



ICT-601102 STP TUCAN3G

Wireless technologies for isolated rural communities in developing countries based on cellular 3G femtocell deployments

M32

Portfolio of products and services

Contractual Date of Delivery to the CEC:	31 December 2013
Actual Date of Delivery to the CEC:	30 June 2014
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Participant(s):	KiNNO, TdP, CREP, EHAS
Workpackage:	3
Est. person months:	4
Security:	Int
Dissemination Level:	CO
Version:	d
Total number of pages:	20

Abstract:

Portfolio of Products & Services, as a sequential activity of D23 and D31 presents a first approach of potential services to be offered through the TUCAN3G infrastructure. These proposed services have been identified by local partners in order to tackle the communication needs of target groups (demand and supply side). In order to present a set of reliable proposed services, various critical factors have been taken into account through the conceptualisation phase of these services, such as the minimum technology and the minimum business requirements.

Keyword list: Products, Services, 3G, rural areas, developing countries

Document Revision History

DATE	ISSUE	AUTHORS	SUMMARY OF MAIN CHANGES
23/06/2014	A	Vasilis Papanikolaou	1 st Draft
24/06/2014	A	Ignacio Prieto	1 st Draft – Comments on 1 st Draft
25/6/2014	B	Vasilis Papanikolaou	2 nd Draft
27/6/2014	C	Ana García	3 rd Draft – Minor Modifications
28/6/2014	D	Vasilis Papanikolaou	Final Version



Executive Summary

This is an intermediate document towards the elaboration of deliverable D34 whose main objective is to present a first approach of potential services to be offered through the TUCAN3G infrastructure. This portfolio has been defined based on the interests and needs of isolated rural communities in developing countries, which were identified in the Marketed Research (D31) performed in the activity 3A1.

This portfolio includes 11 services, and each one of them has been described based on its target group, its minimum business requirements, and its relevance for the objectives of TUCAN3G. This proposal will be evaluated when developing the final business model, taking into account the analysis of the supply side (structure of costs) that will be performed in activity 3A3.

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Table of Contents

1	INTRODUCTION	7
2	PROPOSED PRODUCTS & SERVICES	8
2.1	SERVICES DESCRIPTION	9
2.1.1	<i>Service 1: Prepaid plan</i>	9
2.1.2	<i>Service 2: Special voice fees.....</i>	10
2.1.3	<i>Service 3: Chat & email in your cell phone</i>	11
2.1.4	<i>Service 4: Chat & social networks</i>	12
2.1.5	<i>Service 5: Special Internet fees.....</i>	13
2.1.6	<i>Service 6: Special night fees.....</i>	14
2.1.7	<i>Service 7: Mixed fees.....</i>	15
2.1.8	<i>Service 8: Combined Pre-paid Access.....</i>	16
2.1.9	<i>Service 9: Post-paid plan</i>	17
2.1.10	<i>Service 10: News service</i>	18
2.1.11	<i>Service 11: Control account.....</i>	19
3	CONCLUSIONS.....	20

List of abbreviations & symbols

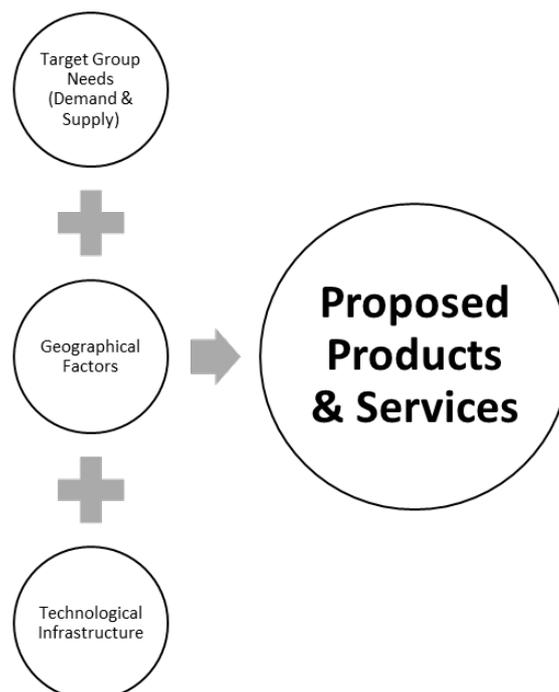
3G	3rd Generation
4G	4th Generation
CLARO	América Móvil Perú
CREP	CREPIC- Cauca Regional Centre for Productivity and Innovation, Colombia
EDGE	Enhanced Data Rates for GSM Evolution
EHAS	Foundation Hispano-American Health Connection
FITEL	Telecommunications Investment Fund, Peru
KINNO	Kinno Consultants Ltd.- Knowledge and Innovation Consultants, Greece
R&D	Research and Development
SIM	Subscriber Identity Module
UCAU	University of Cauca, Colombia
US \$	United States Dollar
USSD	Unstructured Supplementary Service Data
VoIP	Voice over Internet Protocol
WiFi	Wireless Fidelity



