

Inception Report - Revised

National ICT Needs Assessment Consultancy

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

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A - REPORT

A.1 Introduction

A.1.1 Description of the Project

Celebrating its 50th year of independence, Guyana looks back at several ups and downs, socially as well as economically during these years. Despite having rich reserves in bauxite and gold, as well as rich nature and wildlife, especially in its rainforests, it is still struggling to overcome poverty in general as well as connecting the sparsely populated Hinterland to the densely populated areas at the coast.

Information and Communication Technologies (ICT) are seen as the major foundation to overcome several challenges that are very specific to Guyana:

- Bridging the gap between the Hinterland and remote areas and the highly populated coastal areas
- Providing platforms for people in poor and remote areas, helping them to sell locally produced items
- Promote Guyana as an eco-tourism destination and connect the tourists with the people in the respective areas
- Increase the possibilities to communicate over large distances, personally and business related, helping to exchange experiences to, e.g., improve agricultural methods
- Developing the social cohesion between the different ethnicities and therefore drive a distinctive Guyanese nation building
- Help to protect and secure remote border regions and protect the rainforest from illegal activities

ICT is seen as the major pillar to bring Guyana as a whole into the 21st century and connect all regions with the rest of the world.

A vision for the upcoming years needs to be elaborated to define this “ICT foundation” for Guyana, based on the needs and requirements of the different users and stakeholders. It is essential to understand that this vision cannot be limited to activities that only address the technology itself, it needs to be seen as a multidimensional vision and task plan, addressing technical infrastructure and platforms, tailored services, building of the capabilities of the people in the different communities and providing a suitable regulatory framework.

The e-Government Agency, as the project’s implementing entity, will be responsible for the actual execution of project activities and elaborating an ICT centric vision. The United Nations Development Programme (UNDP), as the partner entity under the GRIF Framework, will be responsible for quality assurance and for providing and incorporating social, fiduciary, and environmental safeguards and best practices into the design and implementation of the project.

The Government of Guyana and UNDP have contracted “Detecon Consulting” to help define and elaborate this vision within the next months.

A.1.2 Purpose and Scope

A.1.2.1 Work Stream 1 – Baseline Data Collection

Work stream 1 contains a baseline data collection (qualitative and quantitative) with focus on the overall project scope. This includes an assessment of existing infrastructure and a needs assessment of the hinterland, poor and remote communities. The survey does not set out to be a statistical data collection in terms of a census-type data collection. The collected data will be analyzed to provide a recommendation in line with the project objectives.

The baseline data collection, which consists of both a qualitative and a quantitative part, is designed to gather data on a community level. In the quantitative part, a community leader (e.g. Toshao) will be questioned and complemented by follow-up interviews on-site until one complete set of data has been compiled per community. Additionally 6 quantitative ICT checklists will be handed out to people in the respective communities. The sample will be comprised of both genders in the following age groups: 1) under 20 years, 2) 21-55 years, and 3) 56 years and over.¹ The ICT checklist is designed to gather data on a personal level. In the qualitative part, data is gathered on a personal (persona-specific) level, where several selected persons from different sectors (prevailing economic activity, educational and medical sector) will be interviewed. Those persons are selected from general population and asked about their personal reality as well as the impression they have about the community they live in. This part aims at identifying the existing national ICT infrastructure and outlines specific ICT infrastructural needs.

During the field work period, which is set between mid-July and end of August 2016, a maximum of 30 communities in all 10 regions of Guyana will be visited by researchers who conduct the surveys. Multiple teams are set out to depart from the headquarters in Georgetown. The teams will cover different regions and report back to Georgetown when necessary.

Collected data will be processed in Georgetown and entered into a database to ensure data backups and continuous analyses.

A.1.2.2 Work stream 2 - Elaboration of the extensive Technical Report

Work stream 2 is based on the results of work stream 1. The aim of this work stream is to provide an overview of potential technologies that might be used to provide both suitable Internet and telephony services in the hinterland, poor and remote communities of Guyana.

In order to decide on an optimal solution for the targeted areas, a comprehensive stakeholder map will be developed and first requirements for a successful implementation of the identified technologies will be derived.

To guide the identification of further requirements, Detecon will provide a high level list of requirements in regulation/legislation in order to support the medium- and long term success of the project endeavor.

To leverage all potential synergies, Detecon will analyze potential partnership capabilities that might be used and elaborate a comprehensive map of potential partners in the dimensions Public, Private, Over-The-Top (OTT) and beyond.

In order to find a target picture for the most suitable ICT solution, Detecon will provide a high level target architecture and design of the infrastructure, description of equipment needed for using internet and telephony

¹ Only on best effort basis, based on the availability of target segments.

communications and high level cost estimates and breakdowns including indicative costs for maintenance over 5 year period.

Clearly defined business and operational models are essential prerequisites for the success of the overall ICT strategy and implementation program. Therefore, Detecon will provide best suiting business and operational models for this program in order to meet the ICT needs in hinterland, poor, and remote areas, taking into consideration the specific situation (very rural and very low income/purchasing power).

Based on a set of assumptions and priorities acting as boundary conditions, Detecon will elaborate recommendations for a prioritized technology rollout and implementation sequence.

For the successful implementation of the ICT program, the identification of appropriate vendors and potentially system integrators is essential. Detecon will support the Guyana e-Government team in the setup and design of the RFP documents for the planned next phase during the duration of this project. A separate consultant at the e-Government team has the ownership of the overall tender documents and is responsible for the detailing of the respective chapters and technical solutions.

A.1.2.3 Work stream 3 - e-Services Readiness Assessment and Elaboration of Respective Action Plan

Work stream 3 is based on results of work streams 1 and 2. It covers the preparation of readiness assessments and action plans for national e-Government and other e-Services. Detecon will document the as-is situation in Guyana regarding availability, quality and reach of existing e-Government services, frameworks needed for efficient e-Government services, like legal, institutional, technological and infrastructural. It will contain an elaborated high-level vision of a realistic e-Government service offering addressing the population in hinterland, poor and remote communities and elaborated gap-analysis and recommendation for next steps to reach the vision including needed ICT solutions, organizational changes, human resources requirements, processes and policies. The financial part will include high-level cost estimations and proposed prioritization for the implementation of the "next steps". To elaborate a respective action plan, Detecon will provide an updated stakeholder map, highlighting roles and responsibilities, as well as support the e-Government team in the development of technical documents regarding the "next steps activities."

Special focus will lie on describing how e-Learning programs need to be tailored to suit the hinterland, poor and remote communities. Different target groups and educational levels, as identified in WS1, will play an important role. E-Learning collaborations and partnerships will be described.

To use the identified e-services and to have scope of trainings for the hinterland, poor and remote communities, Detecon will develop recommendations for a training plan for the different target groups, i.e. members of the hinterland, poor and remote communities including teachers and health professionals, to increase their capabilities in using the proposed technologies and e-Services.

A.2 Project Framework

A.2.1 Overall Approach

A.2.1.1 Work stream 1 – Baseline Data Collection

The main objective of work stream 1 is to gather data on the communities' infrastructure and on the peoples' attitudes towards specific ICT use cases as well as the communities' needs. The aim is to compile relevant data on shortcomings in different sectors, such as social, economic or health and a potential overall improvement plan for the communities in relation to the access to infrastructure for online and/or telephony services.

Work package 1.1

It covers the collection and analysis of data based on the current environment in hinterland, remote and poor communities.

To collect this data, a quantitative survey on community level and an ICT checklist on personal level is compiled, which sets the basis for qualitative interviews. The interviews will be conducted at 30 sites in all 10 regions of Guyana. Those sites are distributed between poor, remote and hinterland areas.

Work package activities:

- Design, preparation and execution of field study:
 - Identify and collect data based on the current environment, indicators to be assessed quantitatively include:
 - number of communities or households that have internet and telephony access
 - number of children aged x-y 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
 - The quantitative survey is based on information given by a representative of each community, e.g. Toshao or community leader. This method carries a measurement error because any number given relies on estimations. The quantitative survey is 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.
 - Facilitate achievable target setting for the project. The individual communities' needs regarding ICT infrastructure will be gathered, assessed, and put into context.
 - Information on key indicators will assist in the evaluation of the achievement of project progress, objectives, outcomes, and impacts.
 - The qualitative survey aims for enriching quantitative data with complimentary background information and covers topics that need to be explored freely to uncover so far unknown circumstances and needs.

- Preparation of field study includes the following work package deliverables:

- Detailed work plan
- Design of field study: methodological approach (quantitative and qualitative)
- Work breakdown structure
- Draft travel agendas
- Sites to be visited
- Persons to be interviewed
- Deliverable formats:
 - Report of results in MS Word format
 - Labelled data sets of relevant splits, such as number of devices (mobile phones, computers, etc.) per geographical area (hinterland, remote, poor), list of main economic activity of the sites visited
 - Quantitative data will be entered into a database (data can be consulted at later point as SPSS data file)
 - PowerPoint presentation of selected results at Steering Committee

Work Package 1.2:

This work package aims to collect relevant data on existing ICT-infrastructure and to identify national ICT infrastructural needs

Work package activities:

- Evaluate national network capabilities (focusing on national backbone as well as all existing operators)

Work package deliverables:

- Identified networks and infrastructure in relation to communities plotted on a map of Guyana
- Description of ICT-infrastructure needs as conclusion from findings from WP 1.1 and 1.2

A.2.1.2 Work Stream 2 - Elaboration of the extensive Technical Report

The work stream contains work packages 2.1 until 2.8.

Work Package 2.1:

The main objective of work package 2.1 is to provide an overview of potential technologies that might be used to provide both suitable Internet and telephony services in the hinterland, poor and remote communities.

Work package activities:

- Description of the technology for access, aggregation and core elements
- Pro's and con's of the different technologies will be listed in general and recommendations with

respect to the specific situation in Guyana will be provided

- As per TOR, this will include (but will not be limited to)
 - Potential target communities
 - Risks and mitigation measures
 - High level implementation scenarios
 - Costs, capacities, reach reliability, security
 - Operational aspects
 - Environmental concerns

Work package deliverables:

- Comprehensive list of potential available technologies to deploy Internet and telecom services in the hinterland, poor and remote communities with the focus on Guyana's specific needs for these regions

Work Package 2.2:

The main objective of work package 2.2 is the Identification of necessary stakeholders and derivation of requirements for a successful implementation of the identified technologies. In order to decide on an optimal solution for the targeted areas, a comprehensive map of all relevant stakeholders is required to make sure that besides the technologies in WP 2.1. all other topics and requirements that might influence the technical solution are recognized.

Work package activities:

- Expert interviews with representatives of all relevant institutions and bodies that might have an impact on the targeted solution, e.g. Guyana telephone and Telegraph Company (GT&T), Digicel, National Frequency Management Unit (NFMU), E-Government Unit- Ministry of the Presidency, Ministry of Indigenous Peoples' Affairs, National Toshias Council, Ministry of Communities, Ministry of Public Infrastructure, Ministry of Education

Work package deliverables:

- Comprehensive stakeholder map to serve as input for work package 2.5
- Records of all stakeholder meetings will be summarized and presented in a report, serving as meeting minutes

Work Package 2.3:

The main objective of work package 2.3 is an assessment of the impact of legislation (existing and impending) in the context of this project this work package identifies and compiles all relevant impacts, risks and opportunities from relevant legislation of ICT infrastructure and services in Guyana.

Work package activities:

- Perform analysis that includes but is not limited to requirements, opportunities, risks evoked of the relevant stipulations in Guyana with special focus on the draft Telecommunications Bill and the draft Public Utilities Commission Bill. The regulatory instruments shall all be balanced to foster the development of the ICT-market in Guyana and the respective economy in general.

Work package deliverables:

- Overview of identified related dependencies with regulation and highlighting the legislative impact towards the projects
- High level list of further requirements in regulation/legislation in order to support the medium- and long term success of the project endeavor

Work Package 2.4:

The main objective of work package 2.4 is the identification of potential partners. It also generates input for work package 2.5 (Identification of best ICT solution).

Work package activities:

- Elaborating recommendations on potential partners that might be used to reach the elaborated vision. Both public and private network and infrastructure providers will be analyzed (existing and near term plans).

Work package deliverables:

- Comprehensive map of potential partners serving as input to work package 2.5

Work Package 2.5:

The main objective of work package 2.5 is the elaboration of a high level technical architecture / design of an optimal ICT framework.

Work package activities:

- Sketching the target picture for the most suitable ICT solution, providing internet and telephony access to all identified hinterland, poor and remote communities/cluster of communities
- Based on the information gathered in work package 2.1 – 2.4 the optimal solution will be elaborated considering commercial and technical viability, as well as existing capabilities.
- Identification of required hard- and software, technical infrastructure for both network and CPEs (functional requirements that will serve as input to WP 2.8 (tendering preparation))
- Identification of smart (i.e. renewable) energy solutions taking into consideration the specific situation of Guyana
- Elaborating recommendations on locations for the above mentioned infrastructure (High level, i.e. based on coverage assumptions)
- Identification of required hard- and software, technical infrastructure for both network and CPEs (functional requirements that will serve as input to work package 2.8)

Work package deliverables:

- High level target architecture and design of the infrastructure
- Description of equipment needed for using internet and telephony
- Recommendations regarding legal, infrastructural, social, and environmental aspects

- High level cost estimate and breakdown including indicative costs for maintenance over a five year period.

Work Package 2.6:

The main objective of work package 2.6 is to have viable business model/models for implementation elaborated.

A clearly defined business and operational model is an essential prerequisite for the success of the overall program. Due to the specific nature of the hinterland, poor and remote areas, , a solely self-sustained approach for a telecommunication network in the framework of this program is difficult. The principle of (infrastructure-based) competition that is meant to be beneficial in all areas, regardless of density, does not apply to remote areas:

- Urban areas enjoy choice between two or three infrastructure networks, while large part of rural areas have no modern ICT-infrastructure at all
- Private operators usually have lower incentive to invest in broadband infrastructure in rural & remote areas

Hence, public intervention, e.g. via funding, is necessary to meet future bandwidth needs and to ensure that society at large can reap the benefits of the digital economy. Therefore, a best suiting business and operational model for this program will be elaborated in order to meet the ICT-needs in hinterland, poor, and remote areas.

For above mentioned reasons, the business potential in the rural internet ecosystem is rather limited. Specifics of this ecosystem, such as additional revenue streams arising from e.g. eco-tourism, will be considered as well as all other levers mentioned in the TOR.

Work package activities:

Based on international best practice, Detecon will analyze up to five different business and will propose the most promising model for this program:

- Drafting of different business and financing model for ICT-Access in remote and rural areas using Detecon's knowledge base based on international experience
- Evaluation of feasibility of the business models: Assessment of benefits, risks and impacts on Guyanese population, governmental institutions, and market players.
- Recommendation of the best suitable business and financing model. The models consider different approaches e.g. public infrastructure (solely government owned), Public-Private-Partnership, Locally Supported, Direct and Indirect Subsidies

Work package deliverables:

- Best fitting operational and business model taking into consideration the specific situation (very rural and very low income and purchasing power).

Work Package 2.7:

The main objective of work package 2.7 is the prioritization of the recommended rollout / implementation activities.

The idea of the approach is to sequence the rollout (and hence the CAPEX flow over time) according to a set of requirements that are essential for the overall program.

The requirements should be derived from facts like

- Ease of implementation
- Coverage for specific groups
- Commercial viability
- Public needs
- Etc.

Work package activities:

- Based on these requirements, a target function for the overall rollout sequence will be compiled and a correspondent rollout plan will be elaborated

Work package deliverables:

- Recommendations for a prioritized rollout and implementation sequence of activities identified.

Work Package 2.8:

The main objective of work package 2.8 is to support the e-Government team in preparing their follow up RfP to this project.

For the successful, i.e. sustainable, implementation of the identified activities and recommendations, the identification of appropriate vendors and potential system integrators is essential.

Work package activities:

Support the e-Government team in their RFP preparation from a technical perspective and share best practice experiences.

Elaborate specific RfP guidelines to define as precise as possible the requirements towards vendors / system integrators.

A separate consultant at the e-Government team has the ownership of the overall tender documents and is responsible for the detailing of the respective chapters and technical solutions

Work package deliverables:

- RFP guidelines
- Support in the design and layout of the tendering documents

- Know how transfer with experts

A.2.1.3 Work Stream 3 - e-Services Readiness Assessment and Elaboration of Respective Action Plan

The work stream contains work packages 3.1, 3.2, and 3.3.

Work Package 3.1:

The main objective of work package 3.1 covers the preparation of a National e-Government Readiness Assessment and Action Plan.

Work package activities:

- As-Is Analysis: Documenting the existing types, levels, quality and reach of e-Government services in Guyana; documenting the existing frameworks in place in the country that can drive and enable e-Government services.
- Elaboration of e-Government Vision for Guyana's hinterland, poor and remote communities: Draft of a holistic view on e-Government services to support these communities
- Gap-Analysis: Elaboration of needed activities to reach the e-Government Vision including a high level cost assessment. This analysis will address all architecture layers "Business" (i.e. organization, skills, processes), "Application" (i.e.-Government services, tailoring, supporting services) and "Technology" (i.e. required ICT equipment, infrastructure)
- Support of the e-Government team in the development of related documents needed to execute the activities identified in the Gap-Analysis

Work package deliverables:

- Documented as-is situation in Guyana regarding availability, quality and reach of existing e-Government services, frameworks in place for efficient e-Government services, like legal, institutional, technological and infrastructural
- Elaborated high-level vision of a realistic e-Government service offering addressing the population in hinterland, poor and remote communities
- Elaborated gap-analysis and recommendation for next steps to reach the vision including needed ICT solutions, organizational changes, human resources requirements, processes, and policies
- Cost estimations and proposed prioritization for the implementation of the "next steps"
- Updated stakeholder map, highlighting roles and responsibilities

Work Package 3.2:

The main objective of work package 3.2 is the elaboration of an e-learning customization strategy for hinterland, poor and remote communities.

Work package activities:

- Elaboration of an extended stakeholder view on e-learning programs
- Development of recommendations, and requirements necessary to develop tailored e-learning programs for different target groups and for different educational levels.

- Assess the potential for collaboration and partnerships with the private sector in Guyana and assess synergies with Government Learning Channel, Amerindian Development Fund and Amerindian Land Tiling Projects, One Laptop per Family Project, Telecom Liberalization
- Laying the foundation to build the right capacities and therefore potentially increase Guyana's Human Development Index

Work package deliverables:

- Documented stakeholders and their needs and requirements regarding e-learning
- Examined potential for collaboration and partnerships with the private sector
- Recommendations for next steps and other inputs that can be used to develop tailored e-learning programs for the different educational levels in Guyana

Work Package 3.3:

The main objective of work package 3.3 is the scoping of trainings for the hinterland, poor and remote communities.

Work package activities:

- Determination of the scope of training required for members of hinterland, poor and remote communities on how to use the identified e-services. Special focus groups like teachers and health professionals will be considered as well.

