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Report Work Package 1 - revised

National ICT Needs Assessment Consultancy

ICT Access and e-Services for Hinterland, Poor and Remote Communities in Guyana

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Definitions

Broadband internet access (fixed line)	Internet access that is obtained via fixed line cable. The underlying physical network can be provided by a telco operator, using the telephone cable (technology used ADLS/VDSL) or a fiber optical cable (GPON) or the TV cable operator (following the DOCSIS standard). Achieved up-/download speeds under ideal conditions can be: ADSL: Down: 10 Mbit/s Up: 1 Mbit/s VDSL: Down: 50 Mbit/s Up: 10 Mbit/s GPON: Down 2.5 GBit/s Up: 2.5 GBit/s DOCSIS: Down 200 Mbit/s Up: 100 Mbit/s
Broadband internet access (mobile)	Internet access (wireless communications) that is obtained through a portable modem or other device, such as a mobile phone. A number of network standards can be used for mobile broadband including: UMTS, LTE Achieved download rates under ideal conditions can be: UMTS: 7.2 Mbit/s (up to 42 Mbit/s for HSPA+) LTE: 100 Mbit/s (up to 1 Gbit/s for LTE advanced)
Cellphone	A portable cordless telephone for use in a cellular network, like GSM.
EDGE	Early GSM standard (2G) for data transfer over the mobile network. Maximal transfer rate that can be provided is 220 Kbit/s.
Fixed line penetration	Total number of households with fixed line access expressed as a percentage of the total number of households in the market (the country).
Health Center	Unit to perform basic care and full time services to the population, with appointment or without, on the basic services and can provide dental and other top-level professional assistance. Assistance should be permanent and provided by general practitioner or specialist in these areas. May or may not offer: Support Service for Diagnosis and Therapy and 24 hours Emergency Service.
Health Post	Unit designed to provide assistance to a particular population, with appointment or without, by mid-level professional with intermittent presence or absence of medical professional.
Hinterland Communities	Hinterland communities are inland communities in areas that are far from urban centers on the coastline. This applies to Region 7, 8, and 9. Region 1 is located on the coastline, but is still considered as Hinterland per definition. The regions classified as “Hinterland” are not necessarily difficult to access.
Hospital	Unit designed for the provision of care in the basic specialties, by experts and/or other medical

	professionals. May have Urgency/Emergency service. Must also have medium complexity Support Service for Diagnosis and Therapy. Being able to handle high complex procedures and systems.
LTE	Long-Term Evolution (LTE) is a standard for high-speed wireless communication for mobile phones and data terminals and based on the GSM/EDGE and UMTS/HSPA network technologies. It is commonly marketed as 4G. Data rates of 100Mbit/s and up to 1Gbit/s with LTE-Advanced can be achieved under ideal conditions.
Mobile penetration	Total mobile connections at the end of the period, expressed as a percentage share of the total market population (the population of the country).
Mobile phone	Umbrella term for all phone that have no physical cable connection. This includes cellphones and smart phones.
Narrowband internet access (mobile)	Internet access with mobile device with a low bandwidth, using technologies like WAP, EDGE. Achieved download rates under ideal conditions can be: WAP: 9.6 Kbit/s EDGE: 220 Kbit/s
Poor Communities	Poor communities in the context of this study are communities where people live in conditions “near multidimensional poor”, “multidimensional poor” or “in severe poverty”. The Multidimensional Poverty Index (MPI) for developing countries captures the multiple deprivations that people face in their education, health and living standards. The MPI shows both the incidence of non-income multidimensional poverty (a headcount of those in multidimensional poverty) and its intensity (the relative number of deprivations poor people experience at the same time.
Remote Communities	Remote communities are located not necessarily far away from Georgetown and the coastline from a geographical point of view, but very difficult to access: Either due to poor road’s conditions, or due to accessibility only via water ways (by boat). These areas tend to have limited access in terms of water supply, sewage services, electricity supply, schools, hospitals, road systems, policing, leisure facilities, etc.
Smartphone	A smartphone is a cellular phone with an integrated computer and other features not originally associated with telephones, such as an operating system, Web browsing and the ability to run software applications.
Teledensity	Teledensity describes the number of telephone lines per population in a country or region.
UMTS	The Universal Mobile Telecommunications System (UMTS) is a third generation (3G) mobile cellular system for networks based on the GSM standard. UMTS supports maximum theoretical data transfer

	rates of 42 Mbit/s when Evolved HSPA (HSPA+) is implemented in the network. Users in deployed networks can expect a transfer rate of up to 384 kbit/s for Release '99 (R99) handsets (the original UMTS release), and 7.2 Mbit/s for High-Speed Downlink Packet Access (HSDPA) handsets in the downlink connection.

1. Report

1.1 Overview

Guyana is a country rich in natural resources like gold and oil, as well as rich in nature and wildlife. This abundance has enabled Guyana to thrive in the previous years and to keep up and accelerate the growth momentum, Information and Communication Technologies (ICT) has been identified as a major corner stone of future economic development.

A vision for the upcoming years needs to be elaborated to define a strong "ICT foundation" for Guyana, which takes all the needs and requirements of the different stakeholders into account. Special focus needs to lie on bridging the digital divide between stakeholders in the coastal and in the interior regions of Guyana. It is furthermore essential to not only limit this vision to activities for building up the technology infrastructure itself, but also find sustainable operating models, define a suitable regulatory framework, provide tailored services and enable effective capacity building among all communities.

The e-Government Agency is responsible for elaborating this ICT vision and the execution of the related program. The United Nations Development Programme (UNDP), as the partner entity under the GRIF Framework, is responsible for program quality assurance and for providing and incorporating social, fiduciary, and environmental safeguards and best practices into the design and implementation of this program.

The Government of Guyana and UNDP have contracted "Detecon Consulting" to help define and elaborate this vision as a first step.

1.1.1 Introduction

This baseline report comprises the findings from the work stream 1 of the project "ICT Access and e-Services for Hinterland, Poor and Remote Communities in Guyana". The work stream 1, called Baseline Data Collection and Analysis, aims to collect data that represent the As-Is Situation in the country from different angles: the consumer perspective, the technology perspective, as well as the corner stones of the current ICT regulation in place. It describes the current state (high-level) of the ICT-Situation in the country with focus on the Hinterland, Poor, and Remote areas.

This report will serve as basis for the next work streams: work stream 2 which covers the technical report, and work stream 3 addressing the e-Services readiness assessment. Both work steams will elaborate a complete vision for ICT opportunities for Guyana's specific hinterland, poor and remote areas.

The applied Detecon methodology follows the TOGAF framework[1] that gives a state of the art "skeleton" for a structured approach along the different research layers towards the elaboration of specific architectures.

[1] Source: https://www.opengroup.org/togaf/

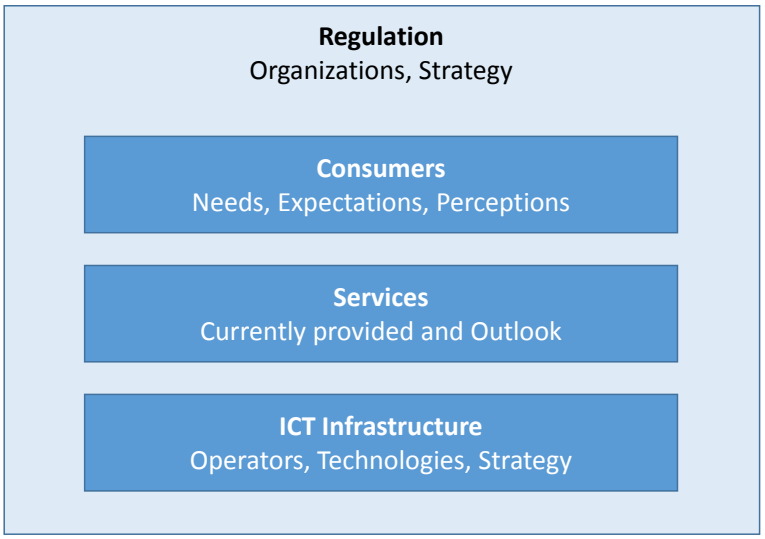


Image 1 -Layers of Research

The analysis of all these layers are essential to compile a holistic overview about the current situation of ICT infrastructure and services in the Hinterland, Poor and Remote areas.

1.1.2 Key findings

This study comprised interviews at 30 communities in all 10 regions of Guyana. Those communities were amongst other criteria selected according to their area characteristics of poor, remote and hinterland. In addition commercial telecommunication operators and the eGovernment-Unit were interviewed in order to obtain a comprehensive picture and understanding of the current situation. The key findings can be summarized as follows:

Socio-economic situation

- Overall the economic development for Guyana has been positive and is expected to grow further. Still in most of the communities, the general economic situation is considered to have worsened during the last years. The main perceived causes are a general lack of training and education and the overdependence of local economy on extractive activities such as mining and logging.
- In terms of generating income and/or revenues the lack of proper education is seen as major problem. Even the few job opportunities available are hard to access for people from the communities due to a lack of proper qualifications. Further reasons are poor access to ICT services, the lack of markets to sell local products, and the absence of natural resources.
- Politics is seen as the most divisive issue in Guyana. Many respondents think that partisanship is a big problem in their country. While ethnical conflicts are in generally seen to be fading away with the younger generations, some interviewees still think that old problems are reenacted in specific situations. Indigenous people tend to express a feeling of alienation from decision-making in Guyana. They want not only to receive occasional aid, but also be consulted and included during the design of public policies.

Availability of ICT-Services:

- The survey shows, that the accessibility of telecommunication-services is very divers in Guyana. The coastal areas are better served by communication services, different from the areas in the interior with poor integration of communication systems. This pattern is reflected in the statements of respondents: The inhabitants on the coast complain about the price and quality of services, while inhabitants in the interior resent the lack of access to infrastructure.

- The communities surveyed can be clustered into three groups in terms of the current accessibility of ICT-Services:
    - **Communities with widespread access to a variety of services** presented a comparatively better situation than others regarding the ICT-Accessibility. For instance, in communities such as Albouystown and Kwakwani services such as 3G, landlines, cellphone signal, and Internet are widely available to the public.
    - **Communities with a relatively limited number of widely-accessible services** have access to basic ICT-Services, but lack access to more advanced services. For example, people in places such as Mabaruma and Port Kaituma (both in Region 1) use cellphones, smartphones and narrowband Internet. Broadband Internet is available only through costly satellite services. Landline phones are also relatively rare, being available almost exclusively in some public facilities.
    - **Communities with very few, very unreliable, or quasi nonexistent telecommunication services** are practically cut off from access to telecommunication and information technology. Kako – a community in the Cuyuni-Mazaruni region with more than 2,000 people – for example, has only a few spots where it is possible to get proper mobile phone signal. In the same region, the Phillipai village does not have any mobile signal or landline phone – with the high frequency radio being the only device used to communicate with other villages and regions in Guyana.
- There is a considerable discrepancy between the accessibility of services in the communities and the statements provided by the telco operators who claimed that they are currently covering 98% percent of the population.[2] Even if a village had a mobile signal it mostly didn't cover the whole village, but only some spots of the community. Furthermore prices for some devices (mainly laptops and computers) were considered too high. Some communities, e.g. Kwakwani, have telecommunication services, but no store or shop to buy respective devices. Hence, cost calculations shall also consider the time and money spent to go to Georgetown in order to purchase such devices.

Improvement of ICT-Accessibility

- The quantitative data show that there has been low investment in ICT in the communities surveyed. Nearly 60% of communities claimed that there have been no ICT development projects previously. Many, however, have sought government support or private companies to help to develop actions to improve telecommunication, as they believe that this sort of project would help to develop the region. Besides that, they also believe it would help the youth to have more access to information.
- The most significant barriers in terms of infrastructure to be overcome are:
    - Lack of electricity access
    - Lack of Internet access/ connectivity in form of telecommunication infrastructure
    - Lack of access to devices at the communities (phone/computer stores)
- The most significant barriers in terms of consumers to be overcome are:
    - Lack of knowledge of usage of the devices
    - Unawareness of all functions of the devices
    - Low emotional affection towards ICT-devices
    - Prices are not affordable/inappropriate to economical profiles of respondents
    - Lack of feeling of unitedness (e.g. disconnected from the coastline or not equally appreciated as a citizen), even though respondents feel Guyanese
- The most significant barriers from the operators' perspective are:
    - High taxation level for telephone companies and high level of fees to the different agencies
    - Lack of skilled workforce in Guyana.

[2] Source: Digicel

- Complex and extremely time consuming processes to obtain permission for building new base stations in the country from public bodies.
- Uncertainty about the market development and the specific role of e-Government Unit as a government funded infrastructure provider in this environment.
- Uncertainty about future evolution of regulatory framework.

1.2 Market Research

This chapter shows the results from the market research, it covers the consumer needs and their perspective in regards to ICT infrastructure, its usage and the experience with the different service providers.

1.2.1 Introduction

In the following, the objectives and the methodologies of the market research done in this project are outlined.

1.2.1.1 Objectives

The main objective of this work was to gather data on the communities' infrastructure and on the people's attitudes towards Information and Communication Technology (ICT) as well as understanding the people's needs regarding ICT-services, their expectations towards ICT-Infrastructure and ICT-Services including an indication of their willingness to pay for ICT services as well as getting an understanding of their respective ICT literacy. The aim was also to compile relevant data on shortcomings in different sectors, such as social, economic or health. These shortcomings will be considered in work streams 2 and 3 and might be remedied by the evolution of the ICT-infrastructure and ICT services in the future.

To collect this data, a quantitative survey and a qualitative survey on community level addressing the head of the community as well as key experts in different domains like health and education. To broaden the sample size and to be able to reflect the different age groups and other variables of the population an ICT checklist was elaborated to be used as a "self-services" questionnaire. The interviews were conducted at 30 communities in all 10 regions of Guyana. Those communities were amongst other criteria selected according to their area characteristics of poor, remote and hinterland.

The data collected identified the current environment of those communities. The indicators assessed quantitatively included:

- number of communities that have Internet and/or telephony access;
- number of children in the communities accessing online education, or separately enrolled in primary, secondary and tertiary education;
- poverty levels of all identified communities;
- number of ICT literate persons within all identified communities;
- number of desktop computers and laptops within all identified communities;
- number of schools, medical facilities, and communal buildings in each community identified.[3]

The quantitative survey was set out to gather indications - this does not include statistically relevant data in the context of a full census or census-type survey. The data will be informative for the scope of the project. The ICT checklists aims to gather a broader sample of the population in a village to get data with relevance.

[3] For further information see Inception Report p.07.

The qualitative survey enriched the quantitative data with complimentary background information and covered topics that needed to be explored freely to uncover so far unknown circumstances and needs.

1.2.1.2 Methodology

The methodology includes quantitative and qualitative analyses. The selection of the sample is based on social-economical and geographical criteria.

1.2.1.2.1 Quantitative and Qualitative Approach

The **quantitative survey** is designed to collect data in a statistical format: whether numeric, on a percentage basis, or as open-ended question type. It aims at gathering baseline data of the community, information on the existing ICT infrastructure and the usage of ICT services, with focus on topics related to ICT literacy. Representative persons of each community were asked to give information about their community. This information was obtained by multiple-choice answers, closed-ended questions, and open-ended questions. The individual interviewee in each community was either a community leader, or a person that has certain knowledge of the community. In many cases, this entailed interviewing multiple persons in a respective community, which additionally helped to reconfirm data and complete any data that might not be answerable by any one person.[4]

The **qualitative survey** was conducted with representative persons of each community: They were asked to speak about their community, conditions and habits. Those persons were selected from the general population and asked about their personal reality as well as their impressions about the community they live in. This information was obtained by open-ended questions and selective inquiring in “individual face-to-face interviews” or “round of talks/round table with several persons” interview approach.

From chapter 1.2.3.8 up to chapter 1.2.6.6, the study addressed the issue of access to telecommunications in a qualitative way. In these chapters, the focus is not to quantify - what Interests is the vision, associations and feelings in regards to the access or lack of access to the available means of telecommunications in Guyana. That helps the researchers to develop a deeper understanding of the subject, more than can be obtained by quantitative research alone. Qualitative research uses methods such as in-depth interviews and direct observation, so that researchers can investigate attitudes, beliefs and preferences of stakeholders - the how and why. These qualitative research methods provide an opportunity for a systematic in-depth assessment of a question that cannot be easily answered through quantitative methods. In addition, the quantitative results add figures to the desires and needs detected using the qualitative method.

1.2.1.2.2 Guyana’s profile

The economy of Guyana is based on agriculture and extractive industries. It is mainly focused on the export of six commodities – sugar, gold, bauxite, shrimps, timber and rice – and it has experienced a moderate growth in the past few years; it is estimated to maintain its levels of growth in the future years. Still, the moderate growth in the economy is only marginally reflected by unemployment rates. In recent years, this rate has demonstrated little change – In 2012 it was 11.3% and in 2013 it dropped to 11.1%. The population of Guyana is predominantly young. The young, young adults and adults represents 65% of the population, followed by those of younger age – 30% between 0-14 years old, and 5% of the population is 65 years and over. The electricity in Guyana is mainly composed by fossil fuel; it was estimated that in 2011 fossil fuel electricity represented 96% of the electricity capacity installed, while the electricity from renewable sources were responsible for only 3,7%. An estimated data for 2011 revealed an electricity production of 725 million KWh and a consumption of 523 million KWh.[5]

[4] For further information on sample size and the methodology adopted see Inception Report p.18.

[5] All data presented in the Results – overview section is a compilation of the data presented in the book *Guyana. Information strategy, Internet and e-commerce developed handbook. Strategic information, programs and regulation*. Published by International Business Publication, USA, 2015.

	Population	Main economic activity
Region 1 - Barima-Waini	18,590	Logging
Region 2 - Pomeroon-Supernaan	42,769	Rice farming
Region 3 - Essequibo Island-West Demerara	91,328	Rice farming
Region 4 - Demerara-Mahaica	297,162 *	Administrative and Commercial activities
Region 5 - Mahaica-Berbice	49,498	Rice farming
Region 6 - East Berbice-Corentyne	142,839	Rice and Sugarcane farming and gold and diamond mining
Region 7 - Cuyuni-Mazaruni	15,342	Cattle rearing
Region 8 - Potaro-Siparuni	5,737	Cattle rearing
Region 9 - Upper Takutu-Upper Essequibo	15,087	Cattle rearing
Region 10 - Upper Demerara-Upper Berbice	39,106	Bauxite extraction
	Total population: 717,458	GDP by sector of origin (2014): Agriculture: 20.3%; Industry: 39.2%; Services: 40.5%.
* The capital city, Georgetown, has 56,095 inhabitants.		

Table 1 - Regions of Guyana

1.2.1.2.3 Selection Parameters of Communities

Through intertwining the selection parameters below, the aim was to cover a representative sample of the population. Selection parameters are:

- **Geographic location** – in order to cover the entire territory of Guyana and its ten regions, including indigenous territory, urban, rural, remote and hinterland areas;
- **Ethnical-racial criteria** – in order to include the different ethnic and racial inscriptions of the country: Afro-Guyanese, Indo-Guyanese, Indigenous People and Mixed;
- **Socio-economic aspects** – in order to include communities of all kind of economic strength: Poor localities as well as non-poor localities: namely localities with economic activities such as mining, logging, agriculture, commerce and tourism.

1.2.1.2.4 Overview of selected communities per region[6]

[6] Regions 1,7, 8 and 9 in blue are defined as Hinterland. For further information on sample selection see Inception Report p.24.

Region	Region Name	Main City	Community 1	Community 2	Community 3	Community 4
1	Barima	Mabaruma	Port Kaituma	Mabaruma		
2	Pomeroon-Supenaam	Anna Regina	Mainstay/Whayaka	Charity	Santa Monica	
3	Essequibo Islands-West Demerara	Vreed en Hoop	Wales	Saxacally	Hogg Island	
4	Demerara-Mahaica	Georgetown	Albouystown	Buxton	Laluni	St. Cuthberts
5	Mahaica-Berbice	Fort Wellington	Perth	Ithaca	Number 3/Rosignol	
6	East Berbice-Corentyne	New Amsterdam	West Canjie	Plegt Anker	Orealla	
7	Cuyuni-Mazaruni	Bartica	Phillipai	Kako	Bartica	
8	Potaro-Siparuni	Mahdia	Tumatumari	Mahdia		
9	Upper Takutu-Upper Essequibo	Lethem	Karasabai	Lethem	Aishalton	Nappi
10	Upper Demerara-Berbice	Linden	Wismar	Kwakwani	Coomacka	

Mixed	Afro-Guyanese	Indo-Guyanese	Indigenous People

Image 2 - Communities per region visited

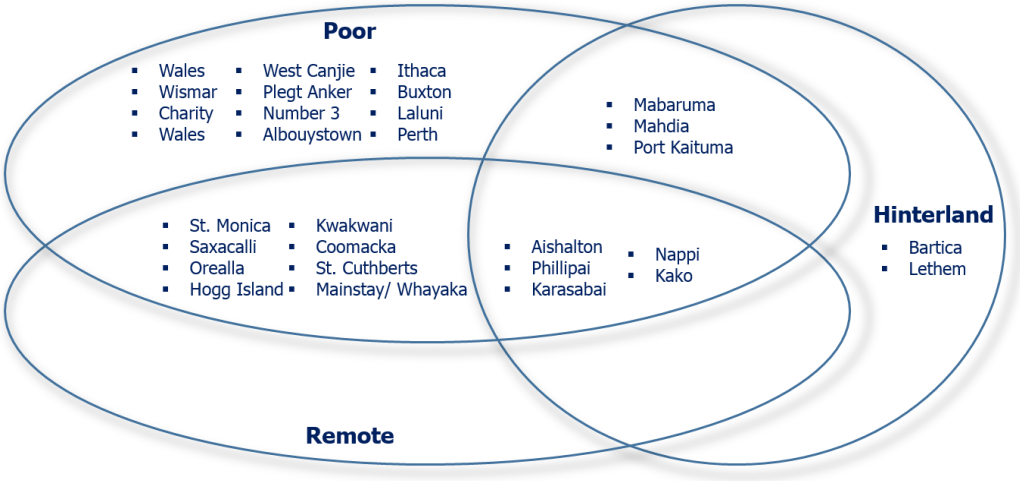


Image 3 - Characteristics of visited communities

This graph indicates the intersections between the three main quota criteria of all selected communities. It shows that most remote communities overlap with the other two criteria: hinterland and poor. Communities in all three dimensions were covered in the research. Remote communities will most likely always be poor, too.

1.2.1.2.5 Geographic Criteria[7]

- Remote[8]

  Classified as remote areas are the areas that are not necessarily far from Georgetown and the coastline from a geographical point of view, but hard to access: Either due to poor roads, or due

[7] For further information on sample selection, see Inception Report p.24.

[8] ALALHAR, Anton (edited). Ethnicity, Class and Nationalism: Caribbean and Extra-Caribbean Dimension. Lanham: Lexinton Books, c2005.Link:https://books.google.gy/books?id=PbMM74ucos0C&pg=PA118&lpg=PA118&dq=academic+citation+meaning+hinterland++Guyana&source=bl&ots=ytt1Xi1LTt&sig=ajpGhrmGAUhY_8bwpRSq7YpGl6o&hl=pt-BR&sa=X&ved=0ahUKEwjvsoemi5TOAhUMOz4KHUAzDUoQ6AEILzAD#v=onepage&q=academic%20citation%20meaning%20hinterland%20%20Guyana&f=false (specifically on pages 94; 95; 110; 118).

to accessibility only via water ways (by boat). These areas tend to be poor in terms of water supply, sewage services, electricity supply, schools, hospitals, road systems, policing, leisure facilities, etc.

- Hinterland[9]

  Classified as "Hinterland" are inland areas that are far from urban centers and the coastline. This applies to Region 7, 8, and 9. Region 1 has a coast, but still is considered as Hinterland per definition. The regions classified as "Hinterland" are not necessarily difficult to access. These areas can have problems in terms of water supply, sewage services, electricity supply, schools, hospitals, road systems, policing, leisure facilities, etc. The Hinterland has not developed because of its lack in real political and economic identity. It is considered an underdeveloped area in comparison to the coastal and urban areas where there is more economic activity. This could be a reason why region 1 is defined as Hinterland despite the fact, that it is located at the coastline.

Image 4 - Regions of Guyana[10]

[9] ALALHAR, Anton (edited). Ethnicity, Class and Nationalism: Caribbean and Extra-Caribbean Dimension. Lanham: Lexinton Books, c2005.Link:https://books.google.gy/books?id=PbMM74ucos0C&pg=PA118&lpg=PA118&dq=academic+citation+meaning+hinterland++Guyana&source=bl&ots=ytt1Xi1LTt&sig=ajpGhrmGAUhY_8bwpRSq7YpGl6o&hl=pt-BR&sa=X&ved=0ahUKEwjvsoemi5TOAhUMOz4KHUAzDUoQ6AEILzAD#v=onepage&q=academic%20citation%20meaning%20hinterland%20%20Guyana&f=false (specifically on pages 94; 118).

[10] Source: https://upload.wikimedia.org/wikipedia/commons/thumb/0/0f/Guyana_regions_numbered_(GINA).png/175px-Guyana_regions_numbered_(GINA).png

- Urban[11]

  Urban areas are characterized by the existence of urban infrastructure, comprising the set of utilities: water supply, sewage service, electricity supply, schools, hospitals, road system, policing, leisure facilities, etc. They undergo continuous development through construction activities. Population per km2 is significantly higher than in remote or Hinterland regions. Economic activities in these areas are mainly related to commerce.

- Rural[12]

  Rural areas are non-urbanized areas. The main activities are agriculture and livestock farming, mining, rural tourism, forestry or environmental conservation. It is in rural areas where much of the food consumed in urban areas is produced. In rural areas, there are large green areas, which can be natural or cultured. Furthermore concentration of people and buildings is low, and there is a striking presence of natural elements, such as rivers and vegetation.

- Poor[13]

  Several aspects must be considered in order to classify areas as "poor": The Multidimensional Poverty Index (MPI) for developing countries captures the multiple deprivations that people face in their education, health and living standards. The MPI shows both the incidence of non-income multidimensional poverty (a headcount of those in multidimensional poverty) and its intensity (the relative number of deprivations poor people experience at the same time). Based on intensity thresholds, people are classified as near multidimensional poor, multidimensional poor or in severe poverty, respectively. The contributions of deprivations in each dimension to overall poverty are also included. According to numbers from 2009, 18,8% of the population of Guyana live near multidimensional and 1,2% of the population live in severe multidimensional poverty.[14]

  According to the World Bank (2016), "The majority of Guyana's poor live in rural areas, while extreme poverty is concentrated in the interior regions. The rural poor are self-employed in agriculture or work as agricultural laborers. Poor rural households have access to adequate land resources, indicating that low productivity is a major cause of poverty. Along the coastal areas, poor households are involved in subsistence agriculture and small-scale rice production. In the interior, subsistence farming is most prevalent. In urban areas, the poor include those employed as wage laborers in a variety of occupations, in small informal businesses, as public servants at the bottom end of the salary scale, and pensioners".[15]

  To identify poor communities to be considered in the survey, the Enumeration District Marginality Index (EDMI) has been used.[16]

[11] PEREIRA, Mariana Cunha. Processos migratórios na fronteira Brasil-Guiana. Estud. av. [online]. 2006, vol.20, n.57 [cited, 2016-07-27], pp.209-219. Available from: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-40142006000200016&lng=en&nrm=iso>.

[12] PEREIRA, Mariana Cunha. Processos migratórios na fronteira Brasil-Guiana. Estud. av. [online]. 2006, vol.20, n.57 [cited, 2016-07-27], pp.209-219. Available from: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-40142006000200016&lng=en&nrm=iso>.

[13] A poverty map for Guyana: Based on the 2002 population and housing census: SKOUFAS, Emmanuel. The World Bank, 2005.

[14] Human Development Report 2015: Work for Human Development, p. 205, UNDP.

[15] The World Bank (2016). Guyana: Strategies for reducing poverty (on-line). WORLDBANK. Available: http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPA/0,,contentMDK:20207586~menuPK:435735~pagePK:148956~piPK:216618~theSitePK:430367,00.html, (13TH JULY, 2016).

[16] See Inception Report, Chapter A.3.1.5.3, p. 32, for details regarding the Economic Criteria.

1.2.1.2.6 Ethnic-Racial Criteria

- Indigenous People

  Indigenous People were the very first inhabitants of the land. They share a rich and diverse culture and are one of the many ethnic groups that make up the people of Guyana. According to the Ministry of Indigenous People´s Affairs (2016)[17], there are nine Indigenous People tribes settled across the ten administrative Regions of Guyana: Wai Wais, Macushis, Patomonas, Arawaks, Caribs, Wapishana, Arecunas, Akawaios, and Warraus. The nine Indigenous People tribes, according to official census in 2012[18], made up 11% of the population by that time.

- Afro-Guyanese[19]

  Afro-Guyanese people in Guyana are from Sub-Saharan African descent. As the Afro-Guyanese people from Guyana they were the inhabitants forcibly brought as slaves to work on the sugar plantations of British Guyana. After the abolition of slavery in the British Colonies, Afro-Guyanese joined together and established small villages. According to the official census in 2012, Afro-Guyanese made up 29% of the population.

- Indo-Guyanese[20]

  Current Indo-Guyaneses are descendants of the first East Indian immigrants who arrived in British Guyana in the mid-nineteenth century after the abolition of slavery in 1838. Ethnically, they were originated from different parts of India; more specifically from a part known to Hindi people (People of Hind). Ethno/linguistic groups came primarily from the north-central Indian region of Hind, which is located in the Gangetic Plain of the Ganga and Yamuna rivers in North India, between the Himalayas and the Vindhyas. Nowadays, Indo-Guyanese are the largest ethnic group in Guyana identified by the official census in 2012, which accounted for about 39,83% of the population.

- Mixed source[21]

  Mixed group are originated from marriages amongst Afro-Guyanese people, Indigenous People and Indo-Guyanese. According to official census in 2012, the Mixed group made up 20% of population.

1.2.1.2.7 Economic Criteria

The main economic activities include mining (gold, diamond and bauxite), forestry and logging, agriculture (rice farms, sugarcane production) and commerce.
The key factors that influenced the selection of communities to be interviewed was the level of poverty. Especially communities with smaller population tend to have more severe levels of poverty. The extent of poverty within

[17] MINISTRY OF INDIGENOUS PEOPLE´S AFFAIRS. (2016). *Amerindian Nations*. (On-line) Ministry of Indigenous People´s Affairs. Available: http://indigenouspeoples.gov.gy/amerindian-nations/, (13th July, 2016).

[18] BUREAU OF STATISTICS A GOVERNMENT OF GUYANA AGENCY. (2012). *Compendium 2 Population Composition*. (On-line) estatisticsguyana. Available: http://statisticsguyana.gov.gy/census.html (13th July, 2016).

[19] BUREAU OF STATISTICS A GOVERNMENT OF GUYANA AGENCY. (2012). Compendium 2 Population Composition. (On-line) estatisticsguyana. Available: http://statisticsguyana.gov.gy/census.html (15th July, 2016).

[20] BUREAU OF STATISTICS A GOVERNMENT OF GUYANA AGENCY. (2012). *Compendium 2 Population Composition*. (On-line) estatisticsguyana. Available: http://statisticsguyana.gov.gy/census.html (15th July, 2016).

[21] BUREAU OF STATISTICS A GOVERNMENT OF GUYANA AGENCY. (2012). *Compendium 2 Population Composition*. (On-line) estatisticsguyana. Available: http://statisticsguyana.gov.gy/census.html (15th July, 2016).

the community could be evaluated considering, for instance, an appropriate energy supply. This selection was made by reviewing the most recent poverty indicators available[22].

1.2.1.2.8 People to Meet/Persona Profiles of Preferred Interview Partners

- Quantitative interviews were conducted with the Toshao or a respective community leader. The given data was confirmed at least once or until one set of complete data has been collected.
- For the quantitative ICT checklist, people of the respective community were approached randomly, regardless of their occupation, having in mind that the different age groups (0-4 yrs, 5-15 yrs, 16-24 yrs, 25-54 yrs and 55 yrs and older) and both genders should be covered, whenever possible. A number of 5-6 checklists was collected per community. The collection of more checklists was intended on best effort.
- The data gathered were entered into the Spiegel-Institute's survey engine (web-based) only once per community.
- The qualitative interview could also be held with the Toshao or Community Leader respectively, when this seemed absolutely necessary out of respect or expectation. Additionally, a maximum of 2-3 further representative people, as described below, was questioned:
    - Toshao/Community Leader/Chairman
    - Representative person of prevailing industry (tourism, handcraft, agriculture, etc.)
    - Representative person of local educational institution (directors, supervisors, teachers)
    - Representative person of local healthcare institution (physicians, nurse, vet)

These interviewees were most likely not preselected, but that does not entail that they show different prerequisites than any randomly selected person. These people could also be visited or searched for by recommendations of people in the community. While for the selection of the different personas a random selection could be made.

The communication protocol as advised was followed in interacting with ministries and agencies. The researchers completed the interviews during one full day per community, meeting local representatives who confirmed and authorized the visits. In case of Indigenous People's communities, the Toshaos was pre-contacted with an official letter from the UNDP.

1.2.2 Results

This report describes and analyzes the information gathered in 70 qualitative interviews and 30 quantitative interviews and 142 ICT checklists conducted between July the 19th and August the 9th of 2016, in thirty communities across all ten regions of Guyana. The qualitative respondents were professionals from health sector, education sector, and business owners. Whenever possible, representatives from these three profiles were interviewed. The quantitative respondents were the Toshaos or community leaders. The ICT checklist respondents were randomly chosen following the criteria specified above.

Based on the presented data, it is clear that the telecommunication systems in Guyana are not equally distributed. The coastal areas are better served by communication services, different from the areas in the interior with poor integration of communication systems. This pattern is reflected in the statements of respondents: the inhabitants at the coast complain about the price and quality of services, while inhabitants in the interior resent the lack of access to infrastructure.

There are three types of variations in access to information and communication technology in the surveyed communities:

1) **Communities that in general have access to a large number services.** In these communities access to 2G or 3G mobile connection, landline phones, and Internet is widely available to the public. Kwakwani and Albouystown are examples of communities with this profile. On the other hand, there are some issues: Mobile Broadband Data

[22] For further information about the poverty indexes used, see Inception report, p.32.

and Internet are considered expensive and unreliable. Moreover, the prices of some devices like computers and laptops are considered as high. Furthermore, there are mentions of difficulties in operating some devices.

2) **Communities that have access to a limited number of services with moderate to good quality**. Here, the same difficulties are encountered as in group 1) such as instability of Internet connection, difficulties in handling some appliances and high service costs. There are, however, areas with good signal quality. Though, this signal is available only in few areas in the respective communities.

3) **Communities with few or very few services available to only a limited number of people**. A situation of isolation regarding access to communication and information technology prevails. Kako is an example, as there are only few spots with cellular coverage. In Philipai there is neither cellular coverage nor landline connection, and therefore HF-radio is communication device most used.

Quantitative interviews also provide the numerical references to regional differences in access to ICT. Despite of not having a consistent sample to divide communities into regional segments, the conclusions take into account the estimates of access to education, infrastructure and communication (estimated percentage) from the total population or households informed by local leaders, which gives us an overview of the reality of the communities.

The observed growth[23] of purchasing personal mobile phones can be ascribed to lack of access and lack of repair of landlines for personal and professional usage. Some regions in remote areas are more affected by poor services of telephone and Internet access as well because there are still problems with electricity.

Besides that, according to the obtained data, communities falling under all three categories (poor & remote & Hinterland), which include the communities of Kako and Philipai, are the poorest in access to essential services such as water, sewage or garbage collection. Furthermore, corroborated with the distribution developed in the qualitative stage, those are communities with very low access to ICT. 40% of the population surveyed have access to mobile telephony. In contrast, only 5% of all communities of the category Poor & Remote & Hinterland have Smartphones and other modern devices for communication as devices are quasi nonexistent.

The general interest and demand for better products and telecommunication services increase, as in some regions people have started to use smartphones for multiple functions, such as: chat, purchasing products, downloading videos, online courses and social media.

The quantitative data also show that there has been low investment in ICT in the communities surveyed. Nearly 60% of communities had no ICT development projects previously. Many, however, have sought government support or private companies to help to develop actions to improve telecommunication.

Access to Internet is much desired: According to 27% of the respondents, Internet inclusion would help to develop their region and to improve education.

Taking into account the findings from the survey, there are several barriers to be overcome in order to improve ICT access for Hinterland, Remote and Poor regions:

Dealing with some infrastructural barriers:

- poor electricity access
- poor Internet access/ data service
- poor access to devices in the communities (phone/computer stores)

Dealing with consumers' barriers:

- Lack of knowledge of usage of the devices
- Unawareness of all functions of the devices
- Low emotional connection to the devices
- Prices not affordable/inappropriate to economical profiles of respondents
- Lack of feeling of unitedness, even though respondents feel Guyanese – requires different communication approach

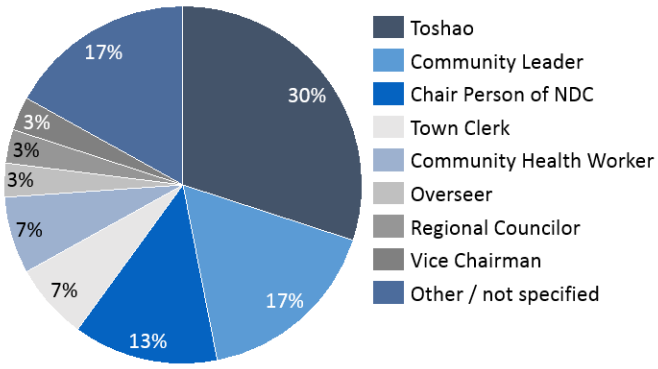
[23] Based on statements in the qualitative interviews – impressions and opinions of the respondents.

1.2.3 Interviews with Leaders of the communities

1.2.3.1 Toshao/Community Leader

The majority of the interviewees occupied a role of leadership in the communities. They had the necessary knowledge regarding their communities and were able to answer the quantitative questions with detailed information.

30% of respondents were Toshaos – Indigenous People leaders; followed by Chair leaders[24] and other communities' leaders with 13% each; the other positions – not specified by the respondents – reached the sum of 17%.



N=30
Image 5 - Interviewees occupation (roles as being stated by the interviewees) (in %)

1.2.3.2 Community Segments

Following the criteria mentioned above (see 1.2.1.2.5), which were decisive for the community's choice, we were able to distinguish amongst the communities, considered that 93% are poor, 47% are remote and 37% are hinterland. A single community may be in more than one category, for example, Kwakwani is poor and remote. Table 2 describes the category of each community.

[24] Role defined by interviewed person

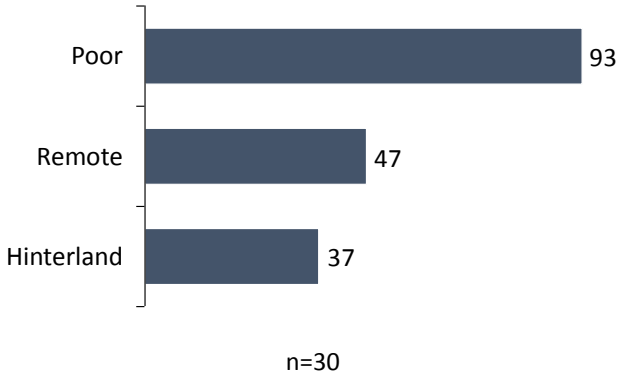


Image 6 – Overview of characteristics of the different segments of communities interviewed (in %)

Poor	Albouystown, West Canjie, Wismar, Plegt Anker, Number 3, Charity, Wales, Perth, Laluni, Ithaca, Buxton
Remote and Poor	Kwakwani, Coomacka, Mainstay/Whayaka, St. Cuthberts, Sta. Monica, Saxacalli, Orealla, Hogg Island
Remote, Poor and Hinterland	Kako, Philipai, Aishalton, Nappi, Tumatumari, Karasabai
Hinterland	Bartica and Lethem
Hinterland and Poor	Mahdia, Mabaruma and Port Kaituma

Table 2 - Communities per community segment (%)

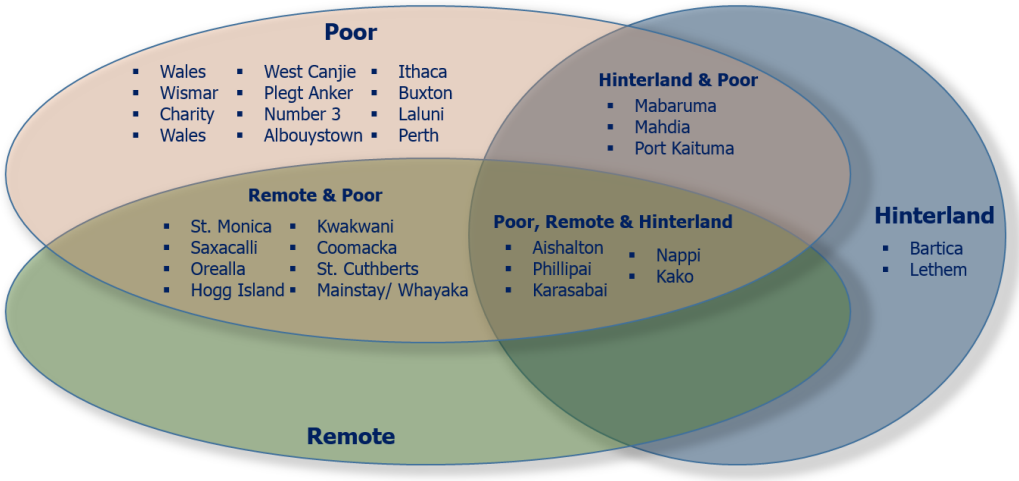
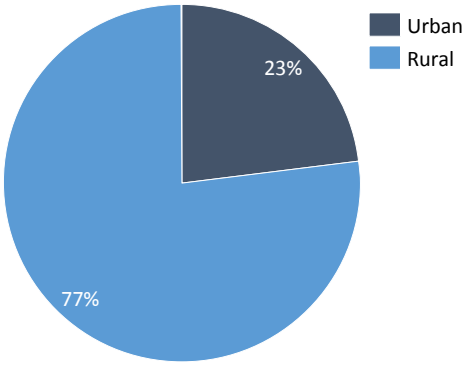


Image 7 - Characteristics of communities visited and segment definitions

The communities surveyed covered all three characteristics: Hinterland, Poor and Remote. Whilst "remote" implies difficulties to access this very location, "Hinterland" is per definition any community located in region 1, 7, 8 or 9. Hence some communities fall under both categories and are "remote" and "Hinterland" at the same time.

Amongst the communities visited, almost eight in ten communities were located in rural areas (77%).



n=30

Image 8 – Characteristics of visited communities (in %)

1.2.3.3 Demography

The population in the communities considered for this study vary from 100 to, approximately, 30.000 inhabitants. The average of person per household is 5. The majority of the population are estimated to be permanent residents in their communities (84%). Hinterland and poor communities have 24% of temporary residents, this is mainly due to the displacement between the mines (where they spend from three to six months working) and their communities or due to the activity of logging that forces them to leave their community for a period as well. For the construction of houses wood is used preponderantly, especially in community segments defined as poor (91% of houses utilize wood). Overall brick is used for 50% of the houses and concrete for 33% (Image 16).

	Population	Domiciles	Average (people by domiciles)
Lethem	8000	4000	2.0
Santa Monica	510	106	4.8
St. Cuthberts	1700	400	4.3
Mainstay	650	120	5.4
Wismar	29298	4883	6.0
Coomaca	900	150	6.0
Bartica	12000	10000	1.2
Aishalton	1058	220	4.8
Charity	3000	2600	1.2
Port Kaituma	7000	400	5.2
Hogg Island	300	50	6.0
Saxacally	104	32	3.3
Karasabai	1300	250	5.2
Wales	6000	2000	3.0
Kako	760	200	3.8
Nappi	690	125	5.5
Perth	1200	60	4.2
Buxton	8000	3000	2.7
No.3/Rosignol	578	100	5.8
Kwakwani	2503	695	3.6
Ithaca	1200	300	4.0
Laluni	735	140	5.3
Albouystown	15000	2000	7.5
West Canje	6000	1000	6.0
Phillipai	1700	700	2.4
Mabaruma	5638	2000	2.8
Tumatumari	135	29	4.7
Plegt Ankor	160	30	5.3
Orealla	500	150	3.3
Mahdia	4200	600	7.0

Table 3 - Average number of persons per domicile (household) [25]

[25] The average was calculated dividing the number of people in the community, mentioned by the leader, per the number of domiciles estimated by the same respondent. By discrepant values (occurred in Philippai and Port Kaituma) the data from the Census (2002) related to the number of inhabitants and households were considered instead. In the case of Kwakwani, value is discrepant, but there is no information about the number of domiciles which prevented the replacement.

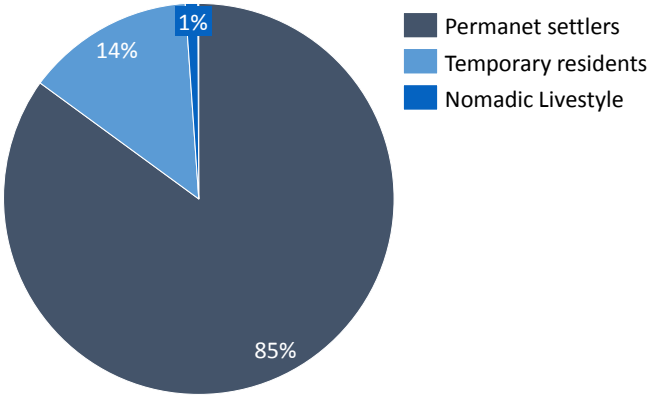


Image 9 - Character of Residents in the communities (in %)

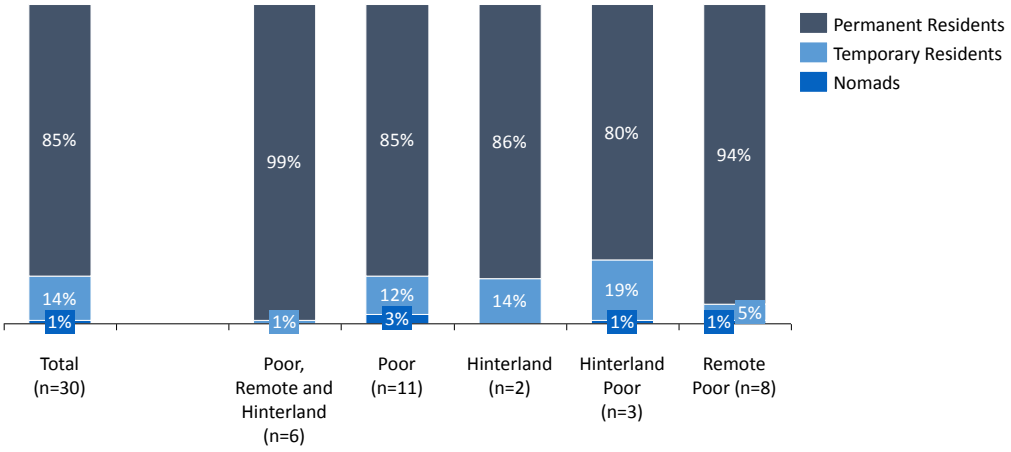
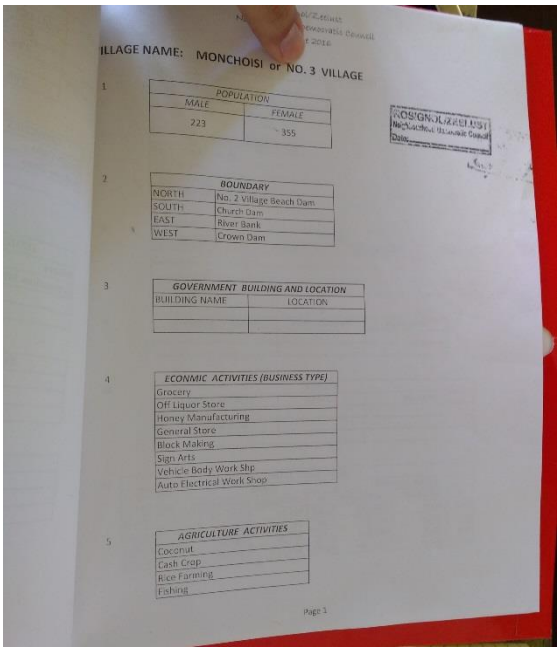


Image 10 -Character of Residents per community segments (in %)

The population of the community relatively young, with a bigger concerntration between 5 to 15 years old. The sample was too small to make any further analyses, the data is inconclusive.

Image 11 - How one community from Region 9 counts the population by age



ILLAGE NAME: MONCHOISI or NO. 3 VILLAGE

1

POPULATION	
MALE	FEMALE
223	355

2

BOUNDARY	
NORTH	No. 2 Village Beach Dam
SOUTH	Church Dam
EAST	River Bank
WEST	Crown Dam

3

GOVERNMENT BUILDING AND LOCATION	
BUILDING NAME	LOCATION

4

ECONMIC ACTIVITIES (BUSINESS TYPE)
Grocery
Off Liquor Store
Honey Manufacturing
General Store
Block Making
Sign Arts
Vehicle Body Work Shp
Auto Electrical Work Shop

5

AGRICULTURE ACTIVITIES
Coconut
Cash Crop
Rice Farming
Fishing

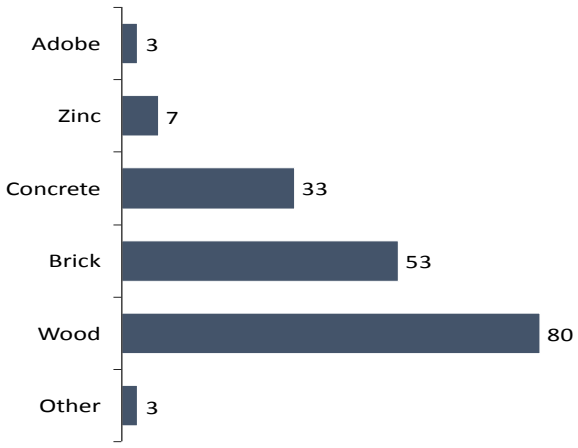
Page 3

Image 12 - How one community from Region 5 counts the population by gender

Image 13 - How one community in Region 9 counts their population

(%)	Total (n=30)	Poor, Remote and Hinterland (n=6)	Poor (n=11)	Hinterland (n=2)	Hinterland and Poor (n=3)	Remote and Poor (n=8)
Children < 5 years	15	13	16	13	21	16
Children 5-15 years	35	23	37	25	21	27
Children-young adults 16-24 years	22	27	22	25	14	18
Adults 25-64 years	19	28	17	25	29	27
Adults 65+ years	9	9	8	12	15	12

Image 14 - Overview of numbers of children and adults per location visited (in %)



n=30

Image 15 - Main housing materials being used (%)

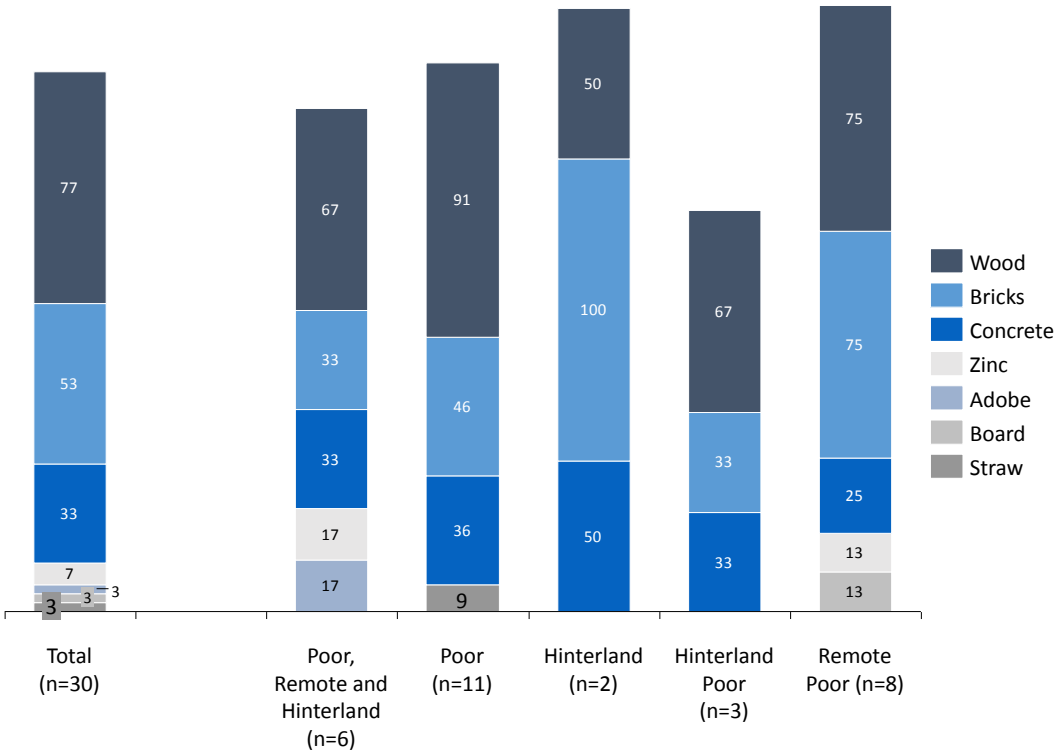


Image 16 - Housing materials being used per community segments (in %)[26]

[26] For samples of size n> 30, called large samples, the best approximation to the sample distributions are normal curve. This approach improves the growth of n. When the sample size is n =<30 they are considered small samples and the statistical treatment is different. This report will consider the normal distribution.

Image 17 - Houses made out of wood (Region 3)

Image 18 - Houses made out of wood (Region 3)

Image 19 - House based on concrete (Region 4)

Image 20 - House based on concrete (Region 5)

Image 21 - Houses made out of straw (Region 7)

Image 22 - Houses made out of wood (Region 6)

Image 23 - House construction with bricks (Region 1)

Image 24 - Burn to clean the field

Image 25 - Houses in Region 6

Image 26 - Street in Region 8

Image 27 - Street in Region 1

Image 28 - Street in Region 10

1.2.3.4 Language/Ethnicity

57% of the sample speaks English as their main language. The second most used is Guyanese Creole English[27]. For those that do not have English as the main language, English is their second language (33%) and Creole being used as a second language for those whose main language is English (23%). English is the most spoken language in the hinterland and in hinterland and poor community segments (Image 29).

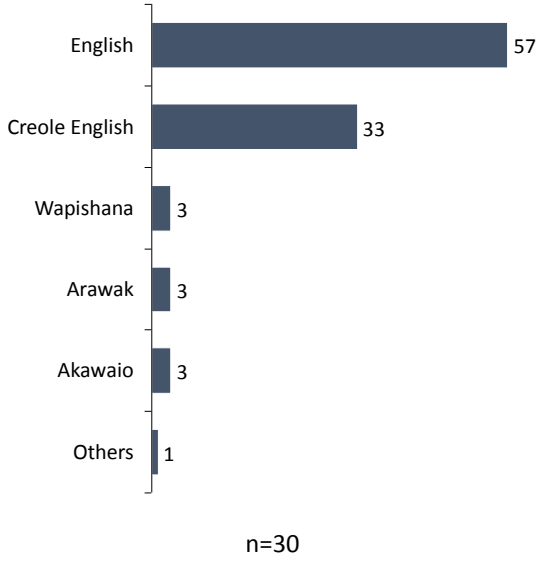


Image 29 - Main Language spoken in the communities (in %)

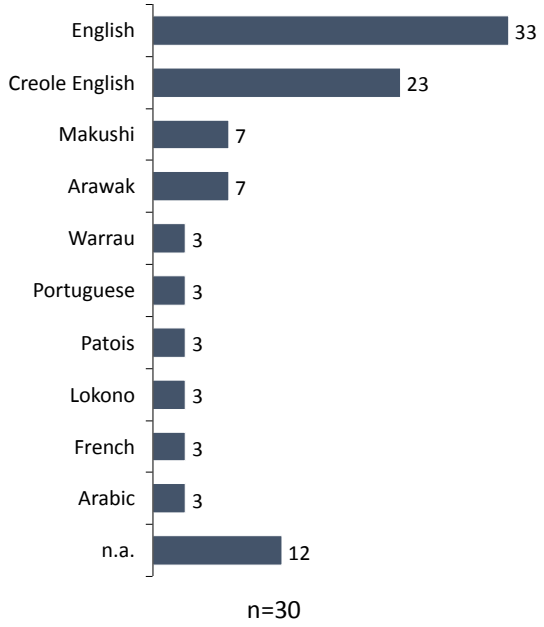


Image 30 - Secondary Language spoken in the communities – as stated by the interview person[28] (in %)

[27] This documents the statement of the interviewed person and does not reflect a linguistic assessment of the spoken languages.

