

ECOTOURISM AS INNOVATOR IN A CONSOLIDATED DESTINATION. A CASE FROM THE ANDES MOUNTAINS IN CHILE.

Sorensen H.^{1*}, Lepe A.²

¹Universidad Andrés Bello, Autopista Talcahuano 7100, Concepción 4260000, Chile

²Nothofagus Science Center, Parcela 36 Las Trancas, Región de Ñuble, Chile

Abstract

Nevados de Chillán is a tourist destination renowned historically for its hot springs and by possessing the longest ski slopes in Latin America. But in 2011 the Biological Corridor Nevados de Chillán - Laguna del Laja was designated by UNESCO as a biosphere reserve, never the less tourism has continued to focus on winter activities starting a gradual decline in the number of visitors and overnight rates. During the last few years, multiple strategies prioritize sustainable tourism to turn Chile into a tourist destination of world hierarchy. The present work aims to explore if and how Ecotourism as learning practice, productive activity and worldview may influence innovation in a consolidated tourism destination otherwise facing declination or possible over tourism.

To this end, two lines of research were developed: one that follows Ecotourism students who investigate and create ecotourism products. The other assessing the impact of local actors on sustainable development, with an emphasis on tourism. The students, referring to thirty-three sites of tourism interest, produced twenty-seven work reports and completed six thesis works, based on new scientific knowledge of the reserve. The recorded information indicated that the presence and integrated actions carried out by multiple actors linked to ecotourism could promote conservation, positively impact local community, create economic sustainability and influence the expected development of the destination. This can be measured by the creation of innovative tourism products, participation in community organizations, leadership and the performance of important activity, individual and collective, almost all related to social, economic, environmental and cultural issues thus supporting expectations of a future different from simple vegetative development.

Keywords: Ecotourism, Biodiversity Reserve, Innovation, Tourism Destination, Scientific Tourism, Impact analysis

1. INTRODUCTION

1.1 Tourism policies in Chile

In the year 2010 the State of Chile promulgated Law N° 20.423 [1], which created a new institutional system for the development of tourism, to recognize the industry as a strategic economic sector and address the gaps, potentialities and opportunities that characterize it. This system saw new organizations with roles and responsibilities in tourism, including the Committee of Ministers of Tourism, the Undersecretary of Tourism and the National Tourism Service (existing since 1975). Within its functions, the Undersecretary of Tourism has the task of coordinating and articulating the multiple actors interacting in the sector, as well as providing immediate collaboration to the Minister/President of the Committee of Ministers. In Addition, the Ministry of Economy, Development and Tourism, within the Agenda of Productivity Innovation and Growth, has defined tourism as a strategic sector for the country's economy; due to its high growth potential. The *National Plan for Sustainable Tourism Development* was then formulated in 2018 with the goal to “promote the sustainable development of the sector, through actions in prioritized tourist destinations of the country, that allow its internal recognition as a relevant economic sector and improve the competitive position of Chile” [2].

The aim of this structural and institutional transformation of the sector into an economic field was not only to mobilize action, it was also to generate equity, promoting possibilities to different segments of the population of enjoying the natural and cultural heritage of Chile, activating alternatives in the

territories to develop their potential and offer growth possibilities to the industry. As a first step in this direction the *National Strategy for Tourism* was elaborated with the participation of all relevant actors in 2011, which stated as its vision: “At 2020, Chile will be recognized as a world-class tourist destination, admired and known for having an attractive, varied offer, sustainable and of high quality” [3].

Turning Chile into a world-hierarchy tourist destination will require a way to take advantage of the Sustainable resources in the country, as well as designing and carrying out tasks in a consensual manner, establishing a charter of navigation with coordinated actions. In other words, developing a roadmap that allows to enhance the tourism products and services that Chile offers to the world. To advance the accomplishment of this challenge the Division of Studies and Territory of the Undersecretary of Tourism together with the unit of Destinations Territory and the Environment, reviewed and updated the last list of tourist destinations from 2017 and published a study of the tourism intensity and definition of Tourism Destinations in 2018 [4]. The determination of these destinations used a methodology that consisted of two stages. The first, corresponding to a factor analysis that generated a tourist intensity index based on the existing and available statistical information from the 346 municipalities in the country. The second, corresponding to the identification and delimitation of the territories that meet the condition of a tourist destination. The identification and delimitation of tourist destinations used the definition present in Decree N ° 30/2016, regulating the procedure for the declaration of areas of tourism interest (Zona de Interés Turística ZOIT). It used the following definition for tourist destination: “a geographic space, physical delimited and administratively, formed by a set of natural and cultural tourist attractions; tourist services; complementary equipment and infrastructure; accessibility conditions; image, human resources and local identity, which motivate the displacement of tourists and the development of associated tourist activities.” [1]. Key factors were the presence of tourism services registered in the National Tourism Agency (Servicio Nacional de Turismo, SERNATUR) and tourist attractions of all hierarchies. From the above, 89 tourist destinations were identified (41 consolidated, 34 emerging and 14 potential), which cover around 200 municipalities and represent, about 84% of the sales from companies related to activities characteristic of tourism [4]. The same study characterized the destinations by type due to their geography and tourism vocation, mentioning: coastal, urban, rural, rural and natural, mountainous; lakes, and finally rivers and islands. Nevertheless, the study also stated that Chile has a concentrated offer in few destinations that mostly present insufficient level of product development and tourism experiences. It concluded that “the integrated development of new destinations and tourism products will help to improve the dispersal of tourist activity of the country, to avoid exceeding the carrying capacity of popular destinations, increase spending and stay for tourists and to position Chile as a more attractive country to visit. [4].