Work package deliverables:

- Training plan for the different target groups, i.e. members of the hinterland, poor and remote communities including teachers and health professionals, to increase their capabilities in using the proposed technologies and e-services.

A.2.2 Stakeholders

Name	Organization
Phillip Walcott	eGovernment Agency
Francis Simmons	eGovernment Agency
Floyd Levi	eGovernment Agency
Samantha Scotland	eGovernment Agency
Nickolaus Oudkerk	Office of the President
Catherine Hughes	Ministry of Public Telecommunications
Sydney Allicock	Ministry of Indigenous Peoples Affairs
Enrico Wollford	Ministry of Public Telecommunications

Hector C. Butts Ph.D.	Ministry of Finance
Sheranne Isaacs	Ministry of Finance
Ronald Bulkan	Ministry of Communities
Lelon Saul, Msc., BSc.	United Nations Department of Safety & Security
Dr. Rupert Roopnaraine	Ministry of Education Personal Assistant to VP and Minister of Indigenous Affairs Special Assistant to the Minister of Indigenous Peoples' Affairs
Errol Ross	Guyana Lands and Surveys Commission
Martin Cheong	
Trevor L. Benn	
Shabnam Mallick	United Nations Development Programme
Patrick John	United Nations Development Programme

Additional stakeholders need to be identified at Guyana Telephone and Telegraph Company (GT&T), Digicel Corporation, National Frequency Management Unit (NFMU) etc.

A.2.2 Risks and Limitations

Risks will arise during the project. An early identification of a possible risk is essential to initiate the right mitigation activities as early as possible. Some risks were already obvious prior to project start:

WP1	The quantitative survey is based on information given by a representative of each community, e.g. Toshao. This method carries a measurement error for each information because any number given relies on an estimation. Answers don't represent reliable and numbers, but estimations.	To minimize possible errors due to estimations, the answers will be cross checked by follow-up interviews on-site until one complete set of data is available per community.
WP1	The ICT checklist partly carries a measurement error for some of the information because some numbers given rely on an estimation.	To minimize possible errors due to estimations, multiple checklists will be collected to be able to analyse the overall entity of checklists throughout all communities,
WP1	At the time of designing the questionnaire, Census data from 2012 was not available. Therefore, answer categories for closed-ended questions will be put in percentages. Additionally, quantitative questions ask for an estimation of an exact number. Example: "Please enter the estimated quantity and percentage of people using the following options in their houses."	Quantitative questions ask for estimations of numbers. Additionally, answer categories are put in percentages. Example: "Please enter the estimated quantity and percentage of people using the following options in their houses."
WP1	Qualitative interviewing targets on insight	Representative persons are pre-selected

	generation. Due to naturally small sample sizes (and under the effect of only a small sample of communities), gained insights might be deep, but not fully representative for the given population. Derivations of underlying distributions or actual dimensions cannot be drawn.	thoroughly to maximize the applicability of gained insights to the underlying basic population.
WP1	Sampling: due to selecting representative persons for the qualitative research part, those persons might be prone to depict their cohort/ group in an idealized way. This might be enforced by the importance that is conveyed by the mere visit of the research team (many visitors, travelling a long way, official/ governmental background etc.).	Interviewers are trained and advised to build a trustful atmosphere during the interview so that effects of social desirability on answering behavior are mitigated.
WP1	Chosen representative persons might not be dedicated spokespersons of their group and thus not experts for the research questions. All qualitative data are subjected to the bias of subjective statements and points of view.	Representative persons are pre-selected thoroughly to maximize the applicability of gained insights to the underlying basic population.
WP1	During field work the research teams might experience obstacles, such as weather conditions, that are beyond their control (flooded roads, flight delays, impenetrable areas, diseases/illnesses, etc.). Events of the above nature might entail a delay in fieldwork timing or a change of communities, interviewers and organizational approach.	Fallback communities have been defined for this reason, as some communities might not be accessible.
WP1	Safety threats in the coastal area, especially close to mining settlements can be a risk.	Travelling will only be done in daylight, in teams of many persons and public transport will be avoided (replaced by e.g. taxi). Extra overnight stays are scheduled in case of daylight travelling not being possible.
WP1	No shows of scheduled interviewees might lead to a delay in field work.	At least one back up respondent is recruited per community.
WP1	Difficult or non-existing access to experts in Guyana ministries and to other stakeholders to gather relevant information.	Use of a local Liaison Officer with extensive knowledge of local culture and with a wide network.
WP1	Access to and generation of relevant data is hindered by external limitations/effects.	Ability to complete generated data with qualified expert estimations, based on data sets and the broad experience of Detecon in multiple projects in the field of ICT-strategy and in emerging and developing countries.
WP1	Bias of community leader towards questionnaire and possible impact on other interviewees in community.	Careful design of survey method as to have 1:1 interviews with community members, preferably without community leader.

WP1	Telco operators might not be willing to share their information in regards to network planning.	Involvement of the Government (e.g. Ministry of Telecommunication, e-Government Unit) to explain the strategic need of their information of the study. If it doesn't succeed, usage of best guess and market benchmarks.
WP2	Intentions of possible suppliers to influence any (investment) decision in the project.	Following Detecon's and Deutsche Telekom's compliance and anti-corruption processes.
WP2	Relevant legislations are non-existing, not sufficient, or not sufficiently documented.	Access to Detecon Regulation Toolkit and usage of Best Practices to elaborate a sound target picture.
WP3	Insufficient access to information in relevant Governmental programs and (e-learning) activities and/or to other stakeholders to gather relevant information.	Use of a local Liaison Officer with extensive knowledge of local culture and with a wide network.

A.3 Proposed Methodologies

A.3.1 Work stream 1 – Baseline Data Collection

A.3.1.1 Quantitative and qualitative approach:

The quantitative survey, as such a questionnaire that is designed to collect data in a statistical format, whether numeric, on a percentage basis, or as open-ended question type, aims at gathering baseline data of the community and on usage and existing ICT infrastructure, focusing on topics related to ICT literacy.

Representative persons of each community are asked to give information about their community. This information is obtained by multiple-choice answers, closed-ended and open-ended questions. The individual interviewee in one community will be a community leader, or a person that has certain knowledge of the community. In many cases this might entail interviewing multiple persons in the respective community, which additionally helps to reconfirm data and complete any data that might not be answerable by any one person.

The quantitative questioning as described above will produce one complete data set of the quantitative questionnaire per community, which equals $n=30$. Additionally, a quantitative questionnaire checklist has been compiled to monitor $n=6$ filled in checklists per community. The sample will be chosen randomly out of persons in the community. The researchers will strive to cover different age groups and both genders. This sums up to approximately $n=180$ checklist questionnaires among the 30 communities.² This data can be analysed according to the following sub-groups over all communities, but not for any specific community: age, gender, ethnicity, level of education.

The aim for the quantitative survey is not to collect statistically valid answers, this is not possible if the prerequisites in timing and in available resources are considered. Nonetheless, the data collected can be analyzed according to different approaches, which will be more than conclusive for defining the following work packages.

Given sample allows to analyze the collected data on the basis of common statistical standards.

The binomial distribution is frequently used to model the number of successes in a sample of size n drawn with replacement from a population of size N . If the sampling is carried out without replacement, the draws are not independent and so the resulting distribution is a hypergeometric distribution, not a binomial one. However, for N much larger than n , the binomial distribution is a good approximation, and widely used.

Binomial probability mass function and normal probability density function approximation for $n = 6$ and $p = 0.5$. If n is large enough, then the skew of the distribution is not too great. In this case a reasonable approximation to $B(n, p)$ is given by the normal distribution and this basic approximation can be improved in a simple way by using a suitable continuity correction. The basic approximation generally improves as n increases (at least 20) and is better when p is not near to 0 or 1.

² Only on best effort basis, based on the availability of target segments.

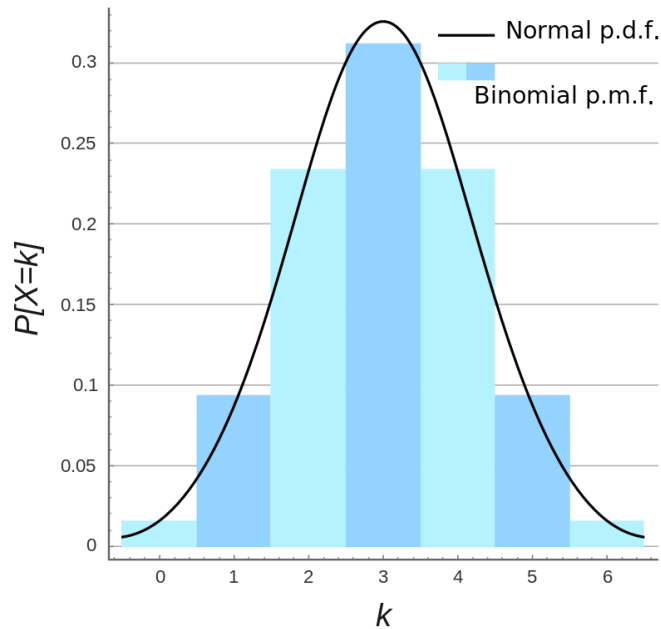


Image 1 - Schematic Overview of Distribution

Approaches for analysis can be, e.g. a frequency analysis and a descriptive statistics analysis.

Frequency data may be analyzed by several different techniques, depending upon how the sample units were located and how the data was collected.

Values collected from randomly located quadrats to determine frequency follow a binomial distribution. In this case, the comparison of sample means (evaluating significant differences between years or among sites, should be based on binomial statistics). In this situation, binomial confidence intervals are used to assess if two sample means are significantly different. The binomial confidence interval for a given frequency remains constant, according to sample size and the level of probability. For a binomial distribution a minimum number of $N=30$ is required.

Tables listing the width of confidence intervals have been developed for commonly used sample sizes and probability levels. If the confidence intervals (for the correct sample size and probability level) for the sample means being compared overlap, it is concluded that these values are not significantly different.

Categorical variables and quantitative variables are defined as follows:

Categorical variables:

Categorical variables are also called qualitative variables or attribute variables. The values of a categorical variable can be put into a countable number of categories or different groups. Categorical data may or may not have some logical order.

Quantitative variables:

The values of a quantitative variable can be ordered and measured.

Often, both types of data are collected when exploring a single subject, because categorical variables are often used to group or subset the data in graphs or analyses.

Examples of categorical and quantitative data when exploring the same subject:

Subject of the analysis	Possible categorical variables	Possible quantitative variables
Communication devices in community	Type of devices; Make and model	Price of different devices; fees

Examples of categorical variables

Data type	Examples
Numeric	<ul style="list-style-type: none"> Gender (0=Male, 1=Female) Survey results (1=Disagree, 2=Neutral, 3=Agree)
Text	<ul style="list-style-type: none"> Different kind of water supply (nobody, nearly no one, some, ...) Product types (landline telephone, cell phone, smartphone, ...)
Date/time	<ul style="list-style-type: none"> Days of the week (Monday, Tuesday, Wednesday) Months of the year (January, February, March)

Examples of quantitative variables

Data type	Examples
Numeric	<ul style="list-style-type: none"> Number of electric devices available in community Percentage of paid back loan Number of people being affected by different living conditions
Date/time	<ul style="list-style-type: none"> Date and time payment is received Date and time of technical support incident

Moreover a descriptive statistics analysis can be applied to the data collected. Descriptive statistics is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way such that, for example, patterns might emerge from the data. Descriptive statistics do not, however, allow us to make conclusions beyond the data we have analyzed or reach conclusions regarding any hypotheses we might have made. They are simply a way to describe our data.

Descriptive statistics are very important because if we simply presented our raw data it would be hard to visualize what the data was showing, especially if there was a lot of it. Descriptive statistics therefore enables us to present the data in a more meaningful way, which allows simpler interpretation of the data. For example, if we had the results of 30 persons, we may be interested in the overall performance of those target group. We would also be interested in the distribution or spread of the marks. Descriptive statistics allow us to do this. Typically, there are two general types of statistic that are used to describe data:

- Measures of central tendency: these are ways of describing the central position of a frequency distribution for a group of data. We can describe this central position using a number of statistics, including the mode, median, and mean.

- Measures of spread: these are ways of summarizing a group of data by describing how spread out the scores are. For example, the mean score of 100 persons may be 65 out of 100. However, not all persons will have scored 65. Rather, their scores will be spread out. Some will be lower and others higher. Measures of spread help us to summarize how spread out these scores are. To describe this spread, a number of statistics are available to us, including the range, quartiles, absolute deviation, variance and standard deviation.

When we use descriptive statistics it is useful to summarize our group of data using a combination of tabulated description (i.e., tables), graphical description (i.e., graphs and charts) and statistical commentary (i.e., a discussion of the results).

Descriptive statistics provide information about our immediate group of data. For example, in case of calculating the mean and standard deviation of a special characteristic for 30 persons, this could provide valuable information about this group. Any group of data like this, which includes all the data you are interested in, is called a population. A population can be small or large, as long as it includes all the data you are interested in.

Descriptive statistics are applied to populations, and the properties of populations, like the mean or standard deviation, are called parameters as they represent the whole population (i.e., everybody you are interested in). Often, however, you do not have access to the whole population you are interested in investigating, but only a limited number of data instead. It is not feasible to measure all characteristics of all persons in a group you are interested in. So you have to measure a smaller sample, which are used to represent the larger population of all persons of the target group. Properties of samples, such as the mean or standard deviation, are not called parameters, but statistics. Inferential statistics are techniques that allow us to use these samples to make generalizations about the populations from which the samples were drawn. It is, therefore, important that the sample accurately represents the population. The process of achieving this is called sampling. Inferential statistics arise out of the fact that sampling naturally incurs sampling error and thus a sample is not expected to perfectly represent the population. The methods of inferential statistics are (1) the estimation of parameter(s) and (2) testing of statistical hypotheses.

The determination of the ICT literacy will be reliant on a set of basic skills beyond the pure ability to handle devices and includes skill for:

- information processing and retrieval
- participation in social networks for creation and sharing of knowledge, information and education
- wide range of professional computing and digital devices skills

The ICT literacy assessment in the context of the project focus will be addressed in the Checklist, the quantitative and the quantitative Questionnaires.

The qualitative survey aims for enriching quantitative data with complimentary background information and covers topics that need to be explored freely to uncover so far unknown circumstances and needs.

Representative persons of each community are asked to speak about their community, conditions and habits. Those persons are selected from general population and asked about their personal reality as well as the impression they have about the community they live in. This information is obtained by open-ended questions and selective inquiring in individual face-to-face interviews or round of talks interview approach.

Contextual Inquiry is an ethnographic interviewing technique that is used to gather qualitative data about users and their goals. The interviewer goes to the user and interviews them at the place where the user uses the product and/or does the work under study. The idea is to interview users in their natural setting, while they are performing their tasks, asking them questions about what they are doing and why (when necessary) along the way. Observing users as they perform activities and questioning them in their environments can bring

important details of the behaviours to light. The qualitative methods are extremely dependent on the interviewees' participation, in case where someone does not make their home available, the researchers will try to obtain any environmental indicators from the interviewee during the conversation.

Our method EthnObserve® has been developed in order to align ethnographic interviewing (deep-dive into the living world and values of respondents) and participating observation with fitting camera work. The ethnographic interview conveys insights into life, world and everyday life of the target audience by empathic understanding of the respondents' lifeworld and culture. In doing so, participants are questioned about their usage habits and needs as well as attitudes, values and other habits and observed during product usage, respectively usage of the object of investigation. Due to certain restrictions in the context of the project (given due dates, resources like budget) the method cannot be applied to its full extend, and has been adapted to fit the scope of this study. Therefore ethnographic interviews were adapted to a semi-ethnographic approach that entails use-cases as a conceptual examination of the study subject, combined with observation of the cultural context by ethnographically trained interviewers and by photo documentation.

To complement the subjective view of interviewed persons, trained researchers assess an outside view by observing habits, behavior and ecosystem of respondents. To assess living situation, infrastructure, living standards and local particularities, photo-documentation is made that depicts the respective ecosystem. . The aim is to comprehend, which facts and what knowledge is important to the interviewee and how their knowledge is linked to their cultural context or their community.

Qualitative data is processed in different steps. The data is collected by audio recording to ensure gapless data assessment with no loss of information. Then audio recordings are transcribed (written down from audio recording) literally, i.e. verbatim transcripts, without shortening of text or any summarization. To complement statements of respondents by an external perspective, interviewers are advised to note down peculiarities that occur to them during the interview (such as irregularities in respondents' statements, e.g. a respondent talks about a new model of mobile phone, but shows a dated model, that might seem new to him). Our analysis generally follows the approach of Grounded Theory (Strauss & Corbin 1990) that is a „qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon“.

For analysis, two ways of analytical approach are used. There is the single case analysis (analysis within one respondent), where one after another, all interviews are reviewed and analyzed in depth. Results of this way of analysis are: current status of ICT usage of respondent in their individual context, motives and reasons for acting in a specific way, identification of individual needs and demands. After analysis of each single case, comparison between cases are drawn through a comparative analysis (analysis between respondents), where a comparison of the whole sample is made. Step by step, each interview topic is reviewed across all respondents to identify differences and patterns within the whole sample for the respective topic. Results of this analysis could be to identify different sub-groups (if existent), differences are then outlined and described.

Furthermore, a comparison of identified or pre-defined sub-groups: to verify the identified sub-samples and test pre-defined possible sub-groups (like the differentiation poor-remote-hinterland), cases within those groups are compared with each other again. If necessary, further sub-groups are identified and described (e.g. remote-female, remote-male). Results of the qualitative analysis entails a summarized description of the sample in total and of all identified and relevant sub-groups including their attributes and characteristics, motives habits and demands.

A.3.1.2 Selection parameters of communities:

Through intertwining the selection parameters below, we aim at a representative proportion of the population.

- Geographic
 - To cover the entire territory of Guyana and its ten regions, including indigenous territory, urban, rural, remote and hinterland areas

- Ethnical-racial
 - To include the different ethnic and racial inscriptions of the country: Afro-Guyanese, Indo-Guyanese, Indigenous People and Mixed

- Socio-economic
 - To include poor localities and other non-poor and economic activities as mining, logging, agriculture, commerce and tourism.

