



# LOCAL DEVELOPMENT AND ENVIRONMENTAL ENHANCEMENT THROUGH RURAL ACCESSIBILITY: CASE STUDY

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## Abstract

Information was gathered in Recinto Cuatro Mangas, Canton Buena Fe, Province of Los Ríos, Ecuador, with the purpose of decreeing the type of accessibility to natural resources that will sustainably allow local development over time by the community. For this purpose, development plans for territorial planning were promoted, including the current institutional framework, strategies and mechanisms that help the environment and local improvement. To achieve the research objective, a total of 100 people were surveyed, including producers and consumers. The most popular products were bananas (40%), and cocoa (30%), followed by ginger, bananas and oranges (11%, 10% and 9%, respectively). It was determined that the products available in the area of Cuatro Mangas are still relatively low in quantity, quality and variety. Therefore, it is proposed to solve this problem in the following way: on the one hand, prioritize the products according to demand, and incorporate new crops adapted with irrigation technologies.

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## Introduction

Rural accessibility as part of an infrastructure network to support territorial logistics competitiveness and the agricultural sector, in particular, is a topic that has been discussed for a long time, determining difficulty in establishing the level of impact on the total cost system. As indicated by (Galván, 2016) in his study of the grain and oilseed logistics chain, where automotive transport predominates, resulting in a high unit cost of land transport (around 300% of rail transport) and relative weight of nearly 70% of total system costs.

The study of accessibility to several basic services in rural areas is of special interest when designing policies to curb rural depopulation processes (Ruiz Pulpón & Martínez Sánchez-Mateos, 2022) presents a methodological proposal for accessibility analysis to serve as a reference for the diagnosis of depopulation processes, in general, and to contribute from a technical perspective to decision making.

According to (Urquía-Fernández, 2014), the panorama of food and nutritional security in Mexico is approached from the four pillars that compose it: availability, access and use of food, and stability of supply, as well as from the two faces of malnutrition in Mexico: obesity and malnutrition.

Ecuador's rural areas face many highly sensitive challenges. One of them is food security, through the provision of food for large metropolises with growing populations, and also serves as environmental buffer zones against pollution generated mainly in large industrial development poles located in urban centers (Sánchez-Luis, 2017).

Although Ecuador's rural communities are food producers, they face food insecurity problems that cause public health problems related to unbalanced diets. The lack of opportunities for rural youth contributes to migration and abandonment of productive land, contributing to poverty belts in urban areas, a situation that alters the demographics of the territories. The impoverishment of the inhabitants of rural areas generates inequalities that impede their progress (Quito Cortez, 2021).

According to (Pardo, 2012), Ecuador's coastal region is no exception to this phenomenon of migration and abandonment of the countryside, the effects of which hinder the sustainable development of rural communities and prevent adequate environmental protection and management.

Cuatro Mangas is located in the central zone of the Ecuadorian Humid Tropics, in the canton of Buena Fe, province of Los Ríos. The proximity of Cuatro Mangas to cities like Buena Fe or Quevedo has generated the voluntary migration of many people in search of a better quality of life, leaving aside the productive food (agricultural and livestock) and environmental potential of the community, factors that contribute to the direct or indirect depredation of natural resources.

In this research, the causes that hinder the development and improvement of the accessibility and environmental quality of the Cuatro Mangas area were identified, as well as the economically viable and ecologically sustainable alternatives that allow the harmonious and in situ development of the inhabitants of the area, identifying the geographic, environmental and social problems that affect the correct territorial development of the Cuatro Mangas area - Buena Fe Canton.

For the development of the above-mentioned, mechanisms and actions oriented to create and strengthen the territorial system of the Recinto Cuatro Mangas for the conservation of the environment through effective actions were developed and it was proposed to promote development plans for territorial planning, including the current institutional framework, strategies and mechanisms that help the environment and local improvement.

## MATERIALS AND METHODS

In order to obtain pertinent information regarding rural accessibility, all the inhabitants of the central area of the Cuatro Mangas precinct were taken as the strategic population. A total of 15 households, 12 farms and 10 premises were surveyed and interviewed to obtain a reliable source to corroborate the accessibility needs of the area.