1.2 The study area

The present investigation took place in one of these destinations, namely the mountain valley called “Valle de Las Trancas - Termas de Chillán” which corresponds to a combination the following two sets of characteristics:

- Tourist destinations of **rural and nature type**: integrating tourist activities of diverse type, that have as common denominator their localization in rural areas and in natural areas, including national parks and other protected spaces, having services usually offered by the local community, becoming a complement of other productive activities that generate an income to the local communities and providers of tourist services.
- **Mountain-type** tourist destinations: formed by a populated center that has supporting equipment and facilities (lifts, viewpoints, etc.), whose main function is orientated to the practice of activities and sports in mountains and high mountains, as is the case with ski resorts. However, nowadays many activities such as thermal baths, spiritual retreats or environmental interpretation, are attractions in mountain areas, giving rise to new products and services. [4].

The geographical location of the study area is central Chile about 500 km south of the capital Santiago reaching an altitude ranging from 600 m to 3400 m above sea level belonging to the Municipality of Pinto in the Region of Ñuble, ranking thirty-nine of Chilean Municipalities in tourism intensity [4].

Simultaneously the study area, enjoys two additional denominations: one from 2011 a UNESCO Biosphere Reserve called Nevados de Chillán-Laguna del Laja, which covers approximately 6000 ha. [5], and since 2018 an official declaration to be a Zone of Tourism Interest (Zona de Interés Turística) which declared that: “ the territory called Pinto has a diversified tourist offer composed by Snow Tourism and Winter Sports, Medicinal Tourism and Wellness, Mountain Tourism, Adventure Tourism, Cultural Tourism, Ecotourism and Agritourism”. “That the territory called Pinto, has a diversity of service offers and consolidated tourist activities, which have quality and environment friendly equipment, such as ski resort, recreational complexes, hotels, hostels, cabins, lodges and Campsites, among others” [6].

According to the Action Plan proposed for the declaration of ZOIT, “the special conditions for the tourist attractions identified for the territory, that motivate the flow of visitors, are mostly to be found in the Biosphere Reserve Nevados de Chillán-Laguna del Laja, one of the main attractions being the volcanic complex Nevados de Chillán, which gives visitors an experience of snow activities and natural hot springs” [7]. It continues: “Development of events and conventions for different target markets, which allows to break with seasonality and keep tourist flows all year round should be promoted. It is important to highlight the cultural and rural tourism where the traditions of the countryside are shown, through markets and festivals customs and agricultural activities that complement the existing offer associated with Snow, nature and mountain” [7].

Following the UNESCO Man and Biosphere Program, [5] this Reserve is divided into three different zones: The Core consisting of three protected areas all National Parks, the Buffer Zone: consists of 395.010 ha, which equals 70% of the territory and the Transition Zone where various sustainable activities may be executed covers 73.954 ha. Following the legal framework for Biosphere Reserves a committee of eight members from the Regional Government is in charge of the management and monitoring responsibilities and additionally a counsel of 28 public and private stakeholders has the task to supervise the fulfillment of the Management Plan. According to the Regional Government important challenges both in the fields of production, investigation, education, and the environment must be met in the area. In terms of tourism although 800 thousand visitors arrive annually to the Biobío Region and 57% come motivated by natural and wilderness attractions, they stay for a short time due to the lack or deficient quality of tourism services and an increase in that number is wished for and declared in the National Tourism Strategy. [8]

About 8.000 people live in seven local settlements in the Biodiversity Reserve, with about 2000 inhabitants in the range Las Trancas-Recinto-Los Lleuques concentrating the mayor tourism development due to growing accommodations and a skiing resort. This sector also called “Nevados de Chillán” due to the snow covered volcano is a tourist attraction historically known for its thermal waters and for possessing the longest ski slopes in Latin America. The tourist complex of the same name has 28 tracks equipped for a total of 35 kilometers. Additionally, between the valley of Las Trancas and Termas de Chillán there are more than a hundred tourist establishments, including cabins, restaurants, handicraft shops, sports activities and small formal and informal businesses destined to meet the demands of tourists. Most of them operate in a seasonal way, with two seasons considered high: The winter, with activities of skiing, and snowboarding and the summer season that is gradually gaining more importance. It is the area of the municipality where the largest tourist offer is concentrated,

