Regional Report

Sustainable Mountain Development in Meso America

From Rio 1992 to Rio 2012 and beyond

2012

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Mountain Partnership

From Rio 1992 to 2012 and beyond:
20 years of Sustainable Mountain Development

What have we learnt and where should we go?

Regional report for Mesoamerica

Prepared by:
Latin American School for Protected Areas (ELAP)
University for International Cooperation (UCI)
Tropical Science Center (TSC)

Olivier Chassot, Ph.D
Alan Valverde, MPM
Vladimir Jiménez, M.Sc.
Eduard Müller, Ph.D
Tania Moreno, B.Sc.

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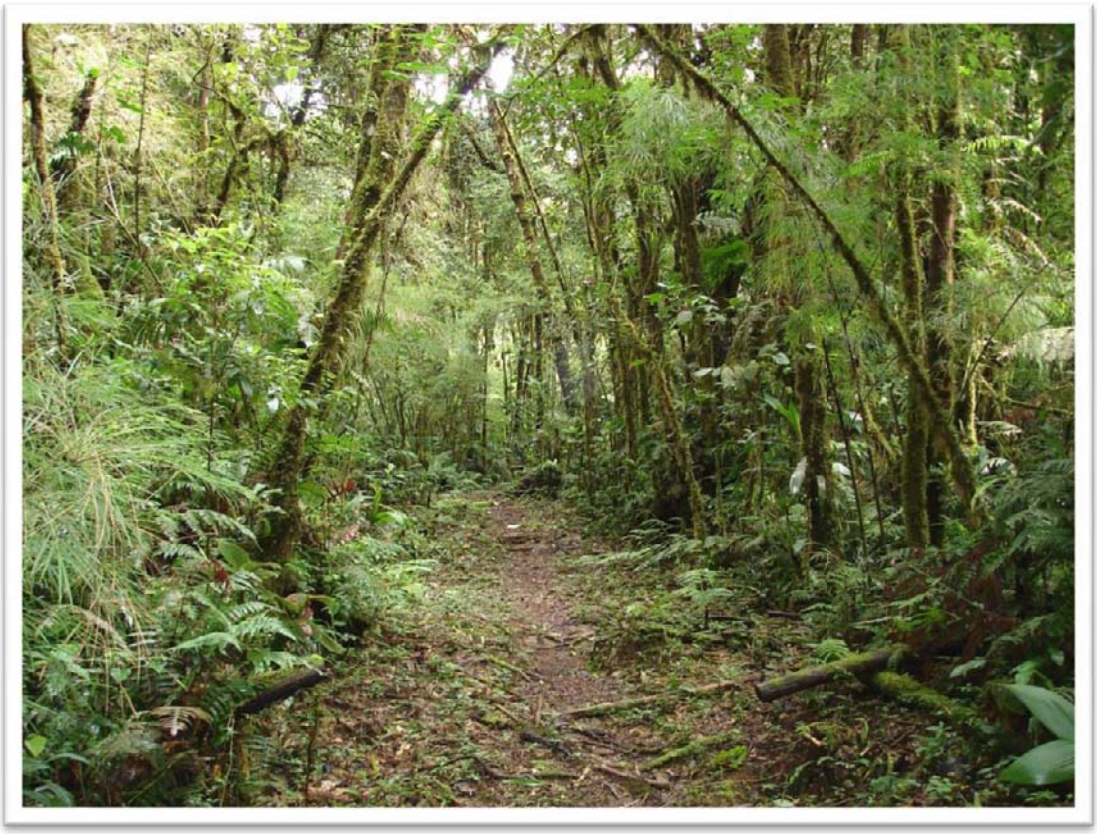
Mountains are the beginning and the end of all natural scenery.
John Ruskin (1856)

A man can hardly be a beast or a fool alone on a great mountain.
Francis Kilvert (1871)

These days when we talk about preservation of the environment, whether we mean the wildlife, forests, oceans, rivers or mountains, ultimately the decision to act must come from our hearts. So, the key point, I think, is for all of us to develop a genuine sense of universal responsibility, not only toward s this beautiful blue planet that is our home, but also towards the innumerable sentient beings with' whom we share it
Dalai Lama (1992)

To Professor Lawrence S. Hamilton, a true champion of Mountain Sustainable Development in Meso America and the mountains of the world. It is a great honour to be able to share a part of the climbing trail with you.



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Why mountains matter for Mesoamerica

Mountains in Mesoamerica cover 25.2% of the region and have a remarkable 12% of the world's biodiversity for only about 2% of earth's land surface. A total of 86 indigenous ethnic groups occupy 54.2% of the mountain territories. The greatest global threat to sustainable mountain development in the region is climate change; other direct threats are mining, expansion of hydropower generation, urban sprawl into mountain areas, deforestation and soil erosion.

Mesoamerica extends from the Tehuantepec Isthmus in Mexico, across Southern Mexico (Campeche, Yucatan, Quintana Roo, Chiapas, Tabasco and Oaxaca) to Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, with a total of 862,468 km^2. Since Rio 1992, Meso America finds itself immersed in a new and more complex international situation without having achieved, in recent years, rapid advances in human development and regional integration. This panorama poses strategic challenges that will not only require innovative and bold regional and national responses, but also major improvements in the collective capacity to implement them.

The contribution of mountains to sustainable development in Meso America

Today, a vast majority of Mesoamerica's more than 50 million people live in the lowlands of the Pacific coast. Nevertheless, Mesoamerica has a higher concentration of large cities in central valleys that increasingly depend on water supplies from the mountains. Regional ecosystems and the economic and social capital they support are now facing climate change and, as a consequence, an unprecedented combination of tipping points including extreme population growth (doubling of the regional population since 1992). Forests, protected areas, biological corridors and indigenous territories cover 72.6% of the mountain land. In contrast to the more densely populated and industrialized lowlands, the mountains represent an opportunity for the region to strengthen conservation and sustainable development.

Manifold challenges

One of the main causes for increased pressure on natural resources is the rapid population growth in the region, having gone from 11 million to more than 50 million in the last six decades. A great part of the region's economy is based on extractive use of mountain natural resources. Energy production from renewable resources within mountain protected areas is growing in many countries in the region, particularly hydroelectric and geothermal energy. The challenges of sustainable mountain development include mitigation of the impacts of climate change, adaptation to climate change, provision of jobs and health services, food security, prevention of outmigration, stabilization of democracy, the fight against corruption, strengthening local government, protection of the natural heritage, and provision of clean energy. Because of their magnitude, no country can address these challenges alone; close and effective collaboration within the region is crucial.

Policy action – the mountains of Meso America and the future we want

The Mesoamerica Biological Corridor (MBC) is the region's best opportunity to implement sustainable mountain development, provided that the Central American Integration System and its Central American Development Commission (SICA-CCAD) are put to work properly with a strong backing from the countries in the region. Today, the MBC still faces many challenges, but the administrative structure has been consolidated, allowing the eight countries to meet and jointly plan and evaluate progress. There is a need for a strong coordinating role, dedicated leadership, and sufficient funding to assure operation in the mid-term and broad regional participation. This must go together with strengthening and empowering local organizations in order to be successful at the local level. The Costa Rican model of connectivity conservation and management, for instance, could be replicated and adapted elsewhere in the region, fostering the institutionalization of regional initiatives expressed in local action through alliances between the states and civil society. Currently, the Mesoamerican Biological Corridor covers only 16,6% of the mountain regions of Mesoamerica, with plenty of room for increasing connectivity in mountainous areas. The design of connectivity landscapes in mountains should be further conducted in order to fill conservation gaps and promote sound land planning. Biological corridors, designed adequately, represent an especially relevant planning and management tool, which may connect mountain protected areas with the densely populated lowlands at the regional and continental scale, providing a link that may enhance the appreciation for mountains in the regional culture.

The regional network of protected areas must also be extended in order to fill conservation gaps and in order to promote connectivity within mountain areas, for the benefit of mitigation and adaptation to climate change. To achieve this goal, national governments must take the necessary measures to complete their national conservation systems in a timely way.

Finally, a mountain culture must be developed at all levels and mountains must become an integral part of local, national and regional agendas in Mesoamerica. There is an urgent need for the establishment of a new inter and multi-disciplinary regional mountain institute that will contribute to foster a "mountain identity" within the region and which will support and orient government action in favor of sustainable mountain development.

Summary: Key points and recommendations

- Mesoamerica finds itself immersed in a new and more complex international situation without having achieved, in recent years, rapid advances in human development and regional integration. The deep changes experienced by the societies of the isthmus have not been sufficient to overcome historical lags, nor have they produced the platform it needs to contend with new world circumstances. This panorama poses strategic challenges that will not only require innovative and bold regional and national responses, but also major improvements in the collective capacity to implement them.
- Regional ecosystems and the economic and social capital they support are now facing climate change and, as a consequence, an unprecedented combination of tipping points including explosive population growth (doubling of the regional population since 1992).
- The greatest global threat to mountains and mountains sustainable development in the region is climate change; other direct threats are: mining industry, hydro-electric dams, urban sprawl to mountainous areas, deforestation and soil erosion.
- There is no Mesoamerican mountain culture comparable to the mountain culture of the Andes, Alps or Himalaya. A mountain culture must be developed at all levels and mountains must become an integral part of local, national and regional agendas.
- 86 indigenous ethnic groups occupy 118,136 km^2 or 54.2% of mountain territories in Mesoamerica. Indigenous ethnic groups must be at the core of decision-making of sustainable development in mountainous areas in the region.
- Altogether, forests, state protected areas, biological corridors (connectivity conservation) and indigenous territories cover 72.6% of mountains in Mesoamerica. Mountains represent the region's opportunity to strengthen conservation and sustainable development initiatives, in opposition to the more densely populated and industrially developed lowlands.
- Pine-oak forests are highly representative of Mesoamerican mountains (from Oaxaca and Chiapas to Nicaragua through Guatemala, Honduras and El Salvador). A specific integral conservation plan must be further developed and implemented on the short term, serving as a platform for sustainable mountain development in Mesoamerica.
- The Mesoamerican Biological Corridor (MBC) is the region's best opportunity to implement sustainable mountain development, if the Central American Integration System and its Central American Development Commission (SICA-CCAD) are put to work properly with a strong backing from the countries in the region.

- The Costa Rican model of connectivity conservation and management should be replicated and adapted elsewhere in the region, fostering the institutionalization of the regional initiative but expressed in local manifestations through alliances between the State and the civil. Currently, the Mesoamerican Biological Corridor covers only 36.208 km^2 or 16,61% of the mountainous regions of Mesoamerica, with plenty of room for increasing connectivity in mountainous areas. The design of connectivity landscapes in mountains should be further conducted in order to fill conservation gaps, and in order to better plan land-use. Biological corridors represent an especially relevant planning and management tool that may connect mountainous areas at the regional and continental scale with more densely populated lowlands, providing a readily link that may enhance the appreciation for mountains in the regional psyche. They also allow for the mitigation and adaptation to climate change, when adequately designed.
- The regional network of protected areas must be extended in order to fill conservation gaps and in order to further connectivity within mountainous areas for the benefit of the mitigation and adaptation to climate change. To achieve this goal, national governments must take the necessary measures in order to complete their national systems in a timely way.
- The Ecosystem Approach, oriented to adapting and mitigating climate change is an appropriate framework for the further implementation of sustainable mountain development in the region.
- There is an urgent need for the establishment of a new inter and multi-disciplinary regional mountain institute that contribute to foster a “mountain identity” within the population and support and orient governments actions that favour sustainable mountain development.

Methodological considerations

Mesoamerica as a region generally includes the seven Central American countries (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama) and the nine southeastern states of Mexico (Campeche, Chiapas, Guerrero, Oaxaca, Puebla, Quintana Roo, Tabasco, Veracruz, and Yucatan). In this report, nevertheless, the geographical range of Mesoamerica extends from the Tehuantepec Isthmus in Mexico, including all Central American countries and the Mexican states of Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco and Yucatan in Southern Mexico. This geographical scope makes sense in terms of the mountain realm, as it stretches from the southernmost extension of the Sierra Madre from Central Mexico to the Darién gap at the border of Panama and Colombia, including all proper Mesoamerican mountain ranges. "Mountains" include elevations superior to 700 meters in regards to its base, with a natural elevation of terrain clearly linked to a mountainous system, including inter-mountainous valleys or highlands. Narrowing arbitrarily the scope to elevations of 700 meters and above allowed us to clearly define a mountainous realm in contrast to a much wider definition that would have almost inevitably included lowlands and coastal areas and a much greater extension of Mesoamerica.

A Geographical Information System (GIS) baseline was established at 1992 (Rio Earth Summit) in order to compare with the current state of sustainable development in mountains (2005-2011, depending on available parameters), including the following information:

a. Protected areas
b. World Heritage Sites
c. Biosphere Reserves
d. Connectivity conservation initiatives (biological corridors)
e. Indigenous people
f. Natural cover
g. Sustainable development projects

Sustainable mountain development case studies were carefully selected from the Eco-Index data base (www.eco-index.org), which details more than 1.200 projects in the Americas. A preliminary selection of thematic areas that were assessed included:

a. Biodiversity and conservation of mountain ecosystems (wildlife, protected areas, biosphere reserves, world heritage sites, biological corridors, impacts of global changes)
b. Natural disasters and risk management (increase and incidence of natural disasters)
c. Social and economic development of mountain regions (tourism development, human population immigration, indigenous people, gender, poverty, education)

d. Land planning in mountain regions development (watersheds, biological corridors, land planning)

e. Sustainable practices and land use policies (water resources, funding for sustainable development, industrial pressure, mining, incentives for conservation of natural resources)

f. Trans-boundary cooperation (conflicts, agreements)

Study cases reflect Mesoamerica's wide thematic and geographic diversity. These cases were intended as a mean to develop the regional consultation process that allowed refining analysis. Unfortunately, only 5 experts took part in the first regional e-consultation process. A workshop was organized by CONDESAN (Consorcio para el Desarrollo Sostenible de la Ecorregión Andina) in Santiago, Chile in September 2011, where a select group of more than 30 experts from Latin America provided insightful comments and suggestions. At the Lucerne World Mountain Conference (October 8-12, 2011), two sessions were organized with worldwide mountain experts in orther to validate our findings. Finally, a keynote address to the plenary of the XV Congress of the Mesoamerican Society for Conservation and Biology in Mérida, Yucatán, Mexico (October 27, 2011), served as a great mean to present and discuss findings in front of an audience of more than 300 representatives from Mexico, Belize, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama.

Very few or virtually no information was available on Mesoamerican mountains and sustainable development, and this report represents a benchmarking. There are no agencies, NGOs or organizations of any sort promoting mountain sustainable development in the region to our knowledge; nor are there any country reports or studies on the subject. There is more information available on cloud forests or pine-oak forests in the region, but they are mostly limited to their natural history and conservation (Nadkarni & Wheelwright 2000, Kappelle & Brown 2001, Hartshorn 2002, García-Mendoza et al 2004, Bruijnzeel et al. 2010). None of the many useful regional reports covers our study area as a whole, most of them being focused on Central America or Latin America and the Caribbean. The following regional reports nevertheless formed the core of the information that has been processed and integrated into the present report, as they finely reflect the region's current state of sustainable development:

- Comisión Centroamericana de Ambiente y Desarrollo (CCAD). 1998. State of the environment and natural resources in Central America.
- Programa de las Naciones Unidas para el Medio Ambiente (PNUMA). 2010. Perspectivas del medio ambiente: América Latina y el Caribe GEO ALC 3.
- State of the Nation in Human Sustainable Development Program. 2008. State of the region on sustainable human development: summary 2008

We provide detailed information on case studies (Annex 1), a detailed list of mountain indigenous people (Annex 2), mountain Biosphere Reserves (Annex 3), mountain World Heritage Sites (Annex 4), and a detailed list of 282 sustainable mountain development projects and initiatives (Annex 5).

Part 1: Setting the stage

A mountain is a large landform that stretches above the surrounding land in a limited area usually in the form of a peak. A mountain is generally steeper than a hill. The adjective "montane" is used to describe mountainous areas and things associated with them. There is no universally accepted definition of a mountain. Elevation, volume, relief, steepness, spacing and continuity have been used as criteria for defining a mountain. In the Oxford English Dictionary a mountain is defined as "a natural elevation of the earth surface rising more or less abruptly from the surrounding level and attaining an altitude which, relatively to the adjacent elevation, is impressive or notable." As a whole, 24% of the Earth's land mass is mountainous and 10% of people live in mountainous regions. Most of the world's rivers are fed from mountain sources, and more than half of humanity depends on mountains for water.

Mesoamerica is a region and culture area in the Americas, extending approximately from central Mexico to Belize, Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica, within which a number of pre-Columbian societies flourished before the Spanish colonization of the Americas in the 16th and 17th centuries. Prehistoric groups in this area are characterized by agricultural villages and large ceremonial and politico-religious capitals (Cooke 2003). This culture area included some of the most complex and advanced cultures of the Americas, including the Olmec, Zapotec, Teotihuacan, Maya, Mixtec, Totonac and Aztec among others. The modern-day indigenous populations who are the descendants of pre-Columbian cultures number roughly over 11 million people (approx. 17.2% of the total regional population) spread across the Mesoamerican region, and are largely among the most disadvantaged and marginalized groups in the region.

The Mesoamerican region is also a trans-national economic region in the Americas that comprises the united economies of the seven countries in Central America - Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama - plus the nine southeastern states of Mexico - Guerrero, Puebla, Campeche, Chiapas, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatan. The identification of the Mesoamerican region as a focus for common regional economic development has been observed since the adoption in 2001 by the signatory countries of the Puebla-Panama Plan (PPP), an initiative intended to foster regional integration and development across southeastern Mexico and the countries of Central America (CBM 2002).

Situated within the wider region of Middle America (on the tapering isthmus of southern North America), the geographical region defined by the Mesoamerican region loosely correlates with that of Mesoamerica, the pre-Columbian culture area defined and identified by archaeologists, anthropologists, linguists and ethno-historians.

In this report, the geographical range of Mesoamerica extends from the Tehuantepec Isthmus in Mexico, including all Central American countries (Belize, Guatemala, El

Salvador, Honduras, Nicaragua, Costa Rica, Panama) and the states of Southern Mexico (Campeche, Yucatan, Quintana Roo, Chiapas, Tabasco and Oaxaca), to the Darien Gap, with a total of 862,468 km^2 (Figure 1 and 2).

Figure 1: Map of Mesoamerica, study area

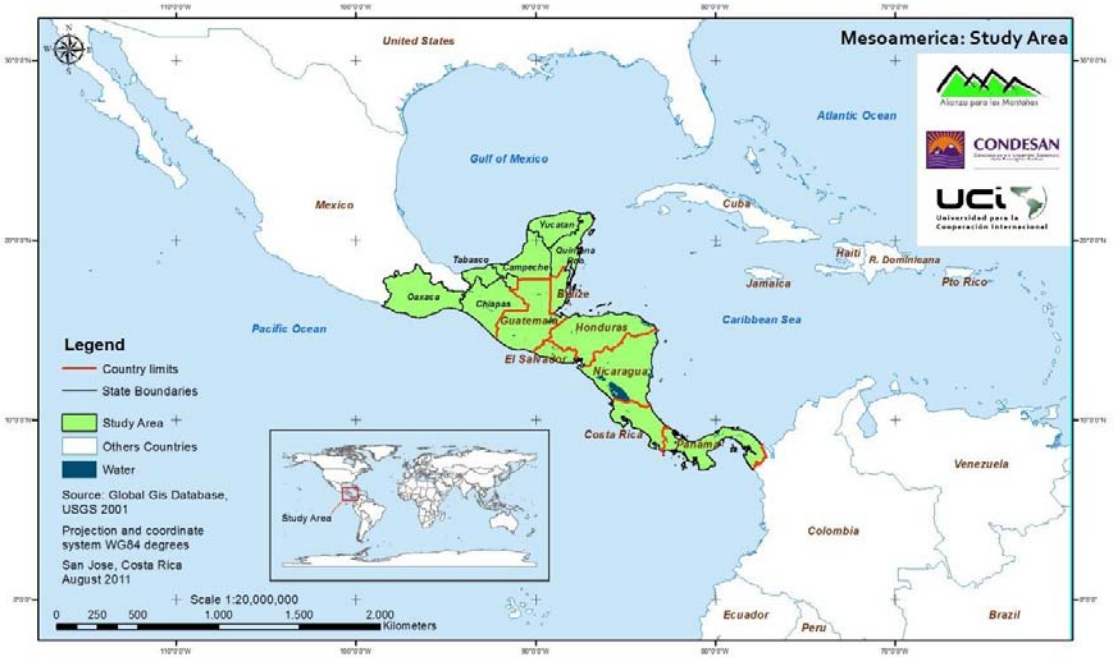
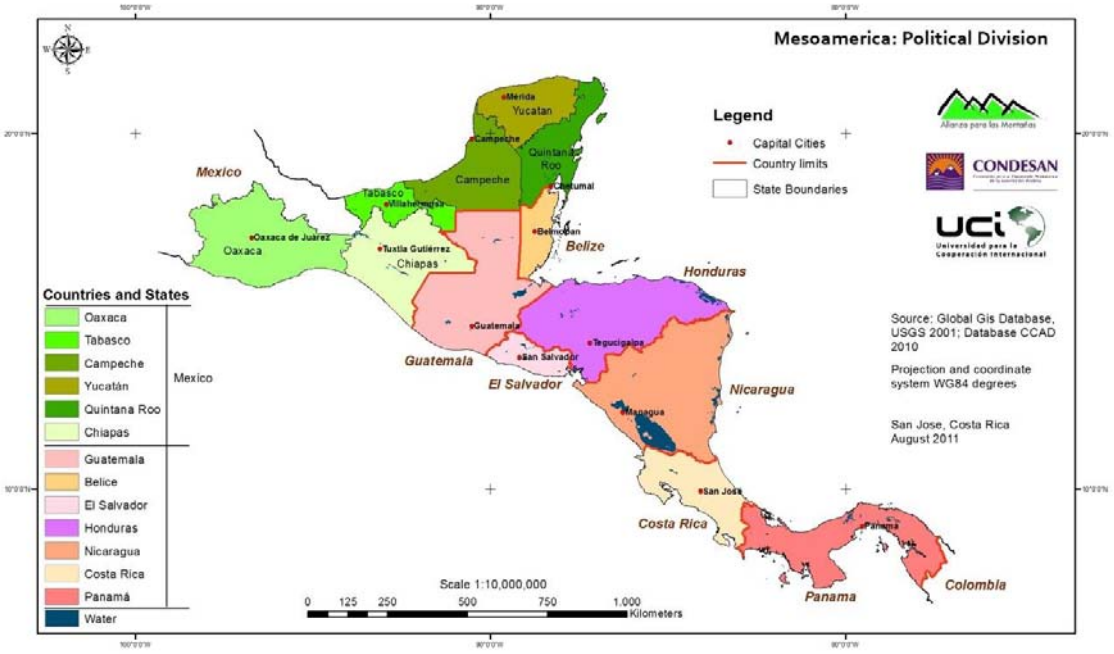


Figure 2: Mesoamerica: Political Division

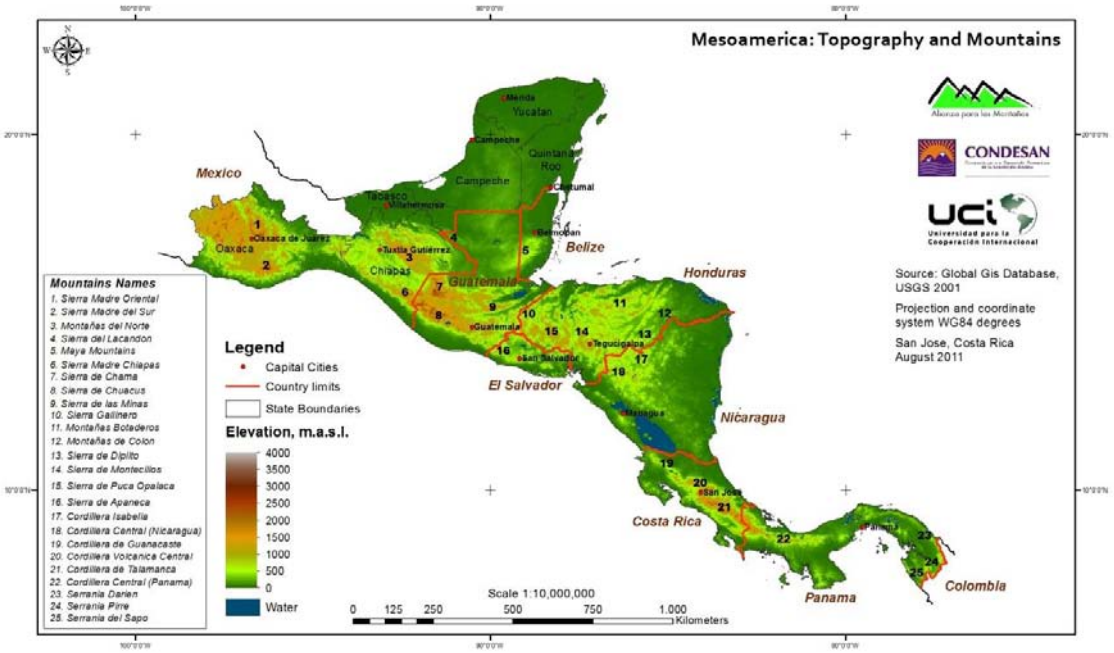


Located on the Middle American isthmus joining North and South America between *ca.* 10° and 22° northern latitude, Mesoamerica possesses a complex combination of ecological systems, topographic zones, and environmental contexts roughly grouped into two broad categories: the lowlands (between sea level and 700-1,000 meters) and the *altiplanos*, or highlands (between 700-1,000 and 2,000 meters above sea level). In the low-lying regions, sub-tropical and tropical climates are most common, as is true for most of the coastline along the Pacific and Gulf of Mexico and the Caribbean Sea. The highlands show much more climatic diversity, ranging from dry tropical to cold

mountainous climates; the dominant climate is temperate with warm temperatures and moderate rainfall. The rainfall varies from the dry Oaxaca and north Yucatan to the humid southern Pacific and Caribbean lowlands.

There is extensive topographic variation in Mesoamerica, ranging from the high peaks circumscribing the Valley of Mexico and within the central Sierra Madre mountains to the low flatlands of the northern Yucatán Peninsula. The tallest mountain in Mesoamerica is Volcan Tajumulco, a dormant volcano located in western Guatemala, nearby the Mexican border. Its peak elevation is 4,220 m (13,845 ft). The Sierra Madre mountain range, which consists of a number of smaller ranges, runs from Northern Mesoamerica south through Costa Rica. The chain is historically volcanic. In central and southern Mexico, a portion of the Sierra Madre chain is known as the "Eje Volcánico Transversal", or the Trans-Mexican Volcanic Belt. There are 83 inactive and active volcanoes within the Sierra Madre range, including 11 in Mexico, 37 in Guatemala, 23 in El Salvador, 25 in Nicaragua, and three in northwestern Costa Rica of which 16 are still active. Mesoamerica features 25 distinct mountainous systems, including the high Sierra Madre in Oaxaca, Chiapas, Guatemala and Western Honduras, the Maya Mountains of Belize and Guatemala, some lower ranges in central Honduras and Northwestern Nicaragua, the Guanacaste and Central Volcanic Ranges in Costa Rica, the Talamanca Range in Costa Rica and Panama, and the Darien in Panama along the Columbian border (see details in Figure 3). The flat Mexican states of Tabasco, Campeche, Yucatan and Quintana Roo have no mountain systems such as defined in this report.

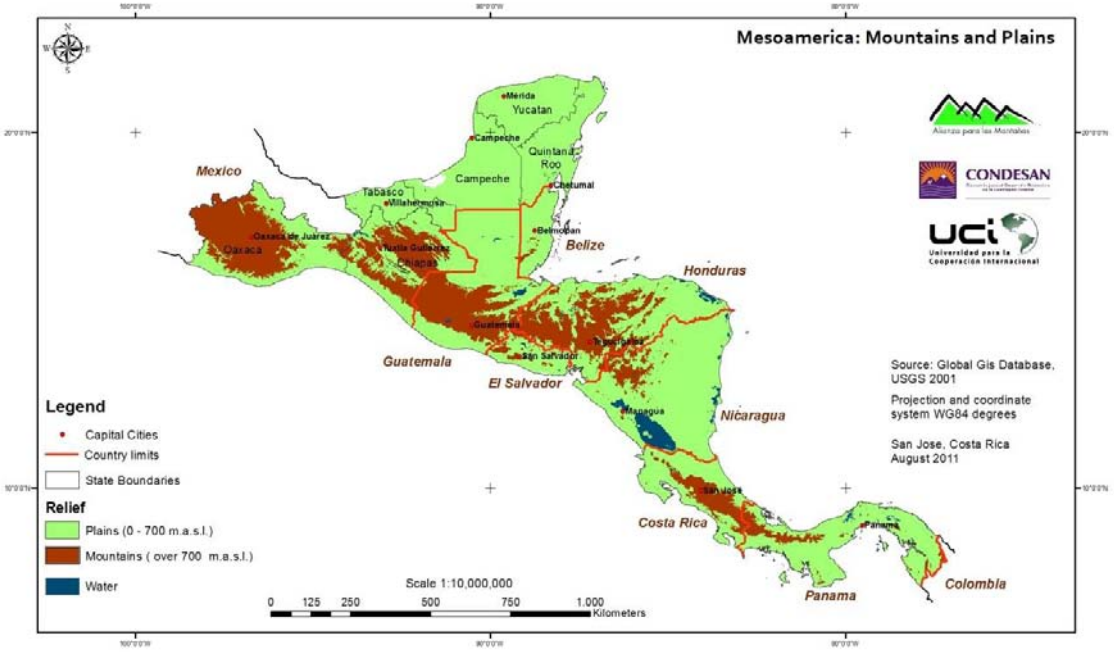
Figure 3: Mesoamerica: Topography and Mountain Systems



One important topographic feature is the Isthmus of Tehuantepec, a low plateau that breaks up the Sierra Madre chain between the Sierra Madre del Sur to the north and the Sierra Madre de Chiapas to the south. At its highest point, the Isthmus is 224 m (735 ft) above mean sea level. This area also represents the shortest distance between the Gulf of Mexico and the Pacific Ocean in Mexico. The distance between the two coasts is roughly 200 km (120 mi). Although the northern side of the Isthmus is

swampy and covered with dense jungle, the Isthmus of Tehuantepec, as the lowest and most level point within the Sierra Madre mountain chain, was nonetheless a main transportation, communication, and economic route within Mesoamerica. Altogether, Mesoamerican mountains (mountainous systems above 700 m.a.s.l.) sum up 217,733 km^2 or 25.2% of the entire region, very similar to the figure for mountains at the global level (Figure 4).