Bibliographic research was carried out with the purpose of knowing methodologies and actions taken by several authors to determine the local development strategy that arises from the requirement to enhance the capacities of a given territory, which allows the fulfillment of national development objectives, the requirement to consolidate the sustainability of the economic, social and solidarity system, boost productivity and competitiveness for sustainable economic growth, deploy productive and environmental capacities, to achieve food sovereignty and Good Rural Living in Ecuador. In this sense, it is necessary to have tools, techniques and methodological procedures to identify the capacities of a community, to achieve development at the local level (Márquez Ortiz, 2019).

The phases, stages, tools and indicators necessary to diagnose the environment of a canton, parish or rural community are identified. In this regard, (García, 2005) presents a guide indicating the steps to elaborate the Environmental Action Plan based on the flexibility to adapt it to local realities. ICLEI identifies ten steps for the elaboration of the Local Action Plan, which form a spiral model: 1) Establish an Environmental Forum, 2) Agree on philosophy: the principle of sustainability, 3) Identify environmental problems and causes, 4) Define and approve general objectives that can be attainable and measurable, 5) Prioritize problems, since resources are always limited, 6) Establish specific objectives, based on their impact, cost-effectiveness and social transcendence, 7) Develop Action Programs to achieve the objectives, 8) Formalize an Action Plan, 9) Implement and monitor the Action Plan, and 10) Evaluate the work and results to provide feedback on the process.

Latin America does not escape the serious events that are causing damage in many countries, since the seriousness of current environmental problems increasingly demands the commitment and participation of all human beings in the plans, actions and initiatives for their solution. In this sense, initiatives for the prevention, confrontation, mitigation or monitoring of environmental risks that involve the greatest

number of people in their design and execution are necessary (Estupiñan Ricardo, 2017).

The limitations that have existed in the implementation of actions for the development of rural communities, in some cases, have their origin in the lack of local policies that integrate all the dimensions of a local development plan, based on identifying the real needs of the communities under study. To counteract this phenomenon, it is necessary to put into practice instruments that increase local capacities, considering their integrality, that strengthen what already exists, stimulate community participation and sustainably manage natural and cultural resources. All of the above contribute to guaranteeing the right to education, culture, sports, health, housing, full employment, gender equity and security, under criteria of accessibility, quality and territorial and cultural relevance, for each of the members of the rural community, under the precepts of sustainable, responsible, ethical and conscious development (Márquez Ortiz, 2019).

Environmental education is of vital importance in overcoming the current crisis suffered by humanity and has been discussed in different national and international meetings and forums, so it can play an important role in overcoming consumption patterns and achieving the desired sustainability. Research on local development has gained an important position at present. A significant element has been to incorporate the vision of local development from an environmental education perspective (Hernández Martínez, 2021).

The study of local development should not be separated from environmental education, since human beings develop their lives in a complex social reality, and it follows that an educational process is necessary to address all aspects of the specific environmental problems of the human group under investigation, which implies the design of policies and strategies at the local level (Hernández Martínez, 2021).

Excessive consumption, exaggerated exploitation of natural resources and profit as the only criteria for good economic development are unsustainable over time since the planet's resources are limited. For this reason, it is



necessary to seek a sustainable development that allows the improvement of the living conditions of the communities, is compatible with the rational exploitation of natural resources, that seeks to satisfy the needs of all and not just a few, that promotes recycling or reuse, that restores the intervened ecosystems, that promotes regional self-sufficiency, the conservation of natural resources and the participation of the communities as dynamic agents of their change and development (Ocampo-Cuervo, 2017).

Environmental problems are seen as the perception of an unsatisfactory situation or state concerning part or all of the environment. It is the qualitative worsening of the environment caused by anthropic activity such as industrialization, urbanization, irrational exploitation of resources, demographic pressure, etc. or by natural factors (Salas, 2017).

Urban development policies converge in land use and urban planning policies, housing, transportation, industries, and universities, among others, all with environmental implications, so that the design and implementation of environmental policies, both implicit and explicit, can be effective, which requires a joint effort between the local power and the institutions of the territory and the community (Salas, 2017).

