The Nature and Culture of Latin America

Review of Polish Studies

Zbigniew Mirek, Adam Flakus, Andrzej Krzanowski,
Andrzej Paulo & Janusz Wojtusiak (eds)

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Naturaleza y cultura de América Latina

Reseña de los estudios Polacos

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Kraków 2010

Proposed citation: Z. MIREK, A. FLAKUS, A. KRZANOWSKI, A. PAULO & J. WOJTUSIAK (eds) 2010. *The Nature and Culture of Latin America. Review of Polish Studies*. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków

Published, distributed and sold by: W. Szafer Institute of Botany, Polish Academy of Sciences, Lubicz 46, 31-512 Kraków, Poland; Tel. [+48] 12 4241731; Fax: [+48] 12 4219790; e-mail: wydawnictwa@botany.pl

Co-edited and co-financed by the Faculty of Geology, Geophysics and Environment Protection, AGH University of Science and Technology, Kraków

ISBN: 978-83-89648-85-3

Printed in Poland: Drukarnia Kolejowa Kraków sp. z o.o., Bosacka 6, 31-505 Kraków

FOREWORD

South America has long fascinated those who study the natural and cultural environment. On that continent, nature and culture together create an extraordinary whole. The power of nature is seen everywhere, not only in the wild primeval areas. Though many places there have not yet been visited by modern-day people, researchers are particularly interested in the dynamic changes taking place in the natural and cultural environment as a result of the expansion of Western civilization, which often threatens local natural and cultural values that are at least as interesting as those yet-undiscovered places.

It is not broadly known that in the last two centuries Polish scientists have played a considerable role in exploration of the South American continent. In light of increased interest in this research in the second half of the 20th century and especially in the last quarter century, it seemed important to examine that Polish contribution to it, and to highlight the lines of research pursued in South America today. These two things were done at a conference entitled *Polskie badania środowiska przyrodniczo-kulturowego w Ameryce Łacińskiej* ('Polish research on the natural and cultural environment of Latin America'), organized in Kraków in 2007. The conference was aimed at reviewing research projects conducted by our institutions, and integrating them where appropriate and possible. This book is one result of that meeting.

After the conference, some authors of the papers delivered there contributed additional material during the review process, and later others supplemented their work with the results of recent research done after the conference. For these reasons, and due to certain financial difficulties, the publication has taken several years to appear.

At long last the book has reached its final form. We hope that it will stimulate further work on these topics and will encourage researchers from different fields to connect with each other, discuss their progress at regular intervals, and take advantage of opportunities for combined research.

I am grateful to everyone who took part in organizing the conference, editing the papers and publishing this book. I owe a particular debt of gratitude to the coeditors for their invaluable contribution, and I thank the authors for their cooperation at the various stages of preparation.

Zbigniew MIREK

INTRODUCCIÓN

Los investigadores del ambiente natural y cultural siempre han sido fascinados y atraídos por América del Sur. Todavía permanece la fascinación por la unidad extraordinaria de la naturaleza y la cultura original. La naturaleza no ha perdido nada de su frescura, especialmente en los lugares más salvajes y primitivos. Todavía existen lugares vírgenes donde la gente nunca ha llegado. Además de estos sitios desconocidos, es muy interesante para los investigadores observar los cambios dinámicos de todo el ambiente natural y cultural estimulados por la expansión de la civilización occidental que muchas veces conlleva el peligro a la identidad de los valores culturales y la naturaleza local.

Los investigadores polacos del siglo XIX y del siglo XX tuvieron una influencia importante, aunque todavía no está completamente reconocida en el conocimiento del continente sudamericano. La intensidad de estas investigaciones en la segunda mitad del siglo XX y su intensificación en el último cuarto del siglo nos ha persuadido a compilar un resumen de la contribución polaca en el conocimiento del ambiente natural y cultural, y también a presentar las líneas de investigaciones propuestas para Sur América actualmente.

Con este objetivo se organizó en Cracovia en 2007 la conferencia 'Las investigaciones polacas sobre el ambiente natural y cultural en América latina' en la que se propuso unas tareas, por ejemplo realizar el reconocimiento de las investigaciones efectuadas en nuestros institutos y su integración eventual donde sea apropiado y posible. El resultado de este encuentro es el libro presente. Los suplementos indispensables hechos por los autores después de la conferencia y dificultades financieras y de organización han causado que el libro se publique más tarde de lo que hemos esperado. Los autores, que han hecho las correcciones de sus textos, han incluido unos suplementos sobre las investigaciones recientes, efectuadas ya después de la conferencia.

Creemos que este libro contribuirá al incentivo de nuevas investigaciones en América del Sur y que se convertirá en el principio de los encuentros cíclicos organizados para resumir el progreso de las actividades dirigidas en este continente.

En este lugar querría dar las gracias a todos los que han tomado parte en la conferencia, tanto en la organización, como en la participación de los trabajos de redacción y en la preparación final del libro. Querría dar las gracias especiales a los redactores que han hecho un enorme trabajo. También agradezco a todos los autores por su cooperación en las diferentes etapas de preparación de este trabajo.

Zbigniew MIREK

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CULTURE – CULTURA

THE ENE RIVER BASIN IN PERU – ITS GEOGRAPHY AND POTENTIAL FOR TOURISM[1]

PETER A. RIZO-PATRÓN

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Abstract. Tourism is an insufficiently developed economic activity in Peru, for reasons including the great complexity of the country's geography. Modern methods of geographic analysis together with images taken in air and land surveys help identify promising regions of the country for ecotourism in the eastern mountainous rainforests of the Andes, in particular the Ene River Basin. Due to its remoteness and difficult access, development there has been neglected by both the government and the private sector. Some of these areas have become a haven for settlers who engage in illegal economic activities which seriously damage the environment and the traditional livelihood of the region's ancestral inhabitants. A solution to the present crisis is proposed through an ecotourism project which would take advantage of the countless attractive features of the region. This project requires serious interdisciplinary studies to design imaginative uses of the areas, and serious state support.

Key words: ecotourism, Ashaninka natives, narcotraffic, depredation, interdisciplinary studies, sustainable development

INTRODUCTION

The extreme complexity of Peruvian geography, which is at the root of its great biological and ethnic diversity, is a barrier to the development of the country due to the difficulty of establishing efficient routes of transport. Many important archaeological sites and attractive places for ecotourism are either in faraway high places with poor roads or in the middle of the jungle with no infrastructure. In addition, Peru has serious economic, environmental and social problems which in the short run limit its ability to take advantage of its potential for sustainable development. This is reflected in insufficient investment in infrastructure.

The zones with the best ecotourism potential, the rainforests in the eastern foothills of the Andes, are seriously threatened by illegal logging and coca production for narcotraffic. The Ene River Basin is one of these zones.

Rapid progress in information technology, together with the growing number of high resolution satellite images, give us increasingly useful tools and data for studying the geography of Peru. The coca-producing areas are being monitored with greater accuracy (UNODC-DEVIDA 2002–2009), and this enables us to better diagnose the problems of different regions, especially the Apurimac-Ene region, the largest producer of coca in Peru. Expeditions are more effectively planned using modern technologies such as Geographic Information Systems (GIS) and the Global Positioning System (GPS) combined with high resolution digital photography and satellite imagery, giving us an in-depth view of many regions hitherto unknown

[1] An updateable HTML version of this paper can be found at www.peruvia-gallery.com/geography/index.htm.

The Nature and Culture of Latin America. Review of Polish Studies (eds Z. MIREK, A. FLAKUS, A. KRZANOWSKI, A. PAULO & J. WOJTUSIAK), pp. 105–134. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków, 2010.

to the world. Moreover, these elements are important aids for planning sustainable development projects.

This paper gives a general view of the geography of Peru and its relation to tourism, a more detailed view of the Ene River Basin and surroundings, its people, its problems, its natural features, and a project proposal for developing ecotourism in an area around the Cutivireni and Quempiri sub-basins. This area, with an advantageous central location for air access, has a large number of attractive and unique natural features, and thus great potential for ecotourism, but is presently almost totally undeveloped due to various factors analyzed here. This present situation, however, is in a way a favorable circumstance for ecotourism, since the natural beauty of large parts of the region remains almost intact to date.

Finally I shall mention some strategic considerations and suggestions for overcoming potential obstacles to the proposed project in the target area of the Ene River Basin.

Selected geographic data of Peru and the Ene River region

The following maps and data convey a very general view of Peruvian geography and the Ene region. The information presented in this document should be supplemented by access to integrated GIS software with the gradual addition of graphic and descriptive elements. Google Earth provides information of this type through layers such as *Panoramio* and *Places of Interest*.

TOPOGRAPHY: the following topographical maps are derived from the Digital Elevation Model (DEM) obtained from the Shuttle Radar Topography Mission – SRTM (US Geological Survey 2008).

Figure 1 is a shaded relief map of Peru as a whole, showing the highly irregular surface of the country in the Andes mountain region.

Figures 2 and 3 are two topographic maps of the Ene River Basin and surroundings.

Figure 2 shows elevations with altitude intervals of 500 meters, derived from the continuous DEM by reclassification, a basic GIS function.

Figure 3 shows slopes derived from the continuous DEM, with the following intervals in degrees: 0–5, 5–10, 10–20, 20–40 and 40 up. On this map it can be seen that the 20 km long area between the Quempiri River and Ene River is almost flat, with a slope of less than 5 degrees, making it a good site for construction of an airport of considerable size, subject to a detailed study of the terrain.

POLITICAL DIVISIONS OF PERU: 24 departments (regions), 195 provinces and 1831 districts.

Figure 4 gives a map corresponding to the 24 departments. The Department of Junin is highlighted because it contains the Ene River Basin, the main subject of this article. Population density is shown for each department as inhabitants per square kilometer.

Figures 5 and 6 show the political divisions of the Department of Junin.

Figure 5 shows the eight provinces of Junin with their population densities.

Figure 6 shows the eight districts of the Province of Satipo with their population densities. The

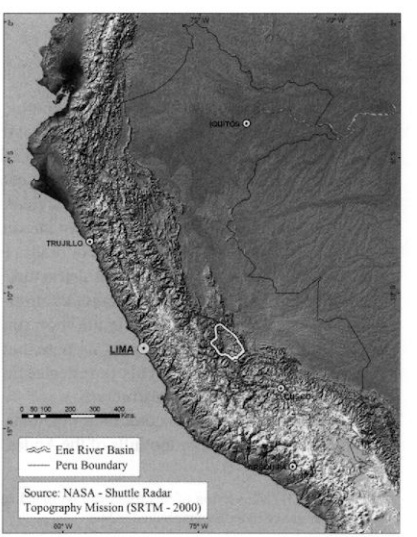


Fig. 1. Topography of Peru – shaded relief map.

