

Networked Climate Empowerment:
General development for communities through internet provision



Networked Climate Empowerment: General development for communities through internet provision

Summary

This project seeks the integration of the countryside with a digital and globalized world that opens new doors in educational, cultural and economic issues; the above, supported within the objectives of Sustainable Development in its numeral 9, the objective of the program is to create a stable infrastructure, foster lasting industrialization and promote creation. The objective of the project was to formulate the technical study that guarantees the internet connectivity of the population in the Zenú Indigenous Community of the Colosó village in the municipality of Tolu Viejo, Zenú Indigenous Cabildo to reduce the connectivity gap. It has a population of 640 inhabitants and 165 families, with a sample of 50 families. It is located to the south of the municipality of Palmira, it is an agricultural village with a wide profile to be a tourist area thanks to its proximity to the Gulf of Morrosquillo. The project provides enough information to leave a technical study as feasibility and regulations for the implementation of the proposal.

Key words: Digital, Globalized, Rural, Connectivity, Viability.

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Introduction

Currently the companies Claro, Movistar and Enlazar, provides internet services in the rural area of Colosó, the service is provided through radio link technology and the connection speed is fixed and the weather also affects the quality, negatively impacting communication, we want the solution to these problems to be real and effective, we propose a new technology that allows to eradicate these connectivity difficulties, a field work was conducted by applying a form which shows us the needs of the community on issues of internet connectivity and its great benefits. It also examines government policies to implement models that ensure rural connectivity and long-term sustainability, involving the private sector, universities and other public sector entities.

According to the sustainable development indexes, the objective is to enable the most remote communities to access information and internet services as an essential public service, due to their geographic location and vulnerable populations, thus making it possible to close the domestic connectivity gap. The implementation of the improved and expanded Internet services included in this project will make a significant contribution to the central government's efforts to enable rural communities to improve the quality of life of Colombians. Cultural development that enables access to and use of information technologies as an opportunity for interaction not only ensures the use of information technologies as a source of virtual activity and research, but also contributes to the economic, cultural, social and educational development of local populations. promotes sustainable growth.

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Problem Formulation

The problem of the lack of high-quality Internet access in the rural area of the municipality of Tolu Viejo can have several negative impacts:

Digital divide: The lack of high-quality Internet access in rural areas creates a digital divide between urban and rural areas. This limits rural residents' access to information, education, job opportunities and online services, which can perpetuate inequality and limit economic and social development in rural areas.

Educational limitations: Limited access to high-quality Internet makes it difficult to access online educational resources, learning platforms, and online training programs.

This can affect the quality of education in rural schools and limit educational opportunities for students.

Economic development: Lack of high-quality Internet access in rural areas can limit opportunities for entrepreneurship and economic development. Rural businesses may have difficulty accessing online marketplaces, conducting electronic transactions, and taking advantage of the digital economy.

Health and wellness services: Limited Internet access can affect the availability of online health services, such as telemedicine and remote consultations. This may hinder access to adequate and timely medical care for rural

residents.

Civic participation: Lack of high-quality Internet access can limit rural residents' civic participation in decision-making and involvement in community activities. This can affect the voice and representation of the rural area in local and regional affairs.

To address this problem, it is necessary to invest in telecommunications infrastructure in rural areas, such as the installation of mobile telephone towers and the improvement of fiber optic networks. It is also important to foster collaboration between local governments, telecommunications companies and community organizations to find viable and sustainable solutions. In addition, options such as the use of satellite technologies or wireless broadband networks can be explored to improve Internet access in remote rural areas.

The Zenú Indigenous Community of the Colosó village in the municipality of Tolu Viejo is no stranger to the above, therefore, this proposal is intended to reach an average population of 625 inhabitants, that is, 145 families in order to improve their connection to high quality internet. This would considerably favor the growth and social, educational and economic development of the sector, which would result in the emergence of students with greater capacity for university studies.

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Objectives

General

Formulate the technical study that guarantees the internet connectivity of the population in the Zenú Indigenous Community of the Colosó village of the municipality of Tolu Viejo to reduce the connectivity gap by complying with the terms of reference established by Min-Tic.

Specific

- To identify the internet connectivity needs of the population of Vereda El Colosó in the municipality of Tolu Viejo - Sucre for the progress of the community.
- Structuring a proposal that allows the implementation of Internet connectivity for validation and viability by the Ministry of Information Technology and Communications.
- Evaluate the impact of the project to improve connectivity in the Zenú Indigenous Community of Colosó, in order to provide the community with tools for study, work, business and recreation through internet connectivity in this village.