A.3.1.3 Overview of selected sites per region

The sample set for the study is n=30 communities

Region	Region Name	Main City	Site 1	Site 2	Site 3	Site 4	Fall-Back-Sites		
1	Barima	Mabaruma	Port Kaituma	Mabaruma			Eclipse Falls	Aruau	Kumaka
2	Pomeroon-Supenaam	Anna Regina	Mainstay/Whayak	Charity	Santa Monica		Tapakuma	Kabakaburi	Bethany
3	Essequibo Islands-West Demerara	Vreed en Hoop	Wales	Saxacally	Hog Island		Santa Aratak	Sand Hills	Nismes/Canal#1
4	Demerara-Mahaica	Georgetown	Albouystown	Buxton	Laluni	St. Cuthberts	Wayaleng		
5	Mahaica-Berbice	Fort Wellington	Perth	Ithaca	Number 3/Rosignol		Moraikobai		
6	East Berbice-Corentyne	New Amsterdam	West Canjie	Plegt Anker	Orealla		Port Mourant		
7	Cuyuni-Mazaruni	Bartica	Pillipai	Kako	Bartica		Kambaru		
8	Potaro-Siparuni	Mahdia	Tumatumari	Mahdia	Kato		Waipa	Taruka	
9	Upper Takutu-Upper Essequibo	Lethem	Karasabai	Lethem	Aishalton		Quiko	Massara (Anna)	Karaudanaw
10	Upper Demerara-Berbice	Linden	Wismar	Kwakwani	Coomaca		Wallaba	Muritaro Paripi	Wikki

Mixed	Afro-Guyanese	Indo-Guyanese	Indigenous People
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The distribution of the sample considered an equal division of cities per region. However, region 4 comprises an extra site (n=4), because it contains different profiles which are of interest to the project.

Overview of selection parameters in relation to the communities³:

³ All communities were approved by the e-Government team and based on the criteria mentioned below. Part of the criteria were requested by e-Government team (ethnic groups, rural and urban).

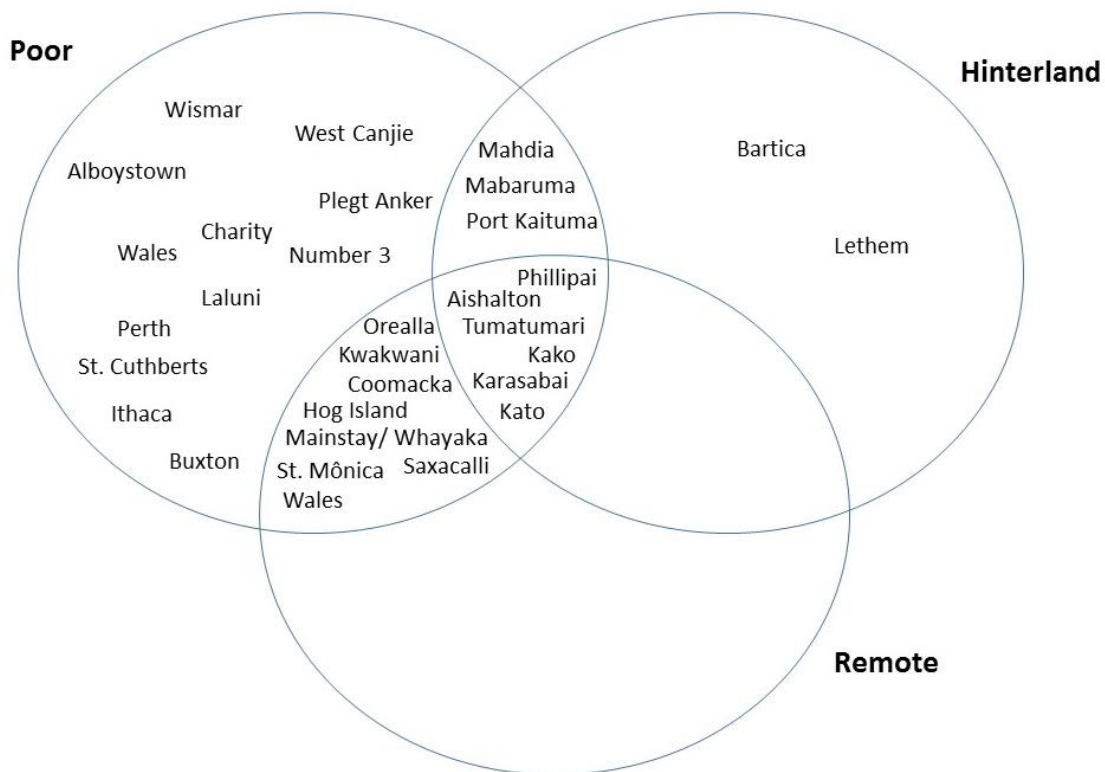


Image 2 - Geographical distribution

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 and indicates that communities in all three dimensions will be covered in the research. Remote communities will most likely always be poor, too. This can also be an overall indicator of the countries' structural disposition.

Overview on prevailing economic activities in selected communities:

	Community	Prevailing industry				
		Agriculture	Mining	Logging	Commercial	Tourism
Region 1	Mabaruma	•	•	•		
	Port Kaituma		•			
Region 2	Santa Monica	•		•		
	Charity	•			•	
	Mainstay/ Whayaka	•		•		•

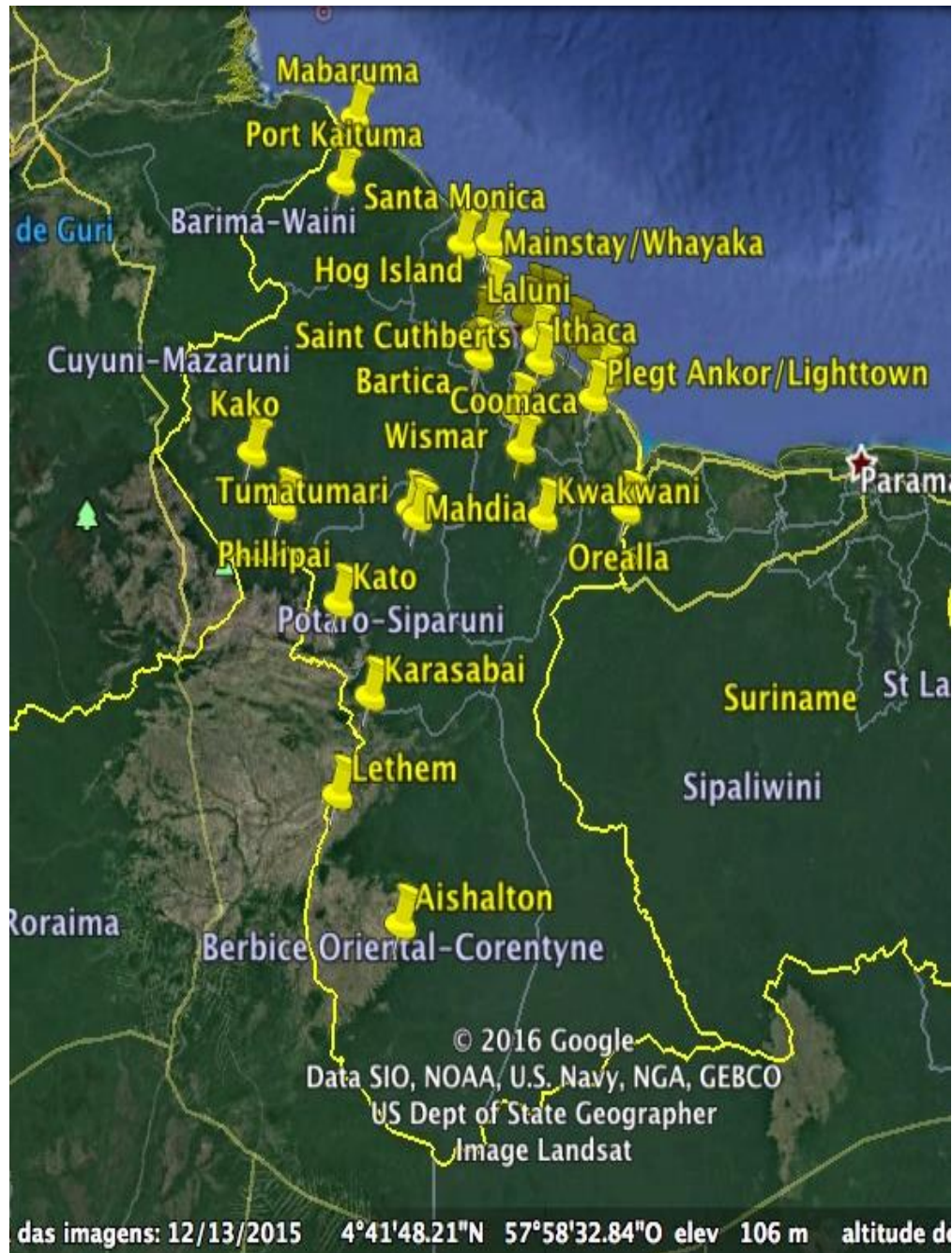
Region 3	Saxacally			•		•
	Hog Island	•				
	Wales	•				
Region 4	Alboystown				•	
	Laluni	•				
	St. Cuthberts	•		•		
	Buxton				•	
Region 5	Perth	•				
	Ithaca	•				
	Number 3	•				
Region 6	West Canjie	•				
	Plegt Anker	•				
	Orealla			•		•
Region 7	Phillipai	•	•			
	Kako	•	•			
	Bartica		•		•	•
Region 8	Tumatumari		•			
	Mahdia		•			
	Kato	•	•			
Region 9	Karasabai	•				
	Lethem ⁴				•	•
	Aishalton		•	•		
Region 10	Wismar		•			
	Kwakwani	•				
	Coomaca			•		

This table indicates the prevailing economic activity in a community. The different profiles support a

⁴ Lethem was chosen because of its proximity to the border with Brazil and due to the high flow of people moving from one country to another due to commercial activities.

diverse sample of communities. The economic activity may be strongly connected to the individual ICT needs of a community.

A.3.1.4. Map of Guyana indicating communities to be visited:



A.3.1.5 Definition of concepts

A.3.1.5.1 Geographic criteria⁵

- Remote⁶
 - Areas inaccessible due to poor roads, need to access via water ways (by boat), not necessarily far from a geographical point of view. These areas tend to be poor in terms of water supply, sewage services, electricity supply, schools, hospitals, road systems, policing, leisure facilities, etc. This difficulty of access, expressed in physical space, is one of the facets of the separation that exists between the different human groups that form Guyana: Afro-Guyanese, Indo-Guyanese, Indigenous People and Mixed; especially among the majority group of Indo-Guyanese and Afro-Guyanese people. With the end of slavery and the beginning of the country's modernization process in the nineteenth century, a growing competition between Indo-Guyanese and Afro-Guyanese for legitimizing their social position in Guyanese society as the most prestigious group has been noticeable. Indo-Guyanese arrived in the country to replace slave labor. They took over the work from the Afro-Guyanese, and from there on the tensions grew about who would achieve more social success. Remote areas, poor in infrastructure of all types just represent the manifestation within regions that are becoming the sidelines, with little economic, political and cultural identity, precisely because the disputes between Afro-Guyanese and Indo-Guyanese are concentrated in coastal and urban areas.
- Hinterland⁷
 - Inland areas, far from urban centers and the coastal areas, except Region 1 that has a coast, but is considered hinterland. They are not necessarily difficult to access and have previously been defined as Region 1, 7, 8 and 9. 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. The hinterland is considered a discontinuous area in comparison to the coastal and urban areas where there is more economic activity to be found. This could be a reason why

⁵ Besides all the criteria and variables mentioned above, the sample considered also a wider variety of aspects of the communities such as predominant ethnic groups, poverty levels, population density and structural profiles like rural or urban. These combinations ensure that a wider spectrum of geographical diversity is being covered in the study.

⁶ 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).

⁷ 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).

region 1 is defined as hinterland since it is close to the coast. The opposition between hinterland, urban and coastal areas mirrors the design of the geographic space of tension and opposition in Guyanese society between Afro-Guyanese and Indo-Guyanese. This tension emerged and grew after the end of slavery in the mid-nineteenth century. Since then, the Indo-Guyanese immigration grew in the country in order to meet the demand for physical and manufacturing labor which got more and more specialized with the modernization of the country. Since the end of slavery and with the modernization of the country, the growing tension and stress dispute about who is more or less successful in modern society grew between the two groups of Afro- and Indo-Guyanese. This underlines the opposition between hinterland and urban areas in terms of geographical space

- Urban⁸
 - Areas characterized by continuous construction and the existence of urban infrastructure, comprising the set of utilities: water supply, sewage service, electricity supply, schools, hospitals, road system, policing, leisure facilities, etc. The economic activities in these areas are mainly activities related to commerce.

- Rural⁹
 - Rural areas are non-urbanized areas, aimed at activities of agriculture and livestock, extraction, 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. Low concentration of people and buildings, and a striking presence of natural elements, such as river and vegetation.

- Poor¹⁰
 - Fundamentally, poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and cloth[e] a family, not having a school or clinic to go to, not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation. "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 nonincome 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 poverty, multidimensional poor or in severe poverty, respectively. The contributions of deprivations in each dimension to overall poverty are also included. The table also presents measures of income poverty—population living on less than PPP \$1.25 per day and population living below the national poverty line." According to the numbers from 2009, 18,8% of the population live near and 1,2% of the population in severe multidimensional poverty¹¹.

⁸ 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>.

⁹ 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>

¹⁰ A poverty map for Guyana: Based on the 2002 population and housing census: Skoufias, Emmanuel. The World Bank, 2005.

¹¹ Human Development Report 2015: Work for Human Development, p. 205, UNDP

- According 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”¹².
- The Enumeration District Marginality Index (EDMI) has been used to identify poor communities (see A.3.1.5.3).

A.3.1.5.2 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)¹³, there are nine Indigenous Peoples 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 2012¹⁴, made up 11% of the population by that time.
- Afro-Guyanese¹⁵
 - 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-Guyanese¹⁶
 - Current Indo-Guyanese 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 Vindhya. 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.

¹² 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).

¹³ MINISTRY OF INDIGENOUS PEOPLE’S AFFAIRS. (2016). *Amerindian Nations*. (On-line) Ministry of Indigenous People’s Affairs. Available: <http://indigenoupeoples.gov.gy/amerindian-nations/>, (13th July, 2016).

¹⁴ 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).

¹⁵ 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).

¹⁶ 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).

- Mixed source¹⁷
 - 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.

A.3.1.5.3 Economic Criteria

The main economic activities include mining (gold, diamond and bauxite), logging, agriculture (rice farms, sugarcane production) and commerce.

The key factors that influence the choice of the communities is the level of poverty existing, especially communities with smaller population tend to have greater levels of poverty. The extent of poverty within the community can be evaluated considering, for instance, an appropriate energy supply. This choice is made by reviewing the most recent poverty indicators available. The 2002 National Population Census Database was utilised by the World Bank to compile two poverty indexes: the Living Conditions Index (LCI) and the Enumeration District Marginality Index (EDMI).

The first index called Living Conditions Index (or LCI) considers the following variables:

- The access and quality of a household's source of water
- Source of drinking water
- The type of toilet facility
- The main method of garbage disposal
- And extent of crowding in the household (the number of the people in the household divided by the number of bedrooms in dwelling).

The second index created, the Enumeration District Marginality Index (EDMI) is based on the following variables:

- The proportion of adults (15 yrs. of age or older) in the enumeration district (ED) who have either no education at all or did not complete primary schooling,
- The proportion of adults (15 yrs. of age or older) in the enumeration district who work in the primary sector,
- The proportion of children (6-14 yrs. of age or older) in the enumeration district who do not attend school full-time,
- The proportion of dwellings in the enumeration district that report not having piped water as their main source of water supply,
- The proportion of dwellings in the enumeration district that do not have a toilet linked to a sewer,
- The proportion of dwellings in the enumeration district that do not report electricity as their main source of lighting,
- The proportion of dwellings in the enumeration district that report their main method of garbage disposal is not garbage collection service, compost, or burying,
- The average number of family members per bedroom in the enumeration.

Regardless of the equation used for the formation of an index, the study will be based on some of these variables which have been used to measure what the level of poverty of the chosen locations is, and thus delimit the distribution of the sample regarding poverty classifications with accurate data.

These indexes can give a fairly accurate picture of the levels of poverty in the various Neighbourhood Democratic Councils (NDC) within Guyana regarding the living conditions of the population in each NDC. Both indexes are related, but the LCI reflects the poverty levels of individual households in the NDC, while the EDM I presents the poverty levels of the individual Enumeration District (ED). The EDM I also presents a wider range of variables and will thus be used for analysis purposes, because it shows the poverty level more accurately in the NDCs.

¹⁷ 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).

Communities which have a greater need for energy supply, ergo a bad energy supply system, tend to also have a higher level of poverty. This serves as an indicator in selecting fitting communities. This primary objective however was modulated by imposing another condition: the community should not be very difficult to access, because the time necessary to access them would have to be in time with the implementation of the project.¹⁸

A.3.1.5.4 People to meet/Persona profiles of preferred interview partners:

- Quantitative interviews will be conducted with the Toshao or a respective community leader. The given data will then be confirmed at least once or until one set of complete data has been collected. To verify, a random selection of interviewees can be chosen, including, but not limited to a representative person with knowledge of the requested data, such as consulting health centres, respectively doctors, nurses or schools, respectively teachers for their records. For the quantitative ICT checklist, people of the respective community will be approached randomly, regardless of their occupation, having in mind that age groups and both genders should be covered, where possible. A number of 3-5 checklists will be collected per community. The collection of more checklists will be intended on best effort.
- The data gathered will be entered into the Spiegel-Institute's survey engine (web-based) only once per community.
- The qualitative interview can also be held with the Toshao or Community Leader respectively, if this seems absolutely necessary out of respect or expectation. Additionally, a maximum of 2-3 further representative people, as described below, will be questioned:
 - Toshao/Community Leader
 - 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)

With representative people any person in the community is meant, both genders will be taken into consideration. These interviewees are most likely not preselected, but that does not entail that they show different prerequisites than any randomly selected person. These people can also be visited or searched for by recommendations of people in the community. While for the selection of the different personas a random selection can be made, it is important to stick to the persona profiles given (see above) to ensure the scope of the other work packages.

The communication protocol is specified as follows: all visits will be scheduled by the e-Government team together with the Ministry of Communities and the Ministry of Indigenous Affairs. The researchers will complete 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 Tosaos will be pre-contacted with an official letter from the UNDP.

As soon as the contact with the local leader or official is made and the visits are scheduled and authorized, the researchers will set out to the communities. None of the researchers will be travelling to any of the communities alone. In some cases of travelling by air or boat precautions have been taken to hire boat captains who are known by the community leader or the research team personally. For air travelling the researchers will be accompanied to the airport and picked up at their destination. All travel by road will also be accompanied by a trusted local driver.

The current status of officials who accompany our researchers to establish official presence at the communities is as follows:

¹⁸ Analyse and selection of Communities in Guyana: Ketwaru, Patrick, 2005.

- Region 2, respectively route 2 will be accompanied by an official of the Ministry of Amerindian Affairs.
Chairman of the National Toshias Council Joel Fredericks

A.3.1.6 Exemplary itinerary of interview activities per day

- 8:00 am: Arrival
- 8:15 am: Introduction and confirmation of the activities of the day with the local leader.
- 8:30 am: Quantitative interview with the local leader or someone indicated by the leader (who is aware of quantitative data from the community), then validation of quantitative data until one complete set of data has been collected.
- 12:00 pm: Lunch break.
- 01:00 pm: One-on-one qualitative interviews (or situational mini groups) will be conducted with representative persons.
- 01:15 pm: Qualitative interviews
- 03:15 pm: Final considerations
- 03:30 pm: If needed, approach individuals/citizens to gather further information or take pictures, also collect local maps.
- 05:30 pm: Departure

It should be noted that the script involves possible changes, as events that are beyond the interviewer will occur. This itinerary only reflects the current planning status.

