

Research paper

# Feasibility of the “Hatun Ñan Ccocha Kunaman” ecotourism micro corredor, apurímac region, Peru

## Viabilidad del micro corredor eco turístico “Hatun ñan ccocha kunaman” region Apurímac, Perú

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### ABSTRACT

*The general objective was: to demonstrate and illustrate the viability of the ecotourism micro-corridor “Hatun ñan ccocha kunaman”, Apurímac región, Peru. The área includes four hydrographic micro-basins, on average they are 60,000 hectares. The population and sample is directed, it is a geomorphological system: the formation of the terrestrial relief by the action of rain, wind and tectonic force, as well as water surfaces, which can be exploited and used by human intervention for its landscape and species of flor and fauna, located between 3,900 to 4,600 masl. Design and level descriptive. There is feasibility the sections present an intensity of average fatigue of walking, which is pronounced when it exceeds from 5 kilograms above the average height; in addition, complementary services such as muleteering, food, staging of rituals and dances can be offered. The construction of infrastructure, with materials from the área, is for leisure or rest, hygiene services in the sections, whose construction does not alter the landscape. The activities that can be developed are: hiking, trekking, camping, mountaineering, fishing in a fish farm. The Price of 84 pen (soles) Will allow to offer service of minimum services. The Project is profitable, at an opportunity cost of 20%, over ten years, it yields a positive result of s/. 72,351.00 pence (soles)*

**Keywords:** conditioning, attributes, organization, operators, accessibility.

### RESUMEN

El objetivo general fue: demostrar e ilustrar la viabilidad del micro corredor eco turístico “Hatun ñan ccocha kunaman”, región Apurímac, Perú. La población y muestra es dirigida, es un sistema geomorfológico: la formación del relieve terrestre por acción de la lluvia, viento y fuerza tectónica, además de superficies de agua, que pueden ser explotados y aprovechados por intervención del hombre por su paisaje y especies de flora y fauna, ubicado entre los 3,900 a 4,600 msnm. Diseño y nivel descriptivo. Existe viabilidad los tramos presentan una intensidad de fatiga media de recorrido a pie, la cual se pronuncia cuando excede a partir de 5 kilogramos por encima al promedio de la talla; se pueden ofertar servicios complementarios como arriaje, alimentación, escenificación de ritual y danzas. La construcción de infraestructura, con materiales de la zona, es para el ocio o descanso, servicios de higiene en los tramos. Las actividades a desarrollar, son: hiking, trekking, campamento, alpinismo, pesca en granja piscícola. El precio de 84 pen (soles) permitirá brindar servicio de paquete de servicios mínimos. El proyecto es rentable, a una tasa de costo de oportunidad del 20%, a diez años, arroja resultado positivo de s/. 72,351.00 pen (soles).

**Palabras clave:** acondicionamiento; atributos; organización, operadores; accesibilidad.

## INTRODUCTION

In the manual on tourism accessible to all, specific to areas of intervention (UNWTO: 2016, p. III, 28) it specifies that measures, actions, projects to improve accessibility must be coordinated and implemented for an adequate use of potential tourist resources. This will contribute at the same time, in planning a regulation, which allows the consolidation of accessible tourism. The step of improvement and projects goes hand in hand with awareness that allows introducing the meaning of accessible tourism in the population, generating awareness (UNWTO: 2016, p. III 29).

The world panorama is the growing concern regarding the advance of differences and inequities in macro-territorial regions, especially in Latin America, as a result of climate change that is becoming progressive and exponential today by 2022 in the case of Europe, from the figures presented by the report Stern (2006); likewise, the summits on climate change have not been able to achieve the development of absolute agreements to curb greenhouse gas pollution; added, the gradual recovery of the scourge that humanity went through; Covid 19, today mutated and known as sars-cov2. Which still keeps the world economy paralyzed.

The measures that many countries have adopted to curb this scourge, such as prolonged confinements due to frequency, have forced a redirection of the practice towards alternative tourism, implementing a strategy of economic recovery in the population, based on natural and experiential tourism, which allows strengthen the ties between tourism, ecology and community relations.

Nature tourism is defined as: that environmentally responsible tourism modality consisting of traveling or visiting natural areas [...] in order to enjoy, appreciate and study the natural attractions (landscape, flora and wild fauna) of said areas, as well as any manifestation cultural (present and past) that can be found there, through a process that promotes conservation, has a low environmental and cultural impact and [...] constitutes a social and economic benefit for local populations (Ceballos Lascuráin, 1996) Ecotourism emphasizes the use of environmental and social studies, as well as long-term monitoring programs, to assess and minimize the impacts of tourism. It strives to maximize economic benefit for the host country, local businesses and communities, living in and adjacent to natural and protected areas (Subtrato and Huibin 2018).

At the regional level, the Concerted regional Development Plan of the Apurímac region. (PDRC to 2021) indicates that tourism is one of the main potentialities to be developed, but to date there are no relevant research projects that demonstrate the conditions of accessibility in natural-archaeological resources to develop tourist corridors.

In the Andahuaylas province, to date there are specific studies on the potentiality, accessibility in the tourism sector both at the provincial and local level, given the wealth of information from former authorities of the sub-regional Directorate of Foreign Trade and Tourism, case former director Lisbeth Salas Ccente, also as president of the Apurímac regional Chamber of Tourism, influences and justifies through her statement that the province of Andahuaylas and the Apurímac region, has a considerable amount of tourist resources, dispersed, which are in deterioration, several are not there and others are inadequately inventoried, among other problems.