Figure 4: Mesoamerica: Mountains and Plains



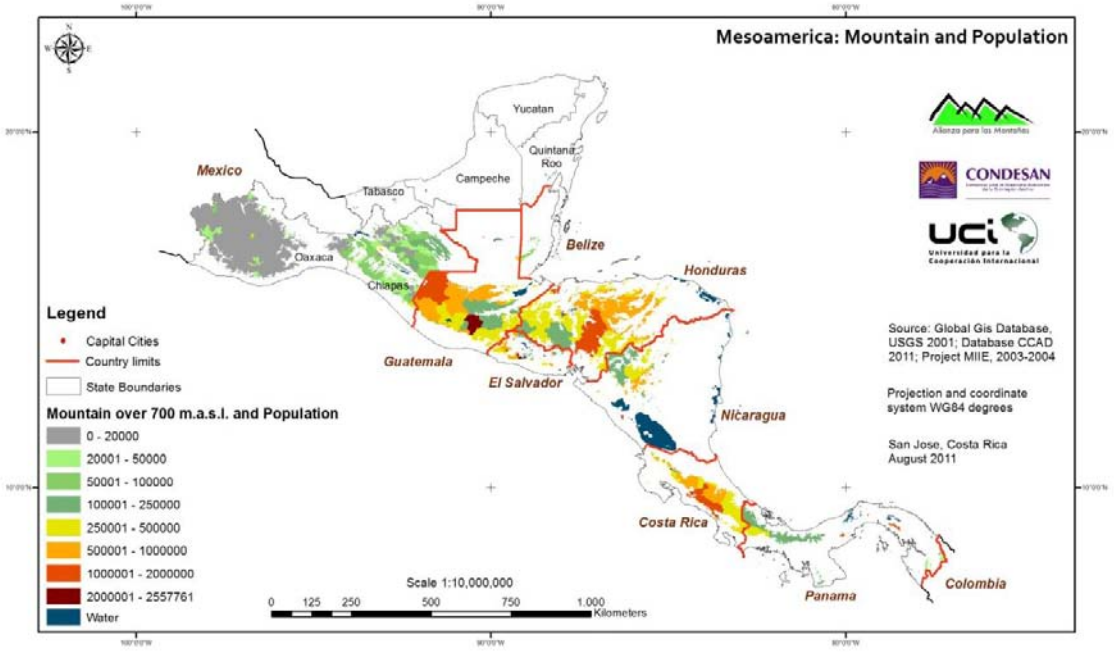
Oaxaca and Chiapas are the most mountainous states in the region (59.7% and 47.5% respectively), followed by Honduras (41.6%), Guatemala (37.5%), Costa Rica (29.2%), El Salvador (18.3%), Panama (11.5%), Nicaragua (7.8%) and Belize (3.8%).

Outside of the northern Maya lowlands, rivers are common throughout Mesoamerica. A number of the more important ones served as loci of human occupation in the area. The longest river in Mesoamerica is the Usumacinta, which forms in Guatemala at the convergence of the Salinas or Chixoy and La Pasión River and runs north for 970 km (600 mi)—480 km (300 mi) of which are navigable—eventually draining into the Gulf of Mexico. Other rivers of note include the Rio Grande de Santiago, the Grijalva River, the Motagua River, the Ulúa River, the Hondo River and the San Juan river. The northern Maya lowlands, especially the north portion of the Yucatán peninsula, are notable for its nearly complete lack of rivers (largely due to its absolute lack of topographic variation). Additionally, no lakes exist in the northern peninsula. The main source of water in this area is aquifers that are accessed through natural surface openings called cenotes. With an area of 8,264 km^2 (3,191 sq mi), Lake Nicaragua (Cocibolca) is the largest lake in Mesoamerica. Lake Petén Itzá, in northern Guatemala, is notable as the location at which the last independent Maya city, Tayasal (or Noh Petén), held out until 1697. Other large lakes include Lake Atitlán, Lake Izabal, Lake Güija, Lemoa, and Lake Managua.

Today, a vast majority of Mesoamerica's more than 50 millions people live in the lowlands of the Pacific coast. Mountains in Oaxaca, Chiapas and Panama have low

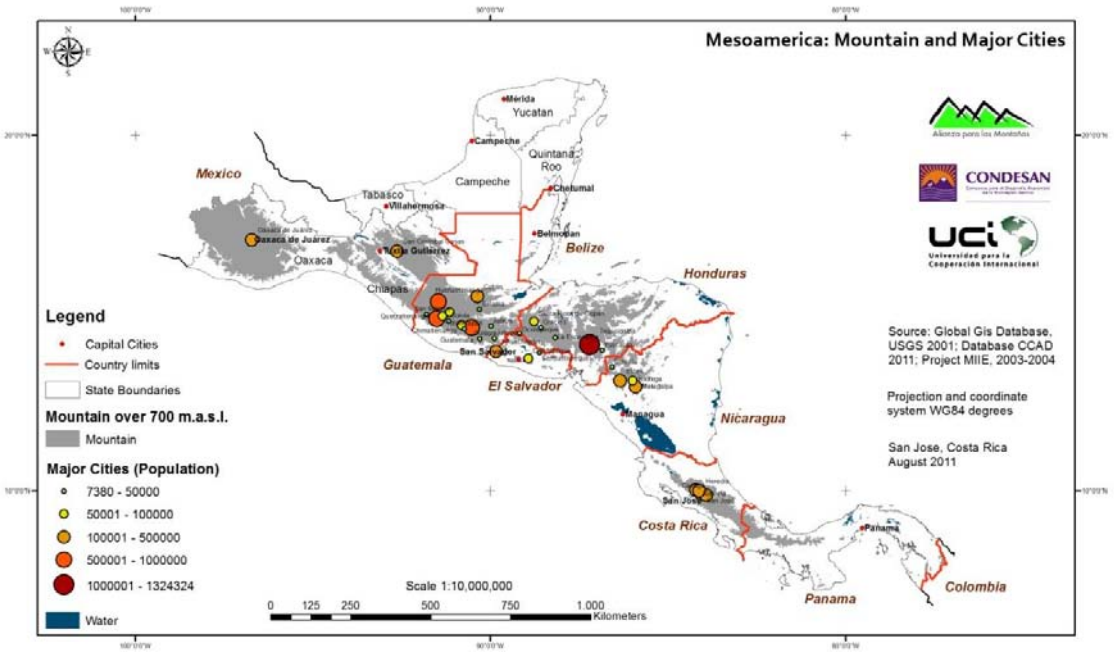
densities, while the highland and inter-valleys of Guatemala, El Salvador, Honduras and Costa Rica have high population densities (Figure 5).

Figure 5: Mesoamerica: Mountain and Population



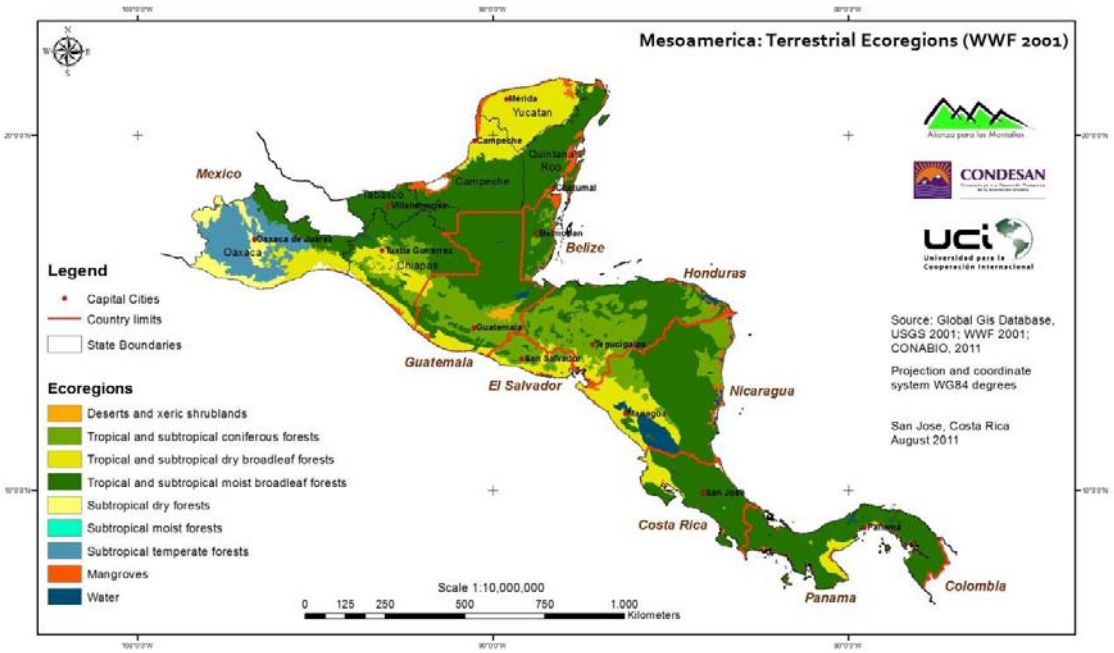
Major cities and capital cities of Mesoamerica follow a similar pattern with the higher concentration of large cities in central valleys, especially in Guatemala (Guatemala City, Huehuetenango, Quetzaltenango), Honduras (Tegucigalpa), El Salvador (San Salvador, Santa Ana), Costa Rica (San José, Alajuela, Cartago, Heredia) and the mexican states of Oaxaca and Chiapas (Oaxaca Juárez, Tuxtla Gutiérrez and San Cristobal de las Casas). These cities rarely have more than one million inhabitants unless the larger metropolitan area is considered (Figure 6).

Figure 6: Mesoamerica: Mountain and Major Cities



A wide variety of ecosystems are present in Mesoamerica (CCAD 2000); the better known are the Mesoamerican Barrier Reef System, the second largest in the world, and La Mosquitia (consisting of the Río Platano Biosphere Reserve, Tawahka Asangni, Patuca National Park, and Bosawas Biosphere Reserve) a rainforest second in size in the Americas only to the Amazonas. The highlands feature mixed and coniferous forest. The biodiversity is among the richest in the world, although the number of endangered species is growing every year. Mesoamerican terrestrial ecoregions, such as defined by the WWF (2001), include *deserts and xeric shrublands*, *tropical and subtropical coniferous forests*, *tropical and subtropical dry broadleaf forest*, *tropical and subtropical moist broadleaf forests*, *subtropical dry forests*, *subtropical moist forests*, *subtropical temperate forests* and *mangroves* (Figure 7).

Figure 7: Mesoamerica: Terrestrial Ecoregions

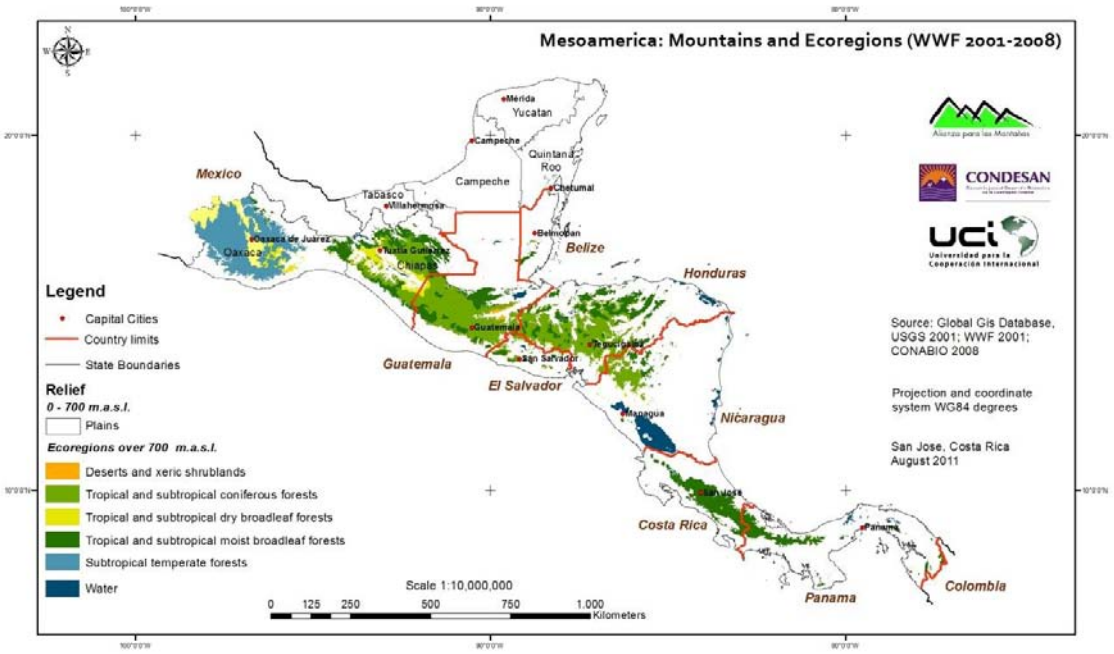


Of these terrestrial ecoregions, only 5 feature a significant representation in the mountainous real of the region: *deserts and xeric shrublands* (Guatemala), *tropical and subtropical coniferous forests* (highly representative of Mesoamerican mountains, with an extension spanning from Oaxaca and Chiapas in Mexico, to Nicaragua through Guatemala, Honduras and El Salvador), *tropical and subtropical dry broadleaf forest* (Oaxaca and Chiapas), *tropical and subtropical moist broadleaf forests* (the ecoregion with a span through the entire region, although not the most extent) and *subtropical temperate forests* (Oaxaca only), (Figure 8).

According to CEPF (2001, 2004) the Mesoamerican hotspot boasts a remarkable 12% of the world's biodiversity for only about 2% of Earth's terrestrial extension and "has an estimated 24,000 species of vascular plants, of which approximately 5,000 (21%) are endemic. The figure for total diversity is fourth highest, exceeded only by the Tropical Andes, Sundaland, and Mediterranean hotspots, while the figure for endemism ranks 10th on the global list. Mammal diversity is the second highest on the hotspot list, with 521 mammal species, exceeded only by the Guinean Forests of West Africa. Of these, 210 (a remarkable 40%) are endemic. Resident bird species number 1,052 and migrant species 141, for a total of 1,193, second only to the Tropical Andes.

Of these, 251 (21%) are endemic, again exceeded only by the Tropical Andes. The region is a critical flyway for at least 225 migratory species; three of the Western Hemisphere's four migratory bird routes converge in Mesoamerica."

Figure 8: Mesoamerica: Mountains and Ecoregions

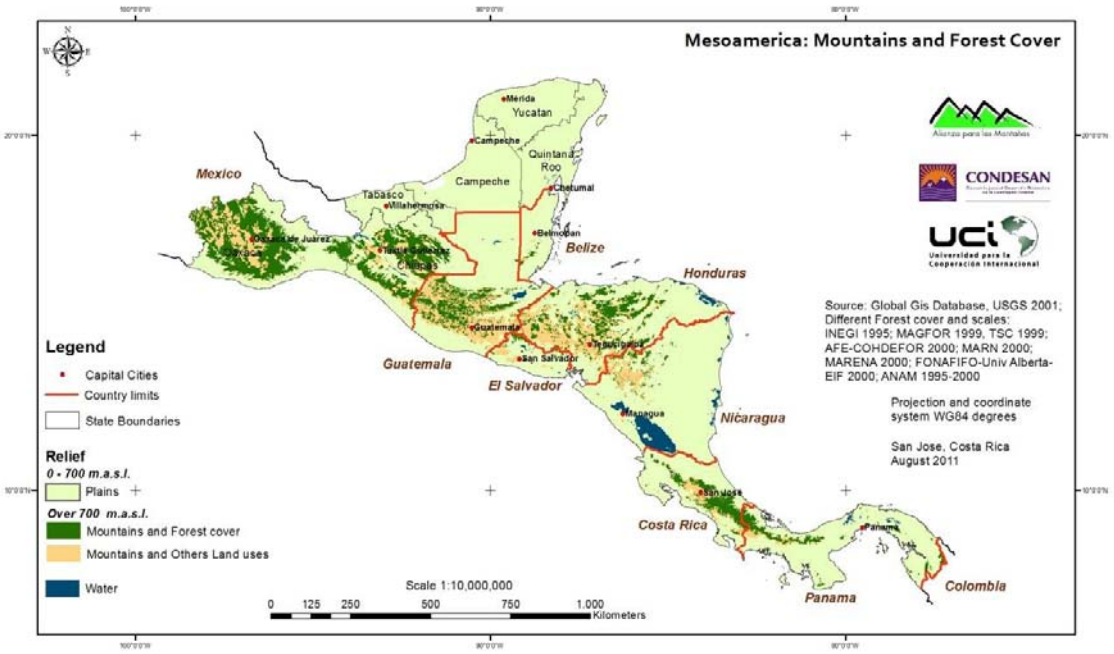


A straightforward indicator of mountain ecosystem health is its forest cover (1995-2000). Amongst countries and states with an extension of mountains over 10,000 km^2, Oaxaca, Chiapas and Costa Rica feature a high percentage of forest cover in mountain areas, while Honduras, Guatemala and Nicaragua maintain a lesser percentage of forest cover (Table 1, Figure 9).

Table 1: Mesoamerica: Mountains and Forest Cover (over 700 m.a.s.l., 1995-2000)

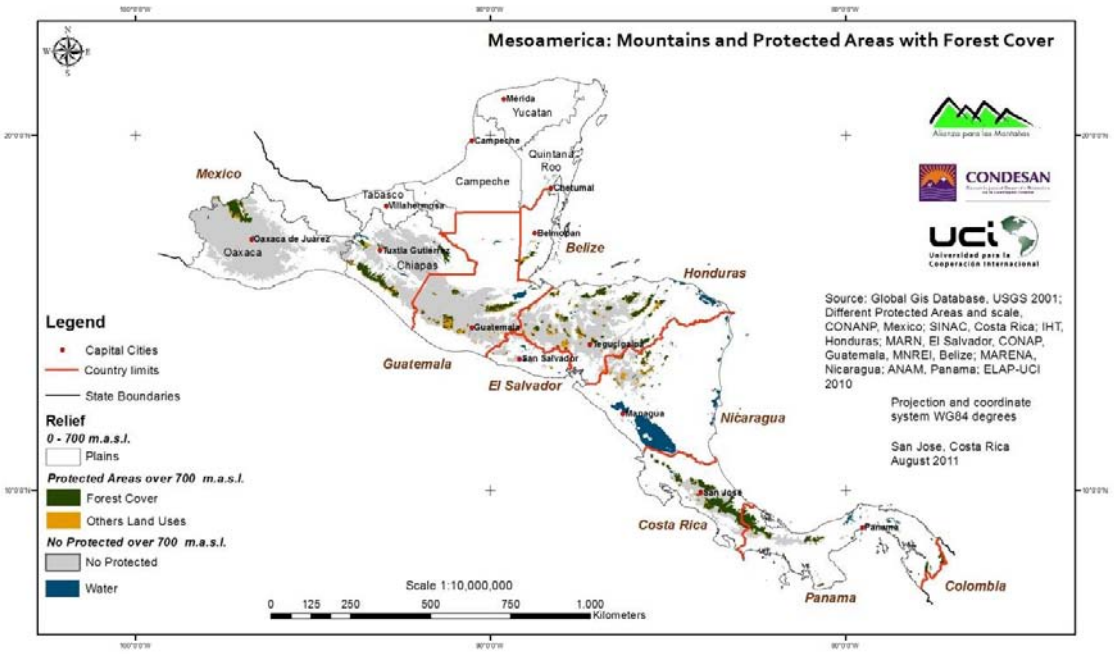
Country / State	Mountains: Forest Cover		Mountains: Other Uses		Mountains: Total
	km^2	%	km^2	%	km^2
Belize	519.81	59.0	361.47	41.0	881.28
Costa Rica	9,210.50	61.6	5,735.23	38.4	14,945.73
El Salvador	1,353.50	35.2	2,493.08	64.8	3,846.58
Guatemala	15,739.48	38.5	25,171.73	61.5	40,911.20
Honduras	19,082.86	40.3	28,224.58	59.7	47,307.43
Mexico: Chiapas	23,946.08	68.9	10,827.03	31.1	34,773.11
Mexico: Oaxaca	39,545.39	70.5	16,579.72	29.5	56,125.11
Nicaragua	3,101.54	30.7	7,008.66	69.3	10,110.20
Panama	6,359.06	70.6	2,653.34	29.4	9,012.39
TOTAL	**118,858.22**		**99,054.84**		**217,936.03**

Figure 9: Mesoamerica: Mountains and Forest Cover



Mesoamerica is recognized for its vast biodiversity (CEPF 2001, PNUMA & CCAD 2005). Regionally, the National Protected Areas Systems (SINAP) and the connectivity areas within the Mesoamerican Biological Corridor contain about 10% of global terrestrial biodiversity for only 0.5% of the global land surface. In order to protect these resources, the Mesoamerican countries have joined efforts through the Central American Commission on Environment and Development (CCAD) and have consistently strengthened their SINAP as a major contribution to the Central American System of Protected Areas (SICAP), using different strategies and programs (CCAD 2003, CONABIO 2008, CONAP 2008). To assess the current management of SINAP, the emphasis is in the fulfillment of the agreements that each country has signed, especially those acquired in the Programme of Work on Protected Areas (PoWPA) of the Convention on Biological Diversity (CBD) and the Millennium Development Goals (CCAD 2002). Several of these commitments have been fulfilled at least partially, among them the increase in the number and area of terrestrial protected areas. The countries of Mesoamerica and have also increased the number of areas with international designations, reaching a total of 206 in 2009 (Valverde et al. 2010). Mexico's effort has to be recognized, having declared between 2008 and 2009 56 new Ramsar Sites. The UNESCO MAB program has had a major upturn, with 21 new Biosphere Reserve nominations in the region after 1992 (28 in total), but still needs to be further improved into a functional network at the regional and continental scale (Dyer & Holland 1991, Daniele et al 1999, Jaeger 2005). Another important commitment of the countries has been the identification of conservation gaps (CAF 2008). This task has lead to the establishment of new protected areas in terrestrial ecosystems that were not previously represented within the SINAP (Figure 8).

Figure 10: Mesoamerica: Mountains and Protected Areas (2010)



In relation to trans-boundary management, efforts have been made mainly on the establishment of bi-national biosphere reserves and the recent appointment of the first tri-national park between Guatemala, Honduras and El Salvador in the Trifinio mountain area. Since Rio 1992, an impressive increase in participatory processes in the management of protected areas and connectivity areas has taken place (Borrini-Feyerabend 1997, CBM 2003).

However, there still is a lack in representativeness of protected areas in mountain areas in the region, with 18.2% of mountains protected, and just 5.7% of the region consisting in protected mountains. Amongst countries with a large extension of mountain areas, only Panama (53.4%) and Costa Rica (44.6%) have a satisfactory network of protected mountain ecosystems. Other countries or states that have extensive mountain systems such as Guatemala (13.1%) and Oaxaca (5.5%) have few mountain protected areas. Belize has the higher percentage of its mountain under legal protection category with 93.9% of its total extension of mountains (Table 2).

Table 2: Mesoamerica: Mountains and Protected Areas (2010)

Country / State	Mountains: Protected			Mountains: Total
	km^2	% country	% mountains	km^2
Belize	827.51	3.6	93.9	881.28
Costa Rica	6,661.49	13.0	44.6	14,945.73
El Salvador	197.94	0.9	5.1	3,846.58
Guatemala	5,353.91	4.9	13.1	40,911.20
Honduras	9,964.84	8.8	21.1	47,307.43
Mexico: Chiapas	5,219.18	7.1	15.0	34,773.11
Mexico: Oaxaca	3,071.79	3.3	5.5	56,125.11
Nicaragua	3,482.74	2.7	34.4	10,110.20
Panama	4,812.32	6.2	53.4	9,012.39
TOTAL	**39,591.74**	**5.7**	**18.2**	**217,936.03**

Most countries have initiated major efforts to value the goods and services provided by natural areas to society (Ferraro 2001, Farber et al 2006). In Costa Rica one study estimated that the ecosystem services of a particular protected area range from US$

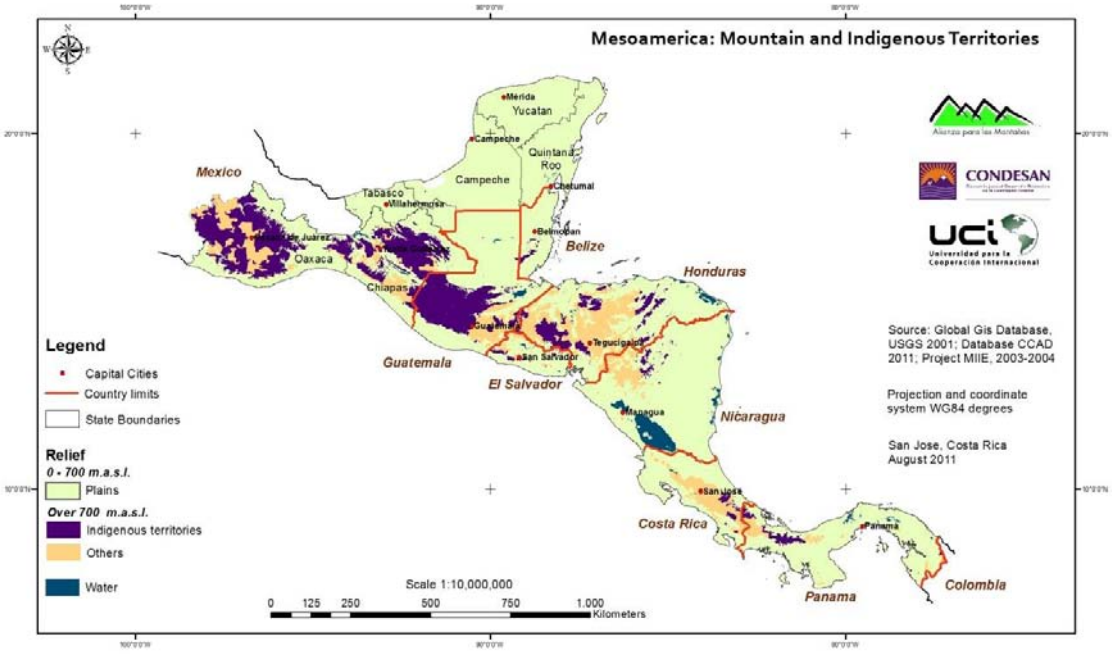
252 to US$ 2500 million annually (Valverde et al 2010). Data from Mexico suggest that for every dollar invested by the Government in protected areas, a return of US$ 56 is generated. However, at regional scale there is limited information available about valuation, resulting in limited appreciation of the value of natural areas by the society as a whole.

The budget for the SINAPs has increased in a sustained manner in almost all countries. However, the increase in the number and size of protected areas has not been accompanied by similar growth in the budget of the systems (Spergel 2002, Davenport & Rao 2002). An outstanding case is Mexico, where the budget has increased by 80% since 2006. The private sector has also been contributing in a significant measure by declaring private protected areas that in many cases allow for a greater connectivity between state protected areas (Kramer et al 2002, Langholz 2002).

One major challenge for the region is its high rate of deforestation (FAO 1993, FAO 2001), although progress has been made in sustainable forestry (FAO 2006a), added to important impacts of climate change, and the pressing needs for mitigation and adaptation strategies that require urgent attention (IPCC 2007). Energy production from renewable resources within protected areas is a growing tendency in many countries in the region, particularly hydroelectric and geothermal energy. Regarding the legal framework, all countries have strong environmental and other related legislation; however, these are rarely properly integrated and harmonized.

A total of 86 indigenous ethnic groups occupy 118,136 km^2 or 54.2% of mountain territories in Mesoamerica (Figure 11, Table 3). The presence of indigenous populations is especially important in the mountains of Belize (100%), Guatemala (75.8%), Chiapas (73.7%) and Oaxaca (69.4%), and not as much in the southern Mesoamerican countries of Panama (38.9%), El Salvador (30.4%), Honduras (28.5%) and Costa Rica (11.4%).

Figure 11: Mesoamerica: Mountains and Indigenous Territories



The role of Mesoamerican indigenous populations as prime stakeholders is fundamental for the success of sustainable mountain development.

Table 3: Mesoamerica: Mountains and Indigenous Territories

Country / State	Mountains: Indigenous				Mountains: Total
	Groups	km^2	% country	% mountains	km^2
Belize	3	881.28	3.8	100.0	881.28
Costa Rica	6	1,702.79	3.3	11.4	14,945.73
El Salvador	5	1,170.66	5.6	30.4	3,846.58
Guatemala	26	31,024.37	28.5	75.8	40,911.20
Honduras	11	13,503.66	11.9	28.5	47,307.43
Mexico: Chiapas	22	25,634.62	35.0	73.7	34,773.11
Mexico: Oaxaca	26	38,939.93	41.4	69.4	56,125.11
Nicaragua	3	1,772.74	1.4	17.5	10,110.20
Panama	5	3,505.54	4.5	38.9	9,012.39
TOTAL	**86**	**118,135.59**	**13.7**	**54.2**	**217,936.03**

Mesoamerica finds itself immersed in a new and more complex international situation without having achieved, in recent years, rapid advances in human development and regional integration. The deep changes experienced by the societies of the isthmus have not been sufficient to overcome historical lags, nor have they produced the platform it needs to contend with new world circumstances. This panorama poses strategic challenges that will not only require innovative and bold regional and national responses, but also major improvements in the collective capacity to implement them.