Fig. 1. Topografía del Perú – mapa de relieves sombreados.

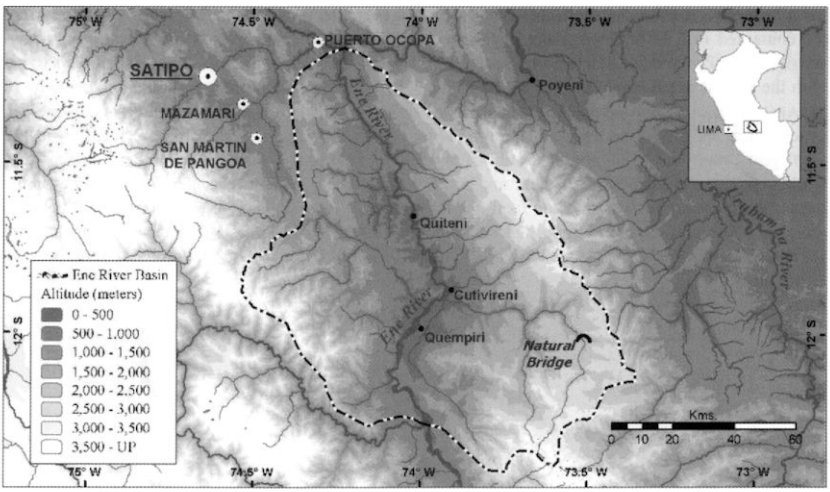


Fig. 2. Topography of the Ene River Basin and surroundings – elevations.

Fig. 2. Topografía de la cuenca del río Ene y alrededores – elevaciones.

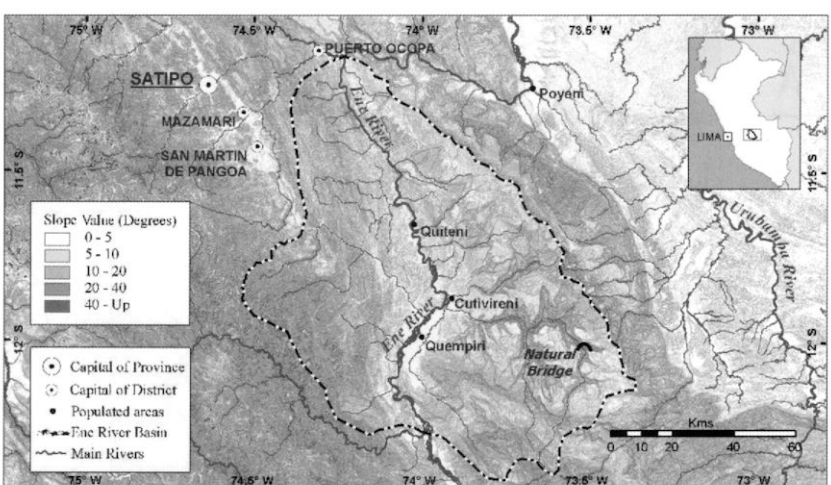


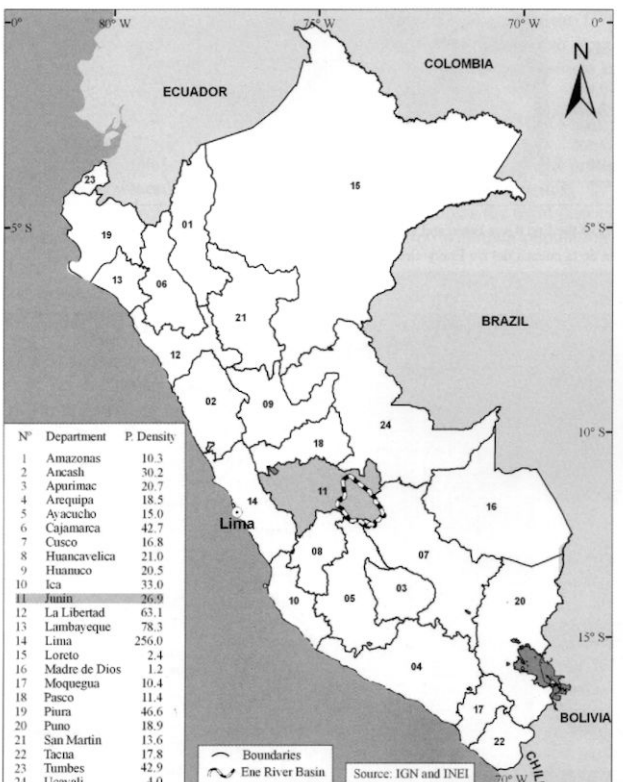
Fig. 3. Topography of the Ene River Basin and surroundings – slopes.

Fig. 3. Topografía de la cuenca del río Ene y alrededores – pendientes.

main attractive features of the Ene River Basin are contained in Rio Tambo District, the largest district in the Province of Satipo and also the one with the lowest population density.

ARCHAEOLOGY: Peru has thousands of archaeological sites covering a period of more than 5000 years, many of which are in locations practically inaccessible at present; others are being excavated and do not have adequate facilities for tourists. There may be some important sites not yet discovered due to the extraordinarily difficult geography of the country, especially on the eastern flank of the Andes which combines steep mountains and canyons with dense rainforests. This was the case of the famous archaeological site of Machu Picchu until 1911 when it was discovered by Hiram Bingham in a remote location in the montane forest of southeastern Peru.

Figure 7 shows the location of some of the main archaeological sites in Peru. Since the area of interest around the Ene River Basin has not been explored for archaeological remains, we



N°	Department	P. Density
1	Amazonas	10.3
2	Ancash	30.2
3	Apurimac	20.7
4	Arequipa	18.5
5	Ayacucho	15.0
6	Cajamarca	42.7
7	Cusco	16.8
8	Huancavelica	21.0
9	Huanuco	20.5
10	Ica	33.0
11	Junin	26.9
12	La Libertad	63.1
13	Lambayeque	78.3
14	Lima	256.0
15	Loreto	2.4
16	Madre de Dios	1.2
17	Moquegua	10.4
18	Pasco	11.4
19	Piura	46.6
20	Puno	18.9
21	San Martin	13.6
22	Tacna	17.8
23	Tumbes	42.9
24	Ucayali	4.0

Fig. 4. Departments of Peru.

Fig. 4. Departamentos (regiones) del Perú.

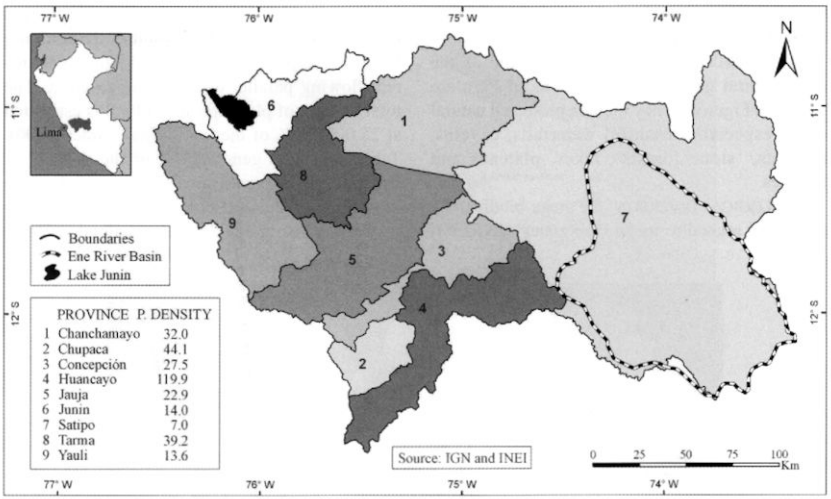


Fig. 5. Provinces of the Department of Junin.

Fig. 5. Provincias del Departamento de Junín.

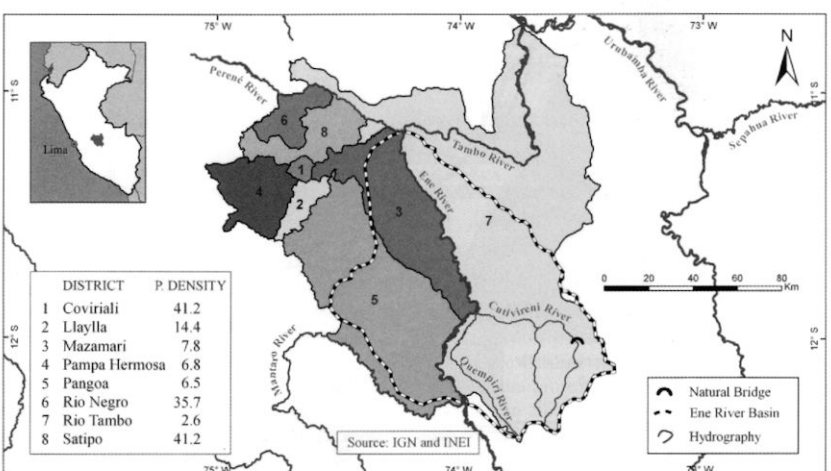


Fig. 6. Districts of the Province of Satipo.

Fig. 6. Distritos de la Provincia de Satipo.

insert a question mark in that area (see section on archaeological potential).

ATTRACTIVE LAND FEATURES: some of the main natural geographic attractions of Peru are shown in Figure 8. They include protected natural areas, especially beautiful waterfalls, caverns, canyons, 'stone forests', lakes, plateaus and beaches.

BIOLOGICAL DIVERSITY: the mega-biodiversity of Peru is related to its 84 'life zones' (INRENA 1995), which in turn are related to the varied topography of the Andes. Another determining factor is the presence of the cold Humboldt current flowing parallel to the Peruvian coast. The total number of plant species in Peru is estimated at 25,000, 10% of the world total (Brack 2000). Table 1 gives a general idea of the number of endemic plant species as a function of the type of ecological region (Leon 2006).

Peru is also mega-diverse in animal wildlife.

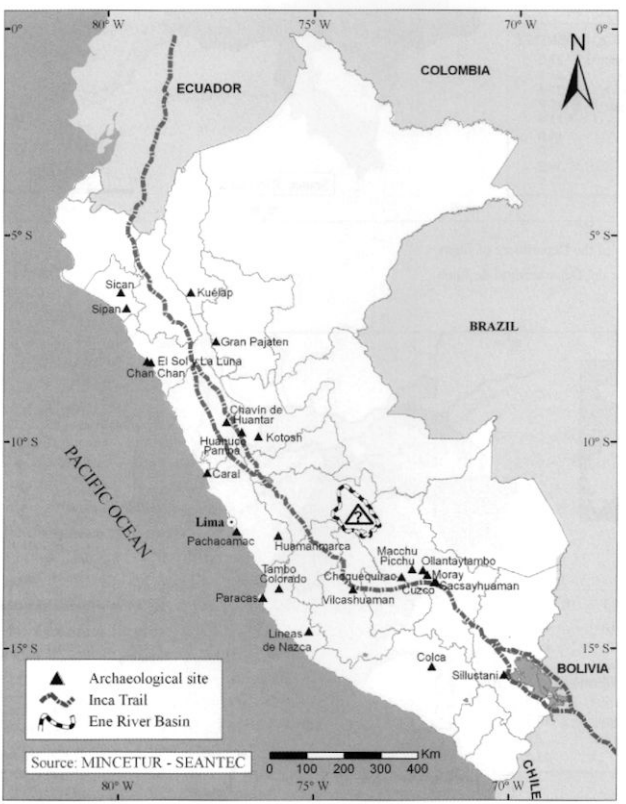


Fig. 7. Archaeological sites.