The interviews made to authorities linked to the tourism and commercial sector, case: Augusto Fernández Cabero carranza, vice president of the Andahuaylas Chamber of Commerce, Industry and Raúl Ángel Gutiérrez Rodas, president of the Andahuaylas Chamber of Tourism; they determine that there is no sustainability for the tourist resource and even categorize it, because the administration that should be in charge of the associations of tour operators are incipient, they have not achieved the vision, sense of cohesion and greater associative development, they present problems in horizontal integration; those that exist are limited to family businesses whose vision is to have daily bread and employ the largest number of family members; In addition, there are very few associations of community tour operators born from the peasant community, whose function or purpose is business training, the rational exploitation and conservation of the space-environment, which contains the tourist resource. The problem is that there are no ecotourism micro corridors in the Apurímac region, which not only allow an improvement in family income from the use of natural resources, but also allow the development of a parallel industry of cultural, leisure and medical services natural; given this, as a result of the advance and positioning of sars-cov2, we have a parapandemia in development, according to an interview with psychologist and teacher William Camilo Yauris Polo, he said that the presence of a

bubble of social imbalance at a psychological and emotional level is identified, which is very soon it will detonate in major consequences; however, it is an opportunity for the agents of the alternative tourism sector, due to the potential market that could be served, aimed at psychological and emotional therapy tourism, related to ecotourism.

There are isolated, non-integrated ecotourism routes that waste potential and investment opportunities to become a major project, in the case of: a) Ñan orccopi Suitoccocha, José María Arguedas district b) Ñan orccopi ccocha kunaman, san Jerónimo district. Based on these local research backgrounds, developed with funding from the José María Arguedas University (undergraduate), we seek to incorporate and convert ecotourism resources into a micro-corridor, which presents the minimum necessary conditions to take advantage of and have sustainability, to conserve lakes and biodiversity.

Another factor that sustains the problem is in the context, which restricts the development of an ecotourism micro-corridor, is that the projected space that it will occupy and the facilities to be implemented are limited by legislation of community organizations in the peasant communal territories, therefore, from Valle (2019) describes that these spaces and resources are protected and preserved based on the provisions, agreements given by the general assembly of the peasant community, whose execution falls on the communal board; this respect and care is unpaid; it is carried out for the identity the conservation of its legacy as an ancient ethnic group that dominated the space, the material and immaterial evidences, form the peasant communal organizations.

Our study focuses on taking advantage of natural tourist resources, with potential, medium accessibility conditions, in addition to their attributes, which are located in the divortium aquarium west of the limit of the provinces of Andahuaylas and Aymaraes in the Apurímac region, taking as an example the case of water surface reserves. The general objective of the research was: to demonstrate and illustrate the viability of the ecotourism micro corridor "Hatun ñan ccocha kunaman" located in peasant communities of the Kishuará, san Jerónimo, José María Arguedas districts, Andahuaylas Province, Peru.

The antecedents that support the investigation allowed

to benefit from an adequate methodology, what was pertinent, punctual was extracted, they were; from Martínez (2017) entitled: Nature tourism: a sustainable tourism product; which indicates that nature tourism has been shaped according to academic approaches and tourism policies in order to a logical process of evolution experienced in the tourism sector worldwide. The negative impacts caused by the conventional model due to predation have raised the alarm and the entire sector has been assisted by the general process of sustainability in local development, consequently prevailing the paradigm of responsibility and sustainability in tourist destinations.

Likewise, the research of Barragán (2017), serves as background since his proposal: Designing of an ecotourism route in the municipality of Coloso-Sucre: hiking and biodiversity, exposes the following conclusions; the diagnosis that was made on the municipality, identified a series of obstacles related to infrastructure issues and tourism planning; due to the neglect in these aspects, the lack of coordination and organization of the local administration with the community and private entities, in the face of the promotion of its attractions, and tourism development; it is palpable. It is a proposal that involves a descriptive design of the route based on the natural attractions, activities related to the knowledge of the history of the municipality, its architecture, culture and customs, as well as typical tasks such as handicrafts and gastronomy.

Authors such as Dagnachew, Mulugeta, Alubel and Engdu (2019) in their study, demonstrated an improvement in enabling policy, a growing global demand for ecotourism, a potential benefit of ecotourism, the location of the site, the expansion of academic institutions, the increasing attention of the government conservation project and NGOs in the forest, indicated that the development of community-based tourism. The main conclusion drawn from this study was that community-based tourism (CBT) has multifaceted contributions to overcome the destruction of resources that is currently underway and to improve the livelihoods of people living around the forest.

Obombo y Velarde (2019), present an investigation that aimed to characterize ecotourism as a conservation and sustainable development strategy in biosphere reserves. To achieve this end, the relationship between the benefits and the attitudes of local communities towards conserva-

tion was analyzed. Mixed methods, a quantitative survey (n=138), open interviews (n=22) and four focus groups were applied. The results indicate that ecotourism can generate important economic benefits for local communities and encourage their participation in conservation initiatives, avoiding destructive practices, such as felling trees, hunting or activities that involve intensive use of natural such as agriculture.

We have Moreno (2017), documented and analyzed a project on alternatives for the management of ecotourism resources in the region of Los Tuxtlas and the Sierra de Santa Marta-Veracruz-México, demonstrating that although the effect of ecotourism is still limited-both for the conservation of natural resources and for local socio-economic development-shows considerable potential for growth in the medium and long as the notorious environmental, economic and sociocultural issues that the ecotourism sector in this region must currently face. The route was descriptively designed, identifying a moderate degree of difficulty, intended for people with some walking experience; the qualification based on the location of attributes, whose route is for different ages; in addition to the passion for contact with nature.