Table 4: Mesoamerica: Overview of Country Data

	Belize	Costa Rica	El Salvador	Guatemala
Capital	Belmopan	San José	San Salvador	Guatemala City
Official language	English	Spanish	Spanish	Spanish
Government	Parliamentary democracy and constitutional monarchy	Constitutional democracy	Presidential republic	Presidential republic
Independence	1981 (United Kingdom)	1821 (Spain)	1821 (Spain)	1821 (Spain)
Area	22,966 km^2 (150th)	51,100 km^2 (128th)	21,040 km^2 (152nd)	108,890 km^2 (106th)
Population	333,200 (150th) 2010	4,608,426 (123rd) 2011	6,134,000 (99th) 2009	13,276,517 (68th) 2009
GDP (PPP) per capita	$7,895 (2010)	$11,215 (2010)	$7,429 (2010)	$4,884 (2010)
HDI	0.694 (high) (78th)	0.725 (high) (62nd)	0.659 (medium) (90th)	0.560 (medium) (116th)
Highest elevation	Doyle's Delight: 1,124 m	Cerro Chirripo: 3,820 m	Cerro El Pital: 2,730 m	Volcán Tajumulco: 4,220 m
Lowest elevation	Caribbean Sea	Pacific Ocean / Caribbean Sea	Pacific Ocean	Pacific Ocean / Caribbean Sea

	Honduras	Mexico	Nicaragua	Panama
Capital	Tegucigalpa	Mexico City	Managua	Panama City
Official language	Spanish	Spanish	Spanish	Spanish
Government	Constitutional republic	Federal presidential constitutional republic	Presidential republic	Constitutional democracy
Independence	1821 (Spain)	1810 (Spain)	1821 (Spain)	1903 (Colombia)
Area	112,492km^2 (102nd)	1,972,550 km^2 (14th)	130,373 km^2 (97th)	75,517 km^2 (118th)
Population	8,249,574 (94th) 2010	112,322,757 (11th) 2010	5,891,199 (110th) 2010	3,405,813 (129th) 2010
GDP (PPP) per capita	$4,417 (2010)	$15,113 (2011)	$3,045 (2010)	$12,577 (2010)
HDI	0.604 (medium) (106th)	0.750 (high) (56th)	0.565 (medium) (115th)	0.755 (high) (54th)
Highest elevation	Cerro Las Minas: 2,870 m	Pico de Orizaba: 5,636 m	Mogotón: 2,107 m	Volcán Barú: 3,475 m
Lowest elevation	Pacific Ocean / Caribbean Sea	Pacific Ocean / Caribbean Sea	Pacific Ocean / Caribbean Sea	Pacific Ocean / Caribbean Sea

The international situation surrounding Mesoamerica is characterized by the destructive geopolitics of security associated with drug trafficking, the growing vulnerability of the isthmus' least developed countries in the international economy, and high international oil and food prices. None of these factors had become evident until very recently. Because of their magnitude, no country can address them alone; rather, close and effective collaboration is necessary to solve practical problems (SNHSDP 2008). These new challenges compound the historical lags of the isthmus, which have not been overcome in any meaningful way due to Mesoamerica's constrained economic and social performance since 1990, and the opportunities for moderate growth lost at the beginning of the 21st century. In general, performance was lower than the average for Latin America, a region that itself did not show remarkable results at the world level (SNHSDP 2008).

"The growth observed after the advent of peace in the isthmus was very quickly exhausted. Now Mesoamerica is facing a new and more compelling international situation with the burden of important historical deficiencies: a cheap and unskilled labor force, majority poor populations, a large emigrant population, environmental degradation, and weak rule of law. This scenario reduces the strategic options available for addressing new challenges" (SNHSDP 2008).

"Mesoamerica, as a region, needs to take firm steps in each of those areas. Its countries have larger populations, they are more urban, their economies have opened up to the international system, and their governments are electoral democracies. These are remarkable transformations. Nonetheless, the total sum of social, demographic, economic, and political changes do not translate into noticeable improvements in human development, nor have they converted the isthmus into a dynamic pole of economic growth and social progress. In fact, these changes have widened the deep gaps between countries and even greater ones within the countries" (SNHSDP 2008).

"Current challenges demand a new way of understanding Mesoamerica and living in it. The region's achievements over the past twenty years give reason for cautious optimism. Despite tremendous difficulties and evident shortcomings, it was able to move forward on a path of transition (from war to peace, from authoritarian regimens to democratic political systems, from war economies to open economies). If two decades ago the region was able to begin relinquishing authoritarian rule and armed conflict, today, with a greater awareness of its needs and potential, it can also address the challenge of ushering forth an important period of progress in human development, within the context of new and narrower international conditions" (SNHSDP 2008).

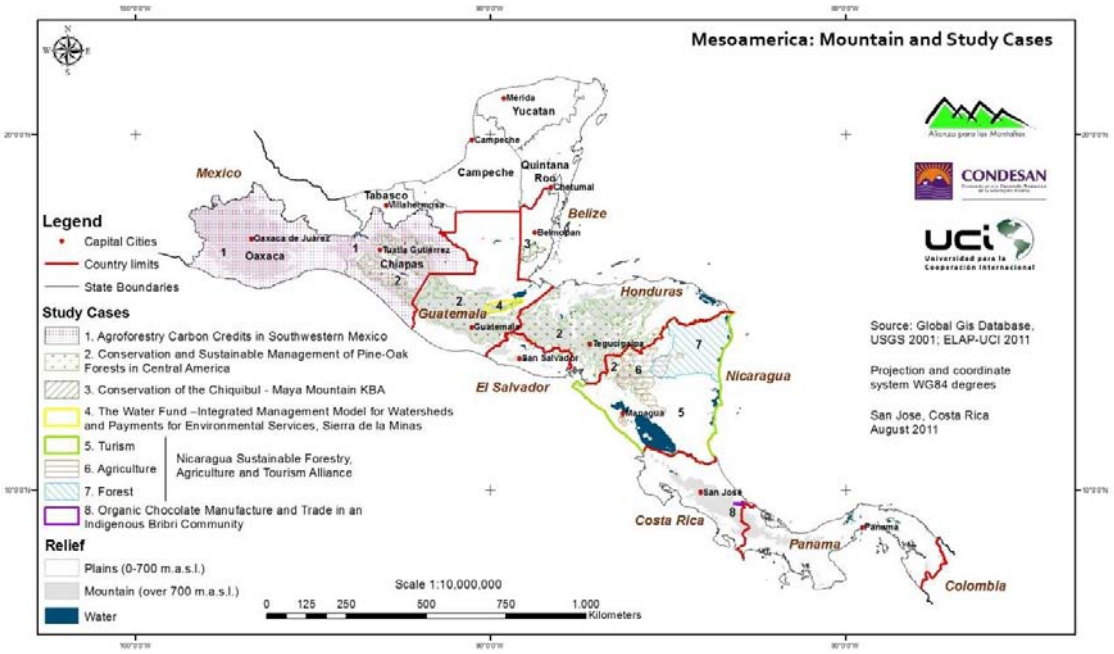
"Mesoamerica has unquestionable strengths for navigating these waters: it has a privileged international location, it is home to a node of world trade, it is rich in biodiversity and offers great potential renewable energy sources. It has achieved greater political stability and has many years of experience (though not fully exploited) with regional integration. But these strengths cannot be easily tapped. It will be necessary to forge national and regional political agreements, reform the institutions of regional integration, modernize national States, and implement coordinated public policies in order to move regional actions forward while promoting the interests of each country at the same time" (SNHSDP 2008).

Part 2: Evaluating progress with sustainable mountain development: Progress, changes, and lessons learnt in the region over the last 20 years

Case studies

Six case studies were selected according to a geographical range, scope, and thematic diversity representative of the region (Figure 11, Table 5):

Figure 12: Location of Case Studies in Mesoamerica



Short description of case studies

Case Study N^{o} 1: *Developing an Integrated Strategy and Project Plan to Conserve the Chiquibul- Maya Mountain Key Biodiversity Area in Belize*

This project focuses on developing a funding integrated proposal for the management of two protected areas in the Selva Maya-Chiquibul area. It also explores and implements a bi-national effort (with Guatemala) in order to conserve the area, promote awareness and raise the interest of stakeholders about the importance of the protected area and the possibility of developing a co-management project. The main achievement of this initiative was the approval for the co-management of Chiquibul National Park by the Belize Forestry Department. Total project cost: US$15,286.

Case Study N^{o} 2: *Nicaragua Forestry, Agriculture, and Tourism Alliance (NIFATA)*

With the intention of strengthening the competitiveness and sustainability of small and medium agricultural, tourism and forestry enterprises, representatives of the private sector joined to allow access to international markets and trade partners, attract new investments, generate income and provide jobs for rural communities, supporting sustainable practices and the protection of ecosystems and biodiversity. The relevant results of this project include: increased investment partners by 400%, the certification of the production of more than 45,000 people, the development of a best practices database of more than 700 coffee and cocoa farms, the training of over

300 people, the development of forest management plans for more than 44,000 hectares, and the consolidation of protection of forest areas close to 50,000 hectares. Total project cost: the initial project budget was US$1,300,000.

Case Study N° 3: *Organic Chocolate Manufacture and Trade in an Indigenous Bribri Community, Costa Rica*
Given that the traditional cultivation of cocoa under sustainable ancestral techniques do not generate enough financial resources, a group of women organized themselves with the objective of generating added value from the cocoa beans and transform it into chocolate products. This project is strengthening the trade and the administrative marketing of organic chocolate. The main achievement of this project was the increase in sales of artisan organic chocolate. Total project cost: US$$54,100.

Case Study N° 4: *The Water Fund – An Integrated Management Model for Watersheds and Payments for Environmental Services in the Motagua-Polochic System of the Sierra de la Minas Biosphere Reserve, Guatemala*
The initiative seeks to protect one of the most important Mesoamerican biodiversity hotspot, promoting the financial sustainability of the conservation of protected areas and the proper management of the upper watershed, by developping a mechanism of compensation and incentives focused on the integrated management of water resources, involving the private sector, community organizations and municipalities. The main achievements were the development of two control and prevention fire programs, the formation of four committees with their respective action plans, and the continuous monitoring of flow and water quality of 12 sub-basins. Total project cost: US$92,660.

Case Study N° 5: *Agroforestry Carbon Credits in Southwestern Mexico*
This project expects to improve the livelihoods of small coffee producers through agro-forestry carbon credits, strengthening their capacities, contributing to the conservation of the forest landscape and maintaining important ecosystem conditions, such as fertile land and consistent water supply. The most relevant result of this project was the training of 15 local partners and project leaders in designing, developing, implementing and monitoring carbon projects. In addition, this work developed a methodology to determine carbon credits for agro-forestry farms. Total project cost: US $99,071.

Case Study N° 6: *Conservation and Sustainable Management of Pine-Oak Forests in Central America*
By bringing together a group of private and public organizations from six countries, this initiative implemented strategic actions to promote the conservation and sustainable management of the pine-oak forests of Central America. The first phase of the project includes the protection and sustainable forest management, and the prevention and management of forest fires. The second phase aims to strengthen and consolidate multi-institutional efforts to sustainably manage and conserve at least 52,000 hectares of habitat, the creation, consolidation and strengthening of protected areas in pine-oak forests, maintaining a consolidated and recognized alliance to promote and monitor the extent of conservation goals. This project achieved the protection of over 50,000 hectares of pine-oak forest. Total project cost: US$620,000.

Table 5: A Snapshot of Case Studies

Case	Project Name	Project Scope	Leader	Site
1	Developing an Integrated Strategy and Project Plan to Conserve the Chiquibul-Maya Mountain Key Biodiversity Area in Belize	Bi-national	Foundation	Protected area in Belize, adjacent to the border with Guatemala
2	Nicaragua Forestry, Agriculture, and Tourism Alliance (NIFATA)	National	International NGOs	Nicaragua (country wide)
3	Organic Chocolate Manufacture and Trade in an Indigenous Bribri Community, Costa Rica	Local	Women's community association	Bratsi District, Talamanca Canton, Limón Province, Costa Rica
4	The Water Fund – An Integrated Management Model for Watersheds and Payments for Environmental Services in the Motagua-Polochic System of the Sierra de la Minas Biosphere Reserve, Guatemala	Local	Foundation	Atlantic Coast in the Guatemalan departments of Izabal and Jalapa
5	Agro-forestry Carbon Credits in Southwestern Mexico	Local	National and international NGOs	Southwest state of Oaxaca, Mexico
6	Conservation and Sustainable Management of Pine-Oak Forests in Central America	Regional	Alliance	Chiapas (Mexico), Guatemala, El Salvador, Honduras and Nicaragua

Sustainability vision of case studies

The approach of the 6 projects includes a vision of sustainability. However, each pillar has a different emphasis, according to the situational analysis of the case studies.

Economic pillar

In most cases, the economic approach is very strong, either in the strengthening of grassroots organizations or in the consolidation of the initiative itself. The issue of payment for environmental services is recurrent, not as a main source of income, but as an extra incentive to develop conservation activities:

1. In the first case, proposals were developed to provide financial support to local communities and to assess the economic activities and resource use by local communities in order to understand the economic dynamics at the community level.
2. In the second case, the economic pillar is more relevant as the economic situation in the project area is very critical and it is not possible to reach a balance of the three pillars of sustainable development until the economic situation drastically improves. Some useful indicators are: the assessment of the number of jobs, the number of small and medium enterprises created or consolidated, and the variation in income.
3. The third case is developed on a smaller scale, and the issue of micro entrepreneurship is focused on improving productivity, generating jobs, diversifying economic activities and paying environmental services.
4. The water initiative fund (Case 4) expects to generate resources to compensate landowners for forest conservation, similarly to a payment for environmental services scheme, but, in this case, using local sources such as industry that exploits the water resource. It also provides for the economic valuation of different types of water use.
5. In the case of carbon credits (Case 5) an agro-forestry approach for Payment for Environmental Services is featured as a tool to contribute to the economy.

6. Finally, the proposed conservation of pine-oak forests (Case 6) presents an analysis of rural economic alternatives, including the issue of payment for environmental services, changing the terminology to “economic investment in environmental services”.

Socio-cultural pillar

This pillar is very important for integrating multidisciplinary and multisectorial groups that ensures real and active participation of stakeholders. Furthermore, it aims to strengthen grassroots organizations:

1. The Selva Maya Chiquibul project (Case 1) developed a mapping process through which stakeholders are identified through a social prims, as well as local stakeholders and the activities they perform.
2. NIFATA project (Case 2) provides training on best practices of social sustainability to beneficiary groups, and also aims to contribute to the improvement of social conditions after Hurricane Felix.
3. As a group of indigenous women, maintenance of cultural traits, community integration and self-management capacity building has received a lot of attention in the organic chocolate project (Case 3). Moreover, the integration of the group has contributed directly to some community improvements such as access, and community infrastructure.
4. The water fund (Case 4) has ensured the inclusion of local communities in the decision making process and has fostered a true level of participation, representing all interests by ensuring the provision of water for local people. Additionally, the project has promoted the integration of different social sectors through investment (roads, community centers, recreation) from companies benefiting from the watershed.
5. Case 5 has aimed to empower local people by strengthening the capacities of local producers and stakeholders.
6. The pine-oak ecosystem conservation project (Case 6) has maintained a representative alliance of all sectors in different countries, and promoted training and active participation of its members.

Environmental pillar

In the case studies, a prevalent issue is the adequate training to ensure proper waste management, protection of natural resources, and environmental services:

1. The Selva Maya project (Case 1) commits to environmental issues through training and informal education programs aimed at raising environmental awareness.
2. NIFATA (Case 2) focuses on the benefit of developing sound environmental practices for environmentally friendly production, leading certifications that provide added value to production schemes. The different projects also prevent contamination of water sources and foster biodiversity conservation through training.
3. The association ACOMUITA (Case 3) uses natural resources along with organic production and forest conservation.
4. The water fund (Case 4) works in compliance with conservation objectives in protected areas that protect watersheds, through financial incentives to landowners.

5. The carbon fund (Case 5) proposes a series of specific practices such as reforestation of the landscape, providing habitat for biodiversity and maintaining ecosystems processes, as well as fertile land and a consistent water supply.
6. Case 6 emphasizes the strengthening, consolidation and creation of protected areas in pine-oak ecosystems, areas of high endemism.

Main themes for the initiatives in the region

The Chapter 13 of the 1992 Rio Declaration concerning "Managing Fragile Ecosystems: Sustainable Mountain Development" emphasizes topics of interest that the Mesoamerican case studies address. All case studies recognize the importance of the relationship between mountain habitants and the need to carry out their activities in a sustainable way:

- In Case 1, a novel mechanism to preserve threatened areas located within an eco-region of international importance is put forward, including bi-national management, the promotion of local co-management of natural resources, taking into account the valuation of environmental services from local people's point of view. On the other hand, a tool that integrates local stakeholders to respond to threats of biodiversity loss is offered. A specific approach is used for water protection, biodiversity conservation, and research and community empowerment.
- Case 2 relates to a process which seeks to develop an integrated approach to conservation, addressing social issues like unemployment and poverty, as well as inadequate management practice agriculture. It promotes the protection

and sustainable use of forest, diversification of the economy and support for community-based tourism activities. The initiative includes the promotion of incentives for conservation. One achievement of the project has consisted in creating a community-based tourism policy which is currently used at the country level. Finally, this experience has successfully improved traditional agricultural activities through new techniques and sustainable certification that make a difference in providing access to other markets and increasing profitability.

- The women in Case 3 have succeeded in diversifying their economy and generating resources related to agriculture. In this case, organic production is an added value, as well as the process of making chocolate in addition to cocoa farming. The group of women seeks to improve the quality of life of its members while using natural resources in a sustainable way. The different experiences generated by this group has helped to promote lost indigenous traditions and practices, and are currently being replicated or adapted by other stakeholders.
- Case 4 focuses mainly on the water component, and the close relationship between mountains and this resource. The development of a fund to guarantee the water supply in the long term involves the direct protection of mountain ecosystems, seeking to harmonize current population needs and land use planning in the highlands. The integrated development of watersheds, as discussed in Chapter 13, is fulfilled through the active participation of local people as it involves both users and administrators. Funds raised through contributions from users are invested in conservation. The documentation of these experiences contributes to the development of the current knowledge on mountains sustainable development.
- The aim of Case 5 is to benefit local producers with extra funding that is obtained through economy diversification. These funds contribute to improve the quality of life, while maintaining the current resources of mountain populations. An interesting contribution is the development of a methodology and guidelines for carbon projects in coffee plantations, which contributes to improve the knowledge about the crop and also allows for technological transfer through training. The ultimate goal of the project, which is the integration of productive activities as a tool to maintain ecosystem integrity, was successfully achieved.
- Case 6 has integrated cross-border conservation efforts that require the inputs of various public private and local sector groups. This initiative has facilitated the identification of conservation gaps, as well as the establishment of mechanisms for the management and protection of key mountain ecosystems into new protected areas. Ecosystem research and international cooperation are the basis for the long-term partnership of this project that also promotes a strong and efficient participation in decision-making from stakeholders.

Institutions and management mechanisms to support sustainable mountain development

No institutions or mechanisms have been created in Mesoamerica since 1992 to support sustainable mountain development, with exception of Mexico where,

following the 2002 Johannesburg Declaration, a mountain program and 25-year plan was established within the National Forest Commission (CONAFOR) in order to ensure the further development of this topic (Table 6).

In 2001, some committees and focal points were created in all Mesoamerican countries in order to support the celebration of the International Year of Mountains. These groups were expected to continue working as dynamic links on the topic of mountains after the celebrations, but this aim was not achieved.

Table 6: Mesoamerican Institutions and Mechanisms that have fostered Sustainable Mountain Development since 1992

Year	Institution or Mechanism (Place)	Objective	Mesoamerican Participation
2000	First International Forum of Mountains, Chambéry (France)	Raise awareness on mountain issues and evaluate progress to date	Unknown
2001	Cusco Declaration on Sustainable Development of Mountain Ecosystems (Peru)	Build a common vision on mountain ecosystems from the perspective of sustainable development	Mexico
	Creation of national committees for the International Year of Mountains and designation of country focal points	Plan and carry out celebrations of the International Year of Mountains	All Mesoamerican countries
2002	Huaraz Declaration on Sustainable Development of Mountain Ecosystems (Peru)	Complement future vision for mountain ecosystems by 2020. Recognize the relationship between water resources and the mountains. Promote research and recommend the formation of a working group of mountain ecosystems, taking advantage of the opportunities offered by the World Summit on Sustainable Development	Mexico
	World Summit on Sustainable Development, Johannesburg (South Africa)	Respond and adequately develop the issues raised in the Rio Declaration of 92, as well as monitor compliance with agreements of the Declaration	All Mesoamerican countries
	Creating Mountains Alliance	Collaborate with the improvement in the lives of mountain people and protect mountain environments around the world	Guatemala and Mexico are the only members of Mesoamerican
	Bishkek Global Mountain Summit (Kyrgyzstan)	Culminate the International Year of Mountains and reinforce the International Alliance for Sustainable Development in Mountain Regions	Unknown
	Creating Mountain Programme managed by the Management of Forest Environmental and a sustainable development plan in the mountains of Mexico long term	Contribute to the development of mountain villages, reduce threats and holistically manage ecosystems	Mexico
	Second World Meeting on Mountains, Quito (Ecuador)	Discuss living conditions in the mountains	Unknown
2003	Statement by the International Mountain Day	A celebration that reminds countries of Chapter 13commitments	All Mesoamerican countries
	The Conference of Merano (Italy)	Define common needs, interests and priorities and probe critical issues related to the structure, membership and leadership of the Alliance of Mountains	Unknown
2004	The Conference of Cusco (Peru)	Exchange experiences, review progress reports and chart the future path of the Mountain Partnership and its dynamic core	Mexico (other countries unknown)

Mechanisms of integration and their implications

The integration of various sectors is a predominant feature in the case studies, particularly the integration of local communities and conservationists.

- Case 1 has been led by a conservation group and supported with resources from international and national NGOs. It has also integrated the government sector, researchers at the United Nations (through different programs), the media and local communities. The implications of inter-sector work have been reflected in the fact that the proposed results were fully achieved.
- Case 2 had ties ranging from the local level (farmers, forest owners and providers of tourist services) to products consumers in Europe and the United States. The work included organized groups and government agencies. The involvement of many actors and diverse interests generated a community-based tourism policy which is currently being implemented at the national scale.
- Case 3 is a local initiative that was supported by international NGO's. It also involved the government at the local and national levels. Due to its excellent performance, the organization has been supported in new projects.
- Regarding Case 4, a shared interest in water resources fostered the inclusion of users and administrators. The productive sector, local communities, international NGOs and governmental agencies were integrated. One implication of this project was the establishment of a fund to support initiatives to conserve water that contributed to maintaining a good relationship between managers and end-users.
- In Case 5, the carbon credits initiative was developed by linking the productive agricultural sector and the environmental sector, in conjunction with local people. Thanks to the involvement of these groups, it was possible to develop a set of guidelines for the design of coffee plantation carbon projects that could be replicated in other regions.
- Case 6 involves community groups, conservation NGOs, and the academic, governmental and productive sector. The implications of this union is reflected in the constitution of a partnership that warrants the conservation of pine-oak forests ecosystems, community agreements for the sustainable use of over twenty-six thousand acres of forests and efforts to protect more than fifty thousand acres.

Participation of stakeholders

The leaders of each of the case studies initiatives vary according to the scale of the project. In Cases 1 and 4, projects are run by foundations, while Cases 2 and 5 are led by national and international NGOs. Case 3 is led by a community group of women and the Case 6 is being implemented by a partnership involving a large group of organizations.

In every case study, the main budget was obtained through international funding agencies and NGOs. The main sources of income are The Nature Conservancy (TNC), the Global Environment Facility (GEF), the United States Fish and Wildlife Service (USFWS), and the United States Agency for International Development (USAID). In

some cases, the financial contribution for the projects also came from regional organizations (Case 2), the government (Case 4) and the private sector (Cases 4 and 5), (Table 7). The 282 mountain sustainable development listed in Annex 5 represent an investment of $246,848,911 over the last two decades.

Table 7: Donors of Case Studies Initiatives

Case	Donor
1	Protected Areas Conservation Trust (PACT), The Nature Conservancy (TNC), RARE, Critical Ecosystem Partnership Fund (CEPF).
2	United States Agency for International Development (USAID)
3	Indigenous and Farmer's Coordinating Association of Community Agro-forestry (Asociación Coordinadora Indígena y Campesina de Agroforesteria Comunitaria - ACICAFOC), The Nature Conservancy (TNC), Global Environment Facility (GEF)
4	Avina Group, Critical Ecosystem Partnership Fund (CEPF), Ministry of Agriculture of Guatemala, Competitive Technology Development Fund Agrifood Guatemala (AGROCYT), Private sector.
5	Waterloo Foundation and United Agribusiness of Mexico Ltd.
6	Conservation International, Global Environment Fund, Legacy Fund, The Nature Conservancy, United States Fish and Wildlife Service - Neotropical Migratory Bird Conservation Act (NMBCA)

The environmental sector is represented in all cases and focused primarily on Cases 1, 4 and 6. The industrial and productive sector had a leading role in Cases 2, 4 and 5. In Cases 1, 5 and 6, international NGOs not only provided funding, but also took an active part in the implementation of the projects. The academic sector was involved in Cases 2, 3 and 6, while the government or its agencies have had a stake in all cases at the local and national levels, while local communities or residents of mountain areas were also involved in all initiatives.

Results and indicators of the case studies

The case studies all met their goals with a very high percentage, and in many cases even surpassed the initial proposal's goals. Their observed weaknesses are mainly related to the continuity of projects at further stages due to the dependence on external financial resources. In general, the case studies were very successful from an economic perspective, as they created new sources of income and allowed for the diversification of the agricultural economy, and increased employment opportunities.

In the socio-cultural component, traditional knowledge is consistently strengthened, creating new groups to support initiatives where participation and representation of different sectors is essential. Indicators include the number of organizations or groups that integrate initiatives or formed out of them, the number of beneficiaries of community development projects and the number of beneficiaries exchange programs and training.

From an environmental perspective, the projects fail to meet the objectives of increasing the amount of protected ecosystems through protected areas, improved management or by certified environmentally sustainable practices. The knowledge and appreciation of local residents on services provided by protected areas was conducted through a survey. Other indicators include the number of acres of ecosystems or protected areas with better management practice, as well as the amount of acres of certified environmental sustainability practices, the amount of environmental education activities developed and numbers of basin committees established

In economic indicators used to determine success measured the amounts of income, investment and input to projects, number of jobs and number of established companies, as well as the number of local people benefiting from initiatives implementation.

Factors of success or failure of the case studies

In general, the success of the case studies is due to a proper definition of the scope of the project, besides the involvement and effective participation of different stakeholders that empowers the initiative. Knowledge of the subject matter and the area where initiatives are developed, as well as the financial support for implementations are also a key to success.

Positive Aspects

- The setting of practical and realistic goals is valued as a key aspect of success (Case 1).
- The involvement of stakeholders from all sectors and from the grassroots to the transnational sector is a key to success (Case 2).
- The community association of women (Case 3) believes that the definition of common values, the co-participatory scheme, teamwork and tolerance are the main factors to a successful initiative.
- The field verification of the progress and a comprehensive quality control of the project are essential (Case 4).

- The use of a recognized and credible methodology contributed to the success of The Rainforest Alliance in the lead of Case 5.
- The alliance for the protection of pine-oak forests (Case 6) considered as key issues the open platform for sharing and systematizing best practices among stakeholders, and defining measures of success together with all stakeholders.

Negative Aspects

- Case 1 faced implementation problems, as the magnitude of one of the problems was not clearly defined and as some legal issues limited the progress of cross-border management.
- The variation in the markets and the lack of information made it difficult to achieve the objectives of Case 2.
- ACOMUITA notes that distrust affected the context of intercultural relations of the project.
- The absence of historical data on the water issue was the main concern in Case 4.

Learned lessons

Due to the diversity of organizations, budgets, scales, objectives and stakeholders, the investigation of all case studies provided a substantial list of learned lessons:

- Advance planning is a key aspect to a good start of the project and this should be based on the principles of sustainability.
- It is important to maintain strategic alliances with stakeholders from different sectors, as they are a fundamental pillar for achieving the expected results and impacts.
- Partnerships diminish costs and facilitate the implementation of projects.
- The productive and industrial sector can contribute to accelerate the implementation process of the initiatives.
- It is important that partners have a capacity for action at the regional level, thus enhancing joint efforts and the positive impact of the achievements.
- The implementation of sustainable tourism practices requires adequate funding.
- In the practice, technical forestry assistance is not enough to promote community forestry.
- An important aspect of the processes of training, production and marketing will only be sustainable over time.
- Agro-forestry systems are a suitable model for improving the environmental and economic conditions of small farms, where the integrity is essential in order to take advantage of all resources.
- The work of both formal and informal education aimed at raising awareness amongst water users and providers has proved to be a good investment.

- Initiatives in the mountain areas can yield benefits when they are promoted in various media, positioning the initiative and increasing the number of adherents.

The role of Chapter 13 of Agenda 21 (Rio 1992)

Role of Chapter 13 in promoting sustainable mountain development

Very few of the objectives delineated in Chapter 13 of Agenda 21 have been achieved. The creation of a mountain database for Mesoamerica (13.4) has not occurred, as mountains have not been treated in a specific manner; nevertheless, progress has been made at the regional level, achieving in part objectives 13.5a (to undertake a survey of the different forms of soils, forest, water use, crop, plant and animal resources of mountain ecosystems, taking into account the work of existing international and regional organizations), 13.5b (to maintain and generate database and information systems to facilitate the integrated management and environmental assessment of mountain ecosystems, taking into account the work of existing international and regional organizations), 13.5c (to improve and build the existing land/water ecological knowledge base regarding technologies and agricultural and conservation practices in the mountain regions of the world, with the participation of local communities) and 13.5f (to generate information to establish databases and information systems to facilitate an evaluation of environmental risks and natural disasters in mountain ecosystems), while 13.5d (to create and strengthen the communications network and information clearing-house for existing organizations concerned with mountain issues) has failed. Objective 13.5e (to improve coordination of regional efforts to protect fragile mountain ecosystems through the consideration of appropriate mechanisms, including regional legal and other instruments) has been achieved in part, through the Oak-pine Conservation Alliance.