1 INTRODUCTION

Throughout TUCAN3G research, it has been made clear that isolated rural areas of developing countries area and the inhabited population, which the project examines, have a specific set of needs and requirements which the project aims to tackle. Milestone M32 – Portfolio of Products & Services, as a sequential activity of Deliverable D23 (Parameters and basic conditions for the market research and the business model) and Deliverable D31 (Market Research), presents a first approach of potential services to be offered through the TUCAN3G infrastructure.

These proposed services have been identified by local partners in order to tackle the communication needs of target groups (demand and supply side) presented and analysed in D31. Both Colombian and Peruvian partners have identified common challenges, opportunities and priorities of population living in rural isolated areas, which need to be tackled with in an efficient and effective way. Throughout interviews conducted and analysis made in D31, valuable outcomes have been extracted which enabled project partners to define a set of services which can be offered via the TUCAN3G infrastructure to target communities.



In order to pre-design and present a set of reliable proposed services, various critical factors have been taken into account through the conceptualisation phase of these services, such as the minimum technology requirements for these services to be fully functional and the minimum business requirements requested for the viability of the services. The first set of constrains have been provided by WP4 and WP5, and the business requirements have been defined by the operators.

Last but not least, these services will be re-examined and re-defined in future steps, according to the final technical capability and capacity of TUCAN3G infrastructure.

2 PROPOSED PRODUCTS & SERVICES

Throughout the analysis made in D31, local partners from the examined regions have identified a number of critical factors and issues that are of high priority to be tackled from the TUCAN3G intervention. Moreover, these critical factors can be also considered as business opportunities to be examined for designing the services to be offered. The most importuned factors, as identified by local partners, are presented below:

1. Prepaid plans are preferred by the population located in the examined area as the majority of the population doesn't have a regular income in order to purchase fixed rate/price contracts, thus flexibility is important.
2. A large percentage of the targeted population is willing to pay a fixed price in order to access continuous internet connection for entertainment or business purposes.
3. A noticeable percentage of the population is using portable devices (i.e. laptops, smartphones etc.) for accessing the internet, thus they are not willing to purchase landline internet services but prefer mobile ones. This indicates that there is a market for mobile internet plans to be exploited.
4. The analysis showed that end users prefer to use the internet mainly for accessing education content and browsing the news. The previous fact suggests that by using offloading techniques it will be possible for the operator to offer access to news at a lower price, as each access to a newspaper will be stored locally and in this way it could be accessed later without consuming core network resources.

Moreover, a set of general issues need to be taken into account while designing the services:

- What are the actual needs and drawbacks for rural and isolated communities and industries when it comes to mobile data connectivity and broadband data connectivity?
- What information and communication technology (ICT) applications and development can arise if mobile broadband is supplied in these locations?
- Is sufficient education provided for the application of ICT development?
- Do people know and understand the choices and freedom of gaining information via applications such as the internet?

By taking into account the above facts, the financial and geographical limitation of isolated rural areas and the habits of the inhabitant population, a sufficient number of services is being proposed in the following section. The services description contain not only a detailed presentation of the services, but also provide a brief of the minimum business and technology requirements needed as well as important factors to be taken into account while designing and implementing the services. The prices here presented have been established based on similar services that are been offered now in Latin America. However, these prices will have to be reviewed after performing the supply side analysis in activity 3A3 in order to produce a sustainable business model in 3A4.