This study was based on the concept of a territorial approach to rural development, which is an approach to development management from the rural territory. It begins with a dynamic and integral analysis of the different economic, social, environmental and political-institutional dimensions. The objective is to promote the welfare of rural society, enhancing its strategic contribution to the overall development of society.

This research proposes several phases to be followed:

Phase I: Preliminary analysis, participation of the local community and delegates from public and private institutions. The methodology indicated in the bibliography consulted should be determined and document analysis, among others, should be incorporated.

Then proceeded to collect as much relevant

information as possible from secondary bibliographic sources and at the institutional level, including the Development Plan and land use planning of the Buena Fe Canton.

Phase II: Planning process, the proposal of a chronogram in which deadlines are determined for each of the phases.

Phase III: Environmental action plan through sustainable rural accessibility based on the prioritization of products according to demand; and incorporating new crops adapted with irrigation technologies.

Phase VI: Evaluation and follow-up of the Local Development and Environmental Improvement Plan through sustainable rural accessibility, it is proposed that productive activities comply with the conditions established to minimize undesirable environmental impacts.

- Agricultural activities should not create environmental problems such as erosion, compaction, loss of soil fertility, modification of water quality, etc.

- That changes (richness and abundance) in flora and fauna species and the conditions of their respective sites are identified.

- Establish criteria for the implementation of contingency and mitigation plans.

Phase V: Feedback, development of the analysis and review of the behavior of each of the indicators or sustainable performance meters.

## RESULTS AND DISCUSSION

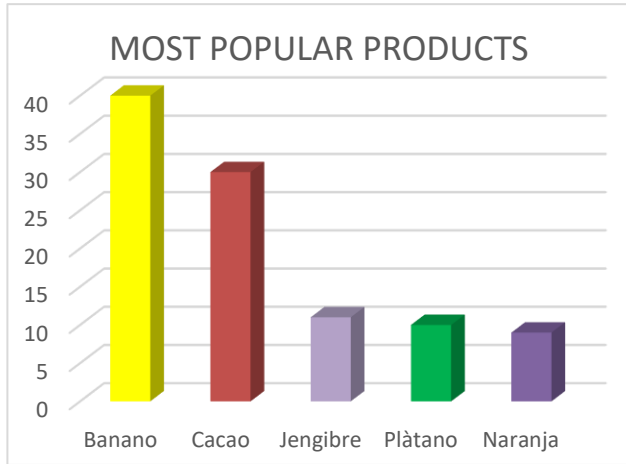
The main objective of this study is to improve the quality of life of rural farmers and the area of influence of the Cuatro Mangas precinct by promoting good agricultural practices aimed at improving the productivity and income of the family farm necessary for rural well-being based on the sustainable management of natural resources and care for the environment.

The sustainability of the project will be based on the protection of biodiversity and ecological processes, as well as on the socioeconomic benefits that will be generated by the implementation of this project.



Question 1. What are the most popular products offered in your community?

**Figure 1. Most popular products offered in your community.**

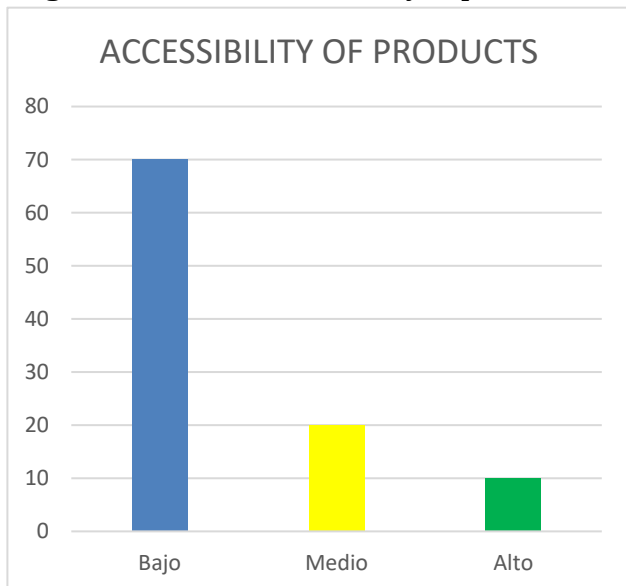


Source: Survey conducted by the author.