Gonzales (2017) in his research work entitled: proposal for the creation of the Flor Florida private conservation area in the Callayuc district-Cutervo-Cajamarca, the legal physical sanitation of the plot was carried out to promote it as a Conservation Area Private who owns Mr. Manuel Gonzales Alvarado, with an extension of 48.54 hectares and presents a public deed. The proposal focused on determining that: the primary actions that will generate potential economic income are eco-tourism activities in the Flor Florida ACP project.

Castro (2018) in his study entitled: proposal for and ecotourism route for the sustainable development of the Suitabamba farmhouse in the Cutervo National Park-Cajamarca, he presents an innovative project aimed at the tourism sector. It is the creation of an ecotourism route, with the purpose of sustainably developing the community of Shitabamba, in the district of San Andrés de Cutervo. In the investigation, various factors were analyzed, such as the disposition of the community towards the development of an ecotourism route, and the resources that would be part of the route, said analysis was carried out with the inventory file of tourist resources of the Ministry of Foreign Trade and Tourism of Peru.

Valle, Huamán and Salas (2019) the purpose of the research is to determine the minimum accessibility conditions that will allow outlining the exploitation plan for a sufficient use and conservation of the ecotourism zone called: ñan orccopi ccocha kunaman. The type of research is basic, descriptive design. The exploitation of ecotourism zone is a usufruct proposal based on the attributes and conditions: landscape, road, access, attractions, tourist plant. An adaptation of internal paths, signage must be carried out. The current state only allows visits of a maximum of six hours. The adaptation includes three phases to increase the value of the ecotourism zone: the first one is to make use of it cleanly, with the adaptation of the pedestrian path, signaling and starting forest planting. The second condition a bridle path and infrastructure care, rest, security, and continue with forest planting.

Within the theoretical bases it is stated:

The formal study of sustainable tourism rises at the beginning of the 90s of the last century, it dealt with some problems and complications in relation to the evaluation of the levels of relevant knowledge on sustainability. At present, it should be noted that the sustainable tourism model could simplify the parameters of its application and, therefore, it will be attractive for destinations and companies, authors such as Grunewald, Sebastián, Fernández & Capel (2011) maintain that the accessible tourism is an activity that implies establishing a "point of view" that will determine the way in which reality will be understood. The foregoing proposes to establish as a definition of accessible tourism: "the complex of activities originated during free time that enable full integration from the functional and psychological perspective of those people with restricted capacities, obtaining during them full individual and social satisfaction of the visitor" (p. 69).

It is Ceballos-Lascurain, in the early 1980s, one of the first writers to use the term "ecotourism". Later it was popularized in the studies of Boo (1990) on Ecotourism, defining it as: that which consists of traveling to relatively calm or unadulterated natural areas with the specific objective of studying, admiring and enjoying the landscape and its wild plants and animals, as well as any existing cultural manifestation (both past and present) found in these areas.

Taking this description into consideration, nature-oriented tourism implies a scientific, aesthetic, or philosophical approach to travel. The main point is that the person

who practices ecotourism has the opportunity to immerse himself in nature in a way generally not available in the urban environment. (Ceballos-Lascurain, cited in Boo 1990) Ecotourism is a variety of tourism that involves visiting fragile, pristine, and relatively undisturbed natural areas, which is assumed to be a small scale, low-impact, and infrequently different from business tourism (Vivanco, 2002) Its purpose is also to empower the individual, produce funds for ecological conservation, directly benefit the economic development and political empowerment of native communities, or foster respect for diverse cultures and human rights.

Since the 1980s, tourism has been considered an essential endeavor by environmentalists, so that future generations could enjoy destinations relatively untouched by human intervention (Honey, Martha, 2008) . According to Arsenijevic and Bohanec (2011) found that "the term ecotourism must be understood in participation with five criteria: nature conservation, low impact, sustainability, significant community participation and environmental education"(p. 47).

For this reason, the participation of rural inhabitants in the management of their own space is transcendental, in addition to their knowledge and appreciation of natural resources, since they are variables that point to a better and more complete planning, in addition to helping to achieve development sustainable local (Rojas, 2013).

The study is supported by what was stated by Sampayo (2010) "it proposes tourism for all and leads to fundamentally establishing integration guidelines during tourist activity for that group of people with different abilities that are manifested by physical restriction as and/or anthropometric" (p. 47).

## METHODOLOGY MATERIALS AND METHODS

The research was carried out in the province of Andahuaylas, Apurímac, region. The place of application was the communal territories of Kishuará, Tintay, Lliupapuquio, Huancabamba-Checche-Huaraccopata, in the districts of Kishuará, San Jerónimo and José María Arguedas, the area includes four micro hydrographic basins, each communal territory exceeds 15,000 hectares of surface, on average together there are 60,000 hectares. Desing and descriptive level.

The population and sample is directed, it includes all the analysis units containe in the ecotourism micro corridor (Hernández, Fernández and Baptista, 2014) The unit analysis is a geomorphological system: the formation of the action of rain, wind and tectonic force, in addition to water surfaces, which can be exploited and used by human intervention for its landscape and species of flora and fauna. The relief of the land located between 3,900 to 4,600 meters above sea level is studied. Within the methods and techniques used we have: theory, principles, on accessible and alternative tourism, the procedures and indicators based on the manual for updating and inventory of tourist resources of the Ministry of Foreign Trade and Tourism of Peru.

MINCETUR (2018) "The national of tourism resoucers constitutes a management tool that contains real, orderly and systematic information on tourism resoucers that identifies the tourism potential of the country" (p. 14) In law 29048, a tourist resoucers is understood as "expressions of nature, archaeological wealth, materila and immaterial historical expressions of great tradition and value that constitute the basis of the tourist product" (p. 14). The research work, only phase I was developed, regarding the categorization, which means: "collection of information, process that orders the data and clssifies the places, objects, events and others of interest of the tourist resoucers of the country, region or determined area" (p. 16).