2.1 Services description

2.1.1 Service 1: Prepaid plan

Service 1: Prepaid plan

Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account						
This product is aimed for people who prefer a prepaid mobile plan.	Nationwide	<p>A SIM card is required to establish voice or data communications through a 3G device.</p> <p>The service is activated by default when acquiring a prepaid SIM card and then the user will be able to receive calls and SMS.</p> <p>When acquiring a prepaid SIM card the user needs to additionally purchase credit to perform voice call, to send SMS or to use data services.</p>	<p>Once the service is activated, the only requirement to establish a voice call is to have enough credit in the mobile phone. The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th>Voice</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>SIM Card</td> <td>US\$ 5</td> </tr> <tr> <td>Per minute</td> <td>US\$ 0,18</td> </tr> </tbody> </table>	Voice	Price	SIM Card	US\$ 5	Per minute	US\$ 0,18	<p>The area must have cellular coverage to make appropriate use of this service. This project will focus on 3G deployments, so it is required to have a cell phone with capacity to support 3G communications in order to make use of this service. However, it would be possible to deliver this service through 2G networks.</p>	<p>The market research performed in D31 shows that prepaid plans are the ones preferred by population in rural areas (49,7% of the population prefers prepaid services), because most of this population don't have a regular income. This service covers the voice communications need of this population segment.</p>
Voice	Price										
SIM Card	US\$ 5										
Per minute	US\$ 0,18										

2.1.2 Service 2: Special voice fees

Service 2: Special voice fees																
Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account											
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion, it is ideal for low-income sectors and rural areas.</p> <p>This “Special Voice Fees” is focused on satisfying the need for voice communication.</p>	Nationwide	<p>This promotion is not permanent and is intended to reward the clients that buy large amounts of credit.</p> <p>The promotion is automatically activated when buying credit for the cell phone.</p> <p>The reward varies according to the amount of credit that has been purchased.</p>	<p>The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan offers extra credit when the user purchases a certain amount of minutes. The cost of each minute of phone call is US\$ 0,18.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th></th> <th>Price</th> <th>Reward</th> <th>Effective</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Special voice fees</td> <td>US\$ 3.5</td> <td>US\$ 0,7</td> <td>30 days</td> </tr> <tr> <td>US\$ 18</td> <td>US\$ 7</td> <td>30 days</td> </tr> </tbody> </table>		Price	Reward	Effective	Special voice fees	US\$ 3.5	US\$ 0,7	30 days	US\$ 18	US\$ 7	30 days	<p>To make use of this promotion is required to have a cell phone with capacity to connect with 3G stations.</p> <p>The area must have 3G coverage to make appropriate use of this service.</p>	<p>The opportunity to make phone calls is the basic service requested by the users. Therefore, “Special Voice Fees” will be the basic service provided by any operator.</p> <p>The marked research performed in D31 shows that prepaid plans are the ones preferred by population in rural areas, because this population don't have a regular income.</p>
	Price	Reward	Effective													
Special voice fees	US\$ 3.5	US\$ 0,7	30 days													
	US\$ 18	US\$ 7	30 days													



2.1.3 Service 3: Chat & email in your cell phone

Service 3: Chat & email																	
Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account												
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion, it is ideal for low-income sectors and rural areas.</p> <p>Chat and email applications have become very popular among the general population. The “Chat & email” is focused on satisfying the need for chat and email applications that make use of data traffic at an affordable cost.</p>	Nationwide	<p>This promotion is not permanent and is intended to capture traffic consumption with low cost in relation to the usual prepayment rates (US\$ 0,18 per MB). Moreover, this rate doesn't have a limit of amount of data (MegaBytes) exchanged per day. Unstructured Supplementary Service Data (USSD) is used in this service, the promotion can be activated with the following steps:</p> <ul style="list-style-type: none"> • Step 1: Dial *515# press CALL button. • Step 2: Mark option 3. • Step 3: Choose an option belonging to promotion “Chat & email”. <p>This service allows unlimited access to chat and email applications during the validity of the promotion. The maximum speed depends on the cellular coverage.</p>	<p>The prerequisite to access this promotion is to have enough credit in the mobile phone. The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th>Chat & email</th> <th>Price</th> <th>Effective</th> </tr> </thead> <tbody> <tr> <td>1 Day Internet</td> <td>US\$ 0,27</td> <td>1 day</td> </tr> <tr> <td>1 Week Internet</td> <td>US\$ 0,90</td> <td>7 days</td> </tr> <tr> <td>1 Month Internet</td> <td>US\$ 2,80</td> <td>30 days</td> </tr> </tbody> </table>	Chat & email	Price	Effective	1 Day Internet	US\$ 0,27	1 day	1 Week Internet	US\$ 0,90	7 days	1 Month Internet	US\$ 2,80	30 days	<p>To make use of this promotion it is required to have a cell phone with capacity to support data traffic via 3G.</p> <p>The area must have 3G coverage to make appropriate use of this service.</p>	<p>This service target those users who don't need continuous Internet access or who can't afford its rates, but who are willing to pay small amounts for keeping connected through chat applications and email.</p>
Chat & email	Price	Effective															
1 Day Internet	US\$ 0,27	1 day															
1 Week Internet	US\$ 0,90	7 days															
1 Month Internet	US\$ 2,80	30 days															