Fig. 7. Algunos sitios arqueológicos del Perú.

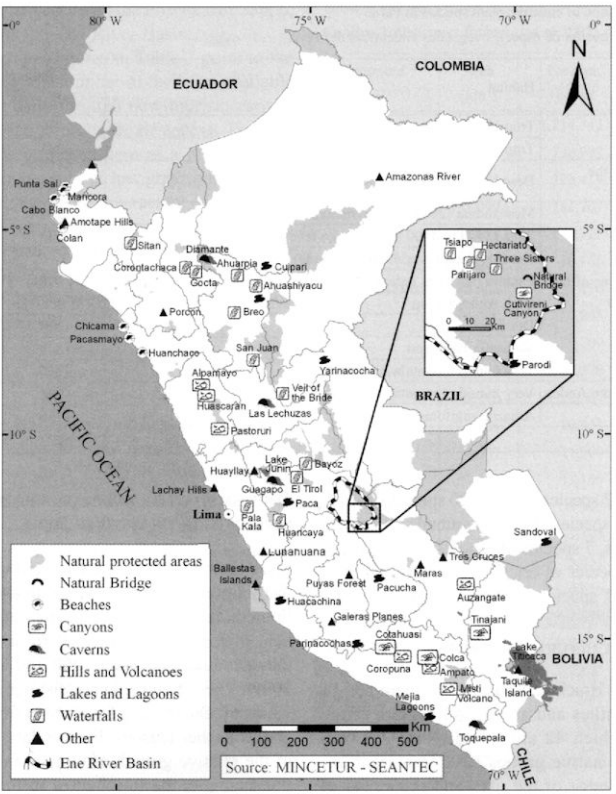


Fig. 8. Attractive natural areas.

Fig. 8. Algunas areas naturales atractivas del Perú.

It ranks fifth in the world in reptiles and amphibians (Duellman 2005) and 3rd in birds (Clements & Shany 2001). Of the 508 identified species of mammals, about 12.8% are endemic, located mostly in the Eastern flank of the Andes (Yungas) and in the Amazon forest (Pacheco *et al.* 2009). Of the 736 sea fish species, 112 are of economic importance (IMARPE 1999).

Studies of biodiversity in the Ene River Basin are very incomplete in the sense that they are not related to the various geographic locations, in a region which has wide differences in life zones due to the extremely varied and complicated topography, practically unexplored by land. The Master Plan of the Otishi National Park (see Figure 24, showing the protected natural areas of the Ene River Basin and surroundings) reports the plant and animal species in this region in its sections 2.2.4 on Life Zones and 2.2.5 on Wildlife (INRENA 2007: 28–31), based on a Rapid Assessment Program carried out in cooperation with Conservation International and the Smithsonian Institution.

Table 1. Distribution of endemic plant species in Peru.
Cuadro 1. Distribución de especies vegetales endémicas del Perú.

Region	Habitat	Endemic species	
		No.	%
Coast	Tropical hot desert (north region)	39	0.6
	Tropical warm desert (central and south regions)	243	3.9
Western side of the Andes	Desert scrub	366	5.8
Main high regions of the Andes ('Sierra')	Mesoandina (2000 to 3000 meters above sea level)	1291	20.5
	Puna (3500 to 4500 m above sea level)	502	8.0
	Desertic Puna (over 4500 m altitude)	6	0.1
	Paramo (northern region, 2000 to 4600 meters)	292	4.6
	High Andes region	185	2.9
	Dry forest	178	2.8
	Mountain rainforest	371	5.9
	Very humid mountain rainforest	1265	20.1
Eastern side of the Andes	Very humid premontane rainforest	798	12.7
Low jungle	Amazon rainforest	756	12.0
Total		6292	100.0

They report 92 species of birds, 20 species of small mammals, 12 species of large mammals, 11 species of amphibians, 7 species of reptiles, 45 species of spiders, 17 species of crickets, 58 species of butterflies and 67 species of bees and wasps.

Human and cultural diversity

According to Brack (2000) in Peru there are 14 linguistic families and at least 44 distinct ethnic groups, of which 42 are found in the Amazon forest. These native groups have important ancestral knowledge of the uses and properties of different species, the genetic resources in plants and methods of their management. Brack stresses the importance of genetic resources, mentioning that Peru leads the world in species and varieties of potatoes (9 domesticated, *ca* 3000 varieties and 180 wild species), hot chili (5 species and many varieties), corn (36 varieties), andean grains (quinua, kiwicha, canigua, tarhui), tubers (potato, oca, olluco, mashua) and Andean roots (sweet potato, arracacha, llacon and others). Brack also gives the very high numbers of species of fruits (650), medicinal plants (1408), ornamental plants (1600) and food plants (787) ancestrally identified and utilized by the natives.

Tourism statistics and geographical distribution of visits in Peru

The existing information on tourist visits and their distribution in the various localities of Peru is very limited. Table 2 shows estimates of annual numbers of foreign visitors to Peru and the income they produced between 1990 and 2005 (Cuanto 2007). These figures do not distinguish foreigners who visit exclusively for tourism from those who visit for other reasons, but the data gives an idea of the relative growth of tourism in recent years. For example, the low figures in the early 1990s were due to the negative effect of terrorism. From 1994 on, tourism increased rapidly as terrorism was for the most part controlled.

Table 3 gives the number of visitors for the 24 departments (regions) of Peru according to MINCETUR (Ministerio de Comercio Exterior y Turismo; the statistical information available in the Internet is periodically updated, as can be seen at www.mincetur.gob.pe/turismo/ESTADISTICA/estadisticas.htm). We can see that the Department of Junin, in whose extreme eastern part lies the Ene River Basin, is among Peru's six lowest in number of visitors. There is no province-level breakdown of the statistics, so we cannot offer

relative quantitative data on the Province of Satipo, which contains the Ene River Basin.

The low global figures in Table 2 point to the need to increase the number of facilities available for tourists, mostly through new tourism centers that have infrastructure with air access. The Ene River Basin is proposed here as a possible new tourism center because it has great potential for attracting tourists due to the variety of its natural features, its favorable topography for air access and its convenient central location, in spite of the narcotraffic and corruption prevailing presently in the zone, a situation that we analyze in the section on the present crisis.

The Ene River Basin

The Ene River Basin is located between the eastern flank of the Andes and the western flank of the northern part of the Vilcabamba range of mountains (12.27°–11.17° S, 74.53°–73.35° W), 320 kilometers east of the city of Lima (Fig. 9). It covers *ca* 9760 km^2. The Ene River is a continuation of the Apurimac River, starting at the confluence of the Apurimac and the Mantaro. The topographical maps of Figures 2 and 9 show the Ene River going through a wide valley between the Andes and the Vilcabamba mountains.

Administratively, the Ene River Basin is located in the Department of Junin, Province of Satipo, shared by the districts of Río Tambo, Mazamari and Pangoa (Fig. 6).

The Ene River Basin is covered by a dense evergreen montane forest up to *ca* 2600 m a.s.l., as on most of the east flank of the Peruvian Andes.

Table 2. Number of foreign visitors to Peru, and the income they produced in 1990–2005.

Cuadro 2. Número de visitantes foráneos al Perú, y el ingreso que produjeron en 1990–2005.

Year	Visitors	Income (US $)
1990	317,000	217,000,000
1991	232,000	225,000,000
1992	217,000	156,000,000
1993	272,000	215,000,000
1994	386,000	331,000,000
1995	540,755	428,000,000
1996	662,736	670,000,000
1997	746,599	816,000,000
1998	819,530	845,000,000
1999	943,917	890,000,000
2000	1,026,867	837,000,000
2001	1,009,512	733,000,000
2002	1,052,991	814,000,000
2003	975,938	940,000,000
2004	1,324,252	1,142,000,000
2005	1,192,602	1,308,000,000

Table 3. Foreign visitors in 2005.

Cuadro 3. Visitantes foráneos en el 2005.

Department (region)	Area (km^2)	Foreign visitors	Visitors (per km^2)
Lima-Callao	34,949	1,214,543	34.75
Cusco	71,987	738,992	10.27
Arequipa	63,345	228,419	3.61
Puno	71,999	181,767	2.52
Ica	21,328	146,121	6.85
Loreto	368,852	56,156	0.15
Madre de Dios	85,301	51,450	0.60
Tacna	16,076	51,055	3.18
Piura	35,892	29,209	0.81
La Libertad	25,500	27,678	1.09
Ancash	35,915	22,567	0.63
Lambayeque	14,231	19,351	1.36
Tumbes	4,669	11,909	2.55
Cajamarca	33,318	11,145	0.33
San Martin	51,253	8,915	0.17
Amazonas	39,249	7,177	0.18
Ayacucho	43,815	5,651	0.13
Moquegua	15,734	4,616	0.29
Junin	44,197	4,570	0.10
Apurimac	20,896	3,151	0.15
Ucayali	102,411	2,803	0.03
Huanuco	36,849	945	0.03
Huancavelica	22,131	700	0.03
Pasco	25,320	558	0.02

The natives that have populated this area ancestrally are called the Ashaninka people.

The Ashaninka people

The origins of the native groups that populate the central montane forest of Peru are not known with certitude, though some anthropologists claim that migration to the region came from the Amazon forest of Brazil (Rojas Zolezzi 1994). The Ashaninka (formerly known as Campa), the main ethnic group of the region, form part of the Arawak linguistic family which includes other groups such as the Asheninka, Nomatsiguenga, Machiguenga, Yanesha, Kaquinte and Yineyami, all of neighboring regions of the Central Jungle of Peru (Santos Granero & Barclay 2005). Some groups from the Colombian and Brazilian Amazon forest also form part of the Arawak linguistic family.