The categories of tourist resoucers are: natural sities, which groups various elements of nature that, due to their own attributes, are considered an important part of the tourist potential Cultural manifestations, are the differnte cultural expressions of the country, region or town, from ancestral times (progressive development of a certain place), such as archaeological sites, historical sites, among others, special reference is made to the elemnts or tangible goods created by the man (p. 21).

Regarding the techniques, they were the following: observation, recognition in the field; topographic survey with GPS; interviews with key informants and discussion and focus groups, analysis of documentary review of secondary sources, the inventory file of tourism resoucers of the Ministry of Foreign Trade and Tourism of Peru; the desing of internal and external routes.

The research desing, according to (Hernández et al, 2014) is a case study, which predominates the mixed approach,

because we carry out the diagnoses, the induction process by collecting information in situ, we detail the characteristics, attributes of the tourist resource, relations and interests of the population and the organization of tour operators with the accessibility of the tourist resource, as well as costs and economic evaluation.

The description accompanied by the illustration, sustained in the economic evaluation, will allow to propose the organization of modifications, adaptations of the ecotourism micro corridor for the benefit of natural resources and population. In addition, by (Hernández et al, 2014) The type of research is basic, because knowledge is expanded from the diagnoses, a proposal is delivered that is the feasibility based on the design of the conditioning and use plan for conservation and rational exploitation of the types of tourist resources contained in the micro-corridor added to the perspective of proposing the installation of signaling, for the start of implementation work by peasant communities, and awareness tests in specific groups and potential claimants.

## RESULTS AND DISCUSSION SECTION HEADING3

The registry search was carried out, through an informative note from the Public records Office-Andahuaylas, having confirmation: The registered communal territories are the following:

1.- Andahuaylas District, Huancabamba-Checche-Huaraccopata peasant community, approved its constitution of the communal organization with Supreme resolution No. 142, of 05.8.1967, made up of 817 families. Registered territory with 24,284.00 has, in original mechanical file 354. It is clarified that the indicated peasant community is now located in the José María Arguedas district, as of the year 2018.

2.- San Jerónimo District, Lliupapuquio peasant community, approved its constitution of the communal organization with Supreme Resolution No. 146, of 05.08.1967, made up of 635 families. Territory registered with 9,387.50 has, in original mechanical sheet 344.

3.- Kishuará District, Tintay peasant community, its constitution of the organization approved with Directorial Resolution No. 022-89-DGTP-CORDEAP, of 10.12.1989, made up of 201 families. Territory registered with 4,830.00 has, in original mechanical sheet 121.

4.- The lakes or water surfaces, located in peasant communal territories, do not have physical-legal sanitation. However, the lakes of the Lliupapuquio community and the Huancabamba-Checche-Huaraccopata community; they present a ministerial resolution for the environmental protection zone and water micro-basin conservation. The smaller lakes, located in the peasant community of Kishuará, do not have a ministerial resolution for an environmental protection zone and micro-watershed conservation.

The future area that the ecotourism microcorridor will occupy is divided into three sections, which, after a process of awareness, accompaniment, taking measures, placing milestone, will allow the consolidation of physical-legal sanitation towards a State institution with competence and functional relevance, which will guarantee the supervision and proper use, which is monitored by the community association, which by public bidding, will have access to the administration of sections of the circuit, these sections being:

- Ccotaquite sector, peasant community of Tintay, the section of 13,308.2 mml in length must be registered, the width or road space is 50 ml. The final area contains 66.54 hectares.
- Lliupapuquio sector, peasant community of Lliupapuquio, the section of 15,025.96 ml in length must be registered, the track width is 50 ml. The final area contains 75.13 hectares.
- Suitoccocha sector, peasant community of Huancabamba-Checche-Huaraccopata, the section of 11,260.17 ml in length must be registered, the track width is 50 ml. The final area contains 56.31 hectares.
- The total area of the ecotourism microcorridor, closed with three entry points, continuous access, is 197.98 hectares.
- The area of the ecotourism micro-corridor crosses the communal territories, does not harm or alter land intended for sowing or seasonal cultivation. The future leisure and rest facilities will be located inside the 50 ml wide.

To date, there are no problems of territorial boundary conflicts between the peasant communities mentioned, what

is important to describe is that in the territory of the annex of Ccotaquite, contained in the peasant community of Kishuará, 10% of territory was approved in community assembly, expansion of forest cover, in the pine species, which contributes to improving and expanding the value of the landscape within the first section of the ecotourism corridor; this first section is separated by a divortium aquarium, which creates conditions for the repopulation of species, which increases the value regarding the sighting of birds and other species.

In the territory of the peasant community of Lliupapuquio, the extension of the forest cover was not approved, because in the micro-watersheds that contain the Antacocha and Paccococha lakes, there are extensive areas whose territory presents conditions for the feeding of South American camelids, added that their Breeding is extended and they carry out tasks of the "chaqo" or shearing of the hair of the South American camelid; however, the extension of the specific forest cover will be carried out in the vicinity of the Cariococha and Tipicococha lakes, to increase the value of the landscape; in this area the South American camelid does not arrive and does not feed.

Lake Suitococha, located in the peasant community of Huancabamba-Checchce-Huaraccopata, is destined for a reservoir and fish development, as well as a territory for grazing South American camelids, it is surrounded by a micro-basin, which protects and prevents it from being violated by anthropic factors with sufficient natural barriers.