2.1.4 Service 4: Chat & social networks

Service 4: Chat & social networks																	
Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account												
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion, it is ideal for low-income sectors and rural areas.</p> <p>Chat applications and social networks have become very popular among the general population because they provide a way to keep in touch with family and friends. The “Chat & social networks” service is focused on satisfying the need for this services that make use of data traffic at an affordable cost.</p>	Nationwide	<p>This promotion is not permanent and is intended to capture traffic consumption with low cost in relation to the usual prepayment rates (US\$ 0,18 per MB) .Unstructured Supplementary Service Data (USSD) is used in this service, the promotion can be activated with the following steps:</p> <ul style="list-style-type: none"> • Step 1: Dial *515# press CALL button. • Step 2: Mark option 3. • Step 3: Choose an option belonging to promotion “Chat & social networks”. <p>This service allows unlimited access to chat applications and social networks during the validity of the promotion. The maximum speed depends on the cellular coverage.</p>	<p>The prerequisite to access this promotion is to have enough credit in the mobile phone. The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th>Chat & email</th> <th>Price</th> <th>Effective</th> </tr> </thead> <tbody> <tr> <td>1 Day Internet</td> <td>US\$ 0,27</td> <td>1 day</td> </tr> <tr> <td>1 Week Internet</td> <td>US\$ 0,90</td> <td>7 days</td> </tr> <tr> <td>1 Month Internet</td> <td>US\$ 2,80</td> <td>30 days</td> </tr> </tbody> </table>	Chat & email	Price	Effective	1 Day Internet	US\$ 0,27	1 day	1 Week Internet	US\$ 0,90	7 days	1 Month Internet	US\$ 2,80	30 days	<p>To make use of this promotion it is required to have a cell phone with capacity to support data traffic via 3G.</p> <p>The area must have 3G coverage to make appropriate use of this service.</p>	<p>This service target those users who don't need continuous Internet access or who can't afford its rates, but who are willing to pay small amounts for keeping connected through chat and social networks applications.</p>
Chat & email	Price	Effective															
1 Day Internet	US\$ 0,27	1 day															
1 Week Internet	US\$ 0,90	7 days															
1 Month Internet	US\$ 2,80	30 days															



