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FUNDAMENTAL SPECIES ON JAMBELÍ ISLAND, ECUADOR**

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BIODIVERSIDAD PARA GARANTIZAR EL DESARROLLO SOSTENIBLE DE ESPECIES FUNDAMENTALES EN LA ISLA JAMBELÍ, ECUADOR

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ABSTRACT

The work was carried out on Jambelí Island, Jambelí Archipelago located in the Santa Rosa canton, El Oro province in Ecuador, the objective of the research was to determine the main anthropic activities through scientific research for the correct social development and conservation of biodiversity. The fieldwork allowed us to know the main activities carried out by its community members to generate sources of work in the place, determining that tourism and the collection of fauna species for sale are common activities among the inhabitants. Although it is a large natural space and important for the environment, conservation is in danger because shrimp farming in the place has triggered a large number of problems for the community members, affecting their proper social development, and causing unfortunate damage to the place. Sustainable social development through bioethics seeks to generate a change in people's awareness to respect life and care for the environment, to achieve a positive impact, mainly benefiting the inhabitants since well-preserved resources create a bridge to a better future. With the study we want to highlight the importance of social development and sustainable development, promoting it from bioethics and achieving the conservation of the habitat of many species that are being lost and that are essential for the food chain and the economic livelihood of many families.

Keywords:

Sustainable development, social development, bioethics, biodiversity conservation, ecosystem loss.

RESUMEN

El estudio se desarrolló en la Isla Jambelí, Archipiélago Jambelí ubicado en el cantón Santa Rosa, provincia El Oro en Ecuador, el objetivo de la investigación fue determinar las principales actividades antrópicas mediante la investigación científica para el correcto desarrollo social y conservación de la biodiversidad. El trabajo de campo permitió conocer las principales actividades que realizan sus comuneros para generar fuentes de trabajo en el lugar determinando que el turismo y la recolección de especies faunísticas para la venta son las actividades comunes entre los habitantes. Aunque es un gran espacio natural y de importancia para el ambiente, conservación está en peligro debido a que la actividad camaronera en el lugar ha desencadenado una numerosa cantidad de problemas para los comuneros han afectado su adecuado desarrollo social, ocasionando perjuicios lamentables para el lugar. Un desarrollo social sostenible mediante la bioética busca generar un cambio en la conciencia de las personas a que se respete la vida y se cuide el ambiente, con el fin de lograr un impacto positivo, beneficiando principalmente a los habitantes, ya que los recursos bien conservados crean un puente hacia un mejor futuro. Con el estudio se desea destacar la importancia del desarrollo social y el desarrollo sostenible, fomentándolo desde la bioética y lograr la conservación del hábitat de muchas especies que se están perdiendo y que son fundamentales para la cadena trófica y el sustento económico de muchas familias.

Palabras clave:

Desarrollo sostenible, desarrollo social, bioética, conservación de biodiversidad, pérdida de ecosistema.

INTRODUCTION

Jambelí Island is one of the main tourist attractions of the province of El Oro, in Ecuador, having several kilometers of beach and large extensions of mangrove that house species of great importance for the ecosystem, but unfortunately one of the economic activities that are generated here is irreversibly destroying this natural space.

The aquaculture activity is one of the most developed in Jambelí Island, being an activity that requires large space to be developed, where the mangrove is felled for the construction of pools to be used in the production of shrimp, and in the course of carrying out the activity large quantities of chemical products are used, which are then discharged into the estuary affecting the surrounding species.

Bioethics seeks to create a commitment in each of the people for the environment to take care of life in all its forms, so it is important that through general education and specifically, the environment, promote that from the home these values are promoted, that from children we take care of the planet and its resources, which are vital for the survival of present and future generations. It is everyone's task to seek a common good where people's rights are respected, and economic interests are not above people who are in unequal opportunities.

Social development in recent decades has led to the fastest growth seen in recent centuries, which has undoubtedly allowed better development in people's lives but has also triggered a number of serious consequences mainly for the environment destroying the life of many species on Earth, as well as the alteration of ecosystems in all parts of the world; As a result, it was necessary to take immediate action to curb the damage that is being caused.