Few of the management-related activities detailed in 13.6 have been achieved as mountain targets *per se*, as governments have failed to strengthen existing institutions

or establish new ones at local, national and regional levels to generate a multidisciplinary land/water ecological knowledge base on mountain ecosystems (13.6a: to strengthen existing institutions or establish new ones at local, national and regional levels to generate a multidisciplinary land/water ecological knowledge base on mountain ecosystems). On the other hand, some relevant progress has been made towards achieving objectives 13.6b (to promote national policies that would provide incentives to local people for the use and transfer of environment-friendly technologies and farming and conservation practices), 13.6d (to encourage policies that would provide incentives to farmers and local people to undertake conservation and regenerative measures), 13.6e (to diversify mountain economies, inter alia, by creating and/or strengthening tourism, in accordance with integrated management of mountain areas), 13.6f (to integrate all forest, rangeland and wildlife activities in such a way that specific mountain ecosystems are maintained) and 13.6g (to establish appropriate natural reserves in representative species-rich sites and areas).

There has been comparatively more efforts and success in promoting integrated watershed development and alternative livelihood opportunities, especially objective 13.15b (to promote income-generating activities, such as sustainable tourism, fisheries and environmentally sound mining, and to improve infrastructure and social services, in particular to protect the livelihoods of local communities and indigenous people), but very few has been achieved towards land-use planning and management for both arable and non-arable land, risk management and early-warning systems (13.15a and 13.15c).

More has been achieved towards establishing task forces or watershed development committees (13.16b), enhancing popular participation in the management of local resources through appropriate legislation (13.16c), supporting non-governmental organizations and other private groups assisting local organizations and communities in the preparation of projects that would enhance participatory development of local people (13.16d) and providing mechanisms to preserve threatened areas that could protect wildlife, conserve biological diversity or serve as national parks (13.16d).

On the other hand, while challenges have not changed dramatically since 1992, all the countries have created or strengthened their ministries of the environment and natural resources, drafted their Environmental Laws, developed their protected areas network, established their national biodiversity strategies and signed many internatonal or regional treaties such as the Convention for the Conservation of the Diversity and Protection of Protected Areas in Central America (1992), the Convention on Climate Change (1993), the Convention for the Management and Conservation of Natural Forest Ecosystems and Management of Forest Plantations (1993), the Environmental Plan for the Central American Region (PARCA, 1999).

Issues not recognized in Chapter 13 that have gained prominence
Some issues that were not specifically recognized in Chapter 13 and that have gained prominence in Mesoamerica include:

- Payment for Environmental Services
- Connectivity conservation
- Regional integration
- Promotion of reforestation, ecological restoration and natural recuperation of deforested areas
- Ecosystem approach instead of the traditional species approach
- Indicative species
- Forest fires and their impacts on furthering climate change
- Ecosystems and species migration towards the poles and towards higher elevations
- Climate change
- Genetically modified agriculture
- Free trade agreements (regional, continental and global levels)
- Human demographic explosion during the last two decades
- Increase in real estate value in mountainous areas
- Dependency on external funding sources for sustainable development projects
- Monocultivation pressure on higher elevations favoured by enhanced and genetically modified crops
- Contribution and importance of private protected areas and ecological easements

Impacts of responses to recent issues and progress towards sustainable mountain development

Financial schemes that include the payment for environmental services have been developed in Costa Rica during the last decade and are becoming a trend in the whole region. Connectivity conservation has become a very promising model to further develop sustainable mountain development. Currently, the Mesoamerican Biological Corridor already covers 16,61% of the mountainous regions of Mesoamerica, with a strong potential for increasing connectivity in mountainous areas. The promotion of reforestation, ecological restoration and natural recuperation of deforested areas has also emerged as a trend in the region, to such an extent that some countries have started or are starting to revert their deforestation trends.

Part 3: Emerging trends, challenges and opportunities for sustainable mountain development in Mesoamerica

"In recent years, a series of events has dramatically changed the global setting, giving rise to complex strategic challenges for Mesoamerica. In general, the region has less maneuvering room than before because of a convergence of factors that severely penalize its human development shortcomings. In the economic arena, most of Mesoamerica's nations undertook a relatively simple, unilateral program of trade and financial liberalization based on cheap labor and the isthmus' privileged geographic position in relation to the world's principal market, with the belief that economic liberalization would be sufficient to bring about sustained and rapid improvements in human development. Without that process, the region today would probably be in worse shape economically and socially. However, it is now clear that the easy stage of economic liberalization is not enough to meet even strictly economic goals, let alone promote rapid development. In the political arena, Mesoamerica faces a serious, multi-faceted problem of public safety. In several countries social violence and crime are among the highest in the hemisphere or clearly on the rise. Public insecurity is a problem of the public order that questions the legitimate authority of the States. It contributes to social breakdown because it weakens trust and reciprocity within communities" (SNHSDP 2008).

One of the main causes for increased pressure on natural resources is the rapid population growth in the region, having gone from 11 million to more than 50 million in the last six decades. A great part of the region's economy is based on the extractive use of mountain natural resources.

"Regarding energy, the emerging challenge is linked to high dependence on imported fossil fuels, which account for 45% of total energy consumption in the region, and to inefficient consumer habits. The transport sector and electricity generation are the biggest consumers of oil products, while firewood is the main source of energy in rural settings. This heavy dependence on oil is exacerbated by a complex international setting characterized by high prices and the prospect of depleting petroleum reserves, which reduces competitiveness, triggers inflation and widens the economic trade deficit in countries where growth is strongly linked to energy use. Lastly, a further complex challenge emerging at the international level is food and nutrition security. Until recently, the relative buoyancy of emerging economies including China and India, combined with low world market prices, enabled Mesoamerica to supply domestic needs with imported food products, given their wider availability. This panorama changed abruptly with the sharp increase in food demand and climbing international food prices stemming from the relative instability of food production. This, in turn, was linked to recurring major weather events and variable rainfall attributed to climate change, and also to the use of food crops for bio-fuels in coping with the oil crisis. In a region highly dependent on imported food, this could become a threat in the near future and give rise to scenarios of food insecurity and a sharpening of nutritional deficiencies among the poorest sectors of the population" (SNHSDP 2008).

The challenges of sustainable mountain human development include:

- Mitigating the impacts of climate change
- Adapting to climate change
- Providing jobs for people
- Having a healthy population
- Guaranteeing food for the people
- Preventing a population exodus
- Stabilizing democracy
- Fighting against corruption
- Strengthening local government
- Protecting the natural heritage
- Having energy for production

Some ecosystems, especially mountains, are known to be especially vulnerable to changes in climate and impacts are being documented (Price 2004, Pounds et al. 1999). Mesoamerica's mountains most pressing challenge is, no doubt, climate change. Mounting evidence suggests that we are approaching a threshold period, a time when stocks of natural, social and economic capital are nearing multiple biophysical tipping points with negative impact cascades underway in many regions (IPCC 2007, Rockstrom et al. 2009). The complexity of the interconnections among such internally complex systems makes simple temporal or spatial impact predictions difficult for

many cascades, adding to a belief among many decision-makers that there is no real problem or that there is time to deal with the issues later (Dawe & Ryan 2003). This approach reflects an understandable lack of familiarity with complex system behaviors and the speed of multiplicative cascades generated by reinforcing feedback loops operating over multiple generations. In addition, despite hundreds of real-time news and other media outlets, there is still no real public or political recognition of the fact that many temporarily successful past societies have triggered abrupt internal declines by overshooting tipping points involving natural, social and economic capital (Diamond 2005, Sachs 2008).

Climate change is considered by many diverse analysts and institutions to be the most pressing challenge to biodiversity conservation and, potentially, human societies in terms of quality of life metrics. Increasing climatic variation is affecting ecosystems at all latitudes and beginning to generating impact cascades among linked social and economic systems (Stern 2009). Scientific consensus on the fundamental causes and impacts of climate change has been present for years, yet robust political action remains markedly absent in both developed and developing countries. The public at large and many decision-makers still do not recognize the magnitude or cross-cutting significance of climate change. Relatively few decision-makers acknowledge the potential for interlinked impacts. For many, it is still something that may happen towards the end of this century.

A look into the future

"Mesoamerica can reap benefits from the new international situation if it identifies the advantages and opportunities it offers, and taps them by expanding and strengthening regional actions to address common challenges. Regional action does not override the responsibility of each State toward its citizens but, in difficult circumstances such as these, it can help generate more opportunities. To achieve this, innovative thinking and bold action are needed. Regarding energy, the region's enormous potential to generate energy from renewable sources could serve as a stimulus for regional investments, while the scarcity and high price of fossil fuels could, stimulate the development of common strategies for transforming transport systems and consumer habits. In addressing the problem of public security, the reaction in Mesoamerica has ranged from "strong arm" tactics to inaction, which has borne no fruit and has had negative social and political implications. In light of this situation, regional cooperation can contribute to the development of carefully designed interventions targeting a number of risk factors within the context of strengthened State institutions bound by the rule of law. Recent international food-market trends may afford opportunities for Mesoamerica. Its fertile soils and abundant water, combined with its long agricultural tradition, could contribute favorably to the expansion of agricultural production. For such an initiative to take shape, however, robust public policies are needed, opening up possibilities for regional action to boost rural development and overcome the socio-economic lags affecting almost half of the population in the area. Two decades ago, Mesoamerica undertook solid efforts to open the way for a transition to peace, democracy and international engagement. After twenty years, the region must once again reject certain temptations and dare to do what it has never done before. "More of the same" is a course of action that will jeopardize the future of the isthmus. Keeping spending on education and health low, or cutting such spending when production growth is down or when State revenues are low, as in the times looming ahead, will only exacerbate the problems. Abandoning efforts to protect forests and increasing the use of firewood to offset energy spending will threaten the natural heritage - one of the region's great advantages internationally. Resorting to "strong arm" tactics and eroding institutional democracy to fight public insecurity can seriously undermine political stability. To cope with the new challenges, we must rediscover Mesoamerica - this shared space, somewhat bypassed as a world priority after playing its part in the last cold-war conflict - so it can enter the global arena. It means, specifically, undertaking joint actions to manage common assets (biodiversity, advantages of location, world business node) and addressing common challenges (geo-politics of security, dependence on fossil fuels, food crisis). The regional institutional framework can be a valuable tool for such action. Although the Central American Integration System (SICA) was remodeled during the post-civil war reconstruction, the conditions and needs of today are different. The isthmus' integration process is at a crossroads: it should either be useful or it should be set aside. Today there are strong and diverse incentives for taking joint action. The main task is to build a political agreement that articulates region-wide endeavors with the interests of each country. To this end, the States must overcome their traditional lack of discipline concerning their region" (SNHSDP 2008).

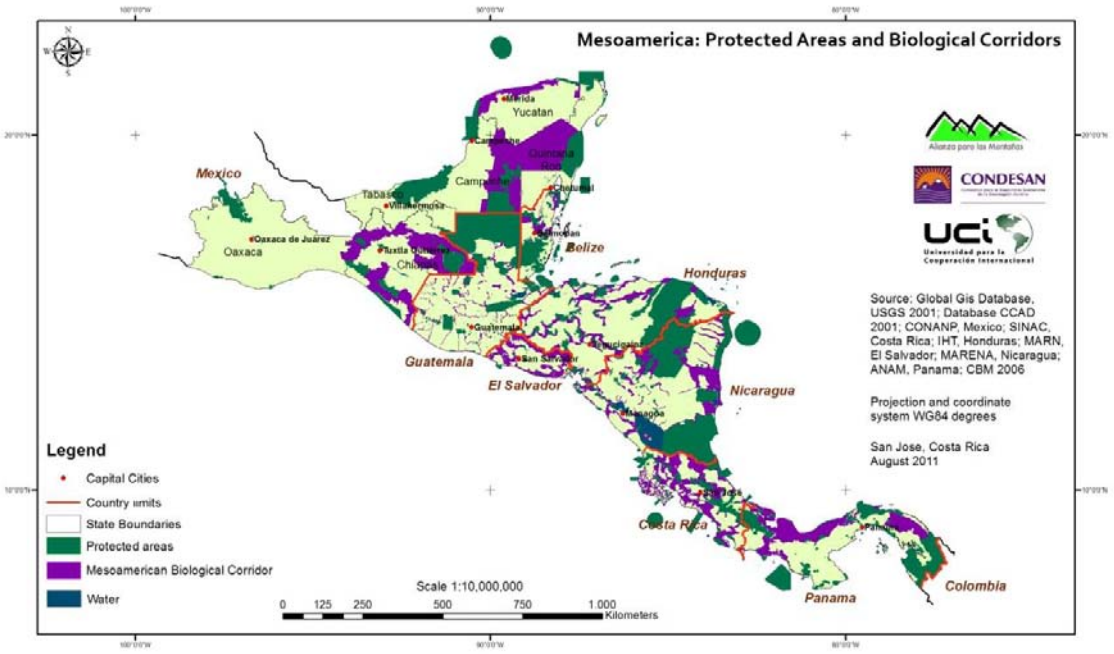
Addressing trends, challenges and opportunities

Mesoamerica has developed a promising experience that includes a regional scale land-use planning, the Mesoamerican Biological Corridor, strengthened by an ever increasingly important approach, the Ecosystem Approach. These two features represent Mesoamerica's greatest challenge and best opportunities to further sustainably develop mountains if adequate policies and a shift towards greening the economy are strongly pushed by the governements.

The Mesoamerican Biological Corridor

In recent years, biological corridors have gained wide recognition and acceptance as one of the most promising conservation tool (Crooks & Sanjayan 2006, Hilty et al 2006, Chester & Hilty 2010). It has been recognized that protected areas alone are not sufficient to guarantee long-term protection for biodiversity (Hudson 1991, Worboys 2010). The focus of biological corridors is to maintain linkages between these focal points (protected areas) which have a more rigorous conservation mandate. Biological corridors offer a degree of flexibility in management approaches that are adaptable over a wide range of social and economic situations and physical landscapes, which would not always be possible in protected areas alone (CCAD 2002, Bennett 2004, CCAD 2005). The Mesoamerican Biological Corridor (MBC) was conceptualized in 1997 as a cooperative initiative between Central-American countries and the southern states of Mexico, to harmonize and execute in a coordinated way the activities aimed to the conservation of biological diversity and to promote sustainable human development in their territories (CCAD 2005). The MBC aims at conserving biological and ecosystem diversity while fostering sustainable social and economic development. The MBC consists of a land-use planning system that maintains the interconnectivity of protected areas, and establishes buffer zones where forms of sustainable natural resource use may occur (Müller & Barborak 2010, Chassot & Canet-Desanti 2010). The MBC initiative is based on the conviction that long-term biodiversity conservation can be achieved only with the reduction of rural poverty and through strengthening the economic viability of countries in the region (CCAD, 2002).

Figure 13: Mesoamerican Biological Corridor



The MBC has progressed in scope, structure and philosophy. Today, the MBC covers only 36.208 km^2 or 16,61% of the mountainous regions of Mesoamerica, with plenty of room for increasing connectivity in mountainous areas (Figure 13).

Later developments lead to a strong social and economical focus, which makes it difficult to satisfy expectations due to the complexity of socioeconomic and political

problems in the region's countries (Müller & Barborak 2010). The MBC project officially ended in 2006, giving way to several new projects with the goal of consolidating the MBC: PERTAP (Regional Strategic Program of 'Work in Protected Areas); PERCON (Regional Strategic Program for Connectivity); PROMEBIO (Regional Strategic Program for Biodiversity Monitoring and Evaluation); and PERFOR (Regional Strategic Program for Forests), (CCAD 2005, Müller & Barborak 2010)

For the design of the MBC, four land-use zones were defined: core zones, buffer zones, corridor zones and multiple-use zones. Buffer zones surround the core areas and have the function of buffering the impact of human activities so that they don't impact directly the protected areas. Most of these buffers are privately owned. It is difficult to regulate land use in the buffer zones (Müller & Barborak 2010). Alternative sources of economic benefit, including ecotourism, must be presented to local communities in order to conserve functioning buffer zones (Davenport et al 2002). The payment for environmental services, mostly for water production but also for carbon fixation, has come to play a very important role in providing income and incentives to local people to conserve the forest cover in the buffer zones. Corridor zones are also usually privately owned and frequently are encroached to some extent by agricultural practices. As with the buffer zones, efforts are made to have farmers use more ecologically friendly practices, such as the use of live, the maintenance or restoration of river margins with native vegetation, reforestation with native trees or the use of agroforestry (Müller & Barborak 2010). Multiple-use zones are devoted to more intense human use, including settlements and intensive agriculture. These areas form a mosaic of different land uses. Efforts are made to maintain or restore biodiversity capability to these areas. As with the two other zones, the existence of technical assistance and incentives to local farmers to establish better practices is fundamental. The MBC is a complex network that brings together international, national and local initiatives (Müller & Barborak 2010).

In 1989 the Central American Commission for Environment and Development (CCAD) was established as the main environmental organ of the Central American Integration System (SICA). The MBC structure is dependent on other regional processes within the Central American Integration System. The CCAD, which is headed by the Council of Ministers for the environment and natural resources, is the main institution in charge of the corridor. The Commission is responsible for the harmonization of the region's policies with regard to the environment and natural resources management. The presidency of the council rotates within the seven countries every six months (Müller & Barborak 2010).

According to Miller et al (2001), effectively planning and implementing the MBC will require that several strategic challenges be addressed, including:

- Reconciling stakeholder interests
- Fostering democratic governance and enabling civil society participation
- Catalyzing information for participatory decision making
- Clarifying the function of MBC land-use categories
- Addressing property rights and land-tenure issues

- Capturing benefits from ecosystem goods and services
- Harmonizing institutional and legal frameworks and promoting inter-sectoral cooperation
- Setting investment and management priorities

Today, the MBC still faces many of these challenges, but the administrative structure has consolidated itself, allowing the eight countries to meet and jointly plan and evaluate progress (CCAD 2005).

One of the most important lessons refers to the need to include all sectors of society. A governmental approach alone would not have allowed this initiative to consolidate itself as it is today (Chassot & Monge 2008). There is a need not only to include all stakeholders from the beginning but to make them true partners, and leave open the possibility to include sectors that initially weren't involved (De Campos & Finegan). Stakeholders range from local communities, private sector, NGOs, especially the local ones, educational institutions, to local governments and central government agencies. Inter-sectoral cooperation is essential, requiring special efforts to coordinate activities between and within institutions.

There is a need for a strong coordinating role, dedicated and with sufficient funding to assure operation in the mid-term and broad regional coordination. This must go together with strengthening and empowerment of local organizations in order to achieve success at the local level.

Ecosystem approach

The ecosystem approach is the ideal tool to implement sustainable mountain development and to further develop the Mesoamerican Biological Corridor (Chassot & Monge 2008), living up to the expectations created by the Central American Alliance for Sustainable Development (ALIDES 1994).

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (UNESCO 1996). Thus, the application of the ecosystem approach will help to reach a balance of the three objectives of the Convention on Biological Diversity (CBD): conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources (Smith & Maltby 2003). An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems. The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Ecosystem processes are often non-linear, and the outcome of such processes often shows time-lags. The result is discontinuities, leading to surprise and uncertainty. Management must be adaptive in order to be able to respond to such uncertainties and contain elements of "learning-by-doing" or research feedback. Measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically (Pirot et al 2000). The ecosystem approach does not preclude other management and conservation approaches, such as biosphere reserves, protected areas, and single-species conservation programs, as well as other approaches carried out under existing national policy and legislative frameworks, but could, rather, integrate all these approaches and other methodologies to deal with complex situations. There is no single way to implement the ecosystem approach, as it depends on local, provincial, national, regional or global conditions. Indeed, there are many ways in which ecosystem approaches may be used as the framework for implementing sustainable mountain development in practice (Smith & Maltby 2003, Sayer & Campbell 2004).

The following 12 principles are complementary and interlinked; they form the core of the ecosystem approach (UNESCO 2000):

Principle 1: The objectives of management of land, water and living resources are a matter of societal choices

Principle 2: Management should be decentralized to the lowest appropriate level

Principle 3: Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems

Principle 4: Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context

Principle 5: Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach

Principle 6: Ecosystem must be managed within the limits of their functioning

Principle 7: The ecosystem approach should be undertaken at the appropriate spatial and temporal scales

- Principle 8: Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term
- Principle 9: Management must recognize the change is inevitable
- Principle 10: The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity
- Principle 11: The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices
- Principle 12: The ecosystem approach should involve all relevant sectors of society and scientific disciplines

Policy measures to promote a shift towards a green economy

To respond comprehensively, consistently and effectively to the above problems, a comprehensive system for sustainable mountain development must be established and must be expressed in several dimensions:

- Institutional: with an open network of public and private entities, academic institutions, businesses, associations, local communities, indigenous people and NGOs that work on a regional, national or local level, putting into practice a harmonized set of management policies and instruments.

- Bio-physical and territorial: based on the biological and productive diversity of the ecosystems and their resilience, including different forms of landscape and sustainable land use, which are promoted and managed to benefit the conservation of the natural heritage of the countries, combating the causes of fragmentation and loss of ecosystems, and reestablishing the ecological connectivity to maintain the environmental goods and services that support livelihoods and the growing well-being of the population.
- Human, social and political: in which stakeholders participate at different levels of decision-making about their development in a concerted effort at planning and management among governments and society in the region. Innovative approaches for inter-sector and inter-institutional approaches increasing the use of future scenarios and holistic responses, based on maximizing livelihoods and quality of life of communities above individuals with solid value and ethical processes that lead to maximum participation and true democracy.

The factors that put sustainable mountain development at risk are similar in all of the countries of the region. In the framework of their national development policies and commitments contracted at the regional and international levels, all of the countries have embarked upon measures and actions to improve their management capacity and to increase their overall contribution. The mission of the CCAD is to assist the countries in harmonizing measures, encouraging intra-regional integration and cooperation, and facilitating joint access to new opportunities for international assistance and cooperation. The CCAD has developed and approved the elements of regional environmental policy that provide a strategic vision and guidance in the

implementation of actions connected to environmental sustainability and conservation of regional biodiversity, such as (CCAD 2005):

- Fostering the sustainability of development, where conservation and sustainable use of biodiversity contribute to an improved standard of living for Central Americans, with sustainable socio-productive alternatives.
- Recognition of the interdisciplinary and intersectoral nature of sustainable development, and promotion of actions with the participation of public and private institutions in bidding processes and with multilateral assistance and cooperation.
- Promotion of broad participation by the various sectors of society in the management and benefits of sustainable development, with social and gender equity.
- Recognition of and support for environmental communication and education as a substantial tool to promote a long-term change in attitudes to support sustainable mountain development.
- Conservation and restoration of the environmental factors that contribute to a decreased risk of natural disasters and social and ecological vulnerability.
- Transparent, decentralized, efficient environmental management, optimizing institutional capacities and delegating decisions to the most local level possible.
- Total economic assessment and internalization of the costs and benefits of integrated management in mountainous areas, distributing them transparently and equitably for a more effective management.
- Production and dissemination of information about the status, pressure and response of ecosystems and biodiversity in general, to improve decision-making.

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ANEX 1: Case studies

Name:	**Developing an Integrated Strategy and Project Plan to Conserve the Chiquibul/ Maya Mountain Key Biodiversity Area in Belize**			Location:	Chiquibul / Maya Mountain Key Biodiversity Area, Belize
Contact:	Rafael Manzanero	E-mail:	rmanzanero@fcdbelize.org		
Theme(s):	Biodiversity and conservation of mountain ecosystems (wildlife, protected areas, biosphere reserves, world heritage sites, biological corridors, impacts of global changes)				
Previous work:	N/A				
Goals and objectives:	Develop an integrated funding proposal for the management of two core areas in the Chiquibul-Maya Mountain Key Biodiversity Area. Explore and set in motion a bi-national effort for the conservation of the KBA. Promote an awareness and interest among key stakeholders about the importance of integrating a management program for the protected areas in the KBA. Obtain a co-management agreement between Friends for Conservation and Development and the Forest Department for the management of Chiquibul National Park.				
Leader:	Friends for Conservation and Development (FCD				
Stakeholders:	Belize Forest Department, PACT, TNC, Bladen Management Consortium Ya´axche Conservation Trust, The Belize Defence Force, Las Cuevas Research Station, Mesa Intersectorial de Protection Acceso y Uso de los Recursos Naturales del Sur de Peten, UNDP, FAO, Rare, IUCN, Pine Lumber Company, Channel 7 and Amandala Newspaper, Flora and Fauna International, Belize Foundation for Research and Environmental Education				
Budget (US$):	$15,286	Funders:	PACT, TNC, Rare and CEPF	Timeframe:	2005-2006
Economic outcomes:	$570,880 was obtained. In addition, some contributions in kind were uncounted.				
Environmental outcomes:	The residents acknowledge the importance of the protected area and its water resources and showed willingness to contribute or support their initiatives. Chiquibul National Park and the Bladen Nature Reserve improved their management programs.				
Socio-cultural outcomes	More than 30 organizations involved in the area, exchange information and criteria are taken into account in management decisions. 10 communities have benefited by hiring local staff for the project. It also benefited through training and exchange programs				
Lessons learned:	Alliances should be built on respect and transparency. Since protected areas generally function as single units, there exists a certain level of competition for funds. However, working as an alliance means that team members must be focused on the common goal and to meet that goal, there must be a strong sense of respect and transparency. If not, the project can become cumbersome to implement and too complex to achieve the desired level of ownership. The government agency responsible for protected areas should always be consulted. NGOs in most countries may believe that government agencies are too bureaucratic and complicated to achieve results, but there must be a high regard for the agencies that are responsible for protected areas because they are empowered to safeguard our national heritage. All management decisions must be made in consultation with these agencies because they can have serious implications at the national level. Building consensus on a Key Biodiversity Area (KBA) means engaging with multiple partners and making concessions. Where there are several stakeholders, it is likely that everyone will not agree when building a consensus but the focus on the goal should never be lost. The Chiquibul/Maya KBA is large and there are several important players. Each one may have distinct expectations and needs, but in the end what matters is to understand the direct and indirect effects and benefits. Ultimately, concessions may need to be made, but it's important to never lose focus on the goal. We should not see the trees alone and forget the forest. Assumptions should always be clarified in advance. Miscommunication can lead to a series of assumptions among key players, which ultimately can lead to serious problems within the team. Clarifying project goals, objectives, and steps is important from the outset. It is crucial to set a communications strategy as a mechanism to ensure that proper communication occurs. Bi-national cooperation is more easily achieved at the technical level. Bi-national agreements are more complex to undertake at the highest levels of government, yet in many cases that is the level where it is pursued. For the Chiquibul/Maya Mountain KBA, we realized that working at the technical level rather than at the higher, more "political" level was more effective and efficient. Technicians on the ground are more sensitive to the various threats, needs, and opportunities and therefore are more committed to obtaining results.				

Future actions	Begin a rapid management program for Chiquibul National Park, one of the core areas, in the next year. Establish a bi-national patrol system along the Belize-Guatemala border. Create an active steering committee whose responsibility would be to oversee the development of the project. Establish a fully-staffed management presence in the Chiquibul National Park and Bladen Nature Reserve.

Name:	**Nicaragua Forestry, Agriculture, and Tourism Alliance**			Location:	Nicaragua
Contact:	Tensie Whelan	E-mail:	twhelan@ra.org		
Theme(s):	Natural disasters and risk management (increase and incidence of natural disasters)				
Previous work:	N/A				
Goals and objectives:	Increase investment, income, and employment in Nicaragua's SME sector. Increase the number of certified, sustainable SMEs in three key sectors of the Nicaraguan economy - forestry, agriculture, and tourism - in order to reach the above goal while conserving biodiversity. Foster a more competitive SME sector by giving SMEs access to financial and business services, sustainable practices, and markets. Increase the sales volume and revenue of certified sustainable timber, agriculture, and tourism from SMEs that will benefit from the project. Connect sustainable forest, tourism, and farm management practices with consistent and efficient production of quality products. Foster linkages among sustainable forestry, agriculture, and tourism activities to diversify income sources for rural communities and reduce dependency on one sector.				
Leader:	The Rainforest Alliance				
Stakeholders:	CANTUR, INTUR, BANEX, RRSP, HOPEN, RENITURAL, FENACOOP, FENIAGRO, TECUILCAN, SNV, Fauna and Flora International, UNDP-SGP, REINTURAL, ANTUR, SAN, ACEN, Mama Quilla, Las Flores café, ACAWAS Alianza de Aprendizaje, PADESAF, IICA-URACCAN , UCAFE, CAMANIC, FAO, INAFOR, SASA				
Budget (US$):	$1,300,000	Funders:	GEF, IADB, Kraft, Mitsubishi Foundation, Roy A Hunt Foundation, USAID	Timeframe:	2006-2009
Economic outcomes:	Investments of $28 million, more than 650 SMEs have access to national and international markets with sustainable products.				
Environmental outcomes:	Establishment of more than 47,000 ha of strict protection areas in forests and farms certified. 54 new coffee farms were certified by the Rainforest Alliance certified 14 farms previously held this distinction. We created a database of more than 700 coffee farms and cocoa using best practices in Nicaragua. He protected a total of 5872 hectares. 100,000 hectares of forest managed under the standard "controlled wood" of the Forest Stewardship Council. 44,500 hectares of forest have general plans for forest management. Five companies manage their own private wildlife reserves in an efficient manner, ensuring the protection of natural resources in nearly two thousand hectares of forest.				
Socio-cultural outcomes	Agreement signed with Ministry of Tourism in order to assume the project as national policy and strategy. Formed over 120 partnerships and business alliances, high-impact, 45,000 workers benefited from certification. More than 450 SMEs have access to financial and business services. Strategic partnerships with six organizations working in the fields of coffee and cocoa. 3362 people in the industries of coffee and cocoa participated in training events, education and certification. It invested more than $4,000,000 in productive and social infrastructure in the participating farms. 2,000 people from more than 300 families of Awas Tingni in RAAN benefited through the creation of the Cooperative Yamaba. Trained more than 3,600 community members (15% of them women) in sustainable forest management techniques and the application and importance of forest certification under the FSC scheme. Pilot operations were added 51 and 14 tour operators to training events. 1835 members of the tourism industry in Nicaragua were trained through the project NIFATA. More than 1349 workers in the tourism industry benefited from the program.				
Lessons learned:	The union of synergies between tourism and agriculture needs to be strengthened. Market demand is an important factor to lead to farmers seeking certification. Advice and assistance is essential for farmers to achieve certification and their keeping. The presence of internal auditors in the country is needed into the cost of certification. The link between the advisory and marketing is basic to certified producers implement social and environmental practices and profit and market incentives. Strategic alliances with industry players are a foundation for achieving results and impact of the work done by the Sustainable Agriculture Program. The advice to farms within the program should be given before and after the certification as part of a process of continuous improvement. You need				

	to have a framework of policies, laws and rules appropriate for that to be sustainable forest management. Forestry technical advice is not enough to promote community forestry. The promotion of partnering is key point to the training process; production and marketing are sustainable over time. It is necessary to support marketing strategies for SMEs to forest and wood-furniture can improve their competitiveness. Implementation of Sustainable Tourism Practices required having appropriate funding for entrepreneurs to make the required improvements in conditions financially viable
Future actions	Project is concluded

Name:	**Organic Chocolate Manufacture and Trade in an Indigenous Bribri Community, Costa Rica**			Location:	Distrito de Bratsi, Cantón de Talamanca, Provincia Limón, País Costa Rica
Contact:	Faustina Torres Torres	E-mail:	comuita@costarricense.cr		
Theme(s):	Social and economic development of mountain regions (tourism development, human population immigration, indigenous people, gender, poverty, education)				
Previous work:	Had previously worked on community strengthening.				
Goals and objectives:	Build basic infrastructure to begin the manufacture of artisanal chocolate. Donate basic tools to ACOMUITA for farming and artisanal production. Strengthen entrepreneurial and administrative capacity and establish a marketing system for placing cacao products in the national market. Manage a revolving loan fund to develop production activities in accord with the conservation actions underway in Talamanca. Incorporate trees into farming systems to generate long term profitability from timber sales and minimize impact to the native forests of Talamanca. Use agroforestry systems to make better use of crop areas and increase forest cover in the region by at least 15,000 trees, which can then be incorporated into the program for environmental services payments.				
Leader:	ACOMUITA				
Stakeholders:	Local community development associations, local and national government, CATIE				
Budget (US$):	$54.100	Funders:	ACICAFOC, TNC, GEF	Timeframe:	2007
Economic outcomes:	Increased sales of organic chocolate artisan, generating higher returns for the associated ACOMUITA. Place products was achieved through the proper marketing, two supermarkets, six local hotels and restaurant of CATIE in Turrialba.				
Environmental outcomes:	They obtain operating sanitary permit issued by the Ministry of Health and the necessary licenses issued by Talamanca´s local government.				
Socio-cultural outcomes	With own funds acquired the land where the infrastructure is being built to house the traditional organic chocolate factory.				
Lessons learned:	Strategic alliances must be formed to help reduce costs and facilitate project implementation; in the case of this project, institutional support was fundamental given that it facilitated support from the Municipality of the Cantón of Talamanca and the Ministry of Health. Agroforestry systems are an appropriate model for improving the environmental and economic conditions of small farms where integration is fundamental for the sound use of all resources. Coordination of projects is very important; this project coordinated with the Small Grants Program of Costa Rica, the Rural Indigenous Coordinator for Central American Community Agroforestry, and The Nature Conservancy				
Future actions	Place a larger quantity of better quality products on the market, once the chocolate factory is operating. Obtain higher-quality cacao production, given that the agroforestry systems of the members are in very good condition. Improve the livelihoods of the members through the loans given to members; they have led to significant improvements on their farms.				