2.1.5 Service 5: Special Internet fees

Service 5: Special Internet fees

Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account																													
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion is ideal for low-income sectors and rural areas.</p> <p>The “Special Internet fees” is focused on satisfying the need for Internet access and the use of Apps that make use of traffic data.</p>	Nationwide	<p>This promotion is not permanent and is intended to capture traffic consumption with low cost in relation to the usual prepayment rates (US\$ 0,18 per MB).</p> <p>Unstructured Supplementary Service Data (USSD) is used in this service, the promotion can be activated with the following steps:</p> <ul style="list-style-type: none"> • Step 1: Dial *515# press CALL button. • Step 2: Mark option 3. • Step 3: Choose an option belonging to promotion “Special Internet fees”. <p>Once consumed the MB or finished the validity of the promotion, a SMS will be sent indicating the end of the service. The maximum speed depends on the wireless coverage, therefore, is required a proper 3G signal coverage in the area.</p>	<p>The prerequisite to access this promotion is to have enough credit in the mobile phone. The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <table border="1"> <thead> <tr> <th>Special Internet fees</th> <th>Price</th> <th>Effective</th> <th>Data Usage</th> </tr> </thead> <tbody> <tr> <td>1 Day Internet</td> <td>US\$ 0,36</td> <td>1 day</td> <td>8 MB</td> </tr> <tr> <td rowspan="2">1 Week Internet</td> <td>US\$ 1,10</td> <td>7 days</td> <td>25 MB</td> </tr> <tr> <td>US\$ 1,45</td> <td>7 days</td> <td>50 MB</td> </tr> <tr> <td rowspan="3">1 Month Internet</td> <td>US\$ 1,80</td> <td>7 days</td> <td>75 MB</td> </tr> <tr> <td>US\$ 11</td> <td>30 days</td> <td>500 MB</td> </tr> <tr> <td>US\$ 21</td> <td>30 days</td> <td>1GB</td> </tr> <tr> <td></td> <td>US\$ 31</td> <td>30 days</td> <td>2GB</td> </tr> </tbody> </table>	Special Internet fees	Price	Effective	Data Usage	1 Day Internet	US\$ 0,36	1 day	8 MB	1 Week Internet	US\$ 1,10	7 days	25 MB	US\$ 1,45	7 days	50 MB	1 Month Internet	US\$ 1,80	7 days	75 MB	US\$ 11	30 days	500 MB	US\$ 21	30 days	1GB		US\$ 31	30 days	2GB	<p>To make use of this promotion is required to have a cell phone with capacity to support data traffic via 3G.</p> <p>The area must have 3G coverage to make appropriate use of this service.</p>	<p>According to D31 “Market Research”, 24% of the population has an income over US\$ 356 in rural areas related to the TUCAN 3G project and most of users are willing to pay more than US\$ 7 per month for continuous internet access. The prices of this service are lower than usual internet access, so they offer an opportunity to attract a different sector of clients with a lower income.</p>
Special Internet fees	Price	Effective	Data Usage																															
1 Day Internet	US\$ 0,36	1 day	8 MB																															
1 Week Internet	US\$ 1,10	7 days	25 MB																															
	US\$ 1,45	7 days	50 MB																															
1 Month Internet	US\$ 1,80	7 days	75 MB																															
	US\$ 11	30 days	500 MB																															
	US\$ 21	30 days	1GB																															
	US\$ 31	30 days	2GB																															

2.1.6 Service 6: Special night fees

Service 6: Special night fees																								
Target Group	Location	Detailed Description	Minimum Business Requirements		Minimum Technology Requirements	Important factors to be taken into account																		
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion is ideal for low-income sectors and rural areas.</p> <p>The “Special night fees” is focused on satisfying the need for Internet access and the use of Apps that make use of traffic data with restriction of having a specific time to use these packages (00:00 a.m. to 7:59 a.m.).</p>	Nationwide	<p>This promotion is not permanent, has a limited effect and is intended to capture traffic consumption with low cost in relation to the usual prepayment rates (US\$ 0,18 per MB). Unstructured Supplementary Service Data (USSD) is used in this service, the promotion can be activated with the following steps:</p> <ul style="list-style-type: none"> • Step 1: Dial *515# press CALL button. • Step 2: Mark option 3. • Step 3: Choose an option belonging to promotion “Special night fees”. <p>The MB may be used from 00:00 a.m. to 7:59 a.m. during the term of the promotion. Once consumed the MB or finished the validity of the promotion, a SMS will be sent indicating the end of the service. The maximum speed depends on the wireless coverage, therefore, is required a proper 3G signal coverage in the area.</p>	<p>The prerequisite to access this promotion is to have enough credit in the mobile phone. The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th>Special Night Fees</th> <th>Price</th> <th>Effective</th> <th>Data Usage</th> </tr> </thead> <tbody> <tr> <td>1 Day Internet</td> <td>US\$ 0,36</td> <td>1 day</td> <td>16 MB</td> </tr> <tr> <td rowspan="3">1 Week Internet</td> <td>US\$ 1,10</td> <td>7 days</td> <td>50 MB</td> </tr> <tr> <td>US\$ 1,45</td> <td>7 days</td> <td>100 MB</td> </tr> <tr> <td>US\$ 1,80</td> <td>7 days</td> <td>150 MB</td> </tr> </tbody> </table>		Special Night Fees	Price	Effective	Data Usage	1 Day Internet	US\$ 0,36	1 day	16 MB	1 Week Internet	US\$ 1,10	7 days	50 MB	US\$ 1,45	7 days	100 MB	US\$ 1,80	7 days	150 MB	<p>To make use of this promotion is required to have a cell phone with capacity to support data traffic via 3G. The area must have 3G coverage to make appropriate use of this service.</p>	<p>The load of the network along the night is expected to be lower than along the day. That’s way this service can offer more competitive prices for those users who prefer to use the service in the proposed timetable.</p>
Special Night Fees	Price	Effective	Data Usage																					
1 Day Internet	US\$ 0,36	1 day	16 MB																					
1 Week Internet	US\$ 1,10	7 days	50 MB																					
	US\$ 1,45	7 days	100 MB																					
	US\$ 1,80	7 days	150 MB																					