A.3.1.7 Timeline –Detail View

	CW 26	CW 27	CW 28	CW 29	CW 30	CW 31	CW 32	CW 33	CW 34	CW 35
Elaborating of study design, draft travel agendas, sites to be visited. Preparing material (questionnaire, script, etc.), Refining and finalising study design, approval of routes and contacts.	26 Jun-2 Jul	3-9 Jul	10-16 Jul	17-23 Jul						
Personal contact with entities, government agencies to arrange interviews with those responsible			10-16 Jul	17-23 Jul						
Training of team				17-23 Jul						
Conducting field study					24-30 Jul	31 Jul-6 Aug	7-13 Aug			
Receiving material and compilation of content						31 Jul-6 Aug	7-13 Aug	14-20 Aug	21-27 Aug	
Preliminary Results of field study									21-27 Aug	
Final Results and presentation										28 Aug-3 Set

This chart only reflects the current planning status and might change.¹⁹

A.3.1.8 Evaluation Planning Matrix

Evaluation Question	Indicator(s)	Data Collection method(s)	Data Source	Sampling	Comments
<u>Demography</u> , including: population of community, domiciles, population split, age ranges,	Check boxes; exact numbers and/ or percentages, open ends.	Personal standardized interview (additionally, to some extent, observation), descriptive	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the	Quantitative

¹⁹ for a detailed schedule see Appendix B.4
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 20160718 Inception report final revised.docx

ethnicity, degree of sedentariness, languages.		analysis with frequencies and means		split of hinterland, poor or remote communities and recommendations of authorities.	
<u>Community facilities and finances</u> , including: number of facilities, infrastructure, poverty indicators, organized crime, micro loans.	Check boxes; exact numbers and/ or percentages, open ends.	Personal standardized interview (additionally, to some extent, observation), descriptive analysis with frequencies and means	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Quantitative
<u>Education</u> , including: attendance at educational institutions, completion of education	Check boxes (quantity ranges)	Personal standardized interview (additionally, to some extent, observation), descriptive analysis with frequencies and means	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Quantitative
<u>Power supply</u> , including: power supply(ies) in community, hours of electricity, number of power breakdowns	Check boxes; indicate percentage range; multiple selection options; open ends.	Personal standardized interview (additionally, to some extent, observation), descriptive analysis with frequencies and means	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Quantitative
<u>Electric devices and ICT usage</u> , including: ownership of devices in community, frequency of use of devices, usage of internet and telephony services, type of calls, online service usage	Check boxes; indicate percentage range; multiple selection options; open ends.	Personal standardized interview (additionally, to some extent, observation), descriptive analysis with frequencies and means	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Quantitative

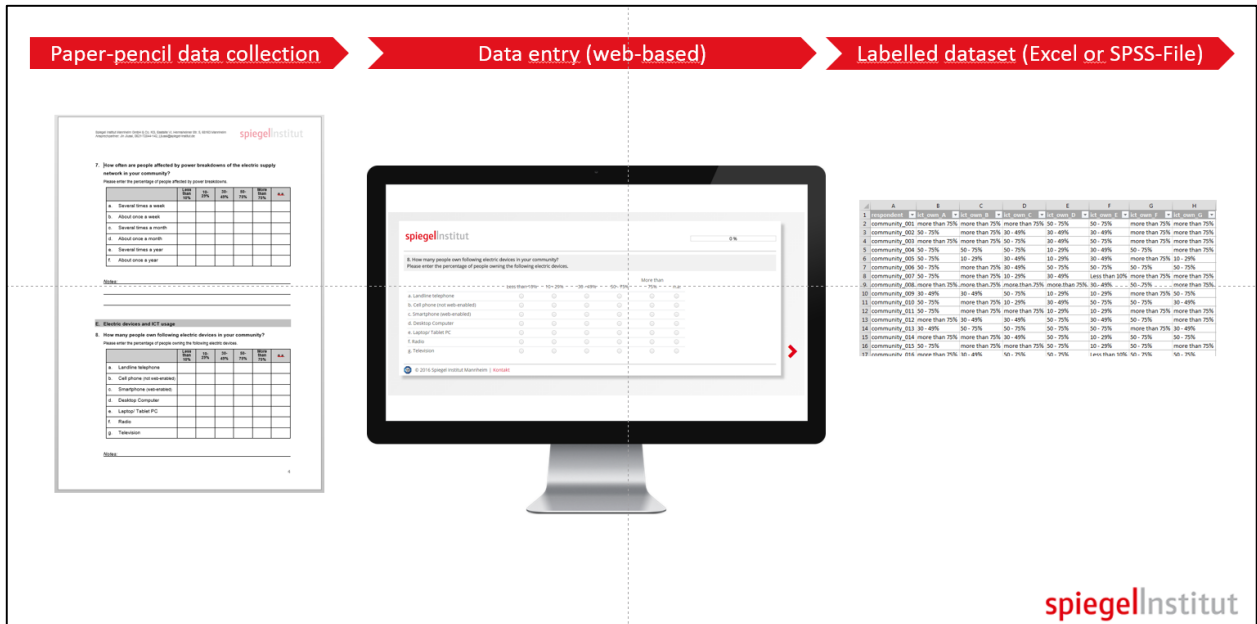
<p><u>Mobile network infrastructure</u>, including: carrier and providers available, current status of ICT infrastructure in community, perceived benefits of technology, governmental support</p>	<p>Check boxes; indicate percentage range; multiple selection options; open ends.</p>	<p>Personal standardized interview (additionally, to some extent, observation), descriptive analysis with frequencies and means</p>	<p>Representatives and/or preselected interviewees of each community</p>	<p>All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.</p>	<p>Quantitative</p>
<p><u>Previous ICT development projects</u>, including: Past projects, description, success of projects, subjective opinion on these initiatives, benefits of ICT-related projects, current economic situation, sources of income, challenges of generating revenue, time line of developments (past, present, future)</p>	<p>Check boxes; indicate percentage range; multiple selection options; open ends.</p>	<p>Personal standardized interview (additionally, to some extent, observation), descriptive analysis with frequencies and means</p>	<p>Representatives and/or preselected interviewees of each community</p>	<p>All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.</p>	<p>Quantitative</p>
<p><u>SITUATIONS Interpersonal communication</u>, including: Communication over long distances, frequency of long distance communication</p>	<p>Guideline; open ends</p>	<p>Personal interview (additionally, to some extent, observation); content analysis</p>	<p>Representatives and/or preselected interviewees of each community</p>	<p>All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.</p>	<p>Qualitative (I. and II.)</p>
<p><u>DEVICES Interpersonal communication</u>, including: means of communication</p>	<p>Guideline; open ends</p>	<p>Personal interview (additionally, to some extent, observation),</p>	<p>Representatives and/or preselected interviewees of each community</p>	<p>All 30 sites (priority 1). Selection of communities on the basis of secondary</p>	<p>Qualitative (III. and IV.)</p>

for individual occasions, typical device for long distance communication,		content analysis		(census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	
Communication role of interviewee, points of contacts with tele-communication	Guideline; open ends	Personal interview (additionally, to some extent, observation), content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (V.)
NO OWNERSHIP of devices, including: landline telephone, mobile phone, computer, laptop, tablet, smart phone; assessment of reasons for absence of devices, purchase intention, preconditions, future developments	Guideline; open ends	Personal interview (additionally, to some extent, observation), content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (VI. + i.-iv.)
OWNERSHIP of devices, including: landline telephone, mobile phone, computer, laptop, tablet, smart phone; period of ownership, capability of usage, ICT literacy, frequency of usage, usage of online services, occasions of usage, usage of specific devices	Guideline; open ends	Personal interview (additionally, to some extent, observation), photo documentation, content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (VI. + v.-x.)

Use case definition for individual devices and considerations on usage	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (VI. + xi.)
Assessment of desired means of communication	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (VII.)
USE CASE E-Commerce (sell handcrafts, goods or buy anything online)	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (UC 1)
USE CASE Money Transfer (transferring money via cell phone deposit)	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (UC 2)
USE CASE Contacting authorities (public or government)	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representatives and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote	Qualitative (UC 3)

				communities and recommendations of authorities.	
USE CASE (only for medical professionals/ vets/ farmers) Consultation of fellow physicians etc.; possibility to seek help and training online	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representativ es and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (UC 4)
USE CASE (only for police chiefs/ responsible person for security issues) Usage of cameras and drones against organized crimes	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representativ es and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (UC 5)
Assessment of cultural identity, national identity, measurements necessary to strengthen national identity, common value systems, unique features, identity construction in relation to communication infrastructure	Guideline; open ends	Personal interview (additionally, to some extent, observation) content analysis	Representativ es and/or preselected interviewees of each community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Qualitative (final questions)
Assessment of living situation, infrastructure, living standards, local particularities	Guideline topics	Photo documentation	Respective community	All 30 sites (priority 1). Selection of communities on the basis of secondary (census) data, the split of hinterland, poor or remote communities and recommendations of authorities.	Ethnographic

A.3.1.9 Data entry and deliverables quantitative survey



A.3.1.10 Example for data entry into our SurveyEngine:

Data is collected via paper-pencil during fieldwork in Guyana. For entering these questionnaires into a database a web-based tool is used (SurveyEngine from Spiegel Institut). This procedure allows a cost-efficient way to produce a clean dataset as Excel or SPSS file with distinct labels for each question.

spiegelInstitut 73 %

Please state the number of the following facilities in your community:

	None	1-4	5-9	10-14	More than 14	n.a.
Schools (nursery)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Schools (primary)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Schools (secondary)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
medical facilities (health center/hut)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
medical facilities (health post)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
medical facilities (hospitals)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
communal buildings (please specify below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
places of social gathering (leisure places, sports courts, youth club, please specify below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Areas of sports activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Libraries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Churches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hotel/ hostels/lodge/guest house	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Notes, additional or explanatory information

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For closed-ended questions, frequencies for each answer category are reported. These frequencies may be reported for different groups, for example for each community or different zones (remote, hinterland, poor).

A.3.1.11 Example for reporting frequencies:

Please describe the power supply in your community.			
Type	Remote	Hinterland	Poor
Electric supply network (landline)	30 (86%)	28 (57%)	12 (31%)
Electric generator (local)	15 (43%)	15 (31%)	18 (46%)
Solar electricity	3 (9%)	1 (2%)	0 (0%)
Hydropower	0 (0%)	0 (0%)	0 (0%)

Wind energy	0 (0%)	0 (0%)	0 (0%)
Thermoelectricity	0 (0%)	0 (0%)	0 (0%)
Biothermal energy	0 (0%)	0 (0%)	0 (0%)
No electricity at all	1 (3%)	5 (10%)	11 (28%)
Total	35	49	39

To illustrate qualitative findings, exemplary/ typical “personas” will be outlined in the result report. These personas are idealized profiles of representative persons who were interviewed during the research phase. They help to understand the situations, perspectives, needs and expectations of different population groups. E.g. a typical farmer who had problems in the past with diseases of his cattle that died because he had no opportunity to seek veterinarian consultation. Such personas are ideal means to communicate in an illustrative way to stakeholders and an ideal basis for derivation of further measures.

A.3.1.12 Technical As-Is Analysis

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.

It will be based on a structured multi step approach, including a questionnaire for guided interviews to get reliable and comparable feedback.

Task	July		Aug.				Sept.	
	29	30	31	32	33	34	35	36
Identification of Stakeholders								
Preparation of Questionnaires								
Information of Stakeholders								
Interviews								
Consolidation of results								

Step 1: Identification of the relevant stakeholders and interview partners.

Focus for a first introductions are the CEOs from all network operators operating networks the Country, i.e. GT&T, Digical, the e-Government Unit as well as Satellite operators (e.g. i-Net). While they represent the company and are important stakeholders, technical and commercial persons (e.g. CTO, CFO) will be needed for the interviews to be conducted.

Step 2: Preparation and elaboration of the questionnaire.

The questionnaire will have:

- a fixed line part: relevant for GT&T and e-Government
- a mobile part: relevant for GT&T, Digicel and e-Government
- a satellite part: relevant for i-Net and other players

Step 3: Information of the stakeholders

After an introduction by the e-Government team to the relevant stakeholders the questionnaires will be send as an advance information to help them to prepare for the planned interviews and to gather the needed and correct information. If there are immediate questions from the stakeholders they can be answered as well.

Step 4: Guided Interviews

Guided interviews, based on the questionnaires will be done with the different stakeholders and their experts to gather relevant information.

If needed, selected side visits in alignment with the stakeholders will be executed to validate the information and to gather additional insights.

Step 5: Consolidation of results

Results and findings will be documented in the final report for work stream 1, i.e. highlighting the current ICT infrastructure situation and the derivation of needs in alignment with WP1.1

Additionally, an interactive map will be elaborated to show selected results dynamically.

A.3.2 Work stream 2 – Elaboration of the extensive Technical Report

Based on each work package, Detecon will use its ICT expertise and specific methodologies to elaborate the best possible solution and to provide recommendations in line with the project objectives.

Work package 2.1: Potential Technologies

Detecon will use its database for wireline and wireless technologies (terrestrial and satellite, licensed and unlicensed spectrum technologies, upcoming and novel technologies) and apply descriptions of implementation scenarios and potential combinations of technologies, which might be suited to fulfil the needs of the surveyed communities following international best practice. Detecon's ICT experts with many years of practical experience will perform this analysis and description of available technologies.

Work package 2.2: Stakeholder Assessment

To identify impacted stakeholders and derive requirements for a successful implementation of the defined technologies, Detecon will perform expert interviews with representatives of all relevant institutions and bodies.

Those include, but are not limited to, Guyana Telephone and Telegraph Company (GT&T), Digicel Corporation, National Frequency Management Unit (NFMU), e-Governance Unit, Ministry of Indigenous Peoples' Affairs, and others. A report will outline the topics and requirements stemming from those stakeholders.

Work package 2.3: Regulatory Analysis

For the assessment of the impact of Guyana legislation on technology rollout, Detecon will identify the pertinent provisions with focus on ICT-infrastructure and ICT-services. An expert analysis of these provisions and resolutions will result in guidelines for technology selection and installation.

Furthermore, Detecon will perform interviews with representatives of the regulatory bodies in Guyana and make a high-level analysis of the existing related and relevant laws (telecommunications law, competition law, etc.) and any existing regulations. Based on Detecon's telecommunications legislation and regulation database, an expert will identify opportunities, risks and further impacts on the proposed solution.

If there is the need for further regulation or legislation, this will be outlined separately. These could include specifications on passive and active ICT-infrastructure sharing, fixed and Mobile Virtual Network Operators (MVNO), rollout targets and population coverage obligations and further wholesale regulations.

Work package 2.4: Potential Partnerships

To identify potential partnerships, Detecon will analyze the capabilities of potential partners via desktop research and dedicated interviews with experts and partners. Interviews are important to clarify topics that go beyond the possibilities of desktop research.

Work package 2.5: Technology Solution

Detecon will elaborate an optimal technology solution with respect to commercial factors, technical feasibility, proposed e-Services, and available capabilities for the implementation and maintenance tasks. The solution will take into consideration at least all requirements collected in WP2.1-2.5 in a scoring model. However, if additional frame conditions arise during the design and specification work, the expert will adopt the target picture accordingly. A high-level cost breakdown will be given. However, the final cost for the solution can only be determined during the tendering phase.

Work package 2.6: Business Model

Based on international best practice, Detecon will analyze up to five different business models, including some already mentioned in the TOR (see Appendix). The focus will lie on long-term sustainability and benefits & risks for the affected communities. The experts will also identify possible funding and partnership models, such as PPP, pure government owned, subsidy supported, etc. Revenue opportunities will be identified, however the business potential is deemed rather limited.

Work package 2.7: Rollout Prioritization

Detecon, in close alignment with the e-Governance team, will develop a model for prioritizing the infrastructure rollout to the affected communities. Possible factors can include, but are not limited to, ease of implementation, number of people affected, commercial opportunities, coverage of special-interest groups, etc.

Work package 2.8: Support in Tender Preparation

Detecon will use the proven tendering and vendor selection tool suite to optimize the preparation of the planned RFPs. Clear RfP guidelines will be set up to precisely describe the requirements towards the vendor or system integrator. Experts will support local Guyanese staff from the e-Government team during the elaboration of the document and during the runtime of this preparation project.

A.3.3 Work stream 3 – e-Services Readiness Assessment and Action Plan

Work package 3.1: e-Government Readiness Assessment and Action Plan

Two specific methodologies will be used to approach this work package from a holistic perspective:

- e-Government expertise will be used following the Detecon e-Government Innovation House model, which profits from previous projects in different fields of government related activities,
- Business Transformation approach, based on open standards like TOGAF to secure a proven and structured framework and methodology to elaborate the expected results.

Following an As-Is analysis of existing and planned services, specific use cases will be described and their relationship to the survey findings of WS1 explained. Possible e-Service use cases include, but are not limited to, the following:

- E-Health
- E-Commerce
- Surveillance/Border protection
- Mobile/virtual payment
- Animal tracking
- Administrative e-Government

Detecon will compile all proposed services into an e-Services vision for the surveyed communities.

Work package 3.2: e-Learning Customization Strategy

Hinterland, poor and remote communities require a tailored e-Learning approach. Following an As-Is analysis of existing offerings, the special needs as identified in WS1 will be transformed into an e-Learning vision for the surveyed communities. Detecon will identify collaborations and partnerships, which can deliver the customized

e-Learning services based on per-defined criteria.

Work package 3.3: Training plan for Communities

Based on the results of WS1 and WP3.1 and 3.2 as well as interviews with experts on Guyana hinterland and remote areas, Detecon will elaborate a training plan for the different target groups in the surveyed communities.