Name:	**The Water Fund – An Integrated Management Model for Watersheds and Payments for Environmental Services in the Motagua-Polochic System of the Sierra de la Minas Biosphere Reserve, Guatemala**			Location:	The Sierra de las Minas Biosphere Reserve, Motagua, and Bocas del Polochic system, Guatemala
Contact:	Oscar Manuel Núñez	E-mail:	onunez@defensores.org.gt		
Theme(s):	Land planning in mountain regions development (watersheds, biological corridors, land planning)				
Previous work:	N/A				
Goals and objectives:	Design and implement a transparent mechanism to manage funds and investments for the conservation of water and biodiversity. Maintain an adequate water supply from Sierra de la Minas in the medium and long term. Raise awareness and provide education to the population located within the Motagua-Polochic system on the importance of the proper use of water. Provide assistance to industries, hydroelectric plants, and citizens in the area to carry out efficient water management and treatment practices. Design, implement, and disseminate standards, policies, and strategies on the use of water in the Motagua-Polochic System				
Leader:	Fundación Defensores de la Naturaleza, Guatemala WWF Regional				
Stakeholders:	Watershed administrators committees, local governments, CONAP, irrigation associations, four industrial companies, two hydroelectric companies, rural community groups.				
Budget (US$):	$92,660	Funders:	Avina Group, CEPF, Ministry of Agriculture of Guatemala, AGROCYT, Private Sector	Timeframe:	Permanent
Economic outcomes:	Contribution of industry partners through a total of $230,000 to work on project				
Environmental outcomes:	Two projects were developed on the prevention and control of forest fires and reduce the threat to water and natural resources. Two campaigns of environmental education. To date we have formed four committees basin two of them are developing their action plans and one of them already have their own regulations on water use, based on participatory processes and consensus. It participates actively with the Global Water Partnership Program (GWP) supporting the formation of the Guatemalan and Central American section. It ended Guatemala's strategic plan and participated GWP also for developing the strategic plan of the chapter in Central America. Were monitored constantly flows (quantity) and water quality in 12 sub basins.				
Socio-cultural outcomes	Established a strategic alliance with the Guatemalan Center for Cleaner Production also built 35 wood-saving stoves.				
Lessons learned:	Monitoring data can be used as a guide for decision-making for watershed management that will bring about positive change and improve sustainable development.				
Future actions	Implement a financial mechanism to earmark small donations made for conservation projects to protect and conserve natural resources. Establish the Water Fund as a legal entity by completing the bylaw review and the legal requirements to legally register the fund.				

Name:	**Agroforestry Carbon Credits in Southwestern Mexico**			Location:	Oaxaca, Southwestern Mexico
Contact:	Jeff Hayward	E-mail:	climate@ra.org		
Theme(s):	Sustainable practices and land use policies (water resources, funding for sustainable development, industrial pressure, mining, incentives for conservation of natural resources)				
Previous work:	N/A				
Goals and objectives:	Enhance the livelihoods of hundreds of smallholder coffee farmers by leveraging carbon finance to reward them for their sustainable farming practices and efforts to mitigate climate change. Implement an innovative reforestation demonstration project that uses Rainforest Alliance certification as an organizing platform for conducting project activities. Build capacity for farmers and local actors to manage the project through activities such as tree planting and monitoring carbon stocks. Contribute to the future conservation of Oaxaca's rich forest landscape by providing habitat for local biodiversity and maintaining important ecosystem services like fertile soils and consistent supplies of water.				
Leader:	Rainforest Alliance, Pronatura Sur, Adopta un Cafetal, farmers				
Stakeholders:	Rainforest Alliance, Pronatura Sur, Adopta un Cafetal, farmers				

Budget (US$):	$99,071	Funders:	Waterloo Foundation, Agroindustrias Unidas de México S.A.	Timeframe:	2011-2011
Economic outcomes:	Future sources of income for local farmers.				
Environmental outcomes:	Contribution to the conservation of the forested landscape of Oaxaca.				
Socio-cultural outcomes	Local partners for the project were identified. He trained some 15 local partners and project leaders in design, development, implementation and monitoring of carbon. A methodology was designed with guidelines to be applied in new projects.				
Lessons learned:	Agricultural Voluntary certification can provide a platform and organizational management in which the carbon project activities can be developed, more significant are the additional training, capacity building, education and, importantly, financial resources are required further to facilitate the development of such projects.				
Future actions	N/A				

Name:	**Conservation and Sustainable Management of Pine-Oak Forests in Central America**			Location:	Chiapas, Guatemala, El Salvador, Honduras y Nicaragua
Contact:	Claudia Macias	E-mail:	info@alianzapinoencino.com		
Theme(s):	Trans-boundary cooperation (conflicts, agreements)				
Previous work:	N/A				
Goals and objectives:	Promote the creation, consolidation, and/or strengthening of protected areas with pine-oak forests that have high levels of ecological integrity. Promote the management and sustainable harvest of pine-oak forests in high priority conservation areas through best forestry practices and/or integrated fire management. Continue to support an Alliance that promotes and monitors the conservation goals established in the conservation plan.				
Leader:	Conservation Alliance of Pine-Oak Forests of Mesoamerica and ProNatura Sur				
Stakeholders:	Conservation Alliance of Pine-Oak Forests of Mesoamerica and ProNatura Sur				
Budget (US$):	$620,000	Funders:	Conservation International, GEF, Legacy Fund The Nature Conservancy USFWS, NMBCA	Timeframe:	2009-2011
Economic outcomes:	N/A				
Environmental outcomes:	Arrangements for the protection of just over 50,000 hectares (ha) of pine-oak forest. Technical information was generated, demonstrating biological and ecological importance of the pine-oak forests.				
Socio-cultural outcomes	Agreement was reached for the community and institutional management and / or development of approximately 26,700 ha of forest. Consolidated Alliance for Forest Conservation of Mesoamerican Pine-Oak.				
Lessons learned:	It is important to work with stakeholders who have the capacity to act in the region and can foster collaboration and meet project goals.				
Future actions	Increase the area of pine-oak forest that is legally protected by 61,528 acres (24,900 hectares). Implement alternative sustainable management practices for forest resources. Reduce threats in 41,513 acres (16,800 hectares). Promote multi-sectoral and regional participation that will foster decision-making on forest use and management that is compatible with conservation goals				

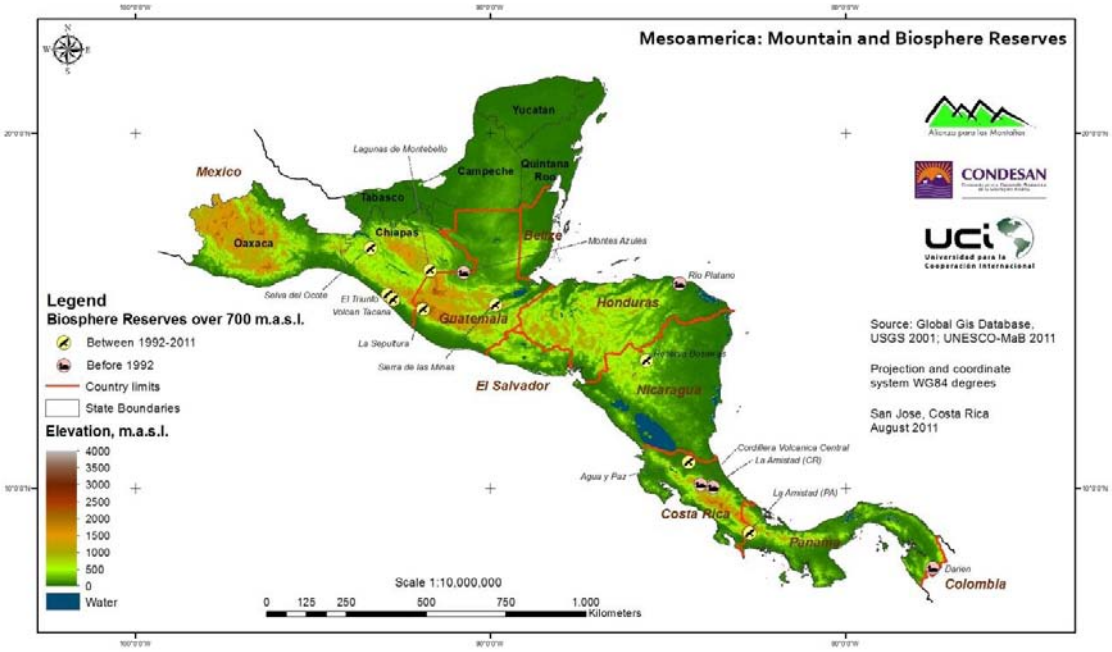
ANEX 2: List of Mesoamerican indigenous territories (mountains)

Country / indigenous territory	Forest cover (Km^2)	Non-forest cover (Km^2)	Total indigenous (Km^2)	Forest cover (%)	Non-forest cover (%)
BELIZE	**804,74**	**1430,86**	**2235,60**	**36,0**	**64,0**
Maya	255,31	356,46	611,77	41,7	58,3
Mopan	17,00	356,46	373,46	4,6	95,4
Q'eqchi'	532,44	717,93	1250,37	42,6	57,4
COSTA RICA	**42193,08**	**56359,44**	**98552,51**	**42,8**	**57,2**
Boruca	6,82	4661,96	4668,78	0,1	99,9
Bribri	15281,19	13514,21	28795,40	53,1	46,9
Cabecar	26727,28	25858,27	52585,55	50,8	49,2
Huetar	34,95	4577,13	4612,08	0,8	99,2
Ngöbes	142,78	5416,89	5559,67	2,6	97,4
Terraba	0,05	2330,98	2331,03	0,0	100,0
EL SALVADOR	**2349,95**	**140692,05**	**143042,00**	**1,6**	**98,4**
Chortis	305,07	2486,22	2791,29	10,9	89,1
Lagos	7,13	3418,10	3425,23	0,2	99,8
Lenca-Cacaopera	1421,83	25301,33	26723,16	5,3	94,7
Lencas	390,52	17407,14	17797,66	2,2	97,8
Pipil	225,40	92079,27	92304,67	0,2	99,8
GUATEMALA	**25351,45**	**581625,75**	**606977,20**	**4,2**	**95,8**
Achi	1574,61	22789,83	24364,44	6,5	93,5
Akateko	103,76	25097,51	25201,28	0,4	99,6
Awakateko	238,54	18842,01	19080,55	1,3	98,7
Castellano	3365,02	35419,89	38784,91	8,7	91,3
Ch'orti'	190,31	19494,47	19684,79	1,0	99,0
Chortis	21,77	27403,30	27425,08	0,1	99,9
Chuj	493,96	25097,29	25591,25	1,9	98,1
Ixil	1424,33	25087,15	26511,48	5,4	94,6
Kan-Tojolateco		13245,84	13245,84	0,0	100,0
Kaqchikel	2239,45	25146,75	27386,21	8,2	91,8
K'iche	5033,87	25100,20	30134,07	16,7	83,3
Mamce	3,30		3,30	100,0	0,0
Mamce-Jacalteco	0,08		0,08	100,0	0,0
Man	2429,45	25148,23	27577,68	8,8	91,2
Mopan	0,28	6243,98	6244,26	0,0	100,0
Popti'	128,23	24472,82	24601,05	0,5	99,5
Poqoman	299,71	78291,30	78591,02	0,4	99,6
Poqomchi'	1660,26	22778,40	24438,66	6,8	93,2
Q'anjob'al	1012,39	25086,82	26099,21	3,9	96,1
Q'eqchi'	3466,46	29022,26	32488,72	10,7	89,3
Sakapulteko	395,18	16533,42	16928,59	2,3	97,7
Sipakapense	197,98	10313,24	10511,22	1,9	98,1
Tektiteko	213,94	18217,63	18431,57	1,2	98,8
Tz'utujil	339,25	25086,08	25425,33	1,3	98,7
Uspanteko	513,31	18217,46	18730,77	2,7	97,3
Xinka	5,98	19489,87	19495,85	0,0	100,0
HONDURAS	**24588,17**	**1230115,25**	**1254703,41**	**2,0**	**98,0**
Ch'orti'	1,71	25273,95	25275,66	0,0	100,0
Chortis	243,36	109382,24	109625,61	0,2	99,8
Garifuna	820,73	25270,05	26090,77	3,1	96,9
Lenca-Cacaopera	7,21	1,11	8,32	86,7	13,3
Lencas	3766,03	912832,17	916598,20	0,4	99,6
Miskito-Sumo	20,38		20,38	100,0	0,0
Pech	5441,52	39427,89	44869,41	12,1	87,9
Pech-Miskitos	9,53	14157,94	14167,47	0,1	99,9
Pech-Sumo	1111,83	25269,97	26381,80	4,2	95,8
Sumo	4853,30	25270,00	30123,29	16,1	83,9
Tolupenes	8312,57	53229,92	61542,50	13,5	86,5
MEXICO	**142505,68**	**621528,82**	**764034,50**	**18,7**	**81,3**
Chiapas	**46177,57**	**272675,11**	**318852,69**	**14,5**	**85,5**

Chol	817,45	10135,89	10953,34	7,5	92,5
Chol-Tzetzal	723,23	8271,91	8995,14	8,0	92,0
Chol-Tzotzil	422,65	8271,91	8694,57	4,9	95,1
Chuj	103,19	5269,70	5372,89	1,9	98,1
Kan-Tojolateco	1397,11	10136,11	11533,22	12,1	87,9
Mamce	1066,34	21591,79	22658,13	4,7	95,3
Mamce-Jacalteco	543,91	8271,91	8815,82	6,2	93,8
Mamce-Kaka	575,57	8271,94	8847,50	6,5	93,5
Man	534,19	8272,15	8806,34	6,1	93,9
Popti'	157,55	3002,26	3159,80	5,0	95,0
Q'anjob'al	7,30	5269,70	5277,00	0,1	99,9
Tektiteko	164,50		164,50	100,0	0,0
Tojolabal-Kanjobal	4696,98	10135,90	14832,88	31,7	68,3
Tzetzal	6573,54	20902,21	27475,74	23,9	76,1
Tzetzal-Chol	833,92	10135,88	10969,80	7,6	92,4
Tzetzal-Tojolabal	7636,57	10787,32	18423,89	41,4	58,6
Tzetzal-Tzotzil	797,84	10135,85	10933,69	7,3	92,7
Tzotzil	9726,68	31097,52	40824,21	23,8	76,2
Tzotzil-Chol	1055,21	10135,85	11191,05	9,4	90,6
Tzotzil-Tzatzal	5372,80	38135,62	43508,42	12,3	87,7
Zoque	998,71	16035,96	17034,66	5,9	94,1
Zoque-Tzotzil	1972,33	18407,76	20380,09	9,7	90,3
Oaxaca	**96328,10**	**348853,26**	**445181,37**	**21,6**	**78,4**
Amuzgo	688,04	4489,42	5177,46	13,3	86,7
Chinanteco	4136,30	14139,82	18276,12	22,6	77,4
Chinanteco-Cuicateco	2470,48		2470,48	100,0	0,0
Chinanteco-Maxateco	2850,14		2850,14	100,0	0,0
Chinanteco-Zapoteco	1642,44		1642,44	100,0	0,0
Chocho	955,57	13203,32	14158,89	6,7	93,3
Chontal de Oaxaca	3378,43	1127,83	4506,26	75,0	25,0
Cuicateco	6281,68	38631,00	44912,68	14,0	86,0
Cuicateco-Mazateco	711,32	3361,59	4072,91	17,5	82,5
Cuicateco-Mixteco	2412,43	15549,83	17962,26	13,4	86,6
Mazateco	2537,43	15549,83	18087,26	14,0	86,0
Mixe	4210,52	9314,37	13524,88	31,1	68,9
Mixe-Zapoteco	6037,91	13521,61	19559,52	30,9	69,1
Mixteco	14986,55	88446,17	103432,72	14,5	85,5
Mixteco-Chatino	775,44	3361,59	4137,02	18,7	81,3
Mixteco-Popoteca	1993,63	1127,83	3121,46	63,9	36,1
Mixteco-Tlapaneco	2649,90	10160,02	12809,92	20,7	79,3
Nahuatl	349,22	6798,44	7147,66	4,9	95,1
Nahuatl-Mixteco	453,31	13203,32	13656,63	3,3	96,7
Tlapaneco-Nahuatl	2392,69	19192,21	21584,90	11,1	88,9
Trique-Mixteco	1957,83	16564,91	18522,73	10,6	89,4
Tzotzil	335,77	1127,84	1463,61	22,9	77,1
Zapoteco	27111,87	44432,48	71544,35	37,9	62,1
Zapoteco-Huave	871,34		871,34	100,0	0,0
Zapoteco-Mixe	1868,90	14422,00	16290,90	11,5	88,5
Zoque-Tzotzil	2268,97	1127,83	3396,80	66,8	33,2
NICARAGUA	**2327,71**	**52990,26**	**55317,98**	**4,2**	**95,8**
Miskito-Sumo	709,61	4712,31	5421,92	13,1	86,9
Nahualt	17,36	6885,02	6902,38	0,3	99,7
Sumo	1600,75	41392,92	42993,67	3,7	96,3
PANAMA	**15125,15**	**7496,48**	**22621,63**	**66,9**	**33,1**
Bribri	3061,60	2259,17	5320,77	57,5	42,5
Emberá-Wounaan	2151,26	1361,24	3512,50	61,2	38,8
Kuna Yala	719,50		719,50	100,0	0,0
Naso-Teribe	4591,61	1244,42	5836,03	78,7	21,3
Ngöbe-Bugle	4601,19	2631,65	7232,83	63,6	36,4
TOTAL	**255245,93**	**2692238,47**	**2947484,39**	**8,7**	**91,3**

ANEX 3: List of Mesoamerican Mountain Biosphere Reserves

Figure 14: Mesoamerica: Mountains and Biosphere Reserves



COSTA RICA

Name:	**La Amistad**	Altitude:	50-3820 m	Year of inscription:	1982
Location:	Southern Costa Rica Coordinates: 8°44' to 10°02'N; 82°43' to 83°44'W		Area:	584,592 ha	
General description:	La Amistad Biosphere Reserve and National Park lies in the foothills and mountains of the Cordillera de Talamanca, between the mountain ranges of Panama and Costa Rica. The Cordillera de Talamanca is the highest and wildest non-volcanic mountain range in Central America, formed by the orogenic activity, which created the land dividing the Pacific and Caribbean Oceans. Of the 20 life zones of Costa Rica, at least eight occur in the park, which includes lowland tropical wet rainforest to cloud and paramo forests. Most of the main crest lays within the montane rainforest life zone, characterized by mixed oak forest, the largest tracts of virgin forest in Costa Rica. On high peaks along the ridge over 3,000 meters above sea level, there are frequent stands of paramo, swamps and cold marshes. The paramo on Mt. Kamuk contains the richest and most variated vegetation in the entire Talamanca Range. Signs of tapirs (Tapirus terrestris), possibly of a species as yet unrecorded for Costa Rica are abundant near the Panamanian border. Puma (Felis concolor), ocelot (F. pardalis), jaguar (F. yagouaroundi), Central American squirrel monkey (Saimiri oerstedii) and Geoffroy's spider monkey (Ateles geoffroyi) are found within the biosphere reserve. Man's impact on the Indian reservations is considerable, with about 24,950 (2002) people maintaining their traditional lifestyles with free-range grazing, hunting, fishing and use of medicinal plants. Local participation has been supported by NGOs, but there is no permanent mechanism of consultation. In 1987, a strategy for conservation was developed with technical and financial support, but integrative work has declined. However institutions work separately to promote the biosphere reserve concept. This site forms part of La Amistad International Park with Panama.				
Major ecosystem:	Tropical dry or deciduous forest; mixed mountain and highland systems				
Major habitat and land cover types:	N/A				
Administrative authorities:	Área de Conservación La Amistad, Sistema Nacional de Áreas de Conservación (SINAC), Ministerio del Ambiente y Energía, Fundación Iriria Tsochok (NGO)				

COSTA RICA

Name:	**Cordillera Volcánica Central**	Altitude:	37-3432 m	Year of inscription:	1988
Location:	Central Costa Rica Coordinates: 09°39' to 10°49'N; 83°22' to 84°20'W		Area:	144,363 ha	
General description:	This biosphere reserve is located in the central highlands, about 60 km north-west to the city of San José. The Cordillera Volcánica Central reserve is one of the richest in both natural resources and cultural heritage. On its long axis there are several volcanic cones with their still well formed craters. It comprises four National Parks, such as the Poás and Irazú Volcano each rising over 3,000 meters above sea level, and both still active. It also encompasses two forest reserves, six protected zones and a national monument. Significant variation in its physical characteristics has fostered a very rich biological diversity evidenced by life zones ranging from wet and rain tropical forests to semi-paramos. Currently, only small patches of vegetation remain in the volcanic peak zone, generally in the riverbeds. Here it is possible to distinguish several oak species, and other trees such as (Escallonaceae), Dogwood (Cornaceae) and Magnolia (Magnoliaceae). The topography is very steep and broken with a great altitudinal range with many streams, waterfalls and several lakes. Premontane rainforest, tropical humid forest, lower montane rainforest and montane rainforest are the reserve's major land cover types. Over 300,000 inhabitants live on land reform settlements surrounding La Selva Biological Station, engaged mainly in agriculture (coffee, cardamom, beans, manioc, maize, and black pepper) and animal husbandry. Management and economic strategies are intended for the protected area, such as forestry activities with emphasis in forest resource management and agro-forestry systems. A number of studies have been carried out, particularly in volcanology and geomorphology, with some work on flora and fauna.				
Major ecosystem:	Tropical humid forests / Mixed mountain and highland systems				
Major habitat and land cover types:	Primary forest including uncommon species such as Metaxya rostrata, Tectaria brauniana, Justicia sarapiquensis, Sphaeradenia carrilloana, Asplundia ferruginea, Elvira cupreiceps,Quercus tonduzii, Prumnopitys standleyi, Podocarpus oleifolius and Automeris kopturae; ranches; agroforestry; agroecosystems with citrus fruit				
Administrative authorities:	Área de Conservación Cordillera Volcánica Central, Sistema Nacional de Áreas de Conservación (SINAC), Ministerio del Ambiente y Energía				

COSTA RICA

Name:	**Agua & Paz**	Altitude:	20-2200 m	Year of inscription:	2007
Location:	Northern Costa Rica Coordinates: Central: 10°36'48.29" latitude N, 84°35'54.55" longitude W		Area:	916,120 ha	
General description:	The Agua y Paz (Water and Peace) Biosphere Reserve is characterised by mountain ranges and plains. In the mountainous zones are the volcanoes Miravalles, Tenorio, Arenal, Chato and Platanar, among others, and in the plains area are lakes, flooded forests and swamps, some of which are Ramsar sites, such as Lake Caño Negro. The reserve is comprised of eight core zones that are protected areas legally constituted in the country and that are administered through the National System of Conservation Areas (SINAC). The estimated population in the territory covered by the Biosphere Reserve is 299,350 people representing about 7% of the total population in Costa Rica. Of this population, the vast majority is considered a rural population.				
Major ecosystem:	Tropical Forest				
Major habitat and land cover types:	Costa Rica uses Holdridge's Life Zones classification of ecological zones, in which every area of life represents a distinctive habitat from the ecological point of view, and finally a different lifestyle. The areas of life in the Biosphere Reserve are: premontane rain forest, low montane rainforest, very humid tropical forest, very wet premontane forest, very wet low montane forest and tropical humid forest.				
Administrative authorities:	By Executive Decree the coordination of the biosphere reserve is responsibility of a governmental technical committee and an advisory board with representatives from different sectors and local organizations.				

