC network is very difficult since water is supplied mostly in late night hours. Servants used to keep the tap open in night so they can hear water drop when water is supplied, then get up and collect the precious liquid. As water supply in the village is erratic, house-owner should install polytanks, to overcome the irregular water supply. Unfortunately this is not the case in New *Nyarubande* where very few houses have plastic tanks. Households not connected to WASAC piped water network collect drinking water to public taps located near the paved road. A jerrycan of water is sold RWF 20.

When there is water shortage, all residents of *Nyarubande* fetch water from springs or *Mpenge* stream. Water from springs is free of charge. As expected, people have to queue for many hours to get water. When there is no water in springs, but this occurs very rarely, people use water collected from *Mpenge* stream that is located around 20-30 minutes far from the village.

According to the residents, water from *Mpenge* is not appreciated because non clean. Once such water is used for cooking or washing clothes, food or clothes get a strange colour. It is not clean water but people are in the obligation of using it, especially the poor people living in the old *Nyarubande*. Rich residents hire cyclists to supply them with drinking water. The cyclist is paid 100 RWF per jerrycan.

Considering the pace at which the village is developing WASAC should assure a regular water supply to the village. But individuals can also invest in piped water collection and vending. Authorities should impose to equip all new constructions with at least 5,000 l or more water polytanks that can be used also for rain water harvesting. This can be put in the requirements to be granted construction permit.

### ***Power used for lighting and charging mobile phones***

As earlier stated, *Nyarubande* is connected to electricity grid. Near all the residents have electricity in their houses and use it for lighting and charging mobile phones. As in other parts of the town, the area faces frequent and unannounced electricity outage especially between 6:00 pm and 10:00 pm. Residents wonder if electricity shortage stems from rationing available power or if there are other some technical problems. They wonder why REG doesnot provide any explanation. To our knowledge Rwanda faces a electricity shortage at national level, therefore REG has to ratio electricity to ensure an equitable distribution all over the country. When there is power outage, *Nyarubande's* residents use kerosene lamps and torches. Rich people have generators while the poorest families use candles.

Electricity is used for charging mobile phones. In new *Nyarubande*, all households have more than 2 mobiles phones: one for the husband, another for his spouse and others for the children. In old *Nyarubande*, most of households have at least one mobile phone. Residents of *Nyarubande* are satisfied with mobile signal coverage since they can use Airtel, MTN and Tigo anytime. Mobile phone is used for calling and text messaging, money transfer, banking, paying electricity etc. Business people use the mobile for fiscal declaration to Rwandan Revenue Authority (RRA) and paying due taxes. Many of the interviewees said that it would be very stressing if they has to spend one day without phone signal.

### ***Fuel used for cooking***

The most common fuel used for cooking is charcoal, however some households still use firewood.

Rich people use to buy sacks of charcoal while poor people buy small quantity to retailers. Charcoal stores are found along the main paved road and frequently transported inside the village by load-carriers. Amount paid to the load-carrier depends on the distance between the store and the buyer's home but generally is around RWF 300. Charcoal is becoming the most fuel used for cooking because firewood has decreased drastically and has become very expensive. Even most of residents of the old Nyarubande have shifted to charcoal. Firewood is also considered as a unclean source of energy: it incommodes houses occupiers and neighbours and can be a source of respiratory diseases when used in poorly ventilated kitchen. Though rich people are settling in *Nyarubande*, few of them use modern sources of energy such as electricity and gas.

### ***Toilet/Sanitation***

Sanitation is not a problem since all households have latrines. All modern houses are equipped with flushing toilets especially in the new *Nyarubande*. People living in modern houses claim strongly year for a permanent piped water supply to maintain the toilet clean and safe. Poor people still use private pit latrines, and the extreme case, pit latrine is shared. As in other lava zones, pit latrines are not deep because the rock is hardly breakable. The depth of pit latrine hardly reaches 5 m. Moreover such toilets have slab made of wood not cemented in most of the cases. These latrines are not appreciated as they exhale bad smells which incommode the residents. Some pit latrines are of poor quality.