[28] Creole: A creole is a language that, through unusual intensity of contact, has been significantly restructured in a short period of time.
Patois: Patois is not a term of art in linguistics. It doesn't have any sort of consistent meaning, though it's frequently a localized language that is rarely if ever written by its speakers.

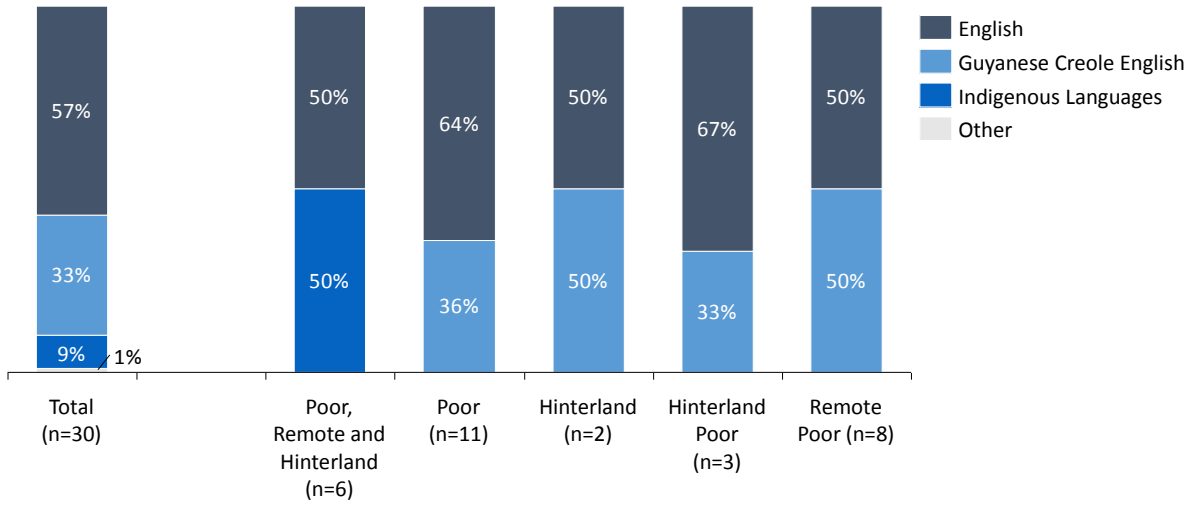


Image 31 - Primary language spoken per community segment (in %)

The majority of the population in the sample is formed by Indigenous People (47%), followed by Afro-Guyanese (23%) and Mixed (17%). The Indo-Guyanese/East Indians group is less represented in the sample because the research focused on the hinterland, remote and poor areas, and etnicity was seen as secondary parameter.

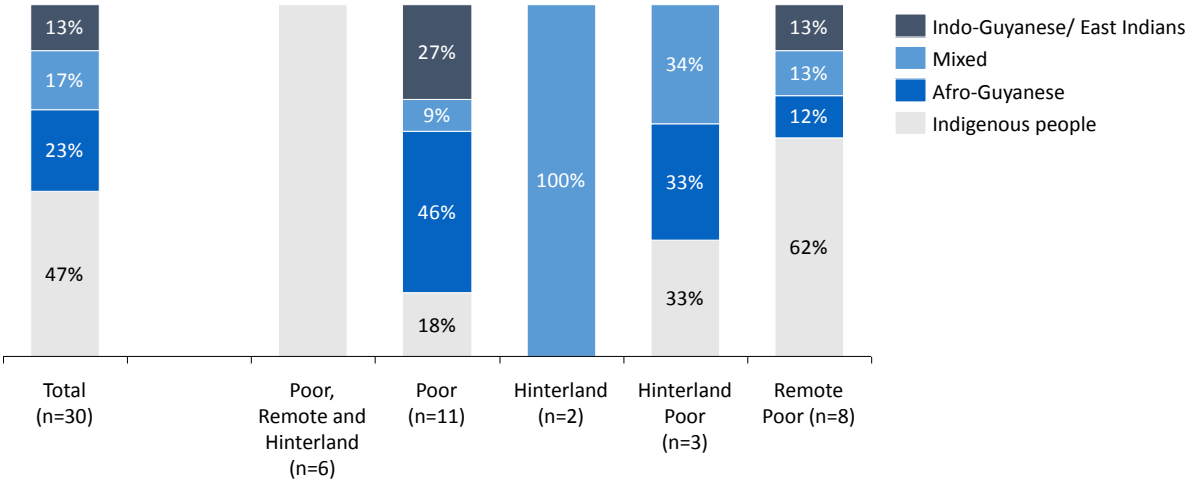


Image 32 - Ethnicity per specific communities (%)

1.2.3.5 Public Infrastructure

1.2.3.5.1 Water Supply

71% of all households (domiciles) in the sample have piped water, especially in the hinterland's urban areas. The communities with less access to piped water are mostly located in the Poor, Remote and Hinterland region with access to rivers/creeks (Image 34).

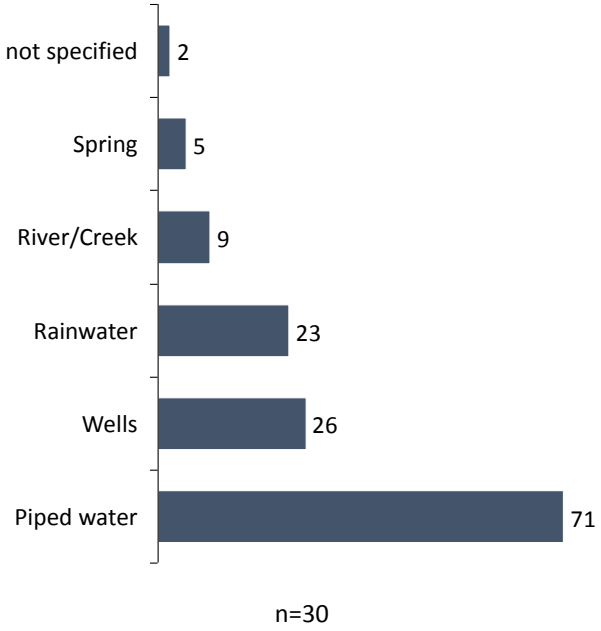


Image 33 - Sources of water supply available (in %)

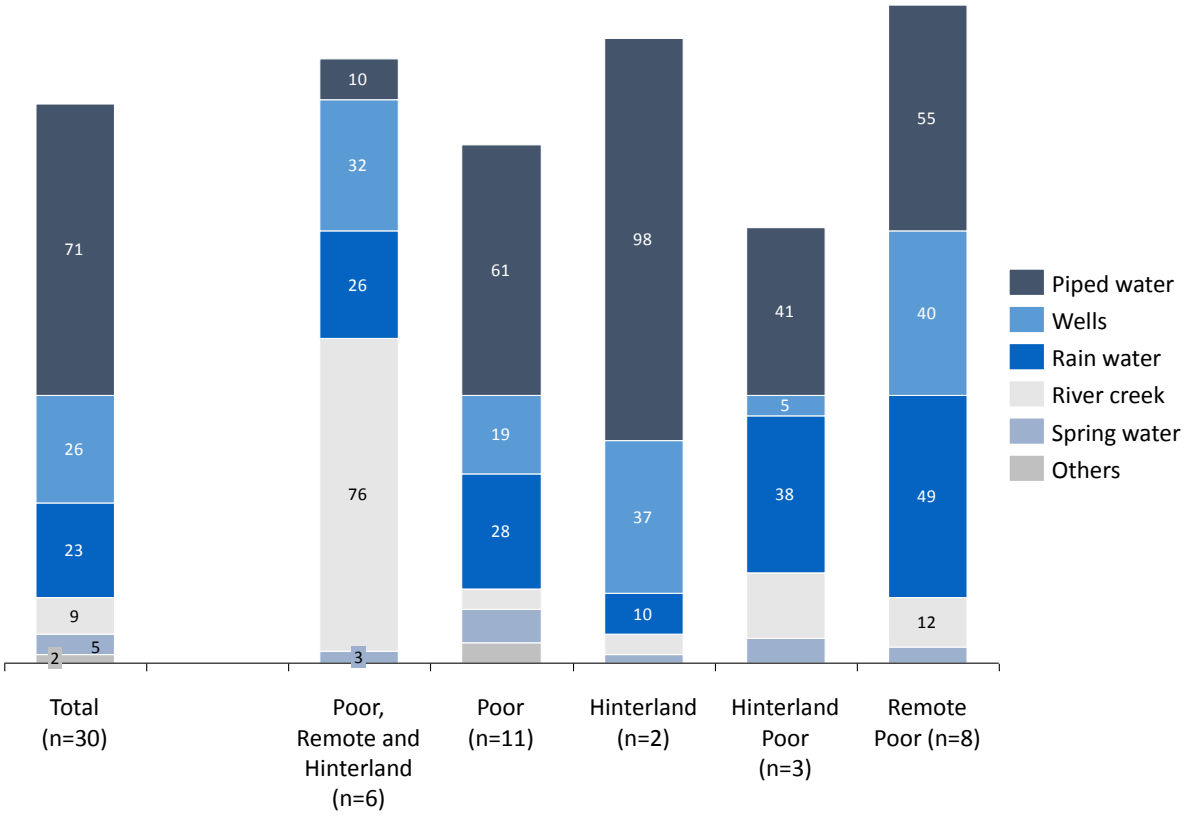


Image 34 - Sources of water supply per community segments (in %)

Image 35 - Water pump in Region 3

Image 36 - Water pump in Region 4

Image 37 - Rain water Reservoir in Region 10

Image 38 - Rain water Reservoir in Region 4

Image 39 - Well in Region 9

Image 40 - Drilling for water (Region 4)

1.2.3.5.2 Sanitary conditions

62% of the domiciles in the communities studies have access to septic tanks. Among the different community segments, the ones that belong to hinterland show the best toilet infrastructure. Only 7% of the sample has a disposal system linked to sewer. In the Poor, Remote and Hinterland community segments the use of Pit latrine with slabs (Image 42) is mostly used. 16% of population of Guyana don't have access to basic sanitation in Guyana according to UNICEF report[29].

[29] 84% of Guyana population use of improved sanitation facilities
http://www.unicef.org/infobycountry/guyana_statistics.html#0

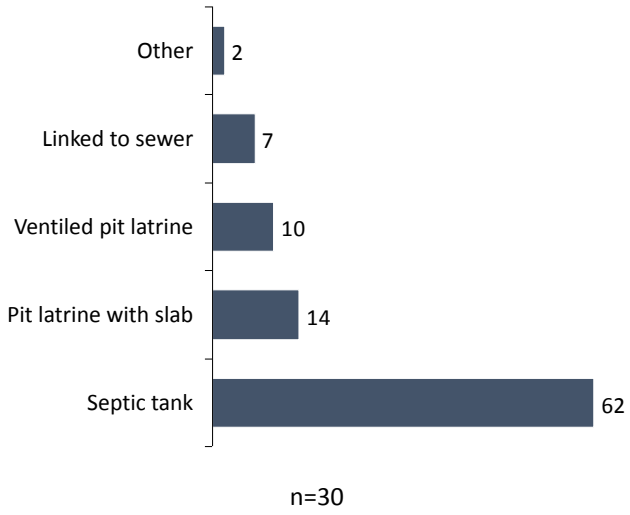


Image 41 - Types of toilet used in the communities (in %)

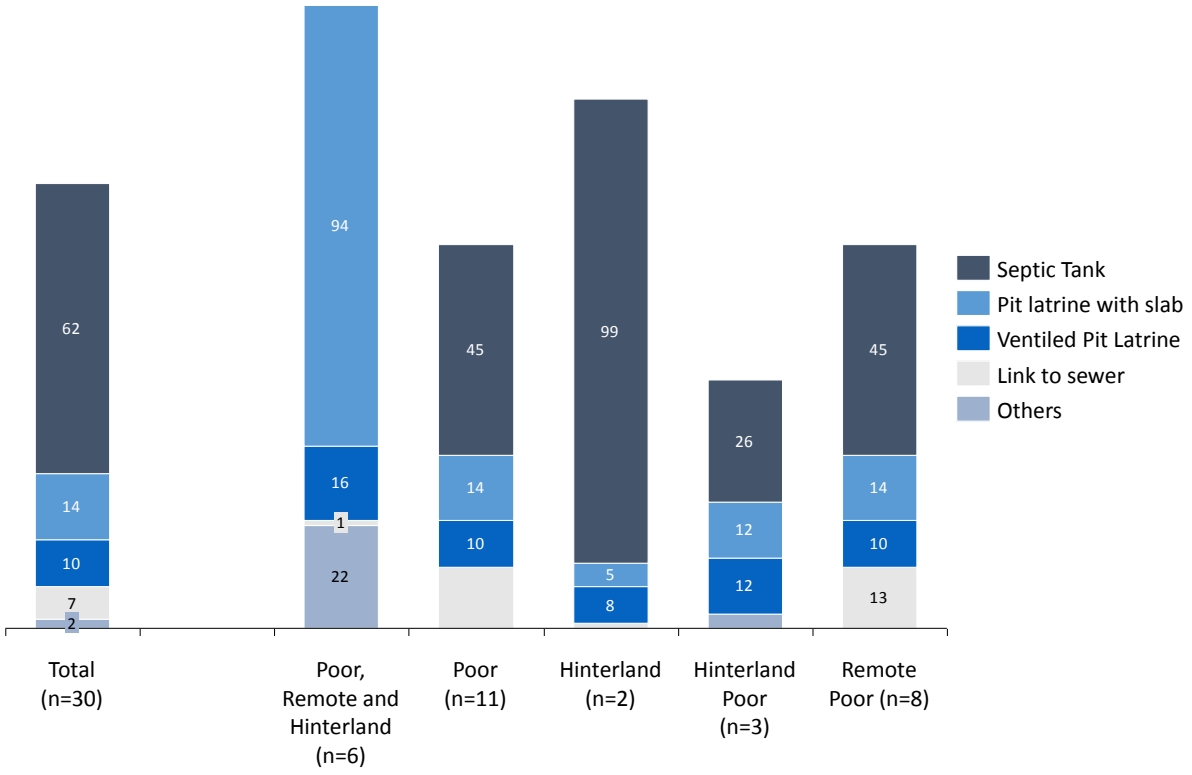


Image 42 - Types of toilets per community segments (in %)

Image 43 - Pit latrine with slab (Region 4)

Image 44 - Toilet linked to sewer (Region 3)

1.2.3.5.3 Disposal of Garbage

60% of the sample use Garbage truck and Dumping on land as method for garbage disposal. The Hinterland mainly relies on the use of Garbage trucks, since these communities have a better-developed infrastructure. The Poor and Remote areas concentrates the use of Burying, and in the Poor, Remote and Hinterland areas almost everybody uses the method of burning the waste (Image 46).

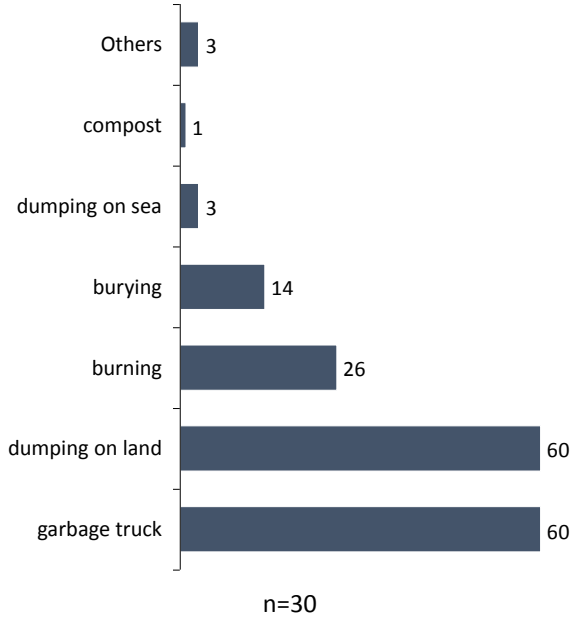


Image 45 - Disposal of garbage in the communities (%)

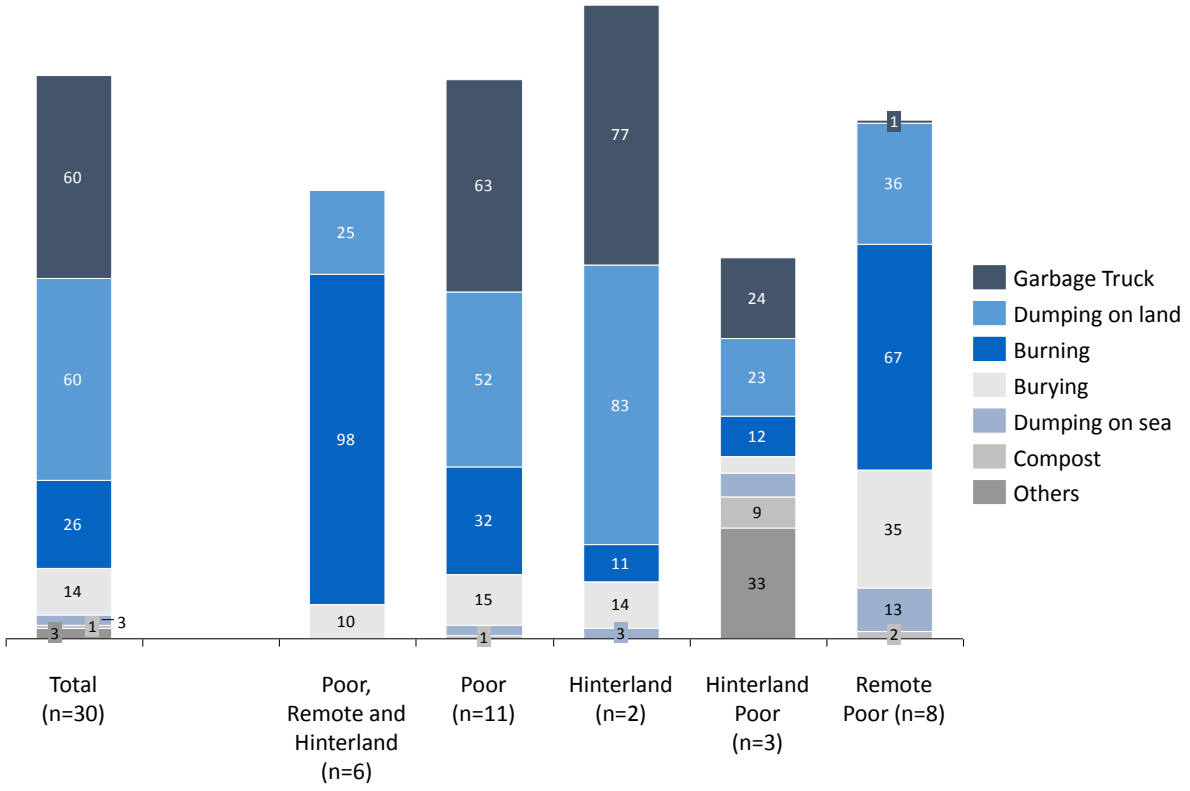


Image 46 - Ways of garbage disposal per community segments (%)

Image 47 - Burning the garbage (Region 3)

1.2.3.5.4 Public Institutions/Facilities Available

From the communities surveyed, the communities that are Poor, Remote and Hinterland, the communities that are poor as well as communities that are remote and poor display a lack of medical facilities (Hospitals and Medical post) and secondary schools. There are more public institutions and facilities in the urban area of the Hinterland. Despite the fact that the Poor, Remote and Hinterland do not have a good infrastructure, considering public institutions and facilities, it has a good number of communal buildings. The poor communities in general have a higher number of religious facilities compared to the other community segments (see Image 88).

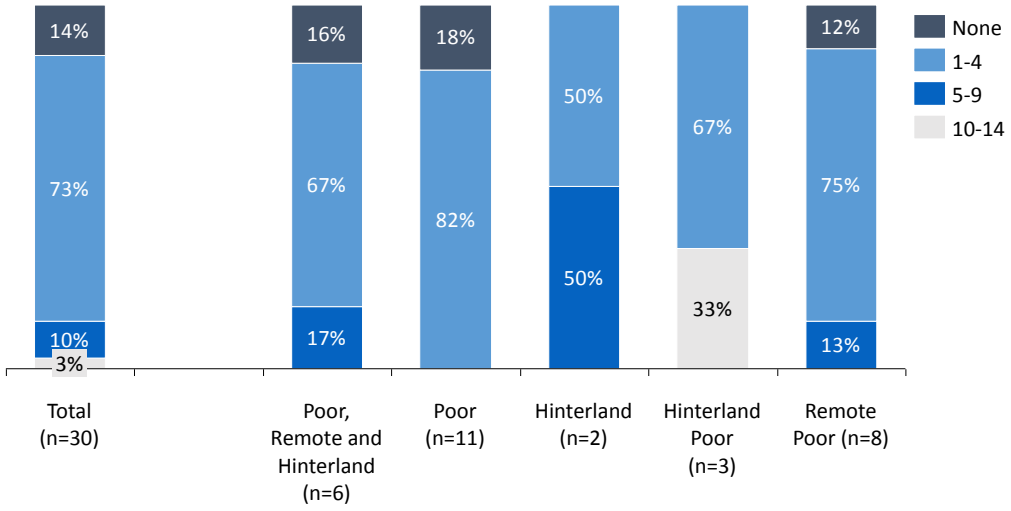


Image 48 – Nurseries per community (%)

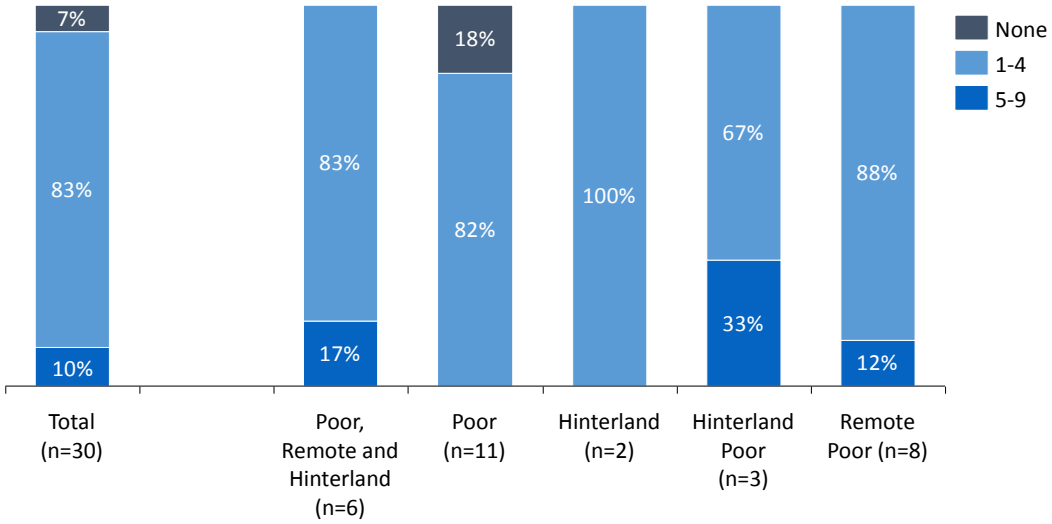


Image 49 - Primary Schools per community (%)

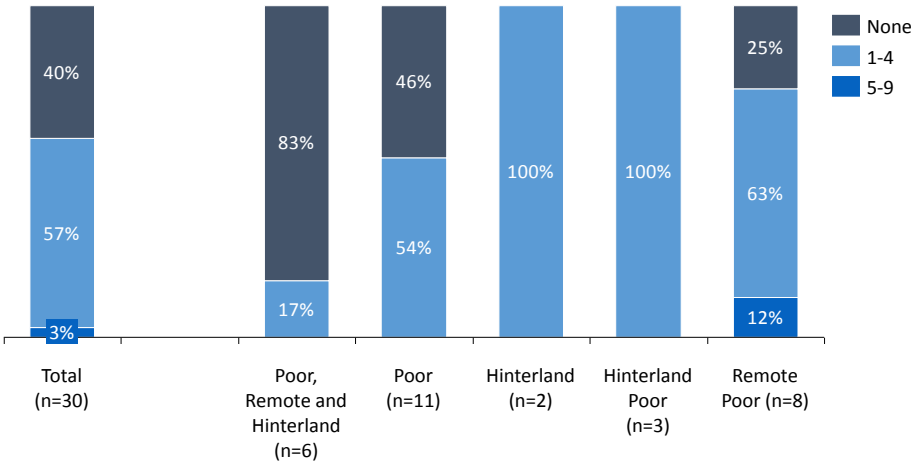


Image 50 - Secondary Schools per community (in %)

Image 51 -Nursery School (Region 2)

Image 52 - Primary School (Region 2)

Image 53 - Primary School (Region 10)

Image 54 - Primary School (Region 4)

Image 55 - Primary School (Region 9)

Image 56 - Primary School (Region 3)

Image 57 - Secondary School (Region 4)

Image 58 - Secondary School (Region 4)

Image 59 - Secondary School (Region 1)

Image 60 - Secondary School (Region 9)

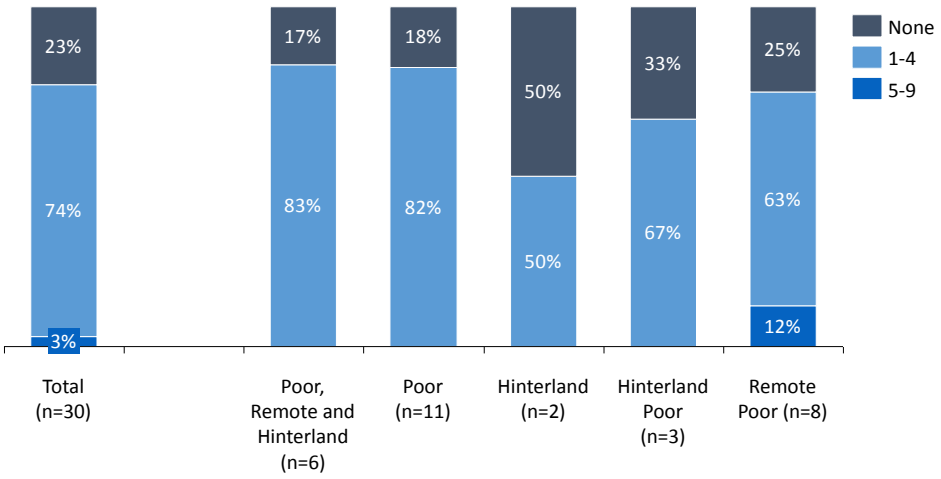


Image 61 - Medical Hut / Health Center (in %)[30]

[30] **Medical Post / Health Post:** Unit designed to provide assistance to a particular population, with appointment or without, by mid-level professional with intermittent presence or absence of medical professional.
Medical Hut / Health Center: Unit to perform basic care and full time services to the population, with appointment or without, on the basic services and can provide dental and other top-level professional assistance. Assistance should be permanent and provided by general practitioner or specialist in these areas. May or may not offer: Support Service for Diagnosis and Therapy and 24 hours Emergency Service.
Hospital: Unit designed for the provision of care in the basic specialties, by experts and/or other medical professionals. May have Urgency/Emergency service. Must also have medium complexity Support Service for Diagnosis and Therapy. Being able to handle high complex procedures and systems.
Source: Brazilian Ministry of Health, Tipo de estabelecimento/ Type of establishment (DATASUS http://tabnet.datasus.gov.br/cgi/cnes/tipo_estabelecimento.htm)

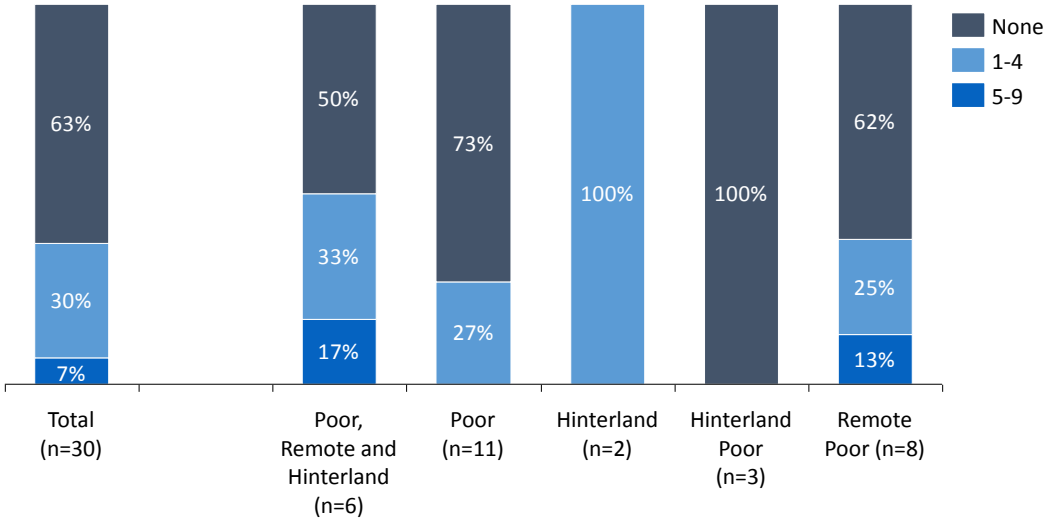


Image 62 - Medical Posts per community (in %)

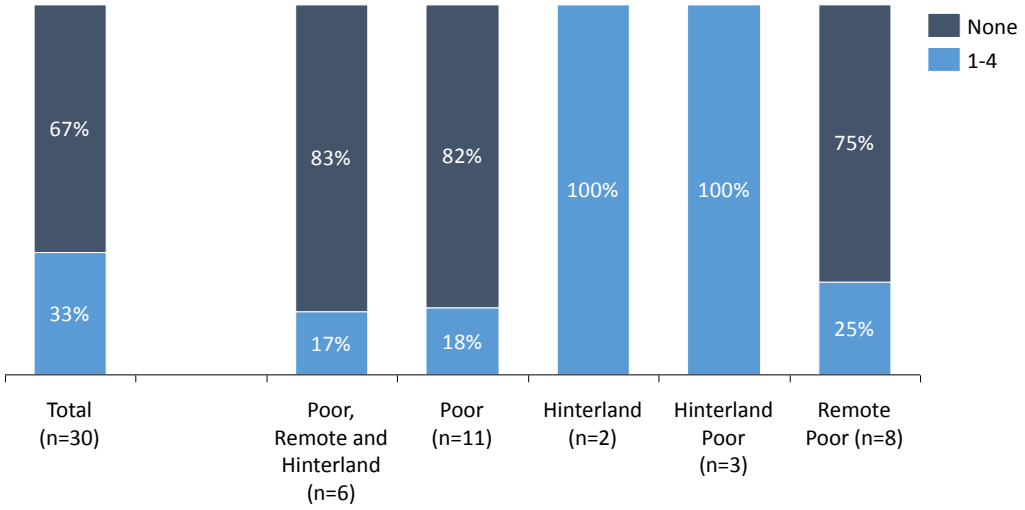


Image 63 - Hospitals per community (in %)

Image 64 - Health Center (Region 9)

Image 65 - Health Center (Region 9)

Image 66 - Health Center (Region 4)

Image 67 - Hospital Bed at Health Center (Region 3)

Image 68 - Health Center (Region 5)

Image 69 - Health Center (Region 7)

Image 70 - Health Post (Region 7)

Image 71 - Patient related health care information (Region 10)

Image 72 - Hospital (Region 10)

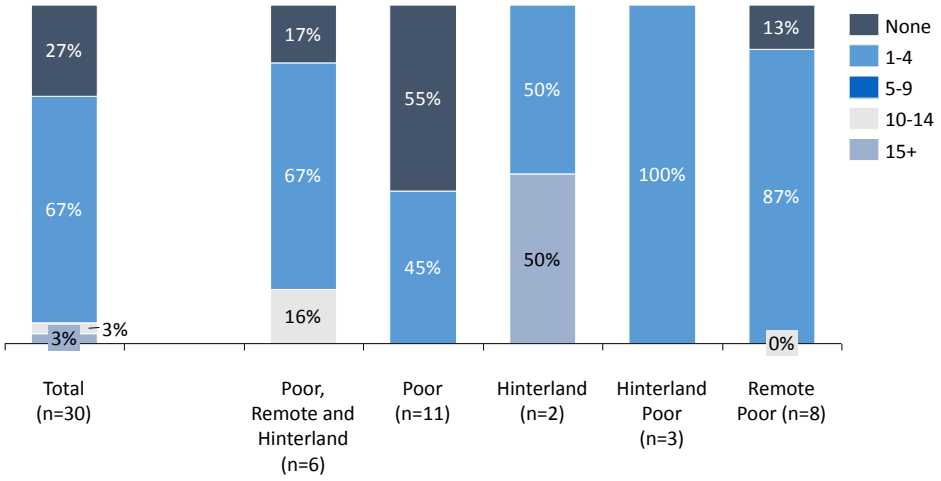


Image 73 - Communal buildings per community (in %)

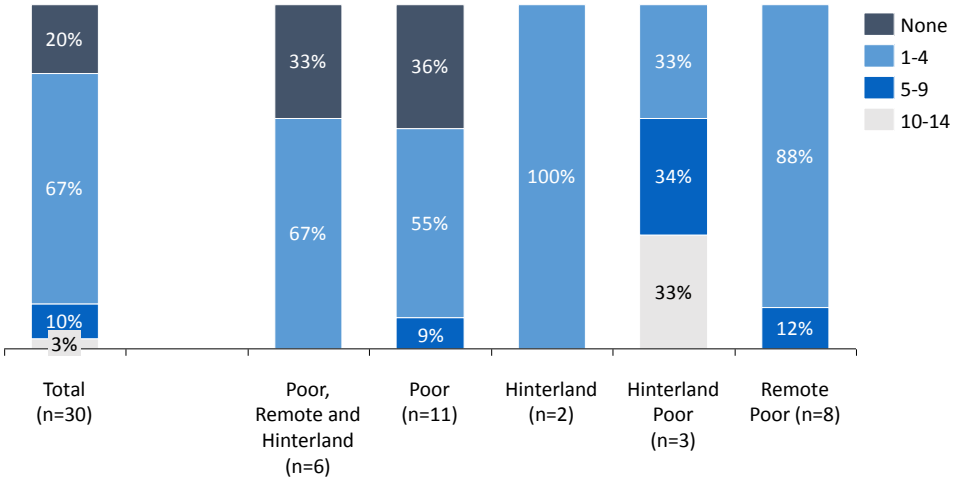


Image 74 - Places of social gathering per community (in %)

Image 75 - Communal building (Region 4)

Image 76 - Multipurpose Center (Region 2)

Image 77 - Social Meeting Place (Region 6)

Image 78 - Example of a Meeting Hut in Nappi, Region 9

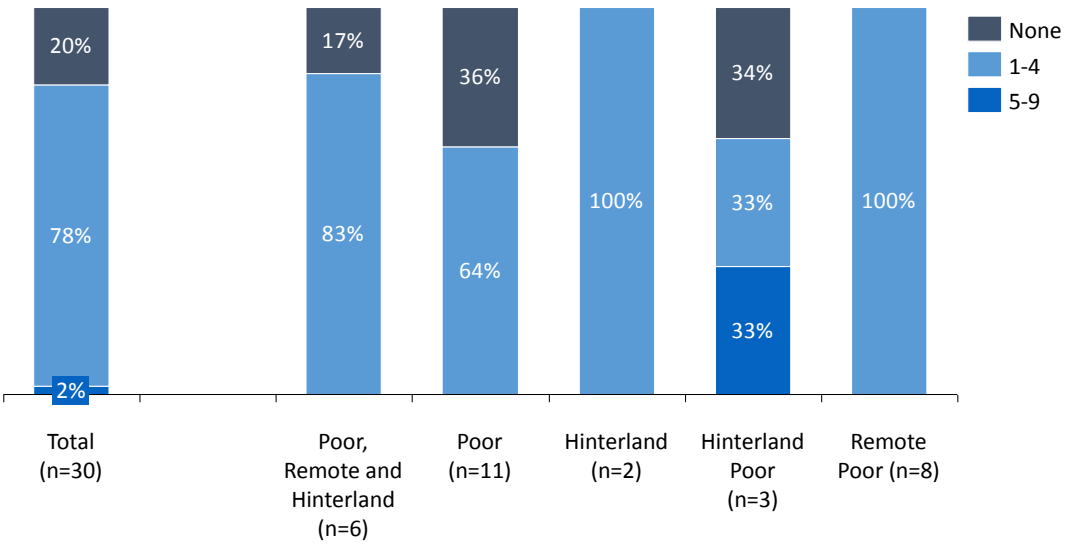


Image 79 – Number of locations for sport activities per community (in %)

Image 80 -Football (Soccer) field (Region 10)

Image 81 - Football (Soccer) field (Region 10)

Image 82 - Football (Soccer) field (Region 7)

Image 83 - Basketball field (Region 5)

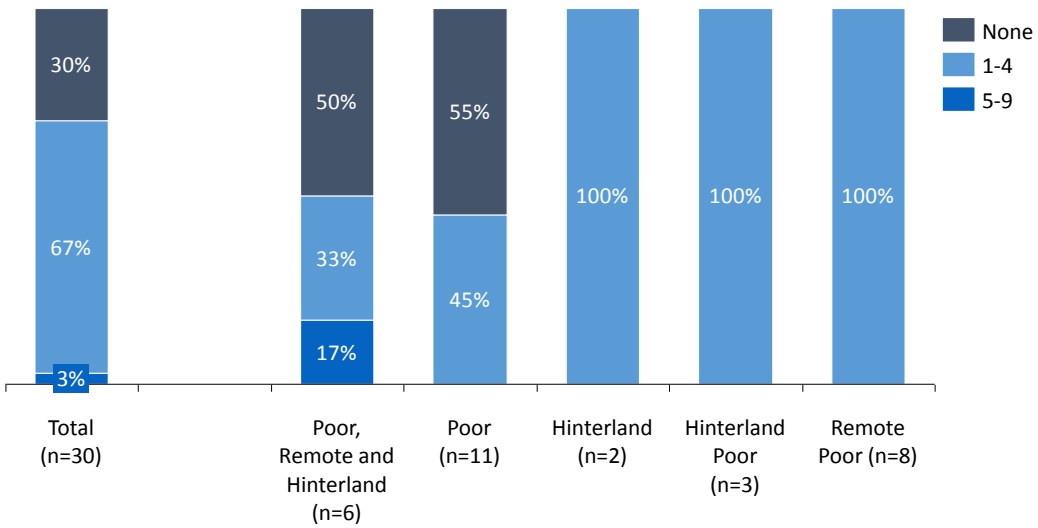


Image 84 - Libraries per community segments (in %)

Image 85 - Library inside Digicel office (Region 10)

Image 86 - Library (Region 1)

Image 87 - Library inside a school (Region 1)

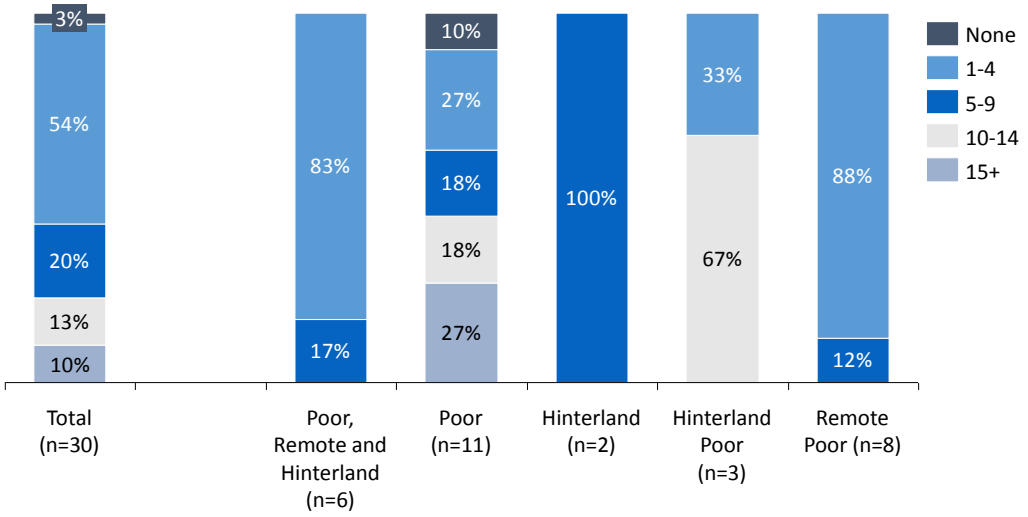


Image 88 - Religious facilities per community segments (in %)

Image 89 - Church (Region 4)

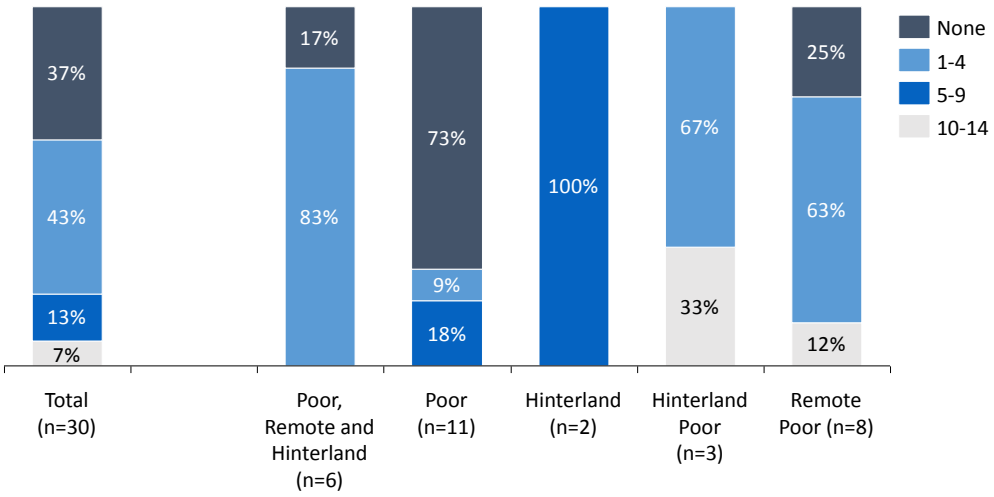


Image 90 – Number of Hotels per community segments (in %)

Image 91 - Lake/Beach (Region 5)

Image 92 - Guest House (Region 10)

Image 93 - Resort (Region 2)

1.2.3.5.5 Communities' Problems

According to estimates of the interviewed community leaders, 3 out of 10 inhabitants of the surveyed communities are owing debts and have no steady income, especially the inhabitants of the "Poor, Remote and Hinterland" and of the "Poor and Remote" communities. According to them, these problems are common where mining prevails as the main economic activity. In those communities, the largest portion of those who do not have a steady income are the mining workers. In the other communities this problem occurs mainly with young people.

The contagious diseases affect more the population of the “Hinterland and Poor”, as per information from the representatives as well as from the information gathered at the Ministry of Health (2012-2015). The same data from the Ministry of Health indicates that Poor communities have a high number of diseases caused by bacteria due to hygiene issues. 25% of the representatives confirmed this information. The Hinterland area, presumably because of the better-developed infrastructure, suffers less from hygiene issues but rather from problems related to violence and drug abuse.

Cases of reported violence usually occur in the family scope at events such as sexual molestation of children and domestic violence.

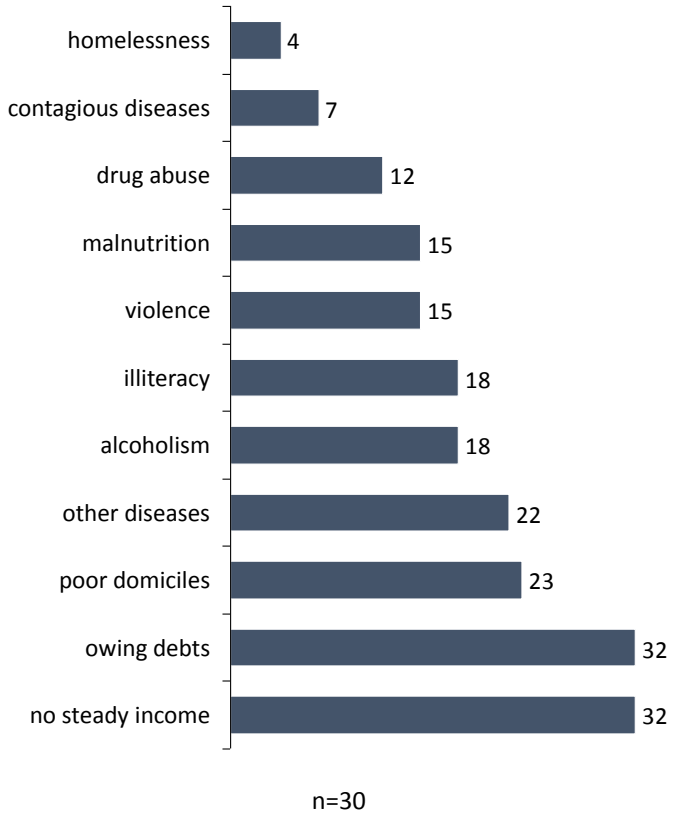


Image 94 - Major communities’ problems stated (in %)

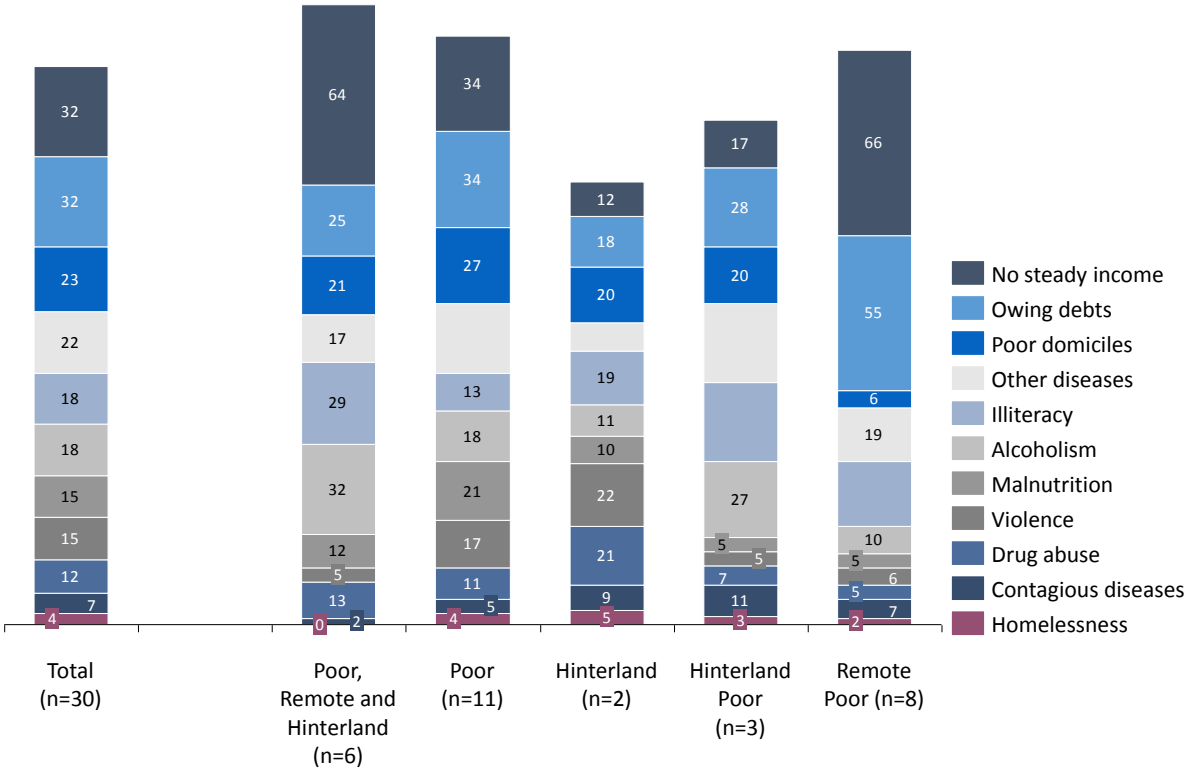


Image 95 - Stated Communities' problems per community segments (in %)

1.2.3.5.6 Electricity

More than two thirds of the communities surveyed have access to the electric supply via landline (power grid). Mainly in the "Remote and Poor" area the power grid supplies 90% of the communities in this segment. The "Poor, Remote and Hinterland" is the community segment less attended by the power grid service: 69% of the energy comes from solar panels. A quarter of the communities classified as "Poor, Remote and Hinterland" do not have access to any kind of electricity, according to the perception of their communities' leaders.

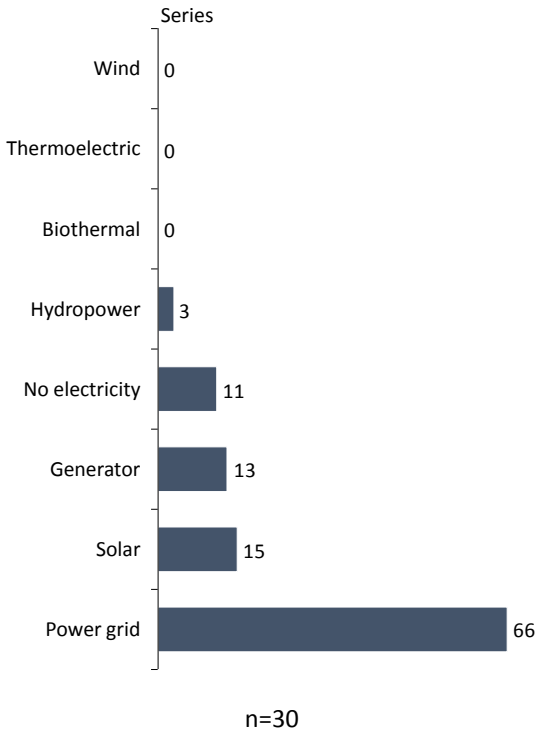


Image 96 - Sources of electric power supply per community (in %)

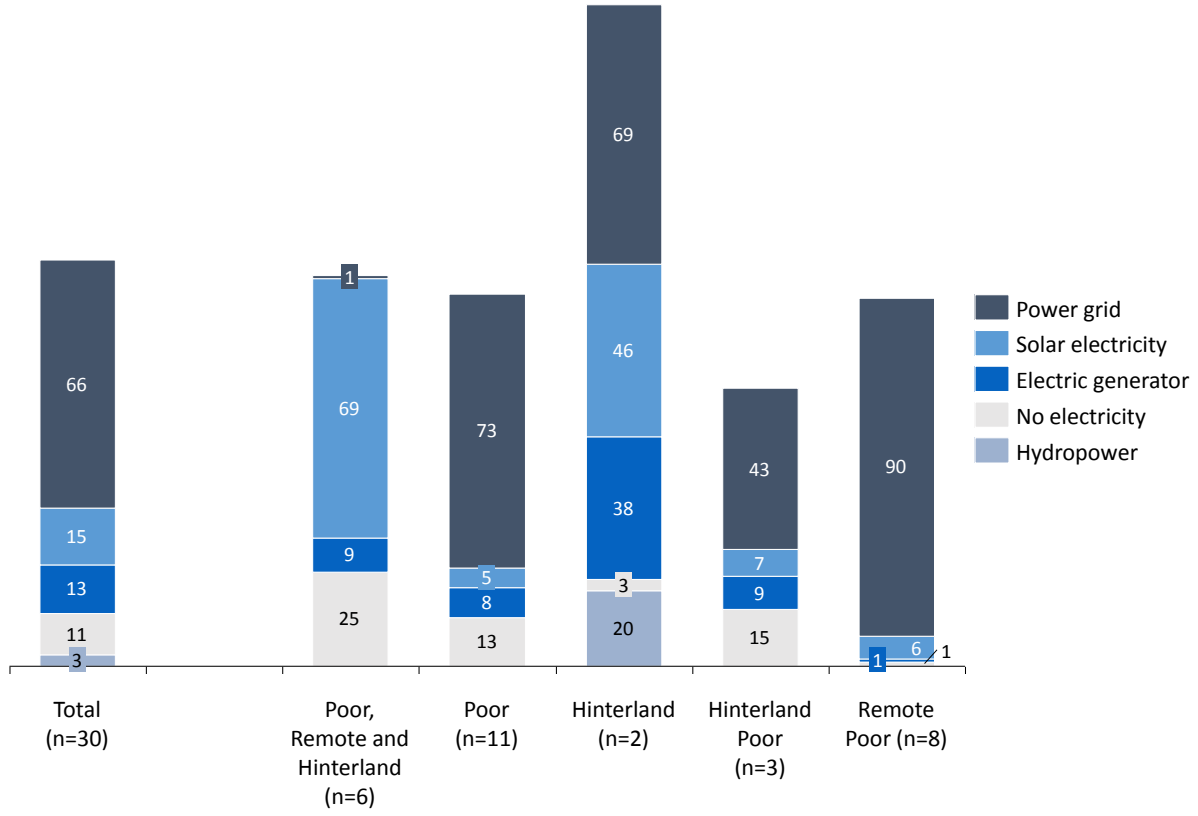


Image 97 - Sources of electric power supply per community segment (in %)

63% of the communities have eletricity for more than 15 hours a day. A quarter of the communities classified as "Remote and Poor" have less than 5 hours of eletricity per day.

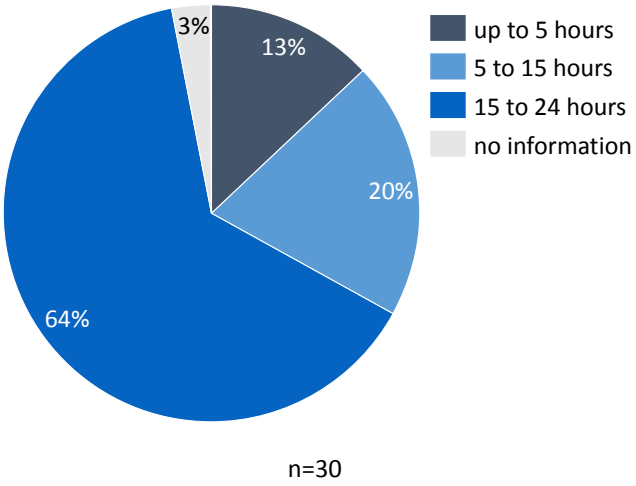


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Image 98 - Hours with electricity per community (in %)

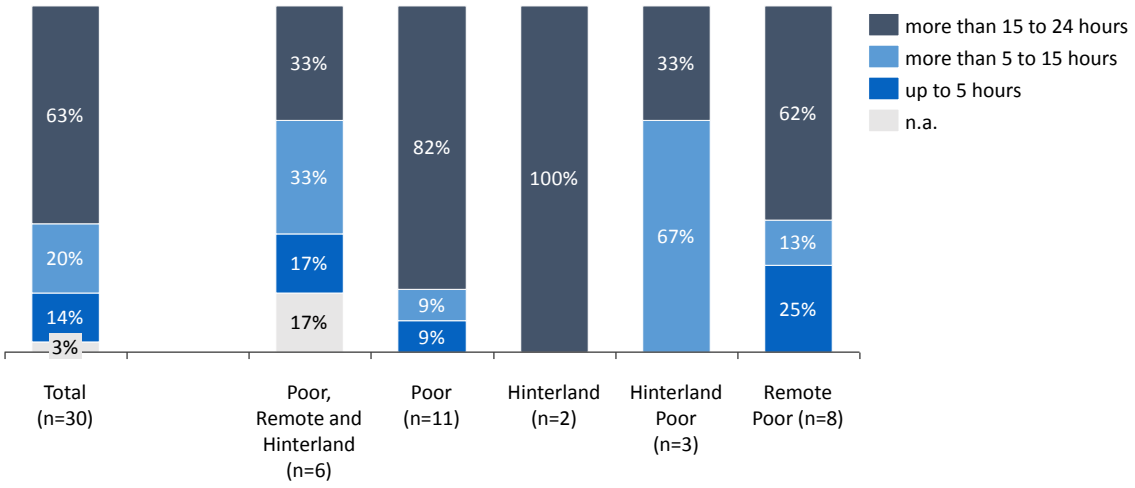

Image 99 - Perceived average hours with electricity per community segments (in %)

Image 100 - Generator (Region 9)

Image 101 - Generator house (Region 9)

Image 102 - Generator (Region 10)

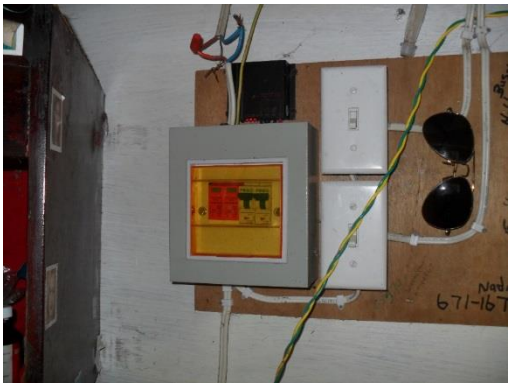

Image 103 - Battery charged by solar panel (Region 9)

Image 104 - Streetlamp (Region 9)

Image 105 - Electric wiring (Region 4)

Image 106 - Solar Panel (Region 2)

1.2.3.6 Economy

The economic situation of a community has a major impact of the adoption and usage of ICT Infrastructure and services.

