Regional Environmental Profile

Andean Countries

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CONTENTS

1. SUMMARY

The Andean Community (Comunidad Andina de Naciones – CAN) was founded in 1969 by the signing of the Cartagena Agreement. CAN has five Member States: Bolivia, Colombia, Ecuador, Peru and Venezuela.

All the five countries share some very important geographical characteristics. In the first place, they all have the Andean Cordillera as a sort of backbone, although it takes different shapes in different countries. North-western Bolivia and south-eastern Peru share the great high plateau (altiplano) with the Lake Titicaca basin. In Ecuador, the Andes split in two parallel cordilleras and in Colombia in three. Bolivia, as is well known, has no coast (it is landlocked), while Peru and Ecuador have economically important and heavily populated coastal areas (the Pacific). Colombia's Pacific coast is mainly covered by tropical forest and has little population. Its Caribbean coast, on the other hand, is one of the most populated and environmentally most affected areas in the whole region. Venezuela divides its northern coast between the Caribbean and the Atlantic; in this case also, the Caribbean coast has been much changed by human activities. In addition to the continental area, there are several archipelagos and islands, the most important ones being the Galápagos Islands (Ecuador), San Andrés (Colombia) and Margarita (Venezuela).

Another important common factor among all the five countries is that they all hold large parts of the Amazon basin, with its important tropical rain forest and biodiversity. Most of the tributaries to the Amazon river have their sources in the Andean countries. In this context, it should be mentioned that CAN has recently signed a memorandum of understanding with the Amazon Cooperation Treaty Organization. This is something that could become of great importance and which should warrant attention on part of the EC.

Due to the great differences in altitude in the Andean countries (0 - > 6 000 meters above sea level) and their latitudinal span (12,5° north – 23º south), there is an enormous diversity in terms of climate and ecosystems. It is impossible to summarize this diversity here; suffice it to say that almost any kind of scenario can be found, from glaciers and dry salt pans to some of the most humid rain forests on earth (Chocó in Colombia).

The geographical and ecological diversity explains the fact that practically all imaginable environmental problems are also to be found within the Andean region. As regards management of natural resources, there is an extremely fast and serious devastation going on with regard to forests and biodiversity, both in the mountain and the lowland areas. The main reasons are the advance of the agricultural frontier (including cultivation of coca and opium poppy) and inadequate forest exploitation and management as well as illegal logging. Heavy demographic pressure, unsuitable agricultural techniques and cultivation in inappropriate areas (e.g. steep slopes) lead to soil loss and soil and water contamination. Proper river basin management is a relatively new item on the agendas in these countries, and much remains to be done. As regards supply of sweet water in the Andean countries, the situation is still favourable in comparison with many other parts of the world, but water resources are very unevenly distributed and increased attention will have to be paid to this matter very soon, if serious problems are to be avoided. The greatest need is to improve institutions and governance in the area of water management.

Big and small industry, e.g. mining and oil extraction, cause serious damage to the environment in different ways (deforestation and contamination). Environmental quality in urban areas, especially the mega-cities (like Lima with its 8 million inhabitants) is low. Air pollution is serious. Access to clean drinking water and adequate sanitation is limited.

The environmental problem in the Andean countries is closely linked to the general poverty problem. Poor people contribute to the degradation of the environment and the degradation contributes to maintain or increase their poverty. These are two problems that can only be solved together.

Over the last decades, the Andean countries have made considerable progress in signing international conventions on environmental issues, on designing plans and strategies and on creating laws, regulations and institutions for environmental management and protection. So has the Andean Community.

In addition to – or related to – the poverty, the main cause for the limited practical results in environmental management in these countries is the notorious low levels of governance that have prevailed here for a long time. Political instability, lack of real (as against formal) democracy, corruption and civil strife or war have been and keep being important characteristics. All the countries have embarked on decentralization processes, but there is still a considerable degree of centralization of government, which is certainly a special obstacle when it comes to the handling of environmental concerns. Civil society is becoming stronger and more involved in political affairs and governance, but much more remains to be done in this area.

Despite all the laws that have been approved and all the institutions that have been created, environmental issues still have a low rank on governments' agenda when it comes to concrete action. One common reflection of this is the scarce allocation of budget resources to Ministries of Environment and equivalent institutions. The Andean countries have a rather impressive portion of their territory set aside as natural reserves and protected areas of different kinds, but to a considerable extent these are protected "on paper" only, not in reality. One of the reasons for this is the weakness of the institutions that are supposed to be responsible for the protection and the control.

There is a wide-spread lack of environmental education in the Andean countries. In particular, there seems to be relatively few people and institutions that have fully absorbed the idea (and the fact) that environmental management and protection is not an isolated subject or a "sector", but that it is "transversal". Of course, it is more transversal than any other transversal issue that has ever existed.

Against the scenario described above, the main line of thought behind the recommendations made for possible EC support, is that the whole environmental problem should be approached from a "sustainable development" point of view and not from a conservation or protection angle. Sustainable management of natural resources must be seen as an investment for the future and not as an expenditure on luxury. This goes for big business as well as for the population in general. The large portion of rural poor in the Andean countries who damage the environment don't do it only (or even mainly) because of ignorance, but rather because it is their only option for economic survival. Obviously, the best way of changing this is to make it clear – in practice – that sustainable management of soils, water, forests, biodiversity, etc. will produce a benefit for them and not a cost or sacrifice.

The proposal is that EC support sustainable management at the local and regional levels, preferably with river basins as units of intervention. By doing this, many technical, economical and social aspects of the environmental problem (*cum* poverty) can be dealt with at the same time and in an integrated manner.

On a regional scale, the EC can support collective improvement of legal instruments, information and evaluation systems and environmental education programmes.

The EC could also play an important role in improving coordination between international cooperating agencies, starting perhaps with its own Member States. There are already large projects going on in the Andean countries under co-financing arrangements. This approach should be enhanced. As it is now, there are so many actors involved in programmes and projects in the area of environment, that it is an almost impossible task for the national coordinating agencies (which are generally weak) to do this on their own.

2. BACKGROUND AND STATE OF THE ENVIRONMENT

2.1 GEOGRAPHY AND CLIMATE

The Andean mountain range is the most important common element among the Member States of the Andean Community, in terms of geographic characteristics and eco-systems. Although the Amazon river basin is usually associated with Brazil, the fact is that almost half of its territory falls within the Andean countries[1]; therefore, one could say that the upper watersheds of the Amazon river constitute the second most noteworthy common factor in the geography of these countries.

Bolivia is the southernmost of the five countries, with a territory of 1 098 581 km^2. Situated between the parallels 9° and 23° South, it belongs to the tropical zone. However, the presence of the Andean cordillera makes for great variations in climate and eco-systems. Temperatures and rainfall increase gradually from west to east, according to the topography. Humidity goes up from south to north, in the mountains as well on the eastern plains. The rainy season varies greatly in length; it is up to 11 months long in Chapare and less than one month in the southern part of the high plateau ("altiplano").

The country is usually seen as divided in two large areas: the Andean highlands (414 574 km²) and the eastern lowlands (684 007 km²). These can be further divided into the following natural regions:

High mountains: Areas located at altitudes above 4 400 meters; includes the dryer zone mainly in the Western Cordillera and the semi-humid zone in the Eastern Cordillera, with a richer flora and fauna. Eternal snow goes down to 5 300 meters.

The Puna region (mountain plateau – "puna"): Between 3 400 and 4 400 meters above sea level. The region includes the "dry puna" which allows cultivation of Andean tubers and cereals (e.g. quinua) and where the fauna is similar to the one in the high mountains. Potatoes and barley are grown on he "semi-humid puna", which is meadow land with shrub. The Puna region also includes large dried up salt lakes and other areas where human activities have destroyed all vegetation. The average annual temperature lies between 11°C in the north and 7 °C in the south, but daily variations can be extreme, from 36°C in the day to - 25°C at night. The southern part of the high plateau is the driest area in Bolivia, with less than 100 mm rainfall per year.

The Yungas region: Altitude between 1 500 and 3 400 meters. High humidity and moderate to high levels of rainfall. At the higher levels there are dense forests of evergreen trees (e.g. pine) and a very diverse fauna. At the lower levels (1 500 – 2 500 m.), there is also a very diverse fauna and production of citrus fruits, coffee and coca.

Inter-Andean ranges and valleys: Altitudes between 1 800 and 2 800 meters. Average annual rainfall is 600 mm. Corn, tomatoes, peanuts and many other agricultural products are grown here.

Sub-Andean belt: Humid forests in Alto Beni and Chapare. Production of rice, plantains, citrus fruits and, of course, coca. Chapare is the centre of coca production in Bolivia. The semi-humid forest that goes from Santa Cruz to Tucumán in Argentina is intensely exploited for timber. Soya, sunflower and cotton are grown in the area.

The Beni and Pando plains (north-northwest): Tropical forest below the altitude of 500 meters. Tropical climate with abundant rainfall and flooding in the summer. Contains economically valuable tree species and important fauna. Savannas at around 200 meters, with grazing land and aquatic plants.

[1] Throughout this report, the Member States of the Andean Community are, for the sake of simplicity, called "the Andean countries", even though there is a sixth Andean country that does not form part of the Community (Chile).

The south-eastern plains: Between 300 and 1 200 meters there is semi-humid forest in a transition area between the Amazon forest and the dry forest of the Chaco. The semi-dry Chaco forest (thorny brush and "quebracho" hard-wood) is found at altitudes between 100 and 350 meters. Variable precipitation, average annual temperature 24ºC but with sudden brusque falls due to cold winds from the south.

Peru is the largest of the Andean countries (1 285 000 km²). Its topography is dominated by the Andean cordillera, which crosses the country from north to south generating three main geographical features: the Pacific coast, the mountains (sierra) and the Amazon forest (selva). Hydrographically, the country presents three main systems: the Pacific, the Amazon and the Titicaca Lake.

The Pacific Coast, which is mostly a rather narrow strip of land between the mountains and the sea, has an arid and semiarid climate, with hot days and cold nights. This area occupies about 10% of the territory and concentrates most of the country's population and industry. The topography is generally flat with presence of small elevations and valleys (or oasis) along the rivers. These valleys have the most important agricultural activities of the country, with most of the arable land under irrigation

The Mountains (Sierra) reach altitudes well over 6 000 metres above sea level. In the southeast, Peru shares the same high plateau as Bolivia. The mountain region occupies about 30% of the total territory. The climate varies enormously from the very cold mountain tops to hot valleys and from sub-humid to semi-arid conditions. The rainfall ranges from 500 to 1 000 mm/year. Agriculture, livestock raising and mining are the main activities in the Sierra.

The Amazon Forest (Selva) occupies about 60 % of the territory and is mainly covered by dense natural forest. The climate is sub-tropical humid to tropical humid with a rainfall that ranges from 1 500 to 7 000 mm/year. As is well known, the Amazon forest is very rich in biodiversity containing numerous species of fauna and flora. Wood production, petroleum and natural gas exploitation are the main economic activities of the region. However, agriculture and livestock production are also present. The environment is extremely fragile, specially when human activities result in deforestation and land denudation. This is the case with agricultural and livestock production, which have resulted in erosion and land degradation on the slopes.

Ecuador, with a territory of 285 000 km², is much smaller than any of the other Andean countries. It has a geography which is, in general terms, very similar to the Peruvian one: Andean cordillera, coastal area and Amazon forest ("Oriente"). To this, however, must be added the Galápagos islands which compose a unique region of their own.