Most of the Ashaninka people are organized in small independent communities numbering between 30 and 500 members, who work collectively in the daily tasks of obtaining their livelihood. Some have adapted themselves precariously to urban life. Traditionally they obtained and produced all they needed from their highly biodiverse land, but in recent decades the communities in closer contact with the rest of the nation have gradually become more dependent on money, given their increasing need for products such as electric generators, motorboats, radios, telephones and even computers, in addition to the costs of educating their children. These needs have forced many to accept the invading settlers, who pay them to use their land for logging and for coca cultivation for cocaine production. The next sections give some details and remarks on this negative situation.

Recent developments in the Ene River Basin

Between 1984 and 1992 the Ashaninkas were the main victims of a bloody war waged by the Shining Path Maoist terrorists, also known as Sendero Luminoso (Gagnon *et al.* 1993). According to a report by the Truth and Reconciliation Commission (Comisión de la Verdad y Reconciliación

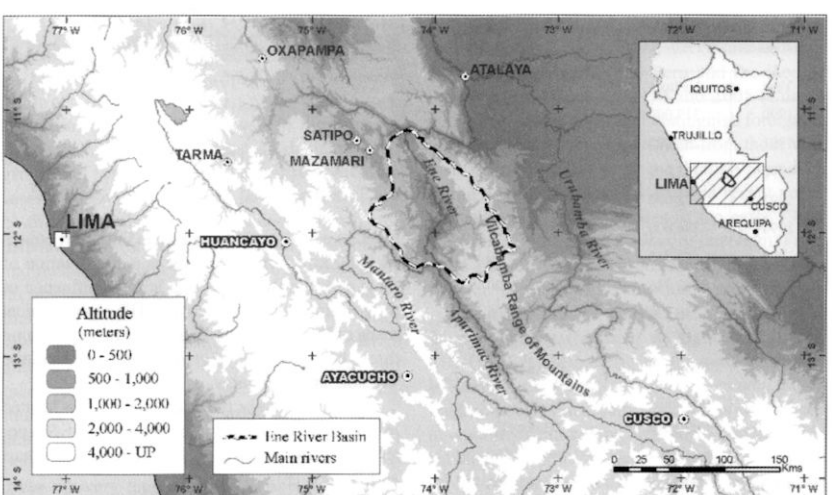


Fig. 9. Location of the Ene River Basin.

Fig. 9. Ubicación de la cuenca del río Ene.

2003), 'There are no precise data, but the majority of specialists and institutions estimate that of 55,000 Ashaninkas, around 10,000 were displaced by force in the valleys of the rivers Ene, Tambo and Perené, 6000 were killed and 5000 were captured by the communist terrorists, and it is estimated that during the years of the conflict between 30 and 40 Ashaninka communities disappeared'. Many of the Ashaninkas who were abducted as small children are still in the hands of the terrorists, though some have been rescued in operations coordinated between the police and native organizations.

The massive displacement of the Ashaninkas from their native lands up to 1992 paved the way for new settlers from the higher Andes mountains in the west, who took over many of their lands. A few years after the bloody war, many of the displaced Ashaninkas came back to their area only to find that the new settlers had already been given official property rights over some of their land.

Since 1992, the year in which Shining Path was formally defeated by the government, the present situation has been relatively calm in the Ene River Basin, because the groups of terrorists that remain in the region have opted for a 'peaceful' tactic. However these groups are still preaching their communist doctrine in the region and at the same time profiting from illegal logging and cocaine production on the land invaded by the mentioned Andean settlers and also on some land legally owned by Ashaninka communities. The population of these narcoterrorist groups is growing and they are becoming gradually more powerful, posing a serious political threat to the region, aside from the environmental damage caused by their irresponsible allies in the depredation of forests wrought by logging, which is followed by coca cultivation.

The present crisis: forest depredation and narcotraffic

Since 2001 the main coca plantations in Peru have been systematically monitored annually with satellite analysis and aerial photographs (UNODC-DEVIDA 2002–2009). Some of the results published on the Internet are shown in the following tables. Table 4 compares the coca cultivation areas of the main producing regions in Peru. The valley of the Apurimac River and Ene River is the only one whose area of coca cultivation has grown continuously in the period shown.

A proper comparison of the main producing areas must take into account productivity per hectare. In 2006 the Apurimac-Ene valley was reported to have by far the highest productivity among all coca producing areas in Peru, an average of 3600 kilograms/hectare/year as compared to the national average of 2200 kg/ha/yr, accounting for about 50% of the total coca production in Peru; 98% of this production was reported to be destined to cocaine (UNODC 2007: 28, 29 & 56).

Table 5 shows that the production of coca in the Ene section of the Apurimac-Ene valley grew at a far greater rate than the rest of the valley in the period 2002–2006.

As serious as drug traffic is illegal logging; it damages the environment and is followed by planting of coca. Quoting from the website of a British Foundation operating in the Ene valley, 'The Rainforest Foundation UK (RFUK) is working with local organisations in the Selva Central where the rainforests, which are home to Asháninka and Machiguenga communities, are in serious danger. We are currently only working with the Ashaninka communities at the moment, and not any other peoples in Peru. Settlers are bringing unsuitable mountain farming techniques; illegal logging is rife (often with the connivance of local elites); illegal coca growing is bringing with it pollution and armed gangs; roads are being built and there are rich deposits of oil and gas under the forest that the state is keen to exploit' (http://www.rainforestfoundationuk.org/Ahshaninka_land_rights). This dramatic situation is well known to the authorities and the media, but nothing of significance, aside from small-scale efforts such as that of the Rainforest Foundation, is being done to remedy it; there are no appropriate projects to provide good alternative sources of income for the natives and settlers of the region. Figures 10 and 11, taken by the Ashaninka native Joel Rivera in August 2006 in the lower Cutivireni, illustrate the illegal mahogany traffic in the area.

Table 4. Number of hectares cultivated with coca in Peru (2002–2006).
Cuadro 4. Número de hectáreas cultivadas con coca en el Perú (2002–2006).

Region	2002	2003	2004	2005	2006	Cum.	Avg.	%
Alto Huallaga	15,286	13,646	16,900	16,039	17,080	–	15,790	33
% variation	–	–11	24	–5	6	12		
Apurimac-Ene	14,170	14,300	14,700	15,530	15,813	–	14,903	31
% variation	–	1	3	6	2	12		
La Convención-Lares	12,170	12,340	12,700	12,503	12,747	–	12,492	26
% variation	–	1	3	–2	2	5		
Other regions	5,100	3,940	6,000	4,170	5776	–	4,997	10
% variation	–	–23	52	–31	39	13		
Total	46,726	44,226	50,300	48,242	51,416	–	48,182	100
% variation	–	–5	14	–4	7	10		

Source: www.unodc.org/pdf/research/icmp/peru_2006_sp_web.pdf (June 2007), page 15.
Note: the data have been rearranged and further elaborated by the author.

Table 5. Number of hectares cultivated with coca in VRAE (2002–2006).
Cuadro 5. Número de hectáreas cultivadas con coca en el valle del Apurímac-Ene (2002–2006).

Region	2002	2003	2004	2005	2006	Cum.	Avg.	%
Apurimac	13,283	13,400	13,382	14,125	14,402	–	13,718	92
% variation	–	1	0	6	2	8		
Ene	887	900	1,319	1,405	1,411	–	1,184	8
% variation	–	1	47	7	0	59		
Total	14,170	14,300	14,701	15,530	15,813	2	14,903	100
% variation	–	1	3	6	2	12		

Original data source: www.unodc.org/pdf/research/icmp/peru_2006_sp_web.pdf, page 28.
Note: the data have been rearranged and further elaborated by the author.

The problems of the Ene valley are not only far from being solved but are becoming worse day by day. A comprehensive solution is urgently needed, and this requires interdisciplinary studies with the support of international institutions, private investors and the Peruvian government. These studies should produce an adequate development strategy, which could be based on ecotourism to take advantage of the region's many attractive natural features, which we enumerate in the following section.

Attractive features of the Ene River Basin

The main features we have considered are the following:

Natural Bridge: this is the most emblematic feature of the region. Access by land is very difficult, but it can be clearly seen from light aircraft due to its huge size. The next section tells the story of its discovery and the main land and air expeditions that have reached it.

Waterfalls: the Cutivireni River canyon and tributaries contain hundreds of waterfalls, dozens of which are 100 meters high or more. The most famous of these are the 267 meter high Parijaro or Seward waterfall (OAS-Pan American Union 1965), shown in Figure 12, and the multiple-stage Three Sisters waterfall whose first two stages are shown in Figure 13. The total drop of the Three Sisters waterfall is more than 900 meters. From the 4th stage on, the water seems to disappear into underground caverns (Fig. 14). This important waterfall, considered by the *World Waterfall Database* (http://www.world-waterfalls.com) to be the third tallest in the world, has never been photographed from the ground. The Tsiapo waterfall (Fig. 15)

Fig. 10. Illegal mahogany logging.
Fig. 10. Explotación ilegal de caoba.

Fig. 11. Illegal mahogany transportation.
Fig. 11. Transporte ilegal de caoba.

is one of the most beautiful in the region. It can be reached by a four-hour walk from the town of Cutivireni, going along a creek, so it is only accessible in the dry season. Other spectacular waterfalls in the Cutivireni River and tributaries have not yet been named (Fig. 16) or even discovered. Further explorations should permit the development of a comprehensive database of these important attractions.

Lakes: most of the small lakes in the region lie in a zone of high mountains of the Vilcabamba range in the southeastern part of the Ene River Basin and beyond. These lakes are the sources of some of the main eastern tributaries of the Apurímac-Ene River such as the Pichari, Cutivireni, Mayoventi and Quempiri, and the main western tributaries of the Urubamba River, such as the Picha and Mantalo. Most of these lakes, such as Parodi Lake (Baekeland 1964), lie just outside the Ene River Basin, but can be considered part of its area of influence (Fig. 17). There are several other very small lakes dispersed on the various plateaus, which add beauty to the region.

Canyons and plateaus: the region within the Ene River basin that lies east of the Quempiri River and south of the Mamiri River contains several plateaus that are abruptly cut by canyons, the largest of which is Cutivireni canyon, which in its deepest section reaches depths of more than 1300 meters. The Mayoventi River, which is the main tributary of the Cutivireni River, is the next big canyon, with maximum depth of about 1000 meters. Mamiri canyon, to the north of the Cutivireni canyon, reaches depths of around 800 meters. These numbers are gross estimates based on the 90-meter-per-pixel DEM. The plateaus vary in size, and their mean altitude ranges from

Fig. 12. Parijaro waterfall.
Fig. 12. Catarata Parijaro.

Fig. 13. Three Sisters waterfalls.
Fig. 13. Catarata Las Tres Hermanas.

1100 to 2700 meters. Since these plateaus are for the most part without visible lagoons, and since there are numerous waterfalls in the canyons dividing these plateaus, it is safe to conclude that the underground water of these plateaus is the source of a great proportion of the water in the waterfalls.