1.2.3.6.1 Main Source of Income in the Communities

Almost half (14) of the thirty communities in scope of the survey mentioned subsistence farming as their main economic activity, followed by mining (10). Public servants/work for state, logging, agriculture, and other activities, were mentioned four times each. Sugar, fishing, and tourism, were mentioned three times each. Sales, the culture of rice, and hunting, were mentioned twice. Finally, selling food, working on factories, participating in illegal trade, individual entrepreneurship, working at the Post Office, and cattle, were each mentioned in only one interview.

Image 107 - Craft Center (Region 4)

Image 108 - Small Shop (Region 4)

Image 109 - Market (Region 1)

Image 110 - Market (Region 1)

Image 111 - Paddy field (Region 5)

Image 112 - Farmer association building (Region 4)

Image 113 - Mining Station (Region 8)

Image 114 - Gold Nuggets (Region 8)

Image 115 - Gold (Region 1)

1.2.3.6.2 Unemployment in the Communities

Many respondents mentioned unemployment as a major problem in their communities. A great proportion of the population not having access to a steady income is also a concern commonly mentioned in the interviews.

In most of the communities, the general economic situation is considered to have worsened during the last years. Only two respondents considered local economic conditions to have improved or to be the same as in the past. The main perceived causes for this situation are a general lack of training and education and the overdependence of local economy on extractive activities such as mining and logging.

Respondents believe that improved education could help mostly young people to be more prepared to engage in different activities. Besides that, a few of them believe that better telecommunication infrastructure could boost the local economy, bringing more buyers to local products and allowing tourism to flourish.

1.2.3.6.3 Main Challenges/Difficulties for Generating Revenue/Income

When asked about the main challenges or difficulties for generating income, the responses are in tune with those presented in the section above (reasons for unemployment). The lack of proper education is seen as major problem, since even the few available opportunities cannot be availed by people from the community due to a lack of proper qualification. Bad infrastructure is also mentioned, alongside with the lack of markets to sell local products. The absence of natural resources is considered to be a problem, since few communities have industries.

1.2.3.6.4 Loans

Half of the inhabitants of "Poor, Remote and Hinterland" have received loans in the past ten years. A reason for these loans may be inferred by the fact that this is an area of poor infrastructure and more social problems. In this same community segment, half of those who have received loans in the past have had difficulties in paying them back. 30% of those who have received loans have used it for opening a business and 23% for building houses.

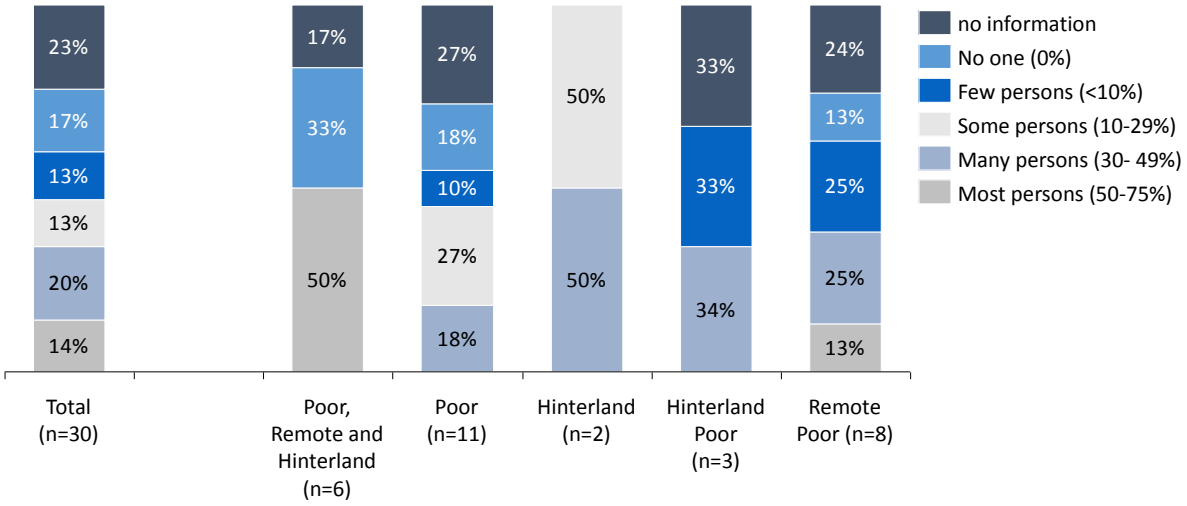

Image 116 - Number of persons that received at least one loan in the past ten years per community segments (in %)

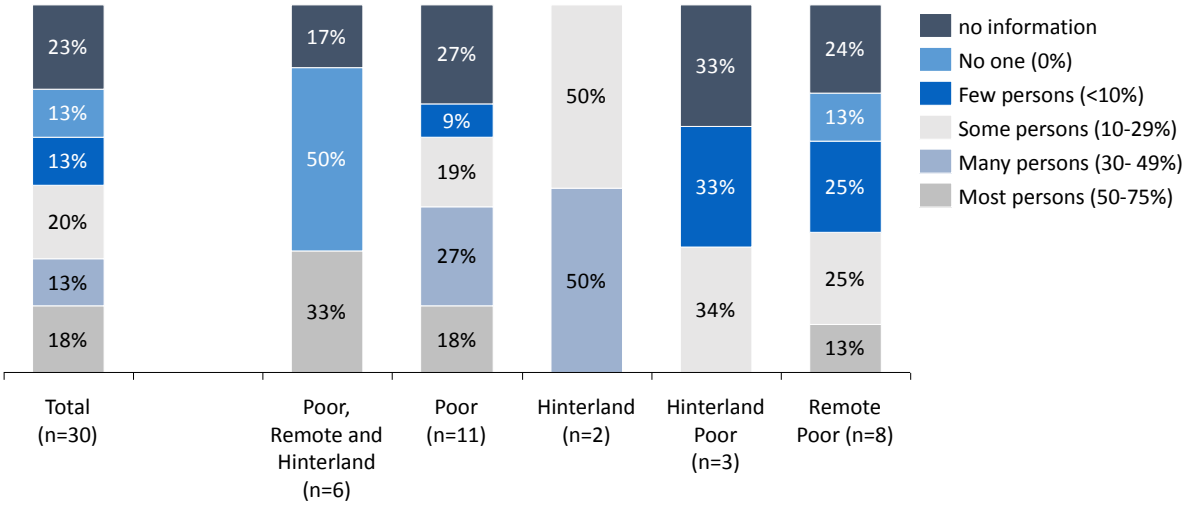

Image 117 – Number of persons that paid back their loans per community segments (%)

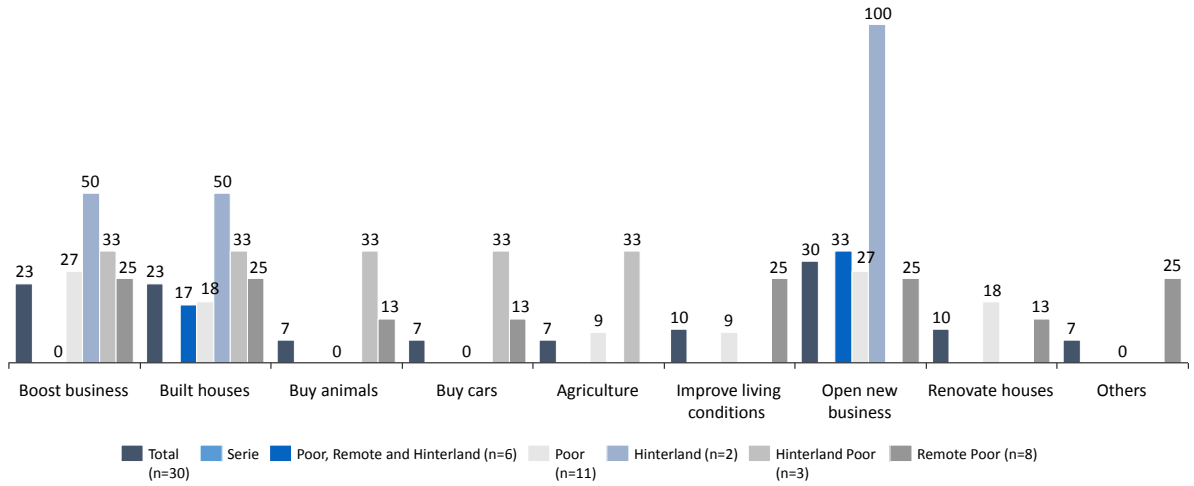

Image 118 - Purpose of Loans per community segments (%)

1.2.3.7 Communication and ICT

In the perception of the communities' leaders, half of the population has access to private smartphones and private landlines. In particular in the community segments "Hinterland and Poor" and "Remote and Poor" the usage of smartphones as communication device is predominant. Landline is most common communication channel in Poor communities, but also very widespread in the communities classified as "Hinterland" and "Remote and Poor". The private cellphone is more used in the Hinterland area, where, according to their perception, almost 80% of the population use cellphones.

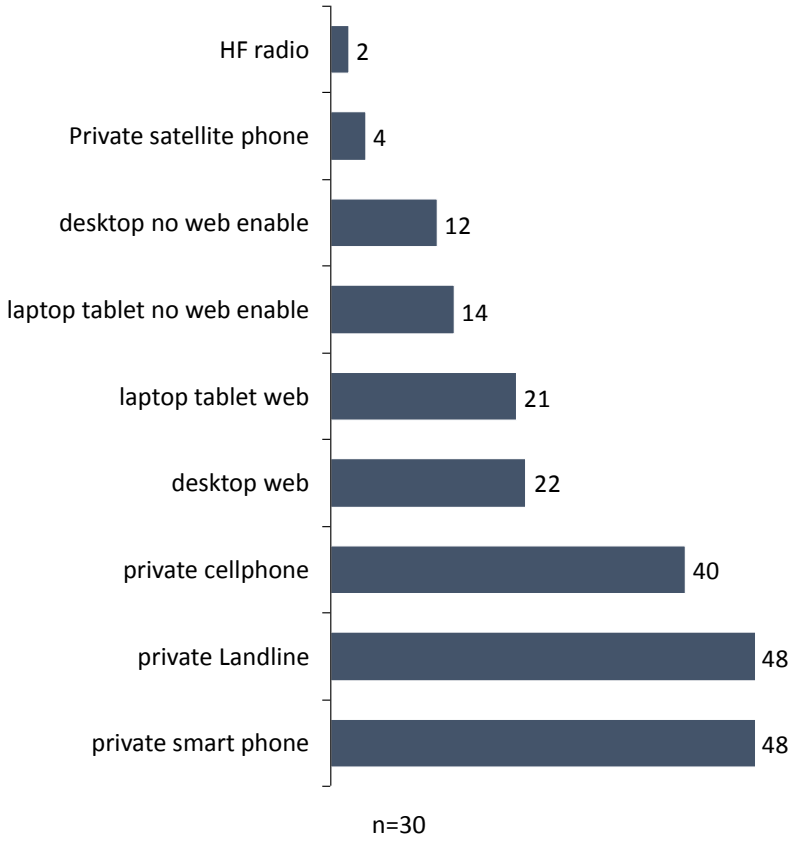

Image 119 - People in the communities with access to communication devices. (%)

1.2.3.7.1 Device analysis

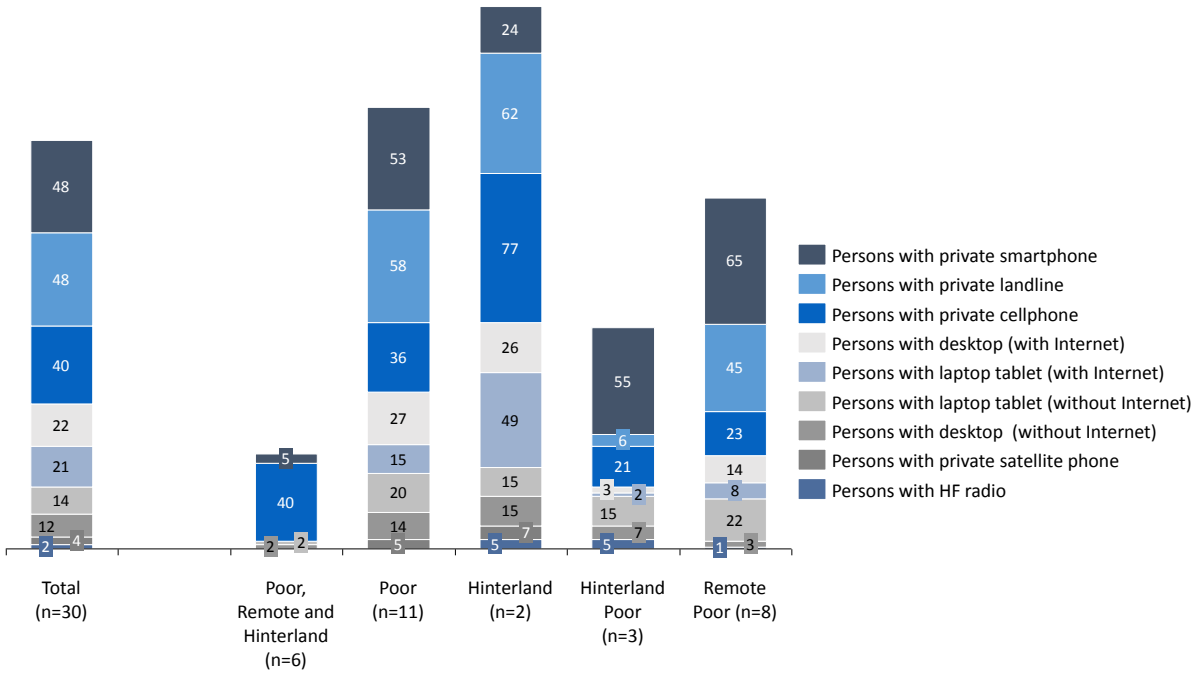

Image 120 – Percentage of persons who own the respective communication devices per community segments (in %)

The most frequently used devices are private smartphones and private cellphones (81% and 90%, respectively). According to the perception of the communities' leaders, more than half of the private landline telephone, laptop (web-enable) and desktop (web-enable) users use these devices several times a day. The most common place of use is their houses (smartphone – 68%; cellphone – 65%). For the desktop computer (with Internet access), the most common place of use is at work, as estimated by the communities' leaders.

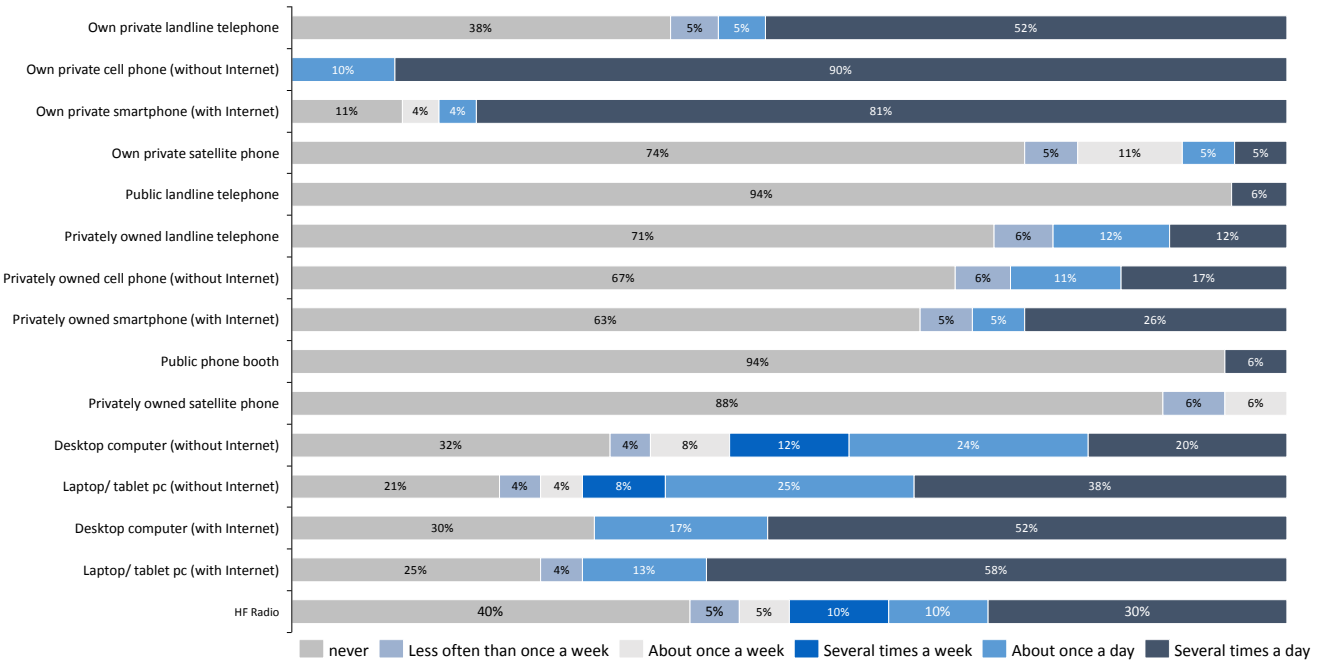

Image 121 - Frequency of use of communication devices[31]

[31] Usage of own private cellphone / smartphone / etc. means the person using the device is also the owner of the device. Usage of privately owned cellphone / smartphone / etc. means the person using the device is not the owner, but borrows it from another person.

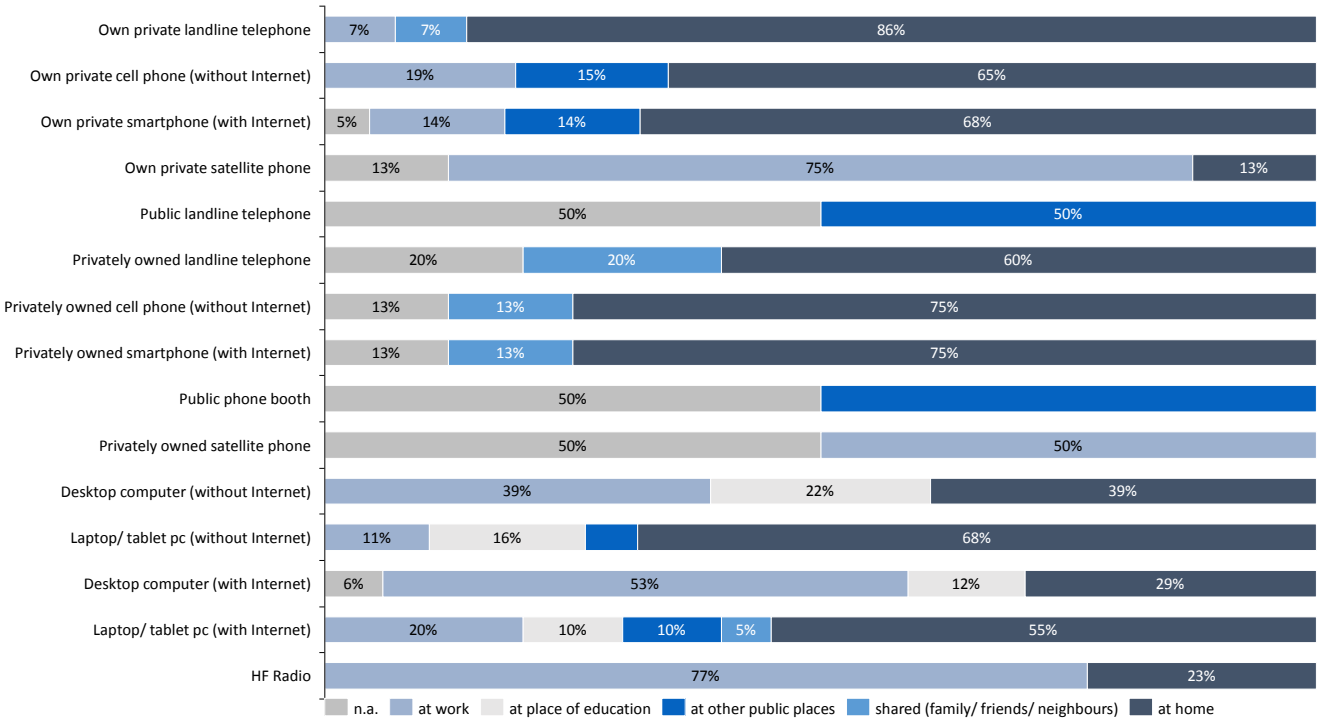

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Image 122 - Location of use of communication devices

Image 123 - Abandoned telephone booth (Region 6)

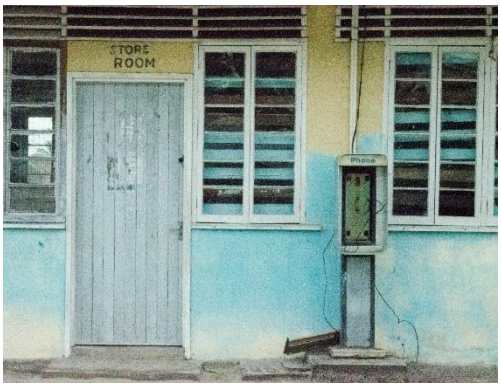

Image 124 - Abandoned telephone booth (Region 4)

Image 125 - Abandoned telephone booth (Region 6)

Image 126 - Public telephone booth (Region 2)

Image 127 - Public telephone booth (Region 2)

Image 128 - Public Landline Phone at health center (Region 4)

Image 129 - 2 hours away from Lethem (Region 9), the only place that phones get a signal

Image 130 - 4 hours away from Lethem (Region 9), the only place with Digicel signal

Image 131 - Signal spot (Region 7)

Image 132 - Up the hill is a spot with signal for cellular phones (Region 2)

Image 133 - Cellphone spot (Region 8)

Image 134 – Advertisement for Free Wi-Fi instore

There are two mobile carriers that provide services in the communities surveyed: Digicel and GT&T. In general there is a slightly higher penetration of services provided by Digicel based on how the availability of services was evaluated by the interviewees.

In the communities categorized as “Poor, Remote and Hinterland” the perceived quality and availability of the mobile network signal is very limited: 67% of the interviewees stated that services from Digicel were available and 17% stated that services from GT&T were available. It is the poorest presence perceived compared to other community segments.

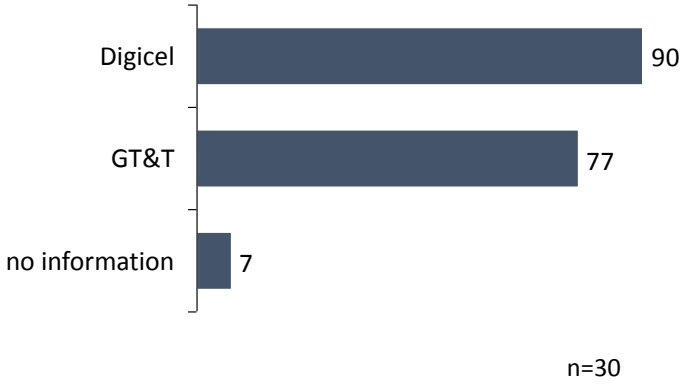

Image 135 – Percentage of persons, confirming the presence and availability of mobile carriers' networks (in %)

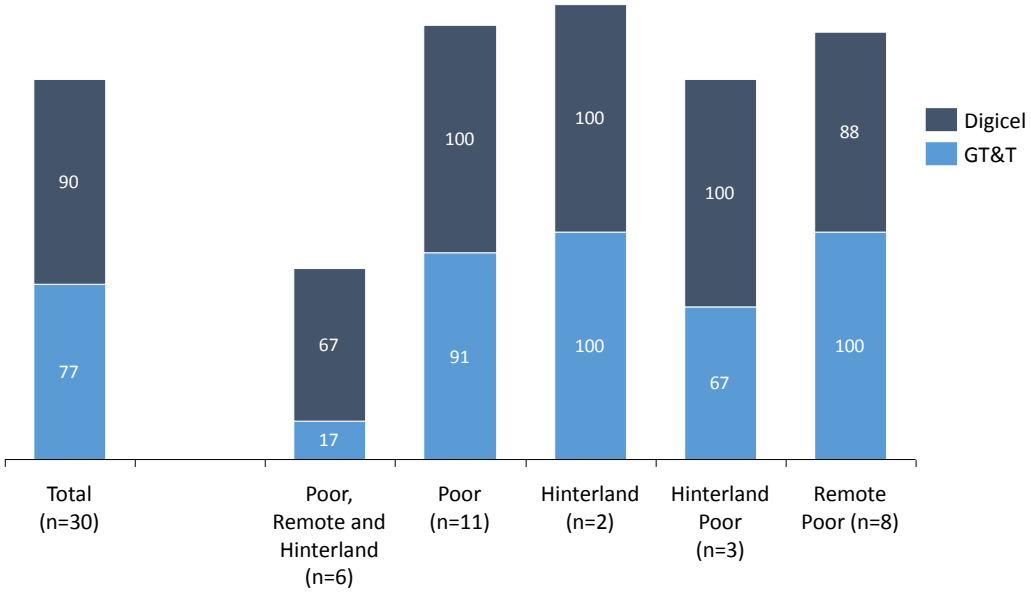

Image 136 - Percentage of persons, confirming the presence and availability of mobile carriers' networks per community segments (in %)

Most of the interviewed leaders (54%) reported having at least one antenna installed in the community. 10% of these leaders of the communities stated, that there were 5 or more antennas or similar type of equipment in the community. However, 43% of respondents are not aware of such equipment installed in the place of their residence. Regarding only the communities categorized as "Poor, Remote and Hinterland", 83% of the leaders state that there is no installation of antennas in their communities.

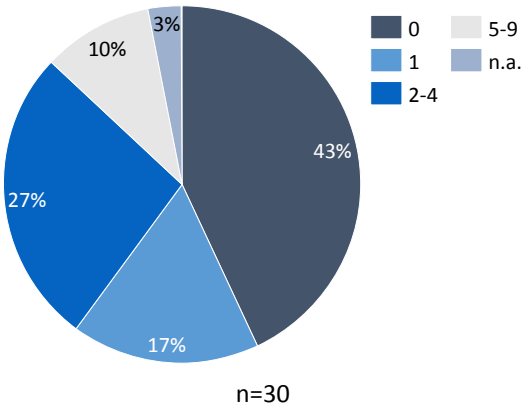

Image 137- Number of installed mobile network antennas per community as perceived by the leader of the community (in %)

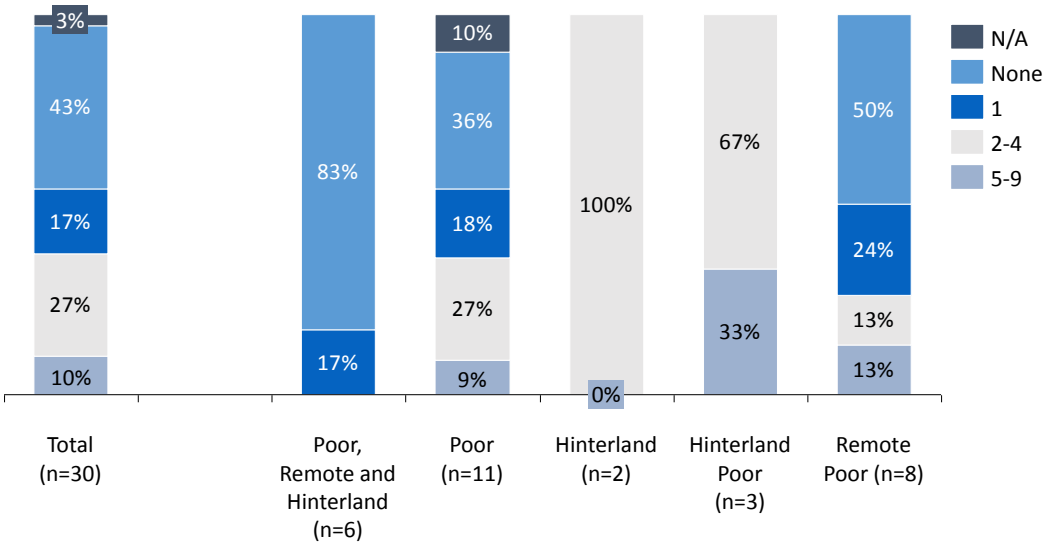

Image 138 - Number of installed mobile network antennas per community segments as perceived by the respective leader (in %)

Almost 60% of the communities in the study have not received any previous ICT development projects. In the communities classified as “Poor, Remote and Hinterland” and “Poor” almost two thirds of the interviewees state, that there were no ICT projects for development in the past. Whereas in the communities “Hinterland and Poor” two thirds of the interviewees confirm the implementation of ICT projects for development in the past.

Amongst these previous projects, the following were named: “small donations”, “computer classes at the Secondary schools”, “a laptop per family from the government”, and “the Internet”. Some of them consider the Digicel’s discounts in plans as a previous ICT project. The failure of these previous projects was due to, according to the interviewees: “*Digicel wanted to start something there, but it never happened. Not successful due to cost of logistics.”; “GT&T haven't ever done any work there.”; “It didn't work, because some of the computers were not Internet ready. Too much politics disturbed the program.”; “They done several requests for improve the communication system there but no response*”. Almost 30% of the respondents believe that this sort of project would help to develop the region. Besides that, they also believe it would help the youth to have more access to information.

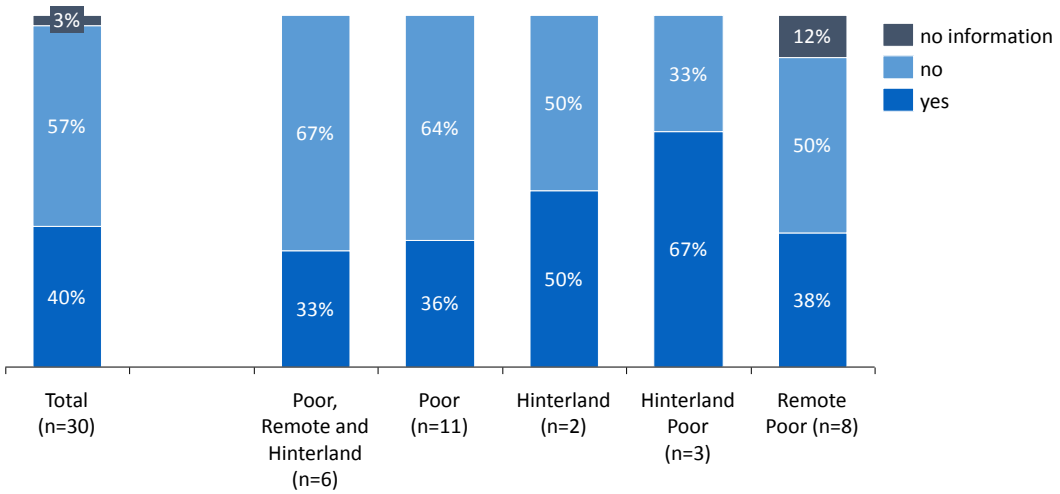

Image 139 - Previous ICT development project per community segments. (in %)

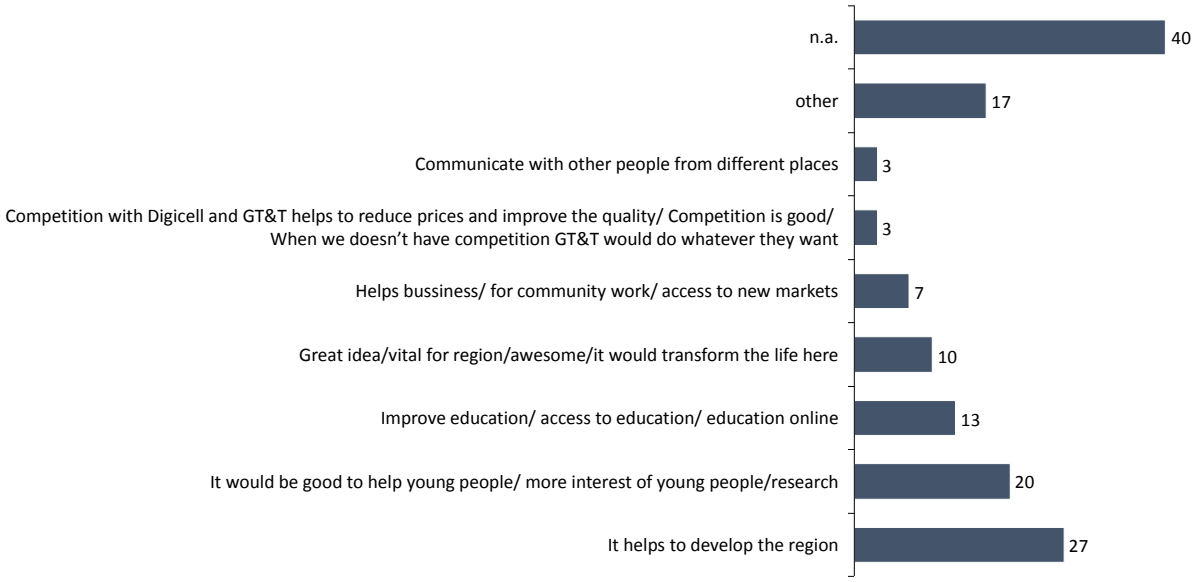

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Image 140 - Opinion about the potential of future ICT projects.

Image 141 - Computers at school without Internet access (Region 4)

Image 142 - Boy with Tablet (Region 5)

Image 143 - Laptop at store (Region 1)

Image 144 - HF Radio inside Store (Region 9)

Image 145 - HF Radio inside a store (Region 8)

Image 146 – Defunct Satellite phone at health center (Region 4)

Image 147 - Digicel Antenna (Region 4)

Image 148 - Antenna (Region 10)

Image 149 - Digicel Antenna (Region 9)

Image 150 - Three towers (Region 9)

1.2.3.7.2 Usage per age segment and gender

Another quantitative survey for this study was done by interviewing some residents at the visited communities. The collected data helped to support the view from the representatives and provided additional figures and indicators for the qualitative study. Interviewees filled up the questionnaires by themselves without the supervision of interviewers. The sample reached a total of 142 completely filled questionnaires.

The distribution of the interviewees is as follows:

Community	Male			Female		
Male	0- 24 yrs	25-54 yrs	55 yrs and older	0- 24 yrs	25-54 yrs	55 yrs and older
Hinterland	1	1	1	3	4	1
Poor	10	3	1	13	8	7
Hinterland and Poor	1	1	0	3	2	1
Remote and poor	8	5	7	10	8	7
Hinterland, poor and remote	6	6	3	8	5	7

Image 151 - Study sample (n=141) overview

73% of the interviewees lived in communities in rural areas.

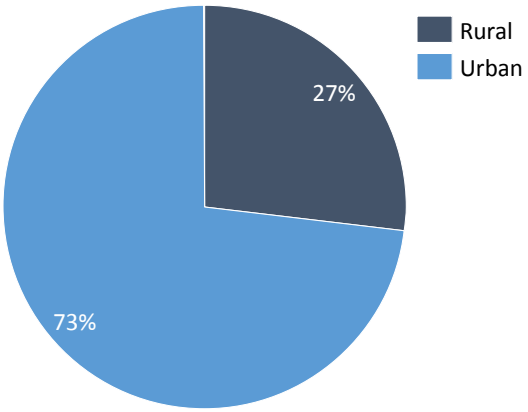

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Image 152 - Characteristics of visited communities

The majority of the interviewees were students, followed by farmers and retired people.

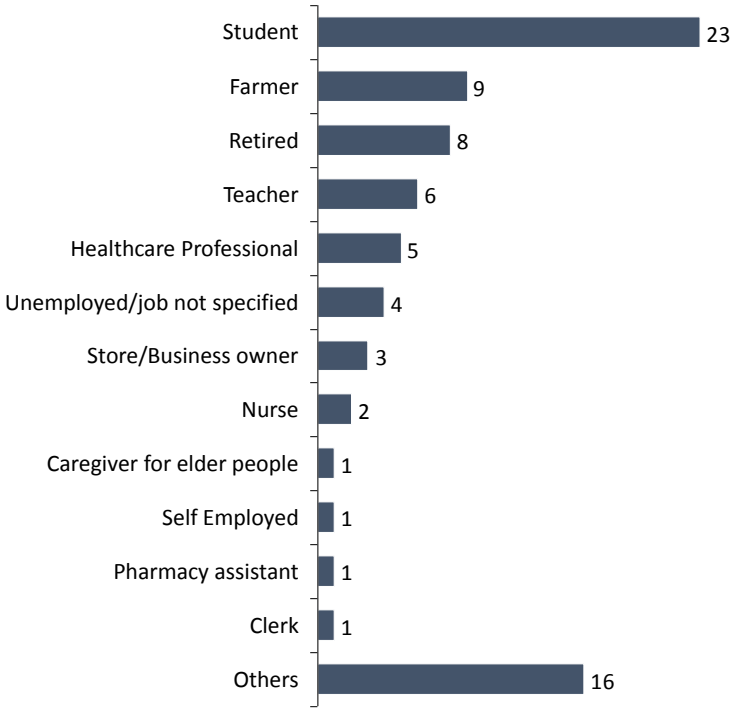

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Image 153 - Occupation of interviewees (%)

The slight majority of the respondents was female (61%)

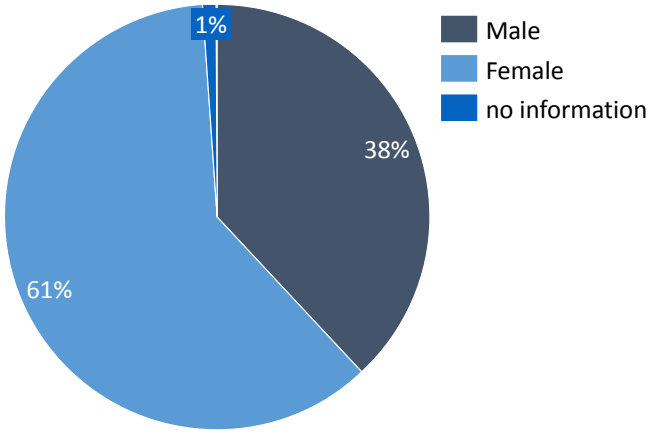

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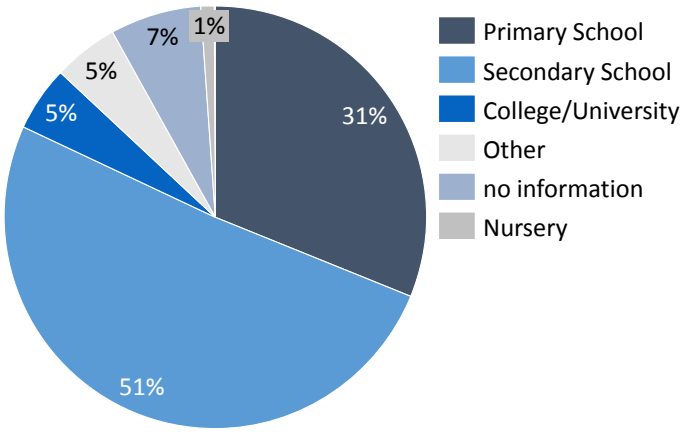
Image 154 - Gender distribution of respondents

More than half of the sample completed the secondary school education. 31% only had primary education.



n=142

Image 155 – Highest Level of education of the respondents (in %)

Most of the interviewees own private cellphones (without Internet) and smartphones (with Internet), 4% of the sample own five or more cellphones (without Internet), 17% own a laptop (with Internet) and only 28% of the interviewees had a private landline telephone.

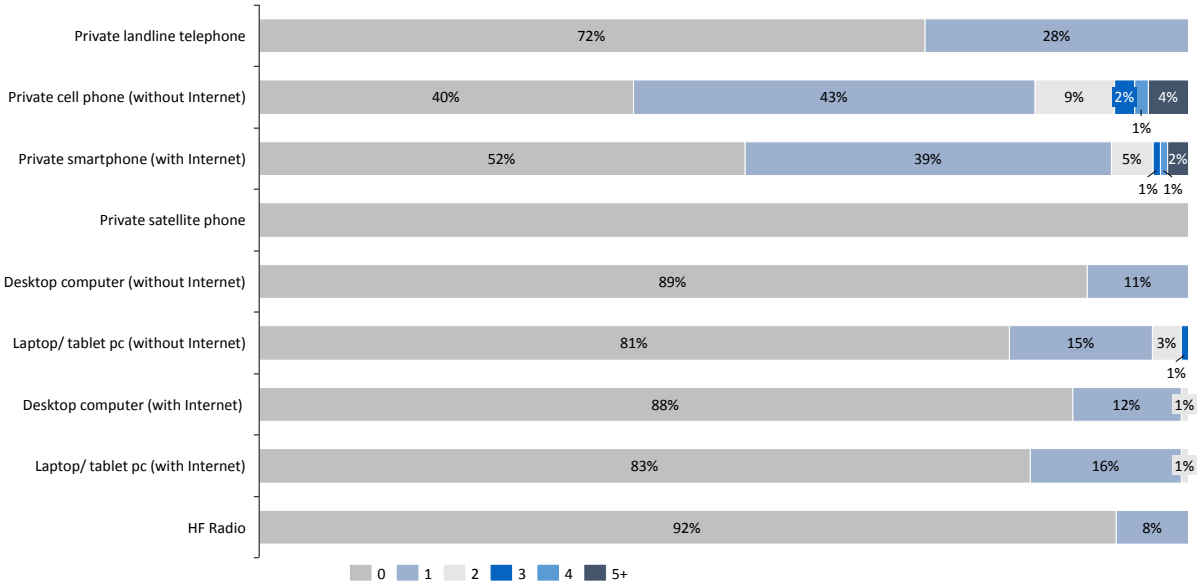


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Image 156 - Number of privately owned ICT devices (%)

There is a predominance of use of devices with access to the Internet among young people under the age of 25 years, especially regarding the use of smartphones. 63% of respondents have at least one smartphone, compared to 44% among the persons in the age range of 25 to 54 years and to only 23% of respondents in the age of 54 years and above. Web enabled computers and laptop also mostly used among young people, but with a neglecting difference to the age range of 25 to 54 years. Among those between 25 and 54 years old, the high percentage of usage of mobile devices without Internet access can be highlighted: 82% of them have at least one such device, almost double the rate among the segment of 0 to 24 years of age. The age segment of 25 to 54 years owns a noticeable number of possession of landline phones and HF Radios.

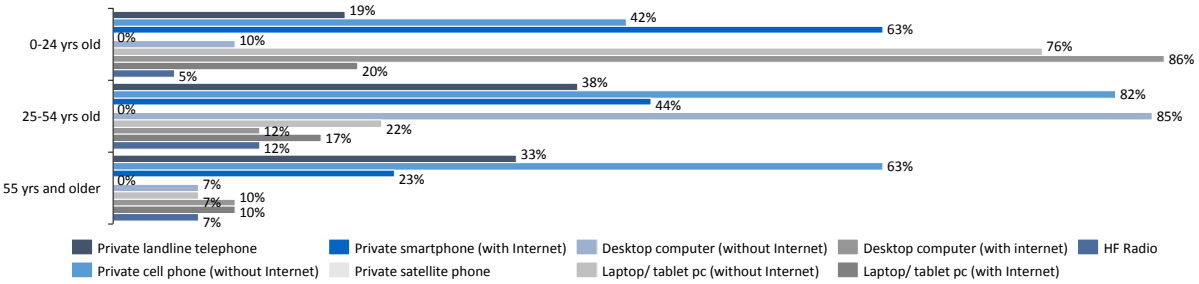

Image 157 - Own devices (one or more) per age segment (in %)

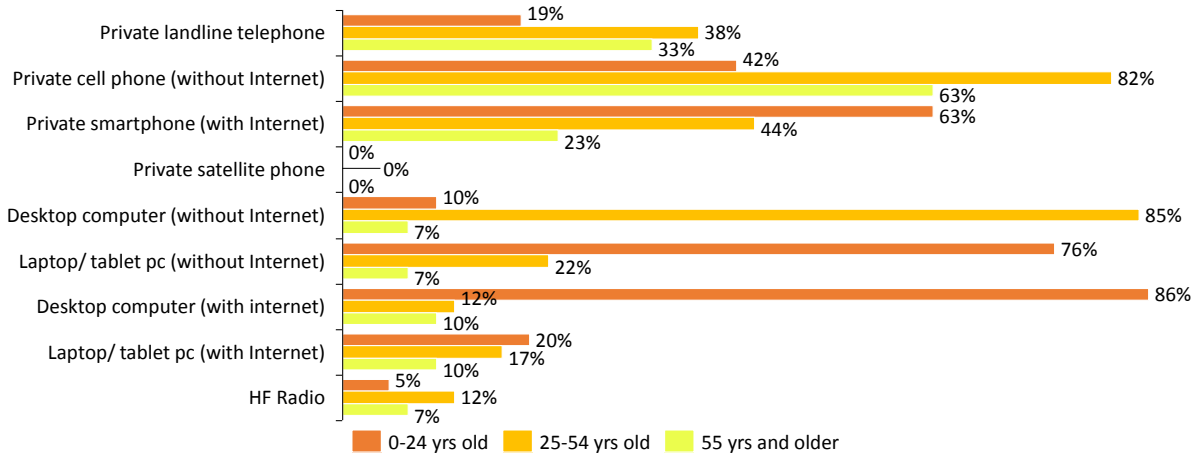

Image 158 - Own devices (one or more) per device type and age segment (in %)

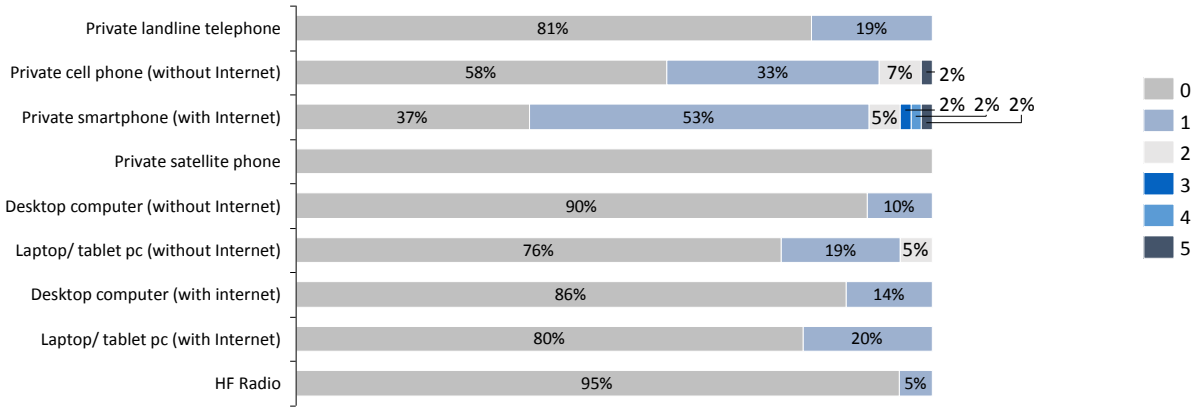

Image 159 - Number of own ICT devices. Age 0-24 yrs. (in %)

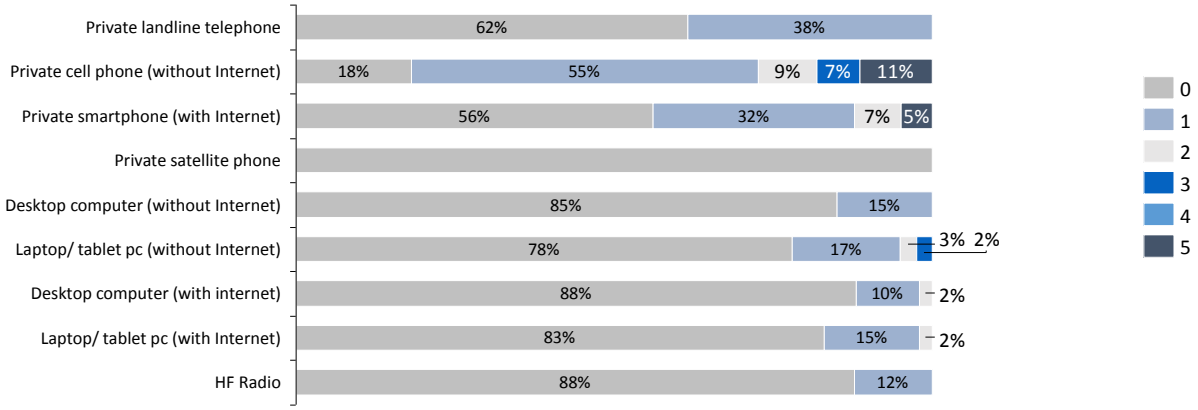

Image 160 -Number of own ICT devices. Age 25-54 yrs. (in %)

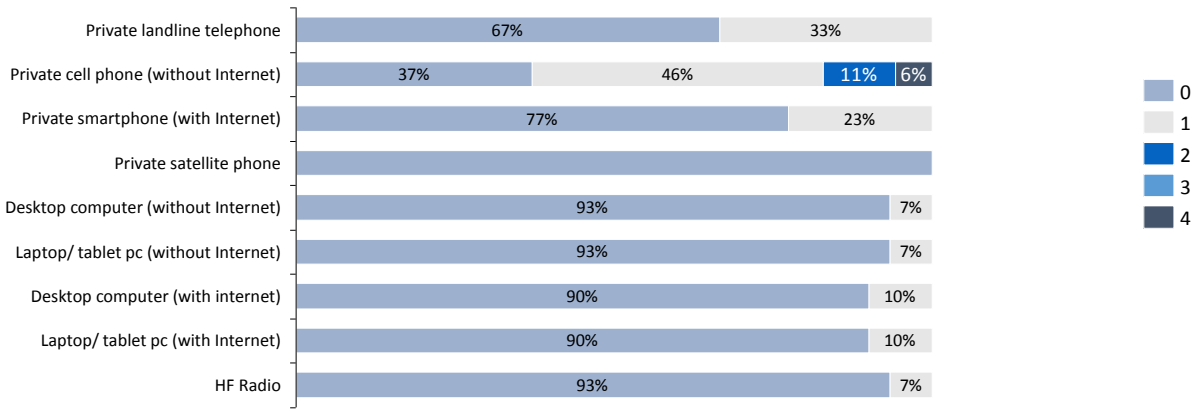

Image 161 - Number of own ICT devices. Age 55 yrs. and older (in %)

Looking at it from a gender perspective, apparently women have a greater access to private landline phones (30%), private cellphones without Internet (61%), desktop computer without and with Internet (13% and 14% respectively). Men stand out in regards to smartphone ownership (50% own such a device compared to 46% of women). Among the other devices no significant difference can be stated by gender.

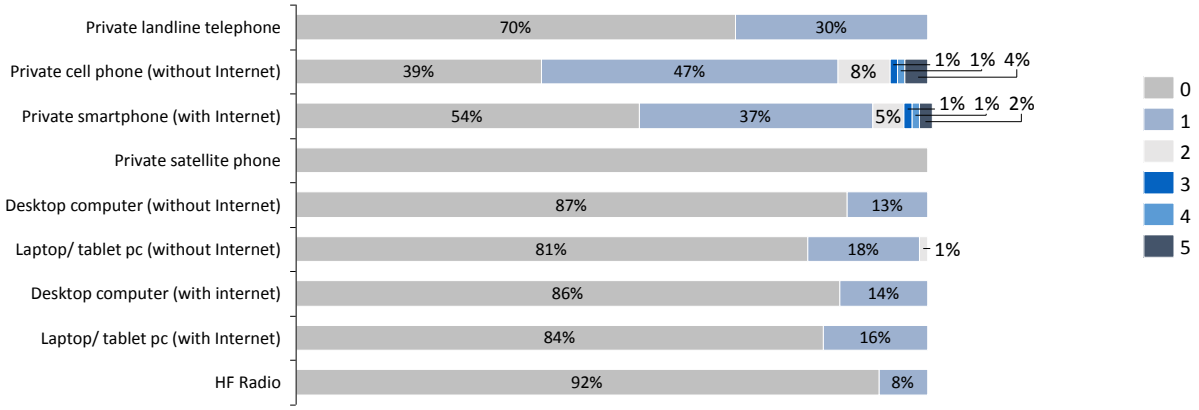

Image 162 - Number of own ICT devices. Females

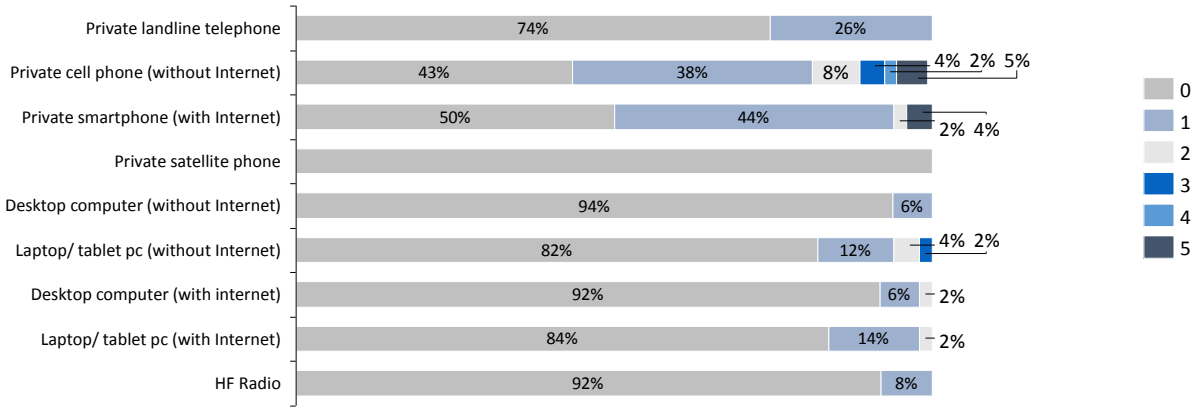

Image 163 - Number of own ICT devices. Males

For almost half of the sample, the interviewees see have up to 10 cellphones (without Internet) available in their community. 11% estimate an availability of more than 150 cellphones (without Internet). The estimated percentage of privately owned smartphones is low – respondents said that almost a quarter of the people in the community own a smartphone. According to their perception, 70% of the communities do not own a public landline telephone. A general feeling of sufficient lack of means of communication in the communities can be stated.

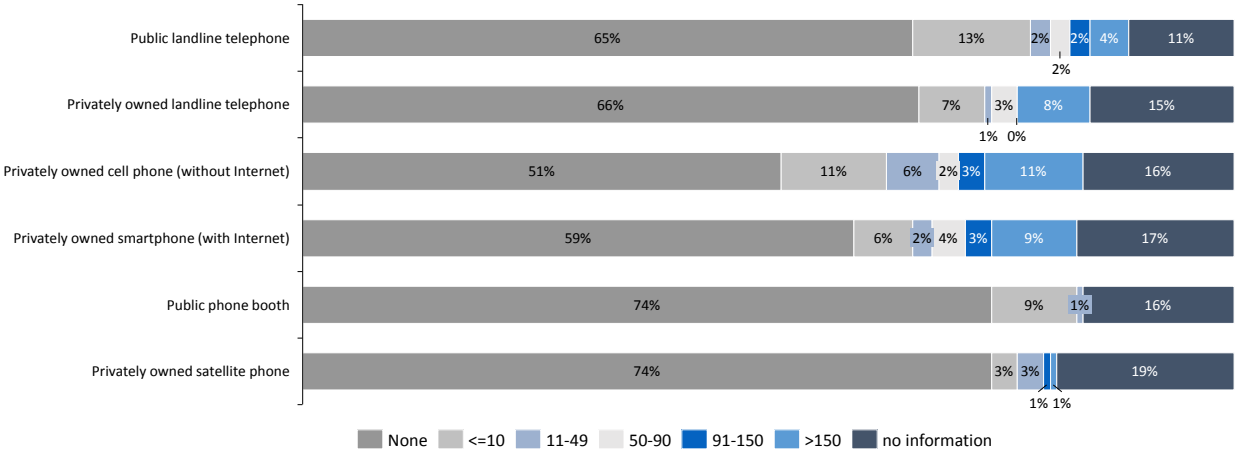

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Image 164 - Perception of available communication devices in the respective community (in %)

The vast majority of respondents perceive limited availability of ICT devices or access to them in the community, regardless of age.