Taking into account the advance of technology in the world, the emergence

of new applications and tools can improve the quality of communication and content in various economic, cultural and educational activities on the internet, generating more demand for internet connectivity service, the rural area is no exception and there is a big problem with this service for these communities. In rural geographic areas, the problem is that the service is little or difficult to access, it is too expensive and affects the economic capacity of families, in remote rural areas there is difficulty in acquiring these connectivity services, increasing the inequality gap.

The inhabitants in the rural area of the Municipality of Tolu Viejo (National Administrative Department of Statistics (DANE 2018) state that the census conducted in 2018 found the following information, 7438 inhabitants with 2045 families in the entire rural area of Tolu Viejo.

The Zenú Indigenous Community of Colosó has an average population of 640 inhabitants with 165 families that currently have difficulty in obtaining internet connectivity. The Ecoceanos Corporation in its project bank has a work for connectivity to rural areas of isolated areas of the country. By presenting this project, it seeks the unification of the private entity and the public company to provide a solution to the issue, and to be able to promote this community in the educational, social and commercial areas.

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On June 30, 2023, the President of the Republic of Colombia signed Decree 1079 (MinTic, 2023) which declares the issue of internet connectivity in rural areas as public policy. The main objective of this decree is to reduce the inequality gap that exists in the issue of internet connectivity in rural areas, giving some guidelines for operators that provide the service to penetrate these communities, the decree has some shortcomings, as it asks for some parameters for the community to be benefited and be viable.



Frame of Reference

Theoretical Framework

Connectivity theory

The Theory of Connectivity by George Siemens (Lorena Hernández) is the creator and CEO of Complexive Systems Inc, a research laboratory that helps entities to structure integrated learning for the development of a global strategy. Connectivism focuses its gaze on learning skills, tasks and tools needed "Internet"

for people to achieve their goals or objectives in a totally digital era.(Zapata-Ros, 2015).

This theory of learning in the digital era is based on the creation of stable connections in all populations of the universe so that people can connect with the rest of the world and enter the digital era so as not to be excluded from global progress. The pillar of this theory is the person who receives all the information through Internet connectivity. Expanding and maintaining stable internet connections are necessary to facilitate continuous improvement. (George Siemens, 2017).



Rural development

The theory gives us the feeling of our rural areas, which have a gap of inequality and seeking with this project to get closer to our farmers, Salazar Arias, Carlos Hernando. Colombian rural development and the challenges of institutionalism. In the course of time, investment in the rural sector has been very little, government investments are focused on urban areas, which causes the rural area to lag behind, leading to the fact that these areas do not reach a full social,

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political and economic development. Today's society should focus its economic efforts on recovering this area of the country, integrating it back into society and the globalization of the world. The state has lacked investment in technology and technification of our countryside or rural areas, investment in social fabric supporting the farmer to take out their families, advance and improve their quality of life (Network of Virtual Libraries of Social Sciences in, 2020).

Conceptual framework

The project is focused on Decree Law 893 of 2017 (Decree 893 of 2017), which prioritizes internet connectivity in rural areas or in conflict zones. To have a reference amount and numbers of homes and inhabitants is based on the 2018 DANE census (DANE, 2018), in order to focus public policies, to enter the MINTIC project bank (MINTIC, 2019), have the technical and operational feasibility, submit to the OCAD (Organ of General System of Regaláis), so that the project is feasible and prioritized financially and have the necessary resources to implement the project (OCAD, 2021). The current president of the republic signs decree 1079 of June 30 (MINTIC, DECRETO 1079 DEL 30 DE JUNIO DE 2023, 2023). This decree declares as public policy internet connectivity for

vulnerable and rural populations organized with their community action boards.

The Internet is a popular network and was created in three stages from 1961 to the present day. These are: the innovation stage, where concepts and technologies were created; the institutionalization stage, where these concepts became reality; and the commercialization stage, where the innovation and institutionalization stages were implemented, thus enabling companies to provide this service to thousands of people around the world (Robayo-Botiva, 2020).

This network is a tool that facilitates the sharing of information and data in the form of text, images, videos, files and more, through the channels that the Internet uses to access online services and applications. It provides access to a wide range of tools, such as websites, emails, social networks, messaging services, live streaming, cloud services and much more. On the other hand, it is a global communication network that allows the transfer of information and data through different online services and applications, connecting millions of devices and users around the world. It is a fundamental tool in today's society, facilitating access to information, communication and the exchange of online resources.