Caverns: there are many caverns of different sizes in the region, most of which have not yet been explored by land. Since many of them are located in Otishi National Park, it will be necessary to obtain special permission to explore them from the Instituto Nacional de Recursos Naturales (INRENA, www.inrena.gob.pe). Eventually it should be advisable to open some of these places for tourists, after the necessary geographic, geological and ecological studies are done to evaluate visitor accessibility and security, and possible environmental vulnerabilities. All over the world, caverns are considered important tourist attractions. Examples of this are four caverns in the United States (Kartchner, Carlsbad, Luray and Mammoth Cave), which together attract more than 3 million visitors per year. These caverns are continuously monitored for possible environmental damage.

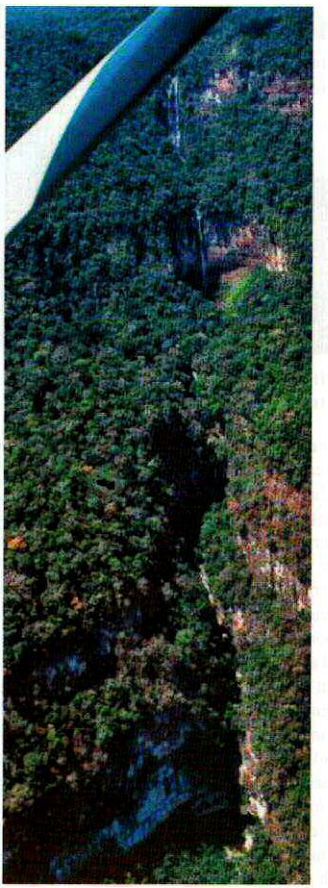


Fig. 14. Three Sisters waterfalls.
Fig. 14. Catarata Las Tres Hermanas.

The great Natural Bridge in Cutivireni Canyon

In 1961, while examining aerial photographs taken by a Canadian surveying company, Hunting Associates, Alfonso Rizo-Patrón[2] observed a break in the course of the Cutivireni River and concluded that there was a very large natural bridge in that location.

Then 26 years later the existence of this great natural feature, probably the largest of its kind in the world, was confirmed by a land expedition financed by the French magazine *Paris Match* (1987). Figure 18 shows a picture from this expedition. In August 2002 the renowned professional

Fig. 15. Tsiapo waterfall.
Fig. 15. Catarata Tsiapo.

photographer Alejandro Balaguer took excellent pictures of the Natural Bridge from a light airplane, one of which is shown in Figure 19. A second land expedition was successfully carried out in September 2006 by Ashaninka natives led by Joel Rivera, who has ample experience in jungle expeditions (Fig. 20). This expedition is the first to have crossed under the bridge to the far side upstream (Fig. 21). A huge cavern was discovered in this expedition near the Natural Bridge (Fig. 22).

The website of the Natural Arch and Bridge Society of the U.S.A. (http://www.naturalarches.org/gallery-Peru-Pavirontsi.htm) gives more information on this natural bridge, including its detailed topography and dimensions.

[2] Minister of Development and Public Works from 1959 to 1960, the period in which he contracted the Canadian Surveying company to study the Ene River Basin in the context of his Peru-Via Plan for the region.

Fig. 16. Unnamed waterfall.
Fig. 16. Catarata sin nombre encontrada cerca al puente natural.

The creation of a National Park in the Cutivireni area

In 1965 the Organization of American States (OAS) published a booklet proposing the creation of Cutibireni National Park, on the basis of the natural beauty of the region (OAS-Pan American

Fig. 17. Lake Parodi.
Fig. 17. Lago Parodi.

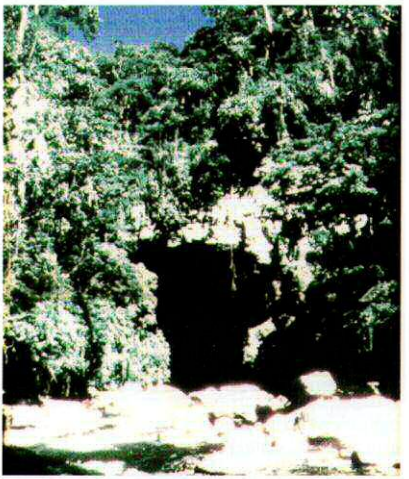


Fig. 18. Northwest side of the Natural Bridge (1987).
Fig. 18. Lado noroeste del Puente Natural (1987).

Fig. 19. Southeast side of the Natural Bridge (2002).
Fig. 19. Lado sureste del Puente Natural (2002).

Union 1965). The project covered about 2100 square kilometers and did not include the area of the Natural Bridge or the source of the Cutivireni River. The booklet named 20 waterfalls within the proposed park. Parijaro waterfall was named Seward in honor of the explorer who measured its height (267 meters).

The OAS project was never accorded official status, but in 1988 the government created the Zona Reservada del Apurímac (reserved nature area) with an area of 16,692 km^2, including the entire area of the OAS project plus all the rest of the Vilcabamba range of mountains up to the Tambo River in the north, the region of high lakes including Parodi Lake, and a large area to the east delimited by the Urubamba River.

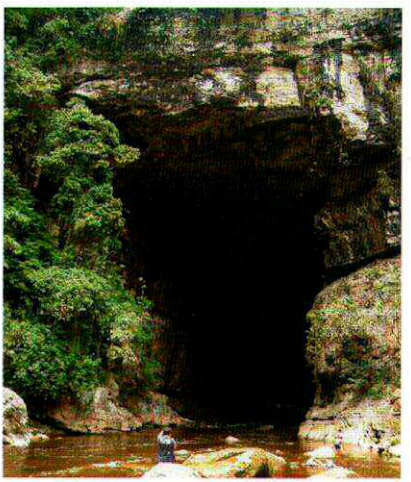


Fig. 20. Northwest side of the Natural Bridge (2006).
Fig. 20. Lado noroeste del Puente Natural (2006).

Fig. 21. Southeast side of the Natural Bridge (2006).
Fig. 21. Lado sureste del Puente Natural (2006).

The members of the 1987 land expedition to the Natural Bridge founded the Association for the Conservation of the Cutivireni Area (ACPC); since then this NGO worked to establish a nature park in the region. Their efforts culminated in January 2003 when Otishi National Park was officially created, together with two surrounding protected areas called Reserva Comunal Ashaninka and Reserva Comunal Machiguenga. Otishi Park covers about 3600 km^2, the Ashaninka Reserve 1845 km^2, and Machiguenga Reserve 2189 km^2, totalling 7094 km^2. The difference of 9599 km^2 between it and the previous Zona Reservada del Apurímac is considered a buffer zone.

The Master Plan for Otishi Park (INRENA 2005) was approved by the government in May 2005 and is in effect for a period of five years until 2010. This document contains useful information, especially its various thematic maps. However, Section 5.1 on Objectives of Zoning imposes some general restrictions that would require revision after interdisciplinary scientific studies. One example of this is the category of Strict Protection, *Protección Estricta* (PE; page 62), which indiscriminately includes all areas at altitudes above 2500 m, covering a total area of 1,333 km^2. According to the Master Plan, the PE zones are supposed to be free of human intervention in perpetuity; thus tourism is expressly prohibited in these areas. This seems quite arbitrary, since there are zones within the PE that offer excellent attractions for ecotourists (caverns and beautiful landscapes), as mentioned later here in the section on the proposed tourism project. The PE areas should be redefined after further detailed exploration of zones of special interest for tourism that would not destabilize the region's ecosystems. Another restriction in the Master Plan which would need to be revised refers to the mentioned buffer zone (section 6.4, page 69 of the Master Plan), stating that there should not be any large-scale tourism in the buffer zone. The problem here is economic. Unless the tourism business is large enough it will not offer a viable economic alternative to the present destructive activities in the region. The environmental costs of large-scale tourism must be weighed against large-scale depredation, in order to choose the lesser evil. This aspect obviously requires studies based on rational criteria, not prejudice stemming from unilateral, extreme conservationist views.

Fig. 22. Cavern close to the natural bridge (2006).
Fig. 22. Caverna cerca al Puente Natural (2006).

Figure 23 is a map showing the three protected areas of the region, and also most of the Ashaninka communities with legal rights that are located around the Ene and the Tambo rivers to the west and to the north of the protected areas respectively. It should be noted that within Otishi Park there are some small isolated native communities that have little or no contact with Western civilization. Five of them are shown on the map, three of which have been contacted in recent expeditions led by Joel Rivera.

ARCHAEOLOGICAL POTENTIAL

There are various accounts by Ashaninkas referring to the possible existence of important undiscovered archaeological remains in the region of the Mantaro, Apurimac and Ene rivers (Ortiz 1976). Expeditions should be made to locate them. There are historical reasons for this. The rebellion

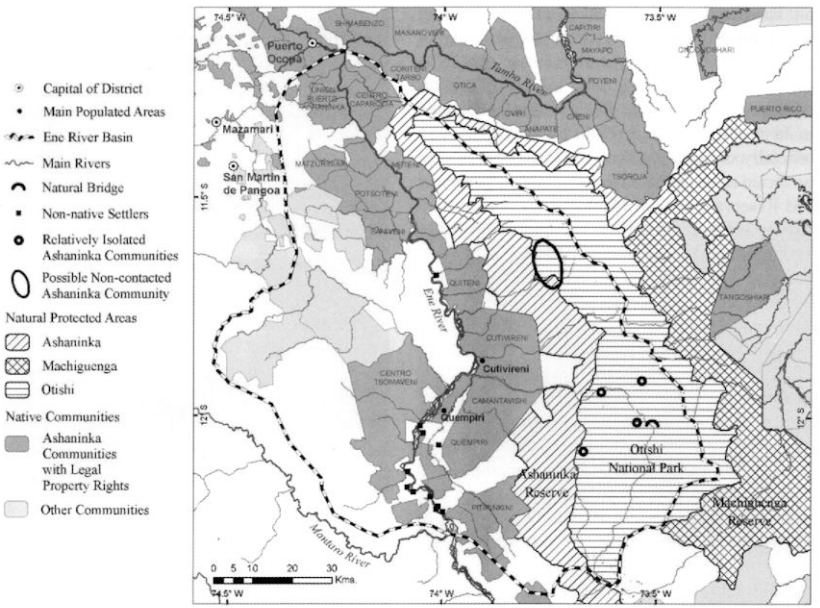


Fig. 23. Protected natural areas and native communities in the Ene River Basin and surroundings.