Older people (age segment 55 years and older), perceived an higher level of lack of devices such as privately owned landline, cellphone and smartphone than younger people (under 54 years).

Access to devices in publicly accessible locations such as public landline phone and public phone booth is perceived as more restricted in the segment of 0 to 24 years of age.

In the view of the majority of those interviewees who reported the existence of ICT devices in their communities, their number has been estimated at not exceeding 10 units.

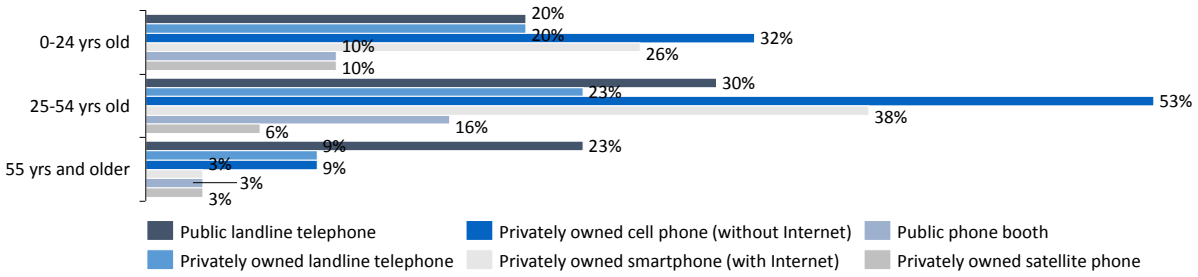

Image 165 - Perceived number of available communication devices in the community per age segment

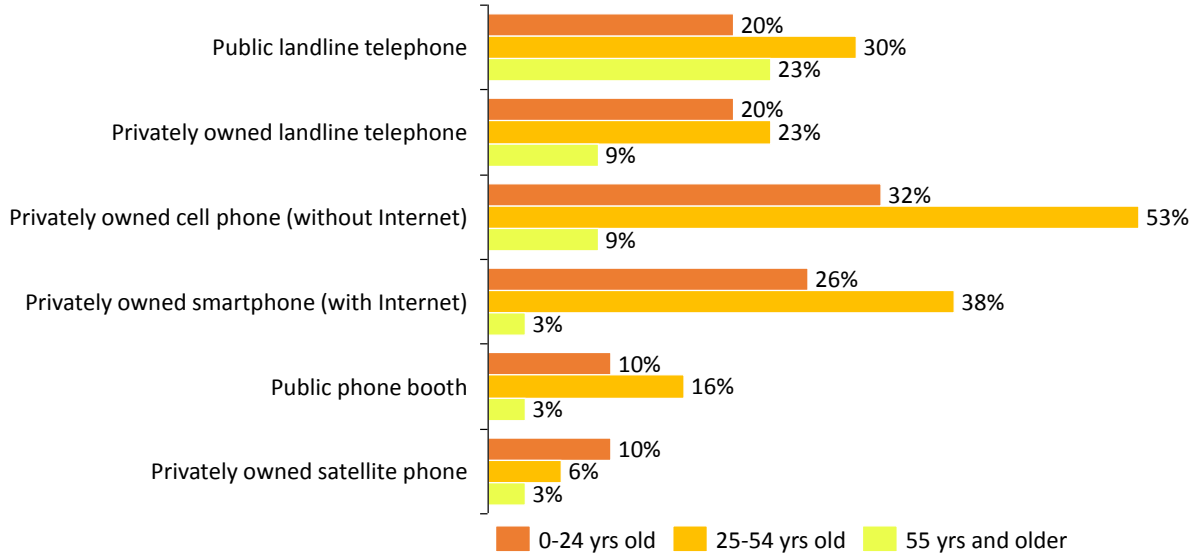

Image 166 - Perceived number of available communication devices in the community per ICT device and age segment

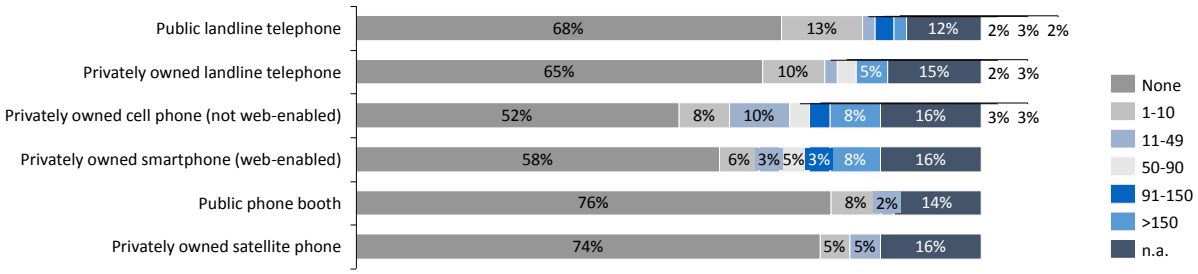

Image 167 - Perception of available communication devices in the respective community, age group 0-24 yrs. (in %)

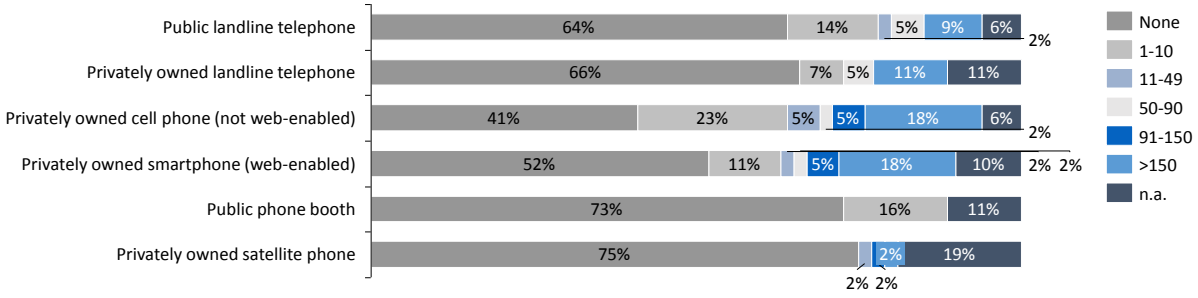

Image 168 - Perception of available communication devices in the respective community, age group 25-54 yrs. (in %)

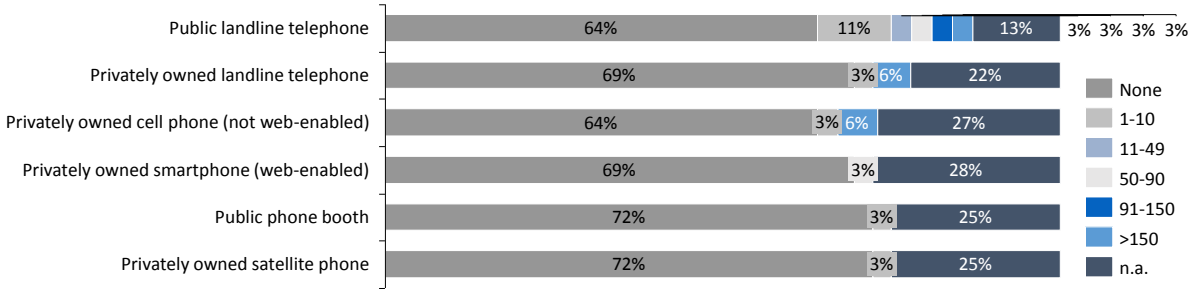

Image 169 - Perception of available communication devices in the respective community, age group 55 and more yrs. (in %)

Most men perceived (compared women) the absence of ICT devices in their community such as Public landline phones (70%), privately owned cellphones (without Internet) (56%), privately owned smartphones (with Internet) (61%).

Interviewed women emphasized a lack of privately owned landline phones (68%) and public phone booths (75%).

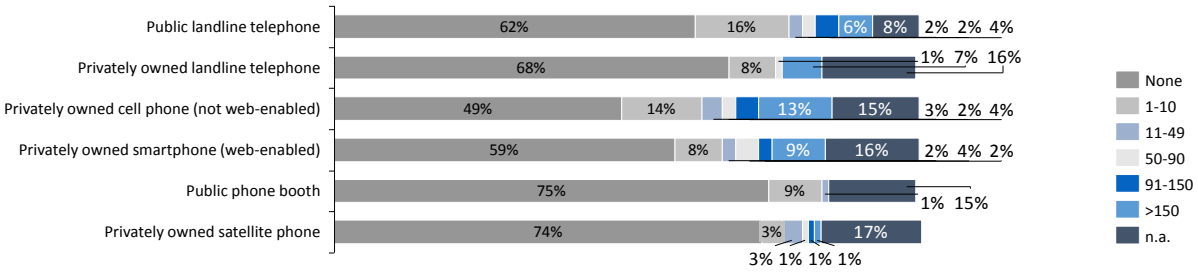

Image 170 - - Perception of available communication devices in the respective community, Females. (in %)

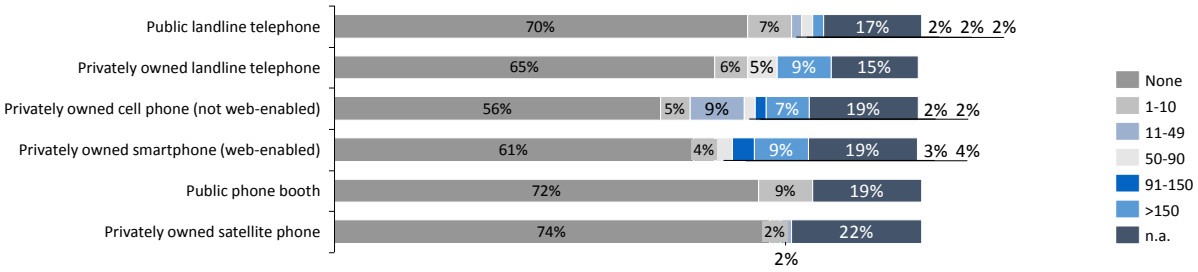

Image 171 - Perception of available communication devices in the respective community, Males. (in %)

The frequency of use of cellphones (without Internet) and smartphones (with Internet) are superior to all other means of communication (54% use their smartphones several times a day).

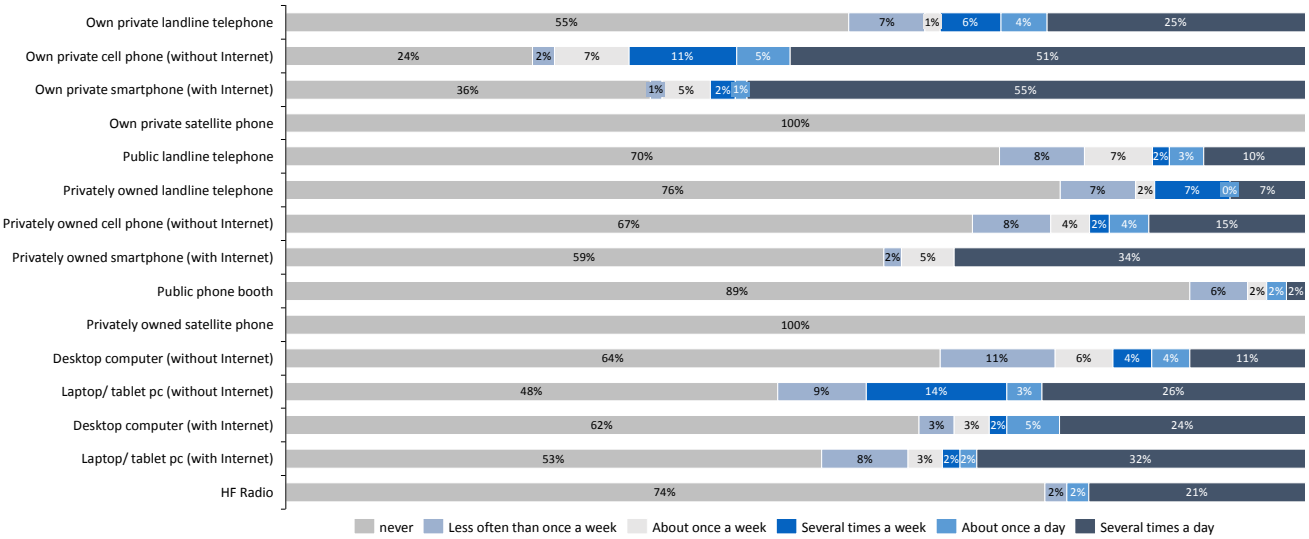

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Image 172 - Frequency of use of ICT devices (in %)

Low access to devices often results in a high percentage of "never" use of any ICT device. This result is consitent over all age groups.

Comparing the differences between the different age groups, there is a higher frequency of use of devices with Internet access. The same happens in the age group between 25 and 54 years in relation to not Internet capable cellular phones.

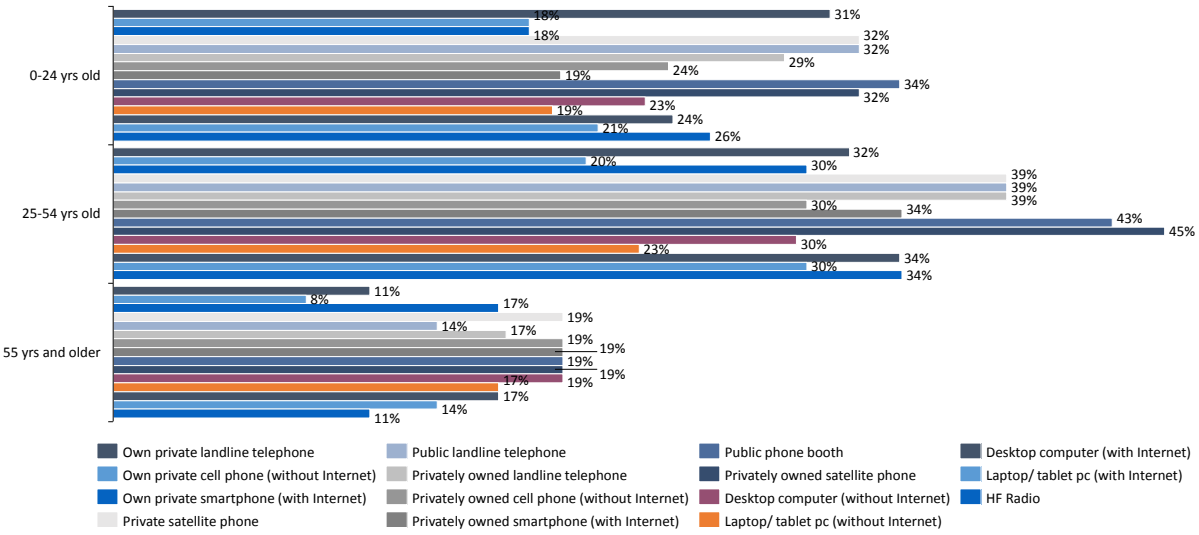

Image 173 - Usage of at least one ICT devices per age group

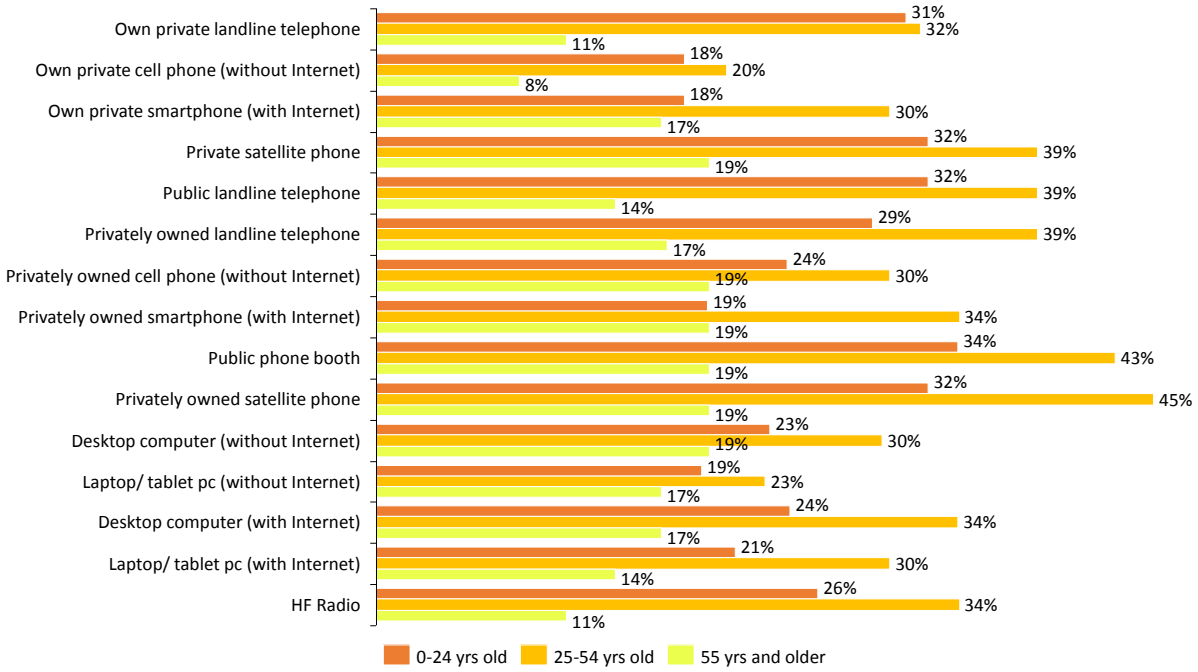

Image 174- Usage of at least one ICT device with specific age breakdown

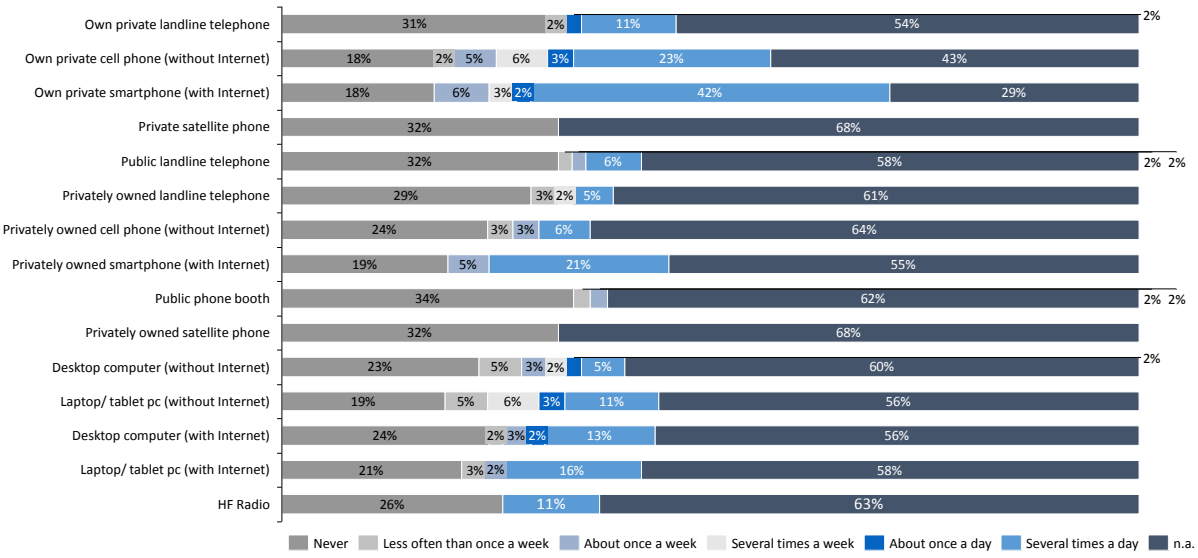

Image 175 - Usage of ICT devices within age group 0-24 years (in %)

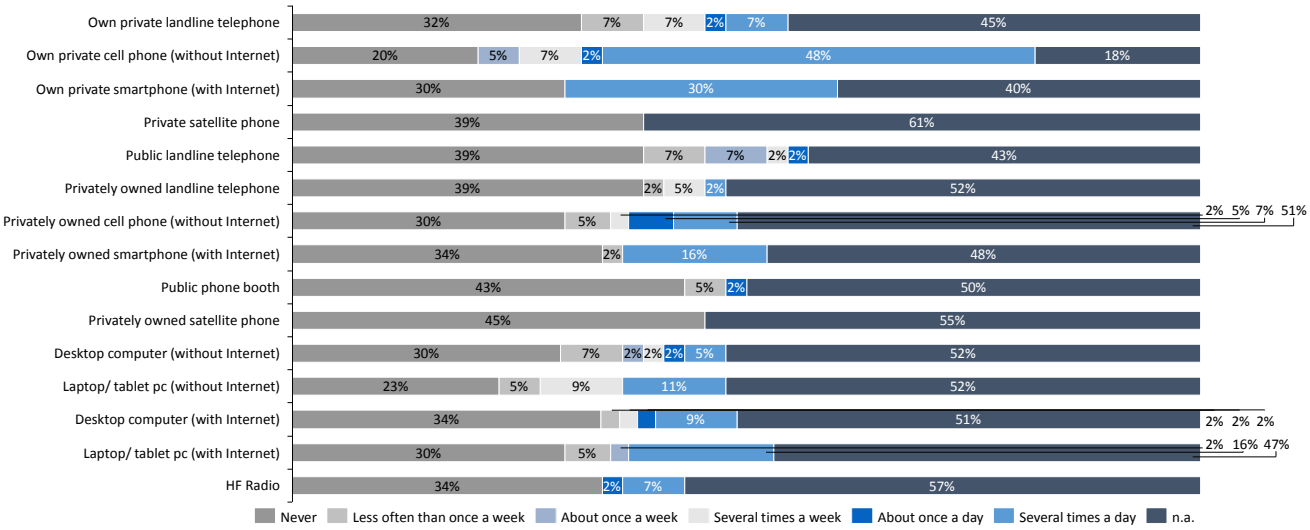

Image 176 - Usage of ICT devices within age group 25-54 years (in %)

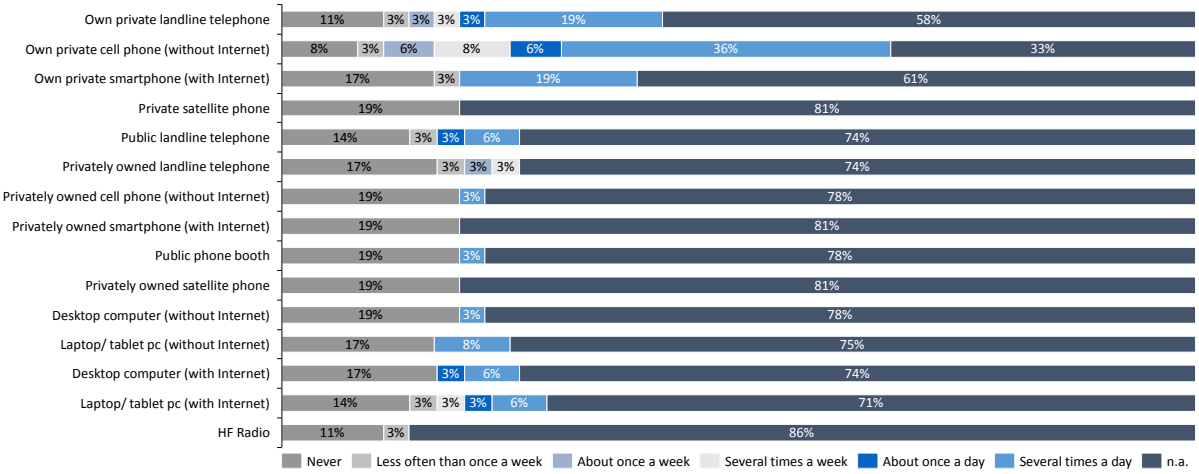

Image 177 - Usage of ICT devices within age group 55 years and older (in %)

Women report a higher usage frequency then men (Several times a day) in regards to devices such as own private landline telephones (15%), own private smartphones with Internet (33%), privately owned smartphone with Internet (17 %), desktop computers with Internet (10%), laptop/tablet pc with Internet (14%) and HF Radio (8%). For other devices no significant differences were found regarding the frequency of use between the genders.

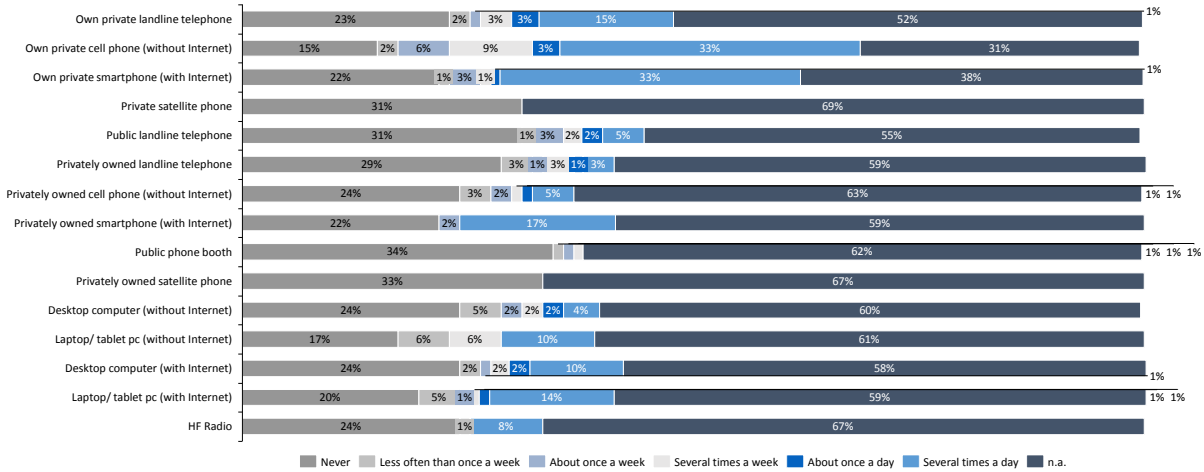

Image 178- Usage of ICT devices within woman (in %)

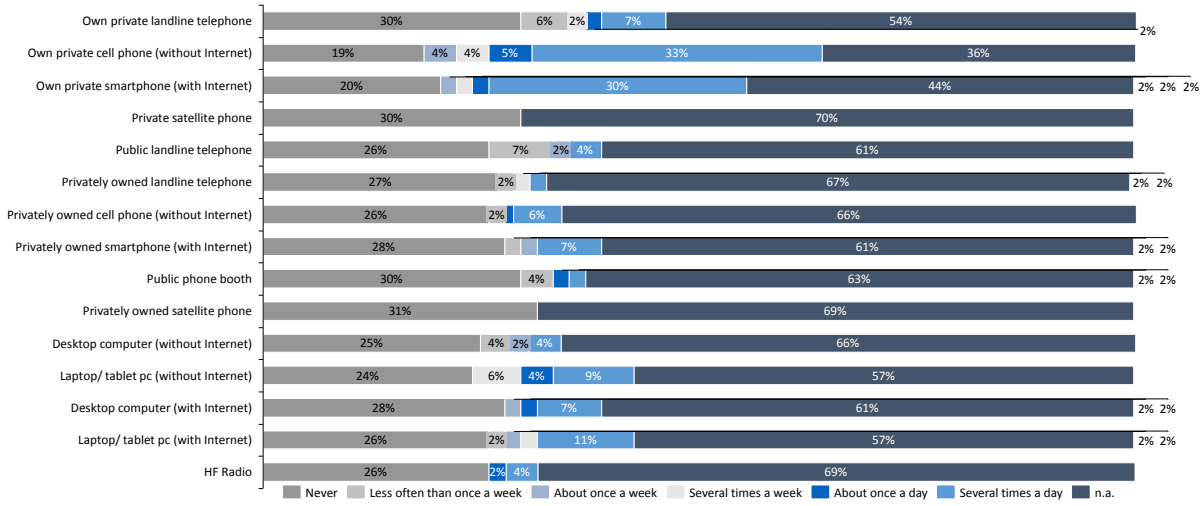

Image 179 - Usage of ICT devices within men (in %)

The private houses are the most common place for usage of the greater part of communication devices. The usage at the place of work is greater amongst those who use public landline telephone or private satellite phone and public phone booth.

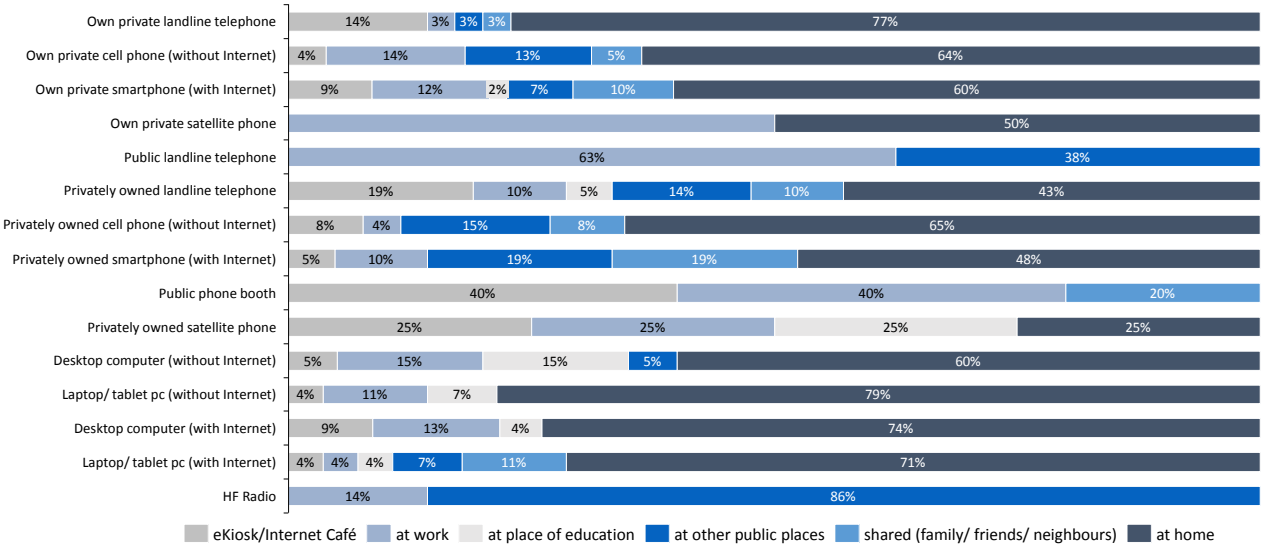

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Image 180 - Location of use of ICT devices (in %)

The private home is the place with access to a higher variety of devices, regardless of age and gender.

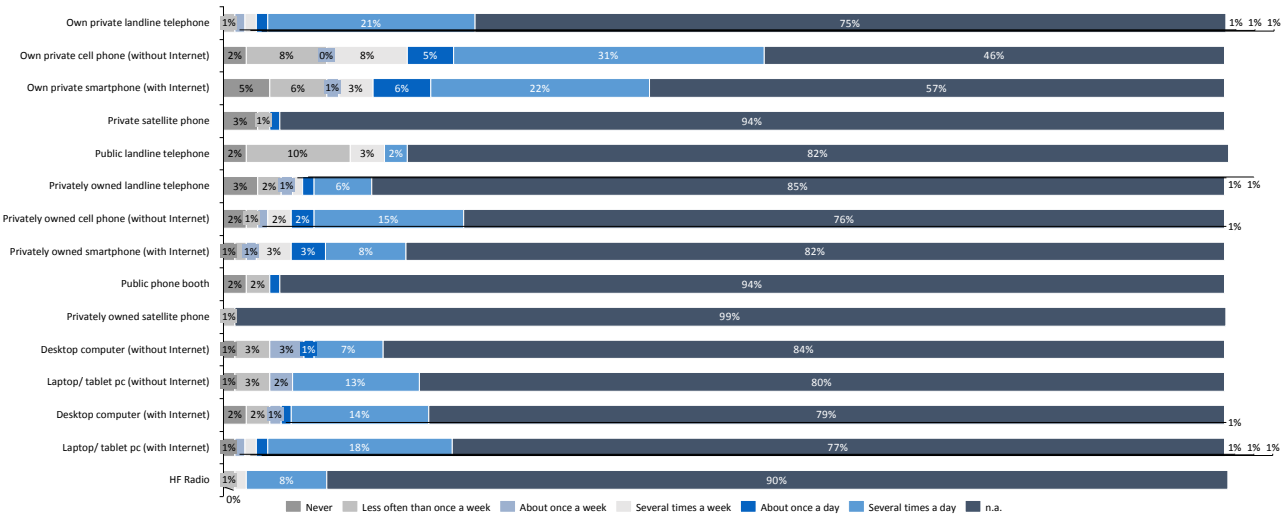

Image 181 - Location of use of ICT devices by females (in %)

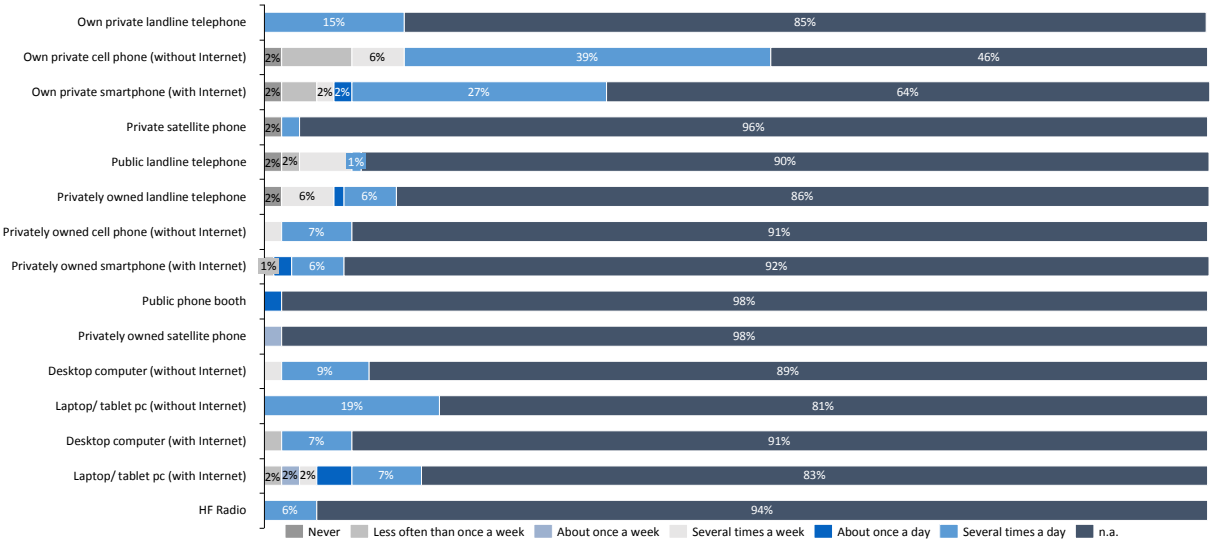

Image 182 - Location of use of ICT devices by Males (in %)

Only 6% of the interviewed persons are aware that there are satellite services available in their communities. The general – and incorrect - perception is that Digicel and GT&T are the providers of this service.

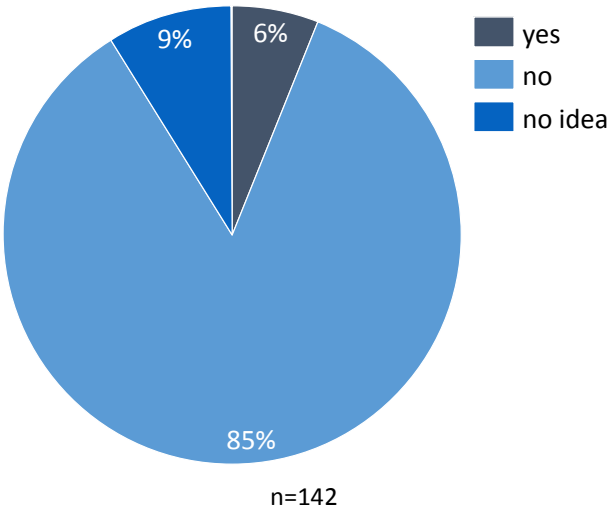

Image 183 - Perception of satellite services available (%)

Majority of interviewed persons is not aware of the presence of such services in their communities.

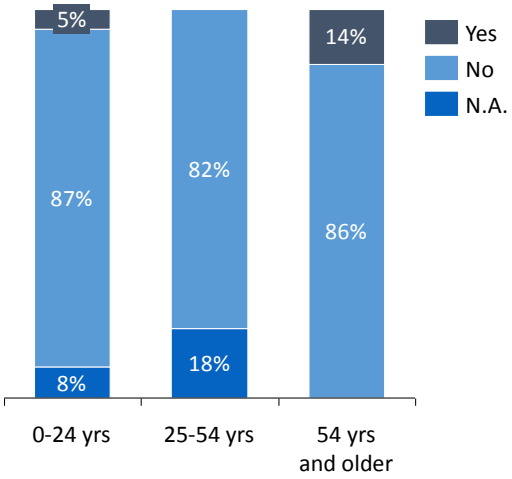

Image 184 - Awareness of availability of satellite services per age groups

Only 7% of women are aware of the availability of satellite services what is still a higher percentage than in the group of men.

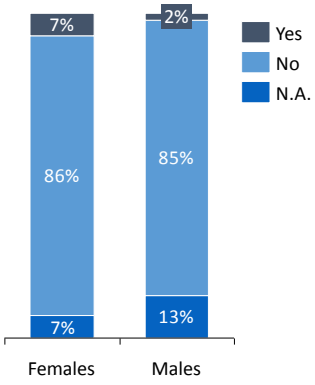

Image 185 - Awareness of availability of satellite services per gender

The interviewees would be willing to pay up to GYD 10.000 per month to have access to Internet at home (maximum). GYD 5.000 on phone calls, up to GYD 4.500 to have Internet on their smartphones and up to GYD 1.200 for texting.

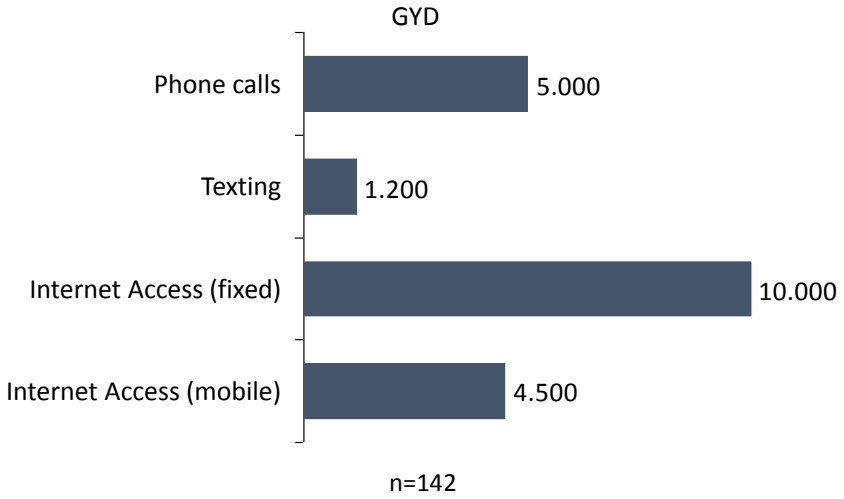

Image 186 - Willingness to pay per month for ICT services in Guyana Dollars.

A breakdown shows the willingness to pay for the different services – reflecting to certain extend the consumer's experiences with current offerings and its prices. This might explain why the willingness to pay for fixed line Internet is higher than for mobile Internet services.

Low familiarity with telecommunication goods and services may have influenced the distortion of the average values the respondents of segments poor, remote and hinterland would be willing to pay mainly in relation to services such as texting or phone calls. In the latter, the average values to be paid for phone calls are more than twice the overall average price[32].

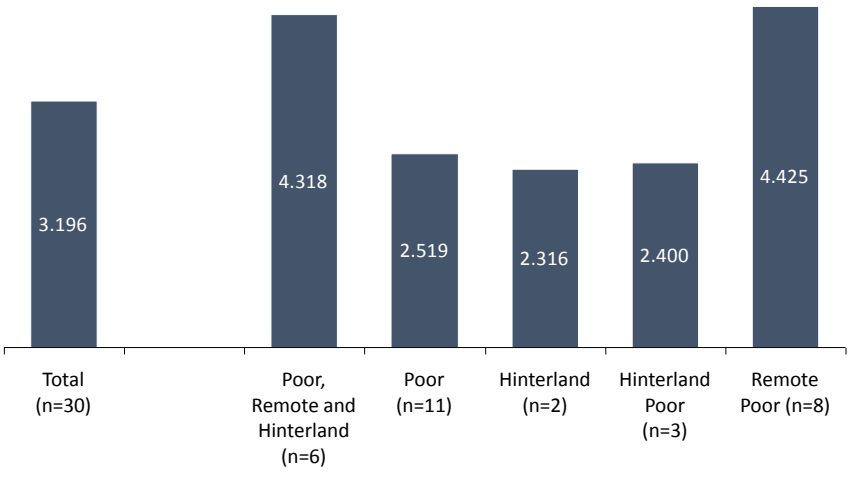

Image 187 - Willingness to Pay: Mobile Internet (in GYD)

[32] This might reflect the interviewee's experience with the price level of using satellite based communication services, even if they are not aware of the communication technology being used.

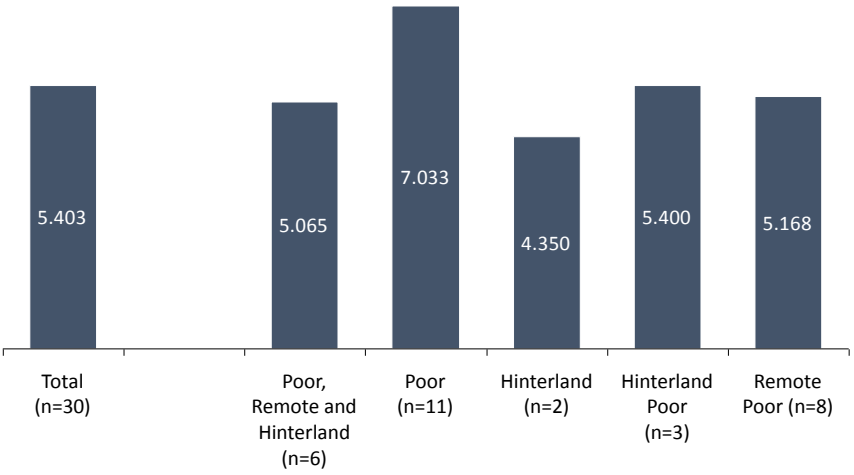

Image 188 - Willingness to Pay: Fixed line Internet (in GYD)

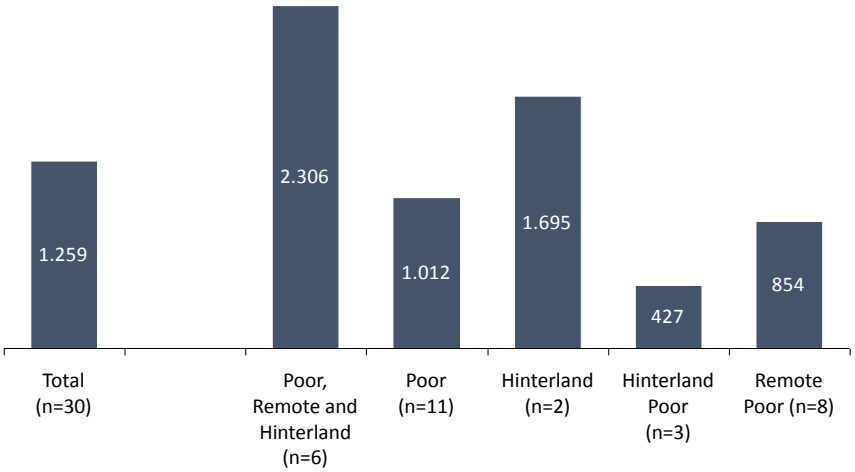

Image 189 - Willingness to Pay: Texting (in GYD)

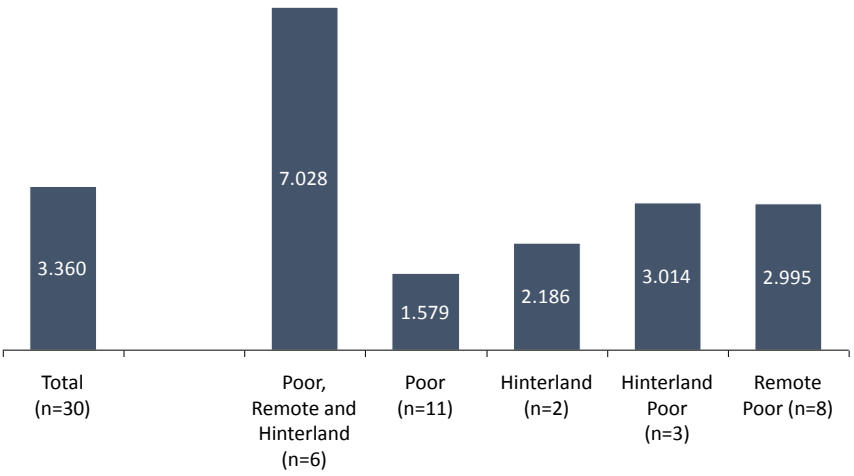

Image 190 - Willingness to Pay: Phone Calls (in GYD)

The younger the interviewees were, the higher the average willingness to pay for Internet services (landline and mobile) could be noted.

A different view can be identified in areas without Internet access: the older the interviewee, the higher their respective willingness to pay for simple communication services like voice and texting.

A detailed view on the different age groups shows a greater willingness to pay for a mobile Internet service if the users already own a Smartphone: 63% of young people under 25 years have at least one smartphone, compared to 44% of the sample between 25 and 54 years and only 23% of respondents over 54 years.

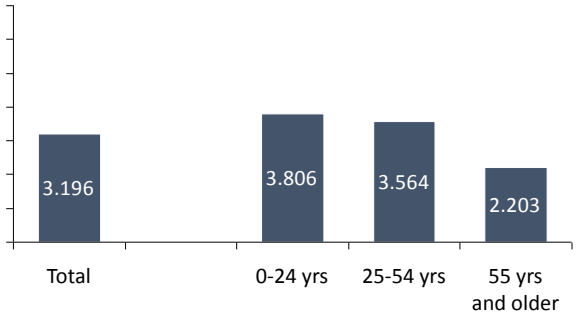

Image 191 - Willingness to Pay - Mobile Internet per age groups

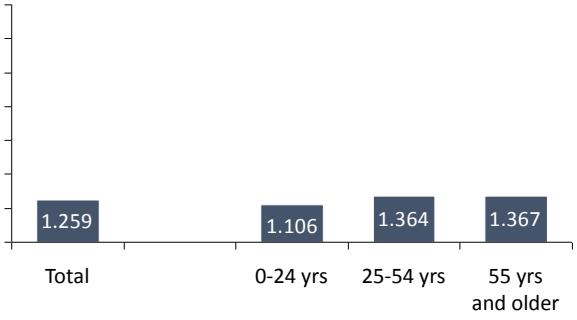

Image 193 - Willingness to Pay - Texting per age groups

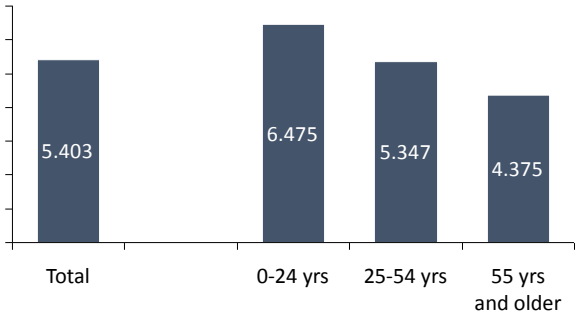

Image 192 - Willingness to Pay - Internet at home per age groups

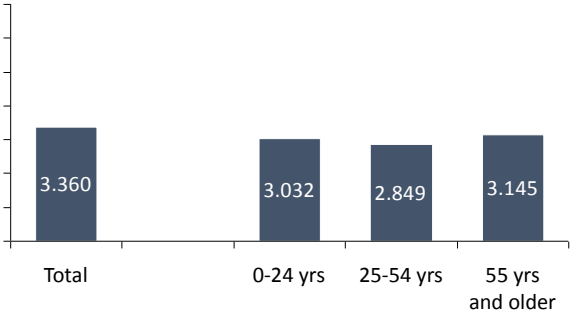

Image 194 - Willingness to Pay - Phone Calls per age groups

Regarding gender split, there is clearly a willingness of men to pay more for all the services offered than women.

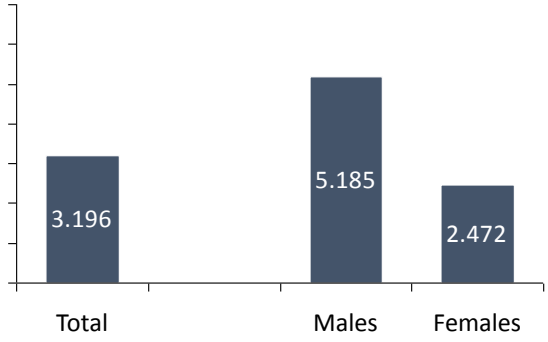

Image 195 - Willingness to Pay - Mobile Internet per genders

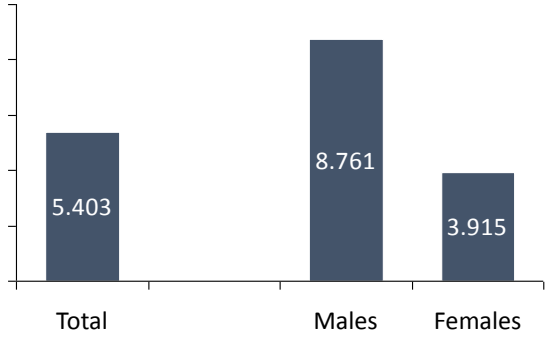

Image 196- Willingness to Pay - Texting per genders

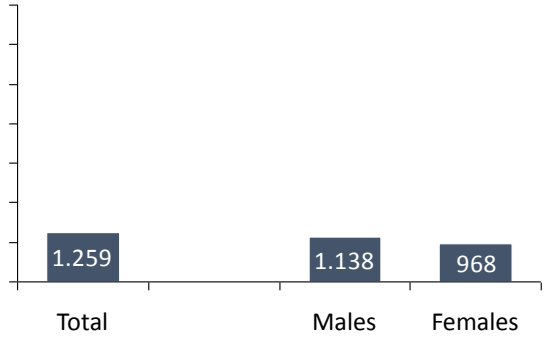

Image 197- Willingness to Pay - Internet at home per genders

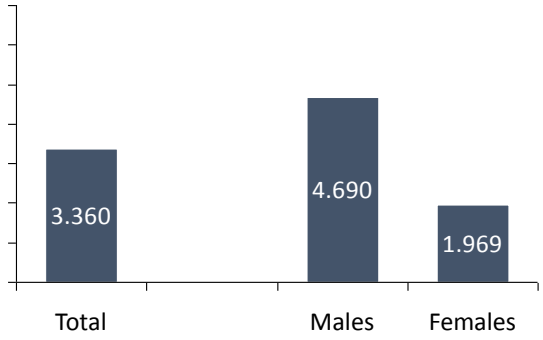

Image 198- Willingness to Pay - Phone Calls per genders

The cellphone is more used for local and national calls and the smartphone – using the Internet for cheap and reliable VoIP calls – is used for international calls.

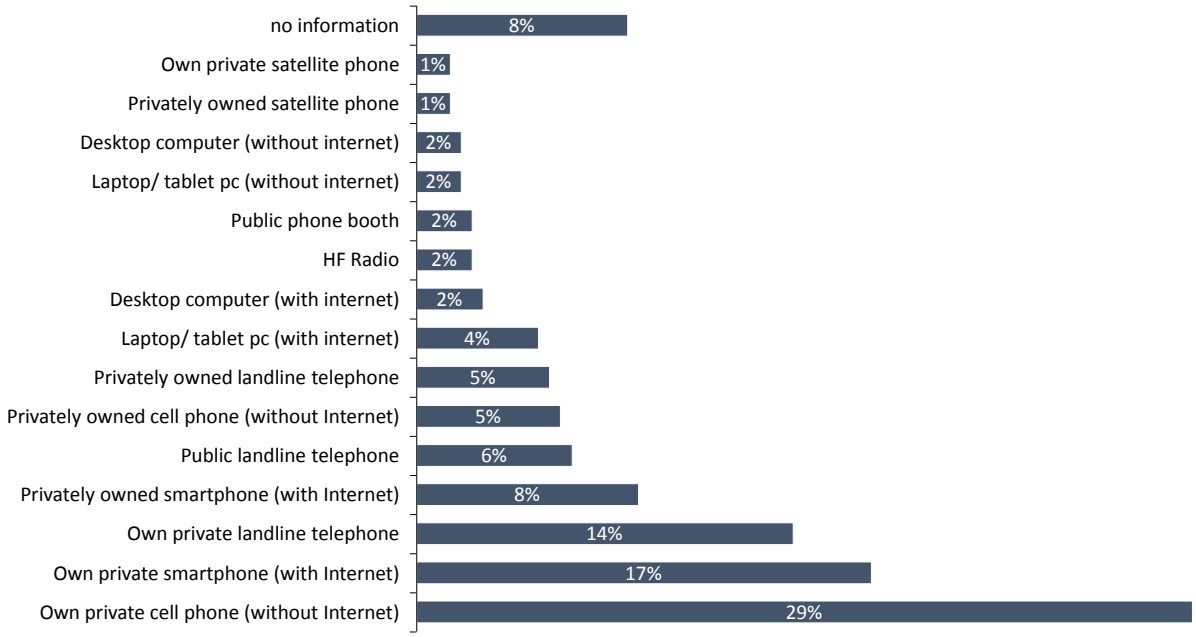

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Image 199 - Devices used for local calls (in %)

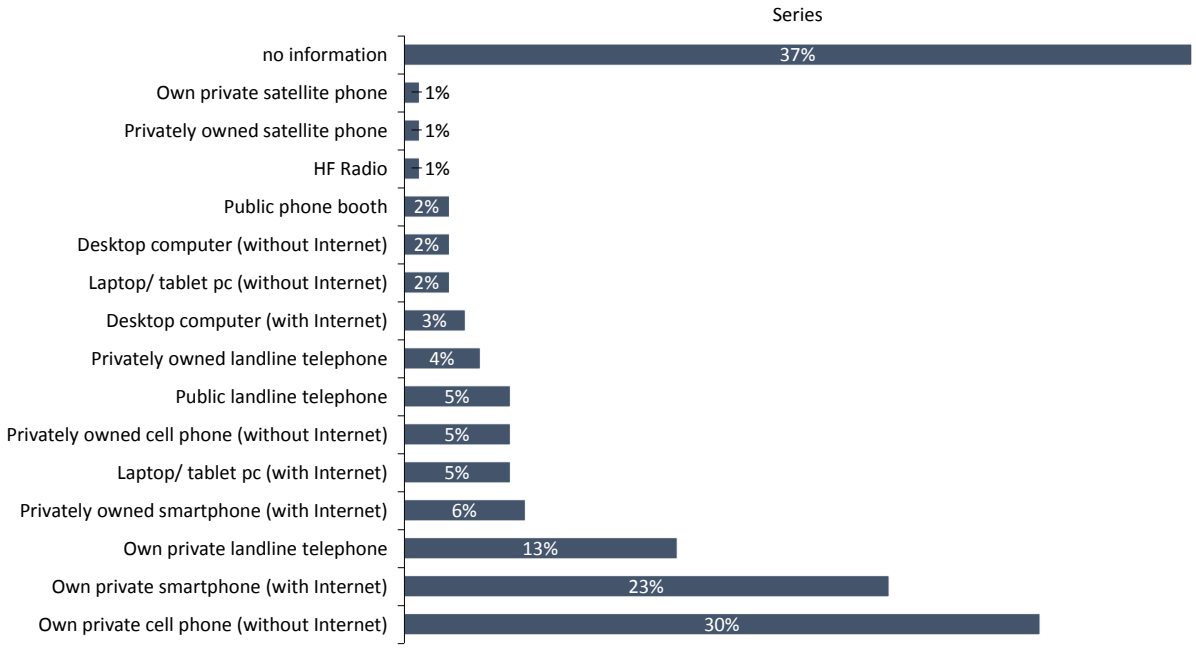

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Image 200 - Devices used for national calls (in %)

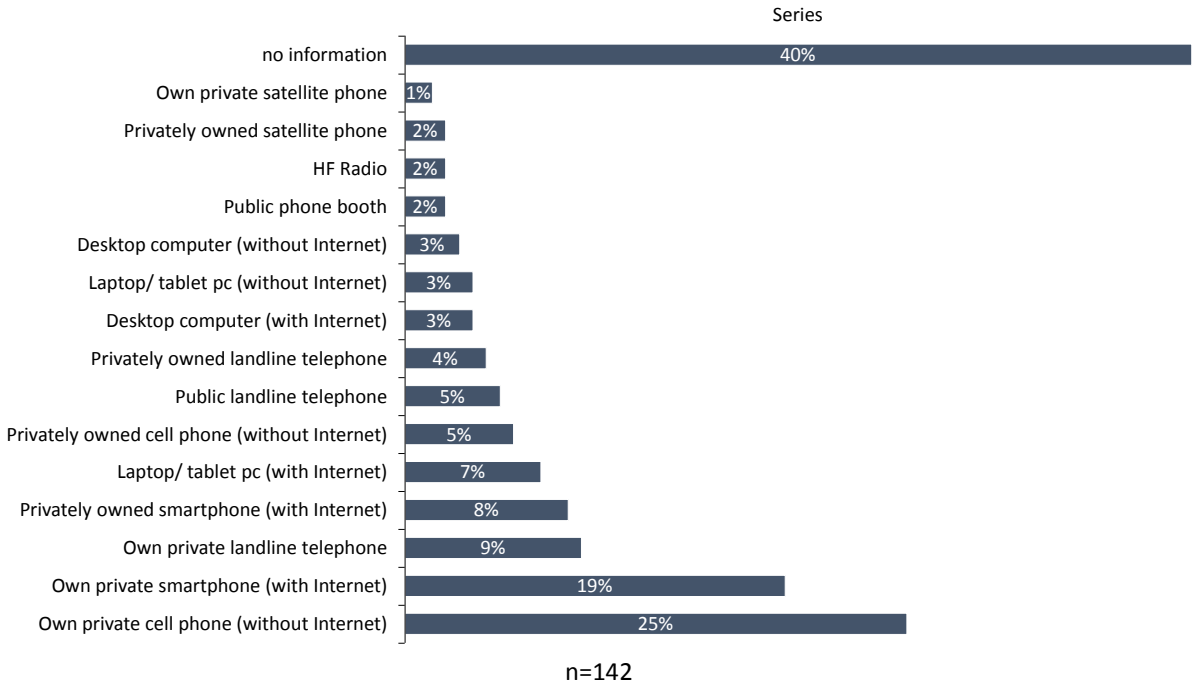


Image 201 - Devices used for international calls

The age segment of 25 to 54 years shows the most diversified use of devices to make local, national and international calls. Comparing the age groups, they are the ones that use the highest number of different devices to make the calls.

