

The ecotourism system: a local approach. Practical case of Cuando Cubango província, Angola

El sistema ecoturístico: un enfoque local. Caso práctico de la provincia de Cuando Cubango, Angola

José Eduardo Ezaquias^{1*}

¹ Graduado en Ciencias de la Comunicación, Docente asistente del Instituto Politécnico de la Universidad Cuito Cuanavale, Menongue, Angola. Email: drezequias@gmail.com

* Corresponding author: drezequias@gmail.com

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ABSTRACT

The objective of this article was to design a spatial circular system with a local approach to the management of ecotourism that contributes to the systematization and establishment of ecotourism networks, as a proposal to minimize theoretical-methodological and material deficiencies of existing systems in the desire to link and concretize the participation of the local community. It is a quali-quantitative and transversal research, where the different categories of the scientific method were used, such as: systemic-structural, analytical-synthetic and induction and deduction from an endogenous approach. The design of the proposal of the Circular Model of Ecotourism and the partial application on the Island of Leapeka, in Cuando Cubango, Angola, allowed the emergence of a new theoretical-methodological instrument, also spatial, for the management of ecotourism, which ecotourism policy makers, travel agencies, tour operators and local communities can strengthen and appropriate for the management of ecotourism activity with indicators for the local community.

Keywords: System, Ecotourism, Management

RESUMEN

El objetivo de este artículo fue diseñar un sistema circular espacial con enfoque local para la gestión del ecoturismo que contribuya a la sistematización y establecimiento de redes ecoturísticas, como propuesta para minimizar carencias teórico-metodológicas y material de los sistemas existentes en el afán de vincular y concretar la participación de la comunidad local. Es una investigación cuali-cuantitativa y transversal, donde se emplearon las distintas categorías del método científico, como: sistémico-estructural, analítico-sintético e inducción y deducción desde un enfoque endógeno. El diseño de la propuesta del Modelo circular del ecoturismo y la aplicación parcial en la Isla de Leapeka, en Cuando Cubango, Angola, permitieron el surgimiento de un nuevo instrumento teórico-metodológico, también espacial, para la gestión del ecoturismo, lo cual los diseñadores de políticas de ecoturismo, las agencias de viaje, turoperadores y las comunidades locales pueden robustecer y apropiarse para la gestión de la actividad ecoturística con indicadores para la comunidad local.

Palabras clave: Sistema, Ecoturismo, Gestión

INTRODUCTION

Covid-19 brought about new social changes and a new political, psychological, cultural and economic culture unprecedented in this century and in turn affected ways of functioning of the nuclear models of tourism. All the relationships that occur, under the dynamism of tourism today, are manifested and managed in a very adverse way, with a high degree of uncertainty and strict biosecurity measures, although some countries are to reduce restrictions.

The conduct of neoliberal policies towards the fight against the pandemic and the unequal distribution of vaccines, further affect the development attempts of poor countries, impacting on tourism in emerging economies. Ecotourism as a tourist activity linked to the environment and rural communities, has not yet reached maturity to be a determining modality for these peoples. The practical weaknesses of ecotourism towards the local community were manifested in countries such as Costa Rica, Ecuador, China, Indonesia, Australia and others. The community alone has not had the capacity of self-management to promote managerial processes to turn the tourist resources at its disposal into attractive and alternative offers of development.

It is necessary to specify ecotourism management models, with a systemic and participatory approach, as mechanisms to take advantage of the growing interests of tourists in wildlife, at the same time, to serve as an alternative means for community progress and enrich the attributes to generate tenacious benefits with sustainable development. "A fair share in the benefits of tourism implies that in advance the participants are actors with a guarantee of political, social, economic and cultural rights, moreover, that they are not only subjects of law, but that they are in the full exercise of them" (Ontiveros and Espinosa, 2018, p. 32). These models as structures of organization of tourism serve to propose and establish political and economic relations, the self-management of the community and suppliers, relying on the correlation of value of endogenous and exogenous resources, in order to make viable the management of ecotourism towards common interests, assuming that this process generates growth at the local level (community and home) in three fundamental pillars of sustainability: economic, socio-cultural and environmental.

However, the classic models found in the literature, although they systematize tourism relations, present insufficiencies in the progress of ecotourism activity, for not considering the local material and social relationship and for not enhancing the agents of the environment as transcendental tourist actors.

From this theoretical-methodological and material contradiction, this article aims to: design a spatial circular system with a local approach to the management of ecotourism that contributes to the establishment of networks and the local development of Cuando Cubango, in Angola.

METHODOLOGY

In this article he makes a critical analysis of different scientific publications that address ecotourism management systems from a spatial and concrete perspective with the community, in order to design and apply a model that is capable of adding value to the management of local development.

On this basis, we use descriptive, qualitative and relational research that is based on scientific methods, including: systemic-structural, analytical-synthetic, historical-logical and analysis of the dimensions of sustainability.