The Ecuadorean coastal plain is, proportionately, much larger than the coastal plains of the other Andean countries. Its climate and eco-systems vary considerably from the north (tropical rain forest) to the south (semi-arid). It is heavily populated and exploited, being the most important area for agriculture (bananas, rice, etc.) and for cattle raising. The country's largest city and industrial and commercial centre, Guayaquil, is located here where the Guayas River runs into the sea. The climate is tropical with high levels of precipitation during the rainy season. Serious flooding is a problem that returns every year and reaches catastrophic proportions when the "El Niño" phenomenon occurs.

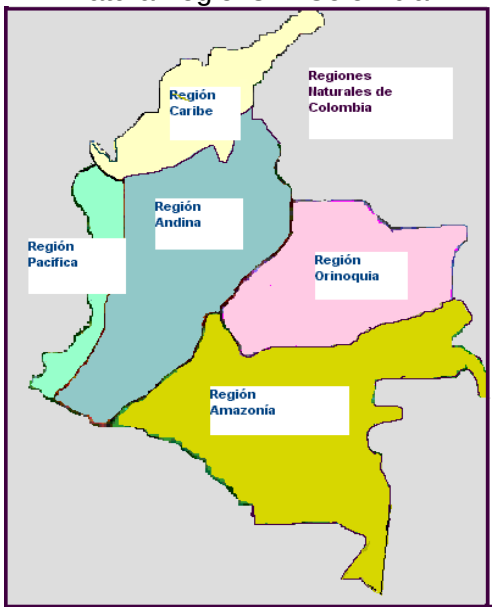
In northern and central Ecuador, the mountain area consists of two parallel cordilleras, here and there joined by transversal elevations. Landscapes, climates and eco-systems are very varied, in so-called micro-climates. One finds green meadows and lakes very close to pure desert areas. In the southern part of the country the Andes splits into a more complex system of mountain ranges and valleys and the climate becomes drier. Since Ecuador is located on the equator (between parallels 1,3º North and 5º South) the climate is warmer than in Bolivia and Peru, on equivalent altitudes.

The eastern third of the Ecuadorean territory consists of the Amazon tropical forest. The northern part of this area is heavily affected by human activities; oil exploitation began here in the beginning of the 1970s and was followed by a disorderly immigration of settlers. The forest areas in this part of the country are being severely damaged by the oil business (deforestation and contamination of water and soils) as well as by logging and inadequate agriculture and cattle raising methods. The area closest to

the Colombian border is affected by coca fumigation done under the Plan Colombia and there are some serious social problems caused by the arrival of Colombian refugees as well as guerrillas who have sometimes used Ecuadorean territory as a sort of rest and recuperation area.

Colombia, with a territory of 1.141.748 km² (very similar to Bolivia), is also characterized by the presence of the Andes, which split up into three ranges here, separated by the Magdalena and Cauca rivers. The country can be seen as divided into six natural regions, as shown in the map and chart below. There are four main watersheds: the Pacific, the Caribbean, the Orinoco basin and the Amazon basin.

Natural regions in Colombia



NATURAL REGIONS IN COLOMBIA		
Item	**Natural region**	**Characteristics**
1	**Caribbean**	Great variations in topography and climate. For instance, the Guajira peninsula is very dry, while there are humid and rainy areas with frequent flooding around the rivers to the south. Forest cover and vegetation is abundant in the northwest (Urabá) and scarce in the Guajira and in he Magdalena delta. The Caribbean region holds 21,6% of the Colombian population and is one of the most intervened areas in the country. Its natural conditions have been transformed by human activities up to 90%, and 72% of the territory is affected by moderate to high erosion.
2	**Pacific**	Western fringe of the country with homogenous characteristics: humid tropical forest on level land (Chocó). This area has one of the highest levels of precipitation in the world and rainfall continues throughout the entire year. It has lower degrees of human intervention and erosion and still contains important forest cover and biodiversity (Chocó).
3	**Andean region**	The three cordilleras and the numerous valleys, mountains, plateaus and watersheds – at different altitudes - produce a great number of different sub-regions with different characteristics. Types of vegetation range from humid tropical forest in the Magdalena river valley to xerophytes in dry areas in Huila. Rainfall varies from 300 to 4.000 mm/year. The Andean region above 500 meters contains 70% of the country's population. About 70% of the area has been transformed by human activities and 45% of it suffers from moderate to very high erosion.

4	**Amazon region**	Mostly level land with humid tropical forest. Many large rivers, tributaries to the Amazon river, run through the region. The population is scarce and consists mostly of indigenous groups.
5	**Orinoco region**	Also known as the Eastern Plaíns (llanos orientales). Level land with savannah type vegetation. Cattle raising.
6	**Insular region**	San Andrés and Providencia archipielago, 700 km from the coast. Tourist and trade centres.

Venezuela is located in the north of South America in the inter-tropical climate zone. The country's total area is of 916,445 Km² (slightly less than Bolivia and Colombia). The country's topography and nature are regionalized as follows.

	NATURAL REGIONS IN VENEZUELA
Regions	**Main characteristics**
Andean-Coastal	Has 80% of the country's population and most of the economic activities. The area concentrates the industrial, commercial and financial sector and most of the petroleum extraction activities. The region also shows the highest levels of environmental damage, such as water and air pollution and inadequate handling of solid wastes.
Guayana	58% of the territory and 5,8 % of the population. It is a reserve of biodiversity and one of the biggest virgin forest areas in the world. There are several parks and protected areas and, in general, their conservation status is acceptable. However, illegal mining, trade of fauna and deforestation has resulted in severe environmental damages in other parts. The most important hydroelectric plants, producing 75% of the country's electricity, are located in this region. In the Amacuro delta, where the Orinoco river meets the sea, there are about 30 different indigenous groups.
The plains (llanos)	This region has 19 % of the territory and concentrates about 19 % of the population. Livestock production, agriculture, oil and gas extraction are the main economic activities. There is a great potential for ecotourism but it is not utilized.
Marine areas	These comprise 423,579 Km² in the Caribbean sea and 78,811 Km² in the Atlantic. It is a zone of great potential in fisheries and tourism. It also has deposits of natural gas. This region receives all the contaminated waters from inland and the direct pollution from the coastal cities and industry.

Source: Estrategia Nacional Sobre Diversidad Biológica y su Plan de Acción. MARN 2001

The climate varies from semi-arid to tropical humid. The mean annual precipitation varies from 400 mm in the semiarid areas to 3.400 mm in the Guyana rain forests. The annual mean temperature varies between 16 ºC in the high part of the Andes and 30 ºC in the lowlands. The relative humidity ranges from 30 to 95 %.

Venezuela is rich in water resources. The Orinoco River is the second biggest system in South America with a basin area of 990,000 km² and a water flow of 37.384 m³/second. Other important hydrological systems are Lake Maracaibo, the Caribbean Sea, Lake Valencia and the Cuyuní River.

The above descriptions of geography and climate are short and sketchy, since space in this report does not allow the introduction of any more details. They should, however, be sufficient to show the enormous geographical diversity within each one of the Andean countries and – even more so – within the region as a whole.

2.2 ECONOMIC TRENDS AND SOCIAL CONDITIONS

After the so called "lost decade" in Latin America (the 1980s), the Andean countries saw some macro-economic improvement during the 1990s, although it was far from stable and equitable. Between 1992 and 1998, the GDP grew in all the countries; in Bolivia, Ecuador and Venezuela by more than 2% per annum. In the period 1999 – 2002, only Bolivia and Peru had some growth in GDP, while Colombia, Ecuador and Venezuela experienced a contraction. According to currently available CAN statistics, real GDP fell in 1999 in Colombia (- 4,2%), Ecuador (-6,3%) and Venezuela (-6,1%). In 2003, all the countries had again a positive growth, except Venezuela (- 9,4%).

At the same time, however, the change in GDP per capita over the period 1990 – 2002 has been extremely modest or disappointing: Bolivia 1,1%, Colombia 0,4%, Ecuador 0%, Peru 0,6%, Venezuela -1,0%. Many observers would argue that the 1990s have turned out to be yet another "lost decade" for these countries.

As regards economic and social trends in the Andean countries, strong emphasis is made here on the poverty issue, since it is a basic hypothesis of this environmental profile, that there is an extremely strong circular cause-effect relationship between poverty and unsustainable management of natural resources and environment. Widespread and profound poverty around small enclaves of great affluence is, unfortunately, one of the main characteristics of all the Andean countries.

As shown in the following table, the distribution of income is extremely inequitable and has become even worse over the last three or four years.

INCOME DISTRIBUTION IN THE ANDEAN COUNTRIES

Country	**Survey year**	**10% poorest**	**20% poorest**	**20% richest**	**10% richest**
Bolivia	1999	1,3%	4,0%	49,1%	32,0%
Colombia	1996 1999	1,1% 0,8%	3,0% 2,7%	60,9% 61,8%	46,1% 46,5%
Ecuador	1995 1998	2,2% 0,9%	5,4% 3,3%	49,7% 58,0%	33,8% 41,6%
Peru	1996 2000	1,6% 0,7%	4,4% 2,9%	51,2% 53,2%	35,4% 37,2%
Venezuela	1998	0,8%	3,0%	53,2%	36,5%

Source: UNDP Human Development Reports 2002 and 2003

As regards poverty, there are different ways of measuring it (both in theory and practice) and many actors do indeed study the issue, with different figures as a result. This is not the place to go into any detailed analysis of the matter, but it may safely be said that poverty has not seen any overall substantial decrease in the Andean countries over the last 10 years, but that it has rather increased in many parts (see table below).

PERCENTAGES OF POPULATION BELOW NATIONAL POVERTY LINES				
Country	**Year**	**Rural**	**Urban**	**National**
Bolivia	1997 1999	77,3% 81,7%		63,2% 62,7%
Colombia	1995 1999	79,0 79,0	48,0 55,0	60,0 64,0
Ecuador	1990 1994 2001	47,0	25,0	40,0 35,0 45,0
Peru	1994 1997	67,0 64,7	46,1 40,4	53,5 49,0
Venezuela	1989			31,3

Source: World Bank; World Development Indicators

On a country by country basis, the following data on economic and social trends should be highlighted.

Bolivia

Economic growth and stability and increased welfare of the population have been the main objectives of economic policy over the last decades. Important structural reforms have been undertaken with regard to administrative decentralization, the development of the bases for a market economy, promotion of foreign investment, simplification of the tax system, liberation of interest rates and – perhaps the most significant – the privatization of public enterprise.

The Bolivian economy is based on mining and agriculture and, increasingly, on natural gas. The Bolivian gas reserves amount to 52 TCF. Of the total Bolivian exports, minerals make up 25% and gas 22%. Tourism is on the increase, but this sector is negatively affected by the political instability and the social conflicts.

In terms of human development, Bolivia (with a population of 8,5 million) has an index of 0,648 as against a Latin American average of 0,760. Of the economically active population, 46.4 % is to be found in the primary sector (agriculture and mining). Utilization of biodiversity is an economically important activity, which stands for 4% of GDP and 9% of employment. The GDP per capita is USD 961 and the external debt (in millions of USD) amounts to 4.117.

The economic crisis in Bolivia is, of course, related to international and continental recession, but it arises as much from internal causes, such as: eradication of coca growing; mismanagement of public funds; general corruption; and the lack of coherence in economic policies. Over the last two years, the acute national conflict on how to handle the gas resources, lends a considerable degree of uncertainty to any forecast of the country's economic future.

Social indicators in Bolivia have improved over the last decades but are still far worse than in the neighbouring countries. For instance, while life expectancy in Latin America is 70 years, in Bolivia it is 62. Infant mortality reaches 60/1000 as against 32/1000 for the region.