In the new *Nyarubande*, waste water from is channelled into sumps which also collect rain water from the roof. Though the rock is solid, house-owners accept to pay much money to dig sump to avoid disputes with their neighbours. Moreover having a sump for waste water and rain water collection is one the requirements to be granted building permit. It is important to note that people who erect houses in *Nyarubande* have to apply for building permit issued by the district. In old *Nyarubande*, as the residents still have not fully developed plots, waste water is thrown either in the courtyard or in garden.

Removal and disposal of domestic solid and commercial wastes are done by a private company. Wastes are filled in used sacks, grouped in one site and a truck collects them every Friday. To benefit from the private company's services, every household pays RWF 1,000 per month. Some households find this amounts high but others are satisfied with the monthly fare.

*"Some people can argue that all RWF 1,000 is not a big amount. However we do not have the same financial capacity. Some individuals can feel simple to pay that amount, others can take it as a burden for them. But on my side there is no problem. It is good to have those people to remove the wastes. They have also to be paid for. Nothing is free of charge in present days, particularly in urban areas "* (Aged females, 38 years old).

Some households throw biodegradable wastes in their gardens.

### **4.2.3. Livelihood and mobility**

#### ***Income generating activities***

The main source of income of *Nyarubande's* residents is first monthly salary. All public servants and residents working in the private sector rely on their salary though they can have other side lucrative activities but these are not known to the interviewees and discussants of different FGDs. Trade people who owns shops in the city or commercial activities rely of benefits. Business people have much opportunities as they can exchange products with Uganda, the city of Kigali and supply the rural hinterland.

Residents of old *Nyarubande* gain money from casual works mostly in the construction. Some work as masons or assistant masons. In Rwanda, assistant masons are unskilled workers who can do any basic work in construction such as terracing building plot, mixing sand and cement, transporting building materials on the building site, carrying water to the construction site, etc. As the village is under development, there is opportunity to get casual works. The mason is paid RWF 3,000 per day and the assistant 1,500 per day. Technicians make their money by offering services, however their income varies according the services offered.

There was a professional shift: some former farmers are now working in construction activities either as masons or assistant masons or other related activities. Some young people have are working as load-carriers in the town, while others migrate to Kigali searching for job opportunities.

#### ***Services availability and income generating activities***

*Nyarubande* is equipped with electricity, piped water, mobile phone, schools, roads, etc. Other services that are not available in the village or in the surroundings are found in the city centre. Those are health care centre, banks, wholesale and some other specialised services. The only public service that is not available in the village is the public transport.

According to the *Nyarubande's* interviewed residents, the services that need the most improvement are regular piped water and electricity supply. The availability of such public services affect people's decision to settle in the vilage. In the early 2000s, when a large part of *Nyarubande* was not provided with electricity and piped water, the number of migrants joining the village was very small. With the provision of the electricity and piped water, migrants people rushed in the area. Nowadays, *Nyarubande* is among the most attractive neighbourhoods of Musanze town because of water and electricity supply, street lighting, schools, etc.

Provision of public services has contributed to the creation of income-generating activities. For instance, following the provision of electricity, beauty salon, small welding units, carpentry units, grain mills, bars, electric and electronic repair works, mobile services etc have emerged in *Nyarubande*. They have attracted people to work in these activities.

#### ***Urban transport, mobility and income generating activities***

As other parts of Musanze town, *Nyarubande* is not served with a public bus transport line. However as stated earlier, public transport is not a big problem since people can easily catch a minibus coming from *Cyanika* (near the border with Uganda) and pay 100 RWF to reach the city centre and vice-versa. Alternatively, residents of *Nyarubande* can also use motorbike or bicycle taxi to travel in the surroundings or to connect with other parts of Musanze town. The normal fare of a one-way from *Nyarubande* to the city centre by motorcycle taxi is RWF 300, and 100 by bicycle. When needed, one can also hire a taxi cab. The fare for one-way travel *Nyarubande* to the city centre by taxi cab is RWF 2,000. People not in hurry use to walk to city centre, and walking is not exhausting since the terrain is flat.