THEORETICAL REFERENCE OF THE RESEARCH

Ecotourism is a process of local interpretations and sensible ethical, solidarity, scientific, technological, economic, commercial, psychological, sociocultural, environmental, political and institutional relationships, product of trips to natural spaces, which from these approaches raises the perception of tourists and impacts on the well-being of the local population, environmental education and generates changes to the environments.

It is a tourist activity that emerged in the 60s of the last century in the field of visits to natural environments, with concerns with the environment of protected areas and also as an alternative to combat poverty in these places. Currently, it is one of the tourist modalities that grows the most with 7% in 2019. All its dynamism is sustained by being a contemporary modality that highlights the theoretical relationship leisure-nature-community, as a functional basis.

The above are based on a model, where interpretations and multidisciplinary relationships are synthesized. For Fernández (2009) the integration of these relationships is called the tourism system. The theoretical systems are based on the work of the German biologist Ludwig Von Bertalanffy of 1950 and 1968 (Ávila, 2014). "the organization functions as a system with dialectical unity between its parts, which have the property of structuring, organizing and being in permanent movement, adaptation and change" (Ávila, 2014, p. 8). For Ludwig Von Bertalanffy a system must fulfill three basic premises: systems exist within systems, systems are open and the functions of a system depend on its structure, which would have the inputs of resources to the system and the outputs obtained from processing the input factors.

A model, according to Lima (2012) and Vera (2013), is the result of the process to generate a graphical representation of a system, in order to analyze the relationship between the components. It is not possible for the system to survive by separating its members. For Lima (2012), the system will be understood as a set of interrelated components for a purpose.

A model according to Lima (2012) integrates: end and objectives; principles; characterization of the object; strategy, methodology (stages, objectives and actions in stages); forms of implementation of the model and forms of evaluation of the model.

For tourism, the systems comprise a set of interrelated elements that evolve in a dynamic and dialectical way to configure the nature of tourism activity (UNWTO, 2004), which include components that define the tourist structure of a space, giving it homogeneity and territoriality, as well as environmental, socioeconomic and urban values (Díaz, Linares, and Jouve, 2002, cited by Escarpanter, 2010).

For Fernández (2015), the tourism system is objectified from an infra-contextual edge that integrates the broad system of the economy that encompasses deeper interrelations and explains the models and philosophies related among its agents. Fennell (2014), observes tourism as a spider tea in which a point has an impact on its entire industry.

Systems simplify complex situations or phenomena, such as peculiar forms of abstraction of reality (Liupart, Naranjo, Laver, Enteza, Pelegrin, González, 2019). Fennell (2014),

synthesizes that ecotourism is a human-environmental relationship. From the conceptualization of ecotourism, relationships come from a complexity in which each element, singularly or collectively, plays its role, the environment, man and the methods they entail.

However, the literature consulted associates ecotourism with the systems of own tourism, but driven by natural and cultural attractions, where its epistemological character presents it as an instrument of income generation, local management and fight against poverty. Authors such as Nofarli, 2018; Sarmiento, Romero, Roman & Martin, 2018 and Nurhayati, Aisah & Supriatna, 2019 admit that ecotourism is a force for the participation of management, local culture, technology, infrastructure and regulatory dimensions to establish zoning, sustainability and conservation rules.

It can be inferred that from the treatment of international theoretical information, ecotourism has had an exponential growth considering it as an alternative vehicle for sustainable development with a local focus. But the demonstrations from its practical application in different places of low-income economies are very ineffective. Ontiveros and Espinosa (2018), refer that this tourist modality "has shown important limitations in the purposes of reducing the conditions of poverty" (p. 21) in these premises.

The author of the article considers "the local", the places adjacent to the ecotourism resources, micro scale of the territory, where the inhabitants and their other endogenous heritages are. For Polamo (1990) cited by Fernández (2015) these invariable tourist resources to the association of man will be essential factors in the planning of the activity, before carrying out a series of tourism expansion projects, which produce local results.

Ojha (2020) ponders that ecotourism can be beneficial to these places. In turn, Rojas, Castillo & Cano (2020), agree that an inefficient projection of the ecotourism system would result in negative effects in these contexts and on the inhabitants themselves.

This problem arises from the limitation of the participation of the local population in the planning, organization and development of ecotourism, which causes the interest in ecotourism of these agents to decrease, literally affecting the income generated (Adom, 2019 and Graciano & Hollandia, 2020).

Although it is still claimed that ecotourism is an alternative path of low impact and socioeconomic transformation for local communities (Kim, Xie, & Cirella, 2019), the practical evidence is still insufficient. In the systems, circuits and models, as a functional representation of different social phenomena, some deficiencies persist regarding the concrete characterization of ecotourism, which admits some abstraction.