Young people, however, stand out to in the segment to make local, national and international calls using their smartphones. For international calls they are also using more privately owned landline phone and laptop/tablet pc, web-enabled, in comparison to the other age segments.

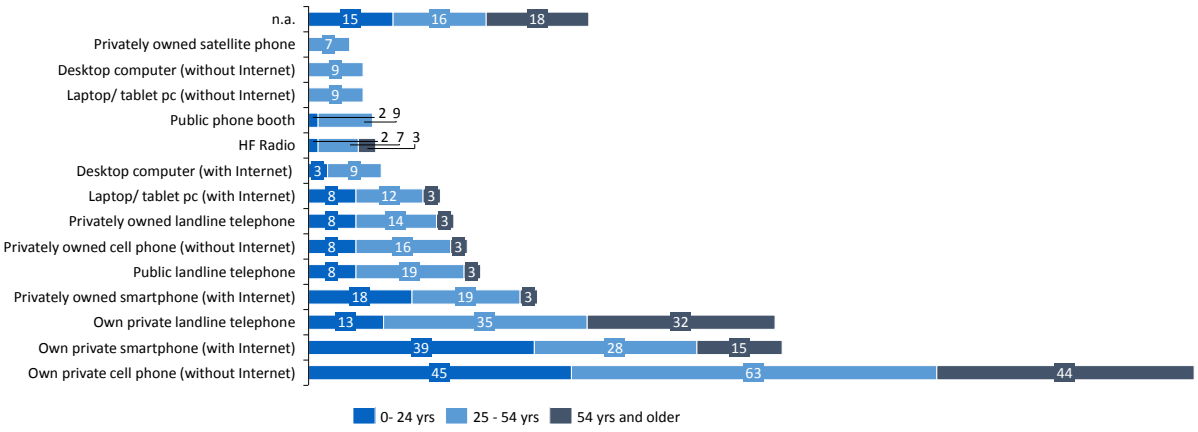


Image 202 - Usage of different ICT devices in the community for local calls per age segments

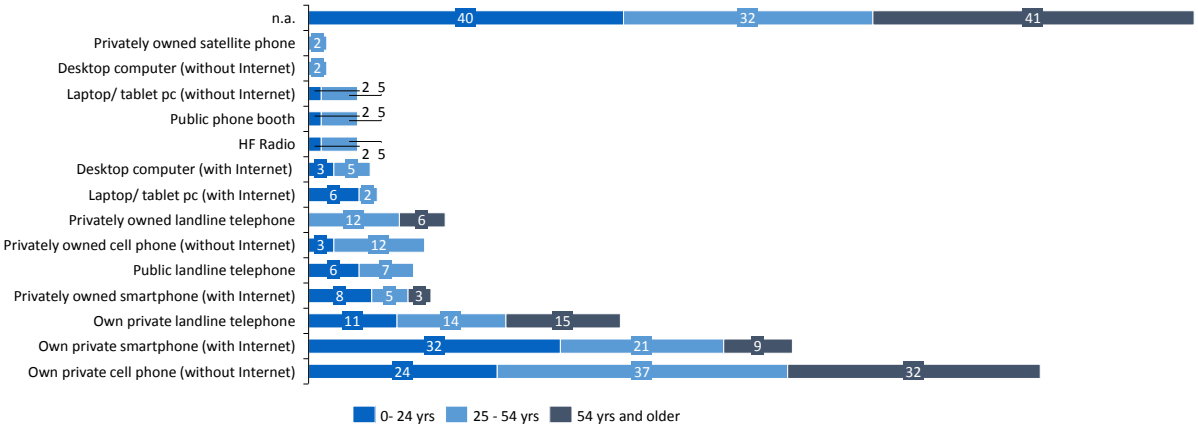


Image 203 - Usage of different ICT devices in the community for national calls per age segments

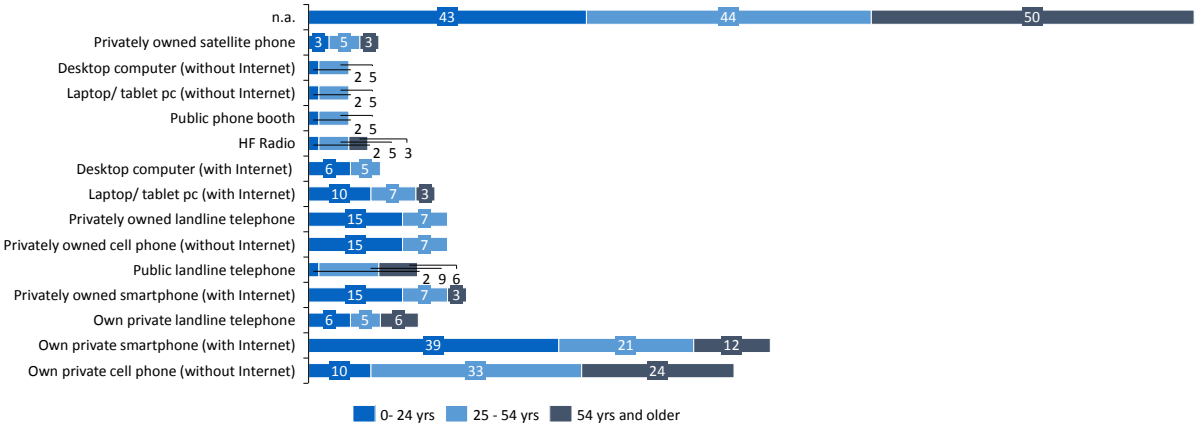


Image 204 - Usage of different ICT devices in the community for international calls per age segments

For local calls women, more than men, use different devices. Mobile phones without Internet and own private landline phone are the most used devices by them for this type of calls. On the other hand, men use the smartphone more often than women for such calls.

For other types of calls, only few differences in the usage pattern between the genders were identified. It is important to note that the use of privately owned smartphone for national and international calls is higher among women than among men.

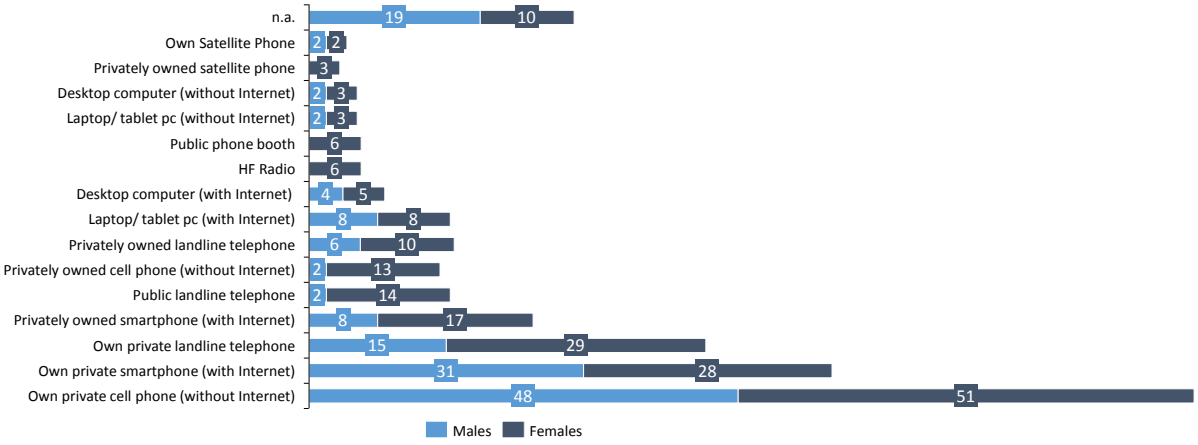


Image 205 -Usage of different ICT devices in the community for local calls per genders

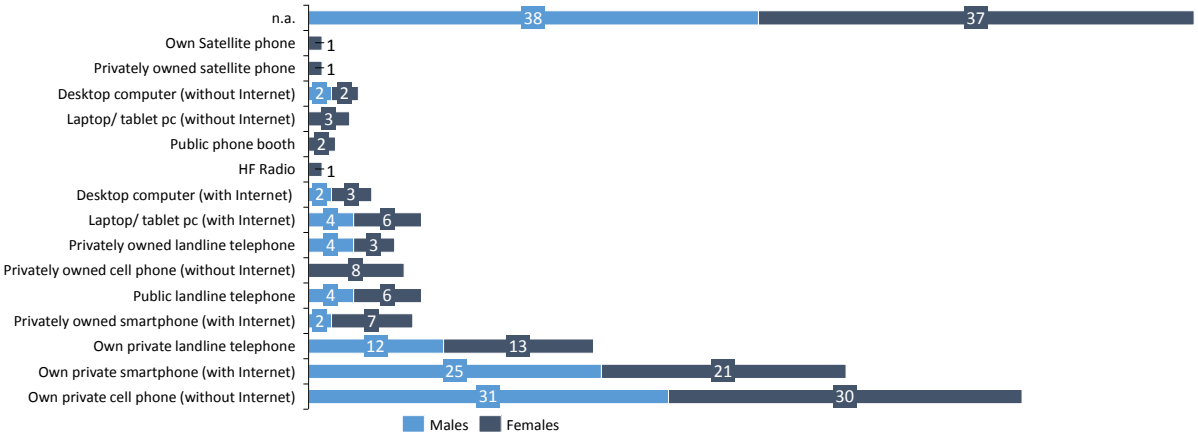


Image 206 -Usage of different ICT devices in the community for national calls per genders

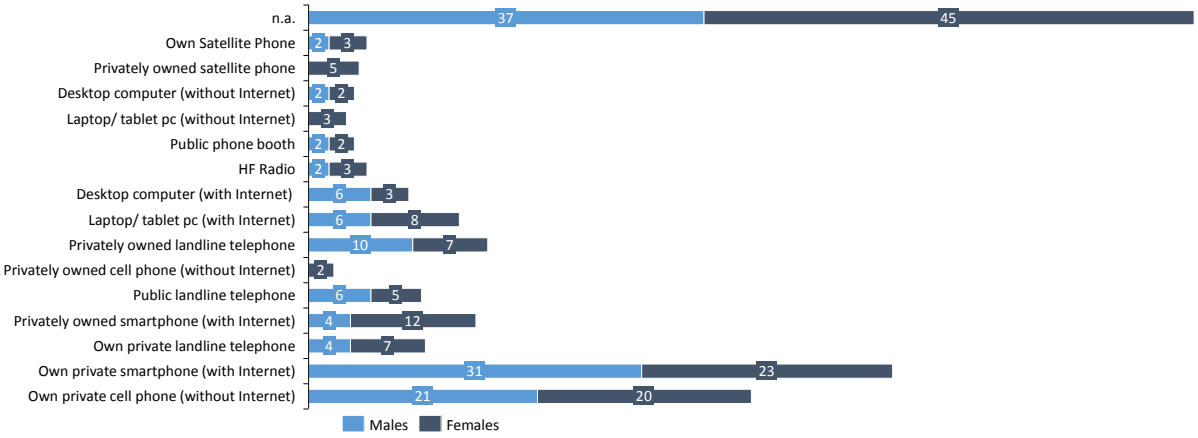
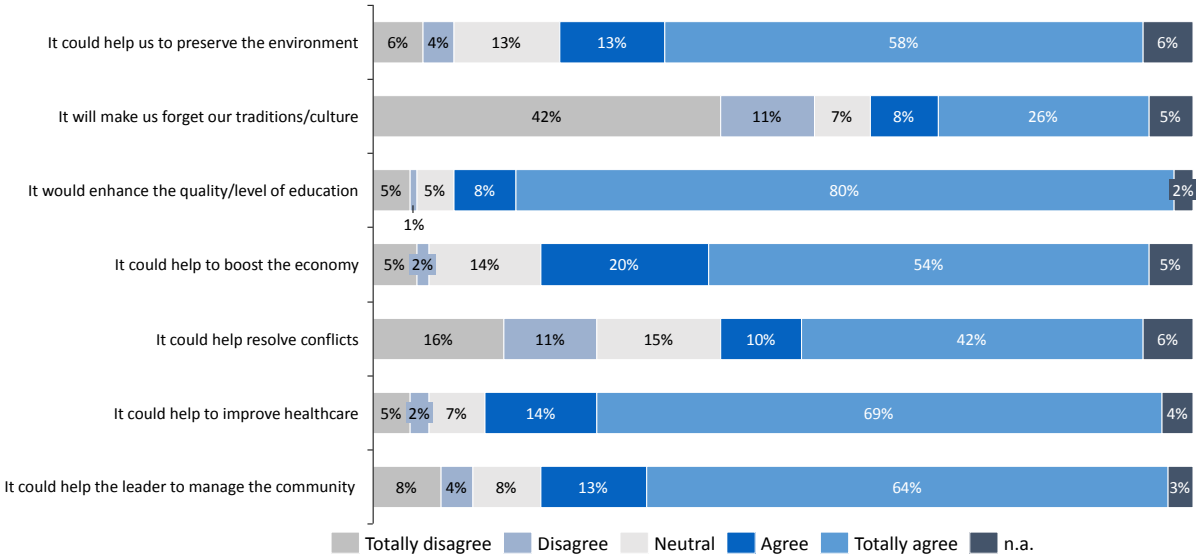


Image 207-Usage of different ICT devices in the community for international calls per genders

80% of respondents agreed that the Internet would enhance the quality and level of education. They also believe it would improve health care and help the leader to manage the community.



n=142

Image 208 - Perceived implications of access to ICT technology

Among older interviewees (over 54 years old), it can be observed that on the one hand they are more conservative about their expectation of the Internet's influence on the preservation of cultural traits: 48% of them believe that the use of this technology can make them forget things related to culture traditional. On the other hand, they show themselves as enthusiasts regarding the benefits brought by the introduction of the Internet in different ways in communities. They agree more than other age groups that the use of Internet can help to preserve the environment, that it would enhance the quality/level of education that it could help to resolve conflicts, that it could help to improve local healthcare services and that the technology might help the leader of the community to manage the community better.

The influence of the Internet to develop business in a better way is felt especially among the interviewees in the age group of 25-54 years. For 71% of those, Internet could help to boost the economy.

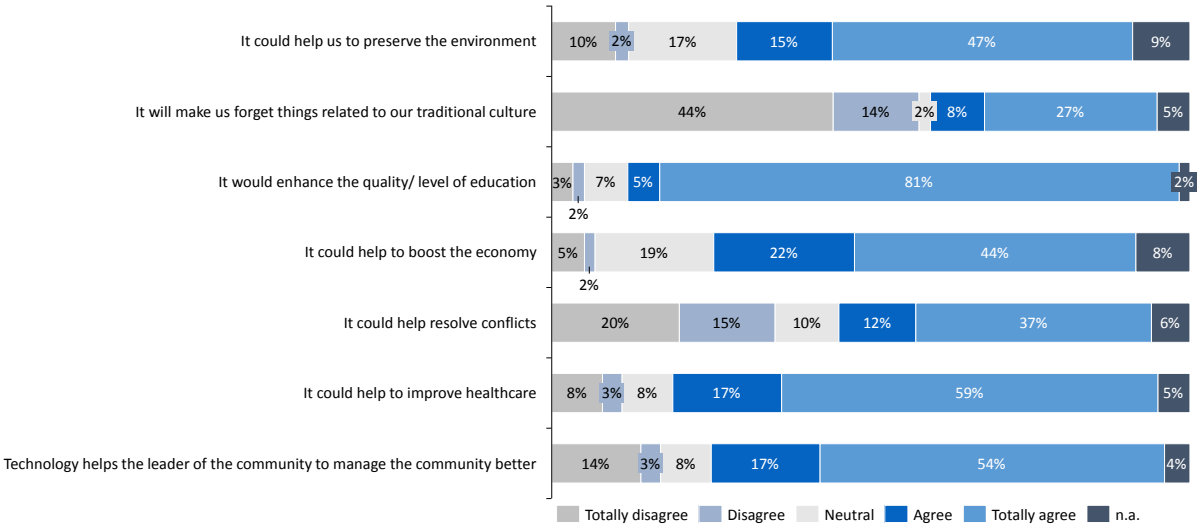


Image 209 - Expected influence of ICT to the community per age segment 0-24 years old

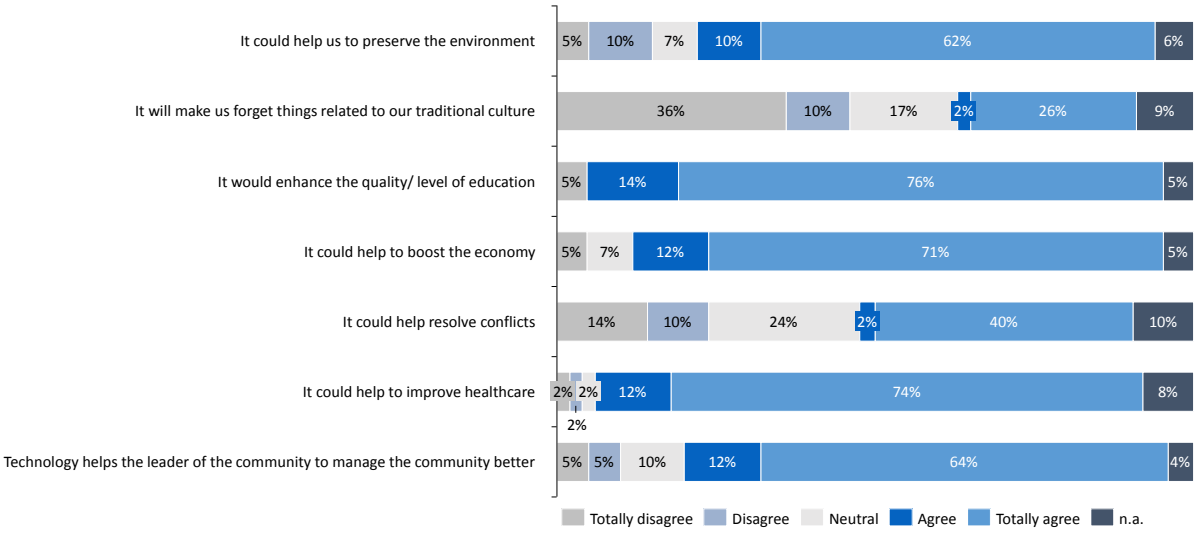


Image 210 - Expected influence of ICT to the community per age segment 25-54 years old

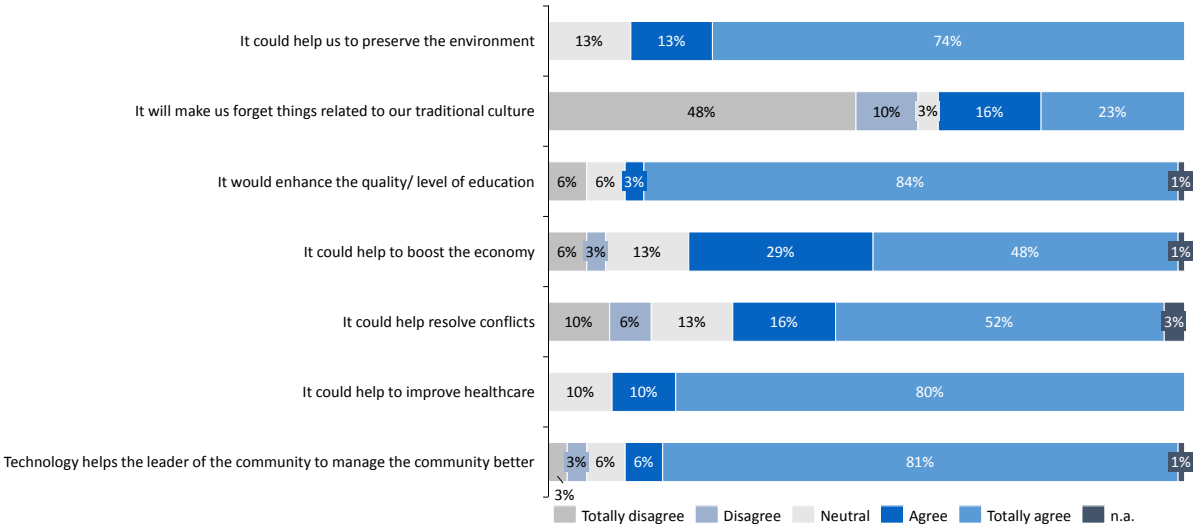


Image 211 - Expected influence of ICT to the community per age segment 55 years and older

Men, more than women, see benefits to the community with the usage of the Internet. Especially when it comes to education: 84% of men agree that the Internet would enhance the quality/level of education, against 78% of women. Women show themselves as more conservative, nearly 30% stated that the Internet will make us forget things related to our traditional culture.

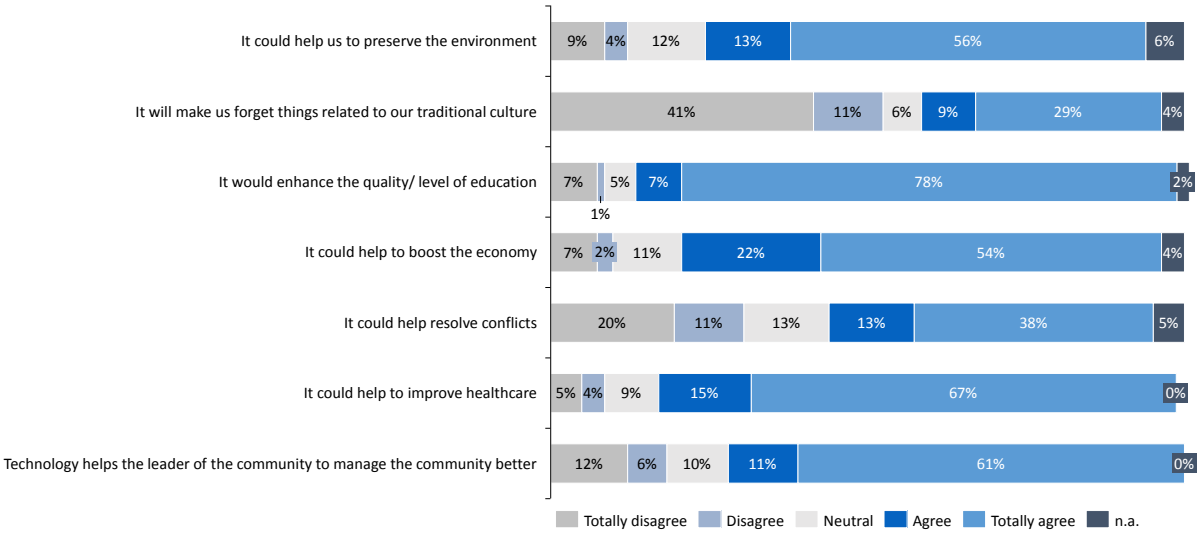


Image 212 - Expected influence of ICT to the community (Females)

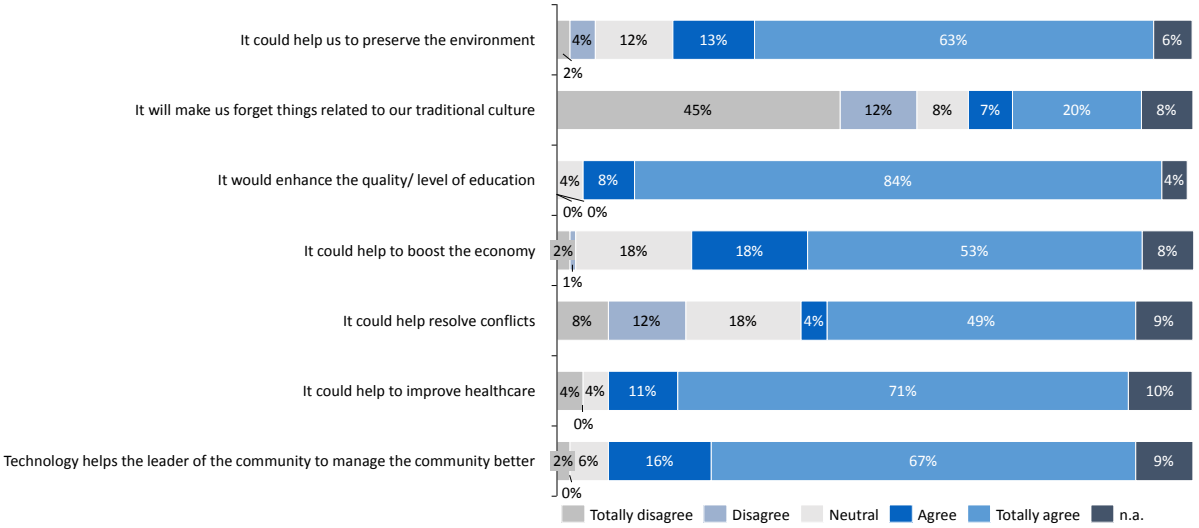


Image 213- Expected influence of ICT to the community (Males)

More than half of the respondents use the Internet for web browsing and chatting. 48% use it for social networking.

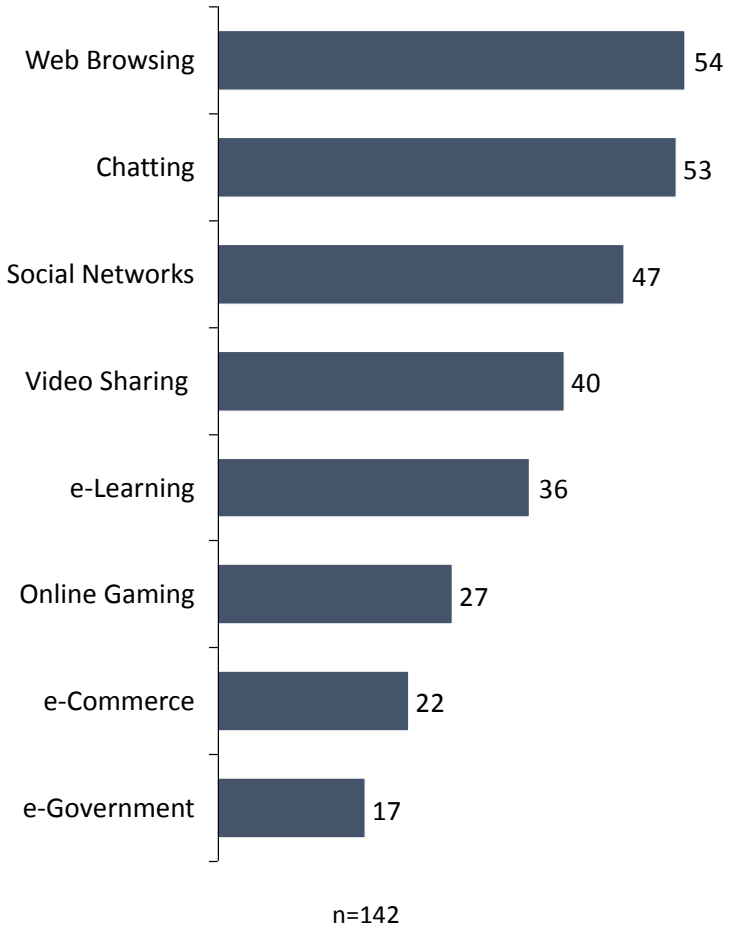


Image 214 - Use of Internet services

Younger people under 25 years old are the most widely respondents who use the services available on the Internet.

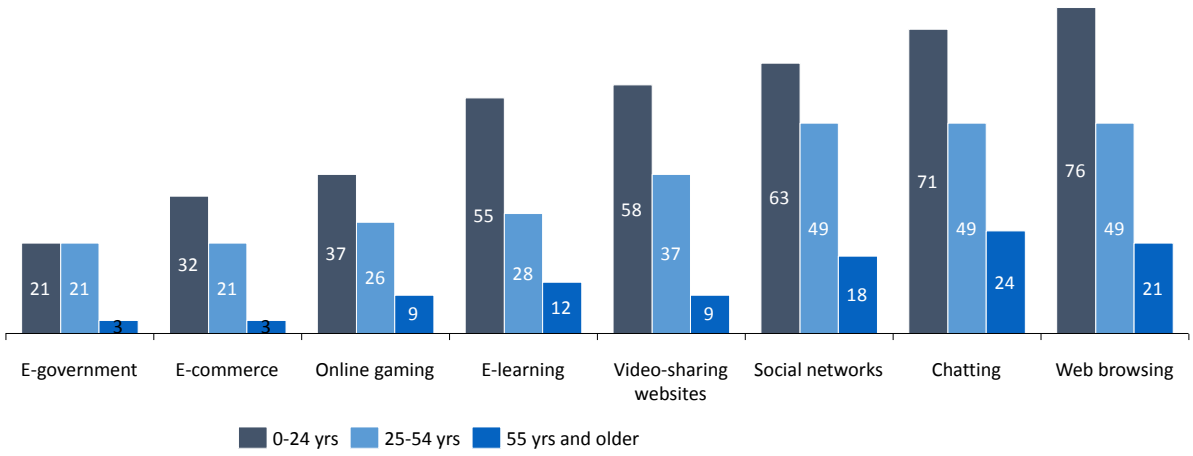


Image 215 - Usage of Internet-Services per age segment (in %)

Men, far more than women, use different services offered on the Internet. Especially social networks, chatting and web browsing.

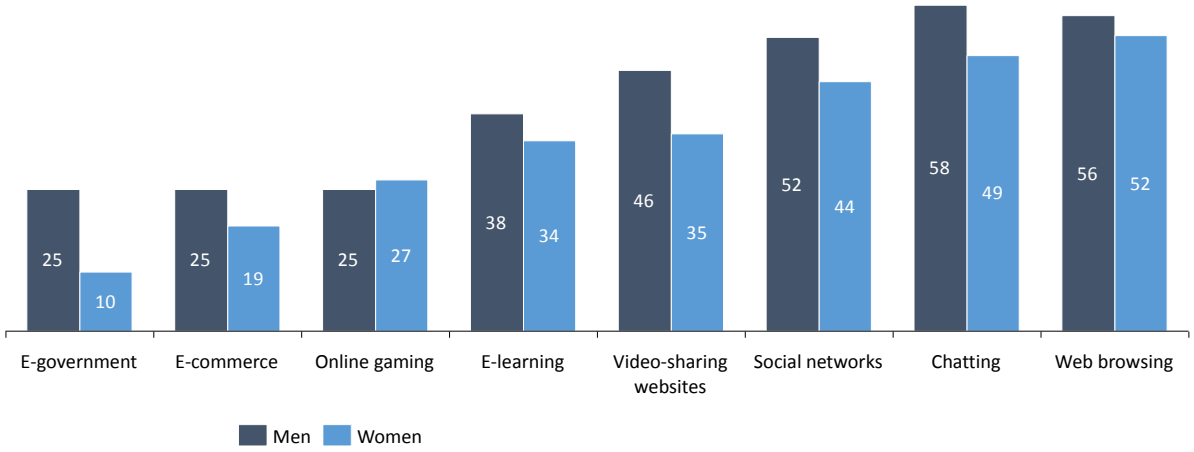


Image 216 – Usage of Internet-Services per gender breakdown (in %)

1.2.3.8 Education

According to the communities' leaders, more than 75% of those who have started school, did not complete it, but dropped out. Financial difficulties is the reason most frequently mentioned by the respondents: Pupils often have to go to a nearby community in order to complete their studies. This is financially not affordable for them. Another reason mentioned is the necessity to give up school in order to work or help their families.

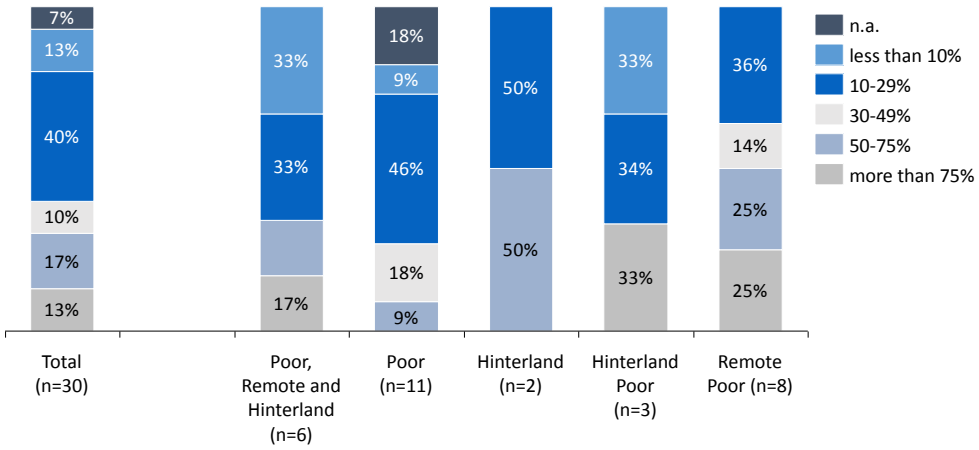


Image 217 – Percentage of school dropouts per community segments (in %)

1.2.4 Interviews with Representatives of the Education Sector

Interviews have been conducted with experts in the communities from different sectors. This chapter provides the key findings from the interviews with experts from the education sector.

1.2.4.1 Overview

The research registers great variation in the access to information and the access to communication technology for education professionals. While most of the heterogeneity can be described in geographical terms, (e.g., variation through regions) some important differences can be noted as other variables, such as race, etc.

One common feature of all analyzed communities, however, is the apparent dominance of cellular phones as the most commonly used mean of communication. With the exception of communities with nonexistent communication services (besides the HF radio), most interviewees define cellphones and Smartphones as prevalent not only in their own communication-related activities, but also in their communities in general. In places where Internet services and landlines are not present, education workers even use their own personal cellular phones to do tasks related to their job.

On the other side computers, laptops and tablets, are not as common as they should be among education professionals – especially considering the specific needs of these professionals. While most teachers, head teachers, and education workers stated their wish for more access to communication and information technology, a similar amount complained about existing conditions. Lack of training, bad or non-existing Internet and Wi-Fi services, as well as delayed delivery of promised equipment were the most frequently mentioned problems.

Nevertheless, in a more positive note, many professionals also mentioned current plans to bring technology access and develop computer literacy in their schools. They also recognized the potential of improved connectivity to improve access to information and services - helping both, students and teachers to complete a greater number of tasks, to acquire greater qualification, and also to connect with the world.

Interviews show that professionals in the education sector are generally optimistic about their country, even though they recognize some challenges in the path of future development. They tend to emphasize the common traces of Guyanese cultures, showing a propensity to cooperate with different races and ethnicities in order to improve their country and their community's situation.

Some interviewees demonstrated trust in the current government, while others externalized general skepticism and anxiety with politics. Besides that, the politicization of ethnicity was a concern mentioned in some interviews. Indigenous people, for example, tend to express a feeling of alienation and marginalization from the Guyanese society.

Finally, almost all interviewees recognized the need to build a better telecommunication infrastructure. They stressed the role these technologies could play in making Guyana more developed, integrated, and culturally unified. Nevertheless, while ICT importance is widely recognized, full knowledge about its possibilities and working is not completely widespread. Therefore, it will be necessary to improve awareness and capacities in a targeted way - in such a manner that all Guyanese ethnicities, regions, and communities, can equally enjoy the possibilities of 21st century communication technology.

1.2.4.2 Communication over Long Distances

The time spans and distances registered in this question varied greatly. Most respondents state that they would not be willing to travel long distances to communicate face-to-face, as long as they can reach their families, friends, co-workers, or supervisors, easily through the cellphone.

Some respondents, however, are prepared to travel longer distances in order to communicate face-to-face. This can be explained by two reasons. First, there are communities which do not possess possibilities for communication over longer distances. Second, some interviewees believe that in certain conditions direct contact with counterparts is needed – such as emergencies and specific work situations. However, these conditions do not occur very often.

> *"I would go the distance, I would go the distance as long as it's important and I know that I can make an impact, I would go the distance. [Interviewer:] Do you have an idea about how long it would take or how many miles? [Interviewee:] Two hours.*
>
> *[Interviewer:] And how frequently do you encounter situations that you need to talk to people over longer distances without a phone? [Interviewee:] Not often. Twice a month. My brother is in Georgetown. [Interviewer:] Oh. Any other situation?*
>
> *[Interviewee:] For university."[Region 5, Rosignol , Female]*
>
> *"Well, depending on the person [she would travel] around Lethem, not too far, but in some instances it would still be far. (…) Let's say 2-3 hundred meters to contact with someone. It depends on the situation. If you need to make contact with parents or so. We rarely have such a case. (…) Around once a month if we get problems or so."[Region 9, Lethem, Female]*

"Like every week, once or twice. In situations you really need, like for a relative, brother, sister, children. [For long distance communication, generally uses] a cellphone. When they have a cellphone, you can call, but if they don't, you have to go. Sometimes we have one but they don't, so we still have to go." [Region 4, Laluni, Female]

"Well, it depends on, like, the situation, like if it was for a work interview or, like, business, then I'd probably travel quite far... well, if it was just for a friend, I'm probably more likely to phone them than going to see them face-to-face." [Region 10, Kwakwani, Female]

"Well, mostly if somebody is far and I have to talk to them I'd do the calling. Instead of just travelling a long distance [to communicate] face to face." [Region 1, Port Kaituma, Female]

1.2.4.2.1 Frequency of Long Distance Communication

The frequency of communication over long distances also varies for professionals in the education sector. Individuals living in communities with regular to good communication infrastructure maintain contact more regularly with friends, relatives, co-workers, and supervisors living in distant locations.

Wherever the quality of this infrastructure and the personal familiarity with devices is lower, however, contacts via long distance communication become less frequent. In this sense, professionals living in worse-off communities - in terms of telecommunication services - generally communicate over long distances only on special occasions. The HF radio set can be used but mostly these professionals have to travel in order to obtain training or to communicate with authorities.

"Almost every day. (…) Like, to find out stuff… calling friends, speaking to relatives, my boss…[interviewer:] So, you'd say that is for personal reasons, like your friends or family that live far away, but also for job related things, you would reach out your supervisor, your boss… [Interviewee:] Yes. [Interviewer:] So, you need this every day, all the time, right? [Interviewee]: Yes." [Region 2, Charity, female]

"[Interviewer:] Oh, so you use it to communicate with your family. [Interviewee:] Yes. My family is far away… [Interviewer:] And regarding your work, do you have to […]. [Interviewee:] Regarding my work I speak with the officers… [Interviewer:] But do you have to communicate over longer distances… [Interviewee:] Yes… regularly." [Region 7, Kako, female]

"I'd usually use [the cellphone] for calls and when I come here, I'm making contact with people, so I have my sister, and if I don't have something really important to say, it's a casual visit, do you understand? (…) I would use my telephone twice a month (…), and sometimes not every month. I'm just giving you an example. Sometimes you have important workshops. You have to contact them, to know if it's still on. Sometimes you have to call here, because it's very expensive to travel." [Region 3, Saxacalli, female]

"When I'm calling home, I usually do that about once a month, so that's a long distance. Or I guess if I'm phoning friends or someone in the country, but that doesn't really happen often, it's mostly … or anything… [Interviewer]: I understand. So mostly for communicating with your family and regarding work, like to get some training here...[Interviewee:] Yeah, well, if I have any concerns about the work or anything like that then, yeah, I would have some communication with them." [Region 10, Kwakwani, female]

1.2.4.2.2 Means of Communication for Long Distance Communication

A common feature of the use of telecommunication throughout Guyana is the prevalence of mobile phones – whether "regular" cellphones (as some respondents refer to the cellphone without access to the Internet) or Smartphones. While some local residents intensely use the cellphone (if coverage permits), some of them can only communicate with the outside world through the HF radio.

The mobile phone is used for a range of activities, from regular calls to chatting and social media. In many places they are the only devices with internet access, what makes them useful not only personally but also professionally. Again, computers, tablets, and laptops, are less used than they should be by education

professionals. The lack of Wi-Fi networks in many locations, alongside with high prices and the absence of near places to buy it are mentioned as the main causes of this situation.

The mentioned devices are used in a number of situations. HF radios are used mostly in emergencies, while cellphones are employed in everyday communication. With few Wi-Fi spots, computers, tablets, and laptops, are rarely used for long-distance communication.

> *"The telephone. Mostly the mobile because the landline is out of order, a little over a year now. (…) [Interviewer:] So you generally use your phone, and your phone, does it have access to the Internet? [Interviewee] No, this one does not have access to it. I have Internet here [in the desktop computer]. [Interviewer:] When do you generally use your phone? When you are working? [Interviewee] Yeah when I am working, most of the time I'm working." [Region 5, Perth, Female]*

> *"Based on my, job, I'm not at home most of the time so to communicate with others I would use a cellphone. For the landline (…) I would use it like 4 times a day, but the cellphone it is like 8 times. [Interviewer:] And you have a cell, do you generally use it when you are working, you need to talk to your family or talking to the students' parents? [Interviewee:] Students' parents, other colleagues even the ministry of education if I need to clarify something, to call the ministry of education office." [Region 5, Rosignol, female]*

> *[Interviewer:] What means of communication do you typically use for long distance communication? [Interviewee:] The telephone. [Interviewer:] The telephone. The landline or the cellphone or Smartphone? [Interviewee:] I don't have a landline; I mostly use the cellphone. [Interviewer:] Do you have an ordinary cellphone or do you have a Smartphone? [Interviewee:] The ordinary one. [Interviewer:] And how often do you use your cellphone? [Interviewee:] Very often. [Interviewer:] And in which occasions do you use it? [Interviewee:] Like, to contact… at school, if we have to contact parents when a child gets sick or something like that, or when I'm home to contact my own children and other family members." [Region 2, Charity, Female]*

> *"[Interviewer:] So, normally… what means of communication do you use for long distances? In Karawabe, do you have a Radio too? [Interviewee:] Yes, there's a Radio there. [Interviewer] And do you use it for long distance too? [Interviewee]: Yes. [Interviewer]: For calling in the mines. Or other places… [Interviewee:] Yes. [Interviewer:] So, normally, you use the Radio and the cellphone as means of communication there, right? [Interviewee:] Yeah." [Region 2, Santa Monica, female]*

Regarding the use of devices for the entire community:

> *"Cellphone, actually for now everybody has got a phone just to call. Sometimes they call, their friends call, you know. We don't have a landline phone so we use the cellphone. So it is the main access to get contact, a phone. Because if you want something you call, if I want something, I'll call her." [Region 4, Laluni, Female]*

> *"[Interviewer:] And about the community, what kind of devices or means of communication are used for long distance calls? [Interviewee:] Normally people would use their cellphones. [Interviewer:] Do they have both, Smartphone and cellphone? Do you know? [Interviewee:] Yes." [Region 2, Mainstay, Female]*

1.2.4.2.3 Role regarding Communication Systems in Communities

Some professionals in education sector respond to the first part of this question mentioning initiatives to bring computers to their schools. They recognize both the need to teach the younger generation how to operate computers, and the necessity to use these devices in order to fulfill complex tasks and to do school-related research.

Regarding points of contact with telecommunication, respondents can access telecommunication mostly at home. The workplace comes after, since some interviewees use phones to communicate with co-workers and to coordinate joint activities.

1.2.4.3 Available Forms and Uses of Telecommunication Systems/Devices

Guyana's telecommunication system is characterized by an unequal distribution of service availability throughout its territory. It follows the following regional pattern: while the coastal areas have in general a better network coverage (mobile and fixed line networks), hinterland areas are less integrated into the national communication network. Regardless of this, there are also relevant differences within the different regions.

Taking into account variations in the level of access to information and communication technology, the set of surveyed communities were divided in three subcategories. The first one characterizes those that have 1) a more diverse number of available services and 2) widespread access to most of these services.

The second comprises communities with a limited number of services with moderate to good quality covering the living areas of a majority of the people. The third group includes communities with very few services available.

1.2.4.3.1 Landline Phone

A majority of communities that have been assessed in this study do not show fixed line services available to the population. If fixed line services exist, they are used in some places exclusively in public offices and facilities (such as hospitals and government offices). In others, landlines were once present in specific communities, but are due to lack of maintenance currently not working. Most of the communities have fixed line networks available are located in the more urbanized, coastal area.

Wherever fixed line networks work, people generally use them for official purposes – like communicating with public authorities and performing business-related activities. Some of the respondents expect the landline service to arrive in their community mostly to get Internet access, while others think the cellular phone already covers most of their needs.

> *"Few [landlines], because some houses still don't have a landline. [Interviewer:] Why they don't have it? [Interviewee:] Because before the cellphones, we were having landlines and they probably had a limited number of lines to distribute. Probably people also thought they had a cellphone, why buy a landline?" [Region 9, Lethem, Female]*

> *"[Interviewer:]: There's no landline here? [Interviewee:] Yes, the resort has... (…) [Interviewer:] There (at the resort) is the only place with a landline telephone? [Interviewee:] Working… yes. [Interviewer:] You said working… is it because there was a landline that was working and now it doesn't work anymore? [Interviewee]: Yes, at the factory… one time they used to have… when it was processing… but it's not processing now… [Interviewer]: How long has it stopped working? [Interviewee:] About three years." [Region 2, Mainstay, female]*

> *"[Interviewer:] The landline doesn't work? [Inteviewee2:] We don't have sufficient line phones in the community… [Interviewee1:] Not every home has one. [Interviewee1:] You have to apply and then you have to wait on the approval… it's a long process (…). [Interviewee2]: They say the area is overloaded, so they don't have landlines… [Interviewee2:] The circuit is overloaded because they say… the landline they have is the one with the [dish] (…) so what you have it's not the landline. [Interviewer:] You have a dish that allows you to have a landline, is that it? (…) [Interviewee2:] And if you have it, it's not working… this one here, our neighbor, we share with our neighbor, but it's not working." [Region 2, Charity, Females]*

1.2.4.3.2 Cellphone/Smart Phone

The cellphone is the primarily used mean of communication across the communities assessed in this study. The mobile network is widely used, not only for phone calls and SMS messages, but also for Internet access. Most of the respondents use Digicel, but GT&T is also being used if the network is available in the respective community.

In some more isolated communities, the research showed that the signal quality is not equally good in the whole community. Communities located outside of the main areas in certain villages are not covered at all. Other villages

have only a few specific spots where the user can get a signal. 3G networks are not available in all communities. Villages with bad network and service quality are generally indigenous people communities in the hinterland regions.

Where a 3G network is available, Smartphones are the main devices used for Internet browsing. Messaging apps, such as *Whatsapp*, and also social networks are generally used via the Smartphone. While the use of this kind of device is reportedly widespread among young people, they also manifested concerns about the capability of older people to operate them. Some of the respondents, even though living in places where Internet is available through the Smartphone, do not feel the need to use the services.

1.2.4.3.3 Computers/Laptops/Tablets

Computers and laptops are available in almost all communities, even though, in some places, only a handful of the public reportedly has access to these devices. Internet cafés and similar services are not common, and many interviewees described that the only way to do Internet browsing is through the Smartphone with a 3G network.

I the views of the respondents' one reason for this situation is the unavailability of connectivity and also financial constraints with the users. In order to buy computers, laptops, or tablets, the consumer who lives in more isolated locations needs to take into account not only the price of the device, but also the costs to travel to a place where these devices are available. Besides that, the absence of Internet services can make the effort to acquire new ICT devices seem futile.

Education professionals interviewed during this research tend to recognize the benefits of using computers, tablets, and laptops. They frequently mentioned some activities in which they could use these devices, e.g. to complete complex tasks or to add new training features to their classes. Nevertheless, many of them do not have proper access to devices and network connectivity to the extend what they consider necessary.

The lack of devices other than the Smartphones is also seen as a problem by the interviewed students. Teachers acknowledge that young people need to be in contact with new technologies in order to stay in the same pace as people with access to better telecommunication infrastructure. However, the teachers themselves do not feel comfortable when using some devices. Therefore, in order to implement programs to improve computer literacy in school, teachers would probably need to obtain extra qualifications.

1.2.4.4 Desire for Different Forms of Communication

Respondents to the questionnaire do not acknowledge many other means of communication besides those directly mentioned during the interview (landline phones, cellphones, Smartphones, computers, tablets and laptops). An interviewee from an isolated community spoke about the HF Radio, since the one in her community was broken, leaving her without any means of communication.

However, most of the interviewees are willing to get better and are expecting less expensive services. Also in locations where communication networks are comparatively underdeveloped, people want to have access mainly to the Internet. Their understanding is that even with the existing of a connected fixed line phone will allow them to browse and use the Internet.

1.2.4.5 Case Scenarios[33]

The average response to the case scenarios demonstrated (for explanations see 1.2.4.5.1, 1.2.4.5.2, 1.2.4.5.3, 1.2.4.5.4) shows that the interviewees have a genuine wish not only for better telecommunication services, but also general interests in new and/or improved Internet based services. They believe that e-services, such as e-commerce, e-learning, e-banking, and e-government not only can be more convenient, but also help people to significantly improve their living standards.

[33] Note: the analyses were done considering an overall view, the quotes are displayed by topics as a way to highlight the aspects taken into consideration.

For instance, propositions in the four case scenarios, which were applied to all respondents, were generally well accepted. E-learning is welcomed as a viable option especially in the field of higher education and seen as a technology that could permit professionals and students to acquire additional qualifications more easily.

E-commerce is also well received. Respondents from villages where agriculture is the main economic activity are particularly enthusiastic. Firstly, some of them believe that a local, government-run website could provide a service more in line with their direct needs and secondly, they think that having direct access to buyers would solve some uncertainties they are currently experiencing.

E-banking is also seen as extremely convenient. Current options for money transfer are risky, expensive and require extra time and efforts. In this context, the idea of transferring money via mobile phone is generally well received by the interviewees.

Regarding e-government, the option of contacting public authorities and services through the Internet is also well received. Particularly, registering newborns in a quicker, less bureaucratic way is considered to be an advancement compared with the current situation.

Notwithstanding, implementing these services will be a challenge for policy makers. The first and more obvious obstacle is the lack of proper telecommunication infrastructure in many of the communities analyzed in this study. E-services depend on reliable Internet connection, which is currently not provided in many of the visited locations. The second obstacle would be a lack of familiarity with e-services in particular and ICT technology in general. Since computer illiteracy is a problem mentioned several times, computing lessons should be provided in such a manner that all customers can learn how to properly utilize new services.

1.2.4.5.1 E-Commerce

> *"I just… I would… [sell] in the market in another area. And then, if it has to go by road, I'd use a vehicle in transport, If it has to go by river, I'd transport through the river, the airplane is too expensive." [Region 1, Port Kaituma, female]*

> *"I would call Mahdia and inform to Mahdia business people, 'Ok, I have 2000 pounds (...) 20,000 of planting, a 1000 pounds of [something] and get access to the market for you. So let's say Mahdia is very much populated in terms of shops. So let's see a thousand shops will take a hundred farms and I would do that." [Region 8, Tumatumari, Female]*

> *"Well, the [beginning of the] process would be making contact. If I have a person I want to sell my goods, I make contact with them, make some sort of arrangement, if it's by boat or by bus, airplane. We would make the arrangements and would ship it to them." [Region 1, Mabaruma, male]*

"Now imagine the possibility of a government-run website that enables you to trade your goods on a national (or international) platform online. How do you feel about this?"

> *"[Interviewee1:] People would go on that… that would be nice… [Interviewer:] Do you think people would like that? [Interviewee1:] Yes. Because in that way you'd see a variety of things that you would want to buy or what other people are selling…things like that… [interviewee2:] So if you want something you could go on the Net. Then you'd say "I want this book", right? And you're selling and I don't know, then I'd go on the Net and browse, then I see where I can find it with you." [Region 2, Charity, Females]*

> *"I think a lot of people are interested in things like Amazon and eBay. But because Kwakwani is kind of removed from the coastal area, I think probably people [are] missing on that. So, if it was like a government-run thing it would probably be more accessible to people actually living in more remote areas." [Region 10, Kwakwani, Female]*

> *"[Interviewee:] That's OK and that's a good idea, but then, I don't think maybe people would know how to do it. They don't know how to put this online or how to create a page or how to… Yes. They don't know how to do it. [Interviewer:] So, if there was such a service, do you think people should be educated? [Interviewee:] Yes." [Region 1, Port Kaituma, female]*

1.2.4.5.2 E-Banking

"Through a businessperson, you know, you negotiate with that person if you want to send this down…yes, you can place order to it." [Region 8, Aishalton, teacher, female]

"For example, when children are far away we just send the money with people that are going out. For example, (…) any family member going out I send the money through them." [Region 7, Kako, Female]

"I normally use Western Union or my neighbor next door is a taxi driver, I'd ask him to take it." [Region 5, Rosignol, Female]

"Now imagine the possibility of transferring money via cellphone deposit. How do you feel about this?"

"I'd feel great if I could do it myself on the Internet. It would save me some time and some cash. [Interviewer:] Would that be also easier maybe than traveling to Western Union? [Interviewee:] Yeah. To travel to both sometimes because when you get there, they're closed or they're not doing business that day. You won't even know if they're not doing business."[Region 5, Perth, Female]

"Really good. I'm not aware of this that you can send through your phone. Yeah, I'd use it." [Region 8, Aishalton, female]

"[Interviewee1:] Well, we're not familiar with that. (…) [Interviewee2:] It's a good idea but a few people would do it. Because they wouldn't know what are the rates, if it's cheap… [Interviewee1:] Ok, like… paying bills through the phone, through the Net? (…)Yes, yes… it's convenient, yes."[Region 2, Charity, Females]

1.2.4.5.3 E-Government

"That would be great, because for registering a newborn (…) you have to travel and spend a lot of money to get to the central community and the region to register the newborn and apply for marriage certificate and so on." [Region 1, Mabaruma, Teacher, Male]

"Well again, we get (…) to persons who are in that kind of arena, politicians in your community. You go and talk, so we can save the information, go somewhere to get that, to garner that information. With myself, I know this girl who works with these people, let me see if I can go and get the information." [Region 5, Perth, Female]

"Well... you sometimes get... (…) there's... like, some meetings and things, so, like, people could go on to meetings if they're open. Other than that, probably it would be online, researching it, or, like, asking friends for their opinions on things... like, I'm not sure how you would actually get the concrete information, probably would have to be online." [Region 10, Kwakwani, female]

"Now imagine the possibility of receiving this information or contacting governmental or public authorities (to register a new-born, apply for marriage, etc.) online. How do you feel about this?"