Colombia

The economic growth has been irregular over the last years; the highest GDP increase recorded was in 1993 (5,7%) and the lowest in 1999 (- 4,2%). At the end of the 1990s, the unemployment rate reached 20%. Income per capita fell from USD 2.257 in 1996 to USD 1.890 in 2001. However, there have been signs of reactivation in the last two years, with a GDP increase of 3,74% in 2003. Unlike Bolivia, for instance, the most important economic sector in Colombia is the tertiary sector. However, natural resources have an important participation in the GDP; in 2002, agriculture-forestry-fishery contributed 15% and mining, gas etc. represented 7%. They also account for 60% of exports in the last ten years.

In 2004, the population of Colombia is estimated at about 45 million, of which 24% is of African descent, 1,8% indigenous population and the remainder mestizo, white and others. About 70% of the population is concentrated in the Andean region and 22% in the Caribbean region. The processes of modernization and economic deregulation, together with rural violence have led to an increasing urbanization; 72% of the population now live in cities and 33% live in the seven biggest cities. However, some rural areas still have a high population density, for instance the coffee growing areas.

According to official data, half of the Colombian population (23 million) are poor and 7,4 million are extremely poor. Two million children are malnourished, 6,7 million persons are underemployed and the unemployment now stands at 15%. The social and economic inequalities between different groups of people in Colombia reflect profound, historical disputes about land ownership and a confrontation between different development models or perspectives – for instance, the collision between the agro-industrial model, linked to the world market, and the small farmers' subsistence economy. The contra-insurgency fight has played an important role for the modernizing purposes of some sectors which have the political and economical power; it has generated more poverty and deprivation of the rural poor, who are forced to move to the cities and confront situations of marginality, unemployment, informality and illegality. The number of people who are displaced each year is about 300.000; some of these people are displaced for the second or third time.

The General Comptroller's Office desribes the situation as follows in the document called “Evaluación de la Política Social 2003”:

“Colombia is today living a humanitarian crisis without precedents in its history. This crisis expresses itself – among many other elements of insecurity and vulnerability – in the notorious increase of poverty during the last decade, which reached higher levels than those of two decades earlier; in the reduction of income for large segments of the population equivalent to a retrocession per capita of 25% in USD terms; in the highest rates ever of unemployment; in the serious situation of many families which have been displaced by the violence; and in the lack of opportunities in the countryside. The nature and magnitude of the social problem faced by the country are of structural origin and therefore very difficult to remedy.”

To the general situation of social injustice and economic exclusion of large sectors, one must add an increasing deterioration of cultural and ethical values, due to the degradation of the armed conflict and the crisis in the educational system.

This report is not the place to go into economic details and complete social statistics. However, the Technical Appendix contains various tables (1 - 7) on these issues in the case of Colombia; they may be of interest to some readers, as one example of an Andean economy and society in difficulties.

Ecuador

In the case of Ecuador, the World Bank's Poverty Assessment (April 2004) found that, while access to basic social services has improved slowly but continuously since 1990, the national consumption-based poverty stood at 45% in 2001, compared with 40% in 1990, while the number of poor people increased from 3,5 to 5,3 million during the period. The poverty increase was highest in urban areas,

due to migration and the 1999 bank and financial crisis, but also in rural mountain areas, the poverty went up by 15%.

During the last twenty years, Ecuador has had a low increase in GDP. Real GDP per capita went down by 0,5% per year between 1980 and 1990 and has more or less stood still since then. The poor economic performance of Ecuador is to some degree caused by external factors, including natural disasters, but mainly it is a consequence of bad policies, wobbly government and slow increase in productivity. The relationship between productivity and growth has become even more significant since 2000, when Ecuador adopted the US Dollar as national currency. By doing this, the country abandoned the possibility of using monetary policy as an instrument for increasing competitiveness.

In addition to the generalized poverty among people still in the country, the other dramatic manifestation of the economic crisis in Ecuador is the emigration. There was always some emigration from Ecuador to the United States, but after the crisis 1999-2000, this became a mass movement. It is estimated that 1,5 million Ecuadoreans have left their country in the last four years, the majority to Europe. At present, there are almost 400.000 legally registered Ecuadorean immigrants in Spain, which has been the most popular destination, followed by Italy. The number of illegal immigrants is also significant. Ecuador has, for the first time in its history become an exporter of people and an importer of remittances; according to the Ecuadorean Ministry of Finance and Economy, the remittances totalled 1,5 billion dollars in 2003. Unfortunately, there is as yet no mechanism in place to help to channel these resources to the productive sectors in an orderly manner; much of it goes to consumption of imported luxury goods.

Peru

Peru has a population of 26,7 million (2002) of which 73 % is urban and 27 % rural. Over the last decade, the investments made in infrastructure and services have improved various development indicators. For instance, child mortality has gone down from 54 to 32 per thousand between 1990 and 2000 and access to secondary education has increased. However, at the same time, the percentage of people below the poverty line has gone up to 54,8% in 2001 and extreme poverty has reached 24,4% of the population.

While institutions like the World Bank are of the opinion that Peru's economic policies are sensible, they also observe that progress is hampered by weak government. The public administration is not very transparent and policy coordination is inadequate, which leads to organizational confusion, duplicity among programs and an excessive centralization. The poverty in Peru is the cause of strong political and social pressures throughout the country, claiming regional development, subsidies, tax exemptions and more social services and benefits. In recent times there have been frequent incidents of violence over such issues.

The country’s main economic activities are mining and fishing. In the mining sector, copper occupies the first place followed by gold, iron and silver. The “anchoveta” is the most important species in the fishing industry as it is used in the production of fish meal and oil. This activity represents about 80% of the national production and about 92% of the fishing industry’s total export. The fishing industry suffered a set-back during the seventies due to overexploitation of the anchoveta. A recovery occurred during the last decade; however, the “El Niño” phenomenon during 1997 and 1998 produced a new low for the industry. The sector employs about 125.000 persons and contributes 1,4% of GDP.

The great diversity of eco-geographical zones, from the coastal desert to the tropical rain forest and the high altitudes of the Andes, makes Peru a country with a rich bio-diversity, offering unique opportunities if the natural resources were managed in a sustainable way. For instance, among the Andean countries Peru is the one with the highest percentage of forestland; 58.9% of the total territory is covered by forest (67.562.000 ha).

The table below shows forestry sector production in 1996 (millions of m^3) and the value of the wood and non-wood products export during 1998 (millions of USD). There is general consensus that forestry production in Peru – even if it seems large – is highly ineffective, often unsustainable and with limited realization of the real value of the raw material. The forestry sector in Peru is, to a considerable degree, based on numerous and huge concessions on state-owned lands, with little or no supervision.

FORESTRY SECTOR PRODUCTION IN PERU (1996)							
VOLUME (million m^3)						**VALUE (million USD)**	
Charcoal and firewood	**Logs**	**Sawn timber**	**Board**	**Paper pulp**	**Paper**	**Wood**	**Non wood**
7.315	1.546	693	83	48	140	54	31

Source: Adapted from GEOANDINO 2003. CAN/UNEP

The participation of agriculture in the GDP was 7,8% in the year 2000. In absolute figures, Peru's total agricultural GDP in 2000 was 4.923 million USD which contributed 9,4% to the total agricultural GDP of the Andean Community.

Agricultural activities are more developed in the coastal area where there are high levels of technology while in the mountains the production systems are more traditional. In the Amazon region, the agricultural and livestock activities are restricted. However, people are invading the forest in search of fertile soils. In the Andes, there is a great potential for wool production from llamas and alpacas, but little is done in terms of research, improvement and marketing.

Venezuela

The 2001 census showed that 80% of the population live in the northern region (Andino-costera) which has only 20% of the territory. The situation of the indigenous ethnic groups, living mostly in the natural forest areas, has been neglected for many years. However, the 1999 Constitution ratifies the rights of indigenous populations according to the Rio de Janeiro convention. The constitutions grant and valorise their own cultural, health and economic practices. It recognises their right to basic services and protects intellectual property on knowledge, techniques and innovations. The approval of the law on land demarcation marks the start of the process, but there is still a long way to go.

Until the beginning of the 20^{th} century, Venezuela was an agricultural and livestock-producing country. Later on, after the discovery of petroleum, the country became a mono-producer and exporter of oil. This resulted in a flow of resources and people to the oil sector and areas, producing unbalances in population distribution and resources allocation.

It is relatively recently (1960 -80) that the country invested in a modern agriculture and forest management. At the same time, the cities were modernized and a network of roads was constructed. This fact together with the development of manufacturing industry resulted in an increase of the per capita income. However, poverty and population concentration remain as serious problems and a threat to the environment.

Being a country rich in natural resources, with one of the largest oil and mineral deposits in Latin America, Venezuela has a great potential to achieve a sustainable social and economic development. Currently, petroleum accounts for 25% of GDP, 80% of exports and 50% of fiscal revenues (like in the case of Colombia, the Technical Appendix contains more details on social and economic

indicators; Table 8). Unfortunately, the country suffers from a prolonged economic and political crisis, high levels of crime and violence and long-term social ills such as extreme inequality and poverty. The percentage of Venezuelans living in poverty (household income of less than 2 dollars a day) has increased from 32,2% in 1991 to 48,5% in 2000. Likewise, the proportion of those living on less than 1 dollar a day (extreme poverty) has gone up from 11,8% to 23,5%. Most observers agree that the biggest obstacle to stable growth in Venezuela is its polarized political climate. To this can be added the historical inefficiency of the public sector, which has blocked the implementation of effective poverty-reduction policies.

The government has designed a 10 year development plan aiming at diversifying the economy and reverting the geographical concentration of the people through regionalization, sustainable use and management of natural resources as well as sustainable industrialization. The plan defines three development pivots: Occidental, Oriental, and Orinoco-Apure. Details can be found in the Technical Appendix (Table 9).

2.3 OVERALL POLITICAL, ADMINISTRATIVE AND LEGAL CONTEXT

The foundation for the Andean Community of Nations (CAN) was laid 35 years ago (1969), by the adoption of the Cartagena Agreement. In comparison with what has happened in the European Union since that year, the progress of the CAN is modest, to use a cautious term. Most of the time, the matter of economic and other integration between the Andean countries has held a low priority on the agendas of the Member States. Anything else could hardly be expected, considering a variety of elements, including the fact that two of them were even at war with each other, as late as 1995 (Peru and Ecuador).

It can be argued that economic integration and free trade must not necessarily be considered as the most urgent or important issue in these countries. More important than regional integration could be the strengthening of the competitiveness and productivity in each one of the countries – and the pursuit of a higher level of internal economic and political rationality in general.[2] However, this is not the real reason why successive national governments have paid little attention to the Andean Community – the real reason is that they have always had other more pressing issues to take care of. In other words, the limited progress in the integration efforts between these countries is basically due to the enormous internal problems of each one of them.

Over the last ten years, the most important common denominator among the Andean countries, in political terms, is the governance crisis. The case of Colombia is probably the best known of all, since the internal armed conflict in this country has been going on for over 50 years by now, although with changing characteristics and actors. Even though the country managed to eliminate the big drug barons at a point in time, the drug traffic and the warring parties ("guerrillas", AUC and high level allies) keep well and alive. The U.S contribution of 1,3 billion dollars to the so called Plan Colombia does not seem to have produced much else than human rights violations and additional damage to the environment and the human health through fumigation (this includes border areas in northern Ecuador).