Fig. 23. Areas naturales protegidas y comunidades nativas en la cuenca del Ene y alrederores.

of Manco Inca against Francisco Pizarro and the Spanish conquerors occurred in 1535. Manco Inca was a younger brother of Inca ruler Atahualpa, who was assassinated by the Spaniards in 1533. The young heir to the throne was initially befriended by Pizarro and used as a figurehead of the Empire while the conquistadors proceeded to loot the country of most of its gold. The Vilcabamba Mts northwest of the city of Cuzco was the region towards which Manco and his people fled to escape from the Spaniards. Explorations by Gene Savoy in the 1960s led him to believe that he had found the 'Lost City of the Incas' in a place called Espiritu Pampa (Hemming 2004). However, close examination of the location of Espiritu Pampa in the geographic context (Fig. 24) leads us to believe that Gene Savoy may have stopped short of the true last refuge of the Inca elite.

The Incas and other prehispanic Andean peoples constructed several thousand kilometers of what is known as the Capaq Ñan or Inca Roads, spanning from Ecuador through Bolivia and the north of Argentina, so the distance from Espiritu Pampa to the northern Vilcabamba region in the Ene River basin (*ca* 100 kilometers) is a very small extra step that could easily have been made by the creators of the marvelous buildings, roads, hydraulic works and agricultural terraces that have made the Incas famous all over the world.

The need for more exploration

Most of the territory of the Ene River basin has not been explored by air or land. Many important natural features of great interest to naturalists or ecotourists exist in this region. They should be mapped

so that a sound plan for the development of sustainable tourism in the region can be drafted. The few air and land expeditions carried out to date have uncovered only a fraction of these features, which include countless waterfalls and caverns. There is also the archaeological potential of the region, as mentioned. Modern geographic hardware and software such as GPS and GIS are valuable aids in exploration, together with aerial photographs, satellite images and digital topographic models. Google Earth is a practical computer tool which combines many of these elements in one package.

An example of the use of these exploration methods is a detailed analysis made by SEANTEC S.A. of a pair of aerial photographs of a plateau within Otishi National Park. These photos show that it is possible for a helicopter to land on this plateau, which has wide and almost flat spaces without significant vegetation. Examination of a stereo anaglyph image derived from the pair of photographs (Fig. 25), showed large holes and depressions on the ground. A digital elevation model was then obtained by photogrammetric methods, allowing detailed measurement of the topography (Figs 26 & 27). Since no water is accumulated in these depressions, and the region has high rainfall, we concluded that this plateau contains a system of caverns. Next, light plane flights were made in 2007 and 2008 to check for visible entrances to caverns that might be easily accessible for ground exploration. The flights gave positive confirmation. Figure 28 is an IKONOS satellite image of the plateau, and Figure 29 is an image from one of the flights showing part of the plateau with some of the main cavities. The next step is to visit the site by helicopter and explore each cavern entrance on the ground. This work is being done in the context of the project for a tourism center in the region that could make this rare plateau one of its attractive locations. This is developed in more detail below in the section on the proposal for a tourism center.

The government does not have the resources or the organization to carry out any type of exploration in this area, but should aid the efforts of the private sector and international groups of explorers to realize this needed venture.

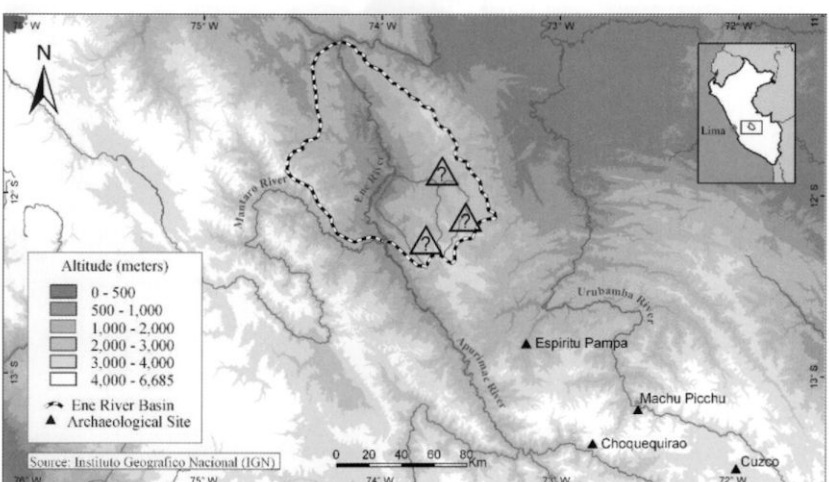


Fig. 24. Some of the possible locations of the last refuge or 'Lost City' of the Incas.

Fig. 24. Algunas de las posibles ubicaciones del último refugio o 'Ciudad Perdida' de los Incas.

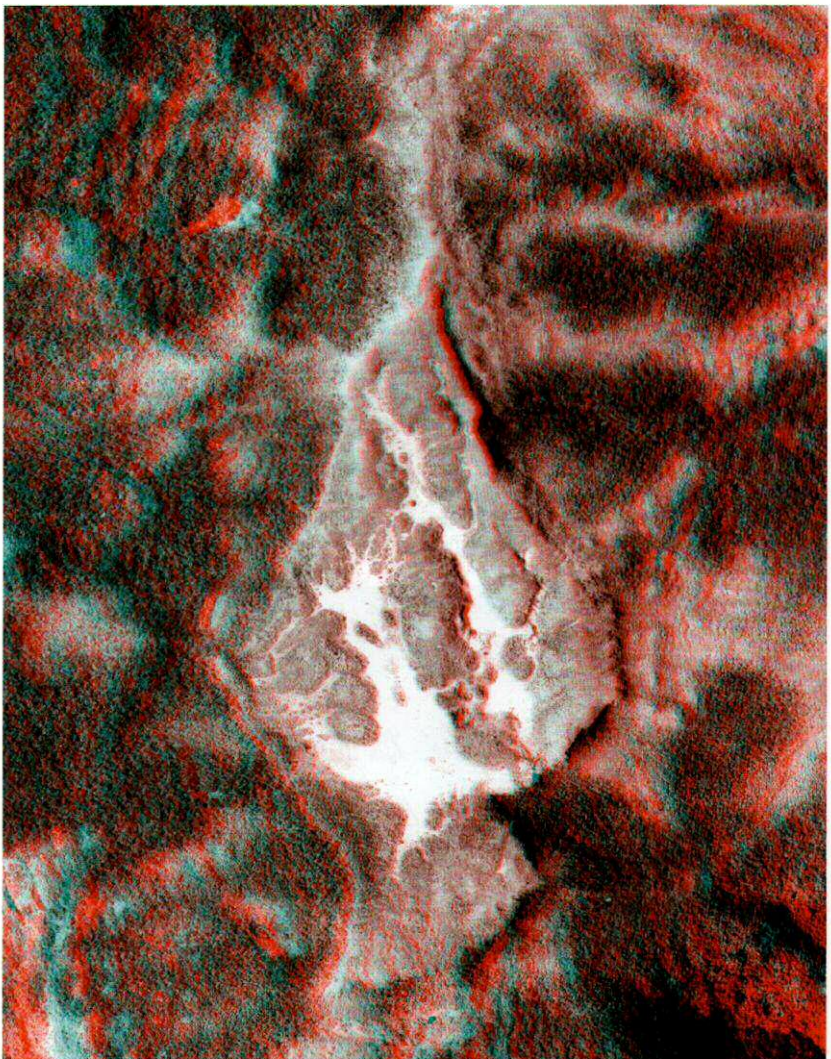


Fig. 27. Three-dimensional view of special plateau in Otishi Park (requires anaglyph glasses enclosed for 3D viewing).
Fig. 27. Vista tridimensional de meseta especial en el Parque Otishi (se incluyen anteojos anaglifos para visualización en 3D).

Criteria for selection of new sites for tourism projects

Given the complexity of Peruvian geography, it is quite costly to establish new tourism centers in many of the attractive places that lack facilities at present. Investors normally try to evaluate possible sites in terms of the market (potential income) versus investment and operating costs. Clearly, however, the market cannot be predicted for remote places where there is presently no significant flow of tourists due to the lack of infrastructure (access, lodges), and since the investment cost depends on the size of the market (projection of the number of tourists), the benefits and costs of the project are not quantifiable. This means that an evaluation of the possible value of a new tourism center depends on qualitative criteria.

The relative importance of different factors (criteria) will vary depending on who is doing the evaluation and the time horizon of the projects. For example, a location with attractive natural features but in a remote region with no infrastructure may be considered unattractive to private investors, but may be a high priority for the state due to strategic reasons.

The following is a list of different criteria that can be used for evaluation of tourism projects:

1. Beautiful landscapes and special natural features;
2. High biodiversity;
3. Proximity to land or air access;
4. Important archaeological ruins.

The tourism project proposed in the next section meets at least the first two of these criteria to a high degree. The third, related to the ease of access, can be met by establishing a convenient airport in the area. The fourth, as previously mentioned, is a possibility which further exploration must elucidate.

Proposal: tourism center in the Cutivireni-Quempiri area

Given the impressive natural features of the region, and their great number, it is fitting that tourists should be able to visit these places and generate income for the native people as well as for the country as a whole. Furthermore, given that the natives are presently engaging in illegal and destructive activities for their short-term survival, they should have an alternative legal way to earn a living which does not harm the environment. Figure 30 is a preliminary map of the location of the proposed tourism center and some of the many attractive features of the Cutivireni and Quempiri river basins.

The Cutivireni-Quempiri area has many attributes that justify the creation of an important tourism center, subject to the realization of a thorough interdisciplinary study done in cooperation with the Peruvian authorities and the natives themselves. One of these assets is the existence of an area between the Ene and Quempiri rivers that seems especially suitable for the construction of an airport big enough to receive large aircraft. This is important, since the influx of a large number of visitors is a necessary condition for the economic sustainability of a tourism project in this zone. The remoteness of the region makes other transport alternatives unfeasible, aside from the fact that building access roads to the area would only contribute to the accelerated degradation of the environment, as has been the experience in other forest areas in Peru (CDC-UNALM 2004; SEANTEC 2005).

From the proposed airport in Quempiri, sightseeing flights over the attractive areas would be much shorter and efficient than presently; light plane flights to view the Natural Bridge now have to be made from Satipo (148 km away) or Mazamari (134 km away). The airport at Quempiri would be only 52 km from that place, with corresponding savings in time and costs per flight. Many air touring companies would have an important incentive to provide this kind of service.