Several international agreements, declarations, protocols, conventions, and treaties were established through these years that ensure the safety of life and the care of the environment, thus emerging in 1987 the term sustainable development, which teaches to use resources according to present needs always thinking about the future, Thus, the present research work highlights the importance of sustainability in conjunction with bioethics. Bioethics can be considered in the Potterian sense the science of survival because it constitutes the knowledge that crystallizes the consciousness, that the human species can only enjoy a dignified way of life, always respecting other species and their environment (Sanz, 2019). This study aims to determine social development and conservation of biodiversity on Jambelí Island to ensure the sustainable development of key species.

The area of study was the Jambelí archipelago, (Figure 1), made up of major and minor islands, estuaries, and channels (Domínguez et al., 2016). Jambelí Island is one of the main islands of the archipelago, located in the Santa Rosa Canton in the province of El Oro, has an area of 2,419 hectares where the ecosystems that predominate are sandy beaches and mangroves, they receive tourists daily and various activities are carried out for the development of it. Jambelí Island belongs since 2005 to the IBAs (Important Bird Areas) program. (Torres et al., 2018).

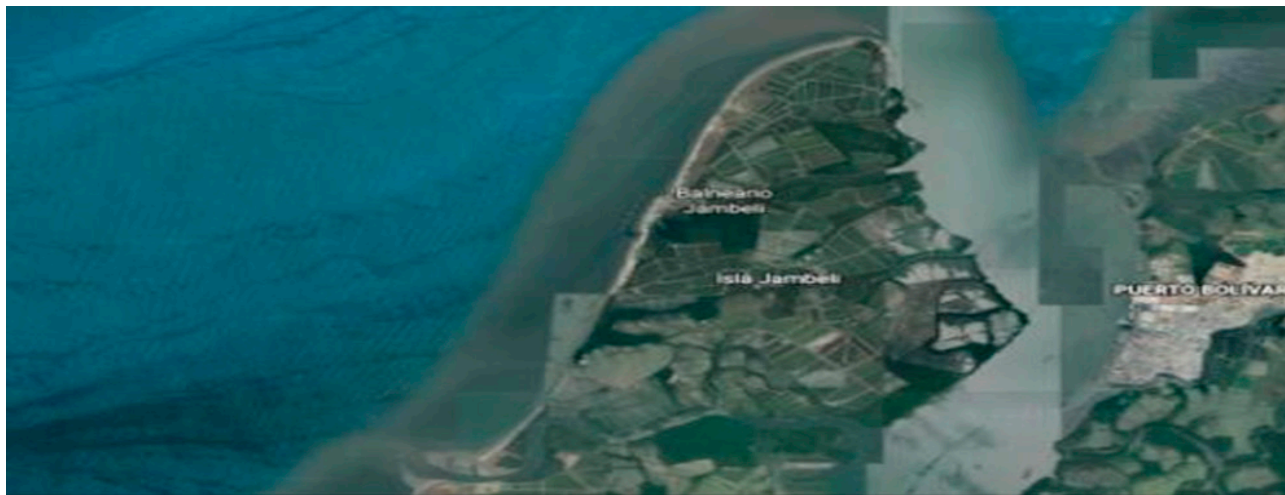


Figure 1. Location off Jambelí Island.

Source: Google Earth (2021).

METHODOLOGY

Through exploratory research, we proceeded to search for information for the Development of the research topic, and carried out the review of indexed journals, scientific articles, and books, the necessary information was written, as well as the search for laws in force in the country that emphasize the importance of compliance with it about the subject

to be developed. The on-site visit to the study site allowed us to establish the different problems that arise on Jambelí Island, the observation was necessary to establish each of the aspects that are causing the loss of ecosystem in the place. To determine which species is most affected by the activities carried out within Jambelí Island (Figure 2 and 3).



Figure 2. Gathering of information with Commoners of island.



Figure 3. Exploratory tour of Jambelí Island.

Legal framework

1-Constitution of the Republic of Ecuador In the year was officially approved the so-called Constitution of the Republic of Ecuador (Ecuador. Asamblea Nacional Constituyente, 2008) that in its art. 14 indicates that it the right of people to live in a healthy environment that guarantees sustainability, as well, in its articles 57 and 83 it refers to the fact that people have the duty to use and manage land as long as they use it rationally.