Connectivity

An internet connection is a property that allows communication or contact with many computers connected in a traditional way by cable or WIFI which is the most widely used means of connection nowadays. There are many ways to establish a good internet connection and network: analog connection,

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ADSL, cable, wireless internet, satellite, cellular or PC (Plieshakov, 2023).

Background

Internet usage strategies

A study conducted in 2022 at the Universidad Piloto de Colombia tried to overcome the connectivity and reach of internet waves for five villages through the implementation of two micro telecommunications nodes with a process time of 1 semester and 3 more months, through the investment of the company Blue Telecomunicaciones SAS. This was achieved through a quantitative study through which they carried out the collection of information whose results showed that it is a costly process over time so that, for its implementation, it is necessary an arduous work of monitoring and supervision, which means going through a process of transformation and adaptation to the costs. Therefore, they conclude at the end that, according to the surveys, it is feasible to continue with the study of the project (Montoya Londoño & Prieto Cortes, 2022).

Design of a self-managed backhaul network for rural connectivity in Sucre -Colombia.

In 2020, in the villages of Chalán and Ovejas in the region of Sucre, the prototype and implementation of a backhaul network was carried out, supplying a self-managed technology known as WiBACK, whose results provided a guide and evaluation of the different problems that will be faced in the expansion of the national broadband access infrastructure in post-conflict areas (L. Cortés & Montaña-Argote, 2021).

At the international level, studies have also been carried out on broadband multiband network models for communications, as was the case in Peru, where in 2018 they are investigating the most appropriate way to develop a satellite platform to cover isolated cities that do not operate with fiber optics.

Digital inclusion of rural communities in Colombia.

Based on the above, it is easy to conclude that telecommunications is a process that is currently necessary in all households, but it is especially important in rural areas, which tend to be somewhat isolated from technological developments.

In a study that took place in 2014 at the Pontifical University of Salamanca, it is conceptualized and determined through a process of documentary review where one of its main conclusions is that the methods of digital enclave should not only be profiled to improve access to ICT and their use, they also have the obligation to seek

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the social ownership of these, respect for diversity and flexibility reflected in everyday life as an added value, conscious and systematic, leading to social and economic change of the people and communities involved (Vega, 2014).



Boschoque free engineering community network to bridge the rural digital divide

Despite the policies and programs generated by current governments, the digital divide remains wide in Latin America and Colombia. In rural areas, population centers and headwaters of Colombian cities, it has been evidenced in the last decade that access to information and communication technologies (ICT), Internet use and infrastructure, have had little growth, only 56.5% of the Colombian population had access to Internet by the end of 2020, with a coverage of 23.8% in rural areas (Peña Gil, 2020). The above implies the need for more detailed studies on how to establish access

routes or better access to telecommunications in the rural area of the municipality.

Rural education is contextualized by geographic location.

Indeed, rural education is contextualized by the geographic location of rural areas. The geographic location of rural communities can have a significant impact on access to education and the conditions under which it is provided. First, geographic location can influence the availability of educational institutions in rural areas. In some remote areas, there may be a shortage of schools or educational centers, making access to education difficult for local students. In addition, distances and lack of transportation infrastructure can make it difficult for students to reach existing schools.

On the other hand, they can affect the quality of education in rural areas. For example, rural areas may face challenges in terms of availability of educational resources, such as textbooks, learning materials and technology. Lack of access to libraries, laboratories and other educational facilities can also limit learning opportunities. In addition, the geographic setting can influence the curriculum and pedagogical approaches used in rural education. Rural communities often have a close relationship with agriculture, animal husbandry or other economic activities specific to the area. Therefore, rural education may be more focused on developing skills and knowledge relevant to these activities, adapting to local needs and characteristics. Geographic location can also influence the availability and quality of information and

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communication technologies (ICTs) in rural education. Rural areas may have limited access to high-speed Internet and technological devices, which hinders the integration of ICTs in education and limits online learning opportunities. In summary, the geographic location of rural areas has a significant impact on rural education. Geographic barriers can hinder access to education, affect the quality of teaching and learning, influence the curriculum and pedagogical approaches used, and limit access to ICTs. Therefore, it is important to take into account the geographical context when developing educational policies and programs for rural areas, and to seek solutions that are adapted to the specific needs and characteristics of each rural community.