EL SALVADOR

Name:	**Apaneca-Llamatepec**	Altitude:	300-2381 m	Year of inscription:	2007
Location:	El Salvador Coordinates: Central: 13°50'00'' latitude N, 89°40'00'' longitude W		Area:	59,056 ha	
General description:	The Apaneca-Llamatepec Biosphere Reserve belongs to the Central Volcanic Chain of El Salvador, and contains both the oldest volcano (Caldera of the Lake Coatepeque) and a more recent formation (Izalco Volcano, from which the name of the Biosphere Reserve derives). Its core areas preserve remnants of natural ecosystems of high ecological significance. The most prominent are the plants growing on lava formations, primary successors that play a fundamental role for the infiltration of water into one of the most important aquifers in the country. Another critical ground cover for harvesting water in this area consists of shade-grown coffee. Approximately 70% of the surface of the Faro del Pacifico Biosphere Reserve, corresponds to this type of land use. The shaded coffee plantations are a key element in the landscape. Several studies conducted in the area demonstrate the ability to keep a high biodiversity, especially those with traditional coffee growing systems where the natural forest canopy is conserved and undergrowth is replaced by coffee plants. Likewise, for its arboreal structure and composition, this system forms the basis of connectivity of the remaining natural ecosystems contained in the proposed core zone, and the mainstay of the Mesoamerican Biological Corridor, in this sector of El Salvador. The human population concentrated in the Reserve is mostly in the towns of the proposed transitional zone. These human settlements date from pre-Columbian times, and retain much of their ancestral traditions and cultural traits, making it one of the most interesting places in the country from a cultural point of view. Sustainable development based on conservation of shaded coffee plantations, development of rural sustainable tourism, conservation and promotion of indigenous culture and the dignity of their communities and traditions and the preservation and restoration of natural ecosystems and biological connectivity, will be the connecting theme of the activities within the Biosphere Reserve, which will undoubtedly encourage conducting research and environmental education to support these processes.				
Major ecosystem:	Native vegetation growing over volcanic lava				
Major habitat and land cover types:	Shade grown coffee				
Administrative authorities:	Ministerio de Medio Ambiente y Recursos Naturales (MARN)				

GUATEMALA

Name:	**Sierra de las Minas**	Altitude:	130-3015 m	Year of inscription:	1992
Location:	Eastern Guatemala Coordinates: 15°04' to 15°20'N; 89°18' to 89°44'W		Area:	236,626 ha	
General description:	One of the truly wild places in Guatemala is the east-western mountain range that runs through the country's southeast highlands. The mountains encompass part of the Baja Verapaz and Izabal departments at the eastern part of Guatemala City. Protection of the area is particularly important because it contains an estimated 60 percent of Guatemala's remaining cloud forest. Because of its geographic isolation, and wide range of elevation, the Sierra is home to at least 885 species of birds, mammals, amphibians and reptiles. More than 17 distinct species of evergreen forest are endemic to the area. The area is considered as an irreplaceable seed resource for reforestation and agroforestry throughout the tropics. Although human intervention (almost 43,200 inhabitants -1990- live in the reserve) is critical to the range's long-term protection, a great deal of the range's habitats have been protected from agriculture by its distinctive natural features: steep hillsides, shallow soils, and changeable weather. Because the heart of the mountains is composed of jade and marble, mining has been carried out here for centuries (thus the name, which means mountain range of the mines). The reserve's managers are engaged in environmental education for local community leaders, many of who are Kekchi Maya. The goal is to discourage ongoing migration into the forest and to establish sustainable agricultural activities instead. Ecotourism is considered an important economic alternative				
Major ecosystem:	Tropical humid forests /Mixed mountain and highland systems				
Major habitat and land cover types:	Subtropical thorn forest characterized by Cactus spp., Guayacum spp., Acacia farnesiana and Bucida macrostachys; premontane dry subtropical forest with Encyclia diota, Ceiba aesculifolia and Leucaena guatemalensis; premontane tropical wet forest characterized by Orbignya cohune, Terminalia amazonia, Pinus caribaea and Manilkara zapota; lower montane subtropical moist forest with Pinus oocarpa, Quercus spp., Alnus jorulensis and Encyclia selligera; cloud forest including Alfaroa costaricensis, Brunellia mexicana, Gunnera spp., Magnolia guatemalensis etc.; agroecosystems with coffee, rice, maize etc.; pasture land Tillandsias distribution				
Administrative authorities:	Consejo Nacional de Áreas Protegidas (CONAP), Fundación Defensores de la Naturaleza (NGO)				

HONDURAS

Name:	**Río Platano**	Altitude:	0-1326 m	Year of inscription:	1980
Location:	North-eastern Honduras Coordinates: 15°00' to 15°50'N; 84°15' to 85°30'W		Area:	800,000 ha	
General description:	The Rio Plátano Biosphere Reserve runs along the western edge of the Gracias a Dios Province. It is also inscribed on the World Heritage List because of its biophysical, as well as cultural and historical characteristics. The biosphere reserve is one of the largest and diverse humid tropical forests in Mesoamerica. It represents habitats for a significant biological diversity and counts four ethnic groups within its limits. The area is also a historical site of archaeological importance and it has more than 200 sites with this type of resources. Nevertheless, strong social, economic and political pressures exist today for its colonization. The advance of the agricultural front and the inadequate management of its natural and cultural resources are examples of these pressures. Some 650 inhabitants (1998) live in the reserve. Despite the importance of the area, it faces critical pressure from immigrating settlers in search of lands and in their wake follow timber merchants, agricultural and livestock activities. The ethnics groups of the reserve (Garifuna, Pech, Tawahka and Miskito) have organized themselves and requesting effective participation in the management and administration of some of the areas within the reserve. The main goal of the biosphere reserve is to protect the area from colonization and deforestation, assist local farmers associations and indigenous people in the sustainable use of natural resources, and to establish a baseline of information through research				
Major ecosystem:	Tropical humid forests including coastal/marine component				
Major habitat and land cover types:	Humid tropical forest; very humid tropical forest; pine savannas dominated by Pinus caribea, yagua palm (Paurotis spp.); mangroves with Rhizophora mangle, Laguncularia racemosa; swamp forest; coastal lagoons; hardwood gallery forest with Inga spp., Cecropia spp., Heliconia spp. and Pachira aquatica; high mountain areas with mahogany (Swietenia				

	macrophylla), Tebebuia spp., cedar (Cedrela odorata) etc.; rivers; agroecosystems; pasture land
Administrative authorities:	Región Forestal de la Administración Forestal del Estado-Corporación Hondureña de Desarrollo Forestal (AFE-COHDEFOR)

MEXICO

Name:	**Montes Azules**	Altitude:	200-1460 m	Year of inscription:	1979
Location:	Chiapas Coordinates: 16°05' to 16°57'N; 90°45' to 91°30'W		Area:	331,200 ha	
General description:	Montes Azules is located in the Selva Lacadona region in the State of Chiapas in southeast Mexico, between the Lacantum and Locania Rivers. It comprises 331,200 hectares inside the area of forestry protection (1978) of the Lacandona Forest. It is one of the largest areas of humid tropical forest in Mexico and Central America with areas of pine forest in higher altitudes and mountain rainforest. The reserve and surrounding forest contain some 500 species of trees. More recently, the forest has been exploited for chicle and mahogany, but has not been seriously altered, even though wood clearing is recognized as a serious threat. It comprises a mixture of federal, communal system and private lands. Rather than viewing this overlap of protected area and indigenous territory as a threat, Tzeltal, Chol, and Lacandon Maya communities see the Montes Azules reserve as a buffer against outside threats to their land. Some 75,400 people (2002) live in the reserve mainly engaged in local agriculture. Under the North American Free Trade Agreement (NAFTA), Mexico is obliged to import corn and other products, by signing a duty free import quota of 2,5 million metric tons over 15 years affecting the local agriculture of corn, chile, coffee and palm 'xate' seriously. The challenge remains to ameliorate life conditions of local communities respecting their traditions and practices into an ecologically sustainable mosaic of food production, agro-forestry, and small-scale cattle production forest reserves.				
Major ecosystem:	Tropical humid forests (tropical rain forest)				
Major habitat and land cover types:	Tropical rain forest; pine-oak forest; cloud forest; riparian vegetation; "acahuales" (tropical rain forest secondary vegetation); agriculture and live stock farming systems				
Administrative authorities:	Comisión Nacional de Áreas Naturales Protegidas (CONANP); Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).				

MEXICO

Name:	**El Triunfo**	Altitude:	450-2550 m	Year of inscription:	1993
Location:	Chiapas Coordinates: 15°09' to 15°57'N; 92°34' to 93°12'W		Area:	119,177 ha	
General description:	El Triunfo is situated in the mountains of Sierra Madre de Chiapas, south of the Chiapas State. The terrain is generally steep and mountainous. The reserve is constituted as the limit between two of the largest hydrological regions of the state; the Pacific coast and the Grijalva-Usumacinta River. As a primary Pleistocene refuge, its location in the mountains of the Sierra Madre de Chiapas, it is considered an endemic area for different groups of plants and animals. El Triunfo is the most diverse evergreen cloud forest in Mexico, and one of the most important sites for bird migration. It is covered with evergreen seasonal forest, montane rainforest and lower montane rainforest that contain a higher proportion of endemic plants. A number of threatened mammalian species can be found in the reserve, namely Geoffroy's spider monkey, margay, jaguar and puma. Avifauna includes horned guan, resplendent quetzal, azure-ramped tanager and great curassau. The population is estimated to 229,280 (1999) living in the buffer and transition area, and a floating population that migrates from Guatemala to work on the coffee plantations. The main activities are agriculture, primarily based on coffee cultivation, maize, 'camedora' palm collection, trade, construction and cattle rising. Coffee plantations have become an important issue, influencing greatly the economical, social and political lives of local peoples. However, poverty and marginalization along with illicit activities such as hunting of threatened species and collection of non-timber forest species worsen the socio-political conditions. The principal goal of the biosphere reserve is to go further than classic local consultation in scientific and technical propositions. To attain effective sustainable development, local communities search to be involved in the biosphere reserve's territorial				

	management and implementation.
Major ecosystem:	Tropical humid forest
Major habitat and land cover types:	Evergreen tropical humid forest; mountain rainforest; tropical deciduous rainforest; evergreen cloud scrub; evergreen cloud forest; pine-oak forest
Administrative authorities:	Comisión Nacional de Áreas Naturales Protegidas (CONANP); Secretaría de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP)

MEXICO

Name:	**Selva El Ocote**	Altitude:	400-1500 m	Year of inscription:	2006
Location:	Chiapas Coordinates: N/A		Area:	N/A	
General description:	Located in the southern Mexican state of Chiapas, is an area of upland rainforest. The area is an important watershed for the Cintalapa Valley as well as Mexico's second most important cave system. As one of Central America's last remaining intact rainforests, the area is vital winter habitat for millions of songbirds that migrate from the U.S. and Canada each year. El Ocote has set an example for sustainable agriculture techniques in local communities.				
Major ecosystem:	N/A				
Major habitat and land cover types:	N/A				
Administrative authorities:	N/A				

MEXICO

Name:	**La Sepultura**	Altitude:	60-2550 m	Year of inscription:	2006
Location:	Chiapas Coordinates: 16° 00' 18''- 16° 29' 01'' Latitude N and 93° 24' 34''- 94° 07' 35'' Longitude W		Area:	167,310 ha	
General description:	La Sepultura Biosphere Reserve consist of a range of different types of ecosystems and natural habitats that represent major biogeographic regions, coupled with traditional forms of local ownership of the land that determine different uses for management and conservation of the site. The main ecological system in the area, due to its extension and biodiversity, is the lowland deciduous or dry tropical forest which is distributed in the lower parts of both strands of the Sierra. Other ecological systems, such as the tropical evergreen forest, seasonal deciduous forests and oak forests which help maintain ecological processes and stable weather conditions in the region. Another important system that is distinguished by its interaction with human activities and is increasingly threatened is the pine-oak forest that is distributed in discontinuous strips along the Sierra and surrounding mixed forests located on the tops of the mountain system. There are also some relics ecosystems like the mountain cloud forest or evergreen cloud forest, scrub and tall pine savannah, which function as an important ecological system that provides unique benefits to area in its totality. Various types of land ownership in the region have created a mosaic of transformed environments which in a particular way preserve a unique richness and where special management practices are developed so as to assist in conservation of the protected natural area. The main activity in the region is extensive cattle breeding mainly in pine forests and traditional agriculture; both activities are linked to agricultural use of fire, thus putting at risk natural ecosystems. Therefore, alternative practices are also carried out to ensure sustainable development. In the area there are successful experiences of sustainable development such as the cultivation and use of palm trees in the ejido Sierra Morena that has served as a platform for exchanges of various experiences at local to national and international levels. This ejido, which currently markets the palm tree leaves directly with the buyer in the United States, represents an important model of sustainable development and has already shared its experiences with other biosphere reserves in the				

	country
Major ecosystem:	Dry tropical forest and tropical evergreen forest
Major habitat and land cover types:	N/A
Administrative authorities:	Comisión Nacional de Áreas Naturales Protegidas

MEXICO

Name:	**Volcán Tacaná**	Altitude:	1300-4100 m	Year of inscription:	2006
Location:	Chiapas Coordinates: 15º09'32'' - 15º04'04'' latitude N and 92º04'22'' - 92º11'24''		Area:	6,378 ha	
General description:	Tacaná Volcano, shared in the borderline with Guatemala, is part of the Central American Core volcanic chain. It contains fragile ecosystems very rich in wild flora and fauna species of cultural, scientific, economic and biological relevance. Its rich biodiversity and high endemism are found particularly in the high mountain ecosystem and landscapes and in the volcanic edifice which presents geophysical features of great scientific and aesthetic value, representative of humid environments of Andean origin that are found in Mexico. The result is that only in this area of the vast Mexican slope of the Pacific are there dense and high rainforests which could be compared to the ones found in the most humid regions in the Atlantic Ocean. Regarding socio-cultural aspects, the last Mexican population of the indigenous group Mame are found in the Reserve, in the high zones of the municipalities of Unión Juárez, Cacahoatán and Tapachula, who still keep their language and traditions. In the region, the Ireland farm is where organic coffee production started for the first time in Mexico. In the communities located particularly in the Sierra Madre of Chiapas, a new opportunity for development is emerging with the implementation of alternative plantations, such as organic coffee. Moreover, Chiapas is the main organic coffee-producing region in the world. This has been combined with the application of good practices for farming and extraction of natural resources; such strategy has helped producers to reach other supportive markets that acknowledge the protection of natural resources. This is no exception in the Tacaná, since there are crops in the transition zone, such as cacao and coffee, corn, natural pastures and fruit trees. Through investment and training in good practices, the management of coffee and cacao plantations may become model activities of sustainable development by allowing producers the access to fair markets as for example the market of organic products				
Major ecosystem:	Middle evergreen forests, hard and flat leaves forests (oak), forests of acicular or scale-like leaves (pines) and high moors				
Major habitat and land cover types:	N/A				
Administrative authorities:	Comisión Nacional de Áreas Naturales Protegidas				

MEXICO

Name:	**Lagunas de Montebello**	Altitude:	1500-1800 m	Year of inscription:	2009
Location:	Chiapas Coordinates: 16º 04' 40'' - 16º 10' 20'' Latitude N and 91º 37' 40'' - 91º 47' 40'' Longitude W		Area:	6,411 ha	
General description:	Montebello is located between the physiographic region of the High Plain of Chiapas and the Gulf Coastal Plain, which is part of the physiographic province of Sierras de Chiapas and Guatemala. This region corresponds to the floristic regions of Miranda, called central massif and plains and slopes of the north of the central massif. Its physiography includes from small drains to great trenches. There are also big caves and cavities of varied shapes and dimensions. In Lagunas de Montebello are 10 % of the orchids registered for the State of Chiapas. It's also the home of more than 42 species of lepidoptera, 70 species of coleoptera, 9 species of fish, 15 species of amphibians, 35 species of reptiles, 277 species of birds and 65 of mammals. The area contains a representative sample of the central massif, besides, it is located in a transition area between the zone lacandon jungle and forest that joins the central Massif with Guatemala. The ecological goods and services produced by the				

	ecosystems of the protected natural area Lagunas de Montebello, include the protection of the genetic heritage; the absorption of greenhouse gases; the climate regulation, the maintenance of water resources; soil conservation; the preservation of landscape value; the production of timber and non-timber forest resources, and the structuring of habitats for a wide variety of flora and fauna.
Major ecosystem:	Coniferous forest, Fir-oak-liquidambar Forest, Mountain mesophyllous forest, Riparian vegetation, Secondary vegetation
Major habitat and land cover types:	N/A
Administrative authorities:	Comisión Nacional de Áreas Naturales Protegidas

MEXICO

Name:	**Nahá-Metzabok**	Altitude:	470 - 1100 m	Year of inscription:	2010
Location:	Ocosingo, Chiapas Coordinates: 17°03'00''N 091°36'00''W		Area:		
General description:	Located in the Selva Lacandona region, it is distinguished by its physiographic and humidity conditions that favor the development of rich ecosystems. This biosphere reserve is part of the Selva Maya Biological Corridor. It has a great importance for biological diversity conservation at the regional level. The Nahá and Metzabok wetlands were designated as RAMSAR site in 2004. There are more than 6,500 inhabitants of indigenous communities like the Maya Lacandon, Tzeltzal and Chol.				
Major ecosystem:	Pine tree forests and wetlands to tall everlasting forests				
Major habitat and land cover types:	The land use is mainly forest. The best part of the territory maintains the forest vegetation and less of the 10% is used for agriculture.				
Administrative authorities:	CONANP				

NICARAGUA

Name:	**Bosawas**	Altitude:	30-1650 m	Year of inscription:	1997
Location:	North-eastern Nicaragua Coordinates: 14°00'N; 85°00'W		Area:	2,181,500 ha	
General description:	The Bosawas Biosphere Reserve is located in the north of the country, next to the frontier with Honduras. Together with three neighbouring protected areas of Honduras 'Río Patuca' National Park, 'Tawhaka' Anthropological Reserve, and 'Río Plátano' Biosphere Reserve, it constitutes the so called 'Heart of the Mesoamerican Biocorridor', representing the largest protected area complex of tropical mountain moist forest north of the Amazon basin. The Isabella Mountain chain crosses the reserve from southwest to northwest towards the Atlantic plain. As a cluster of existing protected areas it includes the Saslaya National Park, a complex of old volcanic peaks as 'Cerro Saslaya' and other peaks with 1,594 meters above sea level. Numerous small streams cascade from the mountains into the Rio Wani, which is an upper tributary of the Rio Prinzapolka. This is a hilly area, covered with tropical humid forest, tropical cloud forest and pine savannas. The biodiversity is extremely rich, with many rare or endangered species. There are more than 130,000 inhabitants (1998), mostly farmers, who live in the extensive agricultural frontier areas. The indigenous Mayangna and Miskitu groups live essentially from subsistence agriculture (maize, beans, rice, cacao, tuber), domestic animals raising and traditional medicine practices in their collective territories. The expansion of colonization with its temporarily and unproductive agricultural systems threatens conservation of pristine forest ecosystems. The Bosawas law of October 2001 lays the basis for the institutional, regulatory, conceptual and participatory development of Bosawas. Within this framework, the reserve's Management Plan was elaborated in a participatory process involving the various stakeholders at the local, national and regional level, giving the conceptual and operational references to implement the strategy of sustainable land use				
Major ecosystem:	Tropical humid forest				

Major habitat and land cover types:	Tropical humid forest dominated by Dialium guianensis, Ampelocera hottlei, Pseudolmedia oxyphyllaria etc.; pre-mountainous tropical very humid forest characterized by Dialium guianensis, Pouroma bicolor, Ocotea paulli etc.; low mountainous very humid forest
Administrative authorities:	Ministerio del Ambiente y Recursos Naturales (MARENA); Comunidades Mayangnas/Miskitu

PANAMA

Name:	**Darién**	Altitude:	0-1875 m	Year of inscription:	1983
Location:	South-eastern Panama Coordinates: 07°10' to 08°30'N; 77°20' to 78°20'W		Area:	859,333 ha	
General description:	The Darién Biosphere Reserve, National Park and World Heritage site is located in the province of Darién to the east of Santa Fe and the Gulf of San Miguel, and covers the region adjacent to the Colombian border, and includes parts of the Pacific coast. This reserve is a unique site, forming the bridge between the two continents of the Western Hemisphere. It comprises raised folds and high mountains with the most extensive lowland tropical forest on the Pacific coast in Central America. It contains a wide range of habitats: sandy beaches, rocky coasts, mangroves, freshwater marshes, palm forest swamps and lowland and upland moist tropical forest. Darién forests have been characterized by scientists as the most diverse ecosystems of tropical America and are still relatively undisturbed. The area is both anthropologically and historically rich, with two major indigenous groups: Chocos and Kunas, and a number of smaller groups still living by traditional practices. These groups have maintained their subsistence agricultural systems through centuries of cultural contact. Over 31,400 inhabitants (2000) live in the buffer and transition areas. On the western boundary of the park, there are a number of small farming plots. Darién is the only incomplete section of the pan-American highway. This would open up the area to settlement and may lead to uncontrolled forestry, mining, agriculture and hunting resulting in deforestation, soil erosion, and disruption of the fragile ecological equilibrium and dislocation of the traditional practices of the indigenous inhabitants. The main goal of the biosphere reserve is to maintain Indian's culture and traditional practices and promote Darién's regional biological diversity conservation				
Major ecosystem:	Tropical humid forests including coastal/marine component				
Major habitat and land cover types:	Lowland moist tropical forest dominated by Persea schiedeana, Quercus copeyensis, Weinmannia pinnata and Cedrela tonduzii; premontane rainforest represented by Chrysophyllum sp., Quercus sp., Virola sp. etc.; humid and very humid tropical forest characterized by Tabebuia chrysantha, Cecropia peltata, Anacardium excelsum, Luehea seemanni, Inga sp. etc.; humid and very humid premontane forest including species such as Hymenaea courbaril, Tabebuia chrysantha and Enterolobium cyclorarpum; tropical dry forest including Guazuma ulmifolia, Xylopia frutescens and Andira inermis; mangroves characterized by Rhizophora mangle, Avicennia nitida, Laguncularia racemosa and Pterocarpus officinalis; residential areas; agroecosystems; grazing areas; agroforestry				
Administrative authorities:	Dirección de la Reserva de la Biosfera Darién Dirección Nacional de Áreas Protegidas y Vida Silvestre de la Autoridad Nacional del Ambiente (ANAM); La Administración Regional del Ambiente de Darién				

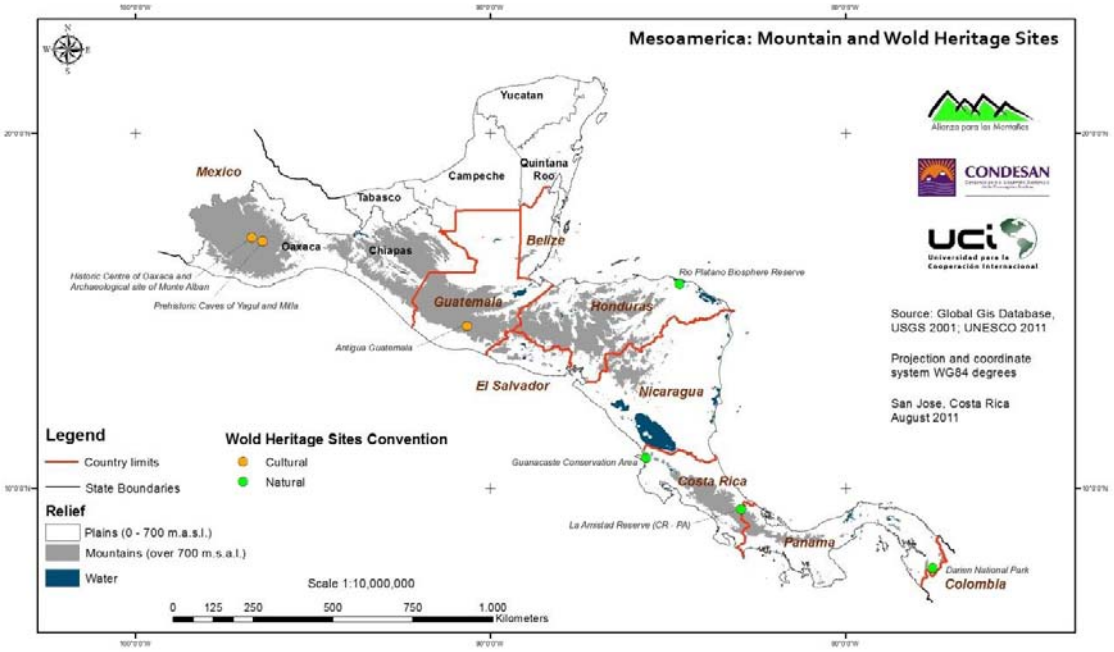
PANAMA

Name:	**La Amistad**	Altitude:	100-3475 m	Year of inscription:	2000
Location:	North-western Panama Coordinates: 09°05'N; 82°40'W		Area:	655,558 ha	
General description:	This biosphere reserve is situated in the northwest of Panama, bordering Costa Rica and the Caribbean Sea. It comprises a variety of different habitats, ranging from low humid mountain forest to mangrove forest and coral reefs. In the highlands some important lagoons, have international recognition under the Ramsar Convention as habitats for migratory bird species. It's also an endemic area of mammals, reptiles amphibious and fish. The unique volcano of Panama, Baru, is also situated in the area. In the low lands a variety of representative species of the Atlantic Panamanian mangrove associations are found, such as 'orey', 'rafia', and 'cativo', 'sangrillo' y 'cerillo' in the San-San Pond Sak wetland. Over 150,000 people live in the buffer zone and the transition area (1998). They live from agriculture, cattle raising, forestry, fisheries and ecotourism. Some indigenous ethnic groups as Ngóbe, Teribe, Buglé and Bribri live in the buffer area. They have conserved their language, cultures, traditions and religions. They also practice traditional forms of				

	agriculture and subsistence hunting. La Amistad offers a considerable opportunity to promote sustainable development by using local resources: fish, flora, fauna, soil, water and landscape beauty. The high degree of under and non-employment, of critical poverty, the high percentage of illiteracy, infantile mortality and under-nourishment as well as the poor road system in the whole area underline the clear need to adopt development strategies to improve living conditions for the local people. This site forms part of La Amistad International Park with Costa Rica.
Major ecosystem:	Tropical humid forest / Mangrove and coral reefs
Major habitat and land cover types:	Coral reefs with 25 species of soft corals and 54 species of hard corals; sea-grass beds dominated by Thalassia testudinum, Syringodium filiforme, Halophila decipiens and Halodule wrightii; mixed inundated forest characterized by Campnosperma panamensis, Prioria copaifera, Pterocarpus officinalis etc.; mangrove dominated by Rhizophora mangle, Avicennia germinans and Laguncularia racemosa; humid tropical forest including Callophyllum brasilensis, Virola sp., Aspidosperma megalocarpon, Carapa sp. etc.; pre-mountainous and low mountain forest characterized by Cedrela odorata, Callophyllum brasilensis, Carapa guinensis; mountain forest with Podocarpus sp., Quercus sp., Alnus sp., Nectandra sp. etc.; humid and very humid low mountainous forest and very humid low mountainous forest dominated by Werneria nubigena, Escallonia sp. and Weinmannia pinnata; arable land with rice, corn, coffee, bananas, cacao etc
Administrative authorities:	Dirección Nacional de Patrimonio Natural de la Autoridad Nacional del Ambiente (ANAM)

ANEX 4: List of Mesoamerican Mountain World Heritage Sites

Figure 15: Mesoamerica: Mountains and World Heritage Sites



COSTA RICA

Name:	**Guanacaste Conservation Area**	Type:	Natural	Year of inscription:	1999
Location:	North-western Costa Rica Coordinates: N10 50 60; W85 37 0		Area:	147,000 ha	
Geographical features:	It stretches 105 km from the Pacific, across the Pacific coastal lowlands, over three tall volcanoes and down into the Atlantic coastal lowlands. It includes the Guanacaste Cordillera and surrounding flatlands and coastal areas (UNESCO-WHC). It is s composed of what used to be different categories of National Parks: Santa Rosa, Guanacaste and Rincón de la Vieja, as well as Horizontes Station and the Wildlife Refuge of Bahía Junquillal (ACG). At least 32 rivers and 16 intermittent streams originate in the vicinity of the Rincon de la Vieja volcano, and flow into the Tempisque river, a river of enormous importance for irrigation of agricultural land in the Guanacaste Province (UNESCO-WHC).				
Biological characteristics:	It contains important natural habitats for the conservation of biological diversity, including the best dry forest habitats from Central America to northern Mexico and key habitats for endangered or rare plant and animal species (UNESCO-WHC). There are found a large diversity of ecosystems like representatives of the rain forest of the Caribbean, dry forest, cloud forest of low altitude (1500 msnm a.s.l.), mangroves and a coastal and marine environment (ACG).				
Socio-economic characteristics:	There are also historic and cultural items of national importance, such as Historical Museum of the Casona de Santa Rosa, and archeological sites of great importance, such as the Petroglyphs in Pedregal (ACG).				
Management:	It is manage by the National System of Conservation Areas of the Ministry of Environment. Administratively, is composed of a Directorate, Technological Committee, Local Counsel, Departments, Sections, and Technical Programs (ACG).				
References: • Área de Conservación Guanacaste (ACG). http://www.acguanacaste.ac.cr • UNESCO, World Heritage Center. http://whc.unesco.org/en/list/928					

COSTA RICA – PANAMA

Name:	**Talamanca Range La Amistad Reserves / La Amistad National Park**	Type:	Natural	Year of inscription:	1983
Location:	Provinces of Bocas del Toro and Chiriquí, Panama. Provinces of San Jose, Cartago, Limón and Puntarenas, Costa Rica. Coordinates: N 9 24 25.5; W 82 56 19.7		Area:	567,845 ha	
Geographical features:	The park lies in the foothills and mountains of Cordillera de Talamanca between the mountain ranges of Las Vueltas, Cartago and Echandi on the Panamanian/Costa Rican border. The Cordillera de Talamanca is the highest and wildest non-volcanic mountain range in Central America (UNESCO-WHC).				
Biological characteristics:	The park includes lowland tropical rainforest and cloudforest, as well as four communities not found elsewhere in Central America: subalpine paramo forests, pure oak stands, lakes of glacial origin and high-altitude bogs (UNESCO-WHC). The wide range of habitats, altitudinal and climatic regimes and the encounter of species from South and North America favours a high species richness and a high endemism (INBIO).				
Socio-economic characteristics:	Four different Indian tribes inhabit this property, which benefits from close co-operation between Costa Rica and Panama (UNESCO-WHC). The communities that surround the park in Costa Rica are a good example of organization an commitment to the conservation and sustainable development. They are organized in two networks, the Indigenous Network in the Caribbean and the Quercus Network in the Pacific sector (INBIO). Archaeological sites are reported along all major watercourses (UNESCO-WHC).				
Management:	In Costa Rica, the Costa Rican National System of Conservation Areas (SINAC), specifically the Amistad-Caribbean Conservation Area (ACLA-C) and the Amistad-Pacific Conservation Area (ACLA-P), are responsible for coordinating efforts to protect and manage the World Heritage Site. In Panama, the management corresponds to the National Environmental Authority (ANAM) and the Regional Environmental Administrations of the Provinces of Bocas del Toro and Chiriquí (UNESCO and IUCN, 2008). Bilateral relations between Costa Rica and Panama are directed by the Agreement on Cooperation for Cross-border Development. The administrative structure of the Agreement proposes a Permanent Binational Commission presided over by the respective Planning Ministers, as well as a series of thematic Technical Commissions including the Environmental Issues Technical Commission in which the ANAM and the MINAE participate (UNESCO and IUCN, 2008).				
References: • UNESCO, World Heritage Center. http://whc.unesco.org/en/list/205/ • Instituto Nacional de Biodiversidad-INBIO. http://www.inbio.ac.cr/pila/comunidades_orgcomunal.htm • UNESCO, IUCN. 2008. Mission Report. http://www.alianzabocas.org/documentos/UNESCO%20-%20Informe%20final%20visita-ingles.pdf					

GUATEMALA

Name:	**Antigua Guatemala**	Type:	Cultural	Year of inscription:	1979
Location:	Department of Sacatepequez, Panchoy Valley Coordinates: N 14 34 0; W 90 40 0		Area:	49 hectares	
General features:	Was founded in the early 16th century and built 1,500 m above sea-level. Antigua Guatemala is an outstanding example of preserved colonial architecture and of cultural value. The religious, private and government buildings bear exceptional testimony to the Spanish colonial architecture. It was the seat of Spanish colonial government for the Kingdom of Guatemala, which included Chiapas (southern Mexico), Guatemala, Belize, El Salvador, Honduras, Nicaragua and Costa Rica. It was the cultural, economic, religious, political and educational centre for the entire region until the capital was moved to present-day Guatemala City after the damaging earthquakes of 1773, but its principal monuments are still preserved as ruins (UNESCO-WHC).				
References: - UNESCO, World Heritage Center. http://whc.unesco.org/en/list/65/					