Despite this its overnight rate, reaches less than half of other similar places such as Pucón, Pichilemu and La Serena and can be considered ‘Low’ [8]. Additionally, according to the results presented by the Monthly Survey of Tourist Accommodation of the National Institute of Statistics in April 2017, the average stay of foreign tourists was 1.81 nights, while national tourists reached 1.64, a minimum difference of 0.17 points in the Biobío Region [9]. It is worth mentioning that the rate of the average stay is given by the quotient between the overnight stays and the arrivals of the tourists.

Possibly these figures are due to a high seasonality, with an offer that depends every year on the amount of snowfall, facing the last few years the certain threat of climate change. However, this territory has a high biodiversity, with abundant native flora and fauna, and a landscape variety with lagoons, rivers, waterfalls, volcanoes and hot springs, constituting the presence of high-ranking tourist attractions that could on their own attract important tourist flows. Both the biodiversity and the two volcanic complexes

and a set of geological formations present constitute a heritage of inestimable importance, as well as collections of geological formations of scientific, cultural or recreational value, which show the evolution of the territory in the last 30 million years. However, the aforementioned, tourism activity has continued to focus on winter activities initiating a gradual decline in both the number of visitors and overnight rates, which adds to the high seasonality, maintaining a low relationship between the traditional activity and the new status of the geographical environment.

1.3 Management of nature and people

Regarding its biogeographic characteristics, the area is located at an average height of 1600 meters above sea level [10]. The climatic conditions vary due to the influence of the Andes, with an annual rainfall average of 1875 mm and its mean temperature is 12.4 °C, with a range of averaging between 6 °C in winter and 20 °C in summer [11]. The rainfall season lasts about 6 Months and those fronts occur mainly because of low-pressure fronts that come of the Pacific Ocean [12]. In terms of disasters by natural phenomena, Chile ranks 11 among the countries most exposed to natural hazards in the world [13]. The main disaster risks include floods, extreme temperatures, wildfires, earthquakes, volcanic activity, storms and landslides [14].

The Ecosystems Project for the Protection of Infrastructure and Communities (EPIC) was implemented by IUCN in Chile between 2013 and 2017 in partnership with the Swiss Institute of Research in Snow and Avalanches, the Ministry of the Environment and the Regional Ministerial Secretary for the Environment of the Biobío Region as well as in collaboration with the Regional Government of the Biobío Region. EPIC's main goal in Chile was to promote the protection and management of forest ecosystems for the role they hold in Reducing Disaster Risk and contribute to Climate Change Adaptation. The site of study at the local level was the Valley of Las Trancas and located in the transition area of the Biological Corridor Biosphere Reserve Nevados de Chillan- Laguna del Laja. The research component developed: (1) A model to demonstrate the native forest's ability to reduce avalanche impacts and (2) other complementary studies on local perceptions of risk, climate change and ecosystem services of the native forest. In Las Trancas the main activity is tourism, therefore it has had an accelerated urbanization to meet the demand of tourists arriving in the area mainly for skiing, trekking and visiting the hot springs. The study recommended that: "The main challenge to protect Chilean communities from the potential risks of natural hazards aggravated by climate change (such as landslides, droughts, fires and flooding) was to reconsider a land planning system that integrates the major value of ecosystems to provide livelihoods and resilience for climate change adaption and to reduce disaster risk" [15].

Following the legal framework for Biosphere Reserves, a Committee of eight members from the Regional Government oversees the management and monitoring responsibilities and additionally a Counsel of 28 public and private stakeholders with the task to supervise the fulfilment of the Management Plan. According to the Regional Government, important challenges both in the fields of production, investigation, education, and in the environment must be met in the area. A multi-stakeholder approach with particular emphasis on the involvement of local communities were to be implemented that should foster dialogue; integrate cultural and biological diversity, and demonstrate sound sustainable development practices and policies based on research and monitoring; and finally the area should act as a site of excellence for education and training.

As can be observed, multiple official public strategies, plans, programs and studies have been overlapping each other in the study area for the last three to four years and all of them prioritise sustainable tourism as an important factor for local development. Most of these initiatives have implemented some form of public participation in their work and the local communities have attended numerous workshops directed by outside consultants or professionals from the regional capital. It seems therefore interesting to mention that the composition of the community mainly consists of descendants from former agricultural activities, forestry and commerce but in recent years, the area has attracted new residents searching for opportunities to adopt a life style away from big cities, stress and consumerism. They want to develop activities more in harmony with nature as for instance foreigners who come to settle in the place, professionals who leave their normal work activity to come to live and work in the Biosphere Reserve. Young families who engage with various initiatives of conservation in the place and students who want to investigate and engage in actions to protect the environment and promote

sustainable development. Ecotourism students from the University Andrés Bello also have found businesses here where to perform their professional internships. They seek knowledge about the landscape, climate, flora and fauna, as well as traditions and culture, which are essential for designing ecotourism products that contain significant experiences while contributing to both conservation and local development.