Regarding accessibility, it was extracted from google earth, satellite photography capture for filed recognition (in situ) then we relied on the walk to establish the direction of access, fatigue levels, rest points and hygienic services facilities (aseptic wells) it should be noted that the walk is intense at the beginning, when it begins by Ccotaquite during the middle of section 1, then it is minimized for section 2, taking a certain intensity of fatigue to start section 3.

The physical conditions, the biological characteristic of an average visitor, obtained from the tests done during the walking tour, are:

**Tabla 1. Nivel de fatiga según edad, peso y talla.**

N°	Edad	Peso (kgr)	Talla (ml)	Reposos en tramo	Tramo
1	De 20 a 35 años	64	1.65	1	1, 2, 3
2	De 20 a 35 años	72	1.65	1	1, 2, 3
3	De 20 a 35 años	78	1.65	2	1, 2, 3
4	De 20 a 35 años	83	1.65	3	1, 2, 3
5	De 20 a 35 años	88 más	1.65	4	1, 2, 3
6	De 20 a 35 años	69	1.75	1	1, 2, 3
7	De 20 a 35 años	76	1.75	2	1, 2, 3
8	De 20 a 35 años	83	1.75	2	1, 2, 3
9	De 20 a 35 años	90	1.75	3	1, 2, 3
10	De 20 a 35 años	101 a más	1.75	4	1, 2, 3
11	De 20 a 35 años	82	1.85	1	1, 2, 3
12	De 20 a 35 años	91	1.85	1	1, 2, 3
13	De 20 a 35 años	104	1.85	3	1, 2, 3
14	De 20 a 35 años	118	1.85	3	1, 2, 3
15	De 20 a 35 años	127 a más	1.85	4	1, 2, 3
16	De 35 a 50 años	73	1.65	1	1, 2, 3
17	De 35 a 50 años	72	1.65	3	1, 2, 3
18	De 35 a 50 años	85	1.65	4	1, 2, 3
19	De 35 a 50 años	82	1.75	2	1, 2, 3
20	De 35 a 50 años	91	1.75	3	1, 2, 3
21	De 35 a 50 años	103	1.75	4	1, 2, 3
22	De 35 a 50 años	92	1.85	2	1, 2, 3
23	De 35 a 50 años	101	1.85	3	1, 2, 3
24	De 35 a 50 años	112	1.85	4	1, 2, 3
25	De 51 a más años	Los pesos y tallas son similares al rango de 35 a 50 años, sin embargo, los reposos son mayores están por encima de 3 a más paradas por tramo e inclusive según caso de salud, el acompañamiento con el servicio complementario de acémila			1, 2, 3

Source: data extracted from the field, with collaborating members of the 2021 research team.

**Figura 1. Territory covered by the ecotourism microcorridor**



Source: Google earth Maxar technologies. Technical aspect: date taken 05.16.2021, elevation 4286 masl, lens eye height 24.35 km UTM coordinates 13°46'47.96" and 73°13'00.10". extracted: final research report at the José María Arguedas National University resolution 244-2022-CO-UNA/JMA.

Figura 2. Territory covered by section 1 ecotourism microcorridor



Source: Google earth Maxar Technologies. Technical aspect: date takes 16.05.2021. Extracted: final research report at the José María Arguedas National University resolution 244-2022-CO-UNAJMA.

Distance and time measurements for each internal route that integrates the ecotourism micro-corridor, for walks or with assimilation support.

TRAMO 1. Ccotaquite	Distancia (m)	Distancia (km)
1 lagos de Tintay	4641.2	4.6412
2 estación	3871.31	3.87131
3 estación	2038.25	2.03825
4 estación	2757.44	2.75744
<b>TOTAL TRAMO 1</b>	<b>13308.2</b>	<b>13.3082</b>

The route begins in the town of Ccotaquite, located above 3,800 meters above sea level, in a south-west direction, it continues along the access or carriageway trail, close to the ravine, passing through the quarry, to station 1 of the section, which is the first stop, for having a slope between 20° tl 30° degrees of inclination, has a distance of 4.64 km, whose travel time on foot for a visitor between 15 to 40 years old, without health problems, something habitual in walking, he runs it in 1 hour and 10 minutes. The visitor between the ages of 15 and 40, without health problems, but overweight and not used to walking uphill, covers the

distance in 2 hours and a half with two intermediate stops of ten minutes.

We continue in a south-west direction until we can observe two lakes in the distance and make a break along the edge of the lakes in a north-west direction, until the second station, which is located at approximately 4000 meters above sea level, to enjoy the panoramic view and landscape. From station 1 to station 2, a distance of 3.87 km is covered, whose travel time on foot for a visitor between 15 and 40 years old, without health problems, something usual on foot, covers it in 1 hour and a half, it is for the slope of 25° to 32° degrees of inclination, here we observe the first two lakes. The visitor between the ages of 15 and 40, without health problems, but overweight and not used to walking uphill, covers the distance in 3 hours and 15 minutes with an intermediate stop of ten minutes.

We continue in a northeasterly direction, passing by two lakes, until we reach the third station, which is located above approximately 4070 meters above sea level, to enjoy the panoramic view and landscape. Grom station 2 to station 3 a distance of 2.03 km is covered, whose walking time for a visitor between the ages of 15 a 40, without health problems, something usual on foot, covers it in half an hour, it is because we went down from 35° to 25° degrees of inclination, here we observe the two more lakes and we see a third lake. A northwesterly direction, the path and passing by the south shore of the lake, until reaching the second station called Paccoccocha, which is located below approximately 4000 meters above sea level, to enjoy the panoramic view, landscape and spot the town of Ccotaquite. From statio 3 to station 4 a distance of 2.76 km is covered; it is covered in forty minutes, it is because we went down from 35° to 25° degrees of inclination, from here, we have a final route, which goes down to the town of Ccotaquite whose distance is 2.24 km, where there are bridle paths and carriage trails.