2-Organic Code of the Environment The Organic Code of the Environment (Ecuador. Ministerio de Medio Ambiente, 2017), indicates in its articles the obligation to preserve the natural resources of the biosphere, so article 5 recognizes the collective rights of nature and the right of different communities. Article 284 states that the National Environmental Authority will create incentives for the owners of mangrove forest properties or other spaces of great importance in order for people to conserve these spaces in their natural state without suffering alterations, and likewise the authority

3-Tourism Law

Being the study area a highly tourist space it is important to highlight the application of strict laws that ensure the conservation of the place, that is why in its article 3 it indicates that on principles of tourist activity, the following: Guarantee the rational use of the natural, historical, cultural and archaeological resources of the Nation The permanent conservation of the country's natural and cultural resources.

4-Agreement No. MAP-SUBACUA-2018-0005-A

The Ministry of Aquaculture and Fisheries (Ecuador Ministerio de Acuicultura y Pesca, 2018) indicates in correspondence with article 73 of the general regulation to the fisheries and fisheries development law that:

-All new shrimp farming projects on private lands are established at a minimum of 30 meters wide of tree-lined withdrawal strip.

Problems on Jambelí Island

Jambelí Island for its extensive mangrove areas with excellent location is the ideal place to carry out one of the most important economic activities in the country and the province. The shrimp activity began to develop in approximately 1968 being the Ecuadorian shrimp one of the best in the world, but the shrimp boom brought with it not only benefits but also damages for the ecosystem where the activity is developed, but it is public knowledge that the interests of the shrimp farmers always prevail before the rights of the commoners. Among the main problems caused by shrimp farming on Jambelí Island are the following:

Anchoring of the estuary: When the shrimp farmers pour the water from the pools they do it at low tide, so some bags are placed in the gates of the wall of the pool is there where all the water comes out and the shrimp is trapped in the bags but also passes all the sediment of the pools and reaches the floor of the channel which causes it to settle.

This has caused the estuary to lose its depth so that at low tide the boats that work in the place or take tourists to the Jambelí resort cannot travel causing great discomfort in people. The corresponding procedures were carried out so that in conjunction with the provincial council dredging is carried out in the place, but the owners of the shrimp farms were adamantly opposed so the proceedings only remained on paper.

Mangrove logging: the presence of shrimp activity and its high growth has brought with it the disappearance of thousands of hectares of mangroves, this ecosystem is of great importance since it is mainly the habitat of several species that serve to feed people, its extraction and subsequent sale to the public is the economic income of more than 60% of the families that inhabit the island, it is also the habitat of several.

The concept of sustainable development appears in 1987 in the Brundtland report by the United Nations, defined as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*". The concept has been characterized by being markedly more flexible and by proposing a comprehensive and integrating vision of the well-being of societies (López et al., 2018).

The development of the population and its production has brought with it environmental problems that increasingly harm the life of both the different ecosystems that exist and that of people, the advance of technology and the industrial area has caused an accelerated growth of global warming among many other problems. If the population continues its development at the pace of recent decades, it is likely that it will end up becoming a catastrophic event, since the productive system is causing irreparable damage to the biosphere, where the quality of life of the present generation and the future of all humanity is definitively affected (Sanz, 2019).

It is important to deepen the link between sustainable social development and environmental education since strategies can be consolidated to address current problems since education is a strategic use value for teaching people (Luna-Nemecio, 2019).

Environmental conflicts are the cause and consequence of deep economic and social inequalities in contemporary communities (López et al., 2018). Many populations around the world are affected by social inequality, a few cents for people living in places of extreme poverty leads them to carry out unsustainable activities affecting their own health and destroy the environment in which they develop. The concern to care for and conserve natural resources has led governments to take action on the matter with the application of strict environmental protection laws, which regulate several activities, several organizations have also been founded that defend and ensure the integrity of natural spaces and their species. Even so, achieving sustainable development remains an important objective on international agendas, although the concept of sustainable development was based on the growing environmental deterioration caused by human activities.

The role of bioethics in social development Fritz Jahr from the union of the Greek words bios and ethos, coined the term bioethics in 1927 to refer to the moral relationship that exists between the human being and the rest of living beings and thereby propose an ethics of respect for experimental animals and methods of scientific research (Sanz, 2019).

Bioethics must participate in the advances and new realities that are changing the understanding and the way we relate to our peers and the environment, it constitutes an instrument of deliberation for democracy because it allows to build of instances of dialogue and participation

that propose prudent solutions to the challenges of sustainable development (Polloni & Lopicich, 2017). The current century, XXI, has marked the desire to achieve through concrete and defined actions, the prosperity of all populations through development but in several dimensions not only economically but also socially and environmentally, referring to sustainable development (Polloni & Lopicich, 2017).