Hypothesis System

The implementation of an internet connectivity system in the Zenú Indigenous Community of the Colosó village in the municipality of Tolu Viejo-Sucre will contribute to reduce the connectivity gap and promote rural progress.

The implementation of an internet connectivity system in the Zenú Indigenous Community of Colosó guarantees to be viable and in compliance with the terms established by the Ministry of Information Technology and Communications.

Internet connectivity in the Zenú Indigenous Community of Colosó can improve the quality of life of the inhabitants, providing them with the necessary tools for their personal and professional development.

Methodological Framework

Type, design, research approach.

The approach is mixed as it is both qualitative and quantitative. Qualitative exploratory phase: in-depth interviews with community leaders, residents to understand the specific needs and challenges of the community in terms of connectivity, focus groups with various segments of the population to identify perspectives and opinions on the proposed implementation of the connectivity project for the community. The data collection was done through a structured survey to obtain

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demographic data and measure the current availability of internet and access in the homes of the Zenú Indigenous Community of the Colosó village. Specific indicators are established to measure the need to use the internet service, study, entrepreneurship, communication or digital markets that are affected by the lack of connectivity.

It is sought that the Ministry of Information Technology and Communications apply the model that is embodied in the research by some instruments and equipment that will give the community an excellent quality and will be sustainable over time. With the analysis of the quantitative information collected through the questionnaire, it can be said that the project is viable to present and have an acceptance of the project that will be self-sustainable in time and

will contribute to the government in its public policies to reduce the connectivity gap in rural and difficult to access areas. The mixed approach helps us to have a deep understanding of the needs of the community and to be able to have a clear and precise understanding, to be able to

objectively measure the impact of the proposal.



Type of research

It is a descriptive type of research since it will be directed to a reality, research design is one of mixed characteristics since it will be based on quantitative and qualitative data, population- sample will be carried out in the Zenú Indigenous Community of the Colosó village of the municipality of Tolú Viejo with a density of 500 inhabitants and the sample is 100 houses that belong to this village.

Population, sample and sampling

The Coloso village, located in the partment of Sucre, Colombia, is home to an indigenous community with a population of approximately 600 people. Of these, approximately 300 are women and 250 are men, with the rest being children. The community is primarily engaged in traditional

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economic activities such as subsistence agriculture, artisanal fishing, and handcraft production, which represent a significant source of income. These activities are not only crucial for subsistence, but also form an integral part of the cultural and social identity of the community. From this population we took as a sample 50 families that correspond to 200 people who make up the household and with whom we were able to determine the needs from different points of view by evaluating each of the members of the population.

Data collection techniques and instruments

Technique

Data collection techniques, surveys and document review are used to affect the village. A field study was carried out to collect real and truthful data to identify sources of information on the most important factors affecting connectivity through the Internet with the population of the Zenú Indigenous Community of the Colosó village, designed for research purposes. It corresponds to a documentary study, clearly related to the statistical data provided by the departments directly involved in the development of solutions to the problem, and with the characterization and differentiated approach of the

population, especially of the municipalities and villages of Tolú Viejo- Sucre.

Data collection instrument

Questionnaire

A structured questionnaire is a data collection instrument that consists of a set of previously designed and standardized questions. It is intended to collect information in a systematic and quantifiable way. This instrument is suitable for quantitative studies and allows the collection of data from a large number of participants in a consistent format.

Survey characteristics

The instrument is structured with the new decree 1079 of June 2023 which establishes regulations for internet connectivity projects for rural areas or areas of difficult access, by the systems engineer Mauricio Montes in charge of the systems area of the municipal mayor of Tolu Viejo, the teacher who gives us accessory to the project Marta Hernandez the questions that are established are 7 which will help us to classify the information of the community of the Zenú Indigenous Community of the village Colosó. This survey is structured from the one generated by the Ministry of Information Technology and Communications which is established in the following link.

Collection of information

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Primary source

General population of the Zenú Indigenous Community of Colosó with field work, Junta de acción comunal de la Comunidad Indígena Zenú de la vereda Colosó, Alcaldía municipal de Tolu Viejo.

Secondary source

Secondary sources should be collected considering the impact of the project and the population affected by the project. One of the secondary sources used is that of the departments, for example, the departments that control and determine the characteristics and classifications of the population. The National Planning Department of DANE, the Municipality of Tolu Viejo and other local governments that have information on the rural areas of Colosó can make our project a success. You can then link it with your territorial development plan POT to make it viable and prioritize it.