2.1.7 Service 7: Mixed fees

Service 7: Mixed fees

Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account																				
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion is ideal for low-income sectors and rural areas.</p> <p>The “Mixed fees” is focused on satisfying the use of Apps that make use of traffic data, e-mail access and use of SMS.</p>	Nationwide	<p>This promotion is not permanent, has a limited effect and is intended to capture traffic data and SMS consumption with low cost in relation to the usual prepayment rates (US\$ 0,18 per MB and US\$ 0.10 per SMS).</p> <p>Unstructured Supplementary Service Data (USSD) is used in this service, the promotion can be activated with the following steps:</p> <ul style="list-style-type: none"> • Step 1: Dial *515# press CALL button. • Step 2: Mark option 2. • Step 3: Choose option 4: Mensajes & Internet • Step 4: Choose the option you prefer. If you want more options, choose option 3. 	<p>The prerequisite to access this promotion is to have enough credit in the mobile phone, the subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th>Mixed Fees</th> <th>Effective</th> <th>SMS</th> <th>Data Usage</th> </tr> </thead> <tbody> <tr> <td>For Only US\$ 1,80</td> <td>5 days</td> <td>90</td> <td>5 MB</td> </tr> <tr> <td>For Only US\$ 2,50</td> <td>5 days</td> <td>126</td> <td>7 MB</td> </tr> <tr> <td>For Only US\$ 1,10</td> <td>5 days</td> <td>54</td> <td>8 MB</td> </tr> <tr> <td>For Only US\$ 1,80</td> <td>5 days</td> <td>100</td> <td>10 MB</td> </tr> </tbody> </table>	Mixed Fees	Effective	SMS	Data Usage	For Only US\$ 1,80	5 days	90	5 MB	For Only US\$ 2,50	5 days	126	7 MB	For Only US\$ 1,10	5 days	54	8 MB	For Only US\$ 1,80	5 days	100	10 MB	<p>To make use of this promotion is recommended to have a cell phone with capacity to support data traffic via 3G.</p> <p>The area must have 2G or 3G coverage to make appropriate use of this service.</p>	<p>According to the D31 “Market Research”, 68.9% of households have at least one household member with a simple mobile phone and 10.7% have a smartphone in the target locations, this indicates that this promotion can have good reception since the beginning of the deployment of mobile coverage.</p>
Mixed Fees	Effective	SMS	Data Usage																						
For Only US\$ 1,80	5 days	90	5 MB																						
For Only US\$ 2,50	5 days	126	7 MB																						
For Only US\$ 1,10	5 days	54	8 MB																						
For Only US\$ 1,80	5 days	100	10 MB																						

2.1.8 Service 8: Combined Pre-paid Access

Service 8: Combined Pre-paid Access									
Target Group	Location	Detailed Description	Minimum Business Requirements			Minimum Technology Requirements	Important factors to be taken into account		
<p>This service is aimed only for people who have a prepaid mobile plan. Due to the price and options of this promotion is ideal for low-income sectors and rural areas.</p> <p>“Combined Prepaid Access” is suitable for families and business users from rural areas that do not count with access to broadband and landline service.</p>	Nationwide	<p>“Dúo Inalámbrico” is a prepaid voice and data service without generating monthly bills aimed at home. Provides access to Internet from laptops, PC, consoles smartphones, etc. The equipment required for this service obtains traffic data through a 3G SIM card and transmits the Internet service via Wi-Fi.</p>	<p>The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc. The plan detail is as follows:</p>			<p>To make proper use of the service, it is required to have a laptop or PC with wireless card, because the equipment transmits Wi-Fi signals. The power of the equipment requires AC. Therefore, electrical power is required on the deployment locations.</p>	<p>According to the D31 “Market Research”, 12.95% of the population use portable computers (laptop, notebook) and 10.53% use smartphones, while 1.66% use tablets. These statistics indicate that there is a market to be exploit. The Market research shows us that the 72% of the population has restricted access to electricity in their home (between 6:00 p.m. to 11:00 p.m.). According to the “Dúo Inalámbrico” roadmap, the operator could deploy equipment that have an operation time of 3 hours in use and 96 hours in standby.</p>		
			COMBINED PREPAID ACCESS	US\$ 13,95	US\$ 17,50				
			EQUIPMENT PRICE	US\$ 50	US\$ 50				
			RENT	US\$ 13,95	US\$ 17,50				
			PLAN	50 minutes to local and national land lines as well as the land lines and mobile phones from the following destinations: USA, Canada, China and Puerto Rico. &500 MB at the speed of 1Mbps. Effective in the next 30 days.	75 minutes to local and national land lines as well as the land lines and mobile phones from the following destinations: USA, Canada, China and Puerto Rico. &1 GB at the speed of 1Mbps. Effective in the next 30 days.				
BONUS FOR NEW USERS	50 minutes to local and national land lines as well as the land lines and mobile phones from the following destinations: USA, Canada, China and Puerto Rico. &600 MB at the speed of 1Mbps. Effective in the next 30 days.	50 minutes to local and national land lines as well as the land lines and mobile phones from the following destinations: USA, Canada, China and Puerto Rico. &600 MB at the speed of 1Mbps. Effective in the next 30 days.							