Another important element of this tourism project is the role of helicopters for access to especially attractive areas on plateaus that have been studied in detail from aerial photographs, and which can only be reached by this means. One of these areas has been photographed from the air (Fig. 29) and shows wide spaces without much vegetation where a base for detailed ground studies can be established. If these studies find that it is feasible, the scientific base can be expanded to

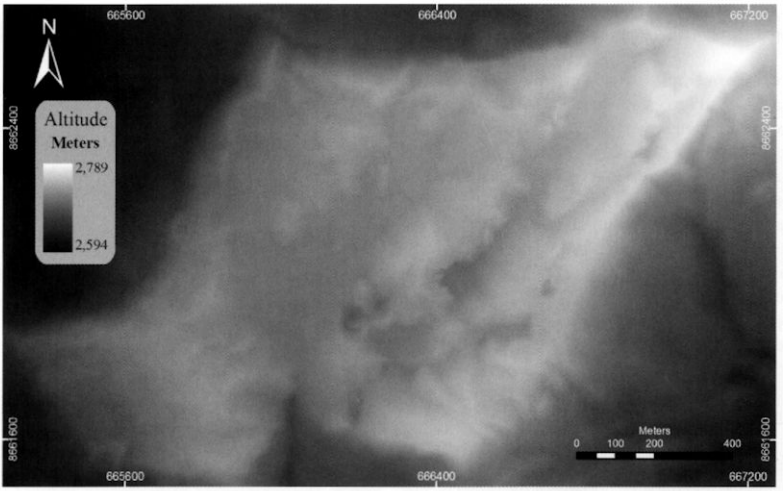


Fig. 26. Topography of special plateau in Otishi Park – digital elevation model (dark areas show depressions).

Fig. 26. Topografía de meseta especial en el Parque Otishi – modelo de elevación digital (áreas oscuras muestran depresiones).

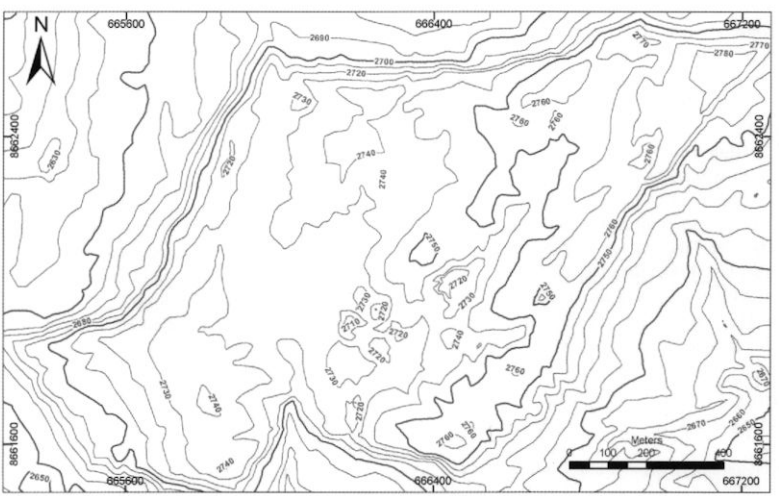


Fig. 27. Topography of special plateau in Otishi Park – contour lines with 10-meter intervals.

Fig. 27. Topografía de meseta especial en el Parque Otishi – curvas de nivel con intervalos de 10 metros.

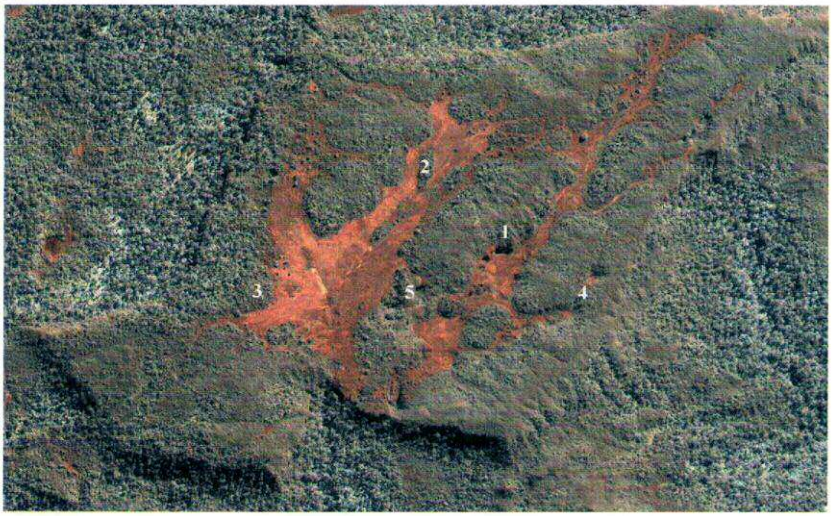


Fig. 28. Detailed exploration of special plateau in Otishi Park – Ikonos satellite image.
Fig. 28. Exploración detallada de meseta especial en el Parque Otishi – imagen satelital Ikonos.

Fig. 29. Detailed exploration of special plateau in Otishi Park – aerial photograph May 29, 2008.
Fig. 29. Exploración detallada de meseta especial en Parque Otishi – foto aérea de Mayo 29, 2008.

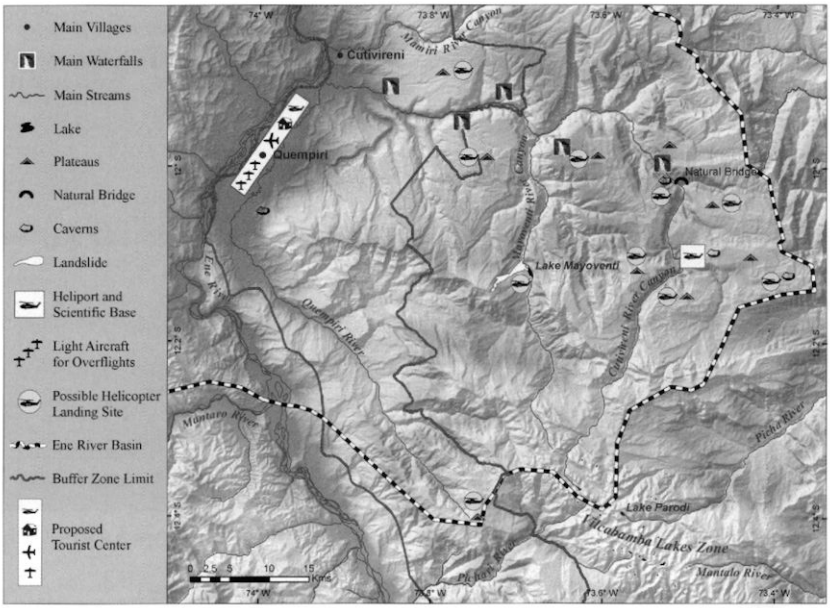


Fig. 30. Proposal for a tourist center in the Cutivireni-Quempiri zone.

Fig. 30. Propuesta para un centro turístico en la zona de Cutivireni-Quempiri.

create a facility for tourists. The attractions of this plateau, 2 km long and at *ca* 2700 m a.s.l. include a probable cavern system and spectacular views all around due to its height above most of the adjacent area. The plateau is also only 10 km away from the Natural Bridge, and from another important cave system at over 2500 m in an area with two waterfalls which was recently identified through high-resolution stereo photographs (Fig. 31). There are many plateaus nearby which have not been explored, with similar characteristics.

At this point it is clear that the establishment of a proper base for scientific studies of the region, hitherto almost unexplored, is an important step toward determining what types of interesting tourism activities are permissible in the region and where they can be located. Those activities will provide an economic alternative for the inhabitants of this region, which is seriously endangered by all sorts of illegal and destructive activities.

Another important element of the proposed project is the role to be assigned to Ene River Basin communities to the west and north of the Cutivireni and Quempiri sub-basins. The proposed solution is for these communities to provide agricultural and natural medicinal products to the local market that would be created by the new tourism center. If this market grows large enough, this would provide a real agricultural alternative to these communities which could replace their present destructive activities.

Finally, it must be said that the proposed tourism center must start on a small scale and gradually grow large enough to make it economically and socially significant for the region. This aspect must be studied by an interdisciplinary team, as it is a com-

plex dimension of the project. Such a study must develop a comprehensive strategy for the short, medium and long term, while recognizing that the zone is in a critical situation and that quick decisions are needed. One aspect for study as soon as possible is the feasibility of constructing a medium-sized airport in Quempiri and furnishing the necessary security forces to prevent this airport from being used for illegal purposes such as narcotraffic.

Macro tourist air routes for central-southern Peru: present situation versus a proposal for the medium and long term

Most international tourists now arrive by jetliner to Peru through Jorge Chavez Airport in Callao Province next to the city of Lima. The incoming traffic to this airport is therefore quite heavy and will soon become bottlenecked if international tourism to Peru grows at the rates that are to be expected given its great archaeological and natural attractions. Other possible sites need to be sought as alternatives for direct flights to Peru. These sites should offer sufficient attractions in themselves, and at the same time be strategically located relatively close to other attractive tourism spots in order to serve as convenient stopping points en route to these other sites.

Figure 32 illustrates the possible logistic advantages of establishing an airport in the Cutivireni-Quempiri area in the medium and long run, subject to the approval of the competent authorities on the basis of the required feasibility studies. The location is ideal since it is on the same side of the High Andes as the important airports of Cuzco and Puerto Maldonado, and much closer to them than the present international airport of Callao. Tourists interested mainly in ecotourism would have shorter, more efficient itineraries to these tourist destinations without having to stop in Lima.

Obstacles to sustainable development of the Ene River Basin

There are several obstacles to sustainable development of the Ene River Basin, including the following:

1. The remoteness of the area, and consequent difficulty of access;
2. Some conservation groups oppose tourism on a large scale, maintaining that it will cause environmental damage;
3. The presence of illegal loggers and coca growers;
4. The native communities of Cutivireni and Quempiri have been opposing ecotourism for reasons that are not clear but could be related to the illegal activities from which they are beginning to obtain short-run indirect benefits to the detriment of the long-run good. This is understandable given the increasing deterioration of the natural environment which traditionally gave them their sustenance;
5. The rigid procedures for obtaining development project funding from international financial and governmental institutions. These procedures tend to favor standard types of projects with fast payback periods instead of well designed and integrated projects focusing on the long run, which require serious and imaginative studies;
6. The lack of interest of local entrepreneurs in such a remote and problematic area as the Ene River Basin, which lacks adequate infrastructure.

The need for dialogue with native communities and training of natives for future tourism development

Creation of a tourism center in the Cutivireni-Quempiri area has to be based on decisions by the native communities of the region to embark on an economic development strategy based on tourism. These communities have ancestral and legal rights over their territories, so any solution to their present problems should not be imposed from outside. Obviously they do not have experience in the modern tourism business, so the idea has to be sold to them. This can only be achieved through dialogue, which requires a sustained effort by organizations with the administrative and financial capabilities to engage in that.