HONDURAS

Name:	**Rio Plátano Biosphere Reserve** *In Danger	Type:	**Natural**	Year of inscription:	1998
Location:	Mosquitia region of North-East Honduras Coordinates: N 15 44 40; W 84 40 30		Area:	500,000 ha	
Geographical features:	The natural landscapes correspond to three broad categories: coastal plains (<150 m.a.s.l.), mountainous terrains (150 to 600 m.a.s.l.) and interior mountains (>600 m.a.s.l.). Towards the South and interior of the Reserve the terrain is dominated by hills and mountains. The Baltimore Mountain reaches more than 1000 meters above sea level at the height of Dama Peak; the mountains land with hills and rocky topography cover the watersheds of Paulaya, Platano, Wampu and Patuca rivers (AFE-CODEFOR, UNESCO, IUCN).				
Biological characteristics:	This is the largest surviving area of virgin tropical rainforest in Honduras and topographical diversity has resulted in a wild array of ecosystem types. The two dominant life zones are Humid Tropical Forest and Very Humid Subtropical Forest. 39 species of mammal, 377 species of bird and 126 reptiles and amphibians have been recorded (UNESCO WHC).				
Socio-economic characteristics:	The Biosphere Reserve includes lands used by approximately 40,000 people living in 120 villages within the limits of the reserve and 60 villages in the influence area. When it was created the population was dominated by indigenous people, now the 52% of the total population is mestizo, 43% Miskito, 3% Garifona, 1% Pech and less than 1% Tawahka (AFE-CODEFOR). There are some 200 sites of archaeological importance in the Reserve. Archaeological remains include the Piedras Pintadas petroglyphs on the bed of the Plátano River, believed to belong to an unknown pre-Columbian culture. The site of Ciudad Blanca (White City) within the protected area constitutes one of the most important archaeological sites of Mayan civilization. The reserve also contains the site where Christopher Colombus first landed in the Americas in 1492 (UNESCO WHC).				
Management:	The Biosphere Reserve is under the institutional responsibility of in the Secretary of State in the Ministry of Natural Resources and Environment, and for its management, the forestry administration AFE-CODEFOR implement the actions (AFE-CODEFOR).				
References: - AFE-CODEFOR, UNESCO, IUCN, United Nations Foundation, TNC, University of Queensland. Management Effectiveness Report of the Rio Platano Biosphere Reserve. http://whc.unesco.org/uploads/activities/documents/activity-331-6.pdf - UNESCO World Heritage Center. http://whc.unesco.org/en/list/196/documents/					

MEXICO

Name:	**Historic Centre of Oaxaca and Archeological Site of Monte Alban**	Type:	Cultural	Year of inscription:	1987
Location:	State of Oaxaca, Municipalities of Oaxaca, Xoxocotlan and Cuilapan. Coordinates: N 17 3 42.984; W 96 43 18.012		Area:	375 hectares	
General features:	Monte Alban was inhabited during a period of 1,500 years by a succession of Olmecs, Zapotecs and Mixtecs. The pyramids were carved out of the mountain and are the symbols of a sacred topography (UNESCO-WHC). The Historic Centre of Oaxaca, founded in 1529, is an example of Spanish colonial town planning; it is adapted to the earthquake-prone region of Oaxaca (UNESCO-WHC).				
References: - UNESCO-World Heritage Center. http://whc.unesco.org/en/list/415					

Name:	**Prehistoric Caves of Yagul and Mitla**	Type:	Cultural	Year of inscription:	2010
Location:	Central Valley of Oaxaca, Mexico		Area:	3,860 hectares	
Geographical features:	Consists of two pre-Hispanic archeological complexes and a series of pre-historic caves and rock shelters. Is an extensive cultural landscape that includes caves and shelters, one of which, the *Guilá Naquitz* cave has provided extraordinarily well preserved botanical evidence of bottle gourds, beans and squash and the earliest known maize cobs, and two others, *Cueva Blanca* and *Gheo Shih* siteshave provided evidence of Pleistocene animals and stone tools and the seasonal use of the abundant summer resources of fruit and small mammals. This demonstrates the link between man and nature that gave origin to the domestication of plants in North America, thus allowing the rise of Mesomaerican civilizations (UNESCO-WHC).				
References: - UNESCO, World Heritage Centre. http://whc.unesco.org/en/list/1352					

PANAMA

Name:	**Darien National Park**	Type:	**Natural**	Year of inscription:	1981
Location:	Province of Darien. It extends along about 80% of the Colombian border. Coordinates: N 7 44 10; W 77 32 50		Area:	597,000 Hectares	
Geographical features:	It is the largest national park in Panama and Central America. The park rises from the Pacific coast beaches, mangroves and coastal lagoons to the premontane rainforests of Cerro Tacarcuna, with 1845 meters above sea level, the highest point of the park (ANAM). This park is in a unique geographical position, as it forms a land-bridge between the Central and South American continents. The Darién, Sapo, Jungurudo and Pirre mountain ranges are found within the site as well as the Jurado mountain chain and basins of the Tuira, Balsas, Sambu, Jaqué rivers and part of the Chucunaque River (UNESCO-WHC).				
Biological characteristics:	Contains a wide range of habitats: sandy beaches, rocky coasts, mangroves, freshwater marshes, palm forest swamps and lowland and upland moist tropical forest (UNESCO-WHC). Its location makes it a place of encounter between the wildlife of North and South America. The endemic species of invertebrates and vertebrates are abundant, there are 7 mammal species only found in this park. More than 56 threatened or endangered species in America have viable populations in Darien (ANAM).				
Socio-economic characteristics:	The area is both anthropologically and historically rich, with two major indigenous groups: Chocó and Kuna Indians and a number of smaller groups still living by traditional practices. Two Indian tribes live in the park along the edges of the rivers: approximately 1,000 Chocó and 200 Kuna Indians. These groups have maintained their subsistence agricultural systems through centuries of European contact. On the western boundary of the park are a number of small farming plots whose owners have no title deeds (UNESCO-WHC).				
Management:	The administration is responsibility of the National Authority of Environment, ANAM.				

References:

- ANAM. http://www.anam.gob.pa
- UNESCO World Heritage Centre. http://whc.unesco.org/en/list/159

ANEX 5: List of selected Mesoamerican sustainable mountain development projects and initiatives

The Rainforest Alliance launched the Eco-Index in 2001 to provide the conservation community with a quickly and easily accessible vehicle to share project data and reports, lessons learned, and best practices in a succinct and consistent format. The site is available in English and Spanish, and profiles of projects based in Brazil are in Portuguese. Each profile posted on the Eco-Index is submitted and updated each year by project directors. Before any information is posted on the site, it is carefully edited and translated by a staff of conservation professionals to ensure that the information provided is as useful as possible.

During the Eco-Index's first two years, the site focused on projects based in Mexico and Central America. In January 2003, the site was expanded to include projects from South America and the Caribbean, making the Eco-Index the premier directory of conservation projects throughout the Neotropics.

Since its launch in February 2001, the Eco-Index has added more than 1,250 profiles of projects conducted by more than 900 organizations, government agencies, and research institutions, with an average of 20 added or updated each month. The site receives an average of 50,000 visits a month.

We present a selection of 282 relevant Mesoamerican sustainable development mountain projects and initiatives, sorted by country, from the Eco Index database (to access more information on each project, please type http://www.eco-index.org/search/results.cfm?projectID= in your browser and add the “Eco Index ID” number before typing “enter”):

Regional projects and initiatives

N°	Name	Countries involved	Topics	Budget (US$)	Eco Index ID
1	Sustainable Agriculture Program	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Certification and sustainable production; Agriculture and farming; Land use; Pesticides and agrochemicals	N/A	86
2	Defining and Monitoring Conservation Outcomes in Northern and Southern Mesoamerica	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Monitoring and evaluation; Habitat conservation and management; Capacity building; Wildlife research	N/A	1027
3	Critical Ecosystem Partnership Fund’s Coordinating Unit of the Southern Mesoamerican Program of Conservation International	Costa Rica	Corridors; Buffer zone management; Habitat conservation and management; Parks and protected areas	210597	729
4	Forests, Climate, and Communities REDD+ Training	Guatemala; Honduras	Climate and climate change; Capacity building;	135,000	1474

			Environmental education; Environmental services payments		
5	Certified Sustainable Products Alliance	Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Certification and sustainable production; Capacity building; Agriculture and farming; Forestry	8,615,633	790
6	Perspectives on Biodiversity in Central America 2003: An Ecosystem Approach for the Evaluation of Biodiversity in Central America	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Habitat conservation and management; Monitoring and evaluation; Threat reduction assessment	N/A	413
7	Cloudforest Alive	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Birds; Botany; Web sites; Environmental education	10,000	172
8	Maya Nut (Brosimum alicastum): An Ancient Food for a Healthy Future	El Salvador; Guatemala; Honduras; Mexico; Nicaragua	Forest resources (non-timber); Agroforestry; Medicinal plants and ethnobotany; Microenterprises	250,000	1181
9	Building Sustainable and Competitive Tourism Enterprises in Northern Mesoamerica	Guatemala; Mexico	Ecotourism and sustainable tourism; Capacity building; Certification and sustainable production; Microenterprises	288,000	1292
10	Comprehensive Book Addressing Private Lands Conservation in Latin America	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Communications; Parks and protected areas; Reserves, private; Conservation easements	10,000	769
11	Exchange and Consolidation of Information on Regional Research on Critically Endangered Species in Northern Mesoamerica Alliance for Zero Extinction Sites	Belize; El Salvador; Guatemala; Honduras; Mexico	Wildlife research; Climate and climate change; Habitat conservation and management; Reptiles and amphibians	16,972	1342
12	Infrastructure Integration and Biodiversity Conservation in Mesoamerica	Belize; Costa Rica; Guatemala; Mexico; Nicaragua; Panama	Infrastructure; Monitoring and evaluation; Capacity building	96,080	898
13	Central American Population and Environment Initiative	Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua	Communications; Policy; Population (human)	262,000	82
14	Preparation of the Regional Map "Indigenous Peoples and Natural Ecosystems in Central America and Southern Mexico"	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Indigenous people; Population (human); Geographic Information Systems	150,000	442
15	Carbon Coffee: Creating and Testing a Carbon Monitoring Methodology for Coffee Farms	Mexico; Nicaragua	Carbon offsets; Climate and climate change; Agriculture and farming; Agroforestry	N/A	1332
16	Conservation Dialogues in Northern Mesoamerica II	Belize; El Salvador; Guatemala; Honduras; Mexico	Communications; Community-based conservation (ICDPs); Parks and protected areas; Threat reduction assessment	45,000	1393
17	Conservation Dialogues in Northern Mesoamerica I	Belize; El Salvador; Guatemala; Honduras; Mexico	Communications; Policy; Threat reduction assessment	14,000	1273
18	Amphibian Action Fund	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Reptiles and amphibians; Captive breeding; Threat reduction assessment; Wildlife research	200,000	1080
19	Forest Seed Bank	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Capacity building; Reforestation and tree farms; Forestry	100,000	292
20	Building a Baseline Foundation for Conserving Important Bird Areas for Neotropical Migratory Birds in Central America and the Caribbean	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Migratory species; Monitoring and evaluation; Birds; Web sites	776,125	1010

21	Building Capacity and Sustainability in Latin American Forestry and Tourism Initiatives	Costa Rica; El Salvador; Guatemala; Honduras	Certification and sustainable production; Forestry; Ecotourism and sustainable tourism; Carbon offsets	150,000	1432
22	Climate Change Allies Program (CCA)	Costa Rica; Guatemala; Honduras; Nicaragua; Panama	Climate and climate change; Carbon offsets; Certification and sustainable production; Reforestation and tree farms	50,000	1223
23	Integrating Migratory Bird Conservation with Regional Conservation and Agriculture Policy in the Mesoamerican Biological Corridor	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Agriculture and farming; Birds; Certification and sustainable production; Migratory species	62,500	1293
24	Linking Conservation of Biodiversity and Sustainable Tourism at World Heritage Sites	Guatemala; Honduras; Mexico	Ecotourism and sustainable tourism; Monitoring and evaluation; Parks and protected areas; Threat reduction assessment	875,000	234
25	Public Use Planning Program	Guatemala; Honduras; Mexico	Parks and protected areas; Environmental education; Habitat conservation and management; Ecotourism and sustainable tourism	N/A	163
26	Sustainable Tourism	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Certification and sustainable production; Ecotourism and sustainable tourism; Parks and protected areas	130,000	354
27	Technology Transfer and Promotion of Professionalism in Natural Forest Management	Costa Rica; Honduras; Nicaragua	Forestry; Forest resources (non-timber); Capacity building	482,000	165
28	Financing Renewable Energy Enterprises in Central America	El Salvador; Guatemala; Honduras; Nicaragua; Panamá	Energy; Policy	N/A	321
29	Communities and Biodiversity Training Program	El Salvador; Honduras	Capacity building; Environmental education; Habitat conservation and management; Microenterprises	164,000	1316
30	Energy Efficiency Program for Business and Industry in Central America	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panamá	Energy; Microenterprises; Climate and climate change; Policy	9,245,000	1364
31	Rainforest Alliance Education Program	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Environmental education; Communications; Web sites	230,000	675
32	Root Capital	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua	Certification and sustainable production; Indigenous people; Agriculture and farming	6,900,000	843
33	Connecting Migratory Species Conservationists through the WHMSI Pathway	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Migratory species; Capacity building; Communications; Web sites	25,000	1395
34	Climate Program	Guatemala; Honduras; Mexico; Nicaragua; Panama	Climate and climate change; Certification and sustainable production; Environmental services payments; Habitat conservation and management	570,000	1224
35	Central America Protected Areas Component of the Regional Environment of Central America Project (PROARCA/CAPAS)	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Grants or fellowships; Certification and sustainable production; Parks and protected areas; Agriculture and farming	1,500	50
36	Adopt-A-Rainforest	Belize; El Salvador; Guatemala; Honduras; Nicaragua	Environmental education; Grants or fellowships; Habitat conservation and management; Parks and protected areas	42,000	48
37	Biodiversity Conservation in Coffee: Transforming Productive Practices in the Coffee Sector by	El Salvador; Guatemala; Honduras	Agriculture and farming; Certification and sustainable production; Habitat conservation and	12,000,000	977

	Increasing Market Demand for Certified Sustainable Coffee		management; Trade		
38	Nature Trail Development: Conservation That Makes Dollars and Sense	Guatemala; Honduras; Mexico	Ecotourism and sustainable tourism; Parks and protected areas	120,000	117
39	Parks in Peril Program	Costa Rica; Guatemala; Honduras; Mexico; Nicaragua; Panama	Parks and protected areas; Habitat conservation and management; Threat reduction assessment; Reserves, private	149,200,000	130
40	Biological Inventories of the World's Protected Areas	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Parks and protected areas; Capacity building; Communications; Web sites	500,000	709
41	Central American Private Conservation Network	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Reserves, private; Habitat conservation and management; Corridors; Buffer zone management	N/A	662
42	Journal of Natural Resources and the Environment	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Communications; Habitat conservation and management; Ecosystem restoration; Forestry	30,000	161
43	Field Methods in Tropical Ecology and Conservation Training Program	Guatemala; Nicaragua; Panama	Environmental education; Community-based conservation (ICDPs); Habitat conservation and management; Wildlife management	42,000	430
44	Golden-cheeked Warbler Conservation (Dendroica chrysoparia)	El Salvador; Guatemala; Honduras; Mexico; Nicaragua	Migratory species; Habitat conservation and management; Wildlife management; Birds	150,000	256
45	Implementation of the Central American Forestry Strategy	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Certification and sustainable production; Forest resources (non-timber); Reforestation and tree farms; Forestry	418,297	647
46	Strengthening a Municipal Information System for Disaster Prevention in Latin America and the Caribbean	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Capacity building; Communications; Policy; Threat reduction assessment	N/A	1166
47	Global Invasive Species Database	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Introduced and invasive species; Web sites; Communications; Monitoring and evaluation	140,000	1048
48	Sustainable Agriculture Coffee Program	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Certification and sustainable production; Agriculture and farming; Land use; Trade	4,500,000	367
49	Strengthening the Renewable Energy Capacity of Central America	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Energy; Climate and climate change; Policy	250,000	306
50	Mesoamerican Biological Corridor Consolidation	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Corridors; Policy	16,600,000	236
51	IABIN Invasives Information Network (I3N)	El Salvador; Guatemala; Mexico	Communications; Geographic Information Systems; Introduced and invasive species	N/A	215
52	Habitat Management Strategies that Enhance Overwintering Survival of Migratory Landbirds	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Migratory species; Birds; Monitoring and evaluation; Wildlife research	N/A	1009
53	Sustainable Agriculture Network Climate Module	Brazil; Costa Rica; El Salvador; Guatemala	Climate and climate change; Agriculture and farming; Agroforestry; Capacity building	N/A	1471
54	Energy, Ecotourism, Environment and Poverty	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Ecotourism and sustainable tourism; Energy	N/A	357
55	PROARCA/SIGMA (Environmental Management Systems)	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama	Waste management; Trade; Ecosystem restoration; Water pollution	N/A	329

56	Forestry Traders Network (ComFor-Net)	Belize; Costa Rica; El Salvador; Guatemala; Honduras; Mexico; Nicaragua; Panama	Forestry; Websites; Trade; Reforestation and tree farms	N/A	669

Transboundary projects and initiatives

N°	Name	Countries involved	Topics	Budget (US$)	Eco Index ID
57	Preparing a Bi-National Guatemalan – Mexican Action Plan to Conserve the Biological Corridor between Calakmul Biosphere Reserve and Mirador – Rio Azul National Park	Guatemala; Mexico	Policy; Community-based conservation (ICDPs); Habitat conservation and management; Parks and protected areas	148,000	1311
58	Ecoregional Plan for the Maya, Zoque, and Olmeca Forests	Belize; Guatemala; Mexico	Parks and protected areas; Policy; Threat reduction assessment; Geographic Information Systems	450,000	989
59	The Mesoamerican Ecotourism Alliance: A Strategy for Linking Tourism, Conservation, and Community Development in Central America	Belize; El Salvador; Guatemala; Honduras; Mexico; Nicaragua	Ecotourism and sustainable tourism; Microenterprises; Parks and protected areas; Capacity building	210,000	93
60	Developing Recommendations and Implementing Priority Actions for Integrating Biodiversity Conservation into Tourism Policy for Guatemala and Belize	Belize; Guatemala	Policy; Corridors; Ecotourism and sustainable tourism; Parks and protected areas	136,212	1263
61	Conservation and Sustainable Management of Pine-Oak Forests in Central America	El Salvador; Guatemala; Honduras; Mexico; Nicaragua	Habitat conservation and management; Migratory species; Fire prevention; Environmental services payments	620,000	1402
62	Talamanca Initiative	Costa Rica; Panama	Agriculture and farming; Community-based conservation (ICDPs); Ecotourism and sustainable tourism; Corridors	N/A	368
63	Mitigating the Impacts on Biodiversity of Road Construction in the Calakmul Key Biodiversity Area and the Selva Maya Biosphere Reserve	Guatemala; Mexico	Infrastructure; Legal issues; Corridors; Geographic Information Systems	N/A	1440
64	Strengthening Public Policy to Mitigate the Impacts of Road Development in the Maya Biosphere Reserve through Public Outreach	Guatemala; Mexico	Infrastructure; Corridors; Parks and protected areas; Policy	93,000	1337
65	Protecting Biodiversity in the Selva Maya Corridor through the Aerial Perspective	Belize; Guatemala; Mexico	Threat reduction assessment; Corridors; Habitat conservation and management; Parks and protected areas	N/A	1290
66	Conservation of Tapirs (*Tapirus bairdii*) in La Amistad International Park	Costa Rica; Panama	Mammals; Habitat conservation and management; Parks and protected areas; Environmental education	17,000	713
67	Conservation of La Amistad International Park and its Key Species in Costa Rica and Panama; Monitoring and Dissemination of Data about Flagship Species	Costa Rica; Panama	Wildlife research; Parks and protected areas; Monitoring and evaluation; Buffer zone management	41,334	1145
68	Recuperation of the Río Mopán Watershed in	Belize; Guatemala	Water pollution; Watersheds; Environmental	40,000	337

	Guatemala and Belize		education; Rivers and streams		
69	Strengthening Public Policies for Fire Management in Guatemala and Belize	Belize; Guatemala	Fire prevention; Habitat conservation and management; Parks and protected areas; Land use	141,355	1262
70	Mitigating Threats to La Amistad International Park Through Community Management and Sustainable Agriculture	Costa Rica; Panama	Parks and protected areas; Environmental education; Reforestation and tree farms; Buffer zone management	101,500	703
71	AMISCONDE ("Friendship, Conservation, and Development")	Costa Rica; Panama	Buffer zone management; Environmental education; Reforestation and tree farms	N/A	109

Belize projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
72	Developing an Integrated Strategy and Project Plan to Conserve the Chiquibul/ Maya Mountain Key Biodiversity Area in Belize	Habitat conservation and management; Community-based conservation (ICDPs); Buffer zone management; Parks and protected areas	15,286	970
73	A Risk Assessment of the Bats of the Greater Maya Mountains of Belize	Wildlife research; Habitat conservation and management; Monitoring and evaluation; Wildlife management	33,900	1268
74	Birds Without Borders – Aves Sin Fronteras®	Migratory species; Environmental education; Habitat conservation and management; Birds	N/A	764
75	Enhancing the Site-Specific and National Population Viability of Threatened Upper Elevation Amphibian Species of the Maya Mountain Massif in Belize	Reptiles and amphibians; Pesticides and agrochemicals; Threat reduction assessment; Wildlife research	181,878	1276
76	Migratory Bird Conservation in the Maya Mountain Marine Corridor of Belize	Migratory species; Fire prevention; Environmental education; Parks and protected areas	235,860	1008

Costa Rica projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
77	Children's Eternal Rainforest	Ecosystem restoration; Habitat conservation and management; Reserves, private; Environmental education	400,000	216
78	Farms with Felines	Mammals; Ranching and grazing; Habitat conservation and management; Wildlife research	28,000	1443
79	Nacientes Palmichal: Rural Community Tourism	Ecotourism and sustainable tourism; Watersheds; Environmental education; Community-based conservation (ICDPs)	50,000	535
80	The Volcánica Central-Talamanca Biological Corridor: A Living Bridge Across Two Mountain Ranges in Costa Rica	Corridors; Agroforestry; Agriculture and farming; Community-based conservation (ICDPs)	N/A	1152
81	Consolidation of the Protected Areas System of Costa Rica	Parks and protected areas; Habitat conservation and management; Wildlife management; Corridors	55,000	993
82	Costa Rican Organic Agriculture Movement Support of a Law to Promote National Organic Production	Agriculture and farming; Legal issues; Certification and sustainable production; Policy	20,000	944
83	Extractive Reserves for Fallen Wood	Forestry; Habitat conservation and management; Microenterprises; Community-based conservation (ICDPs)	N/A	698
84	Framework for Predicting Biodiversity Loss in Response to Land-use Change	Agriculture and farming; Birds; Parks and protected areas	20,000	336
85	Migratory Bird Conservation Using Alternative Coffee Cultivation and Processing	Migratory species; Agriculture and farming; Agroforestry; Birds	141,150	1270

	Methodologies			
86	Climatic Impact of Tropical Lowland Deforestation on Nearby Montane Cloud Forests	Climate and climate change; Geographic Information Systems; Habitat conservation and management; Watersheds	150,000	235
87	Payments for Hydric Environmental Services in the Chorotega Region of Costa Rica	Environmental services payments; Capacity building; Water conservation; Policy	20,000	897
88	Promoting Sustainable Natural Resource Use in Acosta, Costa Rica	Agriculture and farming; Capacity building; Environmental education; Soil conservation and erosion	20,520	891
89	Sustainable Coffee Production and Certification	Agriculture and farming; Trade; Certification and sustainable production; Forestry	245,000	694
90	ACTUAR - Costa Rican Rural Community Tourism Association	Ecotourism and sustainable tourism; Capacity building; Trade; Community-based conservation (ICDPs)	N/A	785
91	Bird Monitoring Program in Costa Rica	Birds; Agroforestry; Migratory species; Environmental education	58,000	1305
92	Costa Rican Bird Route: Section San Juan-La Selva	Migratory species; Birds; Parks and protected areas; Ecotourism and sustainable tourism	340,700	777
93	Environmental Administration and Management of the Cerros de Jesús Biological Corridor	Corridors; Community-based conservation (ICDPs); Environmental education; Waste management	350,000	381
94	Environmental Restoration in Centro Agrícola Cantonal de Santa María de Dota, Costa Rica	Agroforestry; Waste management; Reforestation and tree farms	20,000	1190
95	Finca El Tigre	Reserves, private; Agroforestry; Ecosystem restoration; Forest resources (non-timber)	N/A	1059
96	Jaguar Corridor Initiative, Costa Rica	Corridors; Habitat conservation and management; Mammals; Wildlife research	N/A	1482
97	Management of and Benefits from Organic Waste from Small Pig Farms in the Generation of Bio-gas and Bio-fertilizer Through the Construction of Bio-digestors	Waste management; Energy; Firewood; Water pollution	N/A	233
98	María Aguilar River Biological Corridor: Environmental Education Park, Bike Path, and Green Belt	Corridors; Rivers and streams; Environmental education	N/A	1161
99	Private Conservation through a National Network	Reserves, private; Environmental services payments; Ecotourism and sustainable tourism; Parks and protected areas	12,000	192
100	Protection of the Nacientes Palmichal Watershed: Negro and Tabarcia Rivers	Watersheds; Water conservation; Community-based conservation (ICDPs); Ecotourism and sustainable tourism	N/A	221
101	Rivas Environmental School, Costa Rica	Environmental education; Waste management; Ecotourism and sustainable tourism	N/A	272
102	San Juan-La Selva Biological Corridor	Corridors; Habitat conservation and management; Parks and protected areas; Conservation easements	600,000	262
103	Small Grants Program of Costa Rica	Grants or fellowships; Community-based conservation (ICDPs); Capacity building; Habitat conservation and management	750,000	170
104	Tapir's Path Biological Corridor	Corridors; Habitat conservation and management; Ecosystem restoration; Water conservation	N/A	266
105	Aquatic Macro-invertebrates and Their Relationship to Nutrients Present in the Guacimal and San Luis River Basins, Costa Rica	Rivers and streams; Water conservation; Habitat conservation and management; Monitoring and evaluation	14,318	1052
106	Biodiversity Conservation in the La Amistad Biosphere Reserve Buffer Zone through Sustainable Management of Coffee Farms	Agroforestry; Corridors; Environmental education; Buffer zone management	312,669	489

107	Collection of Bird Calls in Braulio Carrillo National Park, Costa Rica	Birds; Environmental education; Parks and protected areas; Wildlife research	1,600	862
108	Collection of Recycable Solid Waste in Monteverde, Costa Rica	Waste management; Microenterprises; Environmental education; Ecotourism and sustainable tourism	7,500	114
109	Community Natural Resources Vigilance Committees and Brigades to Fight Fires in the Chorotega Biological Corridor in Costa Rica	Capacity building; Corridors; Fire prevention; Buffer zone management	52,000	951
110	Environmental Education in the Tapir's Path Biological Corridor, Costa Rica	Corridors; Environmental education; Habitat conservation and management; Capacity building	30,000	920
111	Establishing a Baseline for Species and Key Biodiversity Areas (KBAs) in Costa Rica	Habitat conservation and management; Parks and protected areas; Geographic Information Systems; Wildlife research	10,000	1136
112	Institutional Strengthening of the Osa Conservation Area	Capacity building; Policy; Parks and protected areas; Threat reduction assessment	19,965	902
113	Land Tenure Study of Non-Indigenous Lands, Land Appraisals, and Demarcation in the Këköldi Indigenous Reserve	Indigenous people; Land tenure; Legal issues; Reserves, private	3,000	736
114	Natural Resources Vigilance Committees in Southern Costa Rica	Legal issues; Parks and protected areas; Indigenous people; Habitat conservation and management	12,000	904
115	Production and Commercialization of Vegetal Charcoal from Trees Dead of Natural Causes or from Sustainably Managed Forests	Trade; Microenterprises; Forestry	3,000	685
116	San Luis Valley Community Lodges and Pacific Trail, Costa Rica	Ecotourism and sustainable tourism; Microenterprises; Environmental education; Corridors	20,000	914
117	Strengthening Forest Fire Brigades, Facilitating Opportunities for National Exchange and Analysis, Costa Rica	Fire prevention; Parks and protected areas; Communications	12,200	853
118	Threats to Aquatic Biodiversity and Biological Corridor Functions in Talamanca, Costa Rica	Capacity building; Corridors; Parks and protected areas; Rivers and streams	16,983	1473
119	Tools for Promoting Sustainable Tourism Development in Talamanca, Costa Rica	Ecotourism and sustainable tourism; Indigenous people; Capacity building; Microenterprises	161,000	775
120	Training Program for Members of the Environmental Education Commission and Educators of Monteverde, Costa Rica	Capacity building; Community-based conservation (ICDPs); Environmental education; Communications	5,000	1422
121	Using Photovoltaic Electrification Microcredits for Remote, Low-Income Indigenous and Farming Populations	Capacity building; Energy; Indigenous people; Microenterprises	20,000	247
122	Villa Mills Environmental Animation Center	Water conservation; Ecotourism and sustainable tourism; Environmental education; Environmental services payments	N/A	687
123	Atta Biodiversity Information System	Communications; Web sites; Arthropods; Wildlife research	N/A	214
124	Biodiversity Conservation in the Nicoya Peninsula, Through Biological Corridors	Corridors; Water pollution; Fire prevention; Climate and climate change	9,000	206
125	Community Development in the Cerros de Escazú Region of Costa Rica	Community-based conservation (ICDPs); Ecotourism and sustainable tourism; Environmental education	7,000	305
126	Conservation and Community Tourism in the Karen Mogensen Wildlife Refuge Reserve	Water conservation; Corridors; Reserves, prívate; Ecotourism and sustainable tourism	10,000	257
127	Conservation of Neotropical Migratory Bird Habitat in Monteverde, Costa Rica	Migratory species; Corridors; Habitat conservation and management; Reforestation and tree farms	100,000	978
128	Demarcation of the Tenorio-Miravalles Biological Corridor, Costa Rica	Water conservation; Capacity building; Corridors; Environmental education	21,758	952
129	Environmental Education for the Protection and Recovery of Important Hydric and Biotic Areas in the Southeast Sector of the Montes del Aguacate Biological	Water conservation; Corridors; Environmental education; Ecotourism and sustainable tourism	N/A	915