This phenomenon called amenity migration have been discussed by various researchers [16], [17], [18] who emphasize “the emergence of socio-territorial conflicts and the development of new kinds of relationships between traditional and new inhabitants” [19]. However, it can also lead to the creation of new ways to generate development and local policies in which ecological issues become relevant [20].

In various workshops with participation from both *traditional* inhabitants and *newcomers*, a lack of knowledge of the environmental and cultural values of the territory, its natural attractions and even the concept of tourist attractions by many suppliers, was detected. A situation that in part may explain the almost non-existent offer of tourist products associated with the value of the physical and cultural environment.

In this context, a series of events (milestones) appears that constitute scenarios benefitting the emergence of eco-tourism in the territory. The University Nacional Andrés Bello opens the study program *Management of Ecotourism* in the Biobio Region in 2010, enabling field trips and in the area of Nevados de Chillán for the students. In June 2011 the designation of the Biosphere Reserve Nevados de Chillán - Laguna del Laja by UNESCO occurs. Also in 2011 the National Tourism Strategy was promulgated, which, for the first time, recognizes and defines Ecotourism as an economic activity, with certain requirements and features that legitimize a proposal up to then only a dream or aspiration for environmentalists.

In 2014, the Nothofagus Science Center was founded as a private initiative with the aim to contribute to the conservation of natural heritage present in the Reserve and the training of young researchers. It initiates various baseline studies in January 2015, envisaging the future development of scientific ecotourism activities.

These initiatives and super structural measures generated expectations in the local community related to the possibility of a more sustainable progress. Expectations that never the less rapidly transformed into disappointment due to lack of initiatives from municipal and regional authorities. The appearance of external actors that adhered and actually acted on the new paradigms catalyzed these concerns; a fact not recognized as common in community development. Is this a matter of cultural modernization? Is it a result of impulse and energy generation, in which young people manage to impose a different political style? Is it the influence of ecotourism, with its integration of nature conservation and the importance of local community?

This context of kaleidoscopic planning activity, social dynamics including the negative and positive impacts of tourism set the scenery for this investigation. The main interest of this study was to discover the influence of Ecotourism on the development of the area, including the influence people who engage in sustainable community activities might have on their fellow beings...humans as well as those belonging to the more-than-human-world [21].

As a result, the objective of this research has been to explore if and how the ecotourism as a productive activity, world view and practice of learning can influence innovation in a consolidated tourist destination, which on the contrary could face a possible decline or over tourism [22].

For this purpose, two specific research units were designed: one that followed groups of ecotourism students who were part of an active process of research, which aimed at the creation of innovative tourism products in the biosphere reserve. The other aiming to assess the possible impact local stakeholders could exercise on sustainable development with special emphasis on tourism. Considering newcomers, locals, renting businesses, tour operators, community organizations, restaurant owners, neighborhood committees, and the Municipal Counsel.

Regarding the first study objective it may be relevant to comment that the usual disciplinary scientific approach, has not, until very recently, bothered with an integrated approach to nature and culture or the

interpretation of this for visitors; but the concept of resilience has lately put this relationship on the menu as a change of perception considering people and nature as separate parts of the interdependent social-ecological system [23]. In this context, ecotourism could be a valuable social tool to diversify tourism proposals and contribute to the conservation of natural heritage.

2. METHODS

2.1. The case

By choosing to focus on the Biosphere Reserve, the research project turned into a case study. In fact, it represents a case of local development, with the purpose of exploring the place-based studies of Ecotourism students and local stakeholders' organizational practice and eventually assessing whether ecotourism could act as an innovating force to link conservation and sustainable development objectives. The approach was *descriptive*, as the objectives was not the testing of a theory. The case may however help to build one, although it foremost provides knowledge referred to a phenomenon. The time lapse was established from the declaration of the Biosphere Reserve in 2011 until the present. Moreover, this case study falls within the category of a single case with two embedded units of analysis [24].

The methods implemented in this exploration build on the findings from earlier studies: first the empirical field work developed from 2015 to 2018 with Ecotourism students and graduates which as such consisted in a semi longitudinal involvement leading to the co-creation of scientific knowledge and proposals for innovative Ecotourism products and services.

Second a follow up of an impact analysis initiated in the year 2016 using the Theory of Change [25] in order to help determine the impact of the various stakeholders in the sustainable development of the study area.