A.4 Work Plan and Project Monitoring & Reporting

A.4.1 Work Plans

A.4.1.1 Work Plan Gantt chart

Overview of the current work plan:

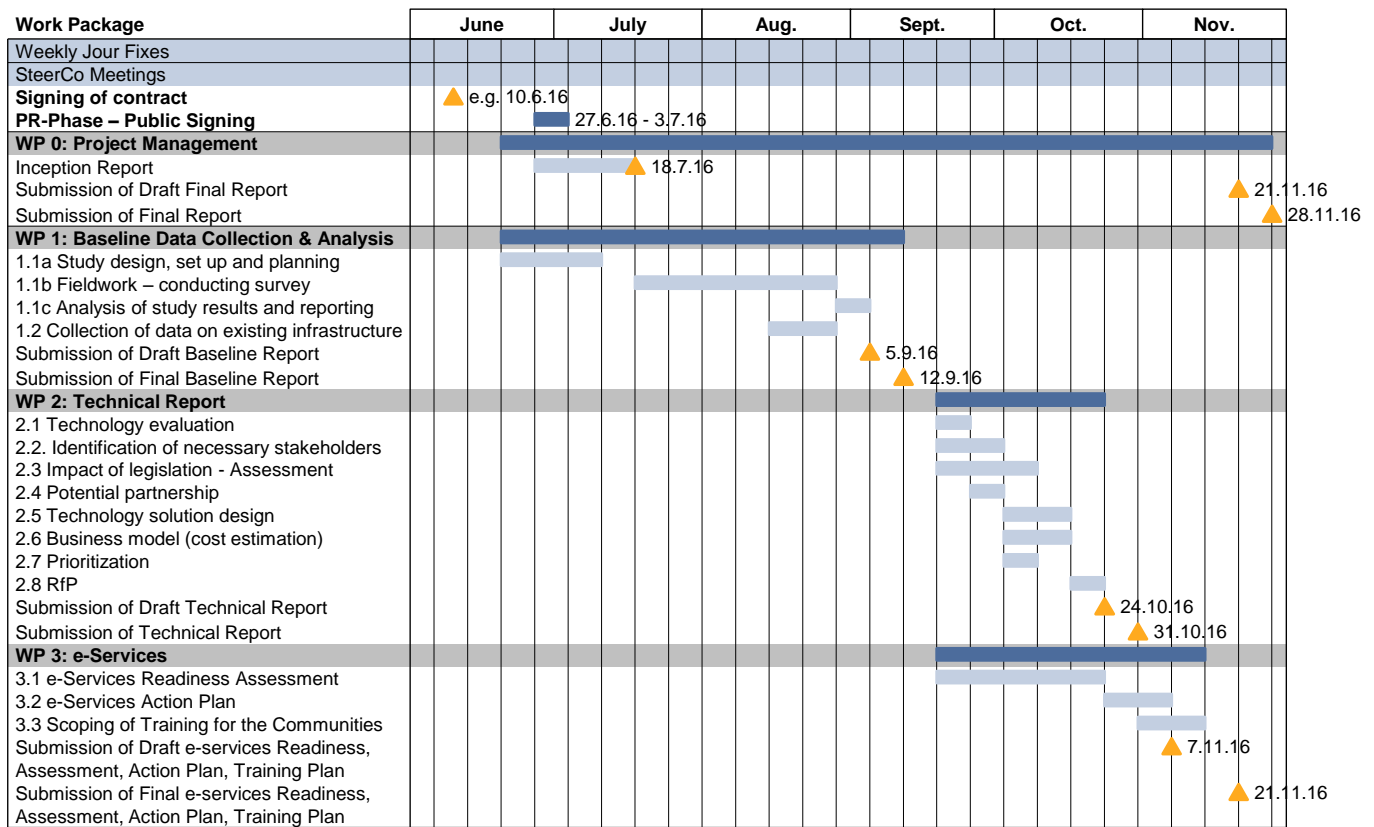


Image 3 - Work Plan Chart

A.4.1.2 Workforce planning

It is planned that the following experts support the project in the calendar weeks as indicated:

Allocated resources	CW	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
		06.06.2016	13.06.2016	20.06.2016	27.06.2016	04.07.2016	11.07.2016	18.07.2016	25.07.2016	01.08.2016	08.08.2016	15.08.2016	22.08.2016	29.08.2016	05.09.2016	12.09.2016	19.09.2016	26.09.2016	03.10.2016	10.10.2016	17.10.2016	24.10.2016	31.10.2016	07.11.2016	14.11.2016	21.11.2016	28.11.2016	
Teamleader	Stephan Dieter	signing contract			0	0	2	3	5				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
TelcoExp1	Dmitry Grigorev												5	5														
TelcoExp2	Torsten Soltmann																											
TelcoExp3	Dr. Jann Erik Diertert																											
Teammember	Isolde Koeppen															5	2											
Teammember	Dr. Daniel Henkel																											
LegalRev (rem)	Dr. Albert Njourné																											
GIS Exp (Rem)	Dennis Juchem																											
Local Expert	Patricia				1			3	1	1	1	1	3	3	3													
Mafo																												
		briefing	Study	Study	Study	FS	FS	FS	FS	FS	FS	FS	Report															
	Legend																											
	onsite Guyana																											
	remote work																											
	pending onsite Guyana																											

Image 4-Workforce Planning

A.4.2 Project Reporting

Weekly Reports will be elaborated and send to UNDP and the e-Government counterparts.

Steering Committee meetings will be scheduled once per month and initiated on an individual basis, if needed.

Final reports for the respective work streams are planned to be elaborated until the following dates:

Submission and Acceptance of Final Baseline Data Report	Final Baseline Data Report after the field work has been completed. This should include the analysis and recommendations based on the collected data supported by the complete dataset from the baseline study and needs assessment.	12 th September, 2016
Submission and Acceptance of Final Technical Report	Final Technical Report	31 st October, 2016
Submission and Acceptance of Final e-services Readiness Assessment and Action Plan, in addition to Training Plan.	Final E-Services Readiness Assessment and Action Plan, in addition to Training Plan	21 st November, 2016
Final Report	A compiled final report should cover all activities identified under the scope of work and include any recommendations made by the e-Government Unit prior to final approval of the report.	28 th November, 2016

A.5 Logistics

- For the execution of this project at nine Indigenous Peoples communities/sites, the team should require authorization and permission from the Toshias to conduct the interviews
- At the others communities/sites we need contact of the representatives from each locality
- Other contacts/permissions (if needed):
Some need for support might only arise during extensive travel planning and can only be determined before setting off on the individual routes or experiencing difficult situations during travel.

WS 2 and 3 will be delivered out of Georgetown with special focus on close interaction with the Guyana e-Government team and the respective stakeholders and players.

B - APPENDIX

B.1 Questionnaires for Primary Market Research

B.1.1 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 <i>(INTERVIEWER: TO TEST THE DEVICES)</i>	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	
<p>Take some panoramic pictures of community or draw a sketch. Highlight the towers/antennas in sketch.</p>	

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 assessed 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, <u>please specify below</u>)						
h. places of social gathering (leisure places, sports courts, youth club, <u>please specify below</u>)						
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	<i>Moderator: please note below</i>						
j. Planned power supply, please specify:	<i>Moderator: please note below</i>						

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	
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 cell phone (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 cell phone (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 cell phone (not web-enabled)							
c. Private smartphone (web-enabled)							
d. Private satellite phone							
e. Public landline telephone							
f. Privately owned landline telephone							
g. Privately owned cell phone (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)							

	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.
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 cell phone (not web-enabled)							
c. Private smartphone (web-enabled)							
d. Private satellite phone							
e. Public landline telephone							
f. Privately owned landline telephone							
g. Privately owned cell phone (not web-enabled)							
h. Privately owned 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.
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

B.1.2 Qualitative Survey

Qualitative Interview/ ethnography

Respondent-ID: _____
Community: _____
Age of resp.: _____
Gender <input type="radio"/> female <input type="radio"/> male
Occupation of resp: _____

Interviewer _____
Date _____
Time _____

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/ smart phone?

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 cell phone 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

B1.3 Checklist

ICT Guyana: Checklist

To be filled in by Detecon interviewer:

Respondent-ID	_____
Community	_____
Zone	<input type="radio"/> remote <input type="radio"/> hinterland <input type="radio"/> poor
Date	_____
Position of resp in comm...:	_____

PLEASE FILL IN YOUR DATA:

Age	_____
Ethnicity	_____
Gender	<input type="radio"/> female <input type="radio"/> 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 you own?

Please fill in the quantity/number of devices that you own, for each device separately.

	Quantity
j. Private landline telephone	
k. Private cell phone (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 in your community, please estimate how many of the devices are available?

	Quantity
f. Public landline telephone	
g. Privately owned landline telephone	
h. Privately owned cell phone (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 cell phone (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 cell phone (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/ neighbours)	at home	n.a.
a. Your own private landline telephone							
b. Your own private cell phone (not web-enabled)							
c. Your own private smartphone (web-enabled)							
d. Your own 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 cell phone (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 service per month?

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 cell phone (not web-enabled)	Your own private smartphone (web-enabled)	Your own private Satellite phone	Public landline telephone	Privately owned Landline telephone	Privately owned cell phone (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. <u>Chatting</u> (WhatsApp, Viber, Skype, LINE...)		
c. <u>Social networks</u> (Facebook, Google+, Twitter, LinkedIn...)		
d. <u>Video-sharing websites</u> (YouTube, Netflix, Vimeo, Vine...)		
e. <u>Online gaming</u> (League of Legends, Counter Strike...)		
f. <u>E-commerce</u> (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						

B.2 Questionnaires for collecting information on existing ICT infrastructure

The questionnaires are tailored to the different stakeholder groups:

B.2.1 Questionnaire Mobile Operator

Introduction

The ICT Access and E-Services for the Hinterland, Poor and Remote Communities project is a Government of Guyana initiative in partnership with the UNDP and is aimed at enabling access to high quality ICT infrastructure in all parts of Guyana with a focus on enhancing connectivity and enabling the provision of training and e-services for individuals and communities - with particular attention given to vulnerable groups and remote communities who might otherwise be excluded.

The lack of readily available accurate information on the accessibility of ICT Services for the residents of the communities described above hinders any effective interventions intended to increase connectivity. As a result the Government of Guyana through UNDP has recruited the services of Detecon International GmbH - a consultancy firm headquartered in Germany - to undertake a national ICT needs assessment focusing on the hinterland, poor and remote areas.

As part of the process, they will conduct research and analysis with the many stakeholders that will inform the study. We consider your input critical to the success of the study and in this context that we are requesting your cooperation by facilitating access to information and personnel.

If you need any clarification or explanation regarding the ICT Needs Assessment Study, please feel free to contact Ms. Shabnam Malick, Deputy Resident Representative at shabnam.mallick@undp.org or 226-4040.

The objective of this questionnaire is to obtain information about the network architecture, technologies used and available capacity of the existing telecommunications networks in Guyana and to analyze them in terms of the requirements of the project, especially within the hinterland, as well as poor and remote communities throughout the country.

Please provide either comprehensive answer in the column D or provide a short statement and provide a name of the reference document in the column E. Reference documents should be attached to the answered questionnaire if possible. If you are sharing any confidential information please highlight this.

In case of misunderstanding of the requirements or any other issues please contact Mr. Dmitriy Grigorev. Contact details are on the cover page of this questionnaire.

General Information

Company Name	
Name	
Position	
E-Mail	
Mob.	

Technical Questions

Question ID	Question	Reason of the request/Details
M.1	General	
M.1.1	Provide a list of services that the operator is currently offering on the market and services planned for rollout for the next three years.	This information is required to get a better understanding of the market, its demands and ideally derive proper requirements for the transport network in hinterland. - Specify the long term voice services development. Are there any plans for migration to VoLTE? - Are there any specific requirements to the packet data caused by use of any kind of applications?

M.1.2	Provide subscriber and traffic figures (current as well as forecast for the next years) for all existing and planned services.	These figures will be used as an indicative input to derive the most appropriate solution for relevant areas in the context of the project.
M.1.3	Provide statistics about mobile service usage on the regional level (number of subscribers, type of the connectivity, services used, etc.).	This information will be helpful to understand required network capacities, again from the context of our project (hinterland, poor and remote areas)
M.1.4	Highlight the company's strategic objectives.	Insights to the operator's strategy are one essential indicator to identification of possible complementing ICT solution for the regions addressed in the project context.
M1.5	Describe any obstacles hindering the implementation and usage of the current access technology.	Described obstacles will be reviewed and considered during the project steps.
M.1.6	List which initiatives are deemed unfeasible? Explain the reasons in details.	Answer to this question will provide insights for the team to understand better the situation and restrictions, which are already faced by the operator, if any.
M.1.7	Provide regulatory requirements and description of the existing emergency backup solution in case of terrestrial network disruption.	These details will provide additional input to the project.
M.2	Technology	
M.2.1	List existing RAN equipment suppliers/vendors.	Details about the existing network and agreements with network equipment vendors will help to understand the network flexibility, opportunities and allow to recommend most appropriate strategies of for ICT in the hinterland, poor and remote areas. Please describe in your answer the following details: - Are there any managed services, implementation services provided by the vendor? What are these services? - How performed operation & maintenance services? Own Operator's team or vendor? - What services are done by the operators themselves, which are outsourced?
M.2.2	Provide documents related to company's technology strategy and description of the currently used technologies.	Insights of the operator's technology strategy are essential for the identification of suitable ICT solutions for the hinterland, remote and poor areas.
M.2.3	Provide a feature list implemented on RAN.	This information will be helpful for the estimation of the required network capacities and services if extended to the project regions.
M.2.4	Outline the technical roadmap (new type of features or functionalities to be introduced)!	Possible impact of the new features introduction will be assessed and taken into account to derive technical recommendations for the hinterland, remote and poor areas.
M.2.5	Describe the current level of the RA network utilization? Which areas are congested, which ones are underutilized.	Provision of these figures will give the understanding of the market demands and required bandwidths in different areas.
M.2.6	List the frequency ranges is radio access network licensed? What are the regulatory constrains regarding the spectrum used and plans for new bands launch coverage obligations for mobile Telcos.	Understanding of the situation in current frequency band allocation and strategy is basic step for the ICT strategy development. What is the current status of the 700MHz band? Is it allocated between operators? Please provide details. Please provide comprehensive information regarding the following bands: - 800 MHz - 900 MHz - 1800 MHz - 1900 MHz PCS - 2100 MHz or AWS band - 2600 MHz (or they might use PCS and AWS as names) Please provide the details about spectrum usage of the 450-470MHz band and 300-450MHz band. Are these band already used by other companies and/or government? What are the strategy to free up these bands? What are the current license expiration dates

		of the used bands? What are the conditions of use? Is support of the regulatory authority / government possible?
M.2.7	Provide the plan of the existing network, including geographical map with all existing base stations with specification of technologies used and backhaul type/capacities should be provided.	Availability of required data for the map plotting is necessary to reveal the areas which are not covered and areas where the new infrastructure should be pulled to, especially in the hinterland, remote and poor areas. Please provide a structured database of the base stations, which contain base station ID, region, city, coordinates, number of sectors/cells, band used, traffic volumes per month and backhaul specification.
M.2.8	Please provide the existing coverage map focusing on technology and their specific abilities in relation to the environment.	The required coverage map should be provided for each technology used, representing indoor and outdoor coverage. RAN planning assumptions and link budget should be provided. Please specify the assumptions and general approach used for planning of different clutter types (dense urban, urban, sub-urban, rural) as well as Hinterland and remote areas. Do you consider any specific assumptions for planning the hinterland and remote areas?
M.3	Backhaul Network	
M.3.1	Outline the general approach of the site backhaul for urban and rural areas (microwave links, fiber access etc.) What kind of the equipment used for the backhaul realization?	Provided details will be used as a baseline for a potential transmission network strategy development in the hinterland, poor and remote areas.
M.3.2	List current the transmission suppliers/vendors.	Details about the existing network and agreements with network equipment vendors will help to reveal the network flexibility, opportunities and allow to recommend appropriate strategies in the project context.
M.3.3	Describe the technical roadmap (new type of components or functionality to be introduced).	Possible impact of the new features introduction will be assessed and taken into account to derive most technically feasible solutions.
M.3.4	Describe what frequency ranges is MW transmission network are licensed?	Understanding of the situation in used frequencies is essential for the ICT strategy development in the project's context.
M.3.5	Describe the architecture of the transmission and IP network.	Availability of required data for the map plotting is necessary to reveal the areas which are not covered and areas where the new infrastructure should be pulled to. The following information should be provided: - All network nodes which are leased or shared with other operators should be marked - network topology diagram geographical map with coordinates of each point of the transport networks - detailed information with available capacities. Which components are deployed at which site?
M.3.6	Describe the general conditions for the backhaul sharing/leasing (including average price).	This information will be necessary for deriving high level cost modelling considering the local conditions and focusing on the hinterland, poor and remote areas.
M.3.7	Provide statistics regarding the current utilization of the backhaul links.	This information will help to understand and predict lack of bandwidth in project focus regions after a potential network expansion.
M.3.8	Provide information if any expansion projects are planned for the backhaul.	This information will help to understand the operator's activities in the backhaul development from a country wide perspective.
M.3.9	Describe the redundancy and resilience concept of the backhaul network applied in general? Please explain in details.	Existing redundancy concept will be taken as a basis for a possible solution concept for the hinterland, poor and remote areas.
M.4	Core network	
M.4.1	Describe the existing solution deployed (vendor, equipment, version, features enabled).	Details about the existing network and agreements with network equipment vendors

		will help to reveal the network flexibility, opportunities and allow to recommend the most appropriate strategy of the ICT sector development.
M.4.2	Provide existing network architecture in details and geographical map with coordinates of all the core network edge components (MSC, gateways, optional BSC).	Availability of required data for the map plotting is necessary to reveal the areas which are not covered and areas where the new infrastructure should be pulled to.
M.4.3	Outline the technical roadmap (new type of components or functionality to be introduced). What are the future developments planned in the core network (IMS, EPC)?	Possible impact of the new features introduction will be assessed and taken into account to derive the most technically feasible solution.
M.5	User Equipment (CPEs)	
M.5.1	Describe the ratio of the 2G/3G/4G capable devices and which frequencies are supported. Please provide forecast for the next 5 years.	Provided forecast will be used for the assessment of the market maturity for the different options of an ICT infrastructure development.
M.5.2	Specify the user equipment strategy. For which services and subscribers are used, feature phones, smartphones, tablets, data dongles / Routers and modems – standalone or embedded e.g. laptops. Do you have specific strategies for customers in the hinterland, poor and remote areas?	Insights of the operator's technology strategy are essential for the identification suitable ICT solutions for the hinterland, poor and remote areas.
M.5.3	Highlight, which Technology Characteristics you see as required in future user equipment (CPEs).	Please explain the strategy which covers capability of the user equipment to support - multi frequencies and multi standards (e.g. 900/1800 MHz, 2,1 GHz, 2,6 GHz), GSM/UMTS/LTE TDD-FDD in different frequencies) - support of different technology features (e.g. HSPA+ 84 Mbps MC, LTE A)
M.6	Towers and metal constructions	
M.6.1	Provide details about existing and planned towers within the country (e.g. tower map).	Please provide the answer with following details: - Detailed information regarding types of the used towers, heights and utilization of the towers - Are the towers shared between operators, and if applicable provide information about how and to what extent the towers are shared with other operators
M.6.2	Provide the average cost and time required for the deployment of the new tower construction with respect to the tower height (e.g. 10m, 20m, 30m etc.) and location (city and remote rural areas).	This information will be necessary for the high level cost modelling considering the local conditions
M.7	Power supply	
M.7.1	Describe, how in general realized power supply of the sites in different regions is handled, esp. with respect to the area type (Dense urban, suburban, urban, and rural). Any specifics in remote and hinterland areas?	Provided information will help to identify the difficulties which should be taken into account in the strategy development. What are the typical problem operator faces especially in the rural area (e.g. fraud, stealing of the oil, vandalism) and how are these problems solved at the moment?
M.7.2	Describe, what role energy efficiency level play for the optimization and the planning of new sites rollout. Do you follow any green IT guidelines?	Provided information will help to identify the difficulties which should be taken into account in the strategy development for the hinterland, poor and remote areas.
M.7.3	Describe the high level roadmap of power supply systems and the general strategy for the deployment of new sites in regards to power supply?	Provided information will help to identify the difficulties which should be taken into account in the strategy development for the hinterland, poor and remote areas.
M.8	Pricing models	
M.8.1	Explain the current service pricing strategy towards B2C and B2B customers. Is there a difference in pricing approach for different areas?	This information will help to estimate revenues from the infrastructure deployment in hinterland, poor and remote areas. Provide answer with the following details: - Service uptake and distribution - service bundling (mobile voice/data, fixed, etc.) - geographical price differentiation
M.8.2	Please specify the market prices for the B2B and B2C	This information helps to understand the

	customers, separating between basic services (basic connectivity) and on-top services.	willingness to pay available in the market for the respective services attached. Provide details for tariff structures for prepaid, postpaid and business service offerings.
M.8.3	Please specify the ARPU for different areas within the country	This information will be necessary for deriving high level cost modelling considering the local conditions and focusing on the hinterland, poor and remote areas. Provide answer with the following details: - ARPU calculation methodology - ARPU metrics - geographical and market segment distribution

B.2.2 Questionnaire Fixed Line Operator

Introduction

The ICT Access and E-Services for the Hinterland, Poor and Remote Communities project is a Government of Guyana initiative in partnership with the UNDP and is aimed at enabling access to high quality ICT infrastructure in all parts of Guyana with a focus on enhancing connectivity and enabling the provision of training and e-services for individuals and communities - with particular attention given to vulnerable groups and remote communities who might otherwise be excluded.