For ecotourism, from abstraction to concrete, a model represents its reality, giving answers to questions such as Where is it?, What does each component do? and Where is it intended to go? For Cartay, Márquez, Sánchez & Martínez (2020), taking Costa Rica as a reference, the abstraction of ecotourism is confirmed by an insufficient and strict system of supervision by the government; the various tourism companies, which organize outreach tours to indigenous communities, do not always respect and benefit local communities and investment in infrastructure (roads, airports and ports) is meager or late.

Added to these shortcomings is the lack of effective collaboration between stakeholders (Wondirad, Tolkach, & King, 2019) and, in particular, the absence of a methodological system that establishes the relationship of these stakeholders and that serves to pay adequate attention to the complexity of local relationships (Sachs, 2008).

For a more thorough understanding of these methodological, spatial and material contradictions of tourism systems and the link with ecotourism, the author takes some models found in the literature. With the desire to minimize the previous problem, it is reasoned that the intrinsic character of ecotourism should be reflected in the management models, in its systemic and spatial vision. In this sense, Fernández (2009) and Liupart et al. (2019), propose the Spatial Approach Model (relationship between sending and receiving geographical units and the displacement of tourists) and the structural-functional or systemic model (form of interaction of the tourist destination) as detailed below.

Theoretical models of spatial approach:

- Leiper model (2002) cited by Fernández (2009).
- Palhares model (2002) cited by Liupart et al. (2019).
- Mariot model (2003) cited by Liupart et al. (2019).

Theoretical and structural-functional or systemic models:

- Inskoop model (2001) cited by Liupart et al. (2019).
- Hall model (2001) cited by Liupart et al. (2019).
- Beni model (2001) cited by Liupart et al. (2019).
- Falcón model (2007) cited by Camunda (2018).
- Molina model (2000) cited by Dast (2019).
- Pentagonal Model by Fernández (2009).

The above identifications show a great methodological value for tourism management, by synthesizing relationships with incidence for demand, receivers, the tourist plant, the displacement of tourists and others. They present an acceptable response to the systematization of tourism, in general. On the other hand, in the field of ecotourism management, they are insufficient, thus missing the explanatory potential they have for ecotourism management.

Theoretical models have been referenced in some years as determinants for tourism research, since they integrate different subsystems towards a common goal and in a certain context. From a perspective of demand and source markets, these models confer an efficient response, but from the perspective of the destination and its communities, lower levels, they present different inconsistencies.

It is influenced that both types of models insufficiently demonstrate the relationships of local actors, with the exception of Laiper (2002) which distinguishes the interaction between the origin and destination of the tourist. As for sustainability, Beni (2001) and Hall (2001), have it present in a weak way by not explaining it, but the other authors do not mention this variable.

The nine models present more economic approaches supported by the demand towards the destination, to the detriment of cultural and environmental factors. In the author's opinion, the models under analysis were designed for developed, first-world destinations with a solid tourism industry, where tourists move to source markets. These models are difficult to adapt and apply in emerging destinations, such as Angola.

That is, these models represented a significant contribution in the tourism planning process, but their technologies were not consistent to give the importance of the resident population, their interests and needs.

However, Molina (2000), Falcón (2007) and Fernandez (2009), in their models propose that the operation of the tourism system affects the community, indirectly, but from the detail, what the community provides to tourism is vague, since these are not passives or objects, but determining subjects of the environment, which translates that the previous systemic and spatial models are scarce for the functional relationship of ecotourism, although they propose an overview of the systematization of tourism activity.

The author justifies these inferences based on the inadequacies of these models in incorporating adjectives typical of ecotourism, such as: participation, contribution, income, conservation, alternative livelihood, benefit for the locals, improvements of local infrastructures, protected areas, environmental education and qualitative and quantitative results towards the local.

Likewise, the author agrees with Buckley (2010), who points out the need for a model that promotes specific indicators that are discriminatory, quantifiable, actionable, sensitive, ecologically significant, integrated and feasible in practice.

Based on these guidelines, the author admits that the emphasis is the absence of a specific circular system for ecotourism, attentive to endogeneity, which would confer greater and better orientation to the community, would clarify exactly the location and role of these agents, since not precisely and always they live in the resource on a restricted scale; demonstrate how locals would exchange with visitors; how they would participate and manage their lands, creating local impact and ecological zoning.

THEORETICAL-METHODOLOGICAL PROPOSAL

Considering the inadequacies of the revised models, he approached an ecotourism system with a spatial approach, which is defined as the functional and structural represen-

tation of a model that concatenates the actors, organs and processes in four different areas: natural and anthropic resources, local organization, economic entities and visitors in which their effective, ethical and harmonious relationships determine competitiveness, local production and enable the management of ecotourism towards the needs of the environment and sustainable development. Thus, the following route was structured, which brings together two stages: 1 – design of the ecotourism system and its sustainability indicators and 2 – partial application of the proposal in the province of Cuando Cubango, Angola.