As can be seen in Figure 1, 100% of those interviewed, that is, 100 people mentioned that the products most offered in the community are bananas (40%), cocoa (30%), ginger (11%), bananas (10%) and oranges (9%), so it can be seen that the production is not diverse and this limits the economic development of the community

Question 2. What is the level of accessibility of production in your community?

**Figure 2. Level of accessibility of production.**

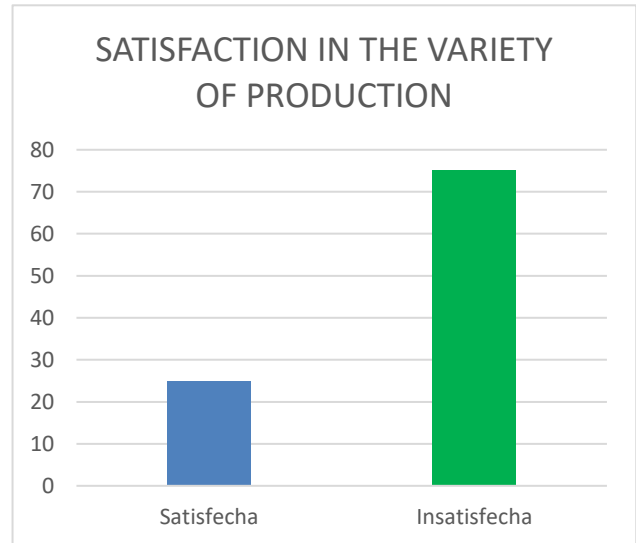


Source: Survey conducted by the author

As can be seen in Figure 2, 100% of those interviewed, that is, 100 people mentioned that the level of accessibility of the products produced in the community is low at 70%, medium at 20% and high at 10%, thus limiting the community's access to the products of the area.

Question 3. What is the level of satisfaction with the variety of production?

**Figure 3. Satisfaction with the variety of products.**



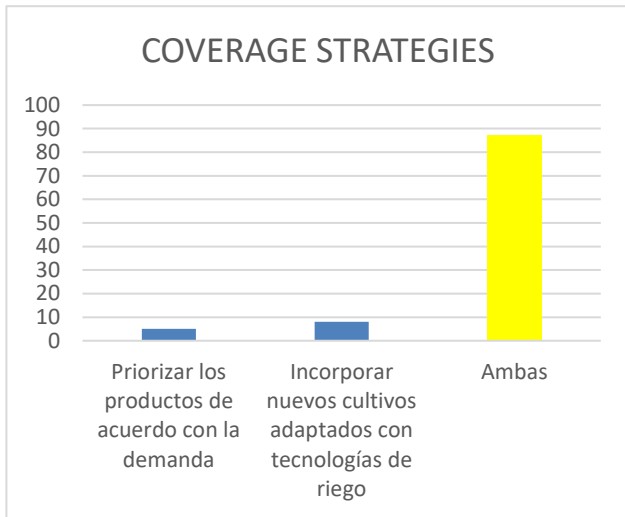
Source: Survey conducted by the author.

As can be seen in Figure 3, 75% of those interviewed, that is, 75 people mentioned that they feel dissatisfied with agricultural production and only 25% feel satisfied. This is evidence of dissatisfaction with the coverage of products in rural community households.

Question 4. What would be the most appropriate strategy to achieve coverage in a large part of the community?



**Figure 4. Coverage strategy.**

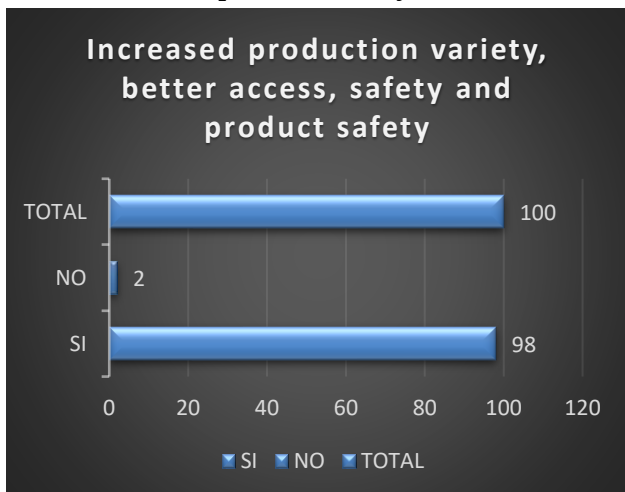


Source: Survey conducted by the author.