2.1.9 Service 9: Post-paid plan

Service 9: Post-paid plan							
Target Group	Location	Detailed Description	Minimum Business Requirements			Minimum Technology Requirements	Important factors to be taken into account
<p>This service is aimed only for people who want to have a postpaid mobile plan.</p> <p>The “Postpaid plan” is focused on satisfying the need for voice communication and Internet access. The service includes a wide range of fees from particular to professional use.</p>	Nationwide	<p>The service can be activated in establishments guaranteed by the operator. This service provides voice communications and Internet access. There is a wide range of rates, so clients can choose the one that meets their needs. When the client consumes the voice minutes, SMS or MB included in the plan, additional costs will be charged.</p>	The available post-paid rates are described below:				
			Postpaid	Monthly rate	Voice minutes	SMS	Internet limit
			Plan US\$ 14,30	US\$ 14,30	100	200	-
			Plan US\$ 21,50	US\$ 21,50	200	400	-
			Plan US\$ 21,50 Int	US\$ 21,50	100	200	200 MB
			Plan US\$ 28,60 Int	US\$ 28,60	200	400	500 MB
			Plan US\$ 53,60 Int	US\$ 53,60	500	Unlimited	2 GB
						<p>To make use of this promotion is required to have a cell phone with capacity to 3G support. The area must have 3G coverage to make appropriate use of this service.</p>	<p>This service targets an 18.75% of the population that would prefer a post-paid service, as it is shown in the market survey results of D31. It is also more convenient for small companies and institutional clients, which also have some presence in the target areas of Tucan3G. The post-paid clients are very important for this business model because they provide a regular income to the operator, what facilitates the business planning process.</p>

2.1.10 Service 10: News service

Service 10: News service																	
Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account												
<p>This service is aimed only for people who want to have a prepaid mobile plan.</p> <p>The “News service” is focused on satisfying the need for access national and international digital newspapers and other sites that provide current news.</p>	Nationwide	<p>This promotion is not permanent and is intended to capture traffic consumption with low cost in relation to the usual prepayment rates (US\$ 0,18 per MB).</p> <p>Unstructured Supplementary Service Data (USSD) is used in this service, the promotion can be activated with the following steps:</p> <ul style="list-style-type: none"> • Step 1: Dial *515# press CALL button. • Step 2: Mark option 3. • Step 3: Choose an option belonging to promotion “News service”. <p>This service allows unlimited access to information providers during the validity of the promotion. The maximum speed depends on the wireless coverage.</p>	<p>The prerequisite to access this promotion is to have enough credit in the mobile phone. The subscribers can obtain credit in establishments guaranteed by the operator (banks, drugstore, gas stations, stores), online, using prepaid cards, from public phones, etc.</p> <p>The plan detail is as follows:</p> <table border="1"> <thead> <tr> <th>News</th> <th>Price</th> <th>Effective</th> </tr> </thead> <tbody> <tr> <td>1 Day news access</td> <td>US\$ 0,18</td> <td>1 day</td> </tr> <tr> <td>1 Week news access</td> <td>US\$ 0,54</td> <td>7 days</td> </tr> <tr> <td>1 Month news access</td> <td>US\$ 1,80</td> <td>30 days</td> </tr> </tbody> </table>	News	Price	Effective	1 Day news access	US\$ 0,18	1 day	1 Week news access	US\$ 0,54	7 days	1 Month news access	US\$ 1,80	30 days	<p>To make use of this promotion is required to have a cell phone with capacity to support data traffic via 3G. The area must have 3G coverage to make appropriate use of this service.</p>	<p>According to the D31 “Market Research”, the type of content that users expect to have on their mobile devices, is mainly educational contents (39%) and news (35%). Using offloading techniques it will be possible for the operator to offer access to news at a lower price, because each access to a newspaper will be stored locally and in this way it could be accessed later without consuming core network resources (it will only consume local network resources).</p>
News	Price	Effective															
1 Day news access	US\$ 0,18	1 day															
1 Week news access	US\$ 0,54	7 days															
1 Month news access	US\$ 1,80	30 days															