FIRST STAGE

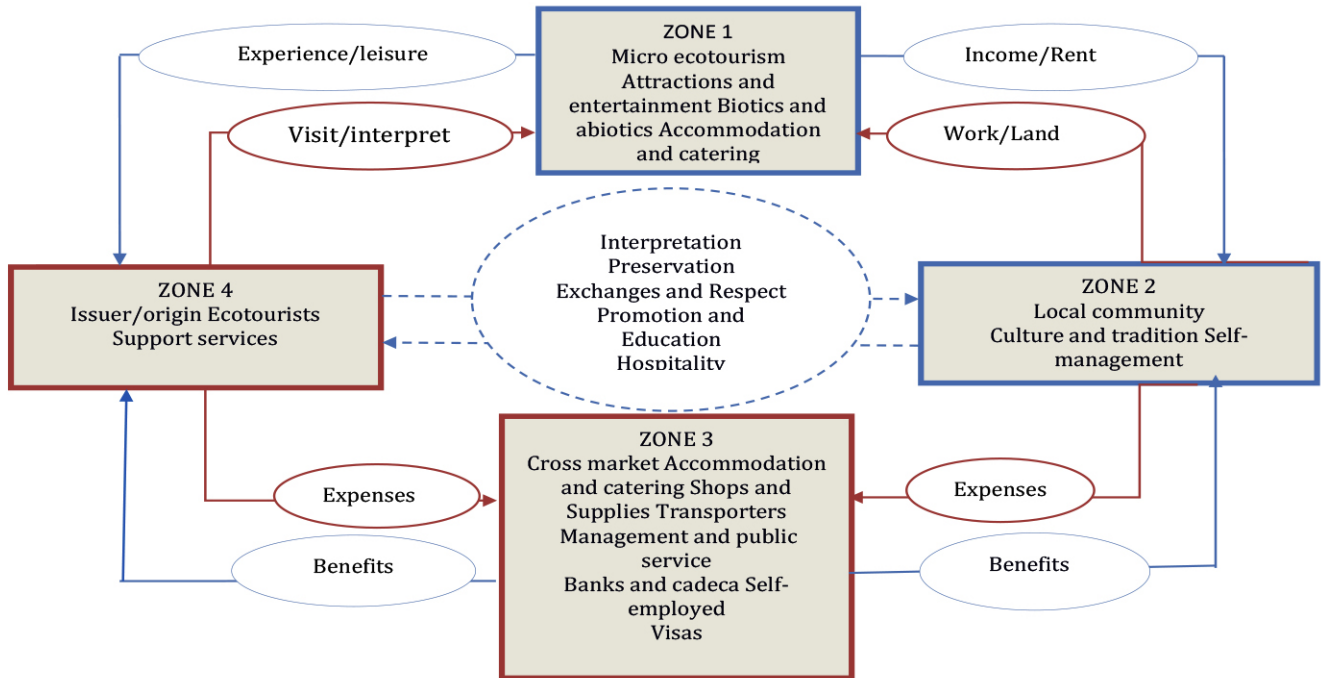
To develop this stage, nine theoretical models of tourism management were consulted, with theoretical contributions on the essential components. The circular flow systems of the economy proposed by Samuelson and Nordhaus (2011), were also analyzed, describing the interrelationship of local actors.

Considering the models consulted and the author's observation of the context of the study, in Cuando Cubango, in Angola, in order to understand the ecotourism phenomenon, the circular system presented in figure one resulted. These relationships are described below from a chain of the four zones, description, their inputs and outputs:

Zone 1: Description: structure of natural and anthropic resources – the biotic and abiotic resources, culture and historical heritage that have the possibility of attracting visitors. This area usually does not have accommodation and restoration and visitors usually do not spend the night as Ortega (2020) said, and the context of the research, but it is desirable to implement integral springs here.

Inputs: creation of attractiveness conditions and resorts.
Outputs: environmental sustainability and economic profitability.

Figure 1. Spatial circular model of ecotourism



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Zone 2: Description: local organization – the local community works (providing its time, effort, skill, skill, hospitality, knowledge, agricultural products and others) in the micro destination and has rights to the land which in turn also rents or cedes to entrepreneurs under state control. From the work, trade, rent and concession of the land, the community has income, profits and rent that allow them to solve their needs and obtain benefits.

Inputs: community participation through work, commerce, rent and social actions.

Outputs: return on income, socialization and socioeconomic supports.

Zone 3: Description: capacity for organization and territorial ecotourism production. It is the transversal market where the ecotourist has the first contact with the destination that at the beginning is in an urban jurisdiction where suppliers, tour operators, supply companies and prepared agents are located. In it is the functional base that confers support and facilities to the management of ecotourism under a provincial government and main companies, direct and indirect.