When *Nyarubande's* residents have to travel outside Musanze town, they normally use public transport. It is easy to connect with any part of the country since there is regular shuttle connecting Musanze town to the city of Kigali, *Rubavu*, *Cyanika* at the border with Uganda, *Vunga* in the south (Nyabihu district). For areas not served with public transport, *Nyarubande's* residents can use taxi cab, motorbike taxi, or bicycle taxi when it is nearby. Of course the mode of the transport depends on one's financial capacity and the urgency. As any elsewhere, public transport is the cheapest. For instance one-way fare to travel to Kigali is RFW 1,800 by public transport while it is around RWF 50,000 by taxi cab.

Rural-urban connections are dominated by foodstuffs supply from rural areas. However, some farmers from the village move to rural areas for ploughing their lands or searching for agricultural jobs. Some public servants also commute daily because their working places are in neighbouring rural areas. Since the village is populated by migrants from many parts of the country friendly visits are frequent in both directions.

*Nyarubande's* residents stated that climate change has impacted on the availability of foodstuffs. They said that, following the June-October dry season, yield of *Irish potatoes* has drastically decreased. Consequently, the price of *Irish potatoes* and vegetables has increased. Wood clearing has also prevented people to sell firewood and wood for construction, in other words, indigenous people have lost one source of income.

#### **4.2.4. Future challenges**

For future plans, residents of *Nyarubande* have said that improvement is needed first of all for water supply, secondly electricity, thirdly sanitation, and lastly road improvement. People are satisfied with services offered by the three mobile phone operators since their networks are always available.

Regular and electricity supply were ranked as the public services that need the most improvement because *Nyarubande* experiences frequent water shortage and electricity outages. This impacts on the people's comfort. Water shortage increases money paid for getting water for domestic use and some activities cannot be done. Electricity outage is detrimental to business: welders and barbers for instance cannot work without electricity. The use of generator impacts negatively on the benefits since petrol is more expensive than electricity.

Climate change has affected public services provision. For instance weather warming has contributed to irregular piped water and electricity supply in last past years. Consequently, regular water supply was ranked as the public service that needs the most improvement.

According to Musanze master plan and views of *Nyarubande* interviewees and FGD discussants, in 10 years time, *Nyarubande* is expected to be a very upscale neighbourhood. It will be settled by affluent people. Indigenous and low-income people will no longer be settling there. Many of the members of the FGD firmly stated that they will move out and will settle on the edge of the town, likely in *Karwasa*.

Most of the respondents would be happy if they could live in *Kizungu* and *Yaoundé* neighbourhoods. These are planned areas where adequate houses are found. They are equipped with road network, good schools, electricity, regular water supply. Most of wealthy people and civil servants in top positions live there.

### **4.3. Rukoro village**

#### **4.3.1. Background**

*Rukoro* village is located in Mpenge Cell, Muhoza Sector, in Musanze town. Its total surface area is around 30 Ha. The village develops over a flat terrain with and has a grid plan with right angles at street junction. The area was given the name Rukoro because it is totally covered with lava stones known as "*amakoro*" in Kinyarwanda. Indeed the half east of the village was too rocky that it was not developed until late 1990s when first migrants started to settle the area. The village is popularly known as *Ibereshi*, which is adaptation in Kinyarwanda of "*Camp Belge*" (Belgian camp), term used in the colonial period to design urban zone settled by Rwandan clerks who were working for the colonial administration. The first Asians who came to Musanze town in the early 1900s for trade were instructed to settle in that village. As most of them were Muslims, the area came to be referred as Islamic neighbourhood. The first Rwandan who converted to Islam joined

also the village. The integration of Rwandans newly converted was eased by the Asians who use to employ them in their business or as servants.

After the German were defeated and fled the country, the new colonisers, the Belgians established the "*Camp Belge*" for Rwandan clerks. Among the first group of people who settled the village included also indigenous relocated from a place called "*Groupement*" which hosts now a police station. The place is where Rwandans selected to be sent to work in mining in the Democratic Republic of Congo were grouped and prepared for the new life.