Paradoxically, Colombia has managed to maintain formal democracy throughout the 1990s; Presidents and governments have succeeded each other peacefully and on basis of elections whose fairness have not been debated. So has Venezuela, even though this country has gone into a phase of extreme political polarization. In the other three countries, four Presidents have been ousted in the last decade: Bolivia 1, Peru 1 and Ecuador 2.[3]

[2] It may be more than a coincidence that Chile, which left the Andean Community in 1973, is considered to be the most successful Latin American country in terms of recent economic and social development.

[3] Bolivia - Gonzalo Sánchez de Lozada, 2003
Peru – Alberto Fujimori, 2001 (fled the country before he could be toppled)
Ecuador – Abdalá Bucaram 1997, Jamil Mahuad 2000

In the case of Bolivia, the size of its territory and the insufficiency of its institutions and resources make it practically impossible for the State to even consider the possibility of controlling all parts of its geography. Traditional regional conflicts have deepened over the last couple of years, particularly in connexion with the question of how to handle the country's natural gas resources. National "disintegration" is a serious possibility, frequently debated in recent times. In November 2004, serious voices of secession are raised in the Santa Cruz and Tarija provinces. From the Andean perspective, it should be mentioned that the Mercosur will possibly be a more important centre of gravitation for Bolivia than the CAN, considering that the natural gas and other important economic factors (and actors) are located "closer" to Brazil and Argentina than to La Paz.

After years of civil war and terrorism (Sendero Luminoso), followed by the authoritarian and extremely corrupt – although economically successful - Fujimori government, Peru suffers from a general crisis of confidence, i.e. citizens' confidence in the national authorities of all sorts. Political parties are weak and lack ideology. The Peruvian parliament, like its Ecuadorean and Bolivian counterparts, is crippled by general bickering and by the dominance of short-term group interests. For instance, the Peruvian parliament has not been able to nominate an Ombudsman (Defensor del Pueblo) since the last one resigned in November 2000. The Ecuadorean parliament has managed to let almost five years pass with the same result; it has let almost two years go by without appointing a General Comptroller.

Corruption in the public sector is rampant in all the Andean countries. The Transparency International Corruption Perceptions Index 2004 lists 146 surveyed countries, among which the Andean countries take the following positions (the higher the number the worse the perceived corruption). Their scores lie between 3.8 at the best and 2.2 at the worst, on a 10-point scale. The best score obtained (Finland) is 9.7 and the worst (Bangladesh and Haiti) is 1.5.

Bolivia, rank 122 (close to Niger and Sudan)
Venezuela, 120 (like Zimbabwe and Sierra Leone)
Ecuador, 112 (equal to Yemen)
Peru, 68
Colombia, 61

The Ecuadorean CPI has deteriorated recently, while the Colombian CPI has approved somewhat over time. Even if Colombia is perceived as the least corrupt of the five countries, indicators here paint a dramatic picture (Technical Appendix; Table 23).

The systems of law in the Andean countries suffer from various weaknesses. First of all, it must be pointed out that in line with 16th century Spanish tradition, there is an excessive "legalism", meaning that there is a generalized idea that any kind of problem is best (or only) solved by issuing a new law. Consequently, there is an enormous number of laws formally valid at the same time, and often contradictory between themselves, as well as outdated in their relations to reality. In Ecuador, for example, the number of legal instruments currently in force is estimated at 60 000 – 65 000; of course, nobody knows the exact number of laws and much less the contents of most of the laws. Laws are very often elaborated in a hurry and "behind closed doors" in parliaments or parliamentary commissions. There is often no serious analysis of issues behind the laws, and usually no consultations with citizenry and interest groups; it follows that many laws are inapplicable from the very beginning.

In this generally gloomy panorama, there are some points of light, however. The Andean countries have seen some notable improvements with regard to the defence of human rights and, above all, in terms of decentralization, local government and popular participation. They have all embarked on processes of decentralization of government, specially to the municipal level. Bolivia may be the strongest case in point, having issued the very radical and innovative Law on Popular Participation in 1994. While all these decentralization processes have followed winding routes and still have a long way to go before they reach their respective goals, there is no doubt that what show-cases there are in economic and social development in the Andean countries can mainly be found on the local or regional levels. Without help from distant and ineffective central governments – and sometimes in

spite of them – there are local actors in different places, who have been able to start important processes of development and improvement of living conditions, including environmental aspects.

Civil society in the Andean countries is increasingly playing a role in lobbying at the political level and in execution of concrete programmes and projects. Local community organizations, indigenous organizations and social movements of different kinds are very active in different areas. However, in some sort of overall estimation, civil society in the Andean countries is far from having the solidity and the influence that it has in European countries. In certain cases, large components of civil society, do in fact work in a clearly anti-systemic manner; one case in point is the intervention of some labour and indigenous organizations in Bolivia, which only claim "the natural gas for the Bolivians" without having any practical proposal for how to get it out of the ground and convert it into something of value. Similar stances are taken by some big organizations in Ecuador which are "against" everything the governments do, but without presenting any viable agendas of their own.

Nevertheless, everything taken together, we do suggest that sustainable management of natural resources as well as control and improvement of the quality of the environment are undertakings that must mainly be realized at regional and local levels, considering the current situation of central governments, which is not likely to change very soon. Of course, the central governments must fulfil a legislative function and create generally valid – and hopefully applicable - rules of the game (the normative aspect), but they cannot take charge of the operational aspects of the matter in a satisfactory manner.

Having said that much about national governments, it follows inevitably that even less expectations should be attached to institutions like the Andean Community, as regards direct practical action in the area of environment. No matter how many supra-national legal instruments or regional strategies the CAN may produce, there is a limited possibility that these will be of much practical importance, as long as national governments have great difficulties even in producing and enforcing useful national laws. In the best of cases, a regional institution like CAN could be useful in providing studies and proposals for strategies and laws and achieve an economy of scale, by relieving member countries of the burden of repeating such exercises five times.

However, what is most absent in the Andean countries – both in general terms and as far as environmental issues are concerned – are not laws, strategies, indicators or even institutions. What is lacking is political will and quick and practical action. Sustainable management of natural resources and control of contamination, etc. are conditions for the survival of the entire humanity in the medium or long perspective. In the Andean countries, however, they are conditions for survival of large parts of the population even in a short term.

2.4 ENVIRONMENTAL ISSUES

2.4.1 Management of natural resources

2.4.1.1 Water

According to the UN World Water Development Report 2003, **Bolivia** ranks number 16 among 180 countries surveyed, as regards abundance of water resources. According to the FAO, the average annual rainfall amounts to 1 258,86 km^3, while total internal renewable water is 303,53 km^3, subterranean water produced internally 130 km^3 and surface water 277,41 km^3. The main river basins are shown in the chart below.

RIVER BASINS IN BOLIVIA		
Basin	**Surface (km^2)**	**% of total**
1. Amazon river	**724.00**	**65,9**
Abuná	25.400	
Beni	182.400	
Mamoré	249.900	
Iténes	239.500	
Yata	26.800	
2. De la Plata river	**229.500**	**20,9**
Pilcomayo	98100	
Bermejo	16.200	
Paraguay	115.200	
3. Highland plateau	**145.081**	**13,2**
Lake Titicaca	12.580	
Lake Poopó	43.100	
Salt pan basin Coipasa	28.951	
Salt pan basin Uyuni	60.450	
Total country surface	**1.098.581**	**100**

While there may be particular limited areas with scarcity of water, water supply overall does not appear to be an important problem in Bolivia for the time being. The unsatisfactory quality of much of the water, however, is a serious issue (see 2.4.2.2). Also, there have been serious conflicts about water management in recent times, for instance in Cochabamba, between defenders of the privatizing and the public management approaches.

Colombia has 45 big river basins, the most important ones being Magdalena, Cauca and Atrato. The Magdalena river basin (the river runs from south to north and goes into the Caribbean Sea) has an area of 256 622 km^2 and contains almost 80% of the population and a large portion of the economic and industrial activities. In the southern part of the country, the Macizo Colombiano produces 60% of the country's water and 21% of the hydropower. Colombia is considered as one of the countries with the most abundant supply of water in the world; the available volume is estimated at 50 000 m^3 per year and per person. The water resources are, however, very unevenly distributed in geographical terms and it is calculated that 14 million people may suffer from water scarcity under dry hydrological conditions; this figure may reach 29 million by the year 2025.

Of the total demand for water, 23% corresponds to domestic uses; the current average consumption is 135,7 l/person/day. The biggest demand of water comes from the agricultural sector (56% of the total demand) while the industrial sector requires 12%.

In the case of **Ecuador**, in the lowlands both to the east and west, there is still – generally speaking – enough water to cover all the needs, from drinking water to water for irrigation and other use. However, for the mountain area it is now clear that serious legal and institutional measures will have to be taken in order to achieve a sustainable water management. While there is still no hard evidence that precipitation would have decreased in general, there are many areas where consumption of water, particularly for irrigation, is exceeding the normal supply, sometimes very much so. Also, there is a problem with protection of water sources, especially in the so-called “páramo” areas, which are high land moors, with a very important capacity for storage of rain water; these are being increasingly damaged by the advance of the agricultural frontier.

Of the five Andean countries, Ecuador is the one with the highest proportion of irrigated agricultural land in relation to the total cultivated area (55%). Unfortunately, there is and has never been any adequate long-term planning of water use. Numerous water concessions have been given without sufficient basic information on available resources and irrigation projects have been implemented, and keep being planned by different actors, without any kind of social, or even private, cost-benefit analysis. There is a conflict of interests (or power game) going on between provincial governments and regional development corporations about who should handle irrigation projects (both want to do it).

With regard to water use and protection in general, there is something of a legal and institutional chaos, where certain aspects are being looked at by different agents at the same time and where other aspects are forgotten by everybody. On the other hand, the Ecuadorean state have gone through a privatization process of irrigation systems and there will (for the foreseeable time) be no more national, public investment in irrigation systems. However, many existing systems and not completed systems, do need considerable investment and improved management in order to be adequately used.

The distribution of the water resources in **Peru** is quite heterogenic due to the different climatic conditions. The rainfall varies from 31 to 3,838 mm /year, the first figure corresponding to the coastal area and the second one to the Amazon forest.

The country presents three main hydrological systems: i) the Pacific system with 54 river basins and a water flow of 1,098 m^3/s; ii) the Amazon system with 44 river basins and a flow of 63,379 m^3/s and; iii) the Titicaca system with 10 river basins and a flow of 332 m^3/s.

As in other countries in the Andean region the main use of the water in Peru is for agricultural purposes, which occupy about 80% of the consumed water in the country. Six percent is utilised as drinking water; 6 % is used in industrial processes; 1 % is utilised by the mining industry and o,4% are utilized in livestock production. Water administration is in the hands of several authorities, such as INRENA, Municipalities, Ministry of Health and Ministry of Energy. However, the sustainable water management is weak and the institutions do not articulate properly. Furthermore, the laws, rules and regulations are not clear; this shows that there is a lack of knowledge about the real value of the water resources.

Venezuela has important sweet water resources located in five main watersheds: Orinoco River, Maracaibo Lake, Caribbean Sea, Valencia Lake and Cuyuní River. The quantity of water in the rivers varies with the geographical location, the rivers in the north being shorter and less copious than the ones in the south. The Orinoco is the second largest river basin in South America with a total area of about 990 000 Km^2 and with a navigable stretch of 2 240 km Other important rivers are Caroní, Caura, Apure, Meta, Ventuari, Portuguesa, Santo Domingo, Uribante and Chama.