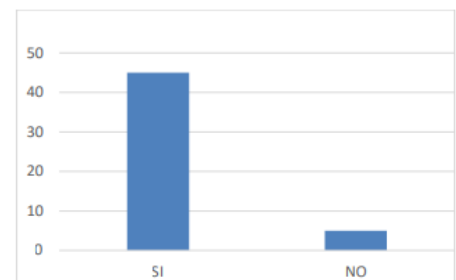
Information analysis.

Next, the data obtained from the surveys on some conditions and priorities of the project to be developed in the Colosó

truth are presented in a general way. The aim is to have clear and precise information in order to make the project feasible and present it to the different regulatory entities for its execution.

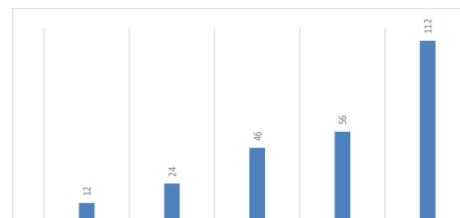
It is necessary to identify whether the Zenú Indigenous Community of the Colosó village has an active community action board and whether it is well received by the community, since it is one of the requirements of the Ministry of ICTs. The Zenú Indigenous Community of Colosó has a community action board, 95% of the population of the village is part of it, which guarantees the involvement of the community in the execution of the project.

Figura 1
Respuesta a la pregunta ¿Pertenecen alguna junta de acción comunal de la vereda?



Note: This figure corresponds to the result obtained for membership in community action boards.

Figura 2
Rango de edades de quienes habitan la vivienda (indique número de personas por rango de edad)



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Nota: Esta figura corresponde al resultado de las edades que recurren mayormente en las viviendas encuestadas. (a. 0 a 4 años, b. 4 a 10, c. 11 a 18, d. 19 a 30 y e. 30 años en Adelante

It is important to identify the age ranges of the population in order to know the focus or direction given to the Project in the educational, social and economic areas.

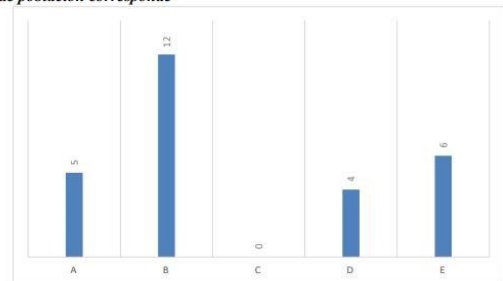
Response to the question: Age range of those living in the dwelling (indicate number of people by age range), it can be identified in the graph that there is a high average among teenagers and young people who can focus on higher education and entrepreneurship and help the economy.

One of the requirements of the Ministry of Information and Communication Technologies is to have a classification of the population. It is necessary to identify if within the community of Colosó there are members of special populations.

It can be identified in the graphs that the Zenú Indigenous Community of

the Colosó village has a multi-Edenic population, which makes the project more attractive to the Ministry of Information Technology and Communications. Why the government wants to reduce inequality gaps in all environments, and this applies to public policies established by the national government.

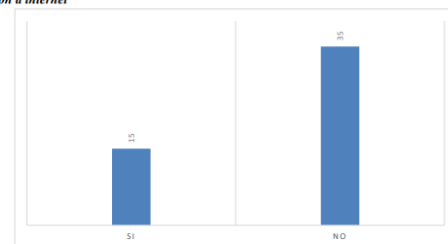
Figura 3
Tipo de población corresponde



Nota: Esta figura corresponde al resultado de los tipos de población existentes en las viviendas encuestadas (a. Indígena, b. Afro, c. Raizal, d. ELGTBI, e. Otro (¿cuál?): desplazados por la violencia).

is required to show which and how many of the selected sample of households already have internet service, in order to know which are the active and potential customers, identifying in the table that 22% have internet connectivity service and 78% do not have this service, which identifies that the project is viable.

Figura 4
Conexión a internet



Nota: Esta figura corresponde a los resultados de la pregunta asociadas a la existencia de internet en el hogar.

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With this question we can determine the needs of the community of the rural area of the Zenú Indigenous Community of the Colosó village for the progress of their needs in terms of internet connectivity, which shows that the project has an excellent reception by the community, which ratifies the need of the community for the internet connectivity service.