TRAMO 2 - Lliupapuquio	Distancia (m)	Distancia (km)
2 estación aceroccocha	6195.88	6.19588
2 estación - Paccoccocha	8830.08	8.83008
<b>TOTAL TRAMO 2</b>	<b>15025.96</b>	<b>15.02596</b>

**Figura 3. Territory covered by section 2 ecotourism microcorridor**



Source: Google earth Maxar Technologies. Technical aspect: date takes 16.05.2021. Extracted: final research report at the José María Arguedas National University resolution 244-2022-CO-UNAJMA.

The route of the micro corridor has two alternatives, one on foot and another in a regular state of paved road. We will start with that alternative, which allows joining and camping from Ccotaquite. It starts from the second station of section 1, known as Ccotaquite, descends in a southerly direction continuing through a ravine that forms a narrow valley, located above 3800 meters above sea level, in a southerly direction, it continues along an access or path, attached to the slope of the hill and view of the ravine, to station 1 of station 2, which is the first stop and we see another lake, it has a slope between 17° to 28° degrees of inclination, it has a distance of 4.14 km, whose travel time on foot for a visitor between the ages of 15 and 40, with no health problems, something of the habit on foot, he travels it in 1 hour and 30 minutes.

In a south-west direction until you can observe a large lake in the distance, with a fish farm facility and make a break along the edge of the lake in a west direction, until the second station, which is located above approximately 4350 meters above sea level, to enjoy of the panoramic view, landscape, lake and bird watching, camelids. From station 1 to station 2, a distance of 6.19 km is covered, whose travel time on foot for a visitor between 15 and 40 years old, without health problems, something usual on foot, covers it in 1 hour and a half, it is for the slope of 15° to 23° degrees of inclination, here we observe the first two lakes, which are born from a formation of battery or continuity.

Standing in a southerly direction until you can observe and cross the lake damming, and then turn east to continue the walk along the southern shore of the three lakes, formed in a battery, we locate a fish farm facility, up to the third station, which is located above approximately 4380 above sea level, to enjoy the panoramic view, landscape, lakes and bird watching, reach an area or mystical sanctuary, where we can see the Apu Qorawiri, desde station 2 to station 3, a distance of 8.83 km is covered, whose walking time for a visitor between the ages of 15 a 40. Without health problems, something usual on foot, covers it in 2 hours and forty and five minutes, it is for the slope of 15° to 20° degrees of inclination, the long section is because we enter to the bottom or beginning of the lakes, plus a 1 hour rest, then we return along the same path, to spend the night on the south shore in front of the dam.

**Figura 4. Territory covered by section 2 ecotourism microcorridor**



Source: Google earth Maxar Technologies. Technical aspect: date takes 16.05.2021. Extracted: final research report at the José María Arguedas National University resolution 244-2022-CO-UNAJMA.

The other alternate entrance for the Lliupapuquio section is through the third entrance that starts from the pine forest, up to the summit, where the first lake can be seen, to continue descending in a southerly and easterly direction, until reaching the next larger lake, which is dammed and supplies to the Chumbao river, bankruptcy and continues in a west, south and east direction until reaching a fork, to the largest lake, and to the east to the largest lake that forms the battery of lakes, the distance for the first one that contains the first fork is 7.84 km, it is done by vehicle

in 1 hour and a half by the slope between the 15° to 29° degrees and the second section that contains the second fork is 9.87 km, it is also done by vehicle in 2 hours by the slope between 15° to 30° degrees. The two sections have a paved road, enabled by the installation of a fish farm in the larger lakes. In addition, in this section, you can make stops on the way back to visit the fish farms installed on the banks of the Chumbao river. The access and route to the three lakes that form the battery, its route on foot is 2 hours and a half round trip. With asémila service it is three and a half hours.

TRAMO 3 - Suitoccocha	Distancia (m)	Distancia (km)
1 estación-día 3	6135.96	6.13596
2 estación-día 3	5124.21	5.12421
TOTAL TRAMO 3	11260.17	11.26017

Figura 5. Territory covered by section 2 ecotourism microcorridor



Source: Google earth Maxar Technologies. Technical aspect: date takes 16.05.2021. Extracted: final research report at the José María Arguedas National University resolution 244-2022-CO-UNAJMA.

The route of the Suitoccocha section has a path in a regular state, the first section of paved road. We will start at the camp from Paccoccocha. It starts from the third station of section 2, known as Lliupapuquio, ascend in a southerly direction, continuing along the summit, reaching a carriage trail, ascending the slope of a ravine that forms a narrow valley, located above 4400 meters above sea level, we continue in an easterly direction, close to the slope of the hill and three lakes can be seen, one of them dammed, up to station 1 of station 3, which is the first stop, we continue in a south-west direction, we see another lake, until we reach the summit and station 2, the entire section has

a slope between 19° to 36° degrees, it has a distance of 6.14 km, whose travel time on foot for a visitor between 15 and 40 years old, without health problems, a bit of a walk, he covers it in 2 hours and 30 minutes.

In a south-west direction, from station 2 until reaching a distance to observe a large lake, with a fish farm installation, a dam and making a break along the north edge of the lake in the west direction, up to the resting summit, which is located by above approximately 4300 meters above sea level, this to enjoy the panoramic view, landscape, lake and bird watching, camelids; from station 2 to station 3, a distance of 5.12 km is covered, whose travel time on foot for a visitor between 15 and 40 years old, without health problems, something usual on foot, covers it in 1 hour and a half, it is for the slope of 15° to 27° degrees of inclination, here we observe the largest lake in all its magnitude.