The country has developed a solid infrastructure in order to utilize the water resources for hydropower production. A network of dams produce the necessary electricity to cover the country's needs and for export to Brazil. Dams are also used for water supply to cities, agriculture and industrial use. It seems, however, that each dam is used with only one purpose, while they could very well be used in a multipurpose way as they constitute a potential for other activities as fish farming, tourism and leisure and increased agricultural production, among others.

The construction of a new big dam in the basin of the Caroní River is presently being discussed with the Inter-American Development Bank. The main purpose would be hydropower production. An interesting strategy is the introduction of a small electricity tax (payment for environmental services) which will be used to maintain and develop the catchment area where a number of indigenous people are practicing migratory agriculture.

The main threat for the water resources in Venezuela are: deforestation in the upper part of the catchments; mining; petroleum exploitation; municipality, industry and household wastewaters and

solid wastes. Most of these residues are thrown to the open water bodies polluting them and contributing to coastal pollution.

A new National Water Law has been submitted by the Government to the Parliament for its approval. It includes two interesting innovations: i) the possibility to bring together the main users in an effort to identify problems and search for solutions and; ii) the recognition of river basin councils.

The **Andean region** as a whole is, at present, in a comparatively (with many other parts of the world) privileged situation in terms of water supply. However, the water is very unevenly distributed and as demographic pressure increases and economic activities grow, competition for resources may arise, both between different user groups and between consumers in upper and lower parts of river basins. These two aspects come together in many cases, since there are many bi-national basins. For instance, many rivers start in Ecuador and go into Peru and Colombia. And, of course, even more rivers start in all the five Andean countries and end up in Brazil (the Amazon River).

As a closing note, it may be pointed out that, for the time being, the issue of water quality seems to be of more immediate concern in these countries than the matter of quantity. Nevertheless, it is high time also to start worrying seriously about the supply and demand of water in the medium and long term. The Andean countries may have a chance to do this before disaster stands at the door.

2.4.1.2 Soils

In **Bolivia**, according to the Land Use Map of 2001, the total cultivated area amounts to 3,7 million ha (3,37% of the country's territory). The Bolivian soils, both in the highlands and the lowlands, have little depth and are fragile and easily eroded. Only 2,6% of the national territory has appropriate conditions for intensive agriculture, the best lands being found in the inter-Andine valleys of Cochabamba, Chuquisaca, Potosí and Tarija. These lands (as many others) are subject to a continuous erosion process, due to inadequate use. Other causes of loss of agricultural land are the urbanization processes (Cochabamba) and the contamination of rivers with residual waters from mining activities (Pilcomayo). According to the FAO, between 1954 and 1996, the area of eroded soils has increased by 86%, from 23,7 million ha to 42,9 million.

The problems of increasing salinity and alkalinity of soils are also very wide-spread, particularly in the arid areas of the country. Light to severe salinity can be found in 40% of the irrigated land (200 000 ha). Desertification has affected 45 million ha (41%) of the Bolivian territory. The loss of soil amounts to 1,8 million tons a year, affecting 1,5 million ha.

The great inequities with regard to land ownership create one of the most difficult problems in the country; not only does it generate social conflict but it also leads to land degradation. In the highlands, where small and very small farms dominate ("minifundio") the land keeps being divided into smaller and smaller plots ("surcofundio")[4]. The fragmentation of land in minifundios force the peasants to over-exploit soil and vegetation. In the lowlands, where the "latifundio"[5] prevails, there may be a relative under-exploitation of the land combined with land-owners' oppression of hired hands (including control of their exercise of political rights).

The continuous and growing protests from peasants and indigenous peoples forced the Government (in 2002) to formulate the so called "Plan Tierra", by which it committed itself to re-launch an agrarian reform process and distribute 500 000 ha of state-owned land to 10 000 families. However, even if

[4] While "minifundio" means exactly a very small or minimal agricultural unit (very often 0,5 – 1,0 ha or even less), "surcofundio" is a linguistic innovation made to explain what an extreme minifundio is; the word "surco", means "furrow".

[5] The opposite of minifundio = a (very) large land property

this plan were to be fully implemented, it would hardly solve the problem, considering that the area in reference is equivalent to only 14% of the presently cultivated area, as above.

The great diversity of eco-systems in **Colombia** explains the diversity in the land use and cover of the territory, which is shown in detail in the following chart:

LAND USE AND COVER IN COLOMBIA 2003		
• **Types of land use**	**Ha**	**%**
- Transitory crops and fallow land	1.902.289	1,7
- Permanent crops	1.931.150	1,7
- Marginal crops in natural reserves	211.642	0,2
• **Total agricultural use**	**4.045.081**	**3,5**
- Introduced and natural pasture	29.403.792	25,8
- Weeds and stubble	8.263.786	7,2
- Pastures in natural forest	4.073.410	3,6
• **Total use for livestock**	**41.740.988**	**36,6**
- Forest	63.078.743	55,2
- Other use (rock outcrops, water bodies, urban and semi-urban infrastructure)	5.309.988	4,7
Total surface	**114.174.800**	**100,0**
Source: Departamento Administrativo Nacional de Estadística , DANE,."Colombia en Cifras 2004"		

The available data show inadequate land use, in the sense that the area used for agriculture is significantly smaller than what would be possible according to the existing potential. On the other hand, the area used for cattle raising is much larger than what it should be, according to environmentally acceptable standards. Even though the area intervened by man has doubled between 1960 and 1995 (from 19,6 million to 39,9 million ha), the area used for agriculture has decreased with 600 000 ha; the most fertile lands are dedicated to cattle breeding.

According to a recent study made by the Instituto Geográfico Agustín Codazzi (IGAC), the appropriate use of the land should be as shown in the chart below. It is interesting to note that the areas most suitable for conservation takes up 43,5 % of the territory. The main conclusion of the study is that Colombia has, within its present agricultural frontier, sufficient land for agriculture, livestock and forestry. In other words, there is, from a technical (not social or political) point of view, no need to expand these limits into marginal or protected lands.

APPROPRIATE LAND USE IN COLOMBIA 2002		
Appropriate use	**Area (ha)**	**%**
• Agriculture	21.493.538	18,9
• Cattle breeding	14.223.774	12,5
• Agroforestry	6.908.398	6,1
• Forestry	21.591.025	19,0
• Conservation	49.652.300	43,5
Source: Annual report on the State of the Environment and the Natural Resources, 2004.. IDEAM based on IGAC		

As regards soil erosion, various studies have been made but with different methods, which makes it difficult to compare results and extrapolate them to a nation-wide scale. However, the best estimations indicate that 35% of the country's territory shows degrees of water erosion, from moderate to very severe. In the Amazonian piedmont, annual soil losses vary between 0,46 and 153,57 tons per ha.

Many of the large river basins (e.g. upper and middle Magdalena, middle Cauca and César) have soil losses exceeding 25 tons/ha/year.

Since the 1960s, two parallel agricultural systems have developed in **Ecuador**: the modern large-scale establishments (haciendas) and the development of the peasantry. The haciendas can be differentiated according to the space they occupy and their orientations with regard to the market. On the one hand there are the big plantations in the coastal area which produce foodstuffs for export (traditionally bananas but more recently a variety of fruits and vegetables). Then there are the cattle ranches, based on the advance of the agricultural frontier and the reduction of forested areas. The small farmers are dedicated to coffee and cacao production for export and rice, corn and other cereals for the domestic market.

In the mountain area, the big haciendas are mainly oriented towards milk production, and recently flowers. The small farmers are now divided between those who occupy land of good quality and have some proximity to markets and communication – and those who occupy the mountain sides with more fragile soil cover and more difficult climate; the latter combine production for the market with production for subsistence. No less than 53% of the territory in Ecuador is located on slopes with different degrees of inclination; 21% is on extremely steep slopes.

According to the 2002 Agricultural Census, there were 842 888 agricultural properties in the country. Of these, 636 375 were of less than 10 ha and 248 398 had less than 1 ha. In the mountain region, the agrarian reform processes and the systems of inheritance have caused a severe fragmentation of land ownership in areas scarcely appropriate for agriculture (including the "páramos"); the end result is an enormous pressure on the land and the destruction of soils and water sources. The pattern is very similar to the one that prevails in many parts of Bolivia. Water sources have become a matter of conflict in the mountains and the same thing is probably going to happen in the coastal area rather soon. Land degradation in Ecuador is shown below.

LAND DEGRADATION IN ECUADOR					
Total Km²	**None %**	**Light %**	**Moderate %**	**Severe %**	**Very severe %**
285 000		5	23	2	4

Source: www.fao.org

In **Peru,** during the period 1980 to 2001, the quantity of arable land fluctuated between 3,2 million and 3,7 million ha. Deforestation, inappropriate agricultural practices, accumulation of rain water in roads and tows and deficient land use planning have resulted in different degrees of erosion and land degradation. Cultivation on steep slopes is one of the main causes of land degradation. FAO indicates that 70% of the territory is located precisely on slopes where cultivation is not recommended - or recommended only if accompanied by serious soil conservation measures.

LAND DEGRADATION IN PERU					
Total Km²	**None %**	**Light %**	**Moderate %**	**Severe %**	**Very severe %**
1,281,000	20	26	21	32	1

Source: www.fao.org

The areas most affected by erosion are located in the Andean region and on its eastern slopes down towards the Amazon forest. The erosion process in these soils have resulted in migrations, forest devastation and desertification, losses in biodiversity and economic resources and finally has produced a social situation of extreme poverty and lack of opportunities, creating social conflicts and political unrest.

Another important factor in the deterioration of soils in Peru is the development of modern irrigation systems on the northern coast, which has produced increased soil salinity. The natural aridity of the northern coast exacerbated by the climatic changes (especially long droughts) has accelerated the salination processes. Peru has 9,6 million ha affected by desertification and participates with 2,95 % in the total desertification in South America.

In Peru, the National Institute for Natural Resources (INRENA) has the responsibility for water resources and integrated river basin management, but the Ministry of Agriculture is responsible for the management of soils and agricultural systems. It seems that the coordination between these authorities is week and it would be necessary to strengthen it in order to achieve sustainable soil management. Furthermore, it will be necessary to coordinate, the different institutions intervening in resources management and other adjacent activities at river basin level.

The soils in **Venezuela** vary according to different ecological zones, being forestry and livestock production their main vocation. In relation to their capability, different sources present figures with great differences indicating that between 2% to 22,6% of the territory would be suitable for agriculture activities[6]. The main limitations for cultivation are the risk for erosion due to topographical conditions, lack of drainage, lack of humidity and low fertility. Regarding erosion and land degradation, FAO indicates that 84% of the soils present land degradation (see below).

LAND DEGRADATION IN VENEZUELA					
Total Km²	**None %**	**Light %**	**Moderate %**	**Severe %**	**Very severe %**
910,000	17	54	8	21	0

Source: www.fao.org

The main causes for soil losses are deforestation, over-grazing, water erosion, and chemical deterioration.

The total agricultural area (arable land) has decreased from 2 840 000 ha in 1980 to 2 640 000 in 1999. In percentage of the total area, the figures are 3,1 % in 1980 and 2,9% in 1999. Erosion and desertification, change of use, migration and lack of incentives can be mentioned as the main causes in the agricultural land reduction.

Regarding desertification, there is no official information available about its extent. However, the "Programa de Acción Nacional de Lucha Contra la Desertificación…" presents some estimates that indicates the presence of desertification in 11 provinces, mainly provinces with semi-arid and sub-humid climate. The total area affected by desertification is said to be 98 831 km² or 10.78% of the total territory.