Escribano (2018), states that in this area are located the services of transport and distribution, car rental, accommodation, catering, travel agencies, after-sales service, as well as areas of support, infrastructure, migrations, communications, health, immigration procedures, road, guides, logistics and technology that are decisive for the management of ecotourism. This is necessary but is not enough for good ecotourism development (Gunn, 2000).

Inputs: systematize the different actors and key bodies for the management of ecotourism.

Outputs: economic profitability of the ecotourism plant of Cuando Cubango.

Zone 4: Description: capacity to organize and distribute trips. It is the issuing market from where the ecotourist leaves for the eco-destination. This agent travels to the destination, and in return gains a new experience and perception. According to Castro (2017), in some issuing countries, it is where travel organizers and distributors or intermediaries are located, characterized by travel agencies and tour operators with a wholesale dimension.

Inputs: visit capacity, expenses and interpretation.

Outputs: satisfaction of the needs of the demand (relax, experiences, perception, education and interpretation).

The previous ecotourism system contains four physical zones, with endogenous (micro-destination) and exogenous (the emitting market) areas interacting and channeling, creating a circular system that, in the author's opinion, promotes complex multifaceted relationships, captures the main managing entities and efficiently represents the local phenomena of ecotourism.

The main foundations of the proposed system are systematization, philosophical, sociological, psychological, training and education, self-management and participation and associativism.

ECONOMIC ANALYSIS

In order for the ecotourism spatial circular system to have results in terms of promoting local profits, it is proposed to analyze it from economic science based on expressions and laws that break down the supply of the local community (dependent variable) and the determining factors for the offer to tourists such as the rent of the land (ecotourism resource), income from work (sum of time, effort, skill, hospitality and knowledge of the members of the community) and price of products (various goods to sell, such as agriculture, crafts, dances and others), considering the rest constant.

$$Slc = f(L, W, Y)$$

Where:

Slc = Local community supply (oferta de la comunidad local)

f = Function

L = Land (natural and cultural ecotourism resource)

W = Work (community skills)

Y = Product (volume and efficiency of local production)

Assuming the above expression, the function of the supply of the local community will be manifested from the relationship of the quantity offered of its product (dependent variable) and the financial inputs of a series of factors (independent variable) considered determinants in the offer of said product. In this way the mathematical expression of the function of the local community's supply will have the following multiple linear expression.

$$Slc = f(R, I, SI)$$

Where:

Slc = Local community supply

R = Land rental

I = Income or salary from work

SI = Profit from the sale of the diverse product

The income generated by the volunteering or solidarity of the tourists and other entities would be considered as marginal income. The author assumes that marginal income is donations, offers, contributions, tips and others that are not regular, are not planned and are not constant, then are considered as unforeseen entries.

In economic terms, it would be:

Marginal income of the local community and other benefits are the same

$$\text{Role of other benefits} = f(b)$$

Where:

f = Function

b = Role of other benefits

In this sense, the total income of the local community after the increase in ecotourism will be determined by the number of factors undertaken to tourism by the inhabitants multiplied by the price, maintaining the rest constant, which would assume the second economic expression.

$$ITcslc = (\sum Cslc) * p$$

Where:

ITcslc = Total Income of the amount offered

Cslc = Amount offered by the local community

P = Price

Main system reading

The increase in ecotourism demand increases the increase in supply, that is, the demand stimulates the supply of goods and services of the community. However, the constant rest, such as local organization, quality of services,

local respect and others must be adequately strengthened to improve local performance in terms of ecotourism agents and means.

In zone 3, known as the transversal market, the economy would function in an eminent balance between the forces of supply and aggregate demand, always controlled by the performance of the public sector, but dominated in productive terms by the business sector.

The function of the supply of the community does not contradict the offer of the provider of ecotourism, it also cannot be considered as concorrentes, assuming that the community would act as a social cooperative but for profit and the providers, as private companies, could assume different commercial characteristics also for profit.

However, according to the criteria of author, Fernandez (2015) and Castro (2017), both the community, the suppliers, agencies and turoporadores would work in the breeding of conditions to satisfy the needs of the turitas. From the above, it would influence the function of ecotourism production, which is summarized in the inputs necessary to meet and satisfy the expectations of tourists, circunscristas in robberies, ease and access, keeping in the rest constant.

Decisiones

If $ITcslc > Cv+Cf$ (Variable Custo plus Custo Fijo of ecotourism) – you can continue to invest in ecotourism

If $ITcslc < Cv+Cf$ – it will be a loss to invest in ecotourism

If $ITcslc = Cv+Cf$ – zero income, it is possible for investors to avoid alternatives.

The above indicators enliven the practicability of ecotourism activity as part of the local economy focused on the community. It is appropriate to quantify or evaluate the magnitude of the community in monetary terms, to identify the fixed costs of the society itself and the variables decuring regular needs to form quality products in the exchange value (quantify how much a different species), use value (quantity and quality) and value (social quality).