For all sections visitors with disabilities in lower and/or upper limbs, heart problems cannot enter and enjoy the respective section. The route can also be done in ass, the time is the same for the group with overweight and little habit, a stop is also made.

PUNTOS	Altitud (msnm)
Entrada al micro corredor eco turístico Ccotaquite	3830
Punto de campamento e inicio segundo circuito	4305
1 estación Acero ccocha	4497
Campamento 2 - Sección 2	4255
Entrada al micro corredor eco turístico Suitoccocha	4305

Points of altitude above sea level, which are traveled, serve as a reference for the physical condition of the visitor, which must be in order to complete the entire journey in two to three days, added between one to two camps. The ride in asémila is by sections in the same section they are made with daily rest and return to the main support city. The entire ecotourism micro corridor oscillates between 3800 masl to 4550 masl.

Regarding the minimum infrastructure to install.

The signage must be installed according to the technical requirements of the Ministry of Foreign Trade and Tourism, in the form of identification panels, information, location, close to the entrance of each tourist resource.

The materials will be as stated in the signaling manual of

the indicated institution. Registration-control booth, at the entrance of each tourist resource, for the registration of visits, communication and persuasion during the transfer. The materials will be a construction of noble material, with a half-water roof, closed, with two rooms: service and collection-store.

Booth or rest environment, for power at the beginning of the circuit. The materials will be from the area. The building will have a double water roof, built with local wood, lined with ichu. The walls, with foundation and wall built with cyclopean material from the place, accompanied with cement, the height of the wall does not exceed 1.50 cm, with a ventilation of half a meter towards the beginning of the roof. In addition, this environment can be used to install tents for overnight stays inside.

Coat rack booth, for changing clothes or clothing, for the effort made, it is a continuous section to the room or rest room, with the same materials except that the whole room is closed. Hygienic service booths with combined materials to prevent the spread of contamination or infections. The materials complement each other, they are not replaced, and it is even implemented with a gas stool transformation system, which will be used for lighting environments.

Rest points in the sections of the route, with cyclopean material from the place for flat base conditions, from here, the installation of a double water shed, spacious 8 m long by 4.5 m wide, made of wood, the roof lined with ichu, inside wooden or stone benches (lined with mud) where you can rest and eat food. Accompanying, hygienic service as a complement, but not with the same specifications, aseptic wells whose maintenance is weekly will be installed.

**Investment costs for the minimum infrastructure to be installed:**

**Tabla 2. Costos de inversión total y por tramos**

N°	Infraestructura	Unidad de medida	Cantidad	Costo unitario	Total
Tramo 1:					
1	Señalética / panel	Unidad	2	5500	11000
2	Servicios higiénicos (sshh)	Unidad	2	7000	14000
3	Caseta de registro	Unidad	1	3500	3500
4	Ambiente de reposo/cambio	Unidad	1	4500	4500
5	Puntos de reposo/sshh	Unidad	2	3500	7000
Tramo 2:					
1	Señalética / panel	Unidad	2	5500	11000
2	Servicios higiénicos (sshh)	Unidad	2	7000	14000
3	Caseta de registro	Unidad	1	3500	3500
4	Ambiente de reposo/cambio	Unidad	1	4500	4500
5	Puntos de reposo/sshh	Unidad	2	3500	7000
Tramo 3:					
1	Señalética / panel	Unidad	2	5500	11000
2	Servicios higiénicos (sshh)	Unidad	2	7000	14000
3	Caseta de registro	Unidad	1	3500	3500
4	Ambiente de reposo/cambio	Unidad	1	4500	4500
5	Puntos de reposo/sshh	Unidad	2	3500	7000
Inversión para acondicionamiento			Por tramo: <b>40,000.00</b>	Total	<b>120,000.00</b>

Source: data provided regarding the conditioning by the director of the Andahuaylas Sub -Regional directorate of Foreign Trade and Tourism, by Lic. Eder Roldán Pineda, 20.11.2021.

### Statistic and economic analysis.

The economic analysis focuses on projecting the demand of the visitors that arrive to Apurímac and Andahuaylas, making a cash flow and finding the Net Present Value and the internal rate of return, because it will be conducted by a private administration. The implementation of the facilities in the initial investment will be financed by the state, however, the return on investment will be gradual in fixed installments without interest, for ten years.

During the year 2018, 500,000 trips were made for internal tourism to the Apurímac region, which represents 1.1% of the total trips nationwide. This percentage fluctuates between a dispersion of 0.10% per year and this is due to the fact that Apurímac, its activities and tourist products are few developed in several provinces with the exception of the regional capital Abancay that is sustained in products of cultural manifestations.

In 2018, according to the statistic by MINCETUR, 36,000 foreigners arrived in the Apurímac region in 2018, present a project trend of increase to 20% for 2019. At the national level, 525,547 national visitors arrived, which consolidated the internal flows, with high and strong frequency coming from the cities of Cusco, metropolitan Lima and Callao, Ayacucho, Arequipa, Puno and Ica. So the tourist demand towards the resources, activities and products contained in the Apurímac region, is the market of internal visitors, followed by foreign tourists. The average expense of a visitor is s/. 421.00 soles.

In 2019, according to the statistical data of Tourism in, 92% of trips made of Peru were for internal tourism, in the amount of 48.6 million national trips for internal tourism whose characteristics are: only Peruvians, all reasons for travel, all socioeconomic level, all ages, the reasons for residence and paid work are excluded. Vacation tourism represents 29.4% of trips within the country.