The results of both studies were analysed and crossreferenced in order to obtain an integrated picture of the influence of Ecotourism on the foreseeable development in the area. The chosen indicators were a) the actual creation of innovative tourism products, b) the agency of stakeholders engaged in Ecotourism endeavors such as power relations, participation in community organizations, leadership and holding of important positions.

2.2. Study Unit 1: Ecotourism Students.

The experiment started in January 2015 when five students answered the invitation from Nothofagus Science Center (hereinafter the Center) to complete their professional internship there. The objective was for the students to initiate the baseline studies of potentials for scientific tourism in the Biosphere Reserve Nevados de Chillán-Laguna del Laja.

The students were challenged to define their own personal learning goals and urged to co-create propositions for new experiences of geotourism, miniature tourism, photo safaris and bird watching. During the stay every student wrote an individual report with his or her findings using technical instruments such as GPS, designing route maps, data registration, photographs, field guides etc. they also used relevant discoveries made by their companions in their final proposals, as well as imagined the significance for visitors. Additionally, they were asked to write about the personal development and meaning the stay had for them.

In this way, an educational investigation began, heuristic in scope and open in structure, sensible to place, people and conditions but oriented towards the discovery of the potentials for co-creation of knowledge about nature/cultures in this setting. During the following summers this type of experience was repeated with Ecotourism and Geology students whose study programs require field activities. Everyone who participated in this work did so voluntarily, although it was not always clear if there would be a result at the end of the road. The field stays were carried out during periods of practice (summer), in workshops; in research seminars or during the realization of their Graduate Project.

During these periods, the student researchers freely explored the territory by selecting places (sites) that had notorious traits of interest whether scenic, biodiversity, geomorphology, or any characteristic associated with activities or attractive experiences for tourism.

The research was exploratory, in all its broad meaning, since there was no history of a similar work, neither written information nor a validated methodology that was applicable to the scenario and the objectives raised.

Given the existence of an indeterminate number of sites, not previously identified or registered, it can be considered that these have been selected by means of a discretionary, intentional or opinático sampling based on the experience and intuition of the researchers.

The work was carried out over a period of 3 years and many sites were selected by more than one investigator and/or according to different thematics. As such the study was based on a case, developed in three different stages with different prime actors during the summers of 2015, 2016 and 2017. It can be inscribed in a social constructionist view.

Each student, depending on their curricular requirements, had to integrate their data and the information produced in the different Reports required by the respective subject.

At the same time, the information associated with each site was stored in tokens or units of information, which created the basic pieces for the design of a product or future experience.

Each of these units constituted a piece of a puzzle that could allow to complete and deepen the knowledge of each site or to construct thematic proposals associating the knowledge of the same discipline obtained for different sites.

In the same way, the system facilitated the creation of products with different themes or objectives that could be built based on the existing information. For example, products such as geotourism, ecotourism with magnifying glass, scientific camps, etc.

This is basically a qualitative approach although many elements are characteristic of a quantitative methodology (analyzes of the objective reality, there is possibility of replication, there are data that facilitates predictions, etc.) the relevant thing is that the phenomena have different contexts: they intervene multiple subjective realities; The meanings are extracted from the data; There is diversity and richness of interpretation, etc.

Regarding the collection of formal information for baseline studies aimed at establishing the potential of each site for scientific tourism, a combined learning model was applied. Problem-based “the work begins with a need to solve a real world problem” [26]. In addition, Place-based learning that prioritizes fieldwork by exploring its identity marks [27] this way the investigating students were challenged to identify gaps in the knowledge base and connect these to the opportunities given in the physical and socio cultural surroundings in order to co-create different levels of proposals for tourism products.

The students, formed teams, identified "sites" or places of interest, recorded their physical characteristics, geomorphological, ecological, landscape and any element that could constitute or give rise to a tourism attraction. From this the reports various elements were disaggregated and "information units" were obtained, by site of interest and by topic, generating a deck of 108 useful units to configure various ecotourism-type products.

2.3. Study Unit 2: Local stakeholders.

A Theory of Change [28] was implemented to assess the changes occurred the last three years regarding community actions influencing sustainable tourism development. This method was originally implemented in 2016 with the aim to explore observable changes in relation to the declared goals or benefits for the Biosphere Reserve as it should be a site of “excellence where innovative sustainable development approaches are tested that combine scientific knowledge and governance modalities with a view to reducing the loss of biodiversity, improve livelihoods and promote social, economic and cultural conditions for the sustainability of the environment” [5].