The lack of readily available accurate information on the accessibility of ICT Services for the residents of the communities described above hinders any effective interventions intended to increase connectivity. As a result the Government of Guyana through UNDP has recruited the services of Detecon International GmbH - a consultancy firm headquartered in Germany - to undertake a national ICT needs assessment focusing on the hinterland, poor and remote areas.

As part of the process, they will conduct research and analysis with the many stakeholders that will inform the study. We consider your input critical to the success of the study and in this context that we are requesting your cooperation by facilitating access to information and personnel.

If you need any clarification or explanation regarding the ICT Needs Assessment Study, please feel free to contact Ms. Shabnam Malick, Deputy Resident Representative at shabnam.mallick@undp.org or 226-4040.

The objective of this questionnaire is to obtain information about the network architecture, technologies used and available capacity of the existing telecommunications networks in Guyana and to analyze them in terms of the requirements of the project, especially within the hinterland, as well as poor and remote communities throughout the country.

Please provide either comprehensive answer in the column D or provide a short statement and provide a name of the reference document in the column E. Reference documents should be attached to the answered questionnaire if possible. If you are sharing any confidential information please highlight this.

In case of misunderstanding of the requirements or any other issues please contact Mr. Dmitriy Grigorev. Contact details are on the cover page of this questionnaire.

General Information

Company Name	
Name	
Position	
E-Mail	
Mob.	

Technical Questions

Question ID	Question	Reason of the request/Details
F.1	General	
F1.1	Describe the current situation on the local broadband	This information is required to get a better

	market.	understanding of the market, its demands and ideally derive proper requirements for the transport network in the project context of hinterland, remote and poor areas.
F1.2	Provide a list of services that the operator is currently offering on the market.	This information is required to get a better understanding of the market, its demands and ideally derive proper requirements for the transport network in the project context of hinterland, remote and poor areas.
F1.3	Provide subscriber numbers (current as well as forecast) for all existing and planned services.	These figures will be used as an indicative input to derive additional and appropriate solution for relevant areas in the context of the project.
F1.4	Describe the reliability models implemented on the network in case of emergency situations.	Existing redundancy concept will be taken as a basis for a possible solution concept for the hinterland, poor and remote areas.
F.2	Architecture	
F2.1	Describe the architecture of the existing transmission network.	Insights of the operator's network architecture is essential for the identification of suitable ICT solutions for the hinterland, remote and poor areas. Please provide a network topology diagram for each of the transport networks.
F2.2	Provide the geographical map with coordinates of all network nodes (OLT/ONT, PE/P, Fiber connectivity DWDM/SDH etc.) deployed within the country with specification of the current/available capacities and type of the equipment.	Availability of required data for the map plotting is necessary to reveal the areas which has no existing infrastructure and areas where the new infrastructure should be pulled to, especially in the hinterland, remote and poor areas. Please provide a structured database of network nodes, which contain node ID, capacity, type of the equipment installed, traffic volumes per month and backbone specification.
F2.3	Describe the current cooperation status with mobile operators.	This information will be necessary for deriving high level cost modelling considering the local conditions and focusing on the hinterland, poor and remote areas. Please provide the following information: - typical SLAs with other mobile and/or fixed providers - price estimation for the backhaul leasing
F.3	Technology	
F3.1	Provide description of the installed equipment (vendors, models, specifications etc.).	Details about the existing network and agreements with network equipment vendors will help to understand the network flexibility, opportunities and allow to recommend most appropriate strategies of for ICT in the hinterland, poor and remote areas. Please describe in your answer the following details: - Are there any managed services, implementation services provided by the vendor? What are these services? - How performed operation & maintenance services? Own Operator's team or vendor? - What services are done by the operators themselves, which are outsourced?
F3.2	Describe technologies that are currently being used on the physical level to implement the different parts of the transport networks.	Provided details will be used as a baseline for a potential transmission network strategy development in the hinterland, poor and remote areas. The following information should be provided: - current condition of the access network - modernization plans for each of the network segment if available - general lifecycle description for each type of the deployment considering local conditions - details about the existing physical lines fiber or copper, method of the cable laying in ducts, aerial installation for each of the regions (special focus on hinterland, remote and poor

		areas)
F.4	Capacity	
F4.1	Provide statistic about fixed internet access service usage on the regional level (number of subscribers, type of the connectivity, services used, etc.).	This information will be helpful to understand required network capacities, again from the context of our project (hinterland, poor and remote areas)
F4.2	Specify the utilization of the existing backbone and traffic details.	This information will help to understand and predict lack of bandwidth in project focus regions after a potential network extensions. Details regarding the utilization of the backbone should be specified for each segment of the network separately.
F4.3	Provide information if any capacity or network extensions is planned.	This information will help to understand the operator's activities in the backbone development from a country wide perspective.
F.5	Roadmap	
F5.1	Provide a 3 year roadmap for services that the operator is planning to offer on the market and the user groups you're targeting.	This information is required for better understanding of the market demands and prepare proper requirements for the transport network in hinterland.
F5.2	What is the technical roadmap (new type of components, technologies or functionality to be introduced).	Possible impact of the new features introduction will be assessed and taken into account to derive most technically feasible solutions.
F5.3	Explain in details currently used access technologies lifecycle with the roadmap (market entry, earn and refine, phase out).	Detailed lifecycle information will help to trace the estimated end of life and swap of the existing systems.
F.6	Deployment	
F6.1	Describe the obstacles that appear at the time of deployment new fiber lines and/or access points with respect to the area type (rural/urban/hinterland/remote).	Please describe in details E2E process of the new backhaul capacities deployment in Guyana with average time required and typical challenges faced by the operators.
F6.2	List specific regulatory rules regarding the deployment of the backbone in different regions. What are the regulatory constraints and coverage obligations?	Specific requirements will be considered during development of recommendation for the infrastructure development in hinterland, poor and remote areas.
F.7	Pricing models	
F7.1	Explain the current service pricing strategy for customers (B2B and B2C). Is there a difference in pricing approach for different areas?	This information will help to estimate revenues from the infrastructure deployment in hinterland, poor and remote areas. Provide answer with the following details: - Service uptake and distribution - service bundling (mobile voice/data, fixed, etc.) - geographical price differentiation
F7.2	Please specify the market prices for the B2B and B2C customers, separating between basic services (basic connectivity) and on-top services.	This information helps to understand the willingness to pay available in the market for the respective services attached. Provide details for tariff structures for different service offerings.
F7.3	Please specify the ARPU for different areas within the country.	This information will be necessary for deriving high level cost modelling considering the local conditions and focusing on the hinterland, poor and remote areas. Provide answer with the following details: - ARPU calculation methodology - ARPU metrics - geographical and market segment distribution

B.2.3 Questionnaire Satellite Operator

Introduction

The ICT Access and E-Services for the Hinterland, Poor and Remote Communities project is a Government of Guyana initiative in partnership with the UNDP and is aimed at enabling access to high quality ICT infrastructure in all parts of Guyana with a focus on enhancing connectivity and enabling the provision of training and e-services for individuals and communities - with particular attention given to vulnerable groups and remote communities who might otherwise be excluded.

The lack of readily available accurate information on the accessibility of ICT Services for the residents of the communities described above hinders any effective interventions intended to increase connectivity. As a result the Government of Guyana through UNDP has recruited the services of Detecon International GmbH - a consultancy firm headquartered in Germany - to undertake a national ICT needs assessment focusing on the hinterland, poor and remote areas.

As part of the process, they will conduct research and analysis with the many stakeholders that will inform the study. We consider your input critical to the success of the study and in this context that we are requesting your cooperation by facilitating access to information and personnel.

If you need any clarification or explanation regarding the ICT Needs Assessment Study, please feel free to contact Ms. Shabnam Malick, Deputy Resident Representative at shabnam.malick@undp.org or 226-4040.

The objective of this questionnaire is to obtain information about the network architecture, technologies used and available capacity of the existing telecommunications networks in Guyana and to analyze them in terms of the requirements of the project, especially within the hinterland, as well as poor and remote communities throughout the country.

Please provide either comprehensive answer in the column D or provide a short statement and provide a name of the reference document in the column E. Reference documents should be attached to the answered questionnaire if possible. If you are sharing any confidential information please highlight this.

In case of misunderstanding of the requirements or any other issues please contact Mr. Dmitriy Grigorev. Contact details are on the cover page of this questionnaire.

General Information

Company Name	
Name	
Position	
E-Mail	
Mob.	

Technical Questions

Question ID	Question	Reason of the request/Details
S.1	General	
S1.1	Provide description of the existing service providers' organizational structure, key users and services provided via the satellite infrastructure.	This information is required to get a better understanding of the market, its demands and ideally derive proper requirements for the transport network and services provided in the hinterland and remote areas.
S1.2	Provide information about the regulatory requirements regarding deployment of the hubs, communication centers, and data centers abroad.	Specific requirements will be considered during development of recommendation for the infrastructure development in hinterland, poor and remote areas
S1.3	Provide information about regulatory requirements regarding licensing of the satellite communication frequencies.	Understanding of the situation in current frequency band allocation and strategy is basic step to derive technical recommendations for the hinterland, remote and poor areas.
2	Architecture	
S2.1	Provide the structure of the existing networks including location of the ground stations and hubs within the country.	Availability of required data for the map plotting is necessary to reveal the areas which have some infrastructure and areas where the new infrastructure should be pulled to, especially in the hinterland, remote and poor areas. Please provide a structured database of the

		ground stations, which contain station ID, region, city, coordinates, and number of transponders used and available, traffic volumes per month and backbone specification for hubs.
S2.2	Describe the technical solution of ground-, space- and terminal segment and technical roadmap for the next 3 years.	Possible impact of the new features introduction will be assessed and taken into account to derive technical recommendations for the hinterland, remote and poor areas.
S2.3	Provide detailed information about the installed equipment of the ground stations (vendor, model, capacity, etc.).	Details about the existing network and agreements with network equipment vendors will help to understand the network flexibility, opportunities and allow to recommend most appropriate strategies of for ICT in the hinterland, poor and remote areas. Describe in your answer the following details: - Are there any managed services, implementation services provided by the vendor? What are these services? - How performed operation & maintenance services? Own Operator's team or vendor? - What services are done by the operators themselves, which are outsourced?
S2.4	Explain the key features enabled in the existing satellite network.	This information will be helpful for the understanding of the existing satellite network capabilities and services if extended to the project regions.
S2.5	Provide the typical service quality KPIs (latency, jitter, etc.), variety of services and protocols supported.	Details about the KPI will help to reveal the network flexibility, service opportunities and allow to recommend appropriate strategies in the project context.
3	Capacity & pricing	
S3.1	Specify the existing utilization level of the satellite access and provide the details about capabilities available e.g. number of transponders of a satellite and frequency bands used, throughput.	This information will help to understand and predict lack of bandwidth in project focus regions after a potential network expansion. Details regarding the utilization of the satellite access should be specified for each segment of the network separately.
S3.2	Explain the current service pricing strategy for customers. Is there a difference in pricing approach for different areas?	This information will help to estimate revenues from the infrastructure deployment in hinterland, poor and remote areas. Provide answer with the following details: - Service uptake and distribution - service bundling (mobile voice/data, fixed, etc.) - geographical price differentiation
S3.3	Specify the average cost per month for traffic and services for business customers (B2B) and end users (B2C).	This information helps to understand the willingness to pay available in the market for the respective services attached. Provide details for tariff structures for different service offerings.
S3.4	Please specify the ARPU for different areas within the country.	This information will be necessary for deriving high level cost modelling considering the local conditions and focusing on the hinterland, poor and remote areas. Provide answer with the following details: - ARPU calculation methodology - ARPU metrics - geographical and market segment distribution

B.3 Terms of Reference

National ICT Needs Assessment Consultancy

1. Background

1.1. The Government of Guyana has developed a Project Concept Note (PCN) to guide its preparatory activities to design the ICT Access and E-services for Hinterland, Poor and Remote Communities project. The project is expected to be funded through the Guyana REDO + Investment Fund (GRIF) which is a multi-contributor trust fund for the financing of activities undertaken as part of the Government's Low Carbon Development Strategy. The funds currently in the GRIF have been earned by the Government of Guyana (GoG) for the provision of its forest climate services and the limiting of emissions from deforestation and forest degradation under its partnership with Norway.

1.2. The ICT Access and E-services for Hinterland, Poor and Remote Communities project is a Government of Guyana initiative in partnership with the UNDP and is aimed at enabling access to high quality ICT infrastructure in all parts of Guyana with a specific focus on enhancing connectivity and enabling the provision of training and e-services for individuals and communities - with particular attention given to vulnerable groups and remote communities who might otherwise be excluded.

1.3. It is recognized that for a truly advanced and inclusive digital society, the facilitation and provision of e-services and ICT are crucial and integral to improving the quality of life for citizens. Therefore the introduction of ICT infrastructure and networks will provide greater convenience, availability and accessibility to support social, economic and environmental development.

1.4. Currently Guyana does not have a universal service fund (USF) in place. Internet and broadband infrastructure is concentrated on the coastal region with sparse and expensive connectivity options in the hinterland, poor and remote communities. Private telecommunications companies have shied away from providing internet services and telecommunications to hinterland, poor and remote communities because of the difficult and varying terrain, economic status of the majority of the residents, and the low return on investments. This means that the onus is on Government to provide the enabling environment for hinterland, poor and remote communities to access ICT, inclusive of access to e-Services.

1.5. In the absence of a National ICT Authority, the Ministry of the Presidency, E-Government Unit

NOTE: (9. This document serves as a guide to Requestor on how to write the TOR for the RFP, by suggesting contents. This document is not to be shared with Proposers in this current state and form. The TOR actually written by the Requestor shall be the TOR that will be attached to this part of the RFP.)

has the responsibility for the development of the ICT sector with the goal of developing a digital knowledge-based society. As part of this initiative, the E-Government Unit is working to improve ICT services delivered to citizens and businesses. In the short and medium term, the Unit has set as its target providing broadband access to hinterland, poor and remote communities to enable the residents of these communities to be informed and empowered to more actively participate in society's decision making processes.

1.6. The end is visualized as significant enhancement in the quality of life of Citizens, national efficiency and competitiveness, inclusive and sustainable growth and development, and the realization of a knowledge-based society. With this in mind the provision of ICT access to hinterland, poor and remote communities is a priority of the E-Government program.

1.7. The lack of readily available accurate information on the access to ICT services by the residents living in hinterland, poor and remote communities has hindered the design of an effective ICT service to meet the needs of these residents.

1.8. The Ministry of Presidency, is therefore soliciting the services of a Consulting Firm (hereinafter referred to as "the Firm") to conduct a current state and ICT needs assessment that would contribute to the socio-economic development of hinterland, poor and remote communities of Guyana.

2. Objectives

2.1 The outputs of this consultancy are intended to inform the preparation of a full project document for approval by the GRIF Steering Committee and the subsequent implementation, monitoring and evaluation of the actual project: "ICT Access and e-Services for Hinterland, Poor and Remote Communities".

2.2 To achieve this objective the GOG with support from the UNDP is seeking to recruit a Firm to conduct the current state and ICT needs assessment study.