These analyses are not usually relevant in the first years of exploitation, but in every life cycle of the destination, assuming that the satisfactory results from the use of the variables independent of the function of ecotourism production begin after the destination is consolidated.

For a better result, it is proposed to organize the local community, as a social and economic cooperative, with specific areas of action, hierarchy, goals and organizational levels. To distribute the functions of the community in order to obtain better results with the development of ecotourism, it is proposed to stratify the functions of its leaders from the Graicunas theory to achieve efficiency in the relations between local leaders. But the community cannot be assumed as a capitalist structure, but a social organization demanding changes, where in ecotourism it can be a force.

According to Matias, Ezequiel, Nicolas & Lien (2013), the Graicunas theory published in 1933 states that while the number of subordinates increases aritimetrically, the number of relationships that the superior has to control increases almost geometrically. Therefore, a superior can only control a limited number of subordinates, and any amount beyond this limit is very difficult to control. Local development requires the coordination of different institutional, social and business actors, so that a unique experience is provided to visitors and community impacts (Montero, Pantoja & Aldana, 2019).

For a better understanding, Graicunas proposes the following metamatic expression.

$$R = S + \left(\frac{2^2}{2} + S - 1 \right)$$

Where:

R – number of relations

S – number of led

The previous formula seeks to clarify that a local leader can only have 222 relationships being a direct superior of six people, humanly possible, that is, the leader can have as a limit six community leaders and a lower level leader up to two sub-leaders to pursue efficiency in local management depending on the level of relationship.

From Matias et al., 2013, the author reasons that this structure of local and hierarchical organization will have as its objective in its functional core to promote an environmentally responsible, socially beneficial and economically viable ecotourism.

SOCIOCULTURAL ANALYSIS

The ecotourism system with a focus on the local should be understood as a proposed instrument to allow the develo-

ment of tourism activity to bring social changes to these environments and recommending that the local population have more opportunities to participate in the tourism market. For Ontiveros and Espinosa (2018), the problem of the previous approach lies in the ability to equitably transfer and distribute the benefits of tourism growth among a wider group of the population.

Ecotourism is currently part of the international challenges to end extreme poverty. In 1992, at the Rio de Janeiro Summit and in 2015, at the summit on the environment, strategies were discussed to achieve the goals of sustainable development in 2030, in which the countries of the world contribute their share of participation. However, the results are far from being achieved.

For more appropriate analysis, the author proposes that a statistical study of these communities should be made, where the first task would be to evaluate the existence of the active population between 17 and 65 years old, the social difference of the work and skill of these populations, labor capacity and the population currently employed. The previous approach would be justified from the adaptation of the following statistical expressions of the economic sciences.

$$LAC = Wt + V$$

Where:

LAC - Local Active Community
 Wt – total number of employed
 V – number of vacant premises

$$WI = (Wt/LAC) * 100$$

Where:

WI – The local employment rate
 Wt – total number of employed
 LAC - Local Active Community

The full employment of the local community to the tourist activity must be estimated at less than 12%, assuming that not only ecotourism serves as an economic force, but all other sectors contribute their participation in the work socially necessary for the functioning and development of the environment. The author adopts the mechanisms proposed by UNWTO (2004) to achieve the benefits of ecotourism to local authors from assets. For an optimal vision, 30% of the active community should be employed in different socio-productive areas.

$$WI = (Weco/Wt) 100$$

Where:

WI – The local employment rate
 Weco – Number of employed in the sale in ecotourism
 Wt – total number of employed.

It is usually cross-centered to evaluate the direct sale of goods and services to visitors and tourist structures by community members. There is no optimal percentual value, but it is rationed to be higher than 30%.

$$Ws = (Os/W) 100$$

Where:

Ws – The rate of employed persons engaged in private sales
 Os – Number of employed in the sale in ecotourism
 W - Number of employed

The supply of goods and services to tourism companies and others to community members are a way of detecting the intensity of use of ecotourism space through indirect and direct methods. However, the local population will always have to have an expressive value compared to tourists and a situation of equilibrium or surplus in consumption.

The economists Samuelson and Nordhaus (2011), present as a methodological proposal to evaluate the consumption that represents the relationship between the performance of the community and the behavior of its expenses (consumption and savings), which will have to be equal to or greater than one.

Consumption = Total Income/Expenditure (Consumption + Savings)

Linear simple consumption function

$$C = \hat{C} + cYd$$

Where:

C – Consumption
 \hat{C} – Consumption autonomous
 c – marginal propensity to consume ($0 < c < 1$)
 Yd - Community Disposable Income

Investment in basic infrastructure, stimulated by ecotourism and other sectors towards the local, which also benefits the members of the community is manifested by the Ecotourism Centrality Index until reaching a minimum of well-being. But its use does not have absolute significance, but a reference of the public and private goods that

arise influenced by ecotourism.

$$Eci = (S1T1 + S2T2 + S3T3 + + SnTn)$$

Where:

Eci - Ecotourism Centrality Index

Si – functional units (commercial establishments) in the determining ecotourism environment

Ti – concentration coefficient of the same type of ecotourism service in the environment.

$$Ti = 100/Pi$$

Where:

Ti – concentration coefficient of the same type of ecotourism service in the environment.