In this case, the Theory of Change was used to explain how the observed activities could be understood as contributing to a chain of results (short-term outputs, medium-term outcomes) able to produce the ultimate intended or actual impacts. It included positive impacts (which are beneficial) and negative impacts (which are detrimental). While many theories of change are represented as a simple, linear process, most development interventions have complicated and/or complex aspects, which are important to acknowledge and address [29]. Accordingly the evaluation distinguished between simple, complicated and complex aspects of interventions and their associated Impact focus such as:

Table 1. Types of Impacts

Level	Attribute	Operationality	Replicability	Difficulty	Impact focus
Simple:	Known' Standardized – a single way to do it	Works pretty much the same everywhere / for everyone	Best practices can be recommended confidently	Knowledge transfer	Did it work or is it still working?
Complicated:	'Knowable' Adapted – need to do it differently in different settings	Works only in specific contexts that can be identified	Good practices in particular contexts	Knowledge translation	What worked for whom in what ways and in what contexts?
Complex:	Unknowable' Adaptive – need to work it out as you go along	Dynamic and emergent		Ongoing knowledge generation	What is working in the current conditions? What is the best way forward at this point in time?

Source: Adapted from RARE Conservation ORG. [30]

To this end data was gathered from the Municipality of Pinto, the administrators of Ñuble National Park, small and medium tourism services and operators, other local businesses and tourists as well as online advertising, documents from ecotourism students thesis work, interviews with three local tourism operators were conducted.

The stakeholder information was registered counted and organized according to type of stakeholder, type of events and type of participation in the events whether promoter, active or passive assistant. The interviews were recorded, transcribed and coded to categories related to community development, satisfaction with performance from public agencies, nature based tourism and visitor management.

This original Theory of Change analysis was followed up during 2018 with a new one as two important events took place in the area then: The proposed installation of a Hydroelectric power plant inside the Biodiversity Reserve, threatening the River Diguillin and: The approvment of the Action Plan for the development of the Zone for Tourism Interest.

Observant participation was now undertaken during protesting demonstrations, organization of fundraising, participation in meetings and workshops, local events such as Festivals, Fairs, Community Walks, Sports competitions and Mountain Clean Ups, where videos and recording helped register interactions, and the communication via Social Media such as Facebook, Websites and Whatsapp by cellphones were added.

3. RESULTS

3.1. Study Unit 1:

A total of 27 reports of field work were produced by the Ecotourism students, referring to 33 sites, from 7 subjects or different dimensions, of which 12 was considered significant from the point of view of the tourist interest. The baseline information analyzed and reordered resulted in 108 units of information, referring to the 33 sites. From these one thesis work based on the Geological Evolution of the Volcanic Complex (23 million years) was completed; Another related to the observation of Bryophytes and Lichens invited to explore the miniature world; A Study Tour for high school students was developed, an experience offering Ecotourism by night (Star gazing) was proposed, another inviting to a six days voyage through the Biosphere Reserve, finally a Geotourism Circuit and an Inclusive Ecotourism Center completed the results of this experimental work to generate innovative tourism products .

In Tables No 2 and 3 obvious interpretations are showed. Table No 4 shows the amount of baseline studies (layers of information) associated with each of the sites selected as most relevant.

This allows for a global idea of the information obtained, as well as the missing information or layers.

Table 2. Significant Numbers of the Process

SIGNIFICANT NUMBERS OF THE PROCESS	
Number of finished studies	27
Number of sites studied	33
Number of significant sites	12
Number of baseline studies	108
Number of designed tourism products	6
Number of tourism products in design stage	2
Number of students doing internship at NSC	15
Number of students performing thesis on R. Biosphere	4
Number of students currently completing thesis work	5
Number of students who have participated in the research	50

Source: Arodys Lepe Z.

Table 3. Completed designs of Ecotourism Products

DESIGNED TOURIST PRODUCTS
Seis días tras la huella del huemul. (Six days in the of the Huemul)
Historia evolutiva del Complejo Volcánico Nevados de Chillán. (Evolutionary history of the Volcanoe Complex Nevados de Chillán)
Indicadores de sustentabilidad para la RB N. de Chillán-Laguna del Laja (Sustainability indicators for the Biosphere Reserve Chillán-Laguna del Laja)
Ecoturismo con Lupa en el Complejo Nevados de Chillán (Ecotourism with a Magnifying glass in Nevados de Chillán)

Ecoturismo sin Límites - Proyecto Centro Ecoturismo Inclusivo (Ecotourism without border- Project Inclusive Ecotourism Center).
Gira de estudios como producto ecoturístico en la Reserva de la Biósfera. (Study Tour as an Ecotourism Product in the Biosphere Reserve).

Source: Arodys Lepe Z.