2.1.11 Service 11: Control account

Service 11: Control account											
Target Group	Location	Detailed Description	Minimum Business Requirements	Minimum Technology Requirements	Important factors to be taken into account						
<p>This service is available to people who would like to have a prepaid phone plan with a monthly fixed cost.</p> <p>It is convenient for people with low income who require Voice and SMS services and do not want to refill their accounts several times a month but to make just one payment without signing a contract.</p>	Nationwide	<p>The “Control account” service includes voice and SMS service. The user must make a monthly payment which ranges between 7.5 and 12.5 dollars, depending on the selected control plan. This payment represents the credit available to make calls and send SMS. The control account plans allow to refill the account once the plan balance is used.</p> <p>There are two available control plans:</p> <ul style="list-style-type: none"> • Option 1: it includes unlimited minutes to a phone number chosen by the user, 100 minutes to 9 preferred numbers, 500 minutes to any destination and 50 SMS. • Option 2: it includes unlimited minutes to a phone number chosen by the user, 170 minutes to 9 preferred numbers, 500 minutes to any destination and 500 SMS. <table border="1"> <thead> <tr> <th>Control Account</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>Option 1</td> <td>7.5 dollars</td> </tr> <tr> <td>Option 2</td> <td>12.5 dollars</td> </tr> </tbody> </table>	Control Account	Price	Option 1	7.5 dollars	Option 2	12.5 dollars	<p>Refills can be paid in Banks, shipping offices, or supermarkets with an electronic bill sent to the user’s email or a code sent to him via SMS.</p>	<p>To be able to use this service, it is necessary to have a cell phone with support for 3G communications.</p> <p>The area must have 3G coverage in order to make good use of this service.</p>	<p>Research carried out in D31 shows that prepaid phone plans are preferred by people from the rural zones (49,7% of the population prefer prepaid phone services), because most of this population lack a regular income. An additional value of this service is that it allows the user to control the expense in mobile telephone service while he enjoys promotions of additional refills offered by the service operators to its prepaid phone service users.</p>
Control Account	Price										
Option 1	7.5 dollars										
Option 2	12.5 dollars										



3 CONCLUSIONS

Rural communities of the examined regions have expressed a variety of needs for internet services to be designed, developed and implemented through the TUCAN3G infrastructure. Most services have as common base the limited financial capacity of the community and their desire for data access instead of voice access.

Following to the above, some major conclusions can be drawn in order to assist the future activities of the project:

- Mobile operators are interested to turn to rural communities unconnected areas to continue increasing their subscriber base.
- Data services are particularly interesting for rural areas, since many vertical markets are very suitable for mobile services, including agriculture, healthcare and transport.
- Such areas are very expensive to connect and the business case is driven either by regulation or social issues and profitability cannot be the top priority.
- Viable business models need to be designed for these services.

This portfolio of products and services has been designed considering the demands of isolated rural communities in developing countries and taking into account the possibilities (and the constrains) provided by the communication solutions proposed in this project. This portfolio will serve to develop a complete business model for an ordinary cellular operator using such technologies. However, the resulting business model will have to be adapted to each concrete operator, and specially, to its concrete portfolio of products. An operator adopting TUCAN3G solutions could of course adopt these proposed services, but the most common scenario is for him to continue with the already deployed services. This can be explains because services are supposed to be accessible nationwide.

Last but not least, all services described need to be take into account by the technology providers and the system integrators as an appropriate and reliable infrastructure needs to be developed capable for delivering these services.