The average spending of the vacationer for the year 2019 was s/. 476.00 soles. The reason for the trips is focused on resting or relaxing 33%, going out with the family 27%, and discovering new places 20%. Then the attention on what aspects or attributes influenced to decide to travel to the interior of the country, are landscape and nature 53%, variety of tourist attractions 31%, and the economy for services 27%. After which medium influenced motivation and making the decision to travel, it was due to the comments and experiences of relatives 44%, due to the internet service pages, app 25% and due to television programs and reports 14%, for this reason there is a strong planning that reaches 82%.

The decision to travel, biased towards proactivity because 60% make the maximum decision up to two weeks, therefore they seek little information that agrees with the above, and represents 73%. The most used transport is the bus, reaching 60%, second plane with 15% and the third that combines private mobility and own mobility 23%. The issuing cities to Apurímac are: Lima, Cusco, Ica, Ayacucho, Puno.

It should be noted that the growth rate towards Apurímac reaches 2% per year, however, during the pandemic it fell to a negative rate of 12% for this reason, for the projection, data will be taken from the years 2018 and 2019,

and because the tourism sector is in recovery in the years 2021 and 2022. Given the data described, we will take a base demand for the year 2018 for Apurímac of 36,000 arrivals, we approximate with the rate of 20% of Apurímac arrivals and 10% for the city of Andahuaylas, then the arrivals to Apurímac exceed 43,000 arrivals in 2019, and to the city of Andahuaylas, 4,200 arrivals.

The demand projection is taken as 15% of visitors to the city of Andahuaylas, which for the three years are 630 with a subsequent growth of 20% per year for a range of three years and the cost per trip for 421.00 soles, we only take the 20% that reaches 84.00 soles.

## **The organization strategy of the tour operators and plan for the use of their own activities that rely on the tourist resource.**

The strategy of organization and use of the administration by sections by an association of community tour operators in the ecotourism microcorridor is necessary, because it will contribute to improving living conditions in direct relationships with the community members, followed, at the same time, by maintenance and security in the circuits and internal trails that each section contains when visitors and tourists move to visit, admire, rest on the diversity that surrounds it. The local municipality helps to generate road infrastructure conditions and internal trails, conditioning in the safety of natural resources, because it will implement the entry of the tourist ticket.

Regarding signage, there is a preliminary sketch, from where and to what place should be signposted for the location of rest infrastructure, restrooms, camp, parking area and campsite, approved climbing area, hook fishing area, risk due to gorge or rock with a pronounced slope, among others.

In addition, entry-exit booths will be located at a maximum of four points, which will serve as control, accompanied by a shelter or interpretation center, preferably at the beginning of each micro basin. Regarding the materials of the area, the species ichu, puna scrub, was identified by frequent quantity, in addition to red clay, flagstone, which will serve as input for the lifting of rest support infrastructure.

**Tabla 3. Cash flow y VAN**

Ítem - anual	1	2	3	4	5	6	7	8	9	10
Inversión	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Contrapartida comunidad	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
<b>Total inversión</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>	<b>9000</b>
Mantenimiento	10000	10000	10000	12000	12000	12000	15000	15000	15000	15000
Seguridad	8000	8000	8000	11000	11000	11000	14000	14000	14000	14000
Personal	10000	10000	10000	12000	12000	12000	14000	14000	14000	14000
<b>Total inversión y costos</b>	<b>37000</b>	<b>37000</b>	<b>37000</b>	<b>44000</b>	<b>44000</b>	<b>44000</b>	<b>52000</b>	<b>52000</b>	<b>52000</b>	<b>52000</b>
Visitantes * precio 84.00	630	630	630	740	740	740	900	900	900	900
<b>Ingresos por visitantes</b>	<b>52920</b>	<b>52920</b>	<b>52920</b>	<b>62160</b>	<b>62160</b>	<b>62160</b>	<b>75600</b>	<b>75600</b>	<b>75600</b>	<b>75600</b>
<b>Flujo de diferencia</b>	<b>15920</b>	<b>15920</b>	<b>15920</b>	<b>18160</b>	<b>18160</b>	<b>18160</b>	<b>23600</b>	<b>23600</b>	<b>23600</b>	<b>23600</b>
<b>Valor actual neto</b>	<b>S/72,321.52</b>		<b>a una tasa COK del 20%</b>			<b>Datos estimados anuales</b>				

Source: self made, yer 2021.

## CONCLUSIONS

There is viability to condition the surface of the puna, located between 3850 to 4600 meters above sea level, where the lakes or water surfaces are concentrated, they form three different, continuous circuits that allow observing, resting, enjoying the landscape, the sections have an intensity walking average, whose fatigue is pronounced when it exceeds from 5 kgr above the average height, in addition, complementary services such as herding, food, ritual staging and dances can be offered.

The construction of infrastructure, with materials from the area, is for leisure or rest, hygiene services in the sections, whose construction does not alter the landscape. The first two sections or internal circuits allow the transfer on foot, by horse or vehicle; the third section is extremely difficult for transportation by vehicle; the activities that can be developed are: hiking, trekking, camping, mountaineering, fishing in a fish farm.

The price of 84 pens (soles) will allow the provision of a complementary minimum services package, which contains: guidance, security, entrance ticket, food. It is crucial that the administration by sections be exercised by the association of community tour operators, who will guarantee the maintenance of the internal circuits, the infrastructure, and the offer of other complementary services. The project is profitable, at an opportunity cost rate of 20%, in ten years, it yields a positive result of s/. 72,351.00 penny (soles)

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