The MARN has developed a strategy to combat desertification, in response to the UN Convention on Combat of Desertification. The "*Programa de Acción Nacional de Lucha Contra la Desertificación y la Mitigación de la Sequía de la Repúiblica Bolivariana de Venezuela*" includes sustainable management of natural resources in dry areas; education and capacity building; research and technology transfer; institutional strengthening and inter-institutional and international cooperation.

The main problems of agricultural soils in Venezuela are found in people's activity, meaning deforestation and depletion of vegetative cover, unsustainable soil management and cropping practices producing erosion, salination and toxicity, which reduce soil fertility and make plant growing impossible. The use of agricultural soils to support infrastructures and the lack of incentives for agricultural production have resulted in migrations and in the concentration of land property in some few hands, reducing opportunities for small and medium holder farming.

[6] Source: Programa de Acción Nacional De Lucha Contra la Desertificación… MARN. 2004

2.4.1.3 Forest

The following table provides the latest official data found on forest cover and deforestation in the Andean countries. They have to be taken with some caution, first of all because they are already 10 years old or more and, secondly, because reliable basic information on many aspects of forestry is generally hard to come by. For instance, in the Ecuadorean case, this table suggests an annual deforestation rate of 1,21%, while other sources now talk of a rate of up to 2%.

	Land area	Forest cover 2000	Forest cover change 1990-2000		Distribution of land cover/use %		
	'000 ha	'000 ha	'000 ha/year	% year	Forest	Other wooded land	Other land
Bolivia	108,438	53,068	-161	-.30	48.9 (1993)	3.9	45.8
Colombia	103,870	49,601	-190	-.38	47.8 (1996)	.0	36.9
Ecuador	27,684	10,557	-137	-1.21	38.1 (1992)	4.4	54.1
Peru	128,000	65,215	-269	-.40	50.9 (1990)	12.4	35.6
Venezuela	88,205	49,506	-218	-.43	56.1 (1995)	29.7	13.0

Source; FAO Forestry Country Profiles

The table shows that **Ecuador** has by far the highest rate of deforestation among the Andean countries and that it has – in absolute terms – the smallest proportion of forest cover in relation to its total territory. In the mountain areas, deforestation has been going on for a very long time and has led to severe erosion of soils and damage of water sources in many and large areas. There are some important reforestation activities here, but far from sufficient.

What is even more dramatic at this point in time is the destruction of tropical and sub-tropical forests, both in the Amazon area and in the northwest area, to the Pacific coast and the border with Colombia (this concerns to a large degree the very special Chocó forest, which runs along the coast from southern Panama, through Colombia, to northern Ecuador. The most affected area on this side is the Esmeraldas province, where forest resources are being severely depleted by logging, opening up of land for oil palm plantations and by peasants' and settlers' pushing forward of the agricultural frontier. To this should be added the destruction of mangrove by the construction of shrimp ponds.

The pattern of ownership of forest lands in Ecuador is interesting and important to bear in mind. According to a well informed source, the forest lands in Ecuador now amount to 11,5 million ha, rather than the 10,5 million indicated in the table. Of this, 3,5 million are in protected areas. Another 3,5 million are to be found on land owned (with official government recognition) by indigenous communities, for instance the *shuar* in the Pastaza Province and the *awa* on the border with Colombia. These communities are claiming another 1,5 million ha as ancestral lands, and it is not unlikely that they will obtain it at some point in time. The population of these indigenous forest owners add up to 2% of the entire population of the country.

The rest of the forest land is mostly owned by small proprietors with an average of 35 ha each. The forest-based industry owns only about 30.000 ha. This situation is very different from the one in Peru and Bolivia, where enormous areas of state-owned land are given in concessions, often with very little management and control. There are no concessions in Ecuador, and one could presume that the situation here represents a much better starting-point for sustainable forest management. To get this,

what is needed is an improvement of the productive-economic chain (increased value to the lumber and its final products), combat of illegal logging which, naturally, exerts a down-ward pressure on prices for the raw material, technical assistance in management, and stronger control in general.

In 2003, the Ministry of Environment of Ecuador implemented an outsourcing of the control of forestry activities, by hiring the Societé General de Surveillance (SGS) for this purpose. A system was set-up with a data base run by the SGS which could cross information on approved forest management plans and transportation permits with the road check-points handled by the so-called Vigilancia Verde, which is a conglomerate of NGO, the police and others. The amount of confiscated "illegal" timber quickly doubled. However, this initiative crumbled after about six months, since forest owners brought legal action against this arrangement, on the argument that it would be unconstitutional (this is a very frequently used trick in Ecuador). The case seems to have been turned down recently and the SGS may come back.

Bolivia has 10% of South America's tropical forests, but this asset is being rapidly reduced, due to the advance of the agricultural frontier, legal and illegal logging and forest fires which are mostly induced to clear land. During the 1999 drought, fires took away 13 million ha. Use of heavy machinery for clearing of land also does irreparable damage.

With an annual deforestation rate of 270 000 ha, since 1993, Bolivia has at present 54,7% of its territory covered by forest (41,5% in the Amazon area). There are 430 900 ha of extensive forest plantations. Current forestry management practices do not ensure regeneration in general, much less a maintained quality of the forests.

According to the 2003 report issued by the Superintendencia Forestal, the 2002 legal production of wood amounted to some 580 000 m³, broken down by origin as shown in the chart below:

LEGAL BASIS OF FOREST PRODUCTION IN BOLIVIA		
Type of authorization	**Volume (m^3)**	%
Forestry concessions on state-owned lands	221.291	38,04
Authorizations on private properties	221.123	38,01
Municipal concessions	18.853	3,24
Community lands	8.771	1,51
Land clearing permits	76.982	13,23
Others	34.762	5,98
Total	**581.782**	**100,00**

Two thirds of the total production of wood and manufactured wood products are exported, mainly to the U.S., UK, Italy, Peru, Brazil and Argentina. The value of the export in 2001 was 68,8 million USD for manufactured products and 26,2 million for sawn timber. The export of forest products other than wood (nuts and heart of palm) have seen a significant increase in recent years, adding up to more than 35 million USD in 2001. It is very evident that an improved forest management in Bolivia could be of great economic value to the country.

The main cause for deforestation in **Peru** is the opening of land for agricultural production. Peru has only 1,6 million ha under agricultural production which means 0,07 ha per inhabitant (one of the lowest rates in the world). The situation in the highlands, with soil losses due to erosion, has pressed the people to search for fertile soils in the Amazon forest. It is estimated that about three quarters of the presently cultivated land is located in protected areas.

As regards the legal forest concessions there are problems with the fulfilment of regulations; for instance, reforestation is not implemented as contracted. Moreover, the concessionaries sell more

timber than what is present in their concessions, taking it from areas outside the concession, including protected areas. The control by the state is week.

El Instituto Nacional de Recursos Naturales (INRENA) through its "Intendencia Forestal y de Fauna Silvestre" is the institution responsible for the protection and management of the forest resources. Among other duties, INRENA is responsible for issuing exploitation permits and for controlling the fulfilment of existing regulations. However, it is impossible for this institution to handle all its duties, since it does not have the necessary financial and human resources.

FONDEBOSQUE, a private institution funded through different contributions (Holland, ITTO, Belgium, INRENA, Government) collaborate with INRENA and the Government in forestry matters. Their field of operations is the forest concession areas where they are offering forestry management services. Presently, FONDEBOSQUE offers credits for the acquisition of mobile sawmills, technical assistance and training. It is also trying to introduce forestry certification, which has not been operational in Peru so far.

In any case, Peru is conscious of its forest resources and there are plans to activate the export of wood from the tropical forest. The Ministry of External Commerce and Tourism[7] has developed a ten years Export Plan (2003 – 2013) for the timber sector, which considers 4 main policies:

- To have clear rules
- Development of the exportable supply
- Development of entrepreneurial management at high levels
- Market development and promotion of Peruvian wood products.

Peru's National Environmental Agenda 2002 mentions the search for new investments in the forestry sector and the reinforcement of agro-forestry activities.

Venezuela also has vast natural forest resources and a considerable potential for industrial forestry production. In the 1980s, 80% of the country's total area was covered by vegetation of which 47 493 575 ha were areas with high trees. Since then, the area covered by natural forest has decreased, while plantations have had an important increase. The table below shows the development of the forestry sector during the 1990s and 2000.

VENEZUELA; FORESTRY SECTOR INDICATORS		
INDICATOR	**1990**	**1995**
Total area covered by forest (ha)	46,512,000	43,995,000
Average annual change 1990 – 1995 in %	- 1.11	
Extent of natural forest (ha)	46,259,000	43,742,000
Average annual change 1990 – 1995 in %	- 1.12	
Extent of plantation forest (ha)	253,000	589,000
Average annual change 1990 – 1995 in %	16.90	
Wood production in logs, 1999 - 2000		
	Volume (m^3)	**Value in Bolivars**
From natural forests	406,621,798	28,463,525,860
From plantation forests	910,373,256	59,193,288,440
Threatened natural forest species: number	70	

Source: Estrategia Nacional Sobre Diversidad Biológica y su Plan de Acción. MARN 2001

The 1990 – 95 deforestation rate of 1,11% is to be favourably compared with the 1975 – 88 rate of 2,72%

[7] Ministry of External Commerce and Tourism. Plan Estrategico Nacional Exportedor 2003 2013

An important factor in the conservation of the natural forests in Venezuela is the considerable number of protected areas (246), covering a total area of 50 634 561 ha. In part of these areas, the Government can issue concessions for forest exploitation. However, it is said that, during 1980 - 92, most of the deforestation occurred outside these areas. A table indicating the areas under special administration can be found in the Technical Appendix (Table 10).

The present forestry practices accompanied by other destructive and unsustainable practices are, however, a threat to the forest and biodiversity resources. In the medium and long terms, these practices are also a threat for the sustainable development of the entire country. The main immediate reasons for deforestation are, among others, unsustainable forestry exploitation (not considering reforestation), increase of the agricultural frontier, shifting cultivation, illegal logging, illegal mining and exploitation of oil and natural gas.

In **Colombia,** the area under forest cover represents about 50% of the continental territory and is spread out over all the five regions. About 42% of the natural forest is located in territories belonging to indigenous and afro-colombian communities.

The natural forests provide close to 60% of the raw materials for the national forest/wood industry (1,5 million m^3 per year). Therefore, the forest cover has suffered a significant reduction; over the last 8 years there has been an annual deforestation of 221 000 ha. Over the last 25 years it is estimated that Colombia's forest cover has diminished by 40%.

2.4.1.4 Biodiversity

All the five countries of the Andean Community are among the 10 countries in the world with the greatest biodiversity (mega-biodiversity). It would be repetitive – and the space here does not allow it – to get into any details regarding species and other aspects, but a number of detailed tables on this can be found in the Technical Appendix (Tables 12-19). What is most important is to make a quick review of the general status of the biodiversity, the processes of damage to it and the actions being taken to protect it.

In **Bolivia**, 254 plant species are at risk according to the National Biodiversity Strategy. The Red List of UICN (2002) contains 70 plant species. **Colombia** has two of the world's most important environmental “hot spots”: the Tropical Andes and the bio-geographical Chocó. It has the biggest number of bird species of any country in the world – 1 721. At present, 112 of them are threatened. More than 1000 native plant species and 24 bird and mammal species are on the verge of extinction. **Ecuador** is number 3 on the world list of countries with numerous species of amphibians and number 3 with regard to birds. Some figures on threatened species can be found in the chapter on the Galápagos. **Peru** has 110 endemic bird species and more than 5 000 endemic plant species and **Venezuela** has 137 141 species, counting both fauna and flora. For this report, no research has been made on how many of them are threatened, but most likely the situation will be similar to the one in the other countries.