3. Scope of Work

3.1. The Firm will be contracted to compile the necessary baseline data and information, as well as establish indicators against which the project and its impacts will be measured. The Firm will also be responsible for conducting a needs assessment study that is intended to identify the scope, costing, best technical solutions and revenue structures in providing, operating and maintaining ICT access and e-services for hinterland, poor and remote communities, as well as assess the overall viability of the project. The Consultancy will, inter alia, be expected to:

Task 1: Baseline Data Collection and Analysis

i. Identify and collect data based on the current environment, analyze data and provide recommendation in line with the project objectives, and to facilitate achievable target setting for the project. Information on key indicators will assist in the evaluation of the achievement of project progress, objectives, outcomes, and impacts. For example: number of hinterland, as well as poor and remote communities or households that have internet and telephony access; number of children ages x-y in the hinterland, as well as poor and remote communities accessing online education, or separately enrolled in primary, secondary and tertiary education; poverty levels of all identified hinterland, poor and remote communities; number of ICT literate persons within all identified hinterland, as well as poor and remote communities; number of desktop computers and laptops within all identified communities; number of schools, medical facilities, and communal buildings in each hinterland, poor and remote community identified.

ii. Identify the existing ICT networks and infrastructure in Guyana, especially within the hinterland, as well as poor and remote communities throughout the country.

a. Both public and private networks and infrastructure should be covered, including any planned expansion of the networks through other initiatives;

b. Identified networks and infrastructure in relation to communities should be plotted on a map of Guyana;

iii. Identify the existing national ICT infrastructural needs;

Task 2: Technical Report

i. Conduct a detailed assessment of current technologies available for the provision of internet access and telephony services to hinterland, poor and remote communities.

a. The assessment of technologies should consider, inter alia, the advantages and disadvantages of each, both generally and with specific reference to Guyana's context, including the potential target communities; important risks (and mitigation measures) associated with each technology and the implementation of these technologies; indicative costs; capacity; reach; reliability; security; important requirements for installation; ease of maintenance and upgrade; and any environmental concerns.

ii. Identify the necessary stakeholders, as well as institutions and institutional requirements for the successful implementation and operation of the identified technologies, for example: Guyana Telephone and Telegraph Company (GT&T), Digicel, National Frequency Management Unit NFMU), E-Government Unit- Ministry of the Presidency, Ministry of Indigenous Peoples' Affairs, National Toshias Council, Ministry of Communities, Ministry of Public Infrastructure;

Note: Records of all stakeholder meetings shall be summarized and presented in a report.

iii. Determine the requirements, impacts, opportunities and risks associated with existing and impending legislation, such as the draft Telecommunications Bill and the draft Public Utilities Commission Bill;

iv. Examine the potential for strategic partnerships and utilization of existing and near-term public and private networks and infrastructure;

v. Identify the best ICT solution or solutions in providing internet and telephony access to all identified hinterland, poor and remote communities (or clusters of communities) considering all previously identified activities. Clearly identify:

- a. All infrastructure, equipment, hardware, and software necessary to provide internet and telephony access to end users;
- b. All infrastructure, equipment, hardware, and software necessary for end users to utilize the internet and telephony access;
- c. Renewable energy solutions (inter alia, solar, wind, and micro-hydro) to power the necessary systems, including infrastructure, networks, and equipment. The analysis should identify any weather data collection equipment required to be installed synergistically with the identified infrastructure, so as to support location-based selection of the best generation technology by establishing a system to collect process and manage alternative energy data, and connect it in a standardized format to a central storage;
- d. Proposed locations for infrastructure and networks;
- e. All legal, institutional, infrastructural, social, environmental and other requirements and considerations;
- f. All associated costs for implementation giving a clear breakdown, including indicative costs for maintenance over a five year period, and training of personnel and community members in installation, use and maintenance;

Note: The technology or technologies identified should consider and incorporate anticipatory flexibility in terms of allowing possible modifications and upgrades in the future - Open Source.

Depending on the ICT solution(s) identified, due consideration should be given to the effective distance between end point infrastructure and essential facilities such as schools, medical facilities, and communal

buildings to determine the feasibility for the use of point to multi-point equipment or other means of facilitating internet access directly in these critical facilities instead of just at a centrally located hub.

vi. Identify the best business model or models for implementation within the identified hinterland, poor and remote communities to provide internet and telephony access. The business model should provide realistic cost and revenue projections required for operation and maintenance of the ICT solution(s), including infrastructure, equipment, networks, and service. Establish criteria for the application of each developed model to specific hinterland, poor and remote communities in Guyana.

The technical, financial, and institutional sustainability of models identified should be clearly formulated. Examples of models include but are not limited to:

- a. Solely Government Owned
- b. Public-Private Partnership
- c. Community Supported

Note: Sustainability measures should, inter alia, consider maintenance, recurrent costs, and training. For example, recurrent costs such as internet charges can be covered in the project cost for 6 years after which the GoG, or a public private partnership arrangement can absorb the cost. In the future, cost recovery measures can include communities paying for their Internet services once they are generating sufficient income. It is foreseen that as the Internet allows for regional, national and international integration of communities, as communities Opt-in, pursue economic ventures such as ecotourism etc., these can provide much needed income, some of which can offset internet charges.

Training is necessary to operate the community system, to support maintenance, and provide permanent initial on site capacity to guide users who are new to the Internet. It is also critical for the diffusion of the services necessary for the community to improve its functions.

vii. Identify the best possible sequence or prioritization of possible hinterland, poor and remote communities (including clusters) to commence project implementation of identified ICT solution(s) based on a selected list of factors such as location, topography, proximity to existing infrastructure and networks, ease of access and cost of logistics, economic activities, size of communities, population dispersion within communities, critical mass, types of linkages between cluster communities, poverty level, existing infrastructure, cost/benefit analysis.

viii. Assist in the development of all necessary information and documentation needed for the procurement of identified ICT technologies/solutions including, but not limited to: engineering designs, technical specifications, bills of quantities, qualifications and experience of firms/suppliers;

Task 3: e-Services Readiness Assessment and Action Plan

i. Prepare a National e-Government Readiness Assessment and Action Plan, identifying:

- a. The current types, levels, quantity, quality and reach of e-Government services in Guyana;
- b. The current state of legal, institutional, managerial, technological, infrastructural and other requirements, structures, and mechanisms necessary for e-Government services (in Guyana) currently in place outside of and inside all Government agencies across all relevant sectors, including but not limited to: education, health, agriculture, business, housing, public security, social protection, social cohesion, and tourism;
- c. A gap analysis and the next steps to bridge the gap needed to establish the additional legal, institutional, managerial, technological, infrastructural and other requirements, structures, and mechanisms necessary to provide additional and improved e-Government services, especially to hinterland, poor and remote communities. Carefully consider, inter alia, all ICT solutions required, including infrastructure; equipment; hardware and software; organizational changes; human resource requirements; processes; policies; list of potential e-services; tailoring of e-services to the social,

- cultural, economic, and environmental scenarios of the hinterland, poor and remote communities; content preparation;
 - d. Map the roles and responsibilities of all relevant stakeholders in providing e-Government services;
 - e. Assist in the development of all necessary documents and information such as engineering designs, technical specifications, bills of quantities, qualifications and experience of individual consultants, firms/suppliers needed to effect the additional requirements identified to provide e-Government services;
 - f. Estimate all necessary costs to implement the next steps and activities identified.
- ii. With specific focus on e-learning and its application to hinterland, poor and remote communities:
- a. Identify the necessary steps, requirements, stakeholders, and inputs in developing and delivering tailored accredited e-learning programs at the primary, secondary, tertiary, and technical/vocational levels.
 - b. Provide costs for all steps and inputs.
- iii. Examine the potential for collaboration and partnerships with the private sector in providing the supporting capacity to create linkages to generate inter-sectoral benefits in the areas identified, but not limited to those, above in "ii (a)";
- iv. Examine the potential for synergies with:
- a. Government Learning Channel
 - b. Amerindian Development Fund and Amerindian Land Titling Projects
 - c. One Laptop per Family Project
 - d. Telecommunication Liberalization
- v. Based on the identified ICT literacy rate of the hinterland, poor and remote communities (established from the baseline study) determine the scope of training required for members of these communities to utilize the technologies and e-services to be provided, including teachers and health professionals within the communities;

B.4 Routes

B.4.1 Region 1 - Barima-Waini

Team members=1

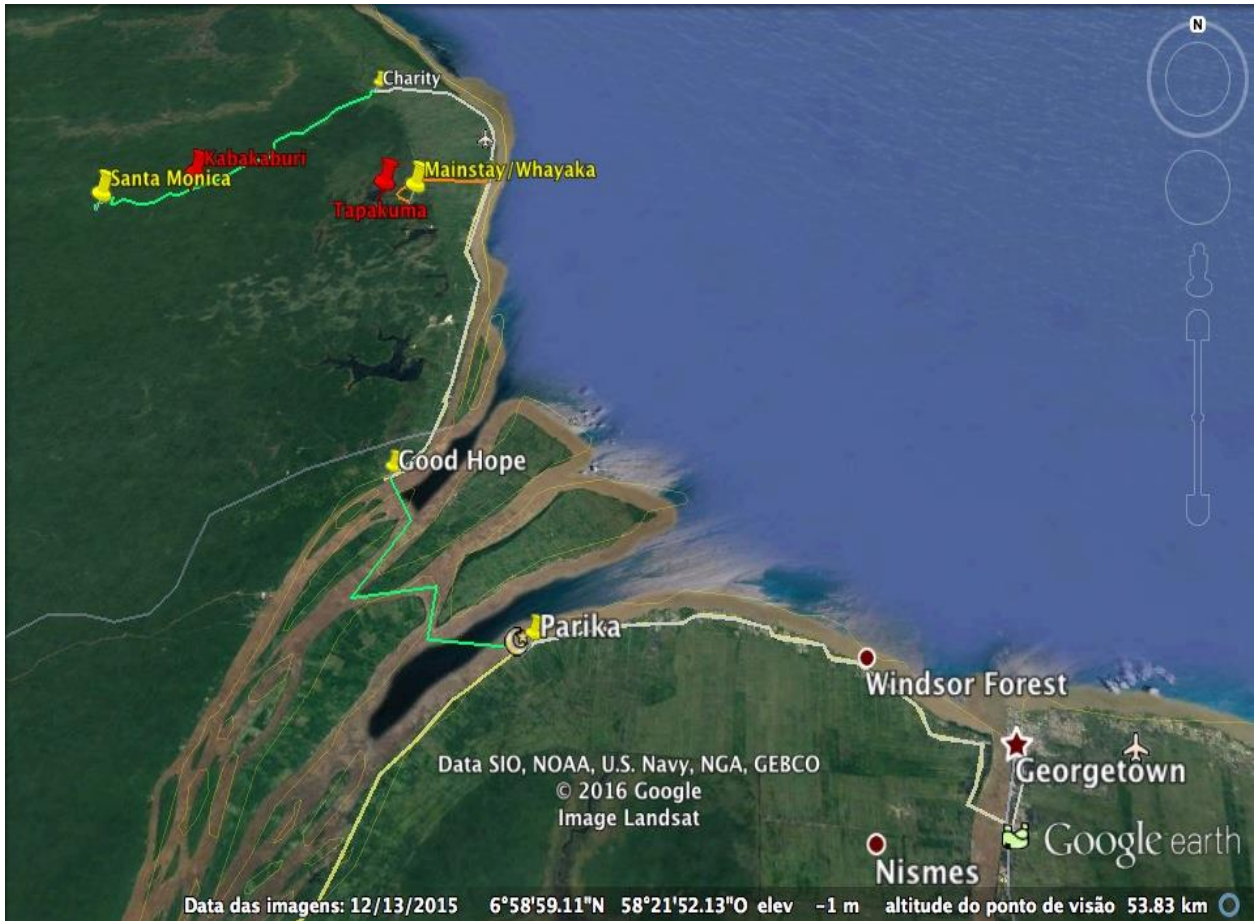
Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Airplane	1	Mabaruma	Overnight	1
Departs 7:45			Region 1		
Base	Airplane	1	<u>Ogle/Georgetown</u>	Overnight	2
			Region 4		
<u>Georgetown</u>	Airplane	1	Port Kaituma	Overnight	3
			Region 1		
	Airplane	1	<u>Ogle/Georgetown</u>	0	4
<u>Georgetown</u>			Region 4		
				Total days	5



B.4.2 Region 2 – Pomeroon-Supenaam

Team members=1

Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	1	<u>Parika</u>	1	1
Departs 6:00	Minibus	40km	Region 3		
	Boat	45min	<u>Supenaam</u>	15min	1
	Speedboat		Region 3		
	Road	1	Mainstay/Whayaka	Overnight	1
	Taxi	44km	Region 2		
	Road	1	Charity	Overnight	2
	Taxi	23km	Region 2		
	Boat	1	Santa Monica	8	3
		34km	Region 2		
	Boat	1	<u>Charity</u>	Overnight	3
		34km	Region 2		
	Road	1	<u>Supenaam</u>	1	4
	Taxi	50km	Region 3		
	Boat	45min	<u>Parika</u>	15min	4
	Speedboat		Region 3		
	Road	1	<u>Georgetown</u>	0	4
<u>Georgetown</u>	Minibus	40km	Region 4		
				Total days	5



B.4.3 Region 3 – Essequibo Islands – West Demerara

Team members=1

Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	1	<u>Parika</u>	15min	1
Departs 6:00	Minibus	40km	Region 3		
	Boat	1	Saxacally	8	1
		35km	Region 3		
	Boat	1	<u>Parika</u>	15min	1
		35km	Region 3		
Base	Road	1	<u>Georgetown</u>	15min	1
	Minibus	40km	Region 4		
<u>Georgetown</u>	Road	20min	Wales	8	2
	Taxi	15km	Region 3		
Base	Road	20min	<u>Georgetown</u>	0	2
	Taxi	15km	Region 4		
<u>Georgetown</u>	Road	1	<u>Parika</u>	15min	3
	Minibus	40km	Region 3		
	Boat	20min	Hog Island	8	3
		8km	Region 3		
	Boat	20min	<u>Parika</u>	15min	3
		8km	Region 3		
	Road	1	<u>Georgetown</u>	0	3
<u>Georgetown</u>	Minibus	40km	Region 4		
				Total days	4



B.4.4 Region 4 – Demerara - Mahaica

This region will be used to validate the questionnaire and to train the trainers due to its proximity to Georgetown.

Team members= 1

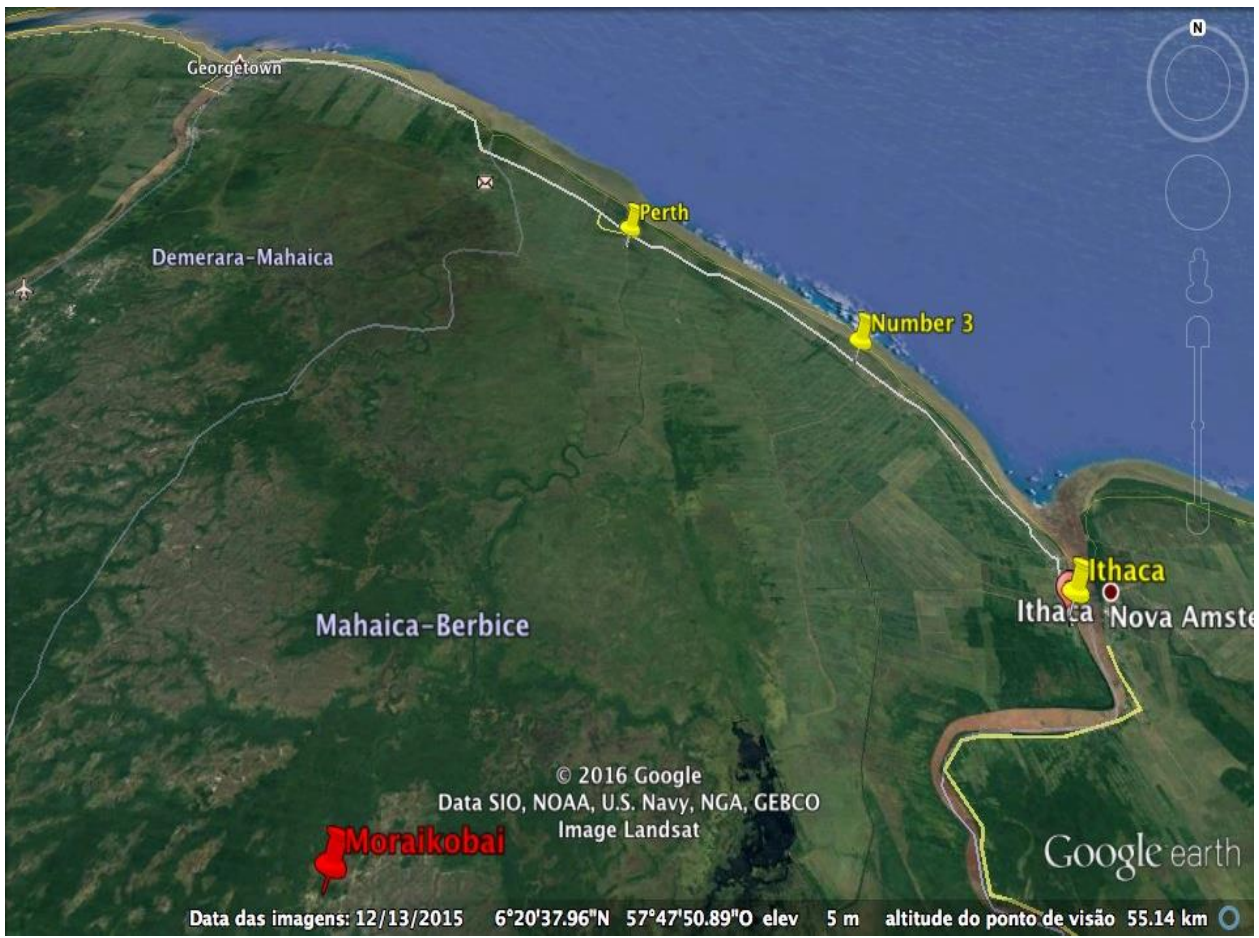
Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	10min	Albouystown	8	1
	Taxi	3km	Region 4		
Base	Road	10min	<u>Georgetown</u>	0	1
	Taxi	3km	Region 4		
<u>Georgetown</u>	Road	30min	Buxton	8	2
	Taxi	19km	Region 4		
Base	Road	30min	<u>Georgetown</u>	0	2
	Taxi	19km	Region 4		
<u>Georgetown</u>	Road	1h30	Laluni	8	3
	Taxi	43km	Region 4		
Base	Road	1h30	<u>Georgetown</u>	0	3
	Taxi	43km	Region 4		
<u>Georgetown</u>	Road	3	St. Cuthberts	8	4
	Taxi	80km	Region 4		
	Road	3	<u>Georgetown</u>	0	4
<u>Georgetown</u>	Taxi	80km	Region 4		
				Total days	5



B.4.5 Region 5 – Mahaica-Berbice

Team members=1

Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	1h30	Perth	8	1
	Minibus	50km	Region 5		
Base	Road	1h30	<u>Georgetown</u>	0	1
	Minibus	50km	Region 4		
<u>Georgetown</u>	Road	2	Number 3	8	2
	Minibus	75km	Region 5		
Base	Road	2	<u>Georgetown</u>	0	2
	Minibus	75km	Region 4		
<u>Georgetown</u>	Road	2h30	Ithaca	8	3
	Minibus	100km	Region 5		
	Road	2h30	<u>Georgetown</u>	0	3
<u>Georgetown</u>	Minibus	100km	Region 4		
				Total days	4



B.4.6 Region 6 – East Berbice-Corentyne

Team members=1

Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	2h45	Plegt Ankor/Lighttown	8	1
	Minibus	130km	Region 6		
	Road	35min	<u>New Amsterdam</u>	Overnight	1
	Minibus	25km	Region 6		
	Road	10min	West Canjie	8	2
	Taxi	5km	Region 6		
	Road	1h40	<u>Corriverton</u>	Overnight	2
	Taxi/Minibus	75km	Region 6		
	Boat	1h30	Orealla	Overnight	3
		75km	Region 6		
	Boat	1h30	<u>Corriverton</u>	15min	3
		75km	Region 6		
	Road	3h30	<u>Georgetown</u>	0	4