Education has taken a high value in the search for the construction and development of citizens, these educational models have adapted to the structures of thought in the environmental field that has ventured rapidly within education (Zárate et al., 2020).

There are different bioethical dilemmas which makes it pertinent to have a social conscience that implies control, anticipation, and action that promotes guiding and building a new social and productive understanding (Cantú, 2019).

Bioethics and sustainable development

Sustainable development and bioethics are intertwined as a discipline that aims to guide the relationships between people and ecosystems, that is, the bridge between science and humanity, guaranteeing the conservation and protection of the various forms of life on the planet (Estrada et al., 2018). Bioethics acquires importance as a tool for reflection and analysis of the processes related to sustainable development, that is, the moral analysis that constitutes the differentiating character of the human species from the rest of the species that inhabit the biosphere. According to Estrada et al. (2018), emotion influences important trends in decision-making, the person can take measures related to the conservation of a site or a species that is affected, without the intervention of their passion, emotion or moral conscience it is possible that the biosphere was greatly affected by the bad decisions of people. Bioethics and socio-environmental well-being.

According to Potter, quoted by Heinzmann & Fonti (2014), about Bioethics, it was to propose a new discipline of concern for progress and growing technological development which made fear for the future. There should be bridges of dialogue between science and humanity. Bioethics incorporates what in ethics would be called a material principle that assumes that the good life is ideal, but also assumes that the material condition necessarily includes the integrity of the community of living beings. Bioethics gives a positive meaning to the relationship between man and nature, the exchange of them generates changes so clear ethical guidelines are needed on how to potentiate life (Gómez, 2020).

Conservation of natural resources

Natural resources are used by human beings to meet their subsistence needs such as food, health, economy, and others; This has become a source of life and development for the community. Man makes use of resources not only has personal benefits but also helps the community to have better local development, all use of natural resources must be subject to sustainability so as not to compromise that of future generations (Orellana & Lalvay, 2018). The development of tourism takes on a greater relationship between man and natural resources, which leads to the development of new ways of maintaining a balance in the use, care, and preservation of resources. There are many activities that today are very close to natural spaces that are altered so it is important to consider the fundamental care and conservation of a place before carrying out any activity.

Influence of bioethics on conservation

The United Nations in 1992 promulgated the Convention on Biological Diversity, to this convention 193 countries adhered where the conservation of biological diversity, sustainable use, and fair and equitable sharing of genetic resources were supported (Bermúdez & De Longhi, 2015). In 2005, the United Nations Educational, Scientific and Cultural Organization (2005), adopted the Universal Declaration on Bioethics and Human Rights, directing states to provide guidance for decisions or practices of individuals, groups, communities, institutions, public and private companies; where its main contribution as a principle of bioethics "protection of the environment, the biosphere and biodiversity". The Declaration of Bioethics and Human Rights highlights defending the intrinsic value of biological diversity and ecological values as well as protecting any species (Bermúdez & De Longhi, 2015).

It is proposed the application of the principles of bioethics common good, justice, autonomy, and responsibility, the common good is oriented to do good in each activity related to the development of projects and the use of natural resources (Leal, 2017).

Identification of the fundamental species on the island.

The mangrove area one of the most important within the province of El Oro is the habitat of many species of great value both flora, fauna, and avifauna that are treasured by the commoners as the main source of economic income. The following table describes the most representative species within Jambelí Island.

Table 1. Fundamental species of Jambelí Island and environmental impact on them.

Species	Common Name	Scientific Name	Environmental Assessment
Flora nisqa	Red Mangrove	<i>Rhizophora mangle</i>	
	White mangrove	<i>Laguncularia racemosa</i>	
	Shell black	<i>Anadara tuberculosa</i>	
Wildlife	Clam	<i>Rachycardium procerum</i>	
	Oyster	<i>Crassostrea iridescens</i>	
	Crab	<i>Ucides occidentalis</i>	
Birds	Pelican brown	<i>Pelecanus occidentalis</i>	
	Frigate magnificent	<i>Fregata magnificens</i>	
	Neotropical cormorant	<i>Neotropic Cormorant</i>	
	Striped egret	<i>Butorides striata</i>	
	Great egret	<i>Ardea alba</i>	

Environmental assessment:

The incidence of the environmental impact in the different species is reflected through different colors, where the yellow color manifests a moderate impact and the green color low impact. Of the 12 species assessed, 8 of them have a moderate impact on the environment on them and the remaining 4 are moderate, fundamentally in species of high consumption in human food. It was determined that of the activities carried out on Jambelí Island. The one that causes the most impact is the aquaculture activity, from the felling of the mangrove to the construction of the pools and the use of machinery, chemicals, and wastewater from the pools, which changed every certain period. (Table 2)

Table 2. Affectations in the aquaculture activity in Jambelí Island.