As part of this, a complementary activity is to develop seminars and training courses to provide interested members of these communities with

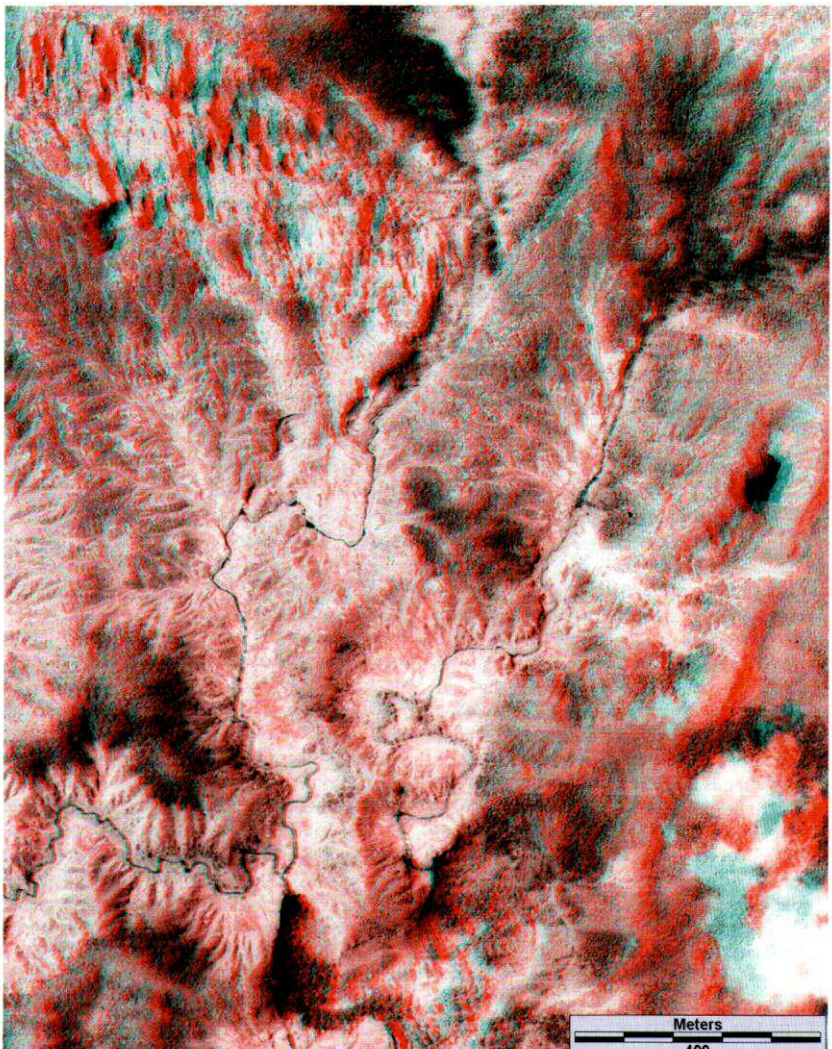


Fig. 31. Three-dimensional view of new region in Otishi Park (requires special anaglyph glasses enclosed for 3D viewing).
Fig. 31. Vista tridimensional de nueva región en el Parque Otishi (requiere anteojos anaglifos incluidos para visualizar en 3D).

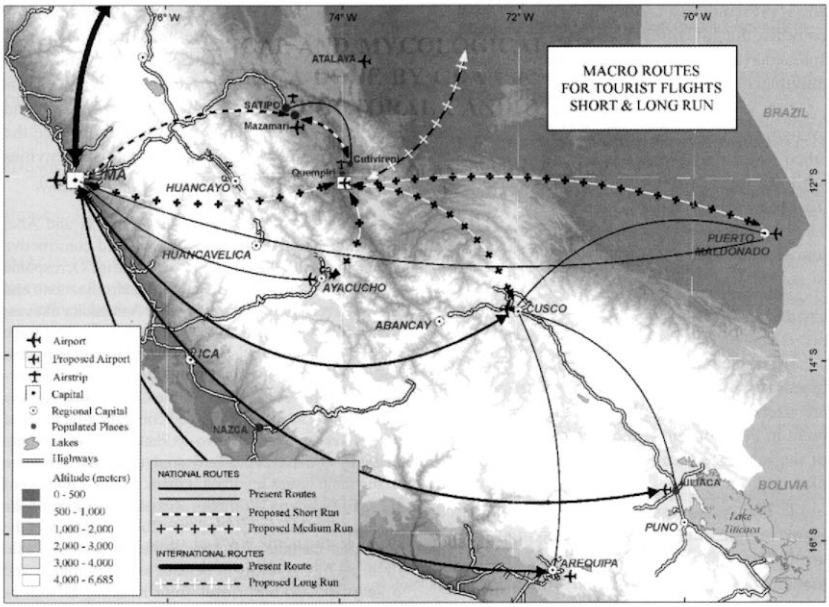


Fig. 32. Macro routes for tourist flights short and long run.

Fig. 32. Rutas 'macro' para vuelos turísticos en el corto y largo plazo.

knowledge of the tourism business, so they can relay this knowledge to other members of their communities who have to make the final decisions on whether or not to develop a tourism project, and on its scale.

The proposed project does not imply that all the natives in the region would be forced to change their lifestyle in a traumatic process. Only a relatively few members of the Ashaninka communities in the region would have to change their ancestral ways of living in the event that a large-scale tourism project materialized. The people who would work in building and operating the tourism center would be selected by an administrative body created with the participation of the communities involved, who would decide how many of their members would be assigned to these tasks.

Some strategic considerations

1. The depredation and narcotraffic in the target zone treated in this paper cannot be countered without the existence of an alternative project large enough to give the people of the zone jobs and income to meet their increasing needs. In the long run, a critical choice must be made between large-scale tourism and large-scale depredation and narcotraffic.

2. At this time the government does not have the resources needed to offer this region effective solutions to their serious problems. It requires cooperation with the private sector (national and international) to design imaginative development projects.

3. Given that this region has suffered from invasions and terrorism in the last two decades,

and is presently in a crisis of depredation and narcotraffic, the government should prioritize control and security so that the risk to the investment is minimized.

4. A large section of the area of interest for tourism in the Ene River Basin is presently classified as a national park (Otishi), with a series of arbitrary restrictions on entry that are detailed in the present Master Plan for the park. Regulations for entry to this zone should be revamped to permit tourist visits under controlled conditions.

Conclusions

1. The techniques of geographic analysis, combined with information obtained from expeditions, are useful means for planning tourism development in Peru, but these techniques are only a part of the integrated methodology required for good planning.

2. The human aspects must be considered: many regions with ecotourism potential in Peru are the ancestral homes of native communities that are the legal owners of many of the territories where new tourism projects might be implemented. They must make the final decision about the investments to be made.

3. Immediate action in the form of sustainable projects is needed to counteract the increasing power of the illegal loggers and cocaine producers, and to halt the consequent deterioration of the rainforests that are the ancestral homes of the natives in Peru. The government is not in a position to develop specific projects, so it must support private initiatives.

4. Action must be preceded by well-devised plans, and good planning requires well-motivated teams of researchers from many disciplines and including natives with their special knowledge of the environment.

5. A comprehensive interdisciplinary study should be carried out, involving diagnoses, elaboration of a development strategy, and a feasibility study of immediate investment projects for the Ene River Basin area (e.g., basic infrastructure such as an airport).

6. To attract the interest of possible investors (public or private) for the needed projects, it is important to publicize the outstanding natural features of the target region. Good images and videos should be published widely. More exploration and scientific study, by land and air, will produce the information needed to specify the tourism activities appropriate for given zones.

Acknowledgments. Christian Contreras and Abel Revoredo prepared the maps and offered constructive criticism during the whole project; Marisa Ocrospoma gave data on biological diversity; Sandro Saettone and David Rivera provided data on the Ashaninka natives; Maria Teresa Menéndez, Luis Miguel Sánchez and Jorge Gómez read the drafts and contributed valuable suggestions. Architect Víctor Aguilar, Director of the Department of Rural Construction at the Universidad Agraria La Molina (UNALM), provided computing facilities at the University's Laboratorio de Planeamiento, Modelamiento y Ordenamiento Territorial, and discussed some of the main issues involved. I thank Marek Lubinski of the NGO Uncaria, Professor Zdzisław Jan Ryn of the Jagiellonian University, Professor Zbigniew Mirek of the W. Szafer Institute of Botany, Professor Andrzej Paulo of the AGH University of Science and Technology, and a long list of other friends from Kraków, as well as speleologist Andrzej Ciszewski, for their encouragement and interest in this work. Finally, I am indebted to my father, Alfonso Rizo-Patrón, who since 1959 inspired my interest in the Ene region with his pioneering Peru-Vía Plan and his discovery of the Natural Bridge.

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La cuenca del río Ene en el Perú – su geografia y potencial turistico[3]

El turismo es una actividad económica que no está suficientemente desarrollada en Perú debido a varios factores que incluyen la gran complejidad de la geografía del país. En este artículo ofrecemos una visión general de la geografía del Perú y su relación con el turismo en base a mapas temáticos generales, una vista más detallada de la cuenca del río Ene y sus alrededores, su gente, sus problemas, sus paisajes naturales, y una propuesta de un proyecto para el desarrollo del ecoturismo en una área alrededor de las subcuencas del Cutivireni y del Quempiri. La cuenca del río Ene es una de las zonas con mayor concentración de atractivos naturales en el país. En una parte de la cuenca se han creado 2 Áreas Naturales Protegidas, el Parque Nacional Otishi y la Reserva Comunal Asháninka. Debido a su lejanía y dificultad de acceso, el desarrollo de estas tierras ha sido descuidado tanto por el Gobierno como por el sector privado. Estas tierras se han convertido en refugios para la subversión y para actividades ilícitas que están dañando seriamente el medio natural y el modo de vida tradicional de los Asháninkas, que son los habitantes ancestrales de la región. El proyecto ecoturístico para la zona se propone como una solución para la actual crisis a través de un aprovechamiento ordenado de los innumerables atractivos naturales de la región, como son las cataratas, cavernas, mesetas, profundas quebradas y el puente

[3] Versión HTML actualizable en español: www.peruvia-gallery.com/geography/indice.htm.

natural más grande del mundo sobre el cañón del río Cutivireni. Para esto se requiere la realización de estudios interdisciplinarios serios e imaginativos para diseñar los usos de los suelos, lo que se conoce como 'zonificación económica y ecológica'. Dada la gran extensión y variedad de los terrenos de la zona del proyecto propuesto, es necesario realizar muchas exploraciones para poder llevar a cabo una zonificación adecuada que aproveche óptimamente el potencial de la zona para el turismo sin poner en riesgo su estabilidad ecológica. Una de las actividades turísticas que puede realizarse exitosamente es sobrevolar en avioneta la zona. El acceso por tierra a los lugares más atractivos es muy difícil, y al no ser recomendable construir carreteras en la zona, el único medio de acceso factible para las exploraciones terrestres es el helicóptero. Se ha identificado una meseta con características especiales en la que podría instalarse un helipuerto con una base científica a partir de la cual se podrían investigar varias zonas de la región.