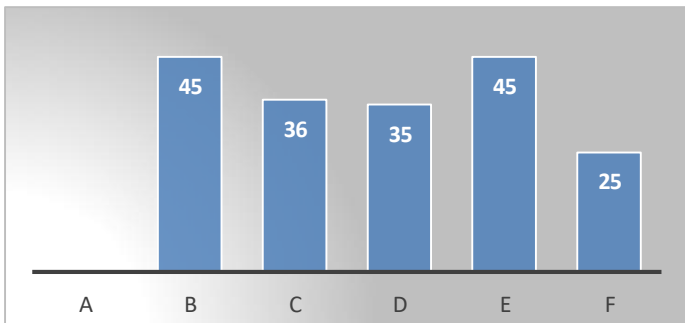


Figure 6 Internet usage

3Note: This figure is the result of the type of use most frequently used in the surveyed households (a. Information, b. Training and education, c. Entertainment, d. Work and business, e. Communication with family and friends).

The answer to this question indicates the needs of the rural community to use the Internet service and to provide training related to their needs.

The table analyzes the needs for which the community requires the internet service. On this basis, it can be focused that there is a wide need for work and entrepreneurship and

higher education, which would bring welfare and economic growth for the community of Colosó.

Proposed Technical Study

Conceptual design of the solution

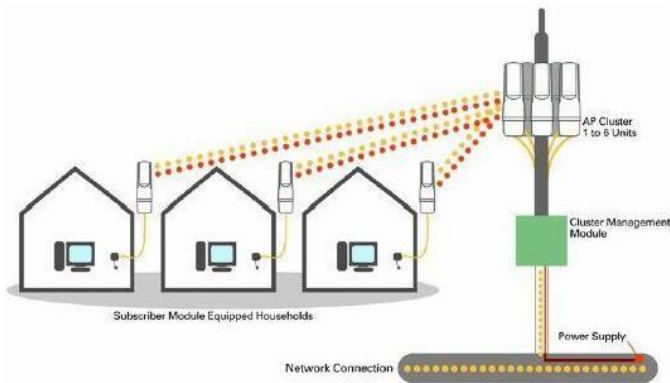
Starlink is a Wi-Fi transmission signal, which can communicate via satellite signal, with a range of more than 30 km and transmission speed of up to 124 Mbit/s. Today, the fastest Wi-Fi structures are around 54 Mbit/s, with a coverage of about 900 meters. It is a candidate technology for providing ultra-fast Internet connectivity with wide area coverage. StarLink provides connectivity very similar to traditional cable ADSL, but without wires, making integration between equipment easy. StarLink stands for Worldwide Interoperability for Satellite Signal Access. StarLink does not require cable connections between subscriber terminals and StarLink base stations, allowing a single base station to support hundreds or even thousands of subscribers. Then you know how it works. Difference between wireless LAN and StarLink

After Internet operators succeeded with Wi-Fi, manufacturers soon began to look for more advanced technologies and in 2001 StarLink certification was born. As you can see, the big difference with Wi-Fi is that it has a longer range and is much faster.

But that's not all. StarLink allows you to communicate even when moving at speeds of up to 250 km/h (155 mph). In addition, Wi-Fi was designed for indoor use, while StarLink was designed for outdoor use and can reach more than

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1,000 users simultaneously. This tower works like a network telephone tower where you stand on top of it and emit radio signals (electromagnetic waves). However, StarLink antennas do broadcast satellite signals. A StarLink tower base station can cover a radius of 30 kilometers or more with a single antenna. Because of this comparative advantage, some operators are betting on this technology to provide high quality internet in rural areas.



This is the best way to have fast, low-cost Internet connectivity in areas where traditional technology is inaccessible or unavailable. Any wirelessly connected StarLink device, such as a computer, laptop, smart phone, etc., can connect to a StarLink network as long as it is within range of the base station and has a StarLink receiver. These devices (receivers) are usually stand-alone antennas or PCMCIA plug-in cards for laptops or computers.

These are one or more devices that receive signals from StarLink base

stations and connect to the network. Connecting to a StarLink base antenna works the same as connecting to Wi-Fi. The most important difference is that StarLink has a longer range spectrum. StarLink uses a data transmission standard that uses radio spectrums with frequencies between 2.3 and 3.5 GHz.