Pi - number of functional entities of a given service in the whole destination (Basic services to ecotourism and not intrinsically tourist).

ENVIRONMENTAL ANALYSIS

Ecotourism is developed in the rural and natural environment, it can count on desimiles of methods, techniques, procedures to proceed with environmental analysis, assuming that all of which serve to minimize the impacts and pressures created by the dynamism of ecotourism activity, investments in hotel units, roads and other Intrinsic. Although the literature addresses different methods of Environmental Impact Assessment, for ecotourism activity, the load capacity is very common, as an optimal resolution for these environments. But it cannot be limited to this method alone, when the aim is for ecotourism to be ecologically bearable in the long term, economically viable and equitable from an ethical and social perspective for local communities and not to undermine the degree of visitor satisfaction with negative externalities.

Carrying capacity is a concept defined as the need to maintain levels of use and avoid negative impacts on the resource depending on the intensity of ecotourism (Ezaquías, 2022). For Chávez (2003) cited by Ortiz (2019), the carrying capacity would be represented by the following function.

$$TLC = f(Cf, Cfr, Cc)$$

Where:

TLC: Tourist Load Capacity

Fc: Landscape fragility coefficient, this coefficient is calculated $Fc = Vc * If$, in which.

Vc: or landscape conservation value and

Fi: Fragility Index.

Crf: Coefficient of recreational functionality

CC: Coefficient of tourist category.

However, for ecotourism the load capacity, the method of Cifuentes, M. et al. 1996 (Vera, 2013; Pires, 2015), which addresses the complexity of the impact of ecotourism by proposing important references to minimize the effects of ecotourism in the different disciplinary fields, which in the opinion of this author is more detailed. Cifuentes, M. et al. (1996) proposed four types of evaluation of the area involved:

Physical load capacity of the study area (PCA): is the maximum number of visitors that one can contain in a specific time.

Actual Load Capacity (ALC): is the load capacity corrected by coefficients related to the length of the trail, the distance required by each group and the number of people per group.

Modified Load Capacity (MLC): refers to the actual load capacity corrected by the existing erosion coefficient (Iero). Its expression is the number of visitors that it is recommended to include in each group to maintain the particularities of the different ecosystems. Mathematical expressions to determine carrying capacity

Physical load capacity of the study area

$$PCA = TL (Leisure/TNV)$$

Where:

PCA: Physical load capacity of the study area

TL: Total length of the study area in meters

Leisure: Leisure day for tourists – Day: 8 hours/day trip

TNV: Time needed to visit each group

Actual load capacity

$$ALC = TL (DRG/NPG)$$

Where:

ALC: Actual Load Capacity

TL: Total length of the study area in meters

DRG: Distance required by each group

NPG: Number of people per group

Effective load capacity

$$ELC = ALC - M\%$$

Where:

ELC: Effective load capacity
 ALC: Actual Load Capacity
 MC: Management Capacity

Management Capacity

$$MC = Cm \times 100 \div Im$$

Where:

MC: Management Capacity
 Cm: Current manageability
 Im: Ideal manageability

Modified Load Capacity

$$MLC = Im - Iero$$

Where:

MLC: Modified Load Capacity
 Im: Ideal manageability
 Iero: erosion index of the studied área

Erosion index (Iero)

$$Iero = (Sero / TL) 100\%$$

Where:

Iero: Erosion index
 Sero: Local area eroded by different impacts
 TL: Total length of the study area in meters

POLITICAL AND INSTITUTIONAL ANALYSIS

The policy, planning and development of the destination are part of the functions of the Government to contribute to the integral development of ecotourism in a coherent way with other local actors, based on the principles of sustainability, to essentially improve the quality of life of the population (Medina and Santamarina, 2004).

To quantify the degree of attention and political commitment to ecotourism, a set of guidance instruments are necessary that, more than the interest of the State and the country, manage the achievements of local development. Among the main instruments, we must have: Legislation, agreements, ecotourism development policies, tourism planning and others.

SECOND STAGE

To develop this stage, a stratified and intentional sample is counted. For Cooper and Schindler (2016) the reasons for the research to adopt the stratified sample is "to increase the efficiency of a sampling and provide adequate data for the analysis of various subgroups of the population" (p. 354). We tried to stratify the unit of analysis from statisti-

cal expressions, which used a population with an estimated degree of confidence of .95 and margin of error of .05. The above allowed to identify three groups that are part of the sample: community leaders, tourists and agents and managers. The use of the sample allows you to understand the exact location of each agent in the system.