Till mid-1980s, *Rukoro* was separated from the commercial zone by a non built public land. From 1985 the department of town planning of the former Ruhengeri Prefecture allotted the hinterland to beneficiaries. The area was then serviced and building plots were then allocated to beneficiaries.

The built environment has changed over time. For instance, grass houses that could be seen in 1990s have been eradicated. The old houses built in the colonial era that were occupied by Rwandan clerks have been sold at auction by the government have been replaced by more adequate new houses. Now rich people are erected multi-storeyed buildings in the village (*Photo 22*). Cement blocks and cooked bricks are becoming the most common construction materials of walls. Even a new mosque is in the final stage of completion. Some roads have been paved. *Rukoro* is now well integrated in the core urban area of Musanze town. It is a planned area with a perfect gridiron layout pattern, with many businesses. The village is experiencing a rapid development in housing and service provision. The area is also said to accommodate female sex workers.

#### **4.3.2. Land, Housing and Services**

*Rukoro* is a well established settlement that can be divided into two distinctive parts: the old *Rukoro* and new *Rukoro*. The first settlers who established in the area in the colonial period were allocated building plots free of charge by the colonial administration because the site was a vacant land. This is the case in the old *Rukoro* which was in place since the colonial time and sometimes is referred as *Muslim neighbourhood*. People were given large plot, indeed there was population pressure.

In the new *Rukoro* that was allotted by *Ruhengeri Préfecture's* department of town planning in 1985, the first beneficiaries were also given building plots free of charge since the plots were demarcated on bare land. However they had to pay small amount of money for plot registration and servicing. Some people who had acquired such plots but who could not able to develop them according the urban standards sold the plots acquired. The price varied according the location and need for the seller, but in late 1980s a building plot (20/20m) was sold around RWF 120,000 be the equivalent of \$150 ( \$ was exchanged at around RWF 80). Currently due to the continuous

high influx of migrants, the village is nearly fully constructed. It is not easy to find a bare building plot in both part of *Rukoro*. According to *Rukoro*'s residents interviewed, if a bare building plot was found in the village, it would cost between 4 and 5 million of RWF, the estimation was based on price paid in neighbouring villages.

The only solution to acquire building plot in *Rukoro* is to purchase property. Property price is agreed upon through bargaining. As modern buildings are mushrooming, property price is also increasing. People who sell their properties mostly head to *Karwasa* that is a neighbourhood located on the north-eastern edge of the town. According to Musanze town master plan, only multi-storeyed buildings are authorised in *Rukoro*, the ground floor will serve for commercial purposes while the upper floors will be dedicated to lodging.

In old *Rukoro*, most of the houses were built before 1980s. Some date back before the independence, especially in the zone commonly referred as *Ibereshi*. All such houses are small old single-storeyed houses, with walls made wood/mud or lava stones. Very few have walls built with mud and burned bricks. Most of them have a gable roof covered with old iron sheets. Many of them are compound houses. The number of sleeping rooms varies from two to three, but some may have four. When the plot has not been developed as compound, there is always a main house and an annexe. The annexe is used for cooking and hosting the servant. Houses with walls made of cooked bricks were occupied by public servants until 1995. They have now been sold at auction by the Government. The zone is very congested but some houses and compounds are in decay since the owner are not authorised to upgrade or repair them because the area is under redevelopment. Though such houses have become decrepit, there are still occupied, either by the house-owners or the tenants.

Houses built between 1985 and 2000 are found in the hinterland between the old *Ibereshi* and the commercial zone. As stated earlier, before 1985, this area was not built. It was covered with lava stones scattered with prickly plants called "*igisura*" in *Kinyarwanda*. The area was not developed because there was still plenty public land that were allocated to people who wanted to construct formal houses, but also the growth of the town was slow. The zone was allotted in early 1985 because many people had applied for building plots and the area was empty. Parcel demarcation and street road design were done by the staff of the *Ruhengeri Préfecture*'s department of town planning. The layout was approved by the Ministry of Public Works and Energy (MINITRAPE) which had town planning and development in its prerogatives. Applications for building plots and building permits were then channelled to MINITRAPE via the same department of town planning.