This is one of the so-called last mile technologies, also known as local loops, where data can be received via satellites and retransmitted over the air. Are you familiar with 4G cell phones? StarLink turned out to be a "bridge" or gateway to 4G and 5G phones. In other words, 5G may be available through StarLink (among others, it is not the only technology used). Both the 802.11 standard, which uses Wi-Fi, and the 802.16 standard, which includes StarLink, define the types of peer-to-peer (P2P) and ad-hoc networks in which it operates. These standards allow users to communicate with other users or servers on different local area networks (LANs) through access points or base stations. For this to work, it is necessary to install repeater antennas (bases) that are strategically located to serve specific areas. At the heart of StarLink technology is the base station transceiver, a central antenna that communicates with subscriber antennas.

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The term point-to-multipoint connection is used to describe how StarLink communicates. Who is StarLink suitable for? StarLink is intended for building a network infrastructure in locations where the environment and distances are not suitable for wired networks (such as rural areas that are difficult to access). This is a faster and cheaper alternative to cable installation. Today, this service is also used for business-to-business or office-to-Internet connections, but many operators are starting to offer this service to end users at very attractive prices and speeds.

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Cronograma de Actividades

Tabla 2

Cronograma de actividades para formular y ejecutar el proyecto actual.

Actividad	Mes 1	Mes 2	Mes 3	Mes 4	Mes 5	Mes 6
Resumen						■
Introducción						■
Formulación del problema - pregunta de investigación	■					
Objetivos generales y específicos	■					
Justificación	■					
Marco referencial teórico - teórico - conceptual - legal y antecedentes		■				
Marco metodológico tipo		■				
Población y muestra		■				
Técnica e instrumentos		■	■			
Aplicación de instrumentos			■	■	■	
Procesamiento y análisis de datos				■	■	
Aspectos administrativos				■		
Cronograma de actividades				■		
Conclusión						■
Bibliografía						■
Sustentación						■

Nota: La presente tabla tiene como objetivo informar sobre las fechas de ejecución del presente proyecto.

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Results

The project internet connectivity for rural progress Zenú Indigenous Community of the village Colosó Tolu Viejo - Sucre, through the use of new technological tools can be promoted as a tourist area, because of its geographical location as it is framed within the area of the passage of the Gulf of Morrosquillo. After conducting an exhaustive study, various internet connectivity needs were identified in the Zenú Indigenous Community of the Colosó village, these needs range from basic access to online services such as email and social networks to more advanced requirements such as online education, teleworking and remote health services.

The lack of internet connectivity has been hindering the socioeconomic development of the Zenú Indigenous Community of Colosó. Without adequate internet access, the population faces significant disadvantages compared to other urban or rural areas with better connectivity.

Based on the analysis of the connectivity needs of the Zenú Indigenous Community of Colosó and the guidelines established by the Ministry of Information Technology and Communications (Min Tic), a solid proposal has been structured for the implementation of Internet connectivity in the area.

The proposal includes precise technical details on the necessary infrastructure, long-term sustainability strategies, equipment required for excellent quality of service. The proposal is

expected to meet the requirements and validation criteria established by the Ministry of Information Technology and Communications.

After implementing the proposed improvements and providing internet access to the population of the Zenú Indigenous Community of Colosó, a significant impact on the development and quality of life of the community is expected to be observed. Key indicators, such as connection speed, service availability and user satisfaction, are expected to show significant positive improvements since the implementation of the connectivity improvement project.

It will be evident in the future how Internet access will improve access to education, entrepreneurship, health, communication and participation in society, which contributes significantly to the progress of the community in general.



Conclusions

The needs of the communities meet the conditions and clauses for the project to be viable for this area geographically with internet connectivity needs. This motivates

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to take the step of structuring the project and present it to the municipal mayor's office to have the viability of the local administration and be included in its POT (land use plan), and to be able to scale it to international sponsors to have a viable project and have the resources for the implementation of the project articulating all public entities involved in this project and to close the gap of inequality in this territory providing new technological tools for the progress of the region in the educational, social and business area as it is an area of great tourist impact. There is a clear need to improve internet connectivity in the Zenú Indigenous Community of Colosó to promote the socioeconomic development of the community, since the lack of adequate internet access is an obstacle to progress and equal opportunities in the rural area of Tolu Viejo-Sucre. Through the exhaustive analysis of connectivity needs and the structuring of a solid proposal, there is a viable plan to implement internet connectivity in the area. The internet connectivity improvement project has the potential to close the inequality gap and promote progress in the educational, social and economic

spheres of the region.

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