	Corridor, Costa Rica			
130	INBio Environmental Education Program	Communications; Environmental education; Capacity building; Habitat conservation and management	N/A	184
131	La Amistad Organic Coffee	Agriculture and farming; Agroforestry; Ecotourism and sustainable tourism; Certification and sustainable production	1,200	946
132	Mitigating Threats to La Amistad International Park in Costa Rica by Strengthening Park Protection	Threat reduction assessment; Parks and protected areas; Buffer zone management; Environmental education	161,000	1075
133	Monte Sky Ecological Lookout	Capacity building; Ecotourism and sustainable tourism; Environmental education; Reserves, private	20,000	696
134	Organic Cacao on La Amistad Farm	Agriculture and farming; Reforestation and tree farms; Buffer zone management; Certification and sustainable production	40,000	779
135	Overcoming Obstacles that Limit the Sustainability of the Protected Areas System of Costa Rica	Parks and protected areas; Corridors; Habitat conservation and management; Wildlife management	350,000	994
136	Promoting Connectivity and Biodiversity Conservation in the Talamanca Caribbean Biological Corridor	Corridors; Ecotourism and sustainable tourism; Environmental education; Ecosystem restoration	191,000	942
137	Promoting Traditional Conservation Practices in the Indigenous Cabécar Communities of Bajo Chirripó and Nairi Awari in La Amistad Biosphere Reserve	Community-based conservation (ICDPs); Indigenous people; Parks and protected areas; Ecosystem restoration	63,000	720
138	Protection of the Savegre River Watershed, Costa Rica	Water conservation; Watersheds; Environmental services payments; Rivers and streams	N/A	863
139	Shade Coffee Production Through Diversification of Shade Trees in Buffer Zone and Micro-watershed Areas in Turrialba, Costa Rica	Agriculture and farming; Capacity building; Corridors; Microenterprises	30,000	903
140	Strengthening Protection along the Costa Rica - Panama Border of La Amistad International Park	Parks and protected areas; Fire prevention; Capacity building; Threat reduction assessment	10,000	1147
141	Talamanca Community Ecotourism Network	Ecotourism and sustainable tourism; Corridors; Community-based conservation (ICDPs); Microenterprises	10,340	405
142	Wastewater Treatment System for the Community of Santa Elena, Monteverde, Costa Rica	Water pollution; Rivers and streams; Conservation easements	N/A	380
143	Collection of Ecological Data and Maps of the Distribution of Ecosystems for Five Conservation Areas - ECOMAPS Project	Habitat conservation and management; Ecosystem restoration; Land use	100,000	463
144	Agroforestry Systems and Organic Shade Coffee in the Quitirrisí Indigenous Territory, Costa Rica	Agroforestry; Indigenous people; Agriculture and farming; Environmental services payments	43,100	1103
145	El Mirador San Gerardo, Monteverde, Costa Rica	Water conservation; Ecotourism and sustainable tourism; Ecosystem restoration	50,000	822
146	Monteverde Cloud Forest Biological Reserve, Costa Rica	Reserves, prívate; Habitat conservation and management; Corridors; Ecotourism and sustainable tourism	850,000	63
147	Reduction of Nature Tourism Impacts on Traditional Ascent Routes to Chirripó National Park	Community-based conservation (ICDPs); Ecotourism and sustainable tourism; Parks and protected areas; Buffer zone management	28,575	874
148	Sale of Services to Scientific and Educational Tourism in the Villa Mills-Siberia Research and Demonstration Area	Environmental services payments; Environmental education; Microenterprises; Ecotourism and sustainable tourism	4,500	686
149	Agro-Ecotourism Project in the Biolley District, Costa Rica	Agriculture and farming; Ecotourism and sustainable tourism; Community-based conservation (ICDPs); Certification and sustainable production	N/A	752
150	La Casa de las Mujeres	Community-based conservation (ICDPs); Ecotourism and sustainable tourism;	N/A	407

		Indigenous people		
151	Producing Organic Fertilizer in Acosta and Aserrí, Costa Rica	Agriculture and farming; Agroforestry; Ranching and grazing; Waste management	28,430	943
152	Species of Costa Rica Web site	Web sites; Communications; Wildlife research; Wildlife management	N/A	204
153	Building Capacity and Promoting Agroforestry Systems in the Cabécar Tayni Indigenous Territory, Costa Rica	Indigenous people; Agroforestry; Forestry; Environmental services payments	62,400	1124
154	Organic Chocolate Manufacture and Trade in an Indigenous Bribri Community, Costa Rica	Microenterprises; Indigenous people; Agroforestry; Agriculture and farming	54,100	1141

El Salvador projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
155	Education for Bird Conservation in El Imposible and Montecristo National Parks	Birds; Ecotourism and sustainable tourism; Environmental education; Parks and protected areas	50,000	230
156	Social-Environmental Improvements in 10 Coffee Cooperatives in the Central and Western Zones of El Salvador, through Rainforest Alliance Certification	Agriculture and farming; Certification and sustainable production; Capacity building	63,000	142
157	Coffee and Biodiversity Conservation in El Salvador	Agriculture and farming; Agroforestry; Botany	100,000	325
158	Protection of El Imposible Natural Area National Park Through the Sustainable Development of the Neighboring Communities	Buffer zone management; Environmental education; Parks and protected areas	115,000	141
159	Environmental Interpretation in Montecristo National Park	Environmental education; Ecotourism and sustainable tourism; Parks and protected areas; Land use	1,000	491
160	Protection and Conservation of the Los Volcanes Complex	Ecotourism and sustainable tourism; Parks and protected areas	250,000	369
161	Protection and Restoration of the San Juan Buenavista Area in El Salvador	Habitat conservation and management; Ecosystem restoration; Wildlife management; Buffer zone management	85,000	269

Guatemala projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
162	Chaculá Farm Rural Inn, Guatemala	Ecotourism and sustainable tourism; Capacity building; Microenterprises; Indigenous people	N/A	1435
163	Community-Based Forest Stewardship in Guatemala's Western Highlands	Agroforestry; Capacity building; Forestry; Watersheds	180,000	1467
164	Conservation of the Ayarza Lagoon in Guatemala	Parks and protected areas; Ecotourism and sustainable tourism; Wetlands; Lakes	50,000	742
165	Environmental Education Program in the Petén, Guatemala	Environmental education	N/A	1229
166	GuateCarbon: Reducing Emissions through Avoided Deforestation in the Maya Biosphere Reserve	Climate and climate change; Certification and sustainable production; Community-based conservation (ICDPs); Forest resources (non-timber)	N/A	1439
167	Initial Research on Insect and Bird Migrations Using a Traditional Chib'al	Migratory species; Indigenous people; Birds; Arthropods	N/A	1214
168	Macaws Without Borders	Birds; Environmental education; Wildlife management; Wildlife research	12,000	1203
169	Natural History Museum in Parque Ecologico Nueva Juventud, Petén, Guatemala	Communications; Environmental education; Habitat conservation and management	55,000	1011
170	New Youth Ecological Park - Medicinal Plants Garden	Environmental education; Medicinal plants and ethnobotany; Parks and protected areas	40,000	326

171	Outreach and Promotion of Guatemala's University System of Protected Areas (SUAP), with an Emphasis on the Role of Rangers	Capacity building; Communications; Ecotourism and sustainable tourism; Parks and protected areas	35,400	1470
172	Participatory Bilingual Environmental Education Program with Maya-Q'eqchi' Communities in the Lachuá Ecoregion, Cobán, Guatemala	Environmental education; Habitat conservation and management; Indigenous people; Wildlife management	50,000	1431
173	Private Natural Reserve and Cascadas de Tatasirire Ecotourism Park, Jalapa, Guatemala	Reserves, private; Ecotourism and sustainable tourism; Environmental education; Ecosystem restoration	N/A	789
174	Analysis and Recommendations for Improving Land Tenure Policy for Biodiversity Conservation in Guatemala	Land tenure; Community-based conservation (ICDPs); Legal issues; Policy	55,806	1348
175	Avian Richness and Abundance in the Understories of Two Fragmented Landscapes in the Area of Influence of Laguna Lachuá National Park, Guatemala	Birds; Habitat conservation and management; Wildlife research; Migratory species	3,558	461
176	Black Howler Monkey (Alouatta pigra) Population Characteristics and Habitat Use in Laguna Lachua National Park, Guatemala	Mammals; Habitat conservation and management; Parks and protected areas; Wildlife research	4,500	350
177	Building Community Capacity to Prevent and Control Forest Fires in the Sierra Lacandon National Park, Guatemala	Fire prevention; Capacity building; Habitat conservation and management; Parks and protected areas	18,525	1388
178	Capacity Building in Municipal/Community Protected Areas in the Pine-Oak Forest of Huehuetenango, Guatemala	Capacity building; Legal issues; Parks and protected areas; Habitat conservation and management	14,992	1403
179	Community Management of the Itzá Biosphere Reserve, Petén, Guatemala	Community-based conservation (ICDPs); Habitat conservation and management; Indigenous people; Parks and protected areas	750,000	766
180	Conservation Incentive Mechanisms in Guatemala	Community-based conservation (ICDPs); Corridors; Parks and protected areas; Reserves, private	50,380	961
181	Control and Monitoring of Two Management Units in the Maya Biosphere Reserve: Uaxactún and the Tikal-Rió Azul Biological Corridor, Guatemala	Capacity building; Community-based conservation (ICDPs); Threat reduction assessment; Corridors	18,000	636
182	Coprophagous Beetle (Coleoptera Scarabaeidae: Scarabeinae) Diversity in the Tropical Landscape of the Lachuá Region in Guatemala	Agroforestry; Agriculture and farming; Habitat conservation and management; Arthropods	2,750	392
183	Establishing a Baseline for Species and Key Biodiversity Areas in Guatemala	Corridors; Habitat conservation and management; Parks and protected areas; Geographic Information Systems	13,729	1029
184	Establishing a Center to Create and Sell Crafts Made of Wicker and Vines	Community-based conservation (ICDPs); Trade; Forest resources (non-timber)	2,850	180
185	Establishment of Private Nature Reserves in the Huehuetenango Region	Reserves, private; Climate and climate change; Corridors; Capacity building	19,984	1334
186	Establishment, Promotion, and Management of Three New Protected Areas in the Sierra de los Cuchumatanes, Tierras Altas Corridor, Guatemala	Legal issues; Community-based conservation (ICDPs); Habitat conservation and management; Parks and protected areas	90,493	1375
187	Establishment of Small Integrated Farms in the Maya Biosphere Reserve, Petén, Guatemala	Agroforestry; Environmental education; Ranching and grazing; Indigenous people	17,350	762
188	Implementation of a Special Protection System Based on Strategic Alliances with Civil Society and Organizations in the Eastern Sector of Laguna del Tigre National Park and Its Surrounding Biological Corridor	Fire prevention; Corridors; Habitat conservation and management; Threat reduction assessment	243,093	899
	Legal Declaration of Punta de Manabique, Guatemala, as a Protected Area	Legal issues; Habitat conservation and management; Parks and protected areas; Policy	2,000	42
189	Management and Protection of the Laguna del Tigre National Park and Biotope, Guatemala	Parks and protected areas; Wetlands; Community-based conservation (ICDPs)	350,000	144
190	Baird's Tapir Conservation in Guatemala	Mammals; Environmental education; Parks and protected areas; Wildlife management	26,500	1461
191	Maya Project	Birds; Habitat conservation and management; Wildlife research	N/A	76

192	Mayan Forestry Action Plan	Forestry; Agroforestry; Community-based conservation (ICDPs); Indigenous people	114,000	95
193	Multi-Stakeholder Plan for the El Mirador-Río Azul Natural and Cultural Zone, Maya Biosphere Reserve, Petén, Guatemala	Capacity building; Ecotourism and sustainable tourism; Parks and protected areas; Policy	42,000	1101
194	Needs Assessment for Conserving the Key Biodiversity Areas of Laguna del Tigre National Park and Chiquibul-Montañas Mayas	Habitat conservation and management; Monitoring and evaluation; Parks and protected areas; Threat reduction assessment	N/A	1325
195	Petén Sustainable Development Program	Agriculture and farming; Community-based conservation (ICDPs); Ecotourism and sustainable tourism; Land tenure	3,500,000	201
196	Preliminary Economic Valuation of Goods and Services From Natural Communities of Pinabete or Guatemalan Fir (Abies guatemalensis Redher) in the Municipalities of Chiantla, Todos Santos Cuchumatán and San Juan Ixcoy, Huehuetenango, Guatemala	Climate and climate change; Habitat conservation and management; Forest resources (non-timber)	4,500	417
197	Prevention, Monitoring, and Mitigation of Impacts From Invasive Exotic Species in Guatemala	Introduced and invasive species; Lakes; Capacity building; Rivers and streams	31,143	840
198	Protection of Southeastern Laguna del Tigre National Park through the Las Guacamayas Biological Station, Guatemala	Parks and protected areas; Wildlife research; Ecotourism and sustainable tourism; Community-based conservation (ICDPs)	N/A	988
199	Organic Coffee Production in Guatemala	Trade; Agriculture and farming; Certification and sustainable production; Capacity building	875,000	62
200	Prevention and Control of Forest Fires in Guaraquiche and Tanshá in the Municipality of Jocotán, Chiquimula, in Guatemala	Capacity building; Community-based conservation (ICDPs); Environmental education; Fire prevention	30,000	663
201	Water Fund of the Sierra de las Minas Biosphere Reserve	Water conservation; Watersheds; Parks and protected areas; Environmental services payments	N/A	374
202	The Water Fund – An Integrated Management Model for Watersheds and Payments for Environmental Services in the Motagua-Polochic System of the Sierra de la Minas Biosphere Reserve, Guatemala	Environmental services payments; Community-based conservation (ICDPs); Water conservation; Parks and protected areas	92,660	999
203	Building Community Capacity to Prevent and Control Forest Fires in Laguna del Tigre National Park, Guatemala	Fire prevention; Capacity building; Habitat conservation and management; Parks and protected areas	6,000	1385
204	Biodiversity Conservation in Shade Coffee Farms	Agriculture and farming; Birds; Migratory species; Wildlife management	5,000	265
205	Land Legalization	Land tenure; Legal issues; Community-based conservation (ICDPs)	75,000	39

Honduras projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
206	Conservation of Natural Resources in Jeannette Kawas National Park	Agroforestry; Water conservation; Ecotourism and sustainable tourism; Parks and protected areas	3,000,000	111
207	Country-wide Conservation and Management Assessment of Critically Endangered Amphibians in Honduras	Reptiles and amphibians; Monitoring and evaluation; Parks and protected areas; Habitat conservation and management	60,000	1255
208	Protecting Neotropical Migratory Birds in Honduras	Migratory species; Birds; Habitat conservation and management; Parks and protected areas	477,000	1230
209	Biogeographical Patterns of Freshwater Fish in Honduras	Fish, fishing and fisheries; Rivers and streams; Wildlife research	30,000	1295
210	Río Plátano Biosphere Reserve Integrated Management Program	Parks and protected areas; Indigenous people; Ecotourism and sustainable tourism; Community-based conservation (ICDPs)	100,000	135

211	Shifting Agriculture and Bird Species Diversity in the Rio Platano Biosphere Reserve, Honduras	Birds; Agriculture and farming; Buffer zone management; Habitat conservation and management	N/A	237
212	Bat Conservation Outreach Program	Mammals; Environmental education; Habitat conservation and management; Wildlife research	N/A	232
213	Conservation of Patuca National Park, Honduras	Parks and protected areas; Community-based conservation (ICDPs); Ecotourism and sustainable tourism; Habitat conservation and management	70,000	340
214	Ecotourism Services	Ecotourism and sustainable tourism; Capacity building; Environmental education; Microenterprises	N/A	864

Mexico projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
215	Protecting Neotropical Migratory Bird Habitat in the Calakmul Biosphere Reserve, Mexico	Migratory species; Birds; Corridors; Wildlife management	14,4797	1245
216	Ecology, Behavior, Management and Conservation of the Native Primates of Mexico	Mammals; Wildlife research; Corridors	N/A	854
217	Integrated Population-Environment Initiative in Mexico	Population (human); Parks and protected areas; Water conservation; Habitat conservation and management	126,291	738
218	Aguaxaca: An Integrated Focus for the Conservation of the Atoyac – Salado Watershed, Mexico	Watersheds; Ecosystem restoration; Community-based conservation (ICDPs); Water conservation	300,000	666
219	Baseline Forest Change Detection and Identifying Key Biodiversity Areas in Southern Mexico	Habitat conservation and management; Wildlife research; Monitoring and evaluation; Capacity building	47,966	1378
220	Bird Habitat Conservation and Management in the El Triunfo Biosphere Reserve, Chiapas, Mexico	Migratory species; Environmental education; Habitat conservation and management; Monitoring and evaluation	800,000	1092
221	Building a Model for Carbon-Coffee in the Sierra Madre de Chiapas, México	Carbon offsets; Air pollution; Agroforestry; Environmental services payments	20,000	1351
222	Building a Model of Conservation Coffee and Carbon Credit in the Sierra Madre de Chiapas	Carbon offsets; Agroforestry; Corridors; Environmental services payments	142,983	1344
223	Conservation and Restoration of Migratory Bird Habitat in Chiapas, Mexico	Migratory species; Birds; Environmental education; Ecosystem restoration	45,300	1041
224	Conservation of Threatened Corridors in El Triunfo Biosphere Reserve, Chiapas, Mexico	Corridors; Migratory species; Parks and protected areas; Birds	415,000	1039
225	Developing a Sustainable Tourism Strategy to Conserve Biodiversity in the States of Chiapas and Oaxaca, Mexico	Ecotourism and sustainable tourism; Infrastructure; Policy; Land use	60,000	1267
226	Linking Mexico's Key Regions and Sites for Neotropical Migratory Birds of Conservation Concern, Phase I	Migratory species; Monitoring and evaluation; Parks and protected areas; Birds	328,000	947
227	Strengthening Protection of La Frailescana Forest and Corridor in the Sierra Madre de Chiapas Key Biodiversity Area	Corridors; Habitat conservation and management; Parks and protected areas	34,200	1286
228	Biological Conservation and Culture of El Carricito	Reserves, prívate; Environmental education; Indigenous people; Migratory species	10,000	1
229	Community Training for Biodiversity Conservation of Forested Coffee Farms in the Sierra Norte of Oaxaca, Mexico	Agriculture and farming; Certification and sustainable production; Community-based conservation (ICDPs); Agroforestry	39,717	299
230	Strengthening Local Capacity to Prevent and Control Forest Fires in Four Key Biodiversity Areas in Selva Zoque, Sierra Madre, Lacandonia, and Gran Peten,	Fire prevention; Community-based conservation (ICDPs); Habitat conservation and management; Threat reduction assessment	112,000	1304

	Mexico			
231	Sustainable Harvesting and Production Evaluation of Tepejilote (*Chamaedorea tepejilote*) in San Miguel Tiltepec, Oaxaca, México	Forest resources (non-timber); Indigenous people; Monitoring and evaluation; Trade	30,000	320
232	Sustainable Tourism in the Sierra Madre de Chiapas and Selva El Ocote, México	Ecotourism and sustainable tourism; Capacity building; Corridors; Microenterprises	58,251	1321
233	Campaign For the Prevention of Forest Fires in the Montes Azules Biosphere Reserve and Its Area of Influence, Lacandon Forest, Chiapas, Mexico	Communications; Community-based conservation (ICDPs); Fire prevention; Habitat conservation and management	N/A	496
234	Impact of Forest Certification in Oaxaca and the Contribution of Communal Forestry Enterprises to Conservation	Certification and sustainable production; Community-based conservation (ICDPs); Forest resources (non-timber); Forestry	60,000	749
235	Migratory Bird Habitat Conservation in the Calakmul Region, Mexico	Migratory species; Community-based conservation (ICDPs); Habitat conservation and management; Birds	200,000	949
236	Environmental Services in Oaxaca, Mexico	Agroforestry; Carbon offsets; Watersheds; Environmental services payments	51,000	140
237	Ecological Restoration of the Río Manialtepec Watershed, Mexico	Watersheds; Water conservation; Capacity building; Reforestation and tree farms	45,000	308
238	Management and Commercialization of Chamaedorea Palm Species in La Chinantla, Oaxaca, Mexico	Agroforestry; Habitat conservation and management; Indigenous people; Forest resources (non-timber)	20,000	819
239	Indigenous Communities and Biodiversity (COINBIO)	Indigenous people; Habitat conservation and management; Grants or fellowships; Monitoring and evaluation	1,200,000	866
240	Strengthening Municipal and State-Level Public Policy and Institutional Frameworks to Improve Fire Management in Southeast Mexico	Fire prevention; Community-based conservation (ICDPs); Habitat conservation and management; Policy	60,700	1302
241	Agroforestry Carbon Credits in Southwestern Mexico	Carbon offsets; Agriculture and farming; Agroforestry; Climate and climate change	99,071	1476
242	Conservation and Restoration of Biological Corridors in the Sierra Madre of Chiapas, Mexico	Corridors; Migratory species; Birds; Habitat conservation and management	1,006,000	1242
243	Cloud Forest Conservation in the Chiapas Highlands of Mexico	Agriculture and farming; Agroforestry; Community-based conservation (ICDPs); Habitat conservation and management	N/A	829
244	Organic Shade Coffee Production and Bird Protection in the Watershed of Upper Perlas River, Selva Lacadona, Mexico	Migratory species; Birds; Agriculture and farming; Certification and sustainable production	85,000	378

Nicaragua projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
245	Consolidation of Conservation Actions and Biodiversity Management in the Cerro Silva and Punta Gorda Reserves, Nicaragua	Community-based conservation (ICDPs); Indigenous people; Parks and protected areas; Land tenure	300,000	1374
246	Community Consultation and Institutional Strengthening for the Sustainable Management of the Rama Indigenous Territory Protected Area, Nicaragua	Parks and protected areas; Indigenous people; Community-based conservation (ICDPs); Land tenure	5,000	957
247	Promoting Private Lands for Conservation and Development	Conservation easements; Legal issues; Policy; Reserves, private	19,000	166
248	Establishing the Island of Ometepe, Nicaragua as a Biosphere Reserve	Capacity building; Habitat conservation and management; Parks and protected areas; Wildlife research	65,000	1330
249	Rural Community-Based and Environmental Tourism on the Ometepe Island Protected Area	Capacity building; Ecotourism and sustainable tourism; Reforestation and tree farms; Community-based conservation (ICDPs)	58,958	1349
250	Environmental Education in Indigenous Communities of the Bosawas Biosphere	Indigenous people; Capacity building; Environmental education; Parks and	53,315	1463

	Reserve, Nicaragua	protected areas		
251	Co-management of Protected Areas in Nicaragua	Community-based conservation (ICDPs); Habitat conservation and management; Parks and protected areas; Wildlife management	3,200,000	279
252	Ecotourism Project "Los Clarineros"	Ecotourism and sustainable tourism	N/A	352
253	Strengthening Participatory Management Processes for Development and Poverty Reduction on the Cosigüina Peninsula, Phase 2	Capacity building; Agriculture and farming; Environmental education; Parks and protected areas	600,000	1357
254	Protection of Biodiversity in the El Jaguar Cloud Forest Reserve, Nicaragua	Reserves, prívate; Birds; Certification and sustainable production; Migratory species	N/A	1303
255	Nicaragua Forestry, Agriculture, and Tourism Alliance	Certification and sustainable production; Agriculture and farming; Forestry; Ecotourism and sustainable tourism	1,300,000	1110
256	Birds, Cloud Forests, and Coffee Farms: Environmental Interpretation in Mombacho Volcano Natural Reserve, Nicaragua	Ecotourism and sustainable tourism; Environmental education; Habitat conservation and management; Parks and protected areas	25,000	704
257	Environmental Administration, Management, Conservation and Development in the Southeast Nicaragua Biosphere Reserve, First Phase	Wetlands; Parks and protected areas; Wildlife management	178,142	388
258	Co-management of Chocoyero-El Brujo, Nicaragua: Implementation of a Model With Participation From Local Actors and Development of Economic Alternatives in the Buffer Zone	Community-based conservation (ICDPs); Environmental education; Parks and protected areas	30,000	285
259	Developing an Action Plan to Prevent Environmental Degradation Caused By Migration in Cerro Silva and Punta Gorda Reserves, Nicaragua	Community-based conservation (ICDPs); Parks and protected areas; Indigenous people; Land use	16,000	1154
260	Consolidation of Conservation Actions and Biodiversity Management in the Cerro Silva and Punta Gorda Reserves, Nicaragua	Community-based conservation (ICDPs); Indigenous people; Parks and protected areas; Land tenure	300,000	1374

Panama projects and initiatives

N°	Name	Topics	Budget (US$)	Eco Index ID
261	Creation of Alternative Medicine Training Centers	Botany; Capacity building; Medicinal plants and ethnobotany; Indigenous people	20,000	711
262	Building an Indigenous Resistance Tourism Route in Panama	Ecotourism and sustainable tourism; Community-based conservation (ICDPs); Indigenous people; Microenterprises	300,000	176
263	Capacity Building for Local Management of the Naso-Teribe Region, Panama	Indigenous people; Capacity building; Legal issues; Parks and protected areas	5,000	1146
264	Achiote: A Bird and Birdwatcher-Friendly Community	Migratory species; Parks and protected areas; Birds; Habitat conservation and management	72,500	781
265	Campaign to Increase Awareness of the Biological Importance of Barú Volcano National Park	Infrastructure; Communications; Legal issues; Parks and protected areas	10,000	692
266	Ecology, Community Participation, and Conservation of the Harpy Eagle (*Harpia harpyja*) in the Republic of Panama	Birds; Environmental education; Habitat conservation and management; Wildlife research	35,000	451
267	Strengthening Community Participation to Protect Barú Volcano National Park, Panama	Legal issues; Communications; Infrastructure; Parks and protected areas	19,945	725
268	Plan to Control Illegal Dumping in the Sub-basins of the Los Hules-Tinajones and Caño Quebrado Rivers in Panama	Waste management; Watersheds; Environmental education; Capacity building	66,000	1207
269	Prevention and Control of Forest Fires in the Buffer Zone of La Amistad Biosphere Reserve in the Pacific Region of Panama	Fire prevention; Environmental education; Capacity building; Buffer zone management	19,800	1137

270	Biodiversity Conservation in the Damani Wetlands Reserve in the Ngöbe-Buglé Region of Panama	Community-based conservation (ICDPs); Capacity building; Wetlands; Indigenous people	80,000	726
271	Halting the Advance of the Agricultural Frontier through Community Environmental Administration for Sound Natural Resource Management and the Adoption of Sustainable Production Practices in the La Amistad Biosphere Reserve Buffer Zone	Agriculture and farming; Capacity building; Community-based conservation (ICDPs); Corridors	95,000	712
272	Citizen Participation in Conservation of the La Amistad Biosphere Reserve, Panama	Parks and protected areas; Legal issues; Capacity building; Water conservation	168,525	1376
273	Promoting Environmental Education in Selected Ngöbe Bugle Communities in the Palo Seco Protected Area of La Amistad International Park	Capacity building; Environmental education; Indigenous people; Parks and protected areas	5,300	743
274	Ecotourism with Community Participation in the Panama Canal Watershed	Ecotourism and sustainable tourism; Watersheds; Buffer zone management; Environmental education	N/A	155
275	Involving Community Residents from Alto La Gloria, Molejón, Los Chiricanos, and La Conga in Natural Resource Conservation	Agroforestry; Environmental education; Reforestation and tree farms; Capacity building	10,000	718
276	San Lorenzo, Panamá: Protection through Community Participation	Community-based conservation (ICDPs); Buffer zone management; Parks and protected areas; Habitat conservation and management	200,000	146
277	Building Environmental Capacity in the No Kribo Region of the Ngobe Bugle Indigenous Reserve, Panama	Capacity building; Corridors; Indigenous people; Buffer zone management	49,900	990
278	Strengthening Biodiversity Conservation in Ecologically Sensitive Areas of La Amistad International Park in Panama	Parks and protected areas; Buffer zone management; Land use; Wildlife research	88,000	708
279	Strengthening Local Capacity for the Management and Sustainable Use of Natural Resources in the Bufffer Zone of San Lorenzo National Park, Panama	Capacity building; Community-based conservation (ICDPs); Ecotourism and sustainable tourism; Buffer zone management	75,000	759
280	Study of the Important Bird Areas of Panama	Birds; Habitat conservation and management; Wetlands; Parks and protected areas	85,000	69
281	Weckso Ecotourism Project	Environmental education; Microenterprises; Parks and protected areas; Ecotourism and sustainable tourism	20,000	714
282	Valle de San Francisco	Community-based conservation (ICDPs); Land tenure	N/A	366

In 1992, at the United Nations Conference on Environment and Development – commonly referred to as 'Rio 1992' or 'the Rio Earth Summit' – mountains received unexpected high political attention. They were granted a chapter in the 'Agenda 21' as fragile ecosystems that matter for humankind.

Since then, efforts by different actors have been undertaken to promote Sustainable Mountain Development. Some of them relate to the above event, others just emerged on their own. However, in view of the UN Conference Rio+20 – United Nations Conference on Sustainable Development in 2012 it seemed relevant to assess and understand what has been achieved by whom and how. It appears equally important to learn what has worked and what has not worked, and why, in order to draw lessons for more effective interventions in future. The anticipation of possible future challenges or opportunities may further help to be better prepared for their management. This will certainly encompass the adaptation to and mitigation of global change as the mainstream concern of the last decade as well as the new, albeit disputed paradigm of a Green Economy. As in the past, major unexpected and unpredictable political, social, economic or technological innovations may overshadow such mainstreams.

The Swiss Agency for Development and Cooperation, committed to sustainable mountain development since many decades, has commissioned a number of regional reports to assess achievements and progress in major mountain regions such as in particular Central Asia, Hindu Kush-Himalaya and the South East Pacific, South and Meso America or the Middle East and North Africa. The Swiss Federal Office for Spatial Development has commissioned - in the context of the Swiss Presidency of the Alpine Convention 2011/12 – a report on the European Alps. In addition, UNEP has facilitated the production of the report on Africa's mountains and mountains in Central, Eastern and South Eastern Europe; and the Aspen International Mountain Foundation together with the Telluride Institute has prepared a report on the mountains of North America.

The insights gained through these reports, which were presented at the Lucerne World Mountain Conference in 2011, and in which key local, regional and global actors have been actively involved provided the inputs for a mountain section in the outcome document of Rio+20. They are also meant to feed into future global and regional processes, institutional mechanisms, and initiatives that emerge as a result of Rio+20 in support of Sustainable Mountain Development.

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CDE CENTRE FOR DEVELOPMENT AND ENVIRONMENT

mri mountain research initiative

TELLURIDE INSTITUTE

IMS International Mountain Society

ICIMOD

CONDESAN Consorcio para el Desarrollo Sostenible de la Ecorregión Andina

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