Table 4: Specific information per site

DETAILED INFORMATION FOR EACH SITE

SITES	Ecotourism Description	Geological History	Geology	Petrology	Geomorphology	Bryophytes and Lichens	Trail proposals	Other	Total
Aguas Calientes	1		1		3	4	1	1	11
Complejo Volcánico		2		2	2	2		2	10
Bosque Perdido	1		3	2	4	2		1	13
Garganta del Diablo	2		2	1	3				8
Gruta Los Pangués	1			1	2	1			5
Laguna del Huemul	2		1	1	3		1		8
Lavas Lanalhue	3		3		3				9
Meseta Palo Huacho			1	1	2	1			5
Patio del Cóndor	2		3		1				6
Shangri-La	1		2	1	4	2			10
Tierraverde	1		2	1	4	4			12
Volcán Renegado	2			1	4		1		8
Otros	1				1	1			3
TOTAL	17	2	18	11	36	17	3	4	108

Source: Arodys Lepe Z.

3.2. Study Unit 2:

In table number 5 below, the registered activities considered relevant for the destination according to the different stakeholders are listed. The source of information, the role of leadership and frequency of the activity, as well as its impact area are shown in columns two, three, four and five. The last column indicates if this impact has been considered to increase or diminish during the last three years marked with + or -. Finally, *new* activities and stakeholders have been added in *italic* and the ones disappeared underlined to indicate changes in the composition and consequently the power relations.

Thus, a Theory of Change has been created that shows the variety of activities related to the ongoing destination development and it is possible to extract the level of impact of these activities on the area.

The results or outcomes indicate an increase in both frequency and influence of Ecotourism relevant activities lead by stakeholders positive to Ecotourism. Additionally, the analysis of the interviews highlighted the following categories related to a worldview compatible with ecotourism: *being able to work outside, having time to follow my interests, know people from the community, and participate in conservation and environmental activities, study biodiversity, pursuing a less stressful family life, live in the mountains and support sustainable tourism*. As in every place, also disagreements between people and organisations were mentioned and discovered during meetings, mainly due to different approaches to offerings made by big private enterprises such as a hydropower plant or a five-story hotel, that flash money to get local approval. This is a discussion that crosses the composition of the inhabitants, both original and newcomers and it reflects the difficulty of sustainability implementation. Never the less this does not diminish the relevance of the impact analysis.

Table 5: Impact Analysis

Activities	Data Sources	Leadership	Outcomes/ frequency	Impacts (on) *	Increased/ Diminished
Avellana Festival (Native nut tree)	Local Community	Neighborhood Committee. Municipality	Yearly	1	+
Mountain and River Clean Ups Campaign	Local Community	Local Environmental NGO	Yearly	1 - 2	++
<u>Free Guided</u> Nature walks	Regional Urban Visitors	Ecotourism Operator	12	1 - 3	-
Natural Music Festival	Local Community	Young residents	Yearly	1	+
Sustainable infrastructure	Ecotourism Operator	1. Manager 2. Director 3.Privateperson	Operators Office, Science Center, House	2	++
<u>Sustainable Tourism</u> <u>Seminars</u>	Local Tourism Branch	Local Tourism Branch	2 cases	2 - 3	-
Investigations about Ecotourism	Ecotourism Students	University	21 Scientific works	2 - 3	+++
Investigations about the Biosphere Reserve	Ecotourism and Geology Students	Science Center	27 Scientific works	2	+++
Tourism Quality Scheme	Hotel and Cabin Owners	Regional Tourism Agency	20 in process	2 - 3	++
New Ecotourism Operators	Local Ecotourism Managers	Ecotourism Operators		3	++
Sustainable Businesses	Small Business owners	Young new residents	Coffee Shops. Ski and Bicycle Rentals Yoga Center, Healthy Foods, Bakery,	1 - 2	+++

New Ecotourism Services	Ecotourism Managers	Ecotourism Operator Ecotourism Students	Eco-Park Trekking Bicycle Routes Horseback Riding Bird watching Jeep Safari Sunset tours Astronomic tours	1 - 2 - 3	++++
Summer camp in the forest	Local Ecotourism Managers Parents	Ecotourism Operator	4 summers	1 - 2	+
Outdoor Fieldtrips	Regional University	Ecotourism Graduate Program	6 four day field trips a year	2 - 3	+++
Visits to National Park	Tourists/ National Park Manager	Ecotourism Operators Tourists	1.843 visits in january-february 2016. 2000 visits in january-february 2018	1 - 2	++ -
Meetings	Biosphere Management Committee	Regional Government	2 yearly		0
Enforcement of Tourism Standards	Local Tourism Branch	Regional Tourism Agency	1	1	++
<i>Municipal Ordinance for Recreation</i>	<i>Municipal Council</i>	<i>Green Counselors</i>	1	2 - 3	+
<i>Protesting campaign against Hydropower plant</i>	<i>Local community</i>	<i>Ecotourism professionals</i>	<i>Ongoing Monthly events</i>	2 - 3	+++++
<i>Declaration of Tourist Interest Zone</i>	<i>Municipality</i>	<i>Local community</i>	<i>Ongoing Monthly events</i>	1 - 3	+
<i>Community Organization</i> <i>Free the Diguillín River</i>	<i>Local community</i>	<i>Environmentalists</i>	<i>Ongoing Frequent Events</i> <i>Daily communications</i>	1-2	+++++
<i>Local Food Market</i>	<i>Community Organization</i>	<i>Community Organization</i>	<i>Weekly</i>	1	+
<i>Local Artisan Fair</i>	<i>Municipality</i>	<i>Artisans</i>	<i>Weekly</i>	1	++

(*) 1 Social, economic and cultural conditions / 2 Sustainable development / 3 Ecotourism Products

Source: Sorensen & Lepe, 2016 -2018.