As can be seen in Figure 4, 87% of those interviewed, that is, 87 people consider that the two proposed strategies are adequate to achieve coverage of a large part of the community, so the products should be prioritized according to demand and new crops adapted with irrigation technologies should be incorporated.

Question 5. Would you like to see a greater and more varied production marketed in your precinct with better access, security and the respective safety of the products?

**Figure 5. Product variety, access, safety and product safety.**



Source: Survey conducted by the author.

As can be seen in Figure 5, 98% of those consulted indicate that they would like to have a greater variety of products, better access to them,

security in accessing them and good product safety when they are marketed. This leads to determining that the population requires a better lifestyle, which is why the implementation of good agricultural practices is proposed.

PHASE I: As a result of this survey, meetings were held with the participation of the local community and delegates from public and private institutions such as MAGAP, Agrocalidad, and Buena Fe canton councilors to carry out a preliminary analysis:

- Several agricultural products in the sector had pesticide residues.
- Consumer distrust
- Decrease in product sales

PHASE II: Planning process, a SWOT was developed

SOIL MANAGEMENT	
STRENGTHS	WEAKNESSES
Identification of different soil profiles	Incorporation of double cropping, which leads to the extraction of nutrients and the number of chemicals applied.
Use of appropriate machinery	
Execution of techniques to maintain soil structure	
OPPORTUNITIES	THREATS
In the future, other activities are possible due to the integrity of the soils.	Insufficient valuation of the potential functions of the resource at the country level.
Soils will continue to be suitable for agriculture	

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ENVIRONMENT AND CONSERVATION	
STRENGTHS	WEAKNESSES
Internal organization	Low % of areas free of agricultural activity
Conservation policy not ruled out	Low control of the impact generated by activities on the environment
Existence of unproductive	No diversification of



areas exempt from agrochemicals	activities
Availability of BPA execution	There are no biodiversity conservation policies.
<b>OPPORTUNITIES</b>	<b>THREATS</b>
Entry into new markets is very possible	Lack of environmental legislation for biodiversity conservation in agricultural systems
High levels of biodiversity can strengthen agricultural systems	Resistant weeds that force the use of herbicides.
	Low profitability

**PHASE III: Environmental action plan:**

- Program 1: Strengthening local capacity for environmental management
- Program 2: Conservation and sustainable use of biodiversity and genetic reserves.
- Program 3: Soil management and recovery
- Program 4: Critical watershed management
- Program 5: Environmental sanitation
- Program 6: Recovery and Sustainable Use of Natural Resources and Ecosystems
- Program 7: Energy for Sustainable Development
- Program 8: Environmental education
- Program 9: Economic Policy Support for Environmental Management
- Execution of the plan

**PHASE IV: Evaluation and follow-up of the Environmental Action Plan:** The Plan will be implemented with the support of the Ministry of the Environment, which will be responsible for its coordination, management and follow-up. The execution of each proposed program and project will be assigned to a competent governmental institution.

**PHASE V: Feedback:** Based on the control method, it will be carried out between the issuers (control institutions) and receivers (producers) to manage a continuous improvement of what has been proposed.

**CONCLUSIONS**

Access to products in the rural area, Cuatro Mangas is relatively low in quantity, quality and variety. To solve this problem, products should be prioritized according to demand and new crops adapted to irrigation technologies should be incorporated.

About the availability of products and value, there is a close relationship since production is focused on a few products that do not meet the food needs of households and prices are disproportionate because they are products prepared for export; this makes technological packages and the production chain more expensive.

The implementation of Good Agricultural Practices helps to make good use of the incorporation of technologies and contributes to the care of consumers concerning health, and to the improvement of the environment. This is because producers not only implement good soil and water management, but also a pest management plan, proper use of pesticides, and good management of residues and contaminants.

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