"I would be happy about that. When things are not going right with your school you can write to it. My ceiling fell the other day. (…) It fell overnight, not during the day. When we got there, it was done. But then I had to use the same phone to try to get the message over. Some people didn't get it, they say we didn't call on time. When you call and don't get through, you've got to wait until you get through. So sometimes, two hours after, because you're far in and these phones, they are not so smart." [Region 5, Perth, Female]

"I feel more comfortable. Because right now I have a grandson that doesn't have a birth certificate… yes, it would be easy for us." [Region 7, Kako, female]

1.2.4.5.4 E-Learning

"[Interviewee:] Probably ask teachers for advice and information on... how to do... And other than that you'd have to go online and research the different universities and different options. But I think probably the first protocol would be a teacher. Like, whatever subjects you wanted to do, ask the teacher what kind of opportunities... [Interviewer:] And people do this often? [Interviewee:] Ah, a lot, not really... I think it are mostly probably families... Like, if someone has a family member who's gone overseas, then they're more likely to go overseas, because they've, like, seen the way to go about it. Yeah, the students do ask about... like, different universities abroad and, like, where can I do this, like, in Guyana there's not really anywhere to study drama, so I've had a lot of people asking me, like, 'Miss, where can I study drama', or like 'become an actress', and things like that. So yes, they do ask." [Region

10, Kwakwani, Teacher, Female]

"I'd have to go to the city to do it. Because we don't have it available online here." [Region 1, Port Kaituma, Female]

"Well, you'd do it once you have the finance. Some have the money and go abroad and study and so forth, but people who don't have money they would suffer. They wouldn't be able to have this education and they'd suffer from that." [Region 1, Mabaruma, male]

"Now imagine the possibility to get a degree from anywhere for yourself online. How do you feel about this?"

"I'd go for it. I'm learning about it from you, this is the first time I hear about it. I'd prefer to do that. If I have the opportunity to go to the university, I don't want to leave my family, which is the reason why I can't go to the university. So you are telling me, you are teaching me about the online classes or whatever you call it and I'd prefer that." [Region 8, Nappi, Female]

"Well, I feel more comfortable. That's a different moment. I have really no knowledge about these things (…)." [Region 7, Kako, female]

"I would like that, because actually not only my children, but for the community and the other young people, it would be really nice if they could get a degree from the Internet. For at least, you know, you see the young people in the community develop instead of going down, they go up." [Region 4, Laluni, Female]

1.2.4.6 Cultural Identity and Belonging[34]

The final questions in the qualitative interview are designed to assess how respondents think about their own self-identification, how they evaluate the general situation of Guyana, and how do they see themselves as a part of a broader collectivity. It also intends to assess in which ways they think better telecommunication infrastructure could help developing Guyana from the perspective of "Nation Building".

Some issues mentioned in the questionnaire – mostly those related to politics – were considered sensitive and a few respondents refused to express their opinions about these questions. While many interviewees expressed trust in the new government, the fact that individuals are afraid to express their opinions over some subjects, in particular fearing retaliation, can be seen as a worrisome sign.

Politics are seen as the most divisive issue in Guyana. Many respondents think that partisanship is a big problem in their country. While ethnical conflicts are in generally seen to be fading away with the younger generations, some interviewees still think that old problems are reenacted in specific situations. Again, indigenous people tend to express a feeling of alienation from decision-making in Guyana. They want not only to receive occasional aid, but also be consulted and included during the design of public policies.

Nevertheless, the general tone of the interviews was one of optimism. As seen in previous sections, people actively and voluntarily engage in activities, which can bring development to their communities. They also see themselves as part of a bigger Guyanese community, and can identify cultural traces that unite all regions and ethnicities.

1.2.4.6.1 Cultural Identity

"I'm a Guyanese and an Indigenous People. The tribe that I belong is the Wapishana. I'm a proud Wapishana. (…) I was born in Guyana and I have lived here all of my life." [Region 8, Aishalton, female]

"I'd describe myself as a Guyanese. I'm a teacher… I'm a teacher for the school; I'd introduce myself like that. I'm a teacher… I'd introduce myself like that to the person and she or he would become my friend and we would get in touch every day" [Region 7, Kako, Female]

"I grew up in an East-Indian background, most would say, the rural part of Guyana, this part that they call hinterland. I went to school right around the area. Got married and live right around here.

[34] Note: the analyses were done considering an overall view, the quotes are displayed by topics as a way to highlight the aspects taken into consideration.

[Interviewer:] And you said… you used the word "background" to talk about your East-Indian aspect. Why would you say that? Do you see yourself more as Guyanese than as East-Indian? [Interviewee:] I'm Guyanese."[Region 2, Charity, Females]

1.2.4.6.2 Government and National Identity

"For me, I feel comfortable with them. Right? They're more people-oriented. Some of the issues that we're facing, they kind of try to tackle it at a level, they can do so much more, right? But they're getting there. Before, we had promises. This government is promising, too, but somewhere along the line they keep you up to date while they're in progress of doing it, you know. It's just like for our political gimmick because of the election time or whatever. They, they're getting there and we have to give them some time." [Region 5, Rosignol, Teacher, Female]

"Not at all, I'm not comparing the former and the present government. Even if I was living with the former government, regardless of either parts, I am still a proud Guyanese. Although both governments tried their best, they say 'I'll do this, I'll do that' but when it comes to it, both or all of them who promised you things, the computers, for example, the previous government promised us and up to now we haven't seen anything. Although they keep promising and promising all these things for us, we are still here and we are trying to do… whatever…we would like to see any government, whoever wins, trying to look into the affairs of all the Guyanese. As I said I'm a proud Guyanese, but I want them to show an interest in us too." [Region 8, Nappi, Teacher, Female]

"From what I've seen it is very mixed... like, some people love the new government and are so happy. They think that things are going to change and then a lot of other people just think that it is just going to stay the same and things can't get better. (…) Maybe, like, improving links between different areas, because, like the country is so... sparse, if you know what I mean, like, there's lots and lots of pockets of people (…). So maybe, like, improving links between different places would bring people together." [Region 10, Kwakwani, Teacher, Female]

1.2.4.6.3 Guyanese Unity

"Well we have to start from the top. The opposition and the government now need to put aside their differences and work collectively. Don't just say well my party or whatever worked. Listen to the ideas because the previous government, was there for 22 years, had to have some good ideas so you use them together, collaboratively and work towards the development of our country. And we as a people, seeing that, would follow that pattern. So through modelling, we can be united." [Region 5, Rosignol, Teacher, Female]

The people have to turn away from racialism, to me that is biggest thing. Politics is bringing a lot of division in the country. The politics… I think that our leaders, for me they are not doing a good job trying to bring the citizens together. Because if they are our leaders and we see them on TV always, you know… they instigate and eventually this would affect us, it would pass on … because we are looking to them." [Region 2, Mainstay, Head teacher, female]

"[Interviewer:] Do you think there is something that could unite people even more? [Interviewee:] I'm not able to think about that, no. [Interviewer:] What would need to happen so that Guyana is even more united (…)? [Interviewee:] I don't want to say anything. (…)I could say, but I don't want to say. (…) I prefer not to say." [Region 3, Saxacalli, teacher, female]

1.2.4.6.4 Infrastructure and Identity

"Yes [because] you'd know more about what is happening at the coastland, than staying here and don't know what is happening. Maybe you can share your ideas with somebody and get in touch with maybe the Ministers or whoever." [Region 5, Perth, Teacher, Female]

"Yes. You'd know more about what is happening at the coastland, than staying here and don't know what is happening. Maybe you can share your ideas with somebody and get in touch with maybe the Ministers or whoever." [Region 8, Nappi, Teacher, Female]

"[Interviewee:] If we get more landlines that would be cheaper. [Interviewer:] Yes, but how would it help to have a more united country and reduce this discrimination? [Interviewee:] I think it can help, too. [Interviewer:] And how would it help? [Interviewee:] Making contact with them, I mean, distributing equally and let them know the benefits of it, you know. The purpose of the benefits and the purpose of having a network, you know. It could make people more united." [Region 9, Lethem, Teacher, Female]

1.2.5 Interviews with Representatives of Health Sector

This chapter shows the key findings from the interviews with experts from the health sector.

1.2.5.1 Overview

One major driver for the usage of personal cellphones was the lack of functioning landlines for personal and professional usage. Lack of sufficient and continous power supply results in poor services of telephone and Internet access especially in some regions in remote areas.
Health area professionals have great need to use their own devices at their workplace. Currently they are paying these business related expenses from their own pocket and they don't see any improvement of this situation in the near future.

The interest of healthcare professionals for ICT in general and their demands for better products and telecommunication services are high. People living in more developed regions have started to use smartphones for multiple usage scenarios lik chatting, purchasing products, downloading videos, e-learning and social media**.**

A lack of knowledge in how to use more complex devices like tablets, laptops and smartphones results in a certain reluctance of understanding the benefits of a "connected device" and therefore no motivation in purchasing them. But once the ideas of scenarios as listed in this report were presented as examples for use cases, the intervwiees showed increased interest in acquiring and using these devices.

Helathcare professionals initally expressed only having a functional association with advanced devices as tablets, laptops and smartphones. The emotional "touch" in having a modern ICT device only begins as they start using these devices. The price of the device and even the physical access to stores to buy these devices are seen as major barriers in obtaining a new and more modern devices.

Two major factors are affecting the adoption rate of ICT devices across all intervewees: the level of personal income (example – talking to a physician and talking to a clerk who probably have different levels of salaries) and the location of the community where they live (remote areas vs urban areas).

The research showed that neither the specific population group of the interviewee nor its gener have signivicant impact on the evaluation of telecommunication possibilities. The only exception identified is that women – more than men - usually talk more about devices that can help their children with their education needs.

1.2.5.2 Communication over Long Distances

15-30 minutes is the maximum interviewees would consider walking to communicate with someone in person, regardless of regions, gender or specific population group.

"I guess it depends on the situation. If it is an emergency, maybe two kilometers… When you don't have credits on your phone. Sometimes we have to go to the patients. And we have to walk. I wouldn't say frequently because most times there is somebody available to take us. In situations there isn't someone, we must walk, but most times people send us messages. Most times the signal is poor. For example, in this health center there is a spot we call it the hotspot where we go to make calls." (Region 4-Demerara-Mahaica, St Cuthberts, Female

"I would say more than 15 minutes walking more like half an hour" (Region 6, East Berbice-Corentyne, Orealla, Male)

"The community here has no phone signal… the distance sometimes to a neighbor would take 30 minutes. Mostly, it is walking and sometimes it is by bicycle." (Region 9, Upper Takutu-Upper Essequibo, Karasabai, Male)

"If I couldn't use a phone, I could walk really far, let's put it to this community, 30 minutes maximum. In Lethem, we never encounter situations in which we need to go this far to talk to someone, I'd say like 10 years back. At this present time, we can just pick up a phone." (Region 9, Upper Takutu-Upper Essequibo, Lethem, Male)

"Very far, because the village is very big and not everyone has a phone. Some areas are not quite developed, so you have areas where you don't have phones. The cables are probably having issues. Ages and ages of complains, every day they say that it will get better soon, but it is hard. I think communication is important and everyone needs a phone in the house, so most times you find people using their cellular… it depends on where you are living, because I'm living at the front part. The persons on the back, remember they don't have a landline phone in the area." (Region 5, Mahaica-Berbice, Rosignol, Female)

"Usually if we are doing a visit to meet persons who can't come, walking would be like about 1 hour, but by car it would be like 10-15 min." (Region 6, East Berbice-Corentyne, West Canjie, Female)

"I live on the east coast and my parents live about 20 kilometers away. And every day I will try to call them. I use the cellular service, mobile. And I use the Internet, video calling via Skype or Facebook Messenger." (Region 4, Demerara-Mahaica, Buxton, Male)

"Some of the areas you don't have access neither by plane, that are very difficult to reach, but not in Bartika." (Region 7, Cuyuni-Mazaruni, Bartika, Male)

" If I have to walk to get in contact with my family, who lives in Matthew's Ridge, it would be approximately, roughly six hours if I have to walk from Mabaruma, which I can't walk."(Region 1, Barima, Mabaruma, Male)

1.2.5.2.1 Frequency of Long Distance Communication

Communicating over longer distances for person working in the health sector is part of their job and it occurs very frequently. Most of interviewed experts say that do it on a daily bases, especially the ones working at emergency service facilities. For example, they have to contact someone from other health centers to transfer patients.

For some other cases, as in Region 7, health experts have to out to visit patients in remote areas.

"We go to Suddie because our hospital here is a district hospital, it's not equipped with an operating room, it just has basic emergency services and we work 24 hours a day. We have our midwives who would come from the Pomeroon, if it's the birth of the first baby we send them to Suddie because we have to be prepared for the complications… we don't know what they might be… so in case they have to go to the operating room… so, we don't take chances with them and high risk for mothers, when they come here… well, the nurses, the mid-wives and the doctors would assess them and then, they decide if we can handle it here or if they have to go out, so they would call Suddie and say "we are sending our patient"… whatever they suspect, maybe it's appendicitis or orthopedic … we don't have an orthopedic technician. We have to communicate with Suddie… so, they're coming with this or whatever… we stabilize them here and then we send them. We use the landline phone from the hospital, but many times our staff has to use their personal cellphone, because I don't give everybody the cellphone to make calls, just for official emergency calls." (Region 2, Pomeroon-Supenaan, Charity, Female)

"It depends. We have a team that visits some remote areas on a quarterly basis." (Region 7, Cuyuni-Mazaruni, Bartika, Male)

"It is pretty difficult, let me explain it to you. Where I'm living (Ithaca), there is a health center and I work at that health center and it doesn't have a phone, so if I have to communicate to a patient or if I have to call somebody for an emergency, I have to use my phone or the other staff members cellphone, but if none of them have credits, what do we do? Or if I have to ask a patient, who has no cellphone, to come to the health facility. That is so difficult." (Region 5, Mahaica-Berbice, Rosignol, Female)

1.2.5.2.2 Means of Communication for Long Distance Communication

A simple cellphone is the device used by respondents, every day, very often – 5-15 calls a day. The signal for making calls has been perceived as better than the signal for smartphones.

HF Radios are used more frequently in some regions, mainly for working purposes but the signal strength is a great barrier of usage, the weather conditions sometimes make its use even worse.

Some of them would prefer using a landline phone at work, but there is no connectivity in many communities available or the lines they had were broken and have never been fixed.

They feel personally capable of using the broad range of ICT devices and they think that most of the people in their communities (especially younger ones) are capable of using them too. What restricts them to use Smartphones are the signal difficulties in the communities.

The capability to use a cellphone is based on the variety of applications / situations a person can apply these services, like talking, chatting using different apps, e-mail, research and the overall access to the Internet.

"Every day, almost. For those persons who have a signal and are within a signal range, the cellphone is being used every day. "(Region 1, Barima, Mabaruma, Male)

"99% the cellphone is used because radio [35]is ugly, very bad. "(Region 7, Cuyuni-Mazaruni, Bartica, Male)

"Mostly we use the Radio Set, it's difficult to get on to them because of the weather and I can't get access to them. I use it every day, mostly during working hours". (Region 7, Cuyuni-Mazaruni, Kako, Male)

"Most times it would be family, because during the job you have to use your cellphone. Other than the phone, the cafe, the Internet café in Blairmont or Rosignol. The majority of the people have a phone with Internet. When the landline phone was working, people were using it often, more often than the cellphone, because it is only if you are not close to a landline or if you are at work, you would use the cellphone. The landline is much cheaper than the cellphone." (Region 5, Mahaica-Berbice, Ithaca, Female)

"To be on the Internet, to browse, I use my phone for everything. I use it every day, several times a day. It becomes a part of the person… researching, social media, chatting… I also have Facebook, Skype…Twitter is not working in Guyana. Not everyone can use a smartphone, the majority of the people use the phone without Internet, of course because it is much cheaper. I don't have Wi-Fi in my house, so sometimes I need to buy a weekly plan, a day plan. "Are the plans expensive?" Yes, the data is used up fast and the Wi-Fi is really slow, really, really slow. The GT&T office over here is at the Region 6, in New Amsterdam. You have to cross the bridge to go there, it is about 20 min by boat and it is about 30 min by car." (Region 5, Mahaica-Berbice, Rosignol, Female)
"Mostly we use the landline because there's no signal. It's just easier to pick up the phone instead of searching for the signal. Actually this is the only place that has a land line. Everybody else uses cellphones." (Region 4-Demerara-Mahaica, St Cuthberts, Female)

[35] Radio here and in the following paragraphs means bi-directional communication using "HF Radio" devices.

"Since we don't have a landline phone here…it is basically the cellphone. Well, some people in the village have it, but we don't have it in the health center. "Do you have a landline phone?" No. Well, I have one, but due to the flooding sometime back, the water went into the line and it stopped working. The company GT&T tried to fix it but it just never came back on. I use the cellphone every day and I have a personal laptop when I have an assignment to type, not very much. I use my phone more." (Region 6, East Berbice-Corentyne, West Canjie, Female)

"When we're leaving from here to go all the way back to Anna Regina, there's a park where we're going that we don't get a signal at all in some of the phones. You mostly find the young people having a smartphone, because of the Internet. And then, the children go to school and they would have to find things for school on the Internet and get information, so most of them have Smartphone. Because, around here we don't have Internet and we go to a place where we can get information for our kids or send our kids there. So now, parents buy a smartphone for their children so they can get some information for the school. You won't find them going on the Internet, unless somebody teaches some of them… because sometimes they pick up the phones and play with it or something. But maybe it'll grow on them more and more, and if you have Internet in your house and maybe teach them about it, they'll get to like it. Once the children grow older and start the secondary school, they'll want phones with Internet, right? "(Region 2, Pomeroon-Supenaan, Mainstay, Female)

"Send messages on the phone to know if we have a better signal but because of the far distance that we live in, sometimes we don't get a proper signal. GT&T has a better signal. Let me say most families in the community could afford to buy a smartphone. "(Region 2, Pomeroon-Supenaan, Mainstay, Female)

"We just have cellphones in here. We could use Facebook or Whatsapp, or if they have an e-mail address, we'd send an e-mail to them. The Internet in here is not good like in other areas, like Anna Regina or in Georgetown. We're living in a remote area. So, it's not really like it's out there. And sometimes, with some of the phones you could only use the Wi-Fi here. Most times it's not good. The tower is just for the resort. They have Wi-Fi, that's all. (Region 2, Pomeroon-Supenaan, Mainstay, Female)

"The phone is used most of times, many times per day, for meetings, to talk to the children. (Region 3, Essequibo Islands, West-Demerara, Wales, Female)

"Most of them want to skype, actually every day, 2-3 times a day. "Do you also use Whatsapp, Facebook?" Yeah, Whatsapp, Facebook, I have all. Every day, every minute, when we have a break at work we make calls and do stuff like that. I'm using it all the time." (Region 5, Mahaica-Berbice, Perth, Female)

Simple cellphones are the main communication device used in their community for long distance communication. At work they try to use it mainly for emergencies calls and during blackouts.

There are some communities with a better penetration of landline phones, available at health institutions but in general their availability is not frequent at all – and where they exist, sometimes there is a single line available for all professionals.

Using fixed line phones are preferred but limited in availability. Some health institutions have them just for work purposes and they still facing problems with the network. They understand that landline phones would be very useful, especially for emergencies as nowadays they have to use their own private cellphone, which is expensive for them.

In some communities as Potaro-Siparuni (region 8) and Upper Takutu-Upper Essequibo (region 9), for example, the usage of HF radio at health centers is common and having a cellphone is not a real alternative for everyone because devices are locally not available for purchase or because the signal in the community is very low or nonexistent.

"Actually, I don't have my cellphone anymore, but the radio. I use it from Monday to Friday and on an emergency on Sunday and Saturday, the weekend. Mostly for the job, sometimes to message the village council, you know, communicate to other villages. Some people also come to communicate and I allow them to use the radio. They use the cellphone more than the radio. Half of the people have a cellphone." (Region 8, Potaro-Siparui, Nappi, Male)

"I allow people to use the radio from the health center but just if it is an emergency. Every day." (Region 9, Upper Takutu, UpperEssequibo, Aishalton, Female)

"Radio, this is the only mean of communication here. I use it every day, from Monday to Friday. When sending a message for far places, it is just the radio, no cellphone or nothing. Mostly related to my job and sometimes related to my friends and relatives who live far away. People here don't use the landline phone and don't use the mobile phone. They are willing to buy it, but most of us started to buy phones because we go out to Lethem. There is no signal, no Internet or telephone signal in the community." (Region 9, Upper Takutu-Upper Essequibo, Karasabai, Male)

"Especially in my working place, because there are times… sometimes when we have an emergency and we have no minutes on our phones and we have to leave here to see where we can get credits to put on our phones so we could make calls. No, we don't have a personal phone for the health post. We use our phone to do our job. To find things for our job, or if we have patients or an emergency patient, we'll call. If we have a pregnant woman and we have to labor, we have to call from our cellphones. But if we get a landline in here, it's gonna be better for us and we are going to communicate more with our supervisor. We just have the cellphone. Some people would use the cellphone with Internet (smartphone). They would put a plan for a month, or maybe if they have something important to do, or a call to make, they just put a one-day-plan, just to send a message." (Region 2, Pomeroon Supenaan, Mainstay, Female)

"A lot of people don't have access to the landline and you can go to the store and get a cellphone. And in GT&T you have to make an application and it goes through and through before you've been process to have a landline. In our compound we have one line for the whole hospital. The cellphone is easier to get. We face problems with the landline. Over two months we can't get calls or anything, it would sometimes receive but sometimes we cannot hear clearly what the other part is saying. Or sometimes they might not hear you. And we complained a couple of times to GT&T. They said they'd send their technician but I haven't seen anyone showing up" (Region 2, Pomeroon-Supenaan, Charity, Female)

"There was a storm and we don't have the landline anymore, it is mute. (Region 8, Potaro-Siparui , Nappi, Male)

"A few have landline too, not everyone has a landline. Mobile phone, almost everyone. Computer- a few people, most of the children and the people who need to access the Internet and so on, they need to come out of the community and go to a private place, pay. Some of the villages have private places. Those laptops that the government has given, I don't know how to say…you won't find people doing educational things with them, they are small laptops and most of the people just play games and so on. Also they last for a particular time, they are small laptops and some of them started having problems" (Region 5, Mahaica-Berbice, Rosignol, Female)

"They go to the Internet café and make calls …. Like 5 minutes driving and about 5 dollars a minute, it depends, some Internet cafés take 5 some take 10 dollars a minute. Most people are improving in technology, so most people have smartphones and stuff like that now. The landline phone only started in my community about 3 to 4 years back. Most people used the phone for small uses, most people had a phone and didn't use the Internet and so, most people have this high tech phone and so on, and they are improving it. The Internet came after the landline." (Region 5, Mahaica-Berbice, Perth, Female)

"People have their private cellphones, but for work purposes they mostly use the landline. For example if it's work-related I won't use my cellphone, if there's a landline available. But I know that in some parts even in Georgetown, the landline phone call to cellphones. So the person would have to use their own phone." (Region 4-Demerara-Mahaica, St Cuthberts, Female)

If you want to get to your relatives you could use the Internet. Let me say I have family in America, and if I want to use the Internet it's just on Facebook to send them a message." (Region 2, Pomeroon-Supenaan, Mainstay, Female)

In some communities as Lethem, besides smartphone,people use a laptop, a tablet at home and a landline phone at work.

"I have a laptop. A tablet. Every minute, every 5 minutes. A majority of people have phones. I prepare the budget for the Region and as a result, we ask computers or we get donations to the health center." (Region 9, Upper Takutu-Upper Essequibo, Lethem, Male)

1.2.5.2.3 Role Regarding Communication Systems in Communities

The trigger for using different means of telecommunication is mostly work, i.e. caretaking of the patients in order to provide them medical assistance and support they need.

The problem the interviewees are facing in regards to communication is that the patient is often located far from a medical center and/or he needs help during a period of the day when it's impossible to physically reach out to him. Examples are people who live in the villages along the rivers where it's not possible to take a boat in the middle of the night to reach them. During those times, the doctor has to make a decision quickly if it is needed to rescue the patient by plane or if it's sufficient to give instructions via phone / video conference in order to handle the situation successfully.

1.2.5.3 Available Forms and Uses of Telecommunication Systems/Devices

Both access technologies, fixed line and mobile, are available in the country and to a different extend in the communities visited. The experience with dealing with the different devices and ICT infrastructure differs significantly from community to community.

1.2.5.3.1 Landline Phone

The main reason for communities to not haveing a landline are basically related to costs and that the operator do not provide connectivity at remote areas.

There are some business that had the same landline phone number for 10-15 years but now they have a cellphone number too.

"The landline used to be from GT&T but now opened up the market and Digicell…it might get improved. If you have competition it can be improved. Cellphones just few of them have at the hospital. The head of each department have the cellphone but the problem is the Internet. " (Region 7, Cuyuni-Mazaruni, Bartica, Health, Male)

"Usually members of the community do not own a landline telephone because of the distance to the city, because we are in a remote area and it's costly to bring the landline" (Region 7, Cuyuni-Mazaruni, Kako, Male)

"I need my landline, because it is from January and the thing on it is: when you have a Digicel and call someone from the other provider and vice versa, your money disappears, it is very expensive, but with the landline no, you could auto manage your calls. Sometimes you would send letters upon letters, you know, but you just can't write everything. So they could just come out and make like a meeting and get things over. (Region 5, Mahaica-Berbice, Ithaca, Female)

1.2.5.3.2 Cellphone/Smart Phone

Most of the respondents have a personal cellphone in most of the communities, except in some communities as in Region 1, Barima. Their major complaints are about the coverage and the weak signal (if available) and that the pricing level for the services are perceived as too high, even for people who consider themselves as a person with a relatively high salary (e.g. doctor).

In most of the regions cellphones are available since almost 10-15 years and in the last 3-8 years people started to purchase them more often.

They feel themselves and the community capable of using the cellphone. But some of them are not allowed to use them at work (which would sometimes be the only place with a stable connection) as the persons working at a hospital kitchen.

Some regions are more developed in terms of using the smartphone with some applications as Whatsapp and Facebook and some others are mainly restricted to simple calls, esp. in communities without a good data connection.

The landline phone has been available for more than 10 years but it is not useful for the ones working in the fields.

Just some members of the communities own a landline telephone.

For some, having their own landline telephone at home would be cheaper in comparison to the cellphone.

For others, for example in some communities from Wales, in Region Essequibo Islands – West Demerara, the respondent mentioned that 90% have a landline telephone as it has been available for over 20 years in the community, but the people are now preferring to have their personal cellphones because of comodity and also because is easier to be purchased.

A landline phone is easy to manage for all the community, even for those people who cannot read.

There are few communities as in Region 3 - Essequibo Islands-West Demerara, where the respondent mentions to have classes where they are being trained in how to handle and operate computers.

Nevertheless, most of the respondents do not feel capable or trained enough for using computers or laptops and understand that a training would be very important as most of the population of a community has no knowledge of all its potentials.

Only in some communities as Wales, Lethem and Regions 4 (Demerara-Mahaica) and 5 (Mahaica-Berbice) people are used to have computers at home and sometimes at work and are more capable of using them but they percieved the Internet connectivity and mobile phone signal are “Bad, *very bad”.*

Smartphones are used every day, more than 5 times a day and for chatting and social media. Whatsapp is used for chatting and exchanging voice messages.

Messenger and Facebook are also common and just few of them use others social media applications such as Viber, Instagram, IMO, Snapchat.

Skype is not used by all the members but is very well known.

Smartphones are used for every occasion and some respondents would be willing to spend up to about 500-600 US on the device plus 50-75 US on the service. It is preferable for calling except to someone in far distance, for example, abroad, mainly because of costs associated with the international calling rate of the mobile operator.

Some occasions to use the smartphone that were highlighted are: taking pictures at parties, practising some sports; Talking / Chat at Whatsapp; Social Media as Facebook; Paying bills (only 1 mention in Region 9).

Shopping via your own smartphone is seen as desirable but not everyone can use shopping portals due to the need of an international credit card (in their understanding maybe as the only way of payment).

1.2.5.3.3 Computers/Laptops/Tablets

Generally members of some communities do not own computers and laptops. They are used mainly at offices and no children have free access to them. Some of interviewees don’t see the relevance of it if they already have a cellphone.

Usually members of some communities own smartphones as they can do everything by phone and very few have plans to purchase a tablet. Price would not be the main problem as the respondent says people spends around 500 US with a smartphone. A cheap tablet would be starting at about 200 US$.

There are 5 main reasons most of the people probably don't own a tablet or a computer/laptop: 1) unawareness of it's capabilities and potential uses; 2) problem with availability - there are no stores selling them; 3) bad or no Internet connectivity; 4) no electricity; 5) Price of services / packages.

Sharing the same device eg. desktop computer at the workplace would be a problem for some institutions as people are not well trained to use them. Also, some respondents cannot find another use for the computer / laptop beyond what is already covered with the smartphone applications.

Computers are mainly used to connect to the Internet, for searching at Google for checking diagnostics, for emails and for writing a report.

A computer or a laptop is needed for PowerPoint presentations but if they users would be trained they could design their own communication/advertising materials.

Free Internet access, faster Internet connection and more availability of data connected are seen as needed.

1.2.5.4 Desire for Different Forms of Communication

There are different opinions among the communities visited: The ones more developed would prefert to use more modern devices (tablets, smartphones) while the ones less developed would prefer to use devices like a computer or a smartphone.

In general, everything that might address and solve their specific needs:

- Save their time – example: computer to do the report and send it by e-mail
- Better Internet signal (for data)
- Connection/Support – example: sending a case of a particular patient to the supervisor in order to faster processes or intercommunication – at hospital
- Access – related to prices/stores available in the community
- Education – for using computers and understanding the potentials of smartphones

1.2.5.5 Case Scenarios

All the case scenarios are considered valuable and they would consider using them all if available and in case the costs for an Internet connection would come down.

For selling goods to remote areas the interviewees would like to use a smartphone to take a picture and send it to people, advertising on cable TV or making connections to people in each community by calling them to bring goods. If using an e-commerce platform operated by the government they see the benefits in savety and reliability in running the processes. Besides that, it would save their time, people would find what they need/ want to purchase and it is a way for growing and developing the business.

For sending money the interviewees have to go to the post office and bank or West Union/ Money Gram or in case it is in another community, sometimes asking someone to do it in person. E-banking idea is considered practical, faster and easy – very valuable and very attractive. Also it seems to be less expensive and much safer than going in person.

Everything involving governmental activities is considerd as very bureaucratic and onvolving a lot of paper work, even resulting in emotional stress. The e-government idea sounds promising to provide easier and practical processes and is understood as extremely handful.

Health professionals face situations where they would need help to examine each patient carefully. Today they have to call someone using their cellphones, or ask someone in person or look at wikipedia/ medicine communities (single mention). Privacy concerns were also raised: One person mentioned that having a private conversation through e-mail would be better than using the personal Whatspapp or Facebook account, especially if talking about health issues, like in occasions when talking about diseases like HIV.

Studying abroad nowadays requires leaving the country, their families, friends and job. E-learning services are seen as a much way to bypass the challenge of physical relocation. Their only concern again is related to the price of the needed Internet connection.

1.2.5.5.1 E-Commerce

"Well, now we can use a smartphone to take the picture and sell it to the other person."(Region 1, Barima, Mabaruma, Male)

"Now imagine the possibility of a government-run website that enables you to trade your goods on a national (or international) platform online. How do you feel about this?"

"I actually buy things from Georgetown. We call them and they bring it to Lethem and from Lethem they bring it here….That idea would be a good thing. That would be better because it can help you, because instead of going far to Lethem and spending money, you could access." (Region 9, Upper Takutu-Upper Essequibo, Male)

"I would save time and it would save you the energy of looking for someone to buy it." (Region 6, East Berbice-Corentyne, WestCanji, Female)

"I wanted some seatbelts for my car, because they are damaged, but I can't find any dealer here or anything, so somebody offered me to buy it online, from Georgetown. For things we don't have here, the only option is online, but I don't know how to do it myself, so I need to ask someone else. Of course it would be excellent, because, you know, everybody works and they are so busy, they would prefer to be able to purchase online and do not go to the store. "(Region 5, Mahaica-Berbice, Rosignol , Female)

"I guess it would be a bit more accessible and since it's the government involved I don't think the risk of being fraud, it would be less because a lot of these deals are done by a third party that is not the government and I don't think it would be a hundred percent, I don't know, legal? (Region 4, Demerara-Mahaica, Buxton, Afro-Guyanese, Physician, Male)

"I never do, but I know people who are buying clothes and sending money, stuff like that, through the Internet. (Region 5, Mahaica-Berbice, Perth, Female)

"That would be good because the Internet reaches everybody, they could make lots of connections. To get more customers. It's a way of expanding. So i think it would be a great help if they have a website so they can reach out to people. Far off from the community. National and international. "(Region 4-Demerara-Mahaica, St Cuthberts, Female)

1.2.5.5.2 E-Banking

"Now imagine the possibility of transferring money via cellphone deposit. How do you feel about this?"

"Well, we have the post office, that we use and we have a bank, but a lot of people don't really use the bank because a lot of people don't have this particular bank so they have to transfer and another option is Western Union. (Region 1, Barima, Port, Kaituma, Male)

"Well, if the person is living in Anna Regina I could ask somebody to take it to them, and if the person is living in Georgetown I could just send it through the post office or Western Union." (Region 2, Pomeroon-Supenaan, Mainstay, Female)

"I go to the post office, deposit and they fax it. I feel unsafe." (Region 9, Upper Takutu-Upper Essequibo, Lethem, Male)

"We have the Western Union here, so I'd send it through Western Union, but if you are not using Western Union, you are probably sending it through someone who is going there by car. It could be done by credit and at time it is useful." (Region 6, East Berbice-Corentyne, WestCanjie, Female)

"If it is international, you need to send it through Money Gram or Western Union. If I give my number, maybe somebody can see it. I'm not sure if I'd use it to send money, to purchase maybe, but not to send money." (Region 5, Mahaica-Berbice, Rosignol, Female)

"In my bank I don't think we have the option but if we can wire money then we have to go to the bank to wire the money. There isn't like an app on our phone that the bank provides us with that would say "hey you want to send this amount". No we don't have that. "(Region 4, Demerara-Mahaica, Buxton, Male)

1.2.5.5.3 E-Government

"Do you generally go to the NDC (Neighborhood Democratic Councils)" well, that is a long story "have you ever needed something from the NDC?" thousand times "do they work fast?" no. "Do you have a lot of bureaucracy?" yes and a lot of paper work, you know, and there is no technology, there is a lot of paper work, everything is paper, there is not even a computer." (Region 5, Mahaica-Berbice, Rosignol, Female)

"Now imagine the possibility of receiving this information or contacting governmental or public authorities (to register a new-born, apply for marriage, etc.) online. How do you feel about this?"

" For example if we have an event here in the health center, old folks that don't have a phone or don't have Internet, so we all have to go out in the community or write posters so the patients know and hopefully somebody gets the message to them. So that's how communication is being done here. They have to go all the way to Georgetown. I think it would be awesome. It's something i wouldn't get too excited about because sometimes these things are not possible. I can only imagine what this would be. Like to have Internet in here. So many possibilities of what could be done. But the last time we thought we were getting it, there was a lot of disappointment when we didn't. But I think this would be really, really good for the community. Special need for the students in the school. For instance we have to send reports directly to Georgetown because we don't have Internet. Because if we had we could just scan it and you just email it to the person. We are not that far away but imagine people that are far away and they could do it electronically, it would be so much easier." (Region 4-Demerara-Mahaica, St Cuthberts, Female)

1.2.5.5.4 E-Health

"Of course it would help me. "Have you ever lived a situation in which you wanted some help?" Yes, I had a patient with an abscess behind his knee and I wanted someone else to participate, to see it, but everybody was busy, so I had to go to the Internet, to research it. This idea would be excellent and better for me, far better for me, because I'm in a remote area and it is the last village in. So imagine something happens, for example, in the middle of the night, look how remote I am. This is closed, that is closed, but I'm the only doctor in the area, so you can imagine that everybody would come to you and the nearest hospital is or in New Amsterdam or in a half hour way. That would be excellent, you know, if I can have, for example, this. If I had a program, where I can speak to someone to give me advices, of course that would be useful. They can instruct me, tell me what to do in some certain situations that would be good, because I'm in a remote area. (Region 5, Mahaica-Berbice, East Indian, Rosignol, Physician, Female)

"I'd say it *is having Internet here. Because the pre-condition is to have Internet. As i said before it would be much easier to get in contact if there's an emergency or if you need medical advice, you skype the person. It's much easier to talk to them. You see them face-to-face if there's something you cannot do. In terms of medical training, the program in continuing medical education. So there are these courses online but i don't have Internet here. So we have to travel all the way there where you have the training, to get my credits. It would be much easier to do it online. And that's not only for me there a lot of people that would benefit from it." (Region 4-Demerara-Mahaica, St Cuthberts, Female)*

1.2.5.5.5 E-Learning

"Recently I did look up for autoimmune diseases on Wikipedia or Netscape." (Region 9, Upper Takutu-Upper Essequibo, Lethem, Male)

"Sometimes you get a person that comes with pressure "high blood pressure?" yes and I want to clarify, because sometimes they say they are using one medication that is not working, so I'd need to send them to the hospital, if I couldn't give them any contact. I'd call the doctor, but if it is a case that my other colleagues could handle, I'd call them." (Region 6, East Berbice-Corentyne, WestCanjie, Female)

"I'd say it is having Internet here. Because the pre-condition is to have Internet. As I said before it would be much easier to get in contact if there's an emergency or if you need medical advice, you skype the person. It's much easier to talk to them. You see them face-to-face if there's something you cannot do. In terms of medical training, the program in continuing medical education. So there are these courses

online but I don't have Internet here. So we have to travel all the way there you have the training, to get my credits. It would be much easier to do it online. And that's not only for me there a lot of people that would benefit from it." (Region 4-Demerara-Mahaica, St Cuthberts, Female)

"Now imagine the possibility to get a degree from anywhere for yourself online. How do you feel about this?"

"Great. Because not everybody would be able to leave to go probably to seek such help… So if you can do it online, through the smartphone, as I said, it's great. "(Region 1, Barima, Mabaruma, Male)

"I think it would be better. Because I think they could send information by e-mail. I mostly would use the Internet to get to the doctor or supervisor to talk about a patient. The most you can get is through Whatsapp, to send a message to them. That's what I'd do. Maybe if we had an e-mail address for the office and you want to send a report or anything through, you could send it through their e-mail, right? So, you could e-mail that to the hospital and they would get it through there. Instead of using, like, Facebook. Because our supervisor, there's certain things that you can't tell her over the phone… maybe you could call her if it's an emergency and all, but there're things you can't tell her on the phone about a patient. Let me say like if a patient is HIV positive, you can't call them and say … I have to call a person there, she wouldn't accept that. So, maybe with the e-mail address…". (Region 2, Pomeroon-Supenaan, Mainstay, Female)
"I would use it if I have the opportunity, maybe soon. (Region 8, Potaro-Siparui, Nappi, Male)

1.2.5.6 Cultural Identity and Belonging

The Guyanese are proud of their nation in general. The fact of being born in Guyana unite them at first sight. To live close to their families makes them feel Guyana is their home.

1.2.5.6.1 Cultural Identity

The respondents feel themselves as a Guyaneses mainly because they were born in and live or lived in the country most of their time, they work here and have their families. Living with diversity is how they describe themselves and relate it to different cultures and beliefs, different races and different lifestyles. Very friendly people, patriotic with common interests e.g. cricket. The government supports some persons mainly in education (as scholarship for 7 years in Cuba).

Esspecially Indo-Guyanese feel emotionally linked to each other and perceive that the population is becoming more mixed and that the government is trying to unite all.

When talking to Mixed, Afro-Guyanese and Indigenous People, the impression is slightly different. They do not feel that the people are somehow united and they do not see any practical action from the government to change this situation. Besides discrimination based on the race, discrimination of women and homosexuals were mentioned.

All understand that the Internet could help to integrate the Guyanese people and to drive the nation building process while conserving and highlighting their own diversity. Better communication infrastructure has been seen as one of the top 10 priorities, but only after education measures and improved health system.

1.2.5.6.2 Government and National Identity

"They are very cultural people, they are very educated, some of them, they are not really educated, but their life style is very different…you have six different races in Guiana…seven. Different cultures and beliefs, and different lifestyles too…. This government I see is trying to make a bit of a more modern Guiana" (Region 1, Barima, Port, Kaituma, Male)

"I have grown up here and I studied many years out of the community, but I still come back to serve my community, because I know that those people here, they need me here. So I don't forget where I came from. I'm from an indigenous community. I love my country because there are natural disasters, but not as you see in the other countries, there are flooding and so on. It is also peaceful, at least in my area. I think there are still discriminations, especially to the Indigenous people. (Region 9, Upper Takutu, UpperEssequibo, Aishalton, Female)

"I was born, grown and I live here and I got a job in Guyana. The birth certificate describes me as a Guyanese. (Region 9, Upper Takutu-Upper Essequibo, Karasabai, Male)

"Well, I'm very mixed. We are a multicultural society and I'm from South America, Guyana." (Region 9, Upper Takutu-Upper Essequibo, Lethem, Male)

"This is my country, this is where I was born. I like my country here, here we get to interact and learn more about each other. During the elections we are less united "why?" because of the political differences and different races. "is the politic here linked to the race?" some. "And when is the country united?" it would be the Mashramni. "Mashramni?" yeah, the 23th February. "Any other time?" well, in some of the holidays, actually most everybody would come together, some people… some just continue their life, but the majority would be together during the celebrations. In common we have cricket, dance, soco music. I think actually all Guyanese like it. Put the races aside and just make us as one. Because it is just the hair that is different and probably the skin color. People could teach each other about differences, different personalities, and different backgrounds on the social media." (Region 6, East Berbice-Corentyne, WestCanjie, Female)

"I was born here, I got a scholarship from the government of Guyana to study medicine in Cuba, for 7 years. After high school, we had some examinations, with 5-7 subjects and we also have an interview." (Region 5, Mahaica-Berbice, Rosignol, Female)

"I'd say my culture is very like yours (Brazilian), but I have a lot of other cultures in me because we're not one race. Right? So if I was to say that I'm of one race would be a lie because, and this is everything for the rest of the country, everybody they eat, they dress, and they mix with other races. People here, they're very friendly despite what people might hear. Apart from being born as a Guyanese, I have that sense of pride and patriotism. (Region 4, Demerara-Mahaica, Buxton, Afro-Guyanese, Physician, Male)

"I'm a Guyanese by birth and I have lived here all of my life, never travelled to another country. Yes, because we live in love, you know. "what else?" people cooperate, we come together and get things done." (Region 5, Mahaica-Berbice, Ithaca, Female)

"I'm born a Guyanese and I study everything in my country and I'm a Guyanese. All of us Guyanese we live as one, but just that sometimes, you know, they do things that when you finish doing it, you start the next. Well, Guyanese are a blessed country, a nice country, a lovely country." (Region 5, Mahaica-Berbice, Perth, Female)

"I was born there and I live in Guyana. I went abroad to study but, I mean, it's my culture. It doesn't matter where I go or how long I live in another country, these are my roots. This is where I'm from, where I was born. I think I'm a hundred percent Guyanese… Guyanese, in general are hard-working people. They love cricket." (Region 4-Demerara-Mahaica, St Cuthberts, Female)

1.2.5.6.3 Guyanese Unity

"You can have a separation between different people, but generally you are forced to live among different people, either it is the right choice or you are forced to be united. "(Region 1, Barima, Port, Kaituma, Male)

"Our region is vast, it's large, and having access or each community having access to communication would be something that would help improve our region as well as the entire country." . "(Region 1, Barima, Mabaruma, Male)

" I'm Indigenous, they try to reach out others … maybe there might be segregation at some times… maybe some people may not like this race or that race… but they try to reach out to every race in Guyana. So, they try to make you comfortable as an Indigenous person. Let me say, this month coming we are celebrating the Indigenous People, at least they let you have it… and you're Indigenous and you will not be ashamed for who you are. I always believe once the head is united, once you have the togetherness there, we'd work along with all the communities and this unity together. (Region 2, Pomeroon-Supenaan, Mainstay, Female)

"The way we speak, the culture, the way we care ourselves. The races need to be together because in a couple of years it would be a good thing to be one race, everybody would be mixed. You wouldn't have to point fingers, you're black, you're white, and that would be a very good thing. That's happening. As

working here most people come and they are mixed races already. With a better communication infrastructure, people would interact more with each other, we'd get to understand each other better. (Region 2, Pomeroon-Supenaan, Charity, Female)

"Looking more to the Indigenous People, helping the Indigenous people. Be more concerned about us, you know and feel good about it. Sports could bring us together. They need to involve the Indigenous People. Get the Indigenous People involved in sports. This road here from Lethem to Georgetown, if it was a proper road, you'd get across in a short time. "And it could unite the people…"(Region 8, Potaro-Siparui, Nappi , Male)

"Love persons for who they are". (Region 3, Essequibo Islands-West Demerara, Wales, Female)

"If you had televisions you'd follow the news and have that information about what is going on in the country. Not only in television, but also in the newspaper, if you have the Internet you could read the newspaper and so on." (Region 9, Upper Takutu, UpperEssequibo, Aishalton, Female)

"Mostly we - the Indigenous People - are united. "Yes, but what about the whole country and all races?" Yeah, all of us are united. "So everyone is united." Yes, everyone is united. We celebrate our culture, the heritage day and other national holiday. We have no communication here, it is only the radio. We need the Internet and some other ways to communicate. If they put more Internet or some other…hmmm, more communication could make the country more united because people would be talking to each other." (Region 9, Upper Takutu-Upper Essequibo, Karasabai, Male)

"People are not united. There is racism, religious differences and political differences. Cultural and social issues, education. If given the opportunities they always stand out. We deal with different people constantly so we should have the capability or the ability to handle certain problems and situations that arise, but on the other hand, due to the impact of low education, people are lacking simple educational practices. "Is there anything that all Guyanese are proud of?" I'd say the independence from the British. To unify, well, proper education, proper health care system, better opportunities and good salaries because it doesn't just link you with your neighbor, links you with the world and the world has a lot to offer and if you can make use of whatever opportunity given, that would be good." (Region 9, Upper Takutu-Upper Essequibo, Lethem, Male)

"In terms of trying to put us united together, not so much racism. In terms of putting the system in place. People following rules and regulations, stopping crimes. It has been like this for years, you are still having people with views of racism. People need to stop thinking about race and start thinking about one race, which is the human race, you know… people have unity, but not that much unity. I mean, when I started living in Cuba, I could see unity. Whatever happens everybody comes together. So for me, 'no'. Guyanese are friendly people, majority they try to help out. They may treat foreigners better than me, a local, especially if you can speak differently." (Region 5, Mahaica-Berbice , Rosignol ,Female)

"In terms of telecommunication, I think they are striving, they're headed in the right place and they're headed towards the right direction in terms of telecommunication. Also, you have a lot of uneducated people out here that they, and generally work hard but then I can't really go around the city, I don't want to, I can't go out at night to party, I can't do anything. I don't think we are united. I would say there are people from, both sides that still hold onto racism and that's what, divides us. The president now he's a black guy and the vice he is an Indian and the opposition, was the opposition also mixed. Guyanese women, they, they don't party so much. So they have a known quality to take care of their husbands, they're great at taking care of the home and stuff like that. So even though we find a lot of Guyanese men, they want to go overseas, a lot of them don't come back to marry a Guyanese woman. For example, the gay community, LGBT, those kind of things, aren't very accepted and it has a lot to do with our cultures and our religion. For Health Care, more infrastructure helps a lot, I can tell you that. What we do is, if you have a case, a medical case and I'm having a difficult time and I have my colleague he's a dermatologist and I need someone with a little bit more information to help with something I can't handle I would snap a picture and WhatsApp it saying "hey, I found this …." (Region 4, Demerara-Mahaica, Buxton, Male)

"The majority of the population is of East Indians, the minority is mixed and Indigenous People but as of lately there have been a lot of political issues that are trying to divide the nation ethnically but I know

for sure that Guyanese people are generally united, but it's only when it gets to political issues that people tend to get divided". (Region 4-Demerara-Mahaica, St Cuthberts, Female)

1.2.6 Interviews with Representatives of Economic Activities

This chapter shows the key findings from the interviews with experts from the business and economic sector in the communities.

1.2.6.1 Overview

The market entry of Digicel as a new mobile carrier changed the market and the perspective of getting access to communication. Guyanese people support competition and seek more affordable costs for communication services, which can boost business and improve education. Competition can also stimulate an improvement of service quality provided as the current available communication services are percieved as not satisfactory.

1.2.6.2 Communication over Long Distances

Especially when Indigenous people of the Region 1 think about talking to someone in a distance, they remember the period prior to the access to communication media, when they had to move (usually miles) to communicate with someone else. Nowadays, they have access to devices like the mobile phone.

> *„Well, for now… the business that I'm involved is locally, here in the community… within the district and then nationally, with Georgetown… this used to be a problem before, but now, since we have access to cellphones, which were recently introduced, most of the problems have been solved. We can contact now…" (Region 7, Mahaica-Berbice, Kako, Male)*

To others, this question focuses on the present situation, given that this "need to walk" still occurs quite frequently nowadays due to breakdown of the mobile operator's signal or lack of money to put credit on the cellphone and the absence of other means of communication.

> *„Because sometimes there is some difficulties and you are alone and you need assistance and sometimes a cattle or a cow or something gets lost or they stuck in the mood, so you need to get assistance, you need to call somebody to come. So you have to leave the area, walk the 2 miles and get out of the road and get assistance back in the background. So it is very, very difficult, sometimes you have a phone, but you don't have credit so there is no other communication." (Region 5, Cuyuni-Mazaruni, Ithaca, Male)*

There are also the persons walking for miles to find not the direct recipient of the message, but the device that connect them (Internet somewhere or a phone booth) to the outside world. Others need to walk a significant distance to get a phone signal at all.

> *"Well, it's very often here because of our work. We're (from communication) and because the signal, it's a kind of bad, so we have sometimes to walk 5 miles or 7 miles we go to adjust the signal." (Region 6, Berbice Oriental- Corentyne, Orealla, Male)*

> *"When I came here, we didn't have any phone. That was 20 years ago, so we used to get phone call through the telephone company, public phone booth. We had a limited number of landlines, there are still, I don't have landlines here and I used to walk around 1km to get to the phone booth." (Region 9, Essequibo-Ocidental Demehara, Lethem, Male)*

1.2.6.2.1 Frequency of Long Distance Communication

The communication over long distances is frequent and has two purposes: social and professional. Normally, the communication with a social nature is focusing on visiting family and friends who live outside the community or, as it often occurs, even outside Guyana. Many have relatives and friends who left the country in search of employment opportunities and often talk to their relatives. This long distance communication happens mostly in

places where there is a certain stable infrastructure for Internet is mostly initiated by respondents who know how to use social media or video conferencing programs like Skype, mostly men.

> *„Yes. I have family in England, in America and stuff like that." "So, generally when you communicate over a long distance you are communicating with them, with your family?" "Yes. We could use IMO, we actually appreciate these apps, do you understand? Skype, right?" (Region 1, Barima Wani, Port Kaituma, Male)*
>
> *"Very often, (unintelligible) relatives from the North…"Do you have many relatives outside of Guiana?" Yes. (Region 1, Barima Wani, Mabaruma,Male)*
>
> *"My wife sometimes goes to Canada or the States and I'll be talking to her on the phone." (Region 2, Demehara-Berbice, Mainstay, Male)*

However, most of the long distance communication done by this audience has a professional goal: contact with suppliers who are outside the community to purchase products or to inform co-workers and supervisors about how businesses goes or to ask for help or in cases of emergency[36]. No differences between genders and ethnicities could be identified.

> *"I use my phone every day. I'm employed at the sugar factory and use it to communicate to the others about the job situation, we also use the cellphone and we need a Smartphone at that time."*

1.2.6.2.2 Means of Communication for Long Distance Communication

The use of mobile phones for long distance calls is prevalent among all Guyaneses. Telephone charges are affordable, but come often with bad quality (almost unanimously mentioned).

In most communities it has been mentioned that citizens have to wander around the community area in the search for the signal from the operator(s); This problem is apparently so prominent, that there is a significant willingness to even pay more to have a better quality of service: One of the respondents in Region 6 mentioned use the mobile signal from one operator out of Surinam that reaches to his community in Guyana, purchasing and using a Suriname SIM card and accepting the higher fees to call someone in Guyana as this is now seen as an international call. But according to his perception, he gets a better signal and higher voice quality, justifying the extra costs.

The use of cellphones is generally descripted as one on a daily basis, despite the difficulties of access.

Most complaints among those using smartphones were: poor Internet signal quality available, instability of signal (in some places only work certain periods of the day) and expensive data plans with no transparency of when is charged how much for what (the person uses the device for a short time and already has to pay again without knowing how much he/she actually used). In addition, they have the impression that the speed of the advertised "4G service" is slow, not matching the expectation.

Many communities have none or very few landline phones, even in commercial facilities such as hotels, health centers and police stations. Even being less widespread and surpassed in use by cellphones, some respondents perceive a financial advantage in using landline instead of the mobile connections over long distances. "It's cheaper." In addition, there is the perception that the telephone companies would not profit much with the expansion of telephone landlines compared to the cellphone, because the monthly payment model for the landline is post-paid and the cellphone is prepaid.

Another advantage of the telephone landline reported by respondents is that through it they could have Internet access, which is still not available for many homes and commercial facilities using mobile connections.

Interviewees from Regions 7, 8 and 9 make use of high frequency radios for communication over long distances.

According to respondents, the majority of the population of the communities have no mobile Internet connection. As stated, it is cost effective, but is not considered cheap by most of the persons asked.

Despite complaints about the signal, they recognize the convenience of having a mobile device that "can be put in your pocket" - Easing mobility.

[36] One example mentioned was: What to do with the cattle that got stuck in the mud (farmer)

According to the estimation of residents, the percentage of those who own a mobile device with Internet access or smartphones varies between 15% and 50% of the population. Most would like to own this type of device, but with a service that provides good quality connection, which at the moment is not a reality.

Respondents see the cause for the low percentage of use in the high prices for the service and Internet access charged by the operators, especially in areas where there is high unemployment and residents with unstable income. In Region 5, there are reports of residents of a community who prefer to pay monthly fees to Internet cafes rather than to a cellphone provider.

The youngest population is currently the leading consumer of smartphones in the communities.

There is also the use of satellite phones (Region 1), HF radios and landlines.

1.2.6.2.3 Role regarding Communication Systems in Communities

Some respondents (not the majority) have approached government agencies like Ministry of Indigenous Affairs and Local Government to request Internet or simply any help to improve access to communication media in the communities. Among those respondents, the majority requested bringing Internet access to schools. Access to youth research centers and the provisioning of digital information in schools is a strong demand among residents of the communities visited. Some haven't had success yet with their requests, but believe that the current government may drive the process of improving access, despite the recognized lack of funds for investments in this sector and despite the short time of the current government being in power to implement such demands.

The private companies that have been contacted by citizens to improve their services or install antennas in the regions did not meet the requests of the applicants as indicated by the interviewees.

> "*We always get promises, like the Internet being provided, Internet for schools, but that never so far materialized. I used to be a teacher at school and GT&T came and said that they would assist us with free Internet, but it was 7 years ago and up today nothing happened*." (Region 9, *Essequibo-Demehara, Aishalton, Female)*

> "*No, because there's no competition. They know that and for whatever reason they are not doing anything. Nothing. They are promising. That's all you're getting. For five years all you get is promises*." *(Region 2, Demerara-Berbice, Mainstay, Male)*

> *"**You said you tried to talk to Digicel to have… Digicel and GT&T to have a tower or improve their services."** " We do request, we do request, but I don't know if this are pulled up or whatever, but we do request… But they don't answer. They didn't reply for the call." **" How long has this happened**?"" Let's say 6 months ago we did some requests and the previous administration said they also did some requests." (Region 6, Berbice-Oriental-Corentyne, Orealla, Male)*

1.2.6.3 Available Forms and Uses of Telecommunication Systems/Devices

Both access technologies, fixed line and mobile, are available in the country and to a different extend in the communities visited. The experience with dealing with the different devices and ICT infrastructure differs significantly from expert to expert in the communities.

1.2.6.3.1 Landline Phone

Existing in some communities for over 10 years, the telephone landlines are in the perception of business people in the communities "out of use". They were popular (but not necessarily available) in the decades of the 1970s and 80s, but can still be found in some locations today. Their use is intuitive and easy, even for those who have never had previous access to the device.

Landline phones are considered, as stated earlier, a form of cheaper communication than the form of communication used by the majority (cellphones). Moreover, it is attractive for some to have a technology to access Internet with services such as DSL, available in the capital Georgetown and selected other areas.