Georgetown	Minibus	200km	Region 4		
				Total days	5

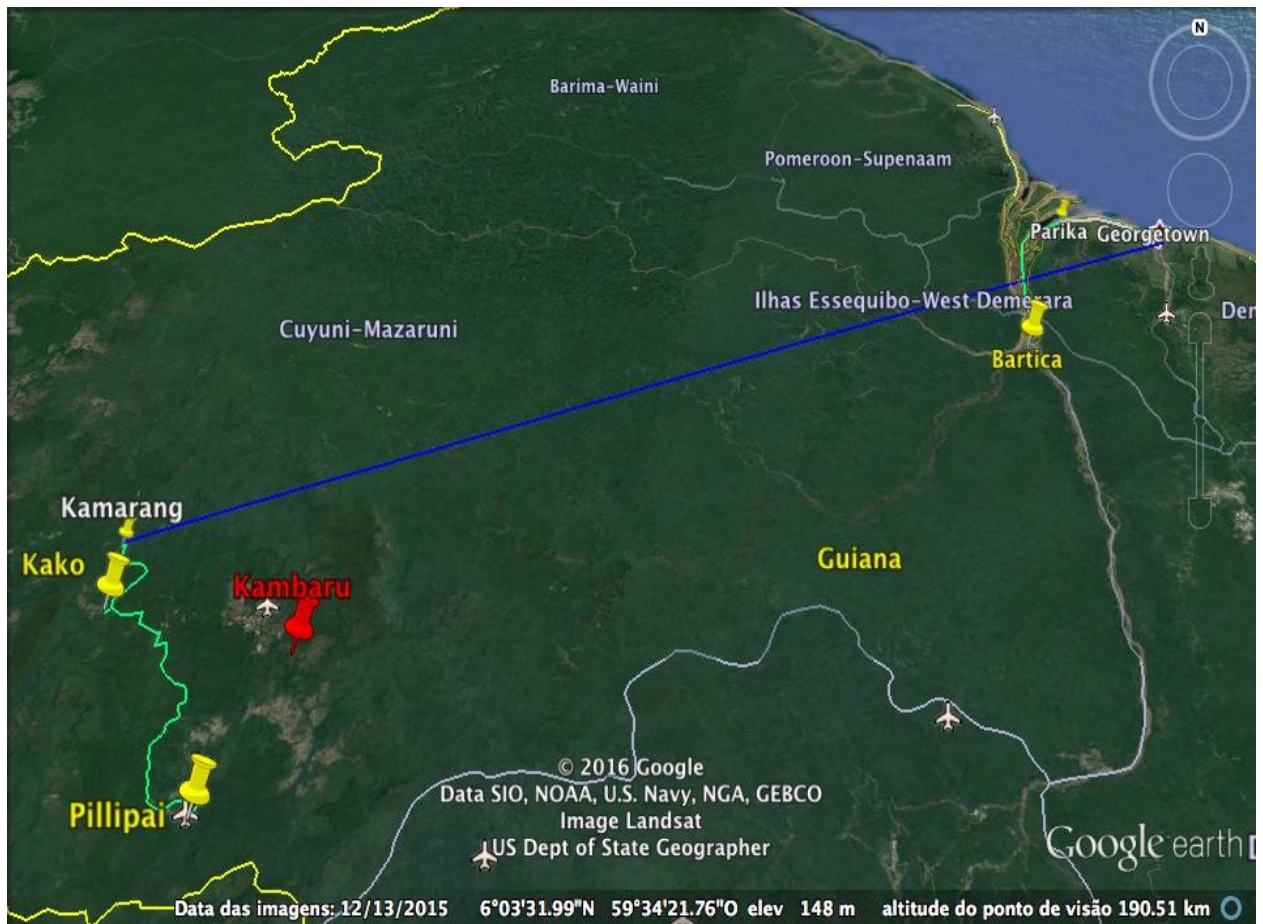


B.4.7 Region 7 – Cuyuni-Mazaruni

Team members= 1

Region 7 (plus Dog Point from Region 3)

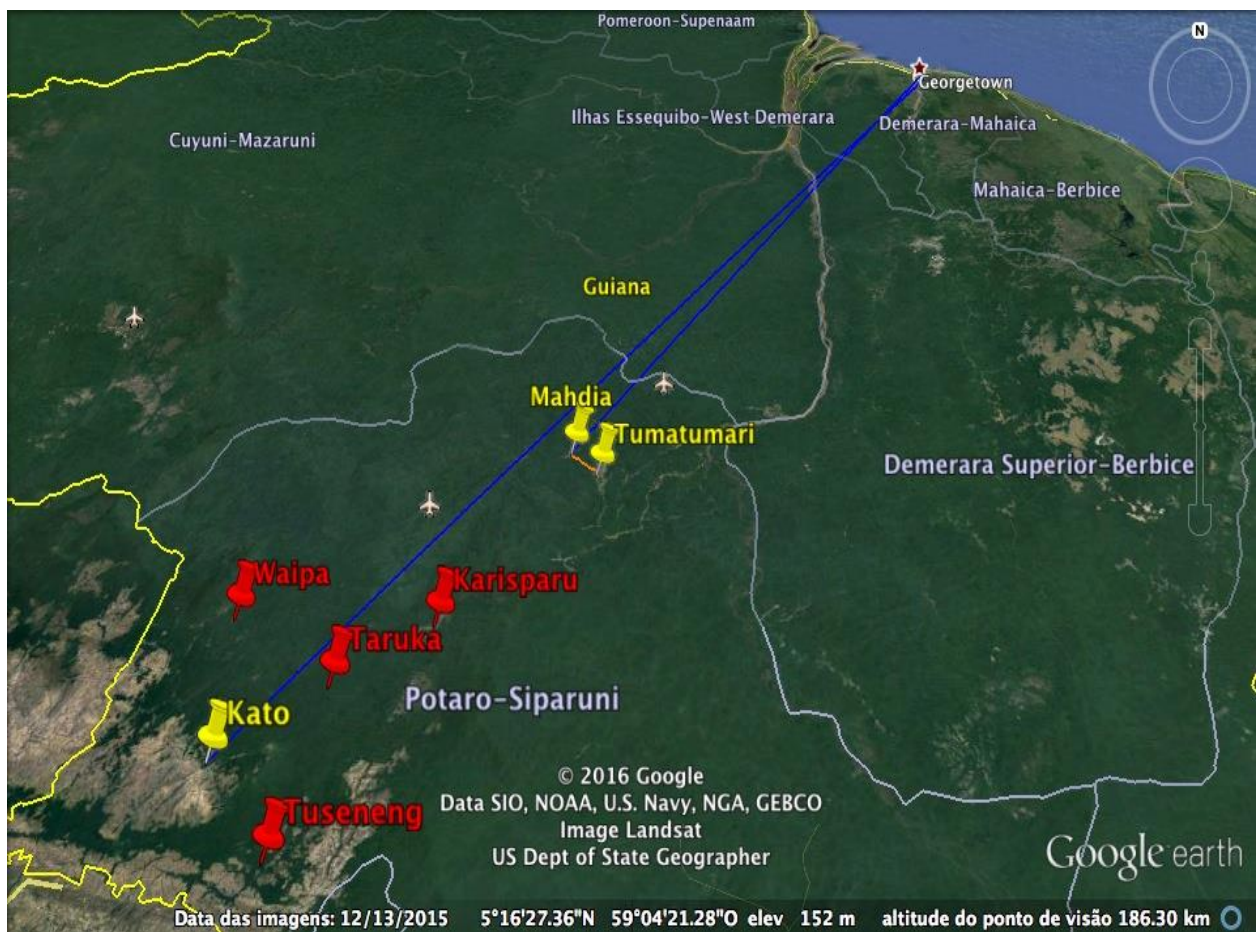
Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	1	<u>Parika</u>	15min	1
	Minibus	40km	Region 3		
	Boat	1	Bartica	8	1
		55km	Region 7		
5pm!!	Boat	1	<u>Parika</u>	15min	1
		55km	Region 3		
Base	Road	1	<u>Georgetown</u>	0	1
	Minibus	40km	Region 4		
<u>Georgetown</u>	Airplane	1	<u>Kamarang</u>	15min	2
			Region 7		
	Boat	40min	Kako	2 Overnight	2
		25km	Region 7		
	Boat	4	Phillipai	2 Overnight	4
		75km	Region 7		
	Boat	5	<u>Kamarang</u>	15min	6
		100km	Region 7		
	Airplane	1	<u>Georgetown</u>	0	6
<u>Georgetown</u>			Region 4		
				Total days	7



B.4.8 Region 8 – Potaro-Siparuni

Team members=1

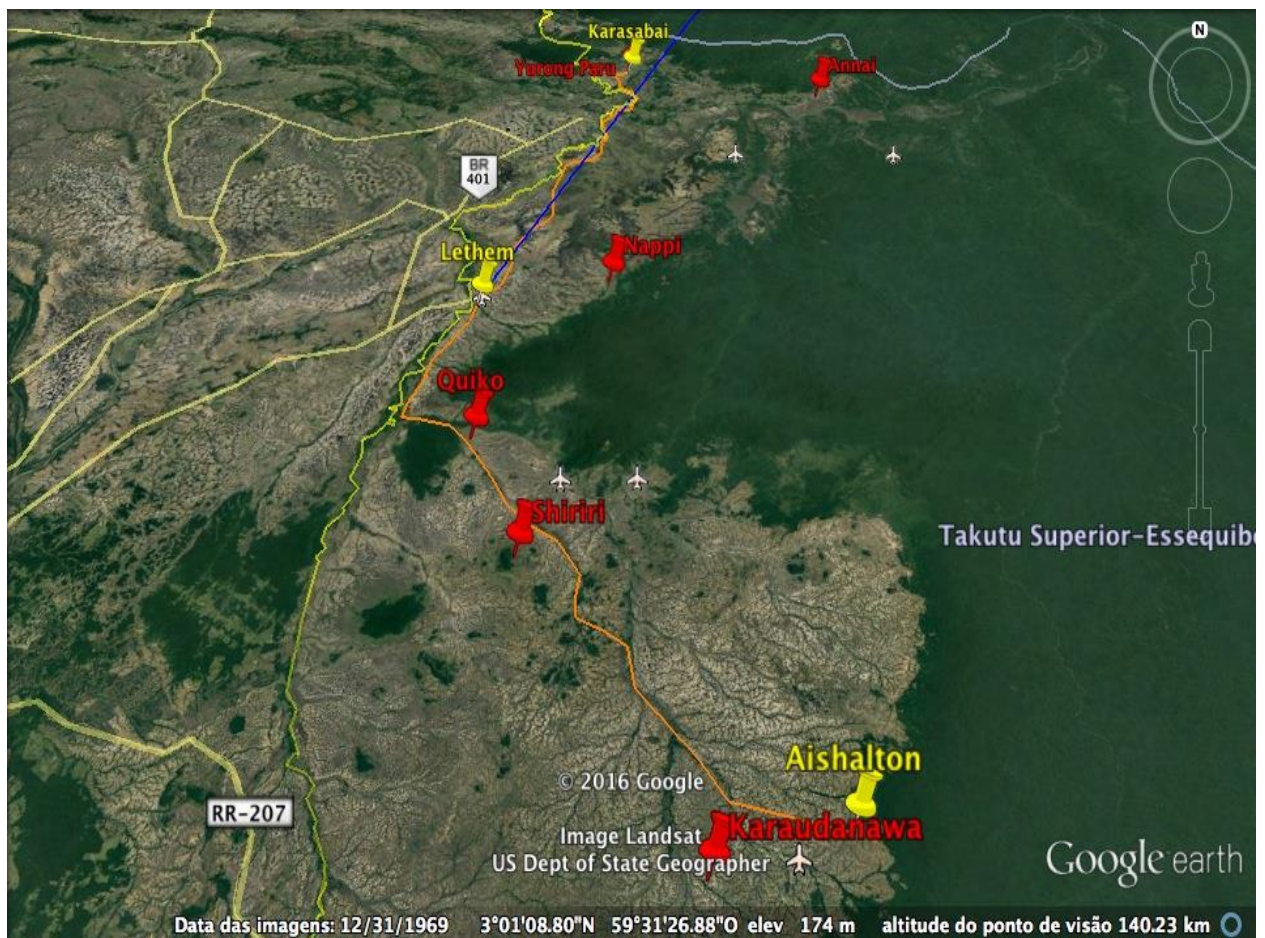
Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Airplane	1	Mahdia	2 Overnight	1
			Region 8		
ö	Road	1	Tumatumari	8	3
	4x4	10km	Region 8		
	Road	1	<u>Mahdia</u>	Overnight	3
	4x4	10km	Region 8		
Base	Airplane	1	<u>Ogle/Georgetown</u>	0	4
			Region 4		
<u>Georgetown</u>	Airplane	1	Kato	2 Overnight	5
			Region 8		
	Airplane	1	<u>Georgetown</u>	0	7
<u>Georgetown</u>			Region 4		
				Total days	8



B.4.9 Region 9 – Upper Takutu-Upper Essequibo

Team members=1

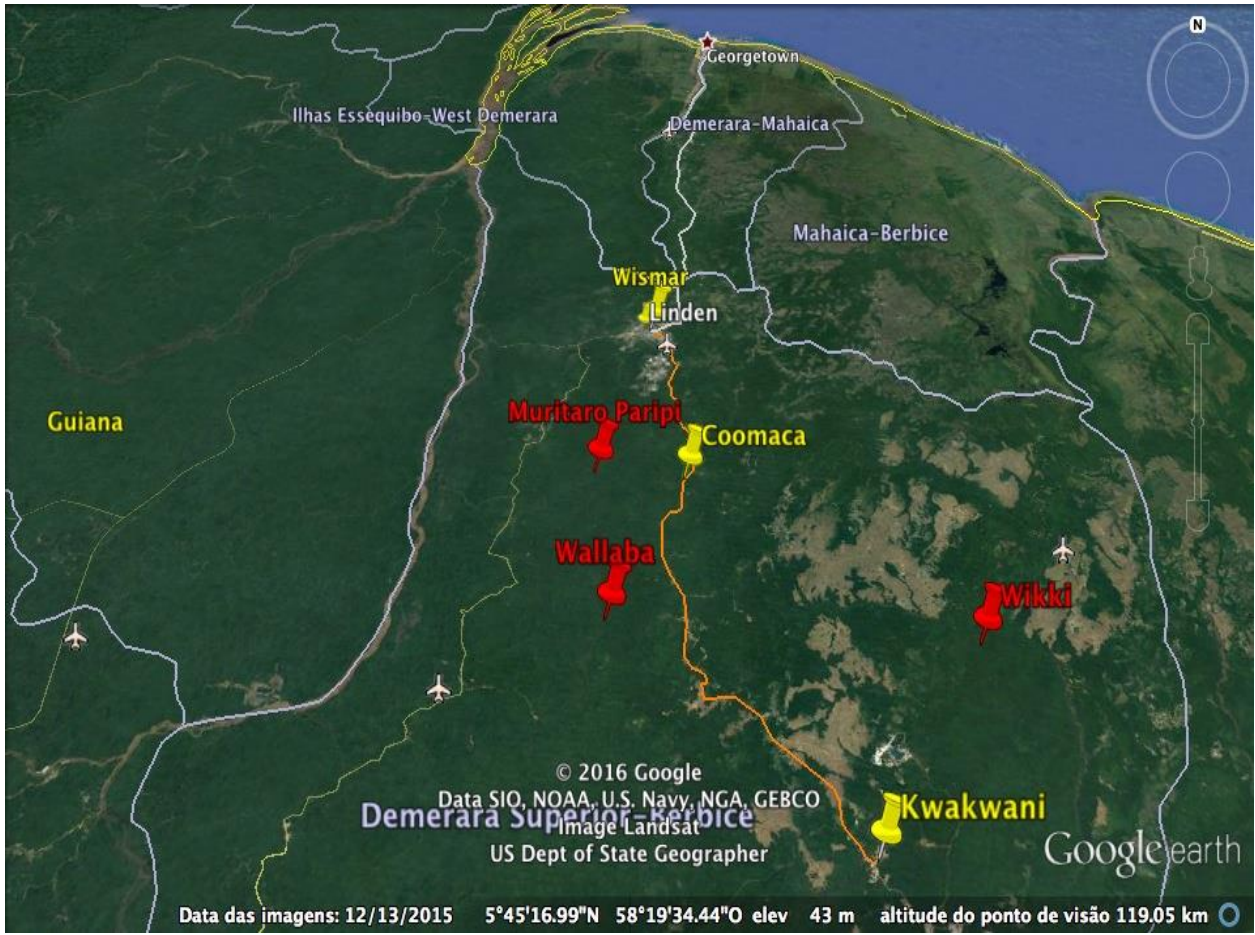
Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Airplane	1	Lethem	Overnight	1
			Region 9		
	Road	3	Karasabai	Overnight	2
	4x4	100km	Region 9		
	Road	3	<u>Lethem</u>	0	3
	4x4	100km	Region 9		
	Road	6	Aishalton	2 Overnight	3
	4x4	140km	Region 9		
	Road	6	<u>Lethem</u>	Overnight	5
	4x4	140km	Region 9		
	Airplane	1	<u>Georgetown</u>	0	6
<u>Georgetown</u>			Region 4		
				Total days	7



B.4.10 Region 10 – Upper Demerara – Upper Berbice

Team members=1

Base	Transport	Trip Hours	Site	Stay (hs)	Day
<u>Georgetown</u>	Road	2	<u>Linden</u>	15min	1
	Bus	110km	Region 10		
	Road	15min	Wismar	8	1
	Taxi	4km	Region 10		
	Road	15min	<u>Linden</u>	Overnight	1
	Taxi	4km	Region 10		
	Road	1	Coomaca	8	2
	Bus	35km	Region 10		
	Road	1	<u>Linden</u>	Overnight	2
	Bus	35km	Region 10		
	Road	3h30	Kwakwani	2 Overnight	3
	Bus	100km	Region 10		
	Road	5	<u>Georgetown</u>	0	5
<u>Georgetown</u>	Bus	215km	Region 4		
				Total days	5



B.5 Detailed timeline of field work

Current state of planning as of July 26th and subject to change.

	July														August													
Day	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
Team 1	Arrival	Briefing/Training		4-Buxton	4-Laluni		7-Barbica	8-Soracally							8-Mahdia	8-Mahdia	9-Tamatumari	Travel	9-Kato	9-Kato	Travel							
Team 2	Arrival	Briefing/Training		4-Alboustown		Travel	5-Mabaruma	Travel	1-Port Kaituma	Travel	3-Wales	3-Plog Island			7-Koko	7-Koko	7-Phillipi	7-Phillipi	Travel									
Team 3	Arrival	Briefing/Training		4-Buxton	4-Laluni		5-Perth	5-No. 3	5-Ithaca		6-West Carge				9-Lethem	9-Karasabai	Travel	9-Ashalton	Travel	Travel								
Team 4		Briefing/Training		4-Alboustown			10-Wismar	10-Coomaca					4-St. Cuthberts		2-Mainstay	2-Charly	2-Sta. Monica	Travel	6-Orealla	6-Orealla	6-Flegt Akkor			10-Kwakwani	10-Kwakwani	Travel		
				Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8	Region 9	Region 10															