People who were attributed building plots had to built houses meeting the standards stipulated in the construction permits. Most of plots are fenced with cooked bricks and simple but large gates to let the car enter the premises. Some houses are self-contained while in others, property owner separated the main house from the annexe. In both cases, the main houses are rectangle-shaped, with walls made of cooked bricks or lava stones and exceptionally mud bricks, and gable roof

covered with iron sheet. They have metallic window and door frames with transparent white glasses. The number of sleeping rooms varies between three and four. Such houses were considered modern at the time of their construction. Even now they are adequate. Monthly price rental is usually above RWF 100,000.

Following the adoption of Musanze master plan in 2010-2011, *Rukoro* will be redeveloped. The redevelopment is planned to start in the old *Ibereshi* where old houses have to be replaced by multi-storeyed buildings. Houses to be demolished in the old *Rukoro* have already been re-marked "*Towa*", meaning simply that such houses have to be demolished. Already some old properties have been sold to property developers who have constructed three- or four-storeyed buildings. In the future there will be anymore single-storeyed house in *Rukoro*.



*Photo 23: Old houses that have to be replaced by multi-storeyed buildings like the one on the right side*

Though *Rukoro* village is planned, with a regular gridiron layout, commercial and residential houses are mixed. The commercial constructions most found in the area are bars and small shops especially in old *Rukoro*. Many residential houses have also small frontage shops where residents can buy basic products such fresh foodstuff, rice, sugar, cosmetics, etc (*Photo 24*).

### **Water**

*Rukoro*, being one of the oldest neighbourhood of Musanze town, is among the first village to have been connected to WASAC piped water network. Water comes from *Mutobo* water treatment plant built in *Gataraga* sector, approximately 15 Km far in the north-west of Musanze town. Most of households in *Ibereshi* have water in their premises. All houses in new *Rukoro* are connected to WASAC piped water network. People without water in their premises, collect it from public water taps. A jerrycan of water is normally paid RWF 20. Poor residents would like to see it lowered to RWF 10. No water tanks were found in the village. When there is no piped water in the

neighbourhood, people use water from *Mpenge* stream or *Kigombe* which are not far. However water from both stream is not clean.

In past years, water was permanently supplied, but in present days the village faces frequent unannounced water shortage. *Rukoro's* dwellers as other residents of Musanze town who face that problem wonder this is due to the population increase or other technical problems of the water plant. The population of Musanze town has more than tripled from 1990 and, to our knowledge, *Mutobo* water treatment plant has not been upgraded consequently.



*Photo 25: WASAC water kiosk and a frontage foodstuffs vending*

### ***Power used for lighting and charging mobile phones***

The area is connected to the electricity grid since late 1970s, and as expected most of households use electricity for lighting and charging mobile phones. Nevertheless, poor households still use candles and kerosene lamps for lighting. These are households headed by very poor people or old people with very little financial capacity.

The group of elder females reported that there is frequent power outage from 7:30 pm to around 10 pm. *Rukoro's* residents do not understand why there are unannounced electricity outage while there electricity post in the village. Because of the prepaid system that is used, households could not tell the approximate amount they monthly pay for electricity as they pop-up every time needed. Pop-uping electricity is not a problem since people pay electricity with their mobile phones, or just move to next shop where they can have electricity pop-up services. Many shops in the village offer that service.

The residents are satisfied with mobile service as the network signal coverage is very good for all the three operators. Most of residents have mobile phone. The most common uses are calling, text

messaging, lighting, listening to radio and music, money transfer, mobile banking, paying electricity, etc. It goes without saying that mobile phone is considered as a basic need in the village. Near all young people manage to have at least one mobile phone. Mobile phones are more affordable than in the past because the import of cheap mobile phones made mostly in China. Nowadays, it is possible to get a new mobile phone at RWF 10,000 what was not possible 10 years ago.