> *"(…) cheaper cost. As long as you have your landline, then you'll have access to Internet, Wi-Fi or whatever and if you don't have a landline, it's hard, because you can only have a little Internet on the smartphone…" (Region 6, Region 6, Berbice Oriental- Corentyne, Orealla, Male)*

In regions where a fixed line connection is available, it is a communication option when there are problems with the signal of mobile devices, in addition to providing the opportunity for sending and receiving fax.

In some places there are reports of theft of telephone cables to sell the copper illegally, without replacement of the stolen infrastructure by the operator, especially in Region 6.

1.2.6.3.2 Cellphone/Smart Phone

The use of cellphones, as mentioned above, is spread in all communities of Guyana. There are two types of devices: with no Internet support and with Internet support, so-called smartphones.

The largest portion of the population of the communities, especially the Indigenous People, own cellphones without Internet, which according to their perception has been present in the country for a longer time (since between 5 and 10 years ago) than the smartphone.

The advent of the smartphone has been more recent – from a few months (quote from Region 8) up to 3 or 4 years ago. According to respondents' statements, its use mainly attracts younger people who use the device as an information source (Google), means of communication (Facebook, IMO, Whatsapp, Instagram) and photography (cameras). Its use is more valuable – than ordinary cellphones – as it combines several use cases/forms of interaction, communication and information gathering in a single device.

The ease of using the smartphone or any new form of technology is determined by three factors: Interest, skills/knowledge and the physical access to the device.

Everyone interviewed would be able to learn how to use new forms of communication. This applies even to the older population, as perceived by the respondents, despite the fact that they might have less interest in learning, lower ICT skills (usage of the devices less often and having trouble understanding it).

1.2.6.3.3 Computers/Laptops/Tablets

Computers and laptops have been used in the communities for a long time, but are not widespread. Many devices are not working any more as they are seen of little use without a working Internet connection.

In some communities laptops were provided to families by the government (e.g. via the One Laptop per Family Programme), but many of them have been abandoned by the users and are not working any more.

Computers can most often be found in offices and some at homes in locations with better electricity and communication infrastructure, such as Region 1, for example.

The use of computers requires, according to the view of some respondents, greater specialization than the use of smartphones. So they see themselves depend on courses and learning, particularly aimed at older audiences, which have more difficulties in operating these types of equipment.

Respondents can see benefits in the use of computers at schools for education and for the information of children and young people. It would be a way to introduce younger audiences to a new technological environment. For businesses ICT devices have been seen as extremely useful, serving as a working tool.

One of the restrictions to usage of this type of device is the access to electricity. There are places where power supply is only available for a few hours a day and other communities where energy costs are very high as it needs to be produced locally. According to a resident of Region 2, the electricity in remote locations is much more expensive compared to the pricing level of Georgetown. This problem is exacerbated by the fact that in remote areas the population often has fewer financial resources compared to the capital. This limits the use of these devices in these regions further.

1.2.6.4 Desire for Different Forms of Communication

Most of the mentioned desires are related to the use of the Internet. Some respondents asked for more Wi-Fi hotspots, while others request services to simplify daily tasks as Mobile Money (banking application via Internet and mobile phone). They also would like to have smartphones with good quality cameras for taking photos.

There are two operators in Guyana that provide commercial mobile phone services: GT&T and Digicel. The service levels provided by both companies are rated as "poor" by most respondents: unstable, weak, expensive and no transparency about the charges and use of credits. Also, in some localities, there is only one of the operators with available service.

The lack of a competitive market environment (only two service providers), makes as per the interviewee's opinion, the consumers dependent on the services of those few providers, which don't seem to be engaged in improving the services. On top of this they are perceived as sometimes not aware of the cultural differences or even not aware of certain limitations of the consumers. One of the Indigenous People communities complained that Digicel requests proof of address to allow the purchase of the SIM cards in a community that has no defined addresses compared to the well named streets in the coastal areas. As the residents are not able to provide this kind of information, they cannot get the provider's SIM cards (Region 1).

Despite these negative statements by the interviewees, some residents see the market entry of Digicel, after years of monopoly by GT&T, as a kind of liberalization. They associate Digicel's image to "market opening", although they think that Digicel still provides a poor service.

The introduction of mobile service in the communities is considered a milestone in the development of the individual quality of life in Guyana, even considering the perceived poor quality of services offered.

1.2.6.5 Case Scenarios[37]

This exercise has shown that regardless of religion, gender or age, the Guyanese lack good service and act creatively and with great effort within their capabilities and limitations.

To market their products or promote their businesses, they recognize the importance of marketing and advertising. They advertise using flyers, business cards or distribute small gifts. They are already using Internet resources advertising on Ebay, Facebook, Youtube or specialized websites according to the business area. They promote through word of mouth in places with few inhabitants. In the hotel industry, they recognize an untapped potential of remote areas for tourism, but resent the lack of government support to advertise.

As there is a great lack of financial institutions in Guyana, respondents typically use services as Western Union or Money Gram when available (greater access in coastal areas) to transfer money. Often they have to travel great distances to get to these institutions or risk losing their money by using somehow unreliable intermediaries to transport the money.

To receive news about the government it requires reading newspaper or news sites on smartphones. There are respondents in such remote locations, however, who need to wait up to a whole week until they get access to the printed news as the smartphone usage is not possible.

All the suggestions given were well received, especially in places where there is a shortage of opportunities to study, banking and other access to information. Respondents highlighted and proposed other uses for Internet in the community, such as applications with regional information and chat to exchange local information, surgery monitoring in different places of the world for medical improvement, or even live follow-up through the Internet of parliament debates and activities.

In the view of the respondents the Internet would improve business, help to advertise goods and services, connect consumers not only of a region, but the country as a whole. For farmers, the online contact with the veterinarian would avoid travel time and often the loss of animals.

These technological innovations, however, require learning and a certain level of education and especially demands for a stable and fast enough Internet connection. In addition, there should be a monitoring of the

[37] Note: the analyses were done considering an overall view, the quotes are displayed by topics as a way to highlight the aspects taken into consideration.

infrastructure in relation to technological development. Today some interviewees mentioned already using e-commerce for shopping, but delivery is slow and often costly because of the difficulty of logistics.

1.2.6.5.1 E-Commerce

„I have no computers yet on the resort and I plan to promote it trying to reach the tour operators across the country in the Suriname with some flyers, business cards, you know, because marketing is very important. And that is why the Internet, the Wi-Fi or whatever, you know, all these things will be very important to the business.“ (Region 6, Berbice-Oriental-Corentyne, Orealla, Male)

„I use Tripadvisor and another one that somebody recently told me about… it's not in my mind, but he said he's gonna link us up… so, I'm looking wherever you can link, so they know you exist so you can get clients here." (Region 2, Demerara-Berbice, Mainstay, Male)

"Now imagine the possibility of a government-run website that enables you to trade your goods on a national (or international) platform online. How do you feel about this?"

"The online is not bad, but if the system is working perfectly. Then, you can go ahead with it." (Region 2, Demehara-Berbice, Charity, Male)

"That would be nice, if I could go to the Internet, access it from here, saving money, time. Maybe I could do all of that here. (Region 9, Essequibo-Demehara, Aishalton, Female)

1.2.6.5.2 E-Banking

„Like I'm saying, for me to send money to Georgetown or any other part within region 1, the only available medium in terms of money transfer, we're talking in the region itself, right? It's the post office. But there's a post office at two of the sub-regions, in Mabaruma there's a post office, there's a post office in Port Kaituma, I don't think there's any post office in Matthews Ridge, so in case I need to send money there, I got to send it with somebody. That person, I trust them to send it, what if they don't carry the money to the receiver. There's no guarantee. That's a risk…" (Region 1, Barima-Wani, Port Kaituma, Male)

"Now imagine the possibility of transferring money via cellphone deposit. How do you feel about this?"

"Perfect idea" (Region 2, Demerara Berbice, Charity, Male)

"*It would be easier for me. I'd save time and that is also expensive to go Lethem, you know, go and come back. It would be less expensive." (Region 9, Essequibo-Demerara, Lethem, Female)*

"That's a great idea, but you see the thing about MobileMoney, I don't think that GT&T has taken the time to actually sensitize and educate persons on actual service, so I'm thinking of persons that might be willing to use their service, but because they don't get the time to educate the people on the service, you don't find people using their service." (Region 1, Barima Wani, Mabaruma, Male)

"Yes, I heard GT&T has this money something, mobile money. Which this service provides. But the GT&T came here and the Toshao said we already have a service. It is just bad. I'm not 100% sure, but what I was told is they came and were turned away. I don't know how true that is." (Region 9, Essequibo -Demerara, Aishalton, Female)

1.2.6.5.3 E-Government

"Well, because of smartphones, there's an app for everything you need, so I usually use this News 2 Go app and that would… I mean, the beauty of News 2 Go is that you read articles from all the major newspaper, the Guiana Times and things like that." (Region 1, Barima Wani, Mabaruma, Male)

"We used to get the information like this when we had the Internet. It was easier for us to go to the Internet and see the news. We had the learning channel, so when it was on, we used to see the news every day, like 7pm to 8pm." (Region 9, Essequibo -Demerara, Karasabai, Female)

"Now imagine the possibility of receiving this information or contacting governmental or public authorities (to register a new-born, apply for marriage, etc.) online. How do you feel about this?"

"That's a major development. The system in Guiana is broken because you may not believe me but I know persons here who are almost 60 and 70 who were born in this country and don't have a birth certificate, for one reason or another, but if that could be done or be extended online, that would be very good. I think it would be more efficient persons could stay right here, they don't have to travel to Georgetown." (Region 1, Barima Wani, Mabaruma, Male)

1.2.6.5.4 E-Learning

"*Well, that's very difficult, because of Internet access. Like I have said to you even with 4G to do a course, I mean, on the cellphone would (unintelligible) but they would have the Internet still, on the laptop, we have persons doing such, but that's because they already have an established Internet source, what… it's not popular here, not because we don't have persons with intellectual ability to further their study, or even to develop what we already know, but it's all about the availability of an Internet source. (Region 1, Barima Wani, Port Kaituma, Male)*

"I'd need to go to Georgetown. I went to Georgetown and did the exams online. But it was costly and I couldn't complete it. I had other commitments. If I had good Internet access here I'd continue studying. Instead of leaving home… It costs a lot to travel and sustain yourself in the city. I'm studying accounting. I started in 2010 and stopped at 2011. I wrote to 2 exams and studied 4 papers." (Region 9, Essequibo -Demerara, Aishlaton, Female)

"Now imagine the possibility to get a degree from anywhere for yourself online. How do you feel about this?"

"That would be better, easier for us. Most of our young people would use it." (Region 9, Essequibo -Demerara, Aishlaton, Female)

"*Online studying. There is one or two universities in Georgetown that actually teaches you US programs, most of the persons in Guyana, most of the students were actually at overseas universities. We're in touch by online system" "One was a lack of access to computers at that time... Finances, basically." (Region 6, Berbice Oriental-Corentyne, West Canje, Male)*

1.2.6.6 Cultural Identity and Belonging[38]

When describing their cultural identity, some respondents draw up a clear division: first and foremost they present themselves as Guyanese. Then they present their cultural heritage whether they are Indigenous People, Indo-Guyanese, or Afro-Guyanese. They are proud of their history and proud of their country.

Politics is a matter that does not please many of the interviewees. Many attribute a social split and lack of unity among Guyanese to the political scene.

Among those who wanted to talk about the government, it could be seen an optimism about the new government and a demand for greater attention by the authorities among Indigenous People.

Almost all respondents see themselves as Guyanese because they were born in Guyana. They consider their hospitality and their food as identity marks.

[38] Note: the analyses were done considering an overall view, the quotes are displayed by topics as a way to highlight the aspects taken into consideration.

1.2.6.6.1 Cultural Identity

„As a Guyanese. That's it. I'm Guianese, we are a people of six races." (Region 1, Barima Wani, Port Kaituma, Male)

"Yeah, I was born in Guyana, but my ancestors came from India, so they are Indian ancestry, so we are Indo-Guyanese. Like, you have the Blacks, they are Afro-Guyanese. The only true indigenous people here is my friend, the captain. But we have a lot of mixture in here too, because we are so close to the coast, you know… and in any part in Guyana they have a lot of mixture. Before time, you couldn't go to a community like this without permission… now, you can go to any community in Guyana without permission." (Region 2, Demerara Berbice, Mainstay, Male)

"I'm Guyanese, because I was born and grew up here. "What else?" I have my Guyana ID card. I'm proud to be a Guyanese." (Region 9, Essequibo-Demerara, Karasabai, Female)

1.2.6.6.2 Government and National Identity

"What I have seen over the years, like, within my country, politics has divided us. Politics has divided us." (Region 1, Barima Wani, Port Kaituma, Male)

"Sometimes we feel left out because of the distance. But now they are coming a lot, yes, but they are coming to tax us, they never used to tax us before. Now we have to pay taxes. That is how they are making us feel that we belong to the country (person laughing). We need to pay taxes. Sometimes they tend to forget us. The money comes to us once a month. Sometimes you need to wait 1 month for the government workers to the supply for the government workers. "So they make you feel Guyanese making you pay taxes?" Yes, but this is a bad way, because not many people are employed in the village." (Region 9, Essequibo-Demerara, Aishalton, Female)

1.2.6.6.3 Guyanese Unity

„Yes. There's the racial part of it. Black and Indians, they are segregating each other." (Region 2, Demerara Berbice, Charity, Male)

"I don't know. Cricket." "Is there any special food or celebration?" "The Amerindian Heritage." "But this is only related to the Amerindian people, what about something for the whole country?" "The Guyana Independence." (Region 8, Demerara-Mahaica, Nappi, Male)

1.2.6.6.4 Infrastructure and Identity

"Yes, yes, because from communicating that is how you would get persons united, from talking to somebody. Relationships could be built like that. Maybe if you had a bad thinking of another race, after speaking and communicating with that person you could see that person is different. Because sometimes the parents of the children would tell them not to talk with the other people, so they grow having fear. Sometimes that is what they teach to their children." (Region 9, Essequibo-Demerara, Aishalton, Female)

1.3 As-Is Analysis Technical Infrastructure and Services provided

This chapter the perspective of the service providers offering ICT services and providing infrastructure within the country.

1.3.1 Introduction

The objective of this network and capacity as-is analysis is to obtain information regarding the existing telecommunications networks in Guyana and to analyze them in terms of the requirements of the project.

The analysis is based on a structured multi step approach, including a questionnaire for guided interviews to collect reliable and comparable information.

Several operators provide telecommunication networks and services within the country, e.g.:

- GT&T: former incumbent, operates fixed and mobile networks
- Digicel: operates a mobile network
- E-Government Unit: operates fixed and mobile networks accessible only for government units
- Several providers offer satellite based IP-based services (Internet and VoIP-telephony):
    - IMON Wireless Solutions (http://www.imon-gy.com)
    - E-Networks (using WiMAX technology) (http://www.ewirelessgy.com)
    - Broadband Satellites (www.bbsatellites.com)
    - I-NET (http://www.inet.gy)
- Broadband solutions available in Brazil are used in border regions of Guyana to extend these services into the national territory

Image 218 – Promotion for brazil-originating Internet at Ogle Airport

It needs to be emphasized that all commercial service provider contacted highlighted their concerns in sharing internal information with the project team. The reason given by them is that they perceive the e-Government Unit as a competitor in developing platforms for basic ICT infrastructure in the highly populated coastal areas of Guyana (where commercial service providers already operate their own networks) and eventually extending them to the public in the future, fearing that a 3rd mobile license might be given to e-Government unit.

1.3.2 Overview Technical Infrastructure

Information about the technical infrastructure was whenever possible collected in individual interviews with representatives of the companies and organizations listed in 1.3.1. If the companies and organizations have not provided certain information, additional research via the respective websites was undertaken. The information displayed and analyzed in this report reflect the status as of 1st of September 2016. The overall aim of this report is to give an indicative overview of services provided and the respective price ranges. The report makes no claims to completeness and exhaustiveness.

The general data regarding access to ICT services in Guyana show that penetration of households with wireline services (PSTN) is at level with the average of Latin America and the Caribbean Countries. Whereas population penetration with wireless services with 75 % (EoY 2015) is significantly lagging behind the regional average (119% EoY 2015).[39]

[39] Source: Telegeography 2016
Countries considered for Average of Latin America and the Caribbean: Anguilla, Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Curacao, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto

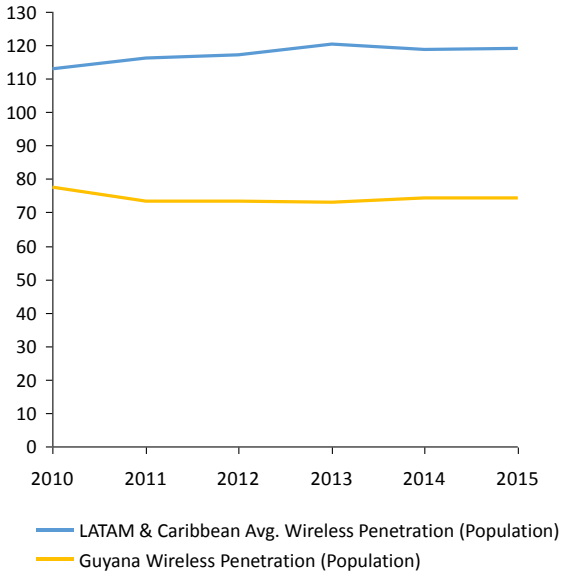


Image 219 - Wireless Penetration in Guyana (in % of total population)

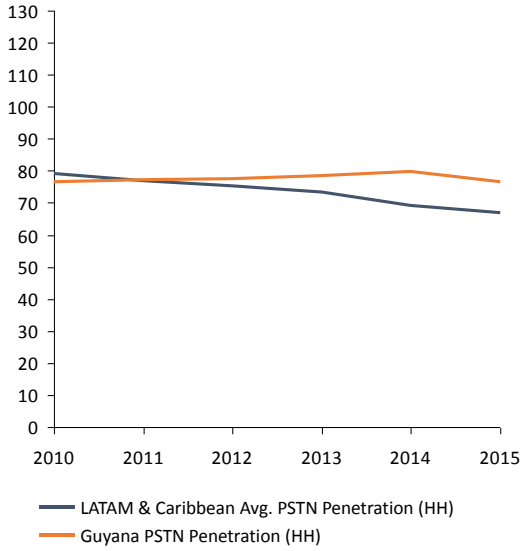


Image 220 - PSTN Penetration in Guyana (in % of total Households)

1.3.2.1 GT&T

GT&T Guyana operates as a full service provider in Guyana, since 1991. It was founded in 1990 with a joint contract between Government of Guyana (GOG) and Atlantic Tele-Network (ATN). ATN purchased 80 percent of the issued share capital and the GOG retained 20 percent of the company[40].

The interview has been conducted with Mr. Justin Nedd, CEO of GT&T.

Guyana Telephone and Telegraph (GT&T, rebranded as GTT+ in late 2015), controlled by Atlantic Tele-Network (ATN), has a monopoly over fixed-line services, but it competes with Digicel in the mobile market.

GT&T's fixed-line monopoly was renewed for 20 years in December 2010, but before renewing it the government drafted a new Telecommunications Amendment Bill willfully to open the telecom sector to competition. The plan to amend the bill was abandoned in September 2011 shortly before the national elections, but is being taken up again and presented to the National Assembly. This time benefiting from inputs from both GTT and Digicel. It includes provisions to set up an Universal Services Fund through a tax on telcos' revenues.[41]

GT&T has been granted the only license to operate an international gateway. The license is valid until 2030.

As main challenges for their operation in the country the following points have been raised:

- High taxation level for telephone companies and high level of fees to the different agencies

Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Saint-Martin, Sint Maarten, Suriname, Trinidad and Tobago, Uruguay, Venezuela, Virgin Islands (U.K.), Virgin Islands (U.S.)

[40] Source: http://gtt.co.gy/why-gtt/about-us

[41] Source: https://www.budde.com.au/Research/Guyana-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses

- Complex and extremely time consuming processes to obtain permission for building new base stations in the country from public bodies.
- Uncertainty about the market development and the specific role of e-Government Unit as a government funded infrastructure provider in this environment.
- Existing legislation in the field of telecommunication is not fully applied.
- Lack of skilled workforce in Guyana.

1.3.2.1.1 Network information

GT&T operates both fixed line network to supply customers in Guyana as well as a mobile network (including HSPA+, which is marketed as 4G to customers).

Additionally, GT&T operates together with Suriname Operator Telesur the Suriname-Guyana Submarine Cable System (SG-SCS) linking Trinidad&Tobago, Guyana and Suriname[42].

Infrastructure is mostly provided by hardware partners Ericsson and Cisco.

The current network capacities are adequate for handling the actual traffic load. But as data usage is increasing the traffic load will significantly grow in the future. GT&T aims to expand the network and to increase capacities constantly in order to meet the future demand.

150 power generators are in operation all over the country to provide power to local infrastructure.

1.3.2.1.2 Services currently provided

Basic fixed and mobile services are provided to Consumers and Business Customers as well as Add-on Services.

1.3.2.1.2.1 Fixed-Line Service

The consumer prices for GT&T landline plans consist in a one-time fee for installation and a monthly recurring rental fee. Voice minutes are charged separately depending on the amount consumed. All Prices are in GYD:

Main line installation	Monthly Rental
500$ per line for the first two lines	500$ per line for the first two lines
2,000$ per line for the third and all subsequent lines	1,000$ per line for the third and all subsequent lines

Costs per minute are as follows, based on the example of a call originating in Georgetown (from the Georgetown telephone exchange):

Destination	Peak-Rate	Off-Peak Rate
Georgetown	0.60	0.30
Cove & John	3.00	2.00
Timehri	4.00	3.00
Anna Regina	5.00	4.00
Lethem/Linden	7.00	5.00
Cellular	12.00	12.00

For further information see appendix.

[42] Source: http://www.kaieteurnewsonline.com/2010/01/07/gtt%E2%80%99s-submarine-cable-operations-start-today-to-bring-cable-to-shore/

To use the Internet, the following rates apply for private land-line customers:

Plan	Speed	Monthly Price in GYD
Bronze	1.5 Mbps	4,999$
Silver	5 Mbps	9,980$
Gold	10 Mbps	14,979$

For business customers the following rates apply:

Plan	Speed	Incl. e-Mail Addresses	Monthly Price in GYD
Bronze	1.5 Mbps	5	9,999$
Silver	5 Mbps	10	19,999$
Gold	10 Mbps	20	27,999$

On top of these basic services, additional services like voice mailbox, conference calls, caller ID etc. can be added for a monthly nominal fee[43].

1.3.2.1.2.2 Mobile Services

For pre-paid Services the general price per voice minute is 26.00 GYD for domestic calls as well as calls to the USA and Canada. Additionally several pre-paid bundles exist, that provide a specified amount of voice minutes and SMs at discounted prices:

Smart Talk local pre-paid Mobile Services			
Validity after purchase	**Costs [in GYD]**	**Minutes**	**SMS**
1 day	180$	10	10
3 days	360$	20	20
7 days	720$	40	40

Data (Internet) can be added at the following costs[44]:

Plan Name	Monthly Rate	Quota	Features*	Coverage
Daily Social Plan	$199	Unlimited	Free Facebook and WhatsApp	Local
Daily Plan	$220	80 MB	Rollover data	Local
Daily Plan Extended	$300	140 MB	Rollover data	Local

[43] Source: http://gtt.co.gy/shop/landline/plans

[44] Source: http://gtt.co.gy/shop/mobile/mobile-plans

3 Day Plan	$499	300 MB	Rollover data, free Facebook and WhatsApp	Local
Weekly Plan	$999	800 MB	Rollover data, free Facebook and WhatsApp	Local
Monthly Plan	$2,299	2048 MB	Rollover data, free Facebook and WhatsApp	Local
Monthly Plan Extended	$2,999	3072 MB	Rollover data, free Facebook and WhatsApp	Local
Shared Family Plan	$3,499	3072 MB	Rollover data, free Facebook and WhatsApp	Local

Postpaid plans are as follows:

Post-Paid Voice:

Plan Name	**Monthly rate in GYD**	**Included Minutes**	**Included SMS (local/int)**	**On-Net Call Rates**	**Coverage**	**Additional Features**
Basic	$999	50	25	$17.40	Local	Rollover and Free Minutes
Standard	$2,999	150	50	$16.24	Local	Rollover and Free Minutes
Gold	$4,999	250	100	$15.08	Local	Rollover and Free Minutes
Premium	$7,999	500	200	$13.92	Local	Rollover and Free Minutes

Data / Internet is priced as follows:

Name Plan	**Monthly rate in GYD**	**Included Data (MB)**	**Additional Data Price**
Chat	$1,999	2048	$0.005 Out-of-Plan Rate per KB
Social	$2,999	3072	$0.005 Out-of-Plan Rate per KB
Connect	$3,999	4096	$0.005 Out-of-Plan Rate per KB

Professional	$4,999	6144	$0.005 Out-of-Plan Rate per KB

GT&T does not charge extra for usage of the 4G network capacities, i.e. faster Internet connection, if available[45].

Mobile devices sold by GT&T reach from simple cellphones at affordable prices to high end smartphones: The "Plum Slick" is the cheapest available cellphone at a price of 3,250 GYD. It allows basic services such as, voice services, SMS, Bluetooth, FM radio, and MP3 / MP4. At the top range of devices there are the Samsung Galaxy S6 at a price of 129,999 GYD or the Apple iPhone 6 Plus at a price of 149,999 GYD (including one month of free data).

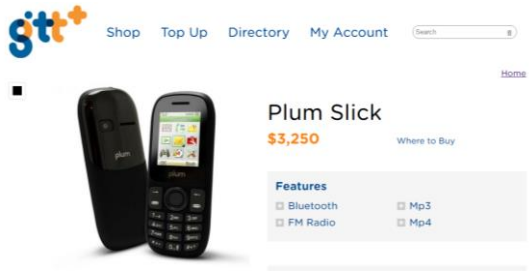


Image 221 - GT&T Mobile Device Portfolio (example low-end device)

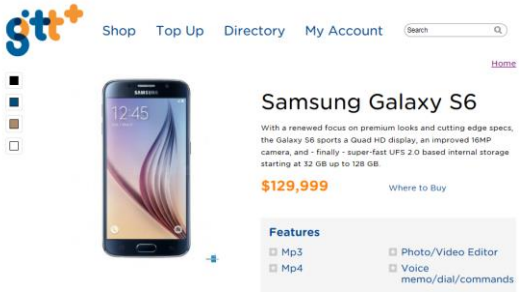


Image 222 - GT&T Mobile Device Portfolio (example higher-end device)

Image 223 – GT&T Mobile Device Portfolio (High-End & Low-End Exaples)

1.3.2.1.2.3 Add-On Services

GT&T provides a payment services, called "Shop'n Go" that is being used not only to pay for GT&T services but also includes payments for 3rd parties as well as offering "Send&Receive Money" within the country[46]

[45] Source: http://www.stabroeknews.com/2016/news/stories/05/09/gtt-launches-4g-service/

[46] Source: http://mmg.co.gy/

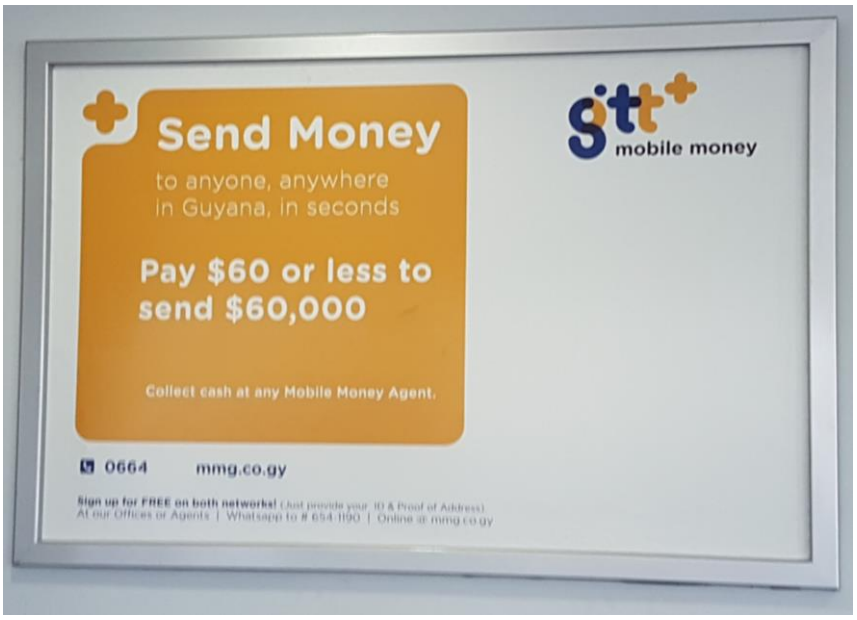


Image 224 - Advertisement for the Mobile Money Transfer Service (Send & Receive)

This financial service falls under the regulation of the Financial Institutions Act.

1.3.2.1.3 Coverage

GT&T claims to provide the largest coverage for fixed Internet. Currently region 1 is not covered by GT&T neither with fixed nor with mobile services.

Coverage maps for fixed and mobile services are not available on their website and haven't been provided yet by GT&T.

1.3.2.2 DIGICEL

In 2007 Digicel group acquired U*Mobile and rebranded it to Digicel Guyana. Since this year Digicel operates a mobile network in the country, currently covering, as stated by the Regional CEO, 98% of the population.

Interviews have been conducted with the Regional CEO, Mr. Gregory Dean, the CEO of Digicel Guyana, Mr. Kevin Kelly and the CTO, Ryan Sinclair.

As main challenges for their operation in the country the following points have been raised:

- High taxation level for telephone companies and high level of fees etc., resulting in Digicel Guyana having the highest costs compared to all national companies of Digicel operating in other countries.
- Complex and extremely time consuming processes to obtain permission for building new base stations in the country from public bodies, involving multiple agencies that would need a better alignment.
- High interconnection fees for international communication and data services
- Lack of surface rights to install needed infrastructure and effortful process to gather required permissions from the land owners[47].
- Uncertainty about the market development and the specific role of e-Government Unit as a government funded infrastructure provider in this environment.
- Uncertainty about future evolution of regulatory framework.

1.3.2.2.1 Network information

[47] Mining companies currently need to give permission for installations and tend to handle this without any priority, delaying needed installations.

Digicel operates their own towers and transmission network needed to connect these towers. Only in very remote areas, towers are connected via satellite. 900 and 1800 MHz are used for GSM services, 850 MHz for LTE services. It is planned to extend the service using the 700 MHz spectrum for LTE services.

Main supplier for hardware as per group directive is Ericsson and Cisco (IP services).

1.3.2.2.2 Services currently provided

Digicel currently provides mobile services to Consumers (B2C) and commercial customers (B2B) in both payment options: pre-paid and post-paid.

1.3.2.2.2.1 Pre-paid in the national networks

Pre-paid standard rates for voice minutes & text messaging in Guyana Dollars (as of Sept. 1st, 2016)[48]:

Destination	Peak	Off-Peak
Calls to Digicel mobiles	30.86	27.34
Calls to non-Digicel phones	33.64	31.32
Texts to Digicel mobiles	11.60	11.60
Texts to other mobiles	11.60	11.60

Prepaid standard data rate

Service	Rate (per KB)
Data Usage	1.0

Special data plans can be added to reduce the standard data rate[49]:

4G Data Plans				
Plan	Costs (GYD)	Minutes incl.	Data incl.	Text Messages incl.
Daily	350,00	0	80 MBs	0
Daily Plus	450,00	10	100 MBs	10
3 Days	700,00	20	300 MBs	20
Weekly	1400,00	30	700 MBs	30
Weekly Plus	1700,00	40	1024 MBs	40
Monthly	3800,00	80	2048 MBs	80
Monthly Plus	5000,00	100	3072 MBs	100
2G Data Plans				
Plan Duration	Costs (GYD)	Minutes incl.	Data incl.	Text Messages incl.
1 Day	280,00	0	120 MBs	0

[48] Source: https://www.digicelgroup.com/gy/en/mobile/plans/prepaid-plans.html

[49] https://www.digicelgroup.com/gy/en/mobile/plans/prepaid-plans/data-plans.html

2 Days	500,00	0	300 MBs	0
1 Week	1100,00	0	900 MBs	0
1 Month	2800,00	0	2355 MBs	0
Quarterly	8000,00	0	6144 MBs	0

In addition special roaming plans and rates exist.

1.3.2.2.2.2 Post-Paid rates in the national networks

Pre-paid standard rates for voice minutes & text messaging in Guyana Dollars, excl. VAT. (as of Sept. 1st, 2016)[50]:

Plan Name	**Monthly Fee**	**Cost per minute (off-peak)**	**Incl. voice minutes**	**Incl. text messages**
Digicel Select 150	3,300.00	22.00	150	10
Digicel Select 200	4,000.00	21.50	200	20
Digicel Select 300	5,800.00	20.00	300	30
Digicel Select 400	7,000.00	19.00	400	40

For post-paid customers the following data plan options exist:

Plan name	**Data Allotment**
Select 75	800 MB
Select 150	1 GB
Select 200	1 GB
Select 300	1 GB
Select 400	1.2 GB
Select 1000	1.5 GB

1.3.2.2.2.3 Handsets

Currently, Digicel Guyana sells different mobile phones. Basic phones like the BLU Zoey II in a price range from about 4,900.00 GYD and Smartphones like the Huawei Ascend Y221 for 15,000.00 GYD or the Alcatel Idol Alpha for 65,000.00 GYD. In addition Digicel sells proprietary Smartphones like the Digicel DL1 Plus for 38,000.00 GYD.[51]

In the future it is planned that Digicel Guyana becomes a full service provider for ICT solutions, meaning they will offer fixed line services like telephony, Internet and triple-play bundles (including TV) as well. Digicel Jamaica is already offering these kind of services.

1.3.2.2.3 Coverage

[50] Source: https://www.digicelgroup.com/gy/en/mobile/plans/postpaid-plans.html

[51] Source: https://www.digicelgroup.com/gy/en/mobile/devices/handsets/smartphones.html

As stated by the CEO, Digicel Guyana is currently covering 98% of the population of Guyana:

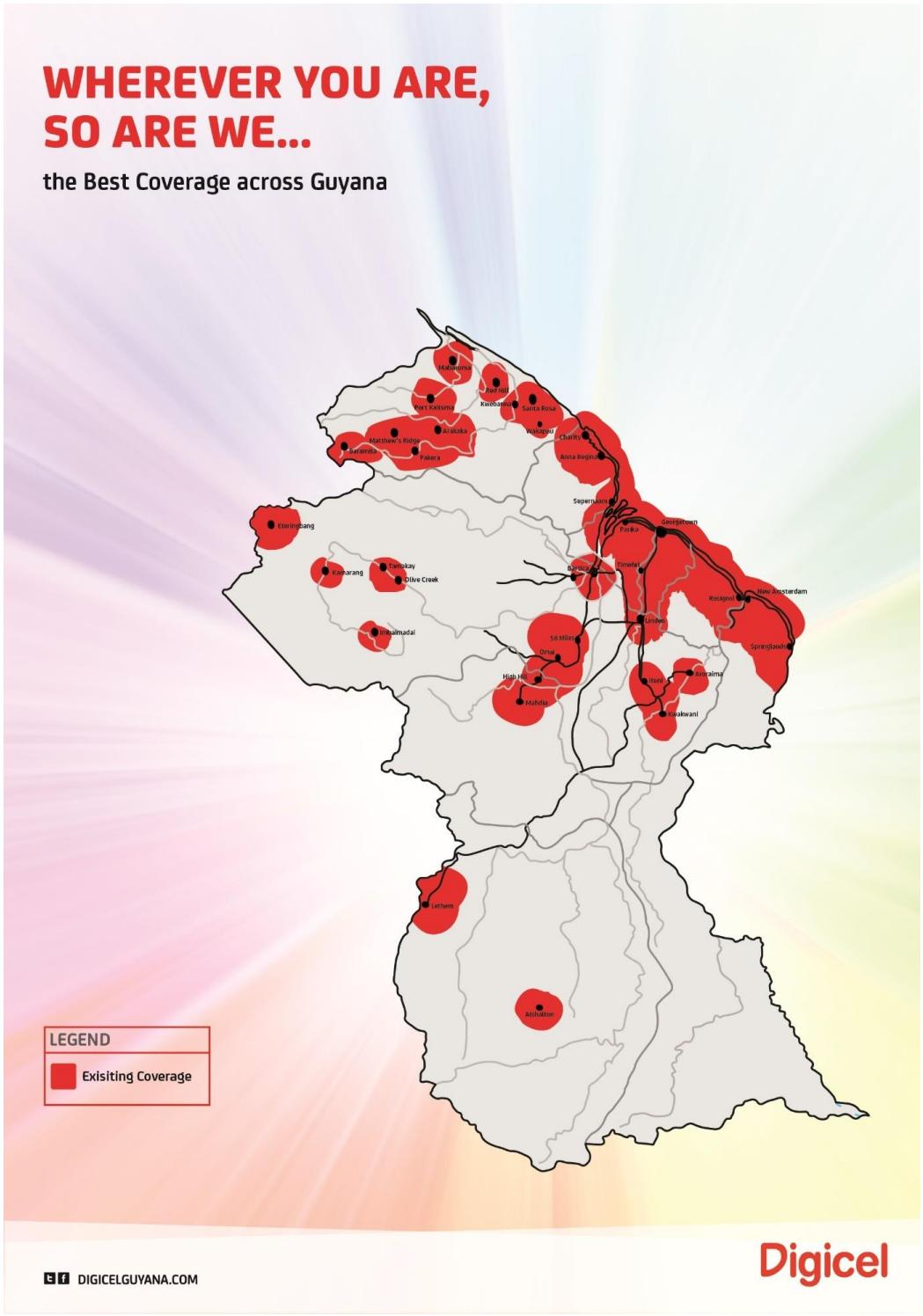


Image 225 - Coverage map of Digicel Guyana (as of July 2015)[52]

[52] Source: Digicel Guyana

1.3.2.3 I-Net

I-Net has been selected as an example for Internet and communication service provisioning via Satellite. An interview has been conducted with the CEO of I-Net, Mr. George Melville.

1.3.2.3.1 Network information

Connectivity is provided via the Ku band on EUTELSAT 8 West A satellite, covering 100% of Guyana.

The termination of the IP traffic will be done at their earth station in the USA.

1.3.2.3.2 Services currently provided

They provide basic Internet connectivity and additional VoIP[53] based telephony services.

For basic Internet connectivity, currently eight different packages are offered:

Basic	Bronze	Silver	Gold
$7,999	$10,999	$16,999	$33,999
512 Kbps Download	1024 Kbps Download	2048 Kbps Download	4,096 Kbps Download
1 GB Data Cap	256 Kbps Upload	256 Kbps Upload	512 Kbps Upload
96 Kbps Upload	2 GB Data Cap	5 GB Data Cap	8 GB
SignUp	SignUp	SignUp	SignUp

Diamond	Platinum	Iridium	Tungsten
$41,999	$74,999	$99,999	$140,000
6,144 Kbps Download	10,240 Kbps Download	10,240 Kbps Download	10,240 Kbps Download
512 Kbps Upload	512 Kbps Upload	512 Kbps Upload	512 Kbps Upload
10 GB Data Cap	25 GB Data Cap	35 GB Data Cap	50 GB Data Cap
SignUp	SignUp	SignUp	SignUp

Image 226 - Overview of packages offered

The telephony services are offered on a reselling model. This means that I-Net sells a bundle of voice minutes to a local reseller who then sells loaded scratch cards to the end customer.

I-Net provides the hardware that is required at the point of usage to provide this VoIP services: Customers can use I-Net- services via "rentals" at GUY $25,000 per month (US $120), on a 3 year contract. This covers all the necessary equipment: VSat, LMB, Modem, Cables etc. Alternatively, customers, respectively communities, can purchase the devices from I-Net for GUY $260,000 (US$ 1,120). This covers all the necessary equipment: VSat, LMB, Modem, Cables etc. Once the VSat unit is installed, customers will then choose which bandwidth package they wish to use.

[53] VoIP=Voice over IP

Image 227 - VoIP Device

Image 228 - Scratch card (front side)

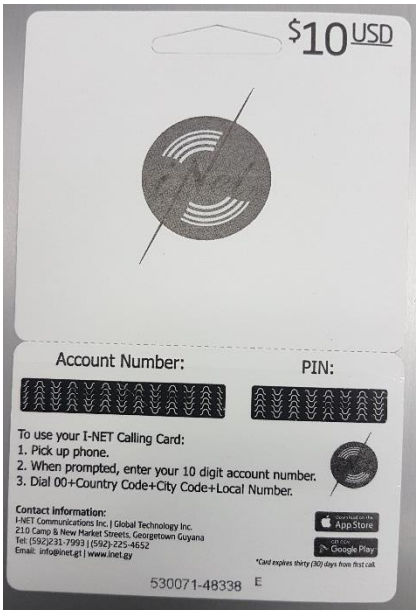


Image 229 - Scratch card (back side)

The technical handling including call termination via their hub in the USA is being operated by I-Net.

1.3.2.3.3 Coverage

Due to the usage of satellite connectivity, 100% of the country can technically be covered, as long as electricity is available in the respective area.

Image 230 - Coverage provided by I-NET[54]

[54] http://www.inet.gy/inet/terrestrial-coverage/

Services are currently provided in the following communities all over the country:

Image 231 – Communities using I-Net service as of September 2016

1.3.2.4 E-Government unit

The Government of Guyana (GoG) in collaboration with the Government of China (GoC), through Huawei Technologies Co. Ltd., jointly constructed the nation's e-government network. The functions as an essential enabler for Government to enhance its social influence and to contribute to continued prosperity of the country. The project was designed to meet current communication requirements and lay a solid foundation for future service evolution.

The Interview has been conducted with the CTO, Mr. Shaka Dow.

It has to be noted that the e-Government network doesn't fall under the current regulation in the country compared to the commercial operators as they are not providing services to the Public, in accordance with their mission statement: "Our mission is to develop and implement appropriate ICT solutions that will transform the delivery of Government services."

1.3.2.4.1 Network information

E-Government operates fiber, microwave links and LTE-access deployments:[55]

The e-Government network currently comprises a "capital ring"-network, microwave links, and a LTE access-network:

Georgetown – Fiber Ring ("capital ring")

The capital ring currently includes a fiber optic infrastructure that spans the geographic locations that encompasses 27km of fiber and is part of a network structure that delivers sufficient bandwidth for access

[55] Source: Information provided by e-Government unit

nodes and avoids single point failures. It encompasses four (4) core sites (Dolphin Secondary School, Transport Sports Club, University of Guyana and Castellani House) and one node site (National Frequency Management Unit - NFMU) with redundancy (see attached image) that eliminates service interruption caused by networking issues.

This ring provides a dedicated network for the government that can easily construct and maintain its official website and implement a business information platform.

The Transport- & Access-Network

The eGovernment's transport network consists of 54 towers, inclusive of four (4) core sites, a Data Center in Georgetown, 48 microwave links and an outside plant (OSP) comprising of East West and South chains totaling 54km of optical fiber. The LTE sites extend from Georgetown east to Skeldon, west to Parika then to Charity via a microwave link from Tuschen to Aurora on the Essequibo Coast. These sites themselves, are connected by microwave links node, and are limited to a maximum capacity of 360 Mb/s. While the microwave backhaul is capable of delivering 150 Mb/s per LTE towers.

Additionally, the unit is currently assessing the possibilities to provide VSAT services in several Amerindian villages, i.e. Mahdia, Annai, Lethem, Mabaruma, Kwakwani and Masikenyari. Minimum bandwidth requirements are 1mbps for the downlink and 512 kbps for the uplink.

1.3.2.4.2 Services currently provided

E-Government unit provides Government to Government (G2G) services for several ministries and state agencies.

Ministry of Business

E-Government unit supplies the network infrastructure in order to provide interconnectivity between certain locations of public bodies and one or more of the eGovernment network nodes. The network is operated on fiber to the Premises (FTTP) or/and LTE, allowing for communication within and across these ministries/agencies:[56]

- Commercial Registry
- Deeds Registry
- Land Registry
- Guyana Revenue Authority
- National Insurance Scheme
- Central Housing and Planning Authority
- Guyana Lands and Surveys Commission

Ministry of Finance

The MOF currently is expanding a wide area network (WAN) microwave infrastructure that spans several GoG ministries and departments. It furthermore provides access to the Integrated Financial Management and Accounting System (IFMAS) business solution via a direct virtual private network (VPN). With the fiber optic backbone infrastructure the MOF can now leverage the use of the system across the capital ring to integrate a faster and more secure network connectivity across ministries and Agencies.

[56] Currently ongoing project, expected to last 3 years until implementation finished

For the implementation of the WAN and VPN following ministries were selected for pilot testing and are connected by now:[57]

- Ministry of Finance
- Ministry of Education
- Ministry of Public Health
- Ministry of Public Security

Maritime Administration Department (MARAD)

The Maritime Administration Department is the primary organization for maritime policy and administration for the Government of Guyana. It performs several important functions: ship registrations, ship inspections and certifications, port state control functions, port security, implementation of international conventions and the examination and certification of seafarers. In addition the activities conducted by the MARAD are prerequisite to bring Guyana into compliance with international maritime requirements regarding the documentation of seafarers and the tracking of seafaring activities.

It is intended that the connection will support the goals of MARAD's mission as it requires ICT specialized solutions which will enable the workforce to efficiently collaborate. This process will also entail the restructuring of the existing IT workforce and incorporate a change management process to promote effective and efficient customer-focused service delivery.

All Ministries and Agencies

Ministries and Agencies are supported in the performance of their duties and responsibilities through the infrastructure and services provided by the eGovernment Unit. The central provisioning of colocation services hosted on eGovernment facilities and provided via the eGovernment transport network allows saving of costs by maintaining large and shared computing facilities while keeping availability high, e.g. by using a defined and shared disaster recovery procedure/technologies. Colocation facilities provide space, power, cooling, and physical security for the server; space in the facility is available for leased by rack, cabinet, cage or room.

Overview of other planned services and the respective projects under the responsibility of the e-Government unit:

Name of Project	Description	Target group
Citizens' Issues Reporting Solution "Tell Us"[58]	"Tell Us" will connect citizens directly to the entities responsible for providing services and responding to their particular needs. The web or mobile based application will facilitate citizens' reporting of issues directly responsible agencies. This would significantly reduce transaction times, improve accountability of those agencies, and encourage citizens' leadership and feedback in the delivery of public services.	This project is expected to benefit the agencies themselves by providing a means for system wide monitoring platform that will aid efficiency and effectiveness. Citizens will be able to take ownership in the continued enhancement of Government services.

[57] The pilot testing has an incubation period of two (2) months, thereafter the remaining ministries and agencies will be phased in accordingly.

[58] The Project begun in April and is expected to be completed in October of this year 2016. It is expected that by the end of 2017 all Government agencies will be connected.

Citizenship and Immigration Information System (CIIS)[59]	Comprising two sub-projects - online passport application processing and online visa applications - this will modernize the Immigration Information and Processing Systems through Guyana and significantly reduce the costs related to these services. In addition the project will help to streamline the business processes related to these services and give clarity to the agencies involved in the delivery of the services.	In particular this will benefit citizens who reside in rural or hinterland communities and those in the diaspora. The current costs for these services to citizens is high and usual involves lengthy processing times, long travelling distances and sometimes unclear procedures. Moreover the authority responsibility will benefit from a centralized process.
Government Portal[60]	The Government of Guyana through its agencies provide a host of services to the public. Some of these agencies are not easily accessible and may have procedures that are not well known by the public. The Government portal is a project to provide a one stop clearing house for all Government services. The web and mobile accessible platform will provide information on the procedures for certain service and direct the user to the e-service centers of the respective agency where these exist.	Citizens, especially those in rural and hinterland communities are the primary beneficiaries. It is expected that citizens in the diaspora will also benefit and the Government of Guyana will accrue savings as a result of foregoing the costs of establishing outstations for some agencies as these services will not be e-based.
Community ICT Hubs[61]	This project is for the establishment of 24 community based public access ICT sites across Guyana (12 Hinterland & 12 Coastland), in the initial instance. The project involves building community relations and ownership of the spaces through the physical installation of the connectivity infrastructure, the provision of laptops and training of community members.	Citizens in the selected communities will be the primary beneficiaries of the project. It is expected that businesses, especially those in the identified communities, will be secondary beneficiaries.

[59] This project started in June, 2016 and is expected to be completed by the end of the first quarter in 2017.

[60] The project commenced in March, 2016, and is expected to be completed in the last quarter of 2016.

[61] This project is ongoing with the initial installations and commissioning expected in the third quarter of 2017.

Schools Connectivity[62]	The aim of this project is to connect 50 pilot secondary schools in the first instance into a private lease connection with the National Center for Education Research and Development. The connection will allow schools to can directly access a number of e-learning resources and to provide real time feedback to NCERD. Furthermore it will facilitate faster communication between NCERD and these schools and thus enable monitoring, reporting and problem resolving in the roll out of the Programme.	Students and teachers of the pilot schools are the primary beneficiaries of this project. NCERD is expected to gain useful information on its e-learning Programme to improve the expansion of the Programme.
Appoint Scheduling[63]	Generally, Government agencies see a large number of persons frequently because of the nature of their services. Usually this involves long queues. In an effort to improve the efficiency of these services and to reduce the costs for citizens, the Government of Guyana has embarked on a process to enable agencies to assign appointments thereby controlling both the intake flow and processing for services.	The passport office in Georgetown has been identified as the first agency to implement this system and will serve as a proof of concept for the scheduling tool through the public services sector.

[62] The Programme which begun in April, 2016, if is expected to be completed in September of 2016.

[63] The pilot project is expected to be implemented at the passport office in Georgetown within the third quarter of 2016 and implemented across other agencies in 2017

Image 232 - eGovernment unit's Could Service Infrastructure

Image 233 - eGovernment unit's ICT Infrastructure in Georgetown

1.3.2.4.3 Coverage

The current focus is on connecting government agencies along the coastline. Detailed information has been provided but has been declared as “confidential”. It is planned to extend the reach to the areas currently not covered by commercial service providers, where there is a certain need for communication services, but due to the remoteness or socioeconomics characteristics of these regions no commercial service offered.

Image 234 - ICT Infrastructure

To prepare for higher traffic loads, e-Government unit is collaborating with Guyana Power & Light Inc. (GPL)[64] to make use of the dark fibers in GPL's fiber network. The intention is to utilize GPL's spare fiber capacity to connect the LTE sites which are in close proximity to the existing GPL fiber route and assist GPL in expanding its connection to other commercial and operation centers. In utilizing GPL's spare capacity, it will form e-Government's fiber optic backbone or primary operational network. E-Government's microwave network in return will serve both GPL and eGovernment operational redundancy needs.

1.4 Regulation of Telecommunication

Several regulatory bodies currently exist in Guyana:

[64] The GPL franchise area encompasses the entire three counties of Demerara, Berbice and Essequibo. It is entirely owned by the Government of Guyana.[source: http://www.gplinc.net/about/history]

- **The Public Utilities Commission (PUC).** It operates under the Ministry of Public Telecommunications and has the following objectives:
    - To establish and enforce rules and procedures for the regulation of public utilities, commensurate with internationally accepted regulatory standards.
    - To promote and regulate the efficient long-term provision of utility services for national development consistent with Government policy.
    - To provide a fair environment conducive to business interest, investment in the public utilities sector, and the interest of consumers.
    - To investigate and seek to resolve in a timely manner complaints filed with the Commission against any public utility.
    - To carry out its functions in a fair, transparent and independent manner.
- **The Competition and Consumer Affairs Commission (CCAC).** It operates under the Ministry of Business and Tourism. Its mission is:
    - For the Consumer Affairs unit: to bring businesses into full compliance with the Consumer Affairs Act.
    - For the Competition Policy unit: to enforce the Competition and Fair Trade Act, i.e. that there is maintenance of a level playing field for all enterprises, and that they all compete fairly.
- **The National Frequency Management Unit (NFMU).** It operates under the Ministry of Public Telecommunications and has the following mission:
    - To efficiently and effectively manage the electromagnetic frequency spectrum and to administer the number blocks for Guyana; being proactive, customer oriented, transparent and keeping abreast with global technological developments in the telecommunications sector, thereby fostering an environment conducive for investment and where the deployment and use of ICTs can be optimized for the social and economic development of Guyana.
- **The National Data Management Authority (NDMA).** It operates under the Ministry of Public Telecommunications and has the following objectives[65]:
    - The development of computer systems in the Public Sector to satisfy its information needs.
    - The establishment of guidelines for the Public Sector for the recruitment, remuneration and general conditions of service of the personnel employed in data processing.
    - The development of training and manpower programs in order to ensure that adequately trained personnel is available for the efficient operation of computer systems.
    - The authorization of the acquisition of all hardware and software for the Public Sector.
    - The establishment and maintenance of reliable communication linkages in the Public Sector in order to achieve optimal utilization and deployment of computer resources.
- **The Private Sector Commission (PSC)** as the leading advocate for the private sector on articulated and shared positions on national issues which will promote socio-economic growth and development through the creation of strategic partnerships with the Government and other stakeholders. Its objectives are[66]:
    - To advocate for, provide leadership and promote activities and projects for all members and stakeholders that will create a platform to foster development in Guyana.
    - To partner with all members and stakeholders to develop and sustain plans for increasing the competitiveness of Guyanese products and Guyana within the CSME and the related global arrangements.
    - To collect and share information to better inform the Private Sector and society as a whole.
    - To work towards ensuring that proper systems of Governance and Security are in place to encourage investments.

[65] Source: National Data Management Authority Act

[66] Source: http://psc.org.gy/

- To create the environment necessary to encourage and facilitate harmonization among members and to continue to build alliances nationally, regionally and internationally, including the Donor Agencies.
- To work with all stakeholders to develop policies and procedures that will reverse brain drain and provide adequate training to better serve the needs of the country.

As the New Telecommunications Bill is expected to be passed within the next months, several changes to this regulation ecosystem are expected to happen, esp. with the **creation of a dedicated Telecommunications Agency**, into which the NFMU will be incorporated. As the technical regulator of the telecommunication sector in Guyana the new Telecommunications Agency will be responsible for matters as[67]:

- Implementing the Minister's policy directives
- Receiving, reviewing, and making recommendations on applications for licenses and frequency authorizations
- Advising and supporting the Minister on matters related to policy, licenses, spectrum and international relations
- Monitoring and enforcing compliance with licenses and frequency authorizations
- Managing the spectrum (plan, supervise, regulate, monitor harmful interference) and other technical aspects of telecommunications including numbers;
- Administering the Universality Fund and universal access/services

Also in the adjusted regulatory ecosystem the **Public Utilites Commission (PUC)** will continue to present the economic regulator, standing next to the Telecommunication Agency in their responsibility as technical regulator. The PUC's responsibilities will include:

- Regulating wholesale and retail prices for telecommunications networks and services;
- Regulating interconnection and access
- Regulating number portability and equal access
- Enforcing competitive safeguards
- Resolving disputes involving operators and service providers
- Protecting consumers and resolving disputes between consumers and service providers program

1.4.1.1 National Frequency Management Unit

Interview has been conducted with the Managing Director of the National Frequency Management Unit (NFMU), Mr. Valmikki Singh and his team.

The NFMU is responsible for managing and overseeing the Spectrum Plan and the utilization of spectrum.

As per their policies they see themselves following a technological neutrality, meaning the frequencies will be allocated based on planned services only, not requesting or defining a specific technology to be used.

Frequencies are not auctioned as per current Government Policy. This is due to the specifics of Guyana as a country and economy, with a limited population and market. It is expected that the companies can spend that money better in their ICT infrastructure in the country, at the end contributing more to the wealth of the country then the auctioned license fees only.

Satellite service providers currently operate in a "grey" area, as they are required to obtain a license for their services, but do not fall under regulation for specific voice services as e.g. lawful interception or emergency call handling. It is expected that this situation will change once the new Telecommunications Bill has come into force.

[67] Source: Minister Catherine Hughes, MP, Telecommunications bill Second Reading June, 2016

The existence of one single oversea network only to connect Guyana with the rest of the world has been seen as a bottleneck for the development of ICT infrastructure and services in Guyana.