4. DISCUSSION

Although the results obtained from the two lines of inquiry stem from different scientific traditions they both relate to a qualitative paradigm, and although they are not readily comparable, the authors consider that for the purpose of responding to the study question regarding the degree of innovative influence of Ecotourism in this tourism destination, they are sufficiently documented. The intention of the presentation of this case from the Chilean Andes Mountains is not to “probe” a hypothesis but rather to illustrate the power of a new approach to recreation in natural areas which highlights the sometimes-messy reality of social life.

A detailed analysis of the results obtained in this study considering the diversity of associated researchers (the Ecotourism students) and interacting stakeholders, clearly shows the exploratory nature of this work. The "study units" were adapted and kept evolving during the investigation and the contents and parameters considered are not identical.

The number of studies carried out for each site are not the same, product of the freedom of options given to the students, as part of the methodology used. The Theory of Change is precisely a changing phenomenon of which the current representation is sort of an instantaneous.

These facts do not remove, however, the value of the results as they are contextualized in real scenarios and express an interpretative richness that does not hinder the extraction of meanings from the data.

5. CONCLUSIONS

The comprehensive review of the results indicates that the presence and actions carried out by multiple actors contributed to generate, implement and live by the principles of ecotourism. This presence also promoted nature conservation and local community development; created the basis for economic sustainability and a practice of hospitality that exercised a tangible impact on the expected development of this rural natural destination, characterized by its forests and mountains. The creation of innovative tourism products, the influence of collective and personal agency on power relations, participation in community organizations, leadership and holding of important positions all constituted evidence of this assertion.

In relation to the first line of work the results show that it is possible to generate basic scientific information that allows to develop ecotourism products, offering new services, other than the traditional ski slopes and hot springs. In addition, the methodology of cogeneration of knowledge and the incorporation of undergraduate students as researchers proved to be useful to the pursued objectives, although there still is room for more demanding studies. The analysis demonstrates that more precise definitions of the parameters for each step could contribute to the methodology, as well as the application of similar layers of analysis and the same criteria to all the sites would allow for a more profound evaluation and decisions making for the design of specific tourism products.

A deeper public knowledge and appraisal of the existing natural heritage (biodiversity and geomorphology) of the Biosphere Reserve Nevados de Chillán-Laguna del Laja promoted by a range of tourism products and services could constitute a promising brand that would contribute significantly to the conservation of this heritage.

At the same time, the impact assessment of the activities that influence the sustainable development of this tourist destination showed that both ecotourism students and professionals as well as other declared ecologists have been (and still are) important actors exercising leadership and agency towards a more sustainable future for the destination, capable of renewing the existing perception of it with innovative dimensions.

In this case, the "amenity migration" as designated by Janoschka [20] has been observed clearly, stressed and fed by the recognition of the territory as a Biosphere Reserve and the emergence of environmental projects that threaten it. In these conflicts, it was revealed that those who have greater knowledge of the environmental and cultural values of the territory and its natural attractions and greater awareness of the need for preservation were young students, ecotourism professionals and newcomers (the last 20 years). In fact, they have achieved significant levels of integration with the traditional local population, but the most relevant actors have been the latter.

From the point of view of the role of stakeholders in the observed process, there are two facts that stand out. One is the role of agitation and "work force" assumed by the younger generation in the various activities of the community, highlighting its distinctive contribution to the dissemination and use of the social media such as Facebook, Instagram, WhatsApp, and various global online groups.

The other remarkable fact is the irrelevant role that the State apparatus has played in this process. The commitment required by UNESCO when requesting the recognition of a territory as biosphere reserve

is to integrate three main and complementary functions: Conservation; Sustainable environmental, economic and human development; and research and educational activities. In this case activities related to these 3 functions are exercised, but the State, represented by the Regional and Municipal Governments has been absent, reluctant or its achievements have been irrelevant.

By any means, and beyond the quantitative aspects, table No 5 in this paper shows a sustained level of activity, individual and collective, that tends to increase, and almost entirely related to social, economic, environmental and cultural issues. It is further observed that technical aspects of sustainable development, such as the design of tourism products, nature conservation awareness, environmental education and scientific knowledge are still emerging but clearly present in the concerns and actions of this community.

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