### ***Fuel used for cooking***

The most used fuel for cooking is charcoal, but there are very few households which still use firewood. As in other parts of Musanze, a sack of charcoal costs around RWF 7,000. The large use of charcoal in *Rukoro* is understandable since the village is among the first urban neighbourhood which adopted urban lifestyle. Charcoal stores are found in the village. Poor people can buy small quantity near retailers for immediate use. Here retailers sell charcoal per kg, 1kg of charcoal is sold around RWF 300.

In the past most of the households were using firewood, but following the deforestation in the nearby villages which resulted in increase of firewood price, people have gradually shifted for charcoal. Cooking is done in annexes, and in houses without annexes, cooking is done outside. When it rains stoves are moved inside the kitchen or the main house.

### ***Toilet/Sanitation***

Sanitation is said not to be a major challenge thanks to the administrative leadership which sensitises the population to seriously take care of all aspects of sanitation. All households have latrines. Most of them are pit latrines. New houses are all equipped with flushing toilets. People living in compounds frequently share latrines. This is common in Rwandan urban areas. As lava rock is very solid, residents cannot dig deep pit latrines. Public latrines are also found in the neighbourhood. They are said to be not clean. However, for the group of elder males, more public latrines are needed as there are many people from outside the neighbourhood who have problems to find a latrine.

Very few households have sumps for collection of waste water. Most of them throw waste water outside and it quickly infiltrates because of high lava porosity. Domestic and commercial solid wastes are removed with a public truck. Sacks of solid wastes are grouped on known sites from where they are collected from and put in the truck. The monthly subscription to benefit from such service varies between RWF 1,500 and 5,000. People who run businesses are the ones to pay RWF 5,000. There are some households which still throw domestic solid wastes in gardens.

### **4.3.3. Livelihood and mobility**

### ***Income generating activities***

There is a wide range of income generating activities in *Rukoro*. These include trading, lodging, rental housing, and informal works (laundry cleaning, construction works, retailing, repairing, tailoring, farming activities, etc).

Trading activities are concerned more with operating small shops, bars and small restaurants, frontage shops and street vending. Shops and frontage shops are usually run by owners. As they are small, no aids are required. The range of products sold is wide. It includes processed foodstuffs (rice, white sugar, pastas, cooking oil, ingredients, etc.), cosmetics, electricity services, mobile phone top-up cards, etc. Bars and restaurants employ around five persons mostly young people less than 30 years old. Local soft drinks and beers, and meat goat kebabs are products mostly served in bars. Restaurants serve local meals made of rice, beans, *Irish* potatoes, bananas, beef meat, eggs, etc. The price of a food plate varies between RWF 200 and 800. Street vending is done by few women. Foodstuff and products are exposed on a simple wood table. Though local authorities would like to ban such retail commerce, but still some cases can be observed.

Lodging is another activity found in the village. There are some cheap lodges where people can stay for some days. The fare per night varies from a place to another. Some of the bars offer cheap accommodation especially for young people.

Rental housing is a well represented income-generating activity in the village, especially in the old *Rukoro*. As stated earlier, many house-owner have built compounds on their plots. Rental housing is seen as a way of making easy money in informal settlement. Because of loose inspection, owners of building plots have erected small annexes to be rented to low-income earners or to the poor fresh in-migrants. Some house-owners have 2 or 3 rented small annexes on the same plot they live also live. Rental price of such annexes is very low. Some of them are occupied by female sex workers. Interviewees said in this case, the monthly rental price varies between RWF 15,000 and 40,000. As elsewhere, the larger and the more comfortable the house the higher the price. In the new *Rukoro*, as houses are bigger, new and better equipped, the monthly rental price can go beyond RWF 100,000. There are also some house-owners who rent frontage shops. Rental price of shop is higher than rental housing price.

Because the area is under redevelopment, construction works are also sources of income for masons, assistant-masons, carpenters, welders, etc. Casual workers are recruited on a daily-basis and do not have to reside necessarily in the village..