1.4.1.1.1 Band Plan for Narrow Band communication

Pursuant to the GFAT, spectrum for narrow band communication is assigned on a first come first served basis with the following

Band	3-30 MHz
Channel bandwidth	5 kHz
Band	136-174 MHz
Channel bandwidth	12.5 kHz (smaller bandwidths such as 6.25 kHz can be accommodated)
Band	401 – 430 MHz
Channel bandwidth	12.5 kHz (smaller bandwidths such as 6.25 kHz can be accommodated)

Table 4 - Band plan for narrow band communication

Assignments in the 450 MHz band are also accommodated once spectrum users accept that they may be required to cease using the said band (the 450 MHz band has been identified as an IMT 2000 Band) and move to another band at their expense after being given about 6 months notice.

1.4.1.1.2 Band Plan for Trunked Communication

Band	811 – 821 MHz paired with 856 – 866 MHz (analogue)
Channel bandwidth	12.5 kHz (smaller bandwidths such as 6.25 kHz can be accommodated)

Table 5 - Band plan for trunked communication (analogue)

This band plan and associated assignments for the analogue trunked system are expected to be phased out over the next two years or so. Digital trunked systems will replace the analogue system.

Band	821 – 824 MHz paired with 866 – 869 MHz (digital)
Channel bandwidth	12.5 kHz (smaller bandwidths such as 6.25 kHz can be accommodated)

Table 6 - Band plan for trunked communication (digital)

1.4.1.1.3 Band Plan for Mobile and Broadband Communication

While the approach of the NFMU is not to dictate what technology an operator should utilize (principle of technology neutrality), it is important to be aware of the capabilities of the various technologies/standards, the associated evolution/generation, the services they provide and the bands in which they operate. The following table summarizes these relationships.

Generation	Technology/standard
2G Capabilities (voice centric)	GSM 850, GSM 1900, GSM 900, GSM 1800
3G Capabilities (data centric)	UMTS 850, UMTS 1900, UMTS 1700, UMTS 2100, UMTS 900, UMTS 1800
4G Capabilities (data centric)	LTE 1700, LTE 2600, LTE 700, LTE 1900, LTE 2100, LTE 800, LTE 1800, LTE 2300

Table 7 - Summary of standards and technologies

The plan below sets out the bands identified for Mobile Broadband. Given the obvious overlaps and in order to maximize spectrum availability, the 1900 Band was not included in the plan. Notwithstanding, it has been included in the chart below to provide a broad overview of the various bands.

Spectrum assignments in the 850 MHz band and the corresponding implications for the adjacent bands require more work on the finalization of the mobile bands below 1 GHz. This information has to be incorporated accordingly and a decision has to be made on the way forward with this plan.

In order to facilitate competition, each band identified for mobile communications should accommodate three operators where possible.

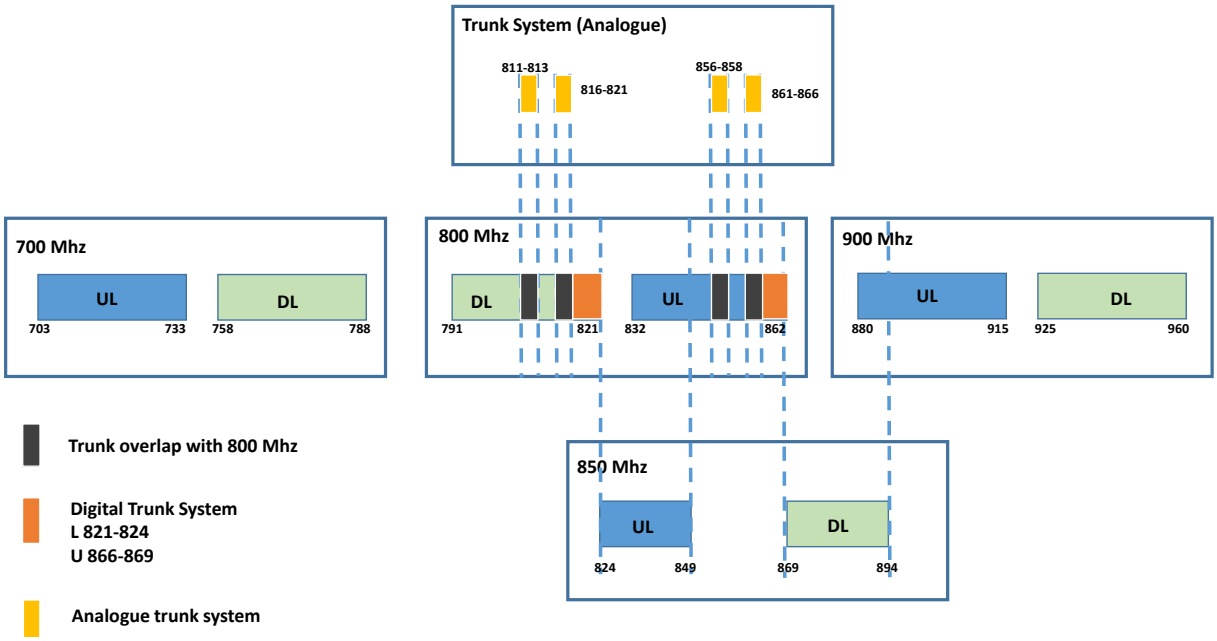


Image 235 - Spectrum plan for 700, 800, 850, 900 MHz Bands

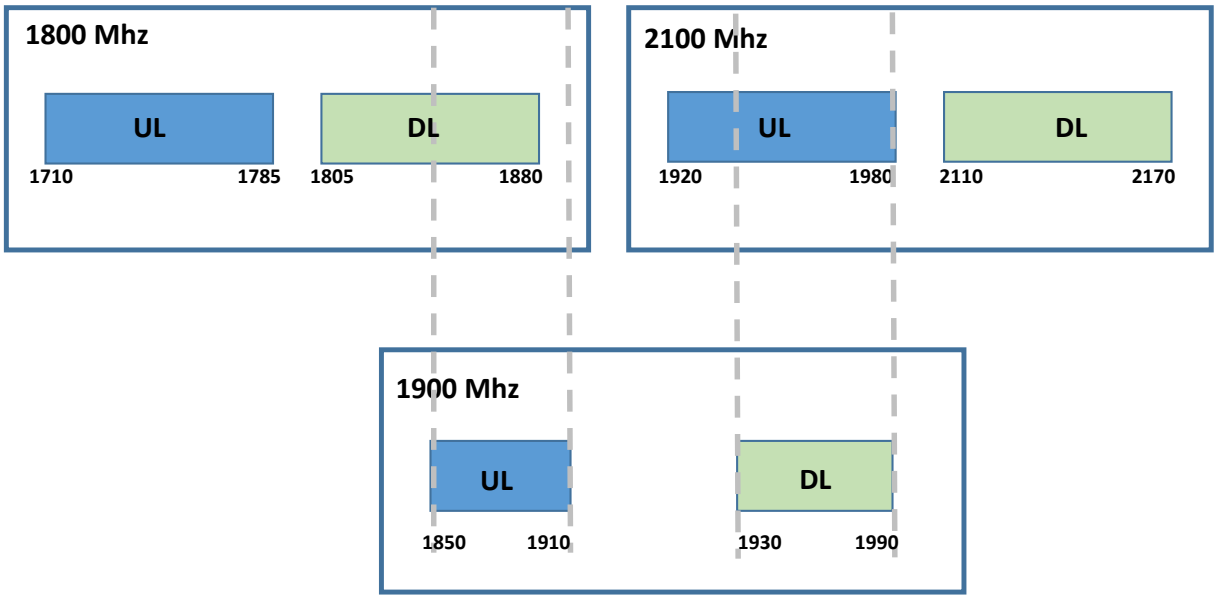


Image 236 - Spectrum plan for 1800, 1900, 2100 MHz Bands

1.4.1.1.4 Allocations identified for IMT Services (IMT-2000)

450-470 MHz	Several assignments have been made for narrow band users. These would have to be refarmed when the need arises for this band when it will be used for broadband purposes.
698-960 MHz	This band has been identified for Mobile services. Only under special circumstances would it be used

	for Broadcasting on a temporary basis until the transition to Digital Terrestrial TV Broadcasting is completed.
1710-2025 MHz	There are no information about the planned utilization of this band available in the current draft of the National Spectrum Plan for Guyana.

Table 8 - Allocations identified for IMT Services

1.4.1.1.5 Microwave Band Plans (Point to Point Backhaul)

2 GHz Band Plan:

ITU Recommendation	ITU-R F.382-8
Band Range	1900 MHz – 2300 MHz
Channel Spacing	29 MHz
Separation between Rx and Tx	213 MHz

Table 9 - 2 GHz Band Plan

Lower 4 GHz Band Plan:

ITU Recommendation	ITU-R F.382-8
Band Range	3800 MHz – 4200 MHz
Channel Spacing	28 MHz
Separation between Rx and Tx	266 MHz

Table 10 - Lower 4 GHz Band Plan

Upper 4 GHz Band Plan:

ITU Recommendation	ITU-R F.1099-3
Band Range	4400 MHz – 5000 MHz
Channel Spacing	30 MHz
Separation between Rx and Tx	300 MHz

Table 11 - Upper 4 GHz Band Plan

Lower 6 GHz Band Plan:

ITU Recommendation	ITU-R F.383-7
Band Range	5925 MHz – 6425 MHz
Channel Spacing	29.65 MHz
Separation between Rx and Tx	252.04 MHz

Table 12 - Lower 6 GHz Band Plan

Upper 6 GHz Band Plan:

ITU Recommendation	ITU-R F.384-8
Band Range	6400 MHz – 6700 MHz
Channel Spacing	40 MHz
Separation between Rx and Tx	340 MHz

Table 13 - Upper 6 GHz Band Plan

7 GHz Band Plan:

ITU Recommendation	ITU-R F.385-10
Band Range	7110 MHz – 7900 MHz
Channel Spacing	7 MHz
Separation between Rx and Tx	161 MHz

Table 14 - 7 GHz Band Plan

8 GHz Band Plan:

ITU Recommendation	ITU-R F.386-8
Band Range	7725 MHz – 8500 MHz
Channel Spacing	14 MHz
Separation between Rx and Tx	266 MHz

Table 15 - 8 GHz Band Plan

11 GHz Band Plan:

ITU Recommendation	ITU-R F.387-10
Band Range	10.7 GHz – 11.7 GHz
Channel Spacing	10 MHz
Separation between Rx and Tx	530 MHz

Table 16 - 11 GHz Band Plan

13 GHz Band Plan:

ITU Recommendation	ITU-R F.497-7
Band Range	12.75 GHz – 13.25 GHz
Channel Spacing	28 MHz
Separation between Rx and Tx	266 MHz

Table 17 - 13 GHz Band Plan

15 GHz Band Plan:

ITU Recommendation	ITU-R F.636-3
Band Range	14.4 GHz – 15.35 GHz
Channel Spacing	14 MHz
Separation between Rx and Tx	490 MHz

Table 18 - 15 GHz Band Plan

1.4.1.1.6 Assigned Frequencies

GT&T and Digicel:

Frequency band	**Service**
850 MHz band	Data network
900 MHz band	GSM voice centric
1800 MHz band	GSM voice centric

Table 19 - Assigned frequencies to GT&T and Digicel

LTE bands:

Frequency band	Operator
2.3 GHz band	E-Government Unit
2.5 GHz band	E-Networks Inc
2.5 GHz band	Quark Communications Inc.

Table 20 - Assigned LTE bands

1.4.1.2 Public Utilities Commission

Initial conversation has been held with Mr. Prem Persaud, Head of the Public Utilities Commission and his team.

PUC highlighted difficulties to be expected in providing telecommunication services in the hinterland and remote areas like language barriers, i.e. people don't speak English very well, and the existence of barter communities.

As the Commission also has the power to initiate and conduct investigations into the operations and standards of service of any public utilities under its purview, it provides local offices where people can file their complaints with the different operators. Reports about the number of complaints and the respective topic are published on a monthly base.

1.5 Conclusion

Interviews with commercial operators showed certain concerns in the overall strategy of the e-Government unit potentially impacting their own core-business with eventually offering competing services in a long term perspective to their respective customers. These concerns were reflected in the feedback and the rather limited information the commercial operators shared with the project team.

Guyana information and telecommunication system is characterized by an unequal distribution of services throughout the territory, the teledensity in 2011 for fixed-lines was about 20%, while for mobile cellular it was 70% and for Internet users 36.7%. An estimated data for 2014 indicated an increase in those numbers, for fixed-lines subscriptions it was estimated 22% of teledensity and for mobile cellular subscription 77%. Mostly, this variation follows regional divisions: While the coastal area is generally better covered, hinterland areas are less integrated in the communication network. The coastal area of Guyana, 5% of its territory, concentrates 90% of its inhabitants, while a few Indigenous People villages are located in the hinterland regions. Regardless of this, there are also relevant differences within the regions[68].

Consequently, the research registered a great amount of discrepancies regarding the needs of different communities. For example, in the coastal area, there were many complaints related to the quality and price of various communication services. At the same time, some hinterland communities are characterized by an almost complete lack of services – which brings completely different challenges for implementing new infrastructure and technology.

[68] Source: Information strategy, Internet and e-commerce developed handbook. Strategic information, programs and regulation. Published by International Business Publication, USA, 2015.
Teledensity describes the number of telephone lines per population.

Interviews with respondents representing the three profiles of the inhabitants of the communities also showed significantly different information. While the availability of services tend to impose similar limitations to all respondents belonging to the same communities, some common features can be found in interviews from professionals with similar backgrounds.

This shows a discrepancy to the statements provided by the operators who claimed that they are currently covering 98% percent of the population – nevertheless even if a village had a mobile signal it mostly didn't cover the whole village, but only some spots of the community.

1.5.1.1 Variations across Regions

Taking into account variations in the level of access to information and communication technology, the set of surveyed communities were divided in three subcategories. The first one characterizes those that have 1) a more diverse number of available services and 2) widespread access to most of these services. The second comprises communities with a limited number of services with moderate-to-good quality accessible to a majority of the people. The third includes communities with very few services, which are available in a limited way.

Communities with Widespread Access to a Variety of Services

While problems regarding telecommunication systems and technologies were described in almost all communities composing the sample for this study, some of those presented a comparatively better situation than others. For instance, in communities such as Albouystown and Kwakwani services such as 3G, landlines, cellphone signal, and Internet are widely available to the public.

Communities in this group presented 3 main problems:

First, many interviewees complained about the cost-benefit ratio for the services they used. 3G mobile Internet, for example, was frequently described as intermittent and expensive. Even close to or in Georgetown, broadband Internet services were described as slow and unreliable.

Second, the prices for some devices (mainly laptops and computers) were considered too high. This problem was even more marked in communities such as Kwakwani – which has telecommunication services, but no store or shop where it is possible to buy specific devices. Therefore, accounts for the costs must also include the time and money spent to go to Georgetown in order to buy such devices.

Third, some of the interviewees described difficulties to operate some devices (again, mainly computers and laptops). Frequently named as "computer illiteracy", this issue is thought to result from a lack of proper training and access to some technologies.

Communities with a Relatively Limited Number of Widely-Accessible Services

For this subset of communities, all the problems described in the section above were also registered. For instance, computer illiteracy, bad services, and high costs for both devices and services were mentioned by most interviewees.

The main specificity within this group relates to a lack of access to some specific services. For example, people in places such as Mabaruma and Port Kaituma (both in Region 1) use cellphones**,** Smartphones and 3G Internet. Nevertheless, broadband Internet is available only through costly satellite services. Landline phones are also relatively rare, being available almost exclusively in some public facilities.

Another problem is the coverage of the mobile network. While the central parts of villages within this group receives relatively good cellphone service, more distant sections have more difficulties in accessing mobile services. For instance, one interviewee mentioned that in some regions near Mabaruma people had to climb trees in order to get proper signal for their cellphone.

Communities with Very Few, Very Unreliable, or Virtually Nonexistent Telecommunication Services

Some of the communities considered in this study are practically cut off from access to telecommunication and information technology. Kako – a community in the Cuyuni-Mazaruni region with more than 2,000 people – for example, has only a few spots where it is possible to get proper mobile phone signal. In the same region, the Phillipai village does not have any mobile signal or landline phone – with the high frequency radio being the only device used to communicate with other villages and regions in Guyana.

While interviewees from villages in this subset complained about the costs of the devices and the lack of available shops and stores to buy them, the main problem mentioned was the lack of services. Computer illiteracy was also mentioned. Some interviewees' highlighted problems related to the lack of proper telecommunication services, such as the inability to contact authorities in order to obtain or provide information. Healthcare and education sector professionals complained about difficulties to obtain training, and emphasized that Internet access should be provided in order to enhance educational standards.

1.5.1.2 Variations across Professional Groups

As described above, geographical differences are the most relevant variables when considering discrepancies in the access to communication services across Guyana. In this sense, when living in the same area, the three professional groups interviewed tend to express similar sets of needs, habits, and perceptions, related to information and communication technology.

This homogeneity can be observed, mostly, in responses to questions I through VII (see Appendix 2.3.2) . With a few exceptions, public officials and business persons generally report to have patterns of access to telecommunication services similar to those they describe in their communities.

Nevertheless, important variations are also registered across professional groups. The most salient is the difference regarding *how* these groups already use telecommunication and/or are willing to use better telecommunication services if they have access to it. For instance, while almost all respondents tend to generally recognize that utilizing the mentioned devices and services can significantly improve their living standards while making life easier, they describe types of usages of these services that are specific to their work.

For instance, when describing existing conditions, healthcare professionals from areas with a relatively limited number of widely-accessible services reportedly need to use their own privately owned cellphones to contact fellow physicians and patients, since there is no landline or Wi-Fi network for professional exchange available. Teachers from all regions complain about the instability and unreliability of Internet access (when it does exist). Better and more reliable Internet access could help students to find needed information in order to complete academic tasks. Business owners from communities with few, unreliable, or practically nonexistent telecommunication services reportedly have severe difficulties to sell their products, since sometimes they cannot contact possible buyers.

When considering the improvement of the telecommunication infrastructure and its possibilities, health care professionals, for example, emphasize how a better mobile network would help them to monitor the health conditions of patients without traveling long distances to do this. Education workers recognize that improved access to the Internet would enable them to remain in touch with authorities from the Ministry of Education, to acquire more training, or to present specific academic activities (mostly involving research) to their students. Businesspeople, by their turn, are willing to use cellphones and e-commerce platforms to amplify their connections with different markets within their regions and communities, their country, and the world.

In this sense, the design and implementation of public policies to develop the telecommunication infrastructure in all regions of Guyana should also take into account the specific needs of different professional groups. Besides that, they should also be seen as partners in this process. Well-trained teachers, for example, could use schools as platforms to improve computer literacy in their communities. When analyzing the information gathered from the interviews, it is possible to observe that most of them are already motivated to do so.

1.5.1.3 Networks & Technology

There is a significant overlap in telecommunication network infrastructure in the country. All operators assessed in this project cover the highly populated coastal areas with their networks with GT&T and Digicel reaching out to the more sparsely populated areas. Nevertheless, as stated above, the perceived quality of the signal in the remote and hinterland areas is quite poor.

Both commercial operators are preparing themselves for the expected deregulation related to the new Telecommunication Bill. They are preparing to launch new services, targeting first of all the highly populated areas in the country. Backbone networks still provide enough capacity to expand services within the country. The availability of only one Submarine Cable to connect Guyana to the outside world has been seen as a cost driver, negatively impacting the overall prices and quality for data and voice services.

Both operators claimed that Guyana shall provide a more investment friendly environment. The current environment has been described as significantly lacking long term stability of economical boundaries (e.g. legislation, regulation, taxation). At the same time complicated procedures for permissions etc. involving too many agencies lead to an extremely long planning and investment phase[69].

Satellite Services are provided and used in some communities of the Hinterland and in Remote areas, for voice as well as Internet services. However the survey shows, that users sometimes are not even aware that they are using a satellite service. The advantage of satellite services is, that they don't require complex fix installed infrastructure on the ground. This allows the providers of satellite services to respond quickly to changing customer requirements especially in the case communities move to another location, which is common in the mining industry and with nomadic communities in the Hinterland. Nevertheless, due to the relatively high price and low performance (as of lower overall capacity and high latency of satellite links compared to e.g. LTE networks) the adoption of satellite services is very slow compared to other ICT services.

1.5.1.4 Regulation

Regulation of the telecommunication ecosystem in Guyana is currently facing significant changes, as the New Telecommunications Bill is expected to be passed within the next months. With the new law coming into force a dedicated Telecommunications Agency as the central technical regulator of the telecommunication sector in Guyana shall be established.

Commercial operators furthermore expect measures to promote the liberalization of the telecommunication market such as the opening of the fixed-line monopoly and the monopoly to operate the international gateway. In addition they hope for more transparency and legal certainty regarding the evolution of the telecommunication market (e.g. a long-term spectrum strategy).

It is expected that several services not explicitly falling under the current regulation (grey areas) will be addressed in the future (i.e. the evaluation of VoIP service providers).

2. Appendix

2.1 Work Package 1.1 – Market Research

Willingness to Pay ranges - By Service per month

[69] It has been highlighted that the duration to get all the needed permissions to build up a new antenna might take 4 times the time compared to neighboring countries like Trinidad & Tobago.

Willingness to Pay: Mobile Internet (in GYD)	Minimum	Maximum
Poor, Remote and Hinterland	0	45.000
Poor	200	8.000
Hinterland	40	3.800
Hinterland and Poor	1.000	3.500
Remote and Poor	50	44.000

Image 237 - Willingness to pay ranges for Mobile Internet in different communities

Willingness to Pay: Fixed line Internet (in GYD)	Minimum	Maximum
Poor, Remote and Hinterland	0	25.000
Poor	0	10.000
Hinterland	0	10.000
Hinterland and Poor	5.000	7.000
Remote and Poor	0	44.000

Image 238 - Willingness to pay ranges for Fixed Line Internet in different communities

Willingness to Pay: Texting (in GYD)	Minimum	Maximum
Poor, Remote and Hinterland	0	10.000
Poor	0	12.000
Hinterland	10	5.000
Hinterland and Poor	20	5.000
Remote and Poor	0	4.000

Image 239 - Willingness to pay ranges for Texting in different communities

Willingness to Pay: Willingness to Pay: Phone Calls (in GYD)	Minimum	Maximum
Total	0	50.000
Poor, Remote and Hinterland	0	50.000
Poor	5	10.000
Hinterland	30	5.000
Hinterland and Poor	20	5.000
Remote and Poor	0	25.000

Image 240 - Willingness to pay ranges for Phone Calls in different communities

Willingness to Pay ranges - By age groups per month

Willingness to Pay: Mobile Internet (in GYD)	Minimum	Maximum
Less than 24 years old	0	45.000
25-54 years old	100	44.000
More than 54 years old	0	5.000

Image 241 - Willingness to pay ranges for Mobile Internet per age groups

Willingness to Pay: Fixed line Internet (in GYD)	Minimum	Maximum
Less than 24 years old	0	10.000
25-54 years old	0	44.000
More than 54 years old	0	20.000

Image 242 - Willingness to pay ranges for Fixed line Internet per age groups

Willingness to Pay: Texting (in GYD)	Minimum	Maximum
Less than 24 years old	0	10.000
25-54 years old	0	12.000
More than 54 years old	0	5.000

Image 243 - Willingness to pay ranges for Texting per age groups

Willingness to Pay: Willingness to Pay: Phone Calls (in GYD)	Minimum	Maximum
Less than 24 years old	0	50.000
25-54 years old	0	25.000
More than 54 years old	5	20.000

Image 244 - Willingness to pay ranges for Phone Calls per age groups

Willingness to Pay ranges - By Gender per month

Willingness to Pay: Mobile Internet (in GYD)	Minimum	Maximum
Male	1.000	45.000
Female	0	28.000

Image 245 - Willingness to pay ranges for Mobile Internet per gender

Willingness to Pay: Fixed line Internet (in GYD)	Minimum	Maximum
Male	0	44.000
Female	0	28.000

Image 246 - Willingness to pay ranges for Fixed Line Internet per gender

Willingness to Pay: Texting (in GYD)	Minimum	Maximum
Male	0	10.000
Female	0	12.000

Image 247 - Willingness to pay ranges for Texting per gender

Willingness to Pay: Willingness to Pay: Phone Calls (in GYD)	Minimum	Maximum
Male	7	50.000
Female	0	5.000

Image 248 - Willingness to pay ranges for Phone Calls per gender

2.2 Work Package 1.2 - Technology research

Price List fixed Line GT&T (as of September 1st, 2016)

EXCHANGE		Georgetown	New Hope	Timehri	Linden	Itumi	Kwakwani	B.V. Central	Cove & John	Mahaica	Mahaicony	Rosignol	New Amsterdam	Whim	Benab	Skeldon	Vreed-en-Hoop	Wales	Leonora	Tuschen	Saddle	Anna Regina	Bartica	Matthew's Ridge	Mabaruma	Lethem	Essiquibo	Mahaica	B.V. West	Cellular
Peak	Georgetown	0.60	3.00	4.00	7.00	7.00	7.00	3.00	3.00	4.00	4.00	7.00	7.00	7.00	7.00	7.00	3.00	3.00	3.00	3.00	5.00	5.00	5.00	7.00	7.00	7.00	3.00	3.00	3.00	12.00
OffPeak	Georgetown	0.30	2.00	3.00	5.00	5.00	5.00	2.00	2.00	3.00	3.00	5.00	5.00	5.00	5.00	5.00	2.00	2.00	2.00	2.00	4.00	4.00	4.00	5.00	5.00	5.00	2.00	2.00	2.00	12.00
Peak	New Hope	3.00	0.60	3.00	5.00	7.00	7.00	3.00	4.00	4.00	4.00	7.00	7.00	7.00	7.00	7.00	3.00	3.00	4.00	4.00	5.00	5.00	5.00	7.00	7.00	7.00	3.00	4.00	3.00	12.00
OffPeak	New Hope	2.00	0.30	2.00	4.00	5.00	5.00	2.00	3.00	3.00	3.00	5.00	5.00	5.00	5.00	5.00	2.00	2.00	3.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	2.00	3.00	2.00	12.00
Peak	Timehri	4.00	3.00	0.60	4.00	7.00	7.00	4.00	5.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	4.00	3.00	4.00	3.00	7.00	7.00	4.00	7.00	7.00	7.00	4.00	5.00	4.00	12.00
OffPeak	Timehri	3.00	2.00	0.30	3.00	5.00	5.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	3.00	2.00	3.00	3.00	5.00	5.00	3.00	5.00	5.00	5.00	3.00	4.00	3.00	12.00
Peak	Linden	7.00	5.00	4.00	0.60	4.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	5.00	7.00	7.00	7.00	7.00	5.00	7.00	7.00	7.00	5.00	7.00	5.00	12.00
OffPeak	Linden	5.00	4.00	3.00	0.30	3.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00	5.00	4.00	5.00	4.00	12.00
Peak	Itumi	7.00	7.00	7.00	4.00	0.60	4.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	12.00
OffPeak	Itumi	5.00	5.00	5.00	3.00	0.30	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	12.00
Peak	Kwakwani	7.00	7.00	7.00	5.00	4.00	0.60	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	12.00
OffPeak	Kwakwani	5.00	5.00	5.00	4.00	3.00	0.30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	12.00
Peak	B.V. Central	3.00	3.00	4.00	5.00	7.00	7.00	0.60	3.00	3.00	4.00	5.00	5.00	7.00	7.00	7.00	3.00	3.00	3.00	4.00	5.00	5.00	5.00	7.00	7.00	7.00	3.00	3.00	3.00	12.00
OffPeak	B.V. Central	2.00	2.00	3.00	4.00	5.00	5.00	0.30	2.00	2.00	3.00	4.00	4.00	5.00	5.00	5.00	2.00	2.00	2.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	2.00	2.00	2.00	12.00
Peak	Cove & John	3.00	4.00	5.00	7.00	7.00	7.00	3.00	0.60	3.00	3.00	4.00	5.00	7.00	7.00	7.00	3.00	4.00	4.00	4.00	5.00	7.00	7.00	7.00	7.00	7.00	3.00	3.00	3.00	12.00
OffPeak	Cove & John	2.00	3.00	4.00	5.00	5.00	5.00	2.00	0.30	2.00	2.00	3.00	4.00	5.00	5.00	5.00	2.00	3.00	3.00	3.00	4.00	5.00	5.00	5.00	5.00	5.00	2.00	2.00	2.00	12.00
Peak	Mahaica	4.00	4.00	5.00	7.00	7.00	7.00	3.00	3.00	0.60	3.00	4.00	5.00	5.00	7.00	7.00	4.00	5.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	7.00	4.00	3.00	3.00	12.00
OffPeak	Mahaica	3.00	3.00	4.00	5.00	5.00	5.00	2.00	2.00	0.30	2.00	3.00	4.00	4.00	5.00	5.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	3.00	2.00	2.00	12.00
Peak	Mahaicony	4.00	4.00	5.00	7.00	7.00	7.00	4.00	3.00	3.00	0.60	3.00	4.00	5.00	7.00	7.00	4.00	5.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	7.00	4.00	3.00	4.00	12.00
OffPeak	Mahaicony	3.00	3.00	4.00	5.00	5.00	5.00	3.00	2.00	2.00	0.30	2.00	3.00	4.00	5.00	5.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	3.00	2.00	3.00	12.00
Peak	Rosignol	7.00	7.00	7.00	7.00	7.00	7.00	5.00	4.00	4.00	3.00	0.60	3.00	3.00	4.00	4.00	5.00	5.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	4.00	5.00	12.00
OffPeak	Rosignol	5.00	5.00	5.00	5.00	5.00	5.00	4.00	3.00	3.00	2.00	0.30	2.00	2.00	3.00	3.00	4.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.00	4.00	12.00
Peak	New Amsterdam	7.00	7.00	7.00	7.00	7.00	7.00	5.00	5.00	5.00	4.00	3.00	0.60	3.00	4.00	4.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	5.00	5.00	12.00
OffPeak	New Amsterdam	5.00	5.00	5.00	5.00	5.00	5.00	4.00	4.00	4.00	3.00	2.00	0.30	2.00	3.00	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	4.00	12.00
Peak	Whim	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	5.00	5.00	3.00	3.00	0.60	4.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	12.00
OffPeak	Whim	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00	4.00	2.00	2.00	0.30	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	12.00
Peak	Benab	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	4.00	4.00	4.00	0.60	3.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	12.00
OffPeak	Benab	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.00	3.00	3.00	0.30	2.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	12.00
Peak	Skeldon	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	4.00	4.00	4.00	3.00	0.60	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	12.00
OffPeak	Skeldon	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	3.00	3.00	3.00	2.00	0.30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	12.00
Peak	Vreed-en-Hoop	3.00	3.00	4.00	7.00	7.00	7.00	3.00	3.00	4.00	4.00	5.00	7.00	7.00	7.00	7.00	0.60	3.00	3.00	3.00	4.00	5.00	5.00	7.00	7.00	7.00	3.00	3.00	3.00	12.00
OffPeak	Vreed-en-Hoop	2.00	2.00	3.00	5.00	5.00	5.00	2.00	2.00	3.00	3.00	4.00	5.00	5.00	5.00	5.00	0.30	2.00	2.00	2.00	3.00	4.00	4.00	5.00	5.00	5.00	2.00	2.00	2.00	12.00
Peak	Wales	3.00	3.00	3.00	5.00	7.00	7.00	3.00	4.00	4.00	5.00	5.00	7.00	7.00	7.00	7.00	3.00	0.60	3.00	4.00	5.00	5.00	5.00	7.00	7.00	7.00	3.00	4.00	3.00	12.00
OffPeak	Wales	2.00	2.00	2.00	4.00	5.00	5.00	2.00	3.00	3.00	4.00	4.00	5.00	5.00	5.00	5.00	2.00	0.30	2.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	2.00	3.00	2.00	12.00
Peak	Leonora	3.00	3.00	4.00	7.00	7.00	7.00	3.00	4.00	4.00	5.00	5.00	7.00	7.00	7.00	7.00	3.00	3.00	0.60	3.00	4.00	4.00	5.00	7.00	7.00	7.00	3.00	4.00	3.00	12.00
OffPeak	Leonora	2.00	2.00	3.00	5.00	5.00	5.00	2.00	3.00	3.00	4.00	4.00	5.00	5.00	5.00	5.00	2.00	2.00	0.30	2.00	3.00	3.00	4.00	5.00	5.00	5.00	2.00	3.00	2.00	12.00
Peak	Tuschen	3.00	3.00	4.00	7.00	7.00	7.00	4.00	4.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	3.00	3.00	3.00	0.60	4.00	4.00	5.00	7.00	7.00	7.00	4.00	4.00	4.00	12.00
OffPeak	Tuschen	2.00	2.00	3.00	5.00	5.00	5.00	3.00	3.00	4.00	4.00	4.00	5.00	5.00	5.00	5.00	2.00	2.00	2.00	0.30	3.00	3.00	4.00	5.00	5.00	5.00	3.00	3.00	3.00	12.00
Peak	Saddle	5.00	5.00	7.00	7.00	7.00	7.00	5.00	5.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	4.00	5.00	4.00	4.00	0.60	3.00	4.00	7.00	7.00	7.00	5.00	5.00	5.00	12.00

2.3 Questionnaires for Primary Market Research

2.3.1 Quantitative Survey

ICT Guyana: Quantitative Survey

Respondent-ID: _____
Community _____

Interviewer _____
Date _____
Time _____

What is the rough distribution of your community (map, drawing, measurements)? Please indicate any masts, telecommunication points and landmarks in the map/drawing.

Moderation: Please use your app "network info 2" to check the mobile networks available and GPS data. Then turn on your WiFi and check if there are any WiFi networks available. Additionally take screenshots of the available WiFis and the network info as backup.

Name of community	
GPS coordinates	
Zone	1. Remote 2. Hinterland 3. Poor
Status of interviewee	
Mobile networks available *(INTERVIEWER: TO TEST THE DEVICES)*	1. GSM (2G) 2. GPRS (2.5G) 3. EDGE (2.75G) 4. UMTS/HSPA (3G) 5. LTE (4G) 99. I didn't get to identify

Main ethnical group of community	
Take some panoramic pictures of community or draw a sketch. **Highlight the towers/antennas in sketch.**	

Moderation: The following document is divided into two sections: 1) Quantitative questionnaire; 2) Qualitative interview/ethnography. Quantitative questions can be assessed in any stage of the research, from initial telephone contact/appointment making to qualitative interview. Some questions might even be assesses by yourself (e.g. counting masts/carriers). For demography, respondents (or other relevant contact persons) might need some time to gather this information themselves.

Please make sure, that all information in quantitative questionnaire is assessed by the end of the research phase for a given community. To ensure this, please carry this document with all collected information with you for the whole research process of a given community.

Quantitative questionnaire is also used as a basis for the qualitative interview.

If respondents cannot give a precise answer to quantitative question, encourage them to give an estimation. In this case, please note down, how sure the respondent was about his/ her answer.

Some questions or sub-questions are marked as medium priority or low priority. If you are facing time pressure, you may skip those questions according to their priority. Though, please cover all questions, if possible.

Hello, my name is _____.

I am a researcher working in behalf of the Guyanese government who aim to assess the situation of telecommunication in Guyana to help its people to get the possibilities they need in a targeted way.

Thank you very much for taking the time to participate in this research! We really appreciate your help and it will make a big and meaningful contribution to the efforts of the Guyanese government.

Let’s start with some basic information about your community.

A. Demography

1. Medium priority: How many people are permanent residents of your community?

	% of people in community	Number of people in community
a. Permanent residents		
b. Temporary residents (live in another region/abroad for part of the year)		
c. Nomadic residents		

Notes/Moderation: if necessary, note additional/ explanatory information here

2. What languages are spoken in your community?

	language	% of people in community	Number of people in community
a. Main language			
b. Second language			
c. Other language(s)			

Notes/Moderation: if necessary, note additional/ explanatory information here

B. Community facilities and finances

3. Please state the number of the following facilities in your community:

Number of facilities	None	1 – 4	5 – 9	10 – 14	More than 14	n.a.
a. Schools (nursery)						
b. Schools (primary)						
c. Schools (secondary)						
d. medical facilities (health center/hut)						
e. medical facilities (health post)						
f. medical facilities (hospitals)						
g. communal buildings (village offices, please specify below)						
h. places of social gathering (leisure places, sports courts, youth club, please specify below)						
i. Areas of sports activities						
j. Libraries						
k. Religious facilities						
l. Hotel/ hostels/lodge/guest house						

Notes/Moderation: if necessary, note additional/ explanatory information here.

IF NO MEDICAL FACILITIES: What are the specific expectations/wishes for your village?

4. Is your community threatened by one of the following occurrences?

	yes	no
a. Destruction of environment/nature		
b. Organized crime (poaching,illegal mining, smuggling, human traffic, etc.)		

Notes/Moderation: if necessary, note additional/ explanatory information here

5. Did people in your community receive a loan? What is the percentage of people living in your community who have received small business loans/microloans within the last 10 years?

What percentage of these people has paid back their loans yet?

	Quantity	0%	Less than 10%	10-29%	30-49%	50-75%	More than 75%	n.a.
	Fill in number	nobody	nearly no one	some	partly	majority	to a great extent	n.a.
a. Received loan								
b. Paid back loan								

Notes/Moderation: if necessary, note additional/ explanatory information here

6. and 7. ONLY if more than 0%

6. **Medium priority: What is the main purpose that people use their loans for?**

Moderation: business development/ establishing new businesses/ repair and maintenance/ refinancing etc.

Notes:

7. **Low priority: Do you think there is enough time to repay these loans? Why/ Why not?**

○ yes ○ no ○ n.a.

Moderation: business development/ establishing new businesses/ repair and maintenance/ refinancing etc.

Notes:

C. Power supply

8. Please describe the power supply in your community.

Please enter the estimated quantity and percentage of people using the following options of power supply.

	0%	Less than 10%	10-29%	30-49%	50-75%	More than 75%	n.a.
a. Electric supply network (landline)							
b. Electric generator (local)							
c. Solar electricity							
d. Hydropower							
e. Wind energy							
f. Thermoelectricity							
g. Biothermal energy							
h. No electricity at all							
i. Other, please specify	*Moderator: please note below*						
j. Planned power supply, please specify:	*Moderator: please note below*						

Notes/Moderation: if necessary, note additional/ explanatory information here

9. How many hours a day does your community have electricity?

	When? / What time span?
a. Up to 5 hours	
b. More than 5 to 15 hours	

	When? / What time span?
c. More than 15 to 24 hours	

Notes/Moderation: if necessary, note additional/ explanatory information here

10. How often are people affected by power breakdowns of the public electric supply network in your community?

Please enter the times of people affected by power breakdowns in the given time span.

	No. of power breakdowns
a. Within the last week	
b. Within the last month	
c. Within the last year	

Notes/Moderation: Please use one time span only, or make sure to include the small time spans into the large time spans.

a) Medium priority: How do people cope with this situation?

b) Medium priority: Are there accumulations of power breakdowns in certain situations (rainy season, certain times of the year/ week/ day, special events etc.?)?

Notes/Moderation: if necessary, note additional/ explanatory information here

D. Mobile network infrastructure

11. Do you know which mobile carrier/ provider is available in your community?

- ☐ Digicel
- ☐ GT&T
- ☐ Other, please specify: _____
- ☐ n.a.

12. How many telephone masts/(towers)/antennas for mobile communication are installed in your community?

None	1	2 – 4	5 – 9	10+

☐ n.a.

13. Where are those telephone masts (towers)/antennas for mobile communication installed in your community?

If respondent is aware of carriers, please ask if these carriers are obvious/easy to find.

Notes/Moderation: if necessary, note additional/ explanatory information here

E. Electric devices and ICT usage

14. Please enter the estimated quantity and percentage of people in your community who own the following electric devices.

Please enter the estimated quantity and percentage of people who own the following electric devices.

	Quantity	0%	Less than 10%	10-29%	30-49%	50-75%	More than 75%	n.a.
a. Private landline telephone								
b. Private cellphone (not web-enabled)								
c. Private smartphone (web-enabled)								
d. Private satellite phone								
e. Desktop Computer (not web-enabled)								
f. Laptop/ Tablet PC (not web-enabled)								
g. Desktop Computer (web-enabled)								
h. Laptop/ Tablet PC (web-enabled)								
i. HF Radio								

Notes/Moderation: if necessary, note additional/ explanatory information here

15. Are the following electric devices available in your community?

	Quantity
a. Public landline telephone	
b. Privately owned landline telephone	
c. Privately owned cellphone (not web-enabled)	
d. Privately owned smartphone (web-enabled)	

e. Public phone booth	

Notes/Moderation: if necessary, note additional/ explanatory information here

16. Please estimate how frequently people in your community approximately use these devices.

Please enter the frequency of use for the following devices for the people in your community.

	never	Less often than once a week	About once a week	Several times a week	About once a day	Several times a day	n.a.
a. Private landline telephone							
b. Private cellphone (not web-enabled)							
c. Private smartphone (web-enabled)							
d. Private satellite phone							
e. Public landline telephone							
f. Privately owned landline telephone							
g. Privately owned cellphone (not web-enabled)							
h. Privately owned smartphone (web-enabled)							
i. Public phone booth							
j. Privately owned satellite phone							
k. Desktop Computer (not web-enabled)							

	never	Less often than once a week	About once a week	Several times a week	About once a day	Several times a day	n.a.
l. Laptop/ Tablet PC (not web-enabled)							
m. Desktop Computer (web-enabled)							
n. Laptop/ Tablet PC (web-enabled)							
o. HF Radio							
p. Privately owned landline telephone							

Notes/Moderation: if necessary, note additional/ explanatory information here

17. Where do people in your community use the following internet and telephone services/ devices mainly?

Please note down any other places/devices of use. **Please only tick one box per row.**

	eKiosk/ Internet Café	at work	at place of education	Other public places (please specify)	Shared (family/ friends/ neigh-bours)	at home	n.a.
a. Private landline telephone							
b. Private cellphone (not web-enabled)							
c. Private smartphone (web-enabled)							
d. Private satellite phone							
e. Public landline telephone							

	eKiosk/ Internet Café	at work	at place of education	Other public places (please specify)	Shared (family/ friends/ neigh-bours)	at home	n.a.
f. Privately owned landline telephone							
g. Privately owned cellphone (not web-enabled)							
h. Privately owned smartphone (web-enabled)							
i. Public phone booth							
j. Privately owned satellite phone							
k. Desktop Computer (not web-enabled)							
l. Laptop/ Tablet PC (not web-enabled)							
m. Desktop Computer (web-enabled)							
n. Laptop/ Tablet PC (web-enabled)							
o. HF Radio							
p. Privately owned landline telephone							

Other, please specify: _____

Notes/Moderation: if necessary, note additional/ explanatory information here

Why do they go there? Coverage? Network? Price? Availability of services (domestic/national/international call). Divide data utilisation.

18. Has your community received any support from the government recently (which has enhanced your communities' living standard)?

Moderation: ***IF IN TIME PRESSURE****, skip this question completely (topic is also covered in Q 30)*

Please note down any info on received subsidies/government programs.

○ yes ○ no ○ n.a.

If yes:

What was the purpose/ application of these support actions?
Where did this aid come from (which part of government/ administration)?

Medium priority: Since when has your community been receiving those aids?

Medium priority: What activities were done in your community because of the aid(s) received?

Medium priority: Has this activities been useful to your community?

Medium priority - Moderation: government subsidies: How has the subsidy been realized? Was it a money transfer solely or programs where infrastructure (streets, energy/water supply,…), healthcare (e.g. vaccinations for humans and animals), health education (birth control,…) have been implemented? Please specify!

Notes:

F. Previous ICT development projects

19. Have there been any previous ICT development projects in your community?

○ yes ○ no ○ n.a.

If yes:

Please briefly describe previous ICT development projects in your community.

How successful were these projects?

If not successful, why did these projects fail?

Notes/Moderation: if necessary, note additional/ explanatory information here

What is your opinion regarding this kind of initiatives?

Notes/Moderation: if necessary, note additional/ explanatory information here

You mentioned/talked about some projects above. In your opinion, would other projects benefit your community or country better than those projects? Which specific projects come to mind?

Moderation: Please probe on environmental initiatives, healthcare, education, infrastructure, etc.

Notes/Moderation: if necessary, note additional/ explanatory information here

20. **Medium priority: We are also interested in the current economic situation in your community or region and how this situation might change in the future.**

    How would you describe the economic situation in your community or region in general? How is the situation of employment and unemployment here?

    Notes/Moderation: if necessary, note additional/ explanatory information here

21. **What is the main source of income or main economic factor in your community or region?**

    Moderation: basically: how do people make a living? For example tourism, farming, handicrafts, natural resources…

    Notes

22. **What are the main challenges/ difficulties for generating revenue/income in your community?**

Moderation: any hindrances according infrastructure/ telecommunication/ accessibility of technology, etc.?

Notes

23. **Medium priority: How did this situation change over the past years? Which developments happened?**

Moderation: developments of certain economical branches (tourism etc.), migration/ in-migration, changes in environment/ climate/ society…

Notes

24. **Medium priority: How do you see the future development regarding economy and sources of income, etc.?**

Is your community planning any projects that will affect the economic situation?

Moderation: also: are plans of government/ private investors etc. known that will affect the situation

Notes

2.3.2 Qualitative Survey

Qualitative Interview/ ethnography

Respondent-ID: _____	Interviewer _____
Community: _____	Date _____
Age of resp.: _____	Time _____
Gender ○ female ○ male	
Occupation of resp: _____	

***Moderation:* This section is to be conducted *for each of the three* contact persons in a certain preselected community.**

This interview part will take about 30 minutes.

We will now have a more open conversation than in the previous interview part. We are solely and exclusively interested in your subjective opinion, so there are no right or wrong answers. You are the expert and everything you say is very important to us. Please tell us whatever comes into your mind, respond spontaneously without thinking about it for too long.

Moderation: Encourage participant to tell stories about themselves.

The following questions are intended as a guideline of topics, not a strict sequence of questions. Please feel free to probe at your own discretion.

You may at any point use examples to investigate deeper that you have heard of in other interviews or feel would be appropriate.

It is not supposed to be a typical interview situation following a structure of questions and responses, but instead the interviewee is supposed to dominate and lead the conversation.

Photos: Respondent in interview situation

I. **When thinking about communication over long distances: Which distance would you call "a distance I do not travel easily myself" to communicate face-to-face with another person?**

Moderation: Please note down time (time spans) for maximum travel if distance is given.

II. **How frequently do you encounter situations in which you need to communicate over longer distances? What situations would that be?**

Moderation: situations like funeral announcements, sports events, etc.

III. **What means (device) of communication would you typically use for such long distance communication?**
How often would you use which means (device) of communication?
For which occasion would you use which means (device) of communication?

IV. **What means (device) of communication are typically used in your community for long distance communication?**

V. What is your role regarding (tele)communication systems in your community? What are your points of contact with telecommunication?

Moderation: e.g. decisions about purchase of telecommunication devices, negotiations with local government, etc.

VI. Do members (any member, including you) of your community own a: landline telephone/ mobile phone/ computer/ laptop/ tablet/ Smartphone?

*Moderation: Please repeat the following questions **for each of the mentioned means of communication**:*

If no:

i. **Why do you or members of your community not own such a device? Is there the wish or need to own or use such a technology?**
ii. **Are there any plans to purchase such a device for your community in the future?**
iii. **How are the preconditions for this technology?**
iv. **Are there any plans to develop the telecommunication infrastructure of your community in the future regarding this technology?**

If yes:

v. **For how long has the following device been present in your community?**

vi. **Do you personally feel capable of using or operating a <device>?**

vii. **How would you evaluate the capability of the members of your community to use a <device>? Please explain.**

viii. **Usage: How frequently do you and the members of your community use a <device>?**

Moderation: in case of smartphone/ computer/ laptop:

Low priority: Do you or a member of your community chat over the internet?

If yes: what channels for chatting are used?

Do you or a member of your community use social media?

Moderation: prompt on facebook, whatsapp, Skype, Twitter

ix. **In what occasions do you/ your community use a <device>?**

x. **Are there any special occasions or cases that a <device> is specifically used for? What occasions would these be?**

For all:

xi. **Are there other uses/applications you can image/you have heard of that a <device> is used for? Would this also be an application that you can consider for yourself/ your community?**

VII. **Are there any other means of communication you would generally wish for?**

Use Cases

Now, I would like to present you some scenarios and learn about your typical habits/ routines in such cases.

Moderation: Please adapt use case 1 to the economic infrastructure/ source of income/ trading goods of community (handcrafts, crops, natural resources etc.)

1) **Imagine: you would like to sell your <goods> to a remote area/ different country/ region/ anywhere you cannot reach easily yourself. How would you do this?**
   Now imagine the possibility of a government-run website that enables you to trade your goods on a national (or international) trading platform online.
   How do you feel about this?

2) **Imagine: you would like to send money to a person/ institution who or that you cannot reach easily yourself. How would you do this?**
   Now imagine the possibility of transferring money via cellphone deposit (e.g. M-Pesa, Kenya).
   How do you feel about this?

Moderation: Use case 3 → Please keep short if respondent uses internet regularly or has a high ICT literacy.

3) **Imagine: you would like to inform yourself about current political issues and developments. How would you do that?**
   Now imagine the possibility of receiving this information or contacting governmental or public authorities (e.g. to register a new-born, apply for marriage…) online.
   How do you feel about this?

Moderation: Use case 4 → only for medical professionals/ vets/ farmers

4) **Imagine: you would like to consult a (fellow) physician/ doctor/ medicine man/ vet/ farmer regarding a severe medical condition or diagnosis unknown to you. How would you do that?**

   Now imagine the possibility seeking help easily and at all times or train yourself online.
   How do you feel about this?

Moderation: Use case 5→ only for police chiefs/ responsible person for security issues

5) **Imagine: your community suffers from organized criminality, such as poaching, plundering of nature, illegal gold mining, border incursion, etc.**
There would be the possibility to use surveillance cameras (also including night vision) or flying drones (affordable) that are equipped with surveillance cameras that directly submit a video stream to your computer.
How do you feel about this?

6) **Imagine: you would like to get a degree from a university outside of your county/community/anywhere in the world. How would you do that?**
Now imagine the possibility get a degree from anywhere for yourself online.
How do you feel about this?

Now, some final questions about you and your environment.
If introducing yourself to a person from another country, how would you describe your cultural identity?

Moderation: Try to ask indirectly about sense of belonging to a certain tribe/ ethnicity/ group/ community. Please be careful about peoples' feelings.

Do you see yourself as a "Guyanese"? Why, why not? Which feeling does the current government give you in this regard? What measures need to be taken to strengthen your national identity as a Guyanese?

Do you feel your country is one big unity of people? Why, why not?

Is there something that in your eyes especially Guyanese people have in common?

Moderation: E.g. a common set of values, something to be proud of, something uniquely Guyanese.

What would need to happen to make Guyana a more united country, to give you a feeling of a more unified community?

Would a better communication infrastructure help to achieve this?

Photos: At the end of interview/ during interview (whenever possible or appropriate): Please kindly ask respondent if you are allowed to take the following pictures:

- Home of respondent: different rooms of house (living room/ kitchen…) (as many shots as possible), home from outside, views outside respondent's home (streets…)
- Detail shots: special objects of interest/ hobby equipment/ family photos
- Community: Streets/ houses/ special places of interest, if applicable

2.3.3 Checklist

ICT Guyana: Checklist

To be filled in by Detecon interviewer:

Respondent-ID _____
Community _____
Zone ○ remote ○ hinterland ○ poor
Date _____
Position of resp in comm..: _____

PLEASE FILL IN YOUR DATA:

Age _____
Ethnicity _____
Gender ○ female ○ male
Level of education _____

Dear participant,

Thank you very much for taking the time to participate in this research! We really appreciate your help and it will make a big and meaningful contribution to the efforts of the Guyanese government! Please answer these following questions to the best of your knowledge and let our interviewer know should there be any need for assistance, they will gladly help with any issue. All answers will be analysed anonymously and no response will be traceable to you as a person.

G. Electric devices and ICT usage

25. How many of the following devices do <u>you own</u>?

Please fill in the quantity/number of devices that you own, for each device separately.

		Quantity
j.	Private landline telephone	
k.	Private cellphone (not web-enabled)	
l.	Private smartphone (web-enabled)	
m.	Private satellite phone	
n.	Desktop Computer (not web-enabled)	
o.	Laptop/ Tablet PC (not web-enabled)	
p.	Desktop Computer (web-enabled)	
q.	Laptop/ Tablet PC (web-enabled)	
r.	HF Radio	

26. Are the following electric devices available <u>in your community</u>, please estimate how many of the devices are available?

		Quantity
f.	Public landline telephone	
g.	Privately owned landline telephone	
h.	Privately owned cellphone (not web-enabled)	
i.	Privately owned smartphone	

(web-enabled)	
j. Public phone booth	
k. Privately owned satellite phone	

27. How frequently do you approximately use these devices?

Privately owned devices are e.g. devices in an internet café or kiosk. A public phone booth, for example, can be owned by a network provider.

	never	Less often than once a week	About once a week	Several times a week	About once a day	Several times a day	n.a.
q. Your own private landline telephone							
r. Your own private cellphone (not web-enabled)							
s. Your own private smartphone (web-enabled)							
t. Your own private satellite phone							
u. Public landline telephone							
v. Privately owned landline telephone							
w. Privately owned cellphone (not web-enabled)							
x. Privately owned smartphone (web-enabled)							
y. Public phone booth							
z. Privately owned satellite phone							
aa. Desktop Computer (not web-enabled)							
bb. Laptop/ Tablet PC (not web-enabled)							
cc. Desktop Computer (web-enabled)							
dd. Laptop/ Tablet PC (web-enabled)							
ee. HF Radio							

28. Where do you use the following internet and telephone services/ devices mainly?

Please note down any other places/devices of use. **Please only tick one box per row.**

	eKiosk/ Internet Café	at work	at place of education	Other public places (please specify)	Shared (family/ friends/ neigh-bours)	at home	n.a.
a. Your own private landline telephone							
b. Your own private cellphone (not web-enabled)							
c. Your own private smartphone (web-enabled)							

	eKiosk/ Internet Café	at work	at place of education	Other public places (please specify)	Shared (family/ friends/ neigh-bours)	at home	n.a.
d. Your own private satellite phone							
e. Public landline telephone							
f. Privately owned landline telephone							
g. Privately owned cellphone (not web-enabled)							
h. Privately owned smartphone (web-enabled)							
i. Public phone booth							
j. Privately owned satellite phone							
k. Desktop Computer (not web-enabled)							
l. Laptop/ Tablet PC (not web-enabled)							
m. Desktop Computer (web-enabled)							
n. Laptop/ Tablet PC (web-enabled)							
o. HF Radio							

29. Are there any satellite services in place?

○ yes ○ no ○ n.a.

If yes, what service is it (name of service)? How much does it cost? When is it available?

_____

_____

30. How much would you be willing/able to spend on a <u>service per month</u>?

Please tell us a price. This is only about your wishes, it does not need to reflect actual prices.

	Price ($)
a. Internet access on cell	
b. Internet access at home	
c. Texting	
d. Phone calls	
e. Other, please specify: _____	

31. Which of the following devices do you use for the following types of calls?

Multiple answers possible. Privately owned devices are e.g. devices in an internet café or kiosk. A public phone booth, for example, can be owned by a network provider.

	Your own private landline telephone	Your own private cellphone (not web-enabled)	Your own private smartphone (web-enabled)	Your own private Satellite phone	Public landline telephone	Privately owned Landline telephone	Privately owned cellphone (not web-enabled)	Privately owned smartphone (web-enabled)	Public phone booth	Privately owned satellite phone	Desktop Computer (not web-enabled)	Laptop/ Tablet PC (not web-enabled)	Desktop Computer (web-enabled)	Laptop/ Tablet PC (web-enabled)	HF Radio
Local call															
National call															
International call															

8. Do you use the internet for the following purposes?

	Yes	No
a. Web browsing		
b. Chatting *(WhatsApp, Viber, Skype, LINE…)*		
c. Social networks *(Facebook, Google+, Twitter, LinkedIn…)*		
d. Video-sharing websites *(YouTube, Netflix, Vimeo, Vine…)*		
e. Online gaming *(League of Legends, Counter Strike…))*		
f. E-commerce *(Amazon, ebay, MercadoLibre…)*		
g. E-government		
h. E-learning		

9. How much do you agree with the following statements about having more access to technology in your village?

	I totally disagree 1	2	3	4	I totally agree 5	n.a.
It could help us to preserve the environment						
It will make us forget things related to our traditional culture						
It would enhance the quality/ level of education						
It could help to boost the economy						
It could help resolve conflicts						
It could help to improve healthcare						
Technology helps the leader of the community to manage the community better						

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