The causes behind the loss of biodiversity are, in principle, the same in all these countries. The advance of the agricultural frontier, the exploitation of forests and the contamination by oil, mining and other economic activities destroy and reduce habitats. To this must be added fishing, hunting and illegal commerce with all kinds of biodiversity.

Another common trait among the Andean countries is the existence of numerous and large protected areas. In **Bolivia**, there are a total of 40 legally protected areas – but mostly without management. The National System of Protected Areas consists of 20 important areas, covering a total of 176 000 km^2, which is equivalent to 16% of the entire national territory. Most of these areas are inhabited by indigenous and peasant communities (a total of 70 000 inhabitants). **Peru** has a complex system of protected areas formed by 10 national parks, 9 national reserves, 6 national sanctuaries, 4 historical

sanctuaries, 6 protection forests, 3 communal reserves, 2 hunting reserves, 1 landscape reserve and 13 reserved zones. Those integrate the national system of natural areas protected by the state (SINANPE). **Ecuador** has 27 protected areas, covering 19,5% of the national territory. Similar situations could be reported from **Colombia** and **Venezuela**.

In the Andean countries, there is obviously no lack of protected areas "on paper", but unfortunately a very large portion of these protected areas are not protected at all – in reality. The wide-spread poverty in these countries force people to exploit protected resources and the lack of general environmental education and awareness help them to do it – and in even worse manners than necessary. But, of course, the overall economic model in these countries lead to as much or more depredation being caused by "big business". The lack of government institutions with sufficient strength in all senses, and with little or no coordination - leads to an absence of effective control and law enforcement. There is a scarcity of qualified human resources to carry out programs and projects; a scarcity of political will to allocate financial resources, decentralise power and open the way for community participation and; a scarcity of general conscience about environment and sustainable development both in the public and private sector.

Despite what has been said above, it must be pointed that, formally, there is an increasing concern about biodiversity (and the environment in general) in the Andean countries. All of them, individually, have a Biodiversity Strategy, and so has the Andean Community. In **Peru**, for instance, the Government created (2001) the National Commission for Biodiversity (CONADIB), which has the mandate to coordinate the conservation and sustainable use of the biodiversity. Furthermore, there is a National Strategy for Biodiversity and 18 local and regional strategies. The national strategy has 8 strategic lines: 1) Biodiversity conservation; 2) Integration of the use of the biodiversity in other sectors; 3) Special measures to tackle external processes; 4) Popular participation, 5) Improvement of the knowledge of biodiversity; 6) utilization of tools and mechanisms that facilitate the decision making processes; 7) Improvement in the Peruvian international image regarding biodiversity and sustainable management of natural resources and 8) Immediate actions on urgent environmental issues.

Also in Peru, the Ministry of External Trade and Tourism has elaborated a National Strategic Tourism Plan for the period 2005 to 2915, the main objective of which is "the sustainable development of tourism in Peru". It proposes activities in institution-building, manpower development, tourism promotion, sustainable environmental management in the tourism industry, and promotion of investments and cultural tourism.

In **Venezuela,** the Ministry of Environment and Natural Resources has also produced a very ambitious "National Strategy and Action Plan for Management and Conservation of the Biodiversity". Some details of it are shown in a chart, in the Technical Appendix (Table 9). This strategy is complemented with strategies targeting, water, desertification and other environmental and natural resources sectors.

2.4.1.5 Coast and seas

The Galápagos Archipielago in the Pacific, belonging to **Ecuador**, may be considered as the most noteworthy or important component of the coast and sea areas in the Andean countries, in view of its unique eco-systems, biodiversity, endemism, tourism values, etc. It is probably one of the most well known nature reserves in the world – even among the public in general. Galápagos is a UNESCO World Natural Heritage; 97% of the land territory of the islands are protected as a National Park (established 1959), and 133.000 km² of the surrounding sea has been declared a Marine Reserve (1986). The Ecuadorean Constitution recognizes the need to restrict free settling, residence, property rights and trade in the islands for conservation purposes. The corresponding Law on Special Regime for the Conservation and Sustainable Development of the Galápagos Province was promulgated in

1998. However, to date, this law does not seem to have had any practical effect on developments in the Galápagos.

In 1962, there were less than 3.000 inhabitants on these islands and the number had only gone up to 5.000 by the beginning of the 1980s. Thereafter, the rate of population increase took a drastic turn upwards, for different reasons; tourism and related services increased, so did fishery activities and, around 1999-2000, even the economic crisis in Ecuador (bank collapse, dollarization, etc) made people move to Galápagos in search of new opportunities. In 2004, the resident population in the Galápagos is estimated at 20.000 or more and is expected to reach 30.000 by 2010. The number of visiting tourists in Galápagos has, over the last few years, increased by 10 – 12% annually and stands now at about 100.000/year, about 70% being foreigners.

The increased pressure on the habitat, both by the growing local population and by tourists does, of course, pose a threat to the eco-system and the wildlife. Already in 1997, more than 20% of bird species, 35% of mammals and more than 40% of reptiles were classified as endangered. In 2002, 58% of evaluated endemic flora is classified as vulnerable or in danger. There are also severe problems in the Marine Reserve, particularly with regard to illegal fishing of shark (for the fins) and sea gherkins. The latter are the object of conflicts between fishermen and the Ministry of Environment at the present time.

Tourism to the Galápagos generates around 100 million dollars per year for the Ecuadorean mainland and 30 million for the islands. The Galápagos inhabitants do certainly not belong to the poorest inhabitants in Ecuador. As regards international cooperation of all sorts, Galápagos has also been quite favoured. Hence, the conservation and sustainable development of the Province (the islands) is not a matter of needing more financial resources, in the short term. It is, once again, a matter of governance, social cohesion and management. Due to the recent strong population growth in the islands, 75% of the people there can be considered as "immigrants" - from all parts of the country. Their level of general education is low. The local social, political and other conflicts that are so common in the entire country are enhanced in the Galápagos, and, as one very knowledgeable observe puts it: "The magic of the islands has been lost" .

This "complex" population and its activities are supposed to be governed and administrated by a rather convoluted set of institutions. Being a Province since 1973, the Galápagos has a provincial government, three municipal governments and, of course, delegations of sectoral Ministries, like any other province. Then there is the INGALA institute (in charge of regional planning), the autonomous National Park administration and the Charles Darwin Foundation. On top of it all, Galápagos is a play-ground for numerous NGO of different sorts, many of them with their own agendas and with little or no coordination between themselves or with any other of the actors.

It is evident that the sustainable development of the Galápagos will not be attained by putting in more technical cooperation projects of the traditional sort or by creating new institutions or introducing new actors on this scene. What is needed, however (of the sort that can possibly be provided from the outside) is general and environmental education of all kinds and for all categories of the population. In addition, the international community should perhaps get together, one way or the other, to create some sort of "supervisory-advisory" body, combined with an international fund under appropriate management, to help to "put the house in order". After all, the Galápagos is a world heritage; at present, and for the foreseeable future, the Ecuadorean state and society do not have all the necessary financial resources to handle the matter nor have they shown, so far, the necessary political and administrative capacity to do it. But the latter problem has to be attacked before the solution of the former will do any good – or at least at the same time. In October 2004, some sources in Ecuador inform that discussions on an "international fund" (as above) would indeed be under way, between the Ecuadoran government and IADB (and possibly other institutions).

Venezuela has 3 806 km of continental coast mainly characterized by high temperatures (above 28 ºC). In the Atlantic, the Orinoco River Delta with flooded areas and muddy beaches dominates the

coast. The Caribbean coast presents two main features: the high coast with steep slopes between land and see and the low coast with muddy and sandy beaches. The marine life is richer in the Caribbean sea where there is a high potential for ecotourism including the presence of several islands.

The life and sustainability of the costal and sea areas are threatened by the discharge of polluted water from inland and direct discharge of municipal, household and industrial wastewaters and solid wastes from coastal cities and industries. The oil industry, mainly located in coastal areas, has contributed to an enormous pollution both in the water and land environments. An extreme case is the Maracaibo Lake, which needs urgent action implying the allocation of enormous financial resources in order to clean it up.

Peru has the second longest cost line in the CAN with 3 080 km and 790,000 km² of marine territory. Regarding mangrove, the country has 51 Km² on the north coast. Within the territorial waters, Peru has the most productive marine environment of the world, due to the Humboldt stream.

One of the main threats to the costal areas is the concentration of population here (considering 100 km inwards from the coastline). By now, 57 % of the total population is located in this area, producing a considerable amount of domestic, municipal and industrial contamination. Peru discharges about 435 million m³ of domestic residues annually along the coast, of which 128 200 tons are of an organic nature

As mentioned earlier, Peru is the second largest producer of fishmeal and the fish industry has contributed heavily to the coastal pollution and to the depletion of the utilized species due to unsustainable fishing practices. Mari-culture is becoming an important activity on the northern part of the coast and it has potential for further development. However, some problems have affected both the production (Virus disease) and the environment (environmental impact in the mangrove). The total area occupied by mari-culture is about 4 to 5 thousand ha (personal information from Environmental and Fisheries Department of the Ministry of Production).

The ministry of Production through its Environmental and Fisheries Department in close collaboration with the “Instituto del Mar” are responsible for the sustainable management t of the costal and marine resources of the country. They have been promoting a cleaner fishing industry through the recycling of their residues. They indicate the most factories are presently utiliszing recycling methods with have resulted in a considerable reduction of the residual flow in the seawaters. They also indicated that there are activities aiming at improvements in small-scale fishing. According to a spokesman of the Department, there is now a proper regional collaboration in the management of the coastal and marine resources.

2.4.1.6 Climate change

Effects of climate change are observable in the Andes, particularly with regard to the reduction of glaciers and, apparently, in changes of the traditional patterns of rainy and dry seasons. In Bolivia, Peru and Ecuador there are concrete data on the withdrawal of glaciers. The surface of the Ecuadorean Antisana glacier, for instance, went down from 21,2 km² in 1976 to 14,6 km² in 1997. One of the most important glaciers in Bolivia, Chacaltaña, is expected to disappear completely in 10 years time. This phenomenon is very disturbing, not only from an aesthetic point of view, but also because glaciers are important water reservoirs. Many irrigation systems are ultimately fed by glaciers and help to take agriculture through the dry seasons.

In **Bolivia**, there is a desertification process going on, from south to north, in the Titicaca Lake basin. Average annual rainfall is on the decrease. Increase of solar radiation, through a diminished ozone layer, has become a real problem for inhabitants in La Paz.

The Andean countries themselves are not large producers of greenhouse gas emissions neither have they entered into any commitment to reduce such emissions. Nevertheless, they have taken different sorts of actions in regard to this matter, of which some examples can be mentioned, as follows. **Peru** has a National Committee on Climate Change and CONAM has a Unit for Climate Change and Air Quality. The work of the latter appears, justifiably so, to be concentrated on air quality with short-term improvement as the main goal. Peru, represented by FONDEBOSQUE, participated in the Carbon Expo in June 2004 and presented 19 projects, of which 5 in forestry. In **Ecuador,** the creation of a National Committee on Climate in 1999 and the establishment of Unit on Climate Change in the Ministry of Environment means that an institutional embryo exists in this area. On the scientific side, close to 50 studies have been made on how to reduce emissions and how to adapt to climate change. As far as **Venezuela** is concerned, it is only in December 2004 that the Government will deliver its National Communication. This document underlines that emissions in Venezuela are very much smaller than those of the developed countries and even of many other developing countries. The Venezuelan contribution to the global emission of greenhouse gases is said to be only 0,48%.