Table 1. Sample size (n) by strata

Stratum Groups	Strata	Population	Sample	%
n1	Community leaders	3	1	33,3%
n2	Tourists	1.042	304	29,1%
n3	Tourism agents and managers	20	14	67%
Total		1.065	319	30%

In this sense, the proposed system was partially applied in the macro environment of the province of Cuando Cubango, where it was modeled to seek regularities on the effective utility as a tool that contributes to sustainable community development. For a better approach, the following budgets were taken:

Zone 1: the island tourist resource of Leapeka was chosen. It presents a beauty characterized by the Kwebe, a tributary of the Cubango River (drains into the Okavango Delta, in Botswana), which forms a series of islands structured in black, gray stones with lush potholes and a harmonious natural landscape, where you can also appreciate the African crocodile and other animal species. Accommodation and catering. It is not common to have hotel structures in this area, however, Leapeka has a Resort the Kuebe Lodge, with 34 rooms, at a distance between four and eight kilometers.

Zone 2: the local community adjacent to Leapeka Island, at a distance of about 4 km from the ecotourism resource, is made up of 525 inhabitants, who retain particularities, such as customs, history, tradition, ancestral veneration and similar folklore. The community of Leapeka (zone 2) from its geographical home does not have direct contact with the tourist who visits its attraction (zone 4), since it moves directly from Zone 3 to the Island. To bring the tourist closer to the community, a work of setting and training of the young community members was developed, who had the opportunity to acquire knowledge to interact with tourists and investors. This process generated 35 community ecotourism guides in 2020 and economic, sociocultural and environmental impacts in 2021 after the application of knowledge.

Zone 3: it is a transversal market or the macro environment, there is the city of Menongue, head of the province of Cuando Cubango. Here are the 14 tourism managers and agents interviewed for this research.

In this area there is a network of agents and companies that directly and indirectly influence ecotourism. All agents and managers interviewed, representing 100%, reside in the cross-sectional area, providing various goods and services. These include the direct production chain (management of natural, historical and cultural heritage, administrative services, transport and communications system, civil construction, energy and drinking water system, food distribution and agricultural development and food and beverage industry); indirect (promotion of the province, trade and services of third parties, production of handicrafts, cultural activities, entertainment and security and protection company) and main (agencies and organizers of trips, hotels and inns, bars and restaurants and cultural activities and tourist animation).

Zone 4: From the sample to tourists, the main emitters can be characterized. Of the 304 travelers, 243 are Angolans (79.93%), 20 meaning 6.58% are Portuguese, 15 totaling 4.93% are Namibians, 10 (3.29%) are Brazilians, 4 (1.32%) Zambians, 3 (0.98) Mozambicans, 2 (0.66%) Argentines and others, represents 1 (0.33%) each, are Russians, Cubans, Chinese, Spaniards, Cape Verdeans, Nigerians and South Africans. Of a total of 304 tourists, 177 (58.22%) stayed in pensions and 127 (41.78%) stayed in hotels in the municipality of Menongue. That is, no tourist stayed in the tourist resources in a concrete way.

THEORETICAL VALIDATION

From the partial application of the circular spatial model of ecotourism proposed in Cuando Cubango, some features that support its theoretical-methodological relevance will be evidenced as a system that drives internal and external networks, starting with the moment that the tourist arrives at the macro-environment or transversal market. From the qualitative modeling process, some deductions were evidenced: Zone 1. Structure to amount of natural and cultural resources. Zone 2. The organizational capacity of the Community of leapeka is adjacent to the resource at an average distance between 3 Km. Zone 3. Political capacity, planning and development of the destination. 80% of the managing bodies are located in the cross-border market and 20% in the community and local gover-

nement. Zone 4. 100% of the tourists, before visiting the micro destination, made their arrangements in the transversal market and had no contact with the community.

CONCLUSIONS

The analysis of the primary information and the partial application of the Spatial Circular Model of Ecotourism on the Island of Leapeka, in Menongue, showed the relevance and value of the proposed system for ecotourism management in Cuando Cubango, with values for the network and local development, allowing better dynamism of the community involved in ecotourism. Its effective use to characterize each physical zone of the system demonstrated how the actors and sectors of ecotourism are articulated, pointing out the implicit fluidity, and therefore, the impact it can generate for each component of the system, conferring better involvement of local actors and areas.

The proposed main system indicators were designed to support the intrinsic economic, socio-cultural and environmental pillars of community dynamics. However, it must continue to be deepened and perfected, essentially in its practical component to guarantee its effective use and viability towards the reflection of ecotourism in the community, not as a capitalist structure, but as a social organization demanding new changes in the field of action of ecotourism activity. In any case, a new procedure for the management of ecotourism emerges, which tourism policy makers, travel agencies, tour operators and local communities can appropriate for the projection and management of ecotourism activity with a focus on the endogenous.

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