		Biotic																
		Fundamental species																
		Flora nisqa						Wildlife				Birds						
		Red Mangrove	White mangrove	Shell black	Clam	Oyster	Crab	White mangrove	Shell black	Clam	Oyster	Crab	Pelican brown	Frigate magnificent	Neotropical cormorant	Neotropical cormorant	Striped egret	Great egret
Actions within Jambelí Island																		
Aquaculture Activity	Pool construction	x	x	x				x	x	x	x	x	x	x	x	x	x	
	Wastewater in shrimp harvest			x				x	x	X								
	bomb noise											x	x	x	x	x	X	
	Indiscriminate use of chemicals			x				x	x	X								
	mangrove felling	x	x	x				x	x	x	x	x	x	x	x	x	x	
summation		2			4				3									

Situational analysis.

The island has all the resources to be used by its inhabitants through tourism and the sale of species that serve as food for people, but for this to be used optimally, we must consider the results obtained in the SWOT matrix of Jambelí Island (table 3), where the situation in which Jambelí Island is located was identified, referring to the social development of its commoners, manifesting the need to carry out a training program to improve and strengthen the intellectual and productive capacities of people and thus make better use of the resources they have. who are the main source of their income for the subsistence of themselves and their families.

Table 3. SWOT Matrix.

<p style="text-align: center;">STRENGTHS</p> <p>It has a spa with several meters of sand forming a beach. It has a water plant to supply this vital liquid to the inhabitants. There are several spaces to taste typical dishes of the area with a variety of seafood. It is a 100% tourist site that can receive people of all ages. You can do various extreme sports such as Parasailing, Kayaking, as well as walking on the beach on horseback. Large areas of red mangrove (<i>Rhizophora mangle</i>) are home to a variety of birds, mollusks, and other species.</p>	<p style="text-align: center;">OPPORTUNITIES</p> <p>There are boats that transport tourists at various times throughout the day allowing the normal movement of people from the island to the mainland. Jambelí Island is located 30 minutes from the Parish of Puerto Bolívar. 60% of the population is dedicated to tourism creating an opportunity to have several options of distraction within the island Jambelí.</p>
<p style="text-align: center;">WEAKNESSES</p> <p>Lack of public sewerage. Lack of cleanliness throughout the beach. The inefficient alliance between the commoners, there should be more organization. The educational level is relatively low, so there is a deficit in primary school students. Lack of training for community members who develop tourist activities.</p>	<p style="text-align: center;">THREATS</p> <p>The shrimp activity is destroying the mangrove, because every day the pool areas within Jambelí Island are extended, destroying the natural habitat that is there. Due to strong waves much of the beach has been lost, which makes it necessary to invest large sums of money for the creation of several retaining walls. When large amounts of hectares of mangrove are lost, the habitat of the crab and shells that serve to feed several families decreases. As well as sources of work. Due to the anchoring of the estuary, which is the main maritime transport route of the island, affects navigation and damages boats.</p>

To achieve sustainable social development in Ila Jambelí it is important that the rights of nature are respected, that is why through bioethics it is expected to create a culture of awareness of environmental care for the conservation of fundamental species, for these bioethics as a branch of ethics seeks to generate that awareness in people where respect for life and the environment always prevails.

CONCLUSIONS

The participation of the authorities in the decisions of Jambelí Island plays an important role in the correct development of the activities carried out there, being the regulatory entities in decision-making, and ensuring that what is established by Ecuadorian laws is complied with, always respecting the rights of the community members and the people who live there.

The representatives of the shrimp farms must present an action plan with corrective measures to minimize the impacts caused by the aquaculture activity and guarantee that there is environmental remediation that mainly includes the reforestation of the mangrove and the different species found there.

The pools that are no longer used in the aquaculture activity can be filled and carry out some projects for the benefit of the community and conservation of the environment on the island.

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