Informal works such laundry cleaning, construction works, retailing, repairing, tailoring, are also visible in the area. Most of them are home-offered. Repairing place (for radio, watch, radio, etc.) is frequently showed by a small signboard posted on the front wall. Farming activities has totally disappeared from the village because all land nearby has been constructed.

### ***Services availability and income generating activities***

All public services (electricity, piped water, schools, health clinics, market) are available or very nearby except public transport. But as stated earlier, public transport is not needed as the area is closed to the main road from Kigali and Musanze taxi park. The availability of public services affect people's decision to settle in *Ibereshi*. The neighbourhood was among the first one to attract more people from rural areas because it was provided with such services.

Public services availability has impacted on income-generating activities in the neighbourhood. For instance with regular electricity supply, selling fresh milk, welding, hair dressing, internet cyber cafe, charging mobile phones, selling electrical services via prepaid system etc. are possible. When there is electricity outage, some services cannot be offered. In addition with permanent electricity supply, people can run their business more hours a day. Interviewees and FGDs discussants consider that regular water and electricity supply are essential for the development of any village.

### ***Urban transport, mobility and income generating activities***

There is not public bus line transport in the neighbourhood. This is not particular to *Ibereshi*, it was noted that there is no urban public transport in Musanze town. To move to and from *Rukoro*, people walk, or when in hurry, they use motorbike taxi. One-way motorbike travel from downtown is between RWF 200 and 300, 300 is paid normally in night hours. People can also use bicycle taxi as the village is flat. However drivers have always to pay attention because of right angles that do not permit good visibility. At the time of the study, road network was being improved and some of them tarred. In coming months, moving in the neighbourhood will be smooth.

Retailers from *Rukoro* go regularly to rural markets of neighbouring districts (*Gakenke*, *Burera*, *Musanze* and *Nyabihu*) to buy foodstuffs (sweet potatoes, beans, maize, bananas, vegetables, etc.) that they sell in *Rukoro* and *Musanze* market. Sometimes, farmers also come themselves to sell fresh foodstuff in the village. *Rukoro's* residents pay friendly visits to relatives living in rural areas, but the same movements are observed in the reverse direction. Usually, people coming from rural areas use to bring fresh food to their relatives and friends who are in town and in return, they give them some money considered as return ticket even though sometimes the amount offered can be higher than the real return ticket. Movement of women coming from rural areas to *Rukoro* has been also observed. Such women are mostly employed in clothes washing and housekeeping. They go back to their villages in the afternoon once the job is completed.

#### **4.3.4. Future challenges**

Public services that have priority for improvement can be ranked as follow: the first is regular piped water supply, the second is adequate sanitation, the third is electricity and the fourth is local transport. Mobile network is good and therefore does not deserve any priority for improvement.

Regular water supply is ranked first because the neighbourhood experiences water shortage, and this lead people to use water from *Mpenge* or *Kigombe* streams. Access to clean water is a basic need as use of unclean water can harm human health because of water borne diseases. WASAC should also explore the possibility for lowering water price especially for vulnerable households.

All interviewees and FGDs discussants are unanimous: the climate change is perceptible through the lengthening of the long dry season and great climate variability. For them climate change affects public services provision, especially electricity and water. When there is low rainfall and excessive long dry season, piped water and electricity supply become erratic because there is little quantity of water than needed, and therefore water treatment plant and hydropower plant production decreases, leading to rationing the supply.

In 10 years' time, *Rukoro* village will be a very modern neighbourhood with many multi-storeyed buildings and more businesses, and good roads. Only rich people will be living there. Most of the current residents think that they will have sold their plots and moved in rural areas or less gentrified urban neighbourhood like *Karwasa* that is nearby neighbourhood where it is still possible to acquire land at affordable price.

Asked on the neighbourhood they would like to stay if there was no constraint, most of the interviewees and FGDs discussants said they would be happy if they could live in *Kizungu* and *Yaoundé* neighbourhoods. These are planned areas where adequate houses are found. They are equipped with road network, good schools, electricity, regular water supply. Most of wealthy people and civil servants in top positions live there.

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