2.4.2 Quality of the environment

2.4.2.1 Air pollution

The air quality in many of the **Peruvian** cities is much below standards due to the concentration of industries and, even more, to the high concentration of vehicles in limited areas in combination with fuels of very low quality. Lima, with 8 million inhabitants, had 67% of the total number of vehicles in the country in 1999. The Peruvian gasoline has an enormous content of sulphur – much higher than in any other Latin American country – and it is also not lead-free. There is now a plan to clean the air of Lima, based on improvements in public transport, replacement of old vehicles, and construction of bicycle roads (ciclovías) among other measures. Several international cooperation agencies (e.g. COSUDE-Switzerland and ASDI-Sweden) are supporting CONAM in air improvement projects in different parts of the country.

All these actions, and others, have their legal framework in the "National Air Quality Standards" approved by the parliament in 2001. The 13 regional groups for environmental studies established by CONAM and with participation of NGO, municipalities and regional governments, universities and representatives of the private sector have had as their first task to measure the air pollution and propose viable solutions. However, the implementation of measures is – once again - hampered by the lack of financial resources in the public and private sectors as well as by the shortage of qualified personnel to carry out the required tasks.

The general air quality situation in **Ecuador** is similar to the Peruvian one, but considerably less dramatic. Concentration of people, industries and vehicles is less pronounced, gasoline is of much better quality (less sulphur contents and lead-free gasoline is available) and considerable work has been done on monitoring of the air pollution in the biggest cities. In terms of concrete actions for improvement, the Municipality of Quito has done a great deal over the last few years, by strengthening collective transport (electric and ecological buses). Attempts have also been made to control pollution caused by the private transport sector; here, progress has been limited due to the lack of cooperation on part of bus and truck owners – not to say active resistance.

In the case of **Bolivia**, there is very little precise information available on air pollution, since there is no institution present to carry out any monitoring. The impression, however, is that the degrees of air pollution in the bigger cities are still low in comparison with those in other countries on the continent, one reason being the presence of stable wind patterns which clean out the contamination. However, the industry produces some pollution; oil refineries and mineral processing plants emit arsenic, antimony and sulphurous anhydride and mining operations produce aluminium and silicon dust. In the

chapter on forests in this report, mention has been made of the wide-spread Bolivian habit of clearing land by fire; this has taken on such proportions that it has even become an air pollution problem.[8]

Venezuela is similar to Peru as regards concentration of people and industries in a few large cities. However, Venezuela is moving towards the use of lead-free petrol and there is a very good metro system in Caracas. However, in Venezuela as in the other Andean countries, it would be highly desirable to promote and strengthen a culture of public transport, using environmental-friendly transport systems. In most of the big cities in these countries there is an enormous chaos of competing private bus and micro-bus companies, which cause much more pollution per passenger than necessary. Due to the low technical standard, danger and general discomfort in these means of transportation, anyone who has a private car is likely to use it every day, even in the face of time loss due to traffic jams and lack of parking spaces.

Air quality in the main urban centres in **Colombia** has deteriorated, due to human activities, reaching levels that are unacceptable according to national as well as international legislation and standards. Over the last few years, however, environmental authorities have been able to introduce some control of the sources of contamination. The chart below provides some interesting details.

COLOMBIA. INVENTORY OF EMISSIONS

City	Year	Total annual emissions	Main source of emissions
Bogotá	1991	329.323 tons of SOx, NO_X, PST, CO and hydrocarbons, HC, of which 87,6% CO	Mobile sources 96,8% of total emissions
	2000	1.546.851 tons of SOx, NO_X,PST,CO and hydrocarbons, HC, of which 88,3% CO	Mobile sources 96,7% of total emissions
	2003*	442.762 tons of which CO represented 69,2%, followed by emissions of Volatile Organic Compounds (VOC) with 12% and Methane 11%.	Mobile sources 84,1% of total emissions
Medellín Metropolitan Area	2000	280.615 tons. 71,4% CO, 8,2% a NO_X, 7,5% HC, 6,6% PST and 6,3% SO_X	Mobile sources 82,1% of total emissions
Cali, Yumbo	1997	461.794 tons. 69,2% CO, 10,7% VOC and 7,7% PM10.	Mobile sources 80,4% of total emissions

*Note: Data in this study are not directly comparable with the others, since it used different emission factors and methods of calculation

Source: Institutito de Hidrología, Meteorología y Estudios ambientales IDEAM. Informe anual sobre el Estado del Medio ambiente y los Recursos Naturales Renovables en Colombia, 2004.

[8] This problem has become so serious in Central America over recent years that airports have had to be closed for up to a week on various occasions.

2.4.2.2 Water contamination

As mentioned earlier, **Bolivia** holds place number 16 among 180 countries with regard to the availability of water resources. As regards water quality, however, it comes in on place 67 of 122; urban population in general does not have good drinking water and the majority of rural population consume unsafe water. Many of the rivers and lakes and also subterranean water, close to the main cities, are seriously contaminated by waste water, specially from industries. One of the most important sources of pollution in the country is the mining industry, which lets out acids and metallic and non-metallic ions. Among the most dangerous heavy metals, one can mention copper, zinc, cadmium, chrome, lead, arsenic and mercury.

Water pollution is a serious problem also in **Ecuador**, both in urban and rural areas. The country is particularly weak in treatment of urban waste water, both from industries and households. In purely rural areas, the most common situation is that waste water goes directly into water streams, without any processing at all.

Water is one of the most polluted and degraded resources in **Peru** and all sectors contribute to it: households, industry, mining and agricultural activities. The principal contaminants are general sewage, petrol, toxic substances, minerals, chemical composites and agrochemicals. Mining and fishing industry are the most worrying sectors from the water quality perspective in the country. Only 14 % of total sewage in the country is properly treated. In addition, an important part of the solid wastes is directly thrown into rivers, lakes and sea.

Regarding access to drinking water and sanitation in Peru, available figures show that 88 % of the urban and 34% of the rural population have access to clean drinking water while figures for sanitation are 89% for urban and 31% for rural population. Although the figures on water supply in the urban areas are quite high, it is important to keep in mind that the reliability of the services is not 100% and that many times people are out of water for long periods.

The high concentration of people in mega-towns, but also in smaller cities, has resulted in difficulties in both supply of clean drinking water and sanitation. This is mainly due to the lack of proper urban development planning and the urgency to accommodate migrants from the interior of the country.

The situations in **Colombia** and **Venezuela** are similar to the other countries and the presentation of more details would not add any important new elements to the general analysis.

For the entire Andean region, there is an enormous need for installation of water and sewage treatment plants. The technology is not a problem – there are many different possible solutions for different circumstances. The problem is financial, but it cannot be solved by external assistance. The only way to come to grips with it is to create systems which in the end charge the costs of installation - ¡and operation and maintenance! - to the consumers of water and the producers of sewage, no matter if they are industries or households. Many people would argue that the poverty of large segments of the population impedes this kind of approach. This is true to some extent, but it is no less true that in the Andean countries there is a wide-spread culture of “non-payment” of tariffs for public services and of taxes (not least among those who can very well afford to pay); this has to be corrected.

2.4.2.3 Solid waste management

In **Peru**, the population produces an average of 0,5 kg of solid waste per day/person, making a total production of 12 811 tons per day or 4 676 015 tons per year. At present, only half of the population have access to refuse collection. Separation and recycling of solid wastes has not been introduced and disposal is often made in inappropriate places using unsuitable methods. In rural areas, wastes are

usually thrown into water bodies or disposed of in any place, at convenience, without any environmental consideration.

Venezuela generates about 18 000 tons of diverse solid wastes per day (4 to 6 million tons per year). The recollection, handling and disposal is a responsibility of the municipalities. The problem is critical in the urban centres, as shown in the table below.

SOLID WASTE MANAGEMENT IN VENEZUELA, 1995 – 2000

Locality	Nr. of recycling centres	Nr. of disposal centres	Collection and disposal			Quantity Ton /day
			Normal	Irregular	None	
Venezuela	**286**	**140**	**27**	**56**	**41**	**17.853**
Capital district	27	3	1	3	-	3.601
Anzoátegui	9	4	-	-	4	837
Aragua	7	8	4	1	3	1.921
Bolivar	4	-	-	-	-	895
Caraboro	25	6	-	6	-	1.869
Miranda	15	1	-	-	-	1.780
Zulia	26	9	9	-	-	2.145
Rest of the country	173	109	13	46	34	4.905

Source: World Bank. Venezuela, Political Notes, Environment

In recent years, there has been an increase in recycling centres, which separate and process paper, glass and aluminium containers. This has generated an economic activity that can be increased in both quantity and quality incorporating other products as hard plastics, other metals, organic residues, wood, and others.

In **Colombia**, 27 500 tons of solid wastes are produced every day. About 75% of the municipalities handle solid waste disposal in an unsatisfactory manner. **Ecuador** and **Bolivia** do not escape the general pattern; waste treatment is practically non-existent in most of the cities in Bolivia - not to mention rural areas. In Ecuador, Quito and Guayaquil may be exceptional cases as regards garbage collection, which is working fairly well in large parts of the cities. Disposal, however, is a more complicated problem – there are no adequate installations. Wastes are mostly used as simple landfills.

2.4.3 Special phenomena

2.4.3.1 Mining and petroleum

Mining and oil exploitation are very important economic activities in the Andean countries. As examples of their environmental effects, some situations in Bolivia, Venezuela and Ecuador can be briefly commented. Mining in **Bolivia** used to be the main activity in the past, but it has decreased; gold and silver are the only mineral exploitations that have increased. Nevertheless, mining - and especially small-scale and artisan-type mining with their rudimentary methods - (which is also very present in Peru) is one of the most contaminating and destructive activities of all. On the one hand, it pollutes water and soil with substances used in the extraction (mercury, for instance). On the other hand it destroys the surface with earth movements, damage of vegetation and the use of fire-wood which contributes to deforestation. One of the most terrible examples in Bolivia is the Pilcomayo river. It has been estimated that the contamination of this river, caused by mining, creates an annual loss of million dollars to agriculture, cattle-breeding and fishery.

As is very well known, oil is the most important resource of **Venezuela**. Its exploitation affects directly the environment. The exploration and perforation stages are associated with deforestation and production of toxic mud, which is discharged into pits subjected to infiltration. Likewise, the exploitation and separation stages are associated with high quantities of toxic water, which are deposited without any environmental consideration. There is a similar situation in **Ecuador**; in general terms, it is of smaller proportions here, but on the other hand the oil fields are located in very sensitive parts of the Amazon forest, including areas belonging to indigenous communities and nature reserves.

2.4.3.2 Illicit cultivations

The problem of coca cultivation in Colombia, Bolivia and Peru is another well-known Andean issue. At least among the public in general, it is usually thought that coca growing (and more recently opium poppy in Colombia) is a problem related "only" to illegal drug production, traffic and consumption, combined with crime, guerrillas and social and public health problems. There seems to be much less awareness of the effect this kind of cultivation on the environment.

The main environmental effect of coca and poppy growing in **Colombia** is deforestation (see table below) with consequent effects on water, soil and biodiversity.

COLOMBIA. DEFORESTATION CAUSED BY COCA AND OPIUM POPPY CULTIVATION

Year	Ha deforested for coca (cumulative)	Ha deforested for poppy (cumulative)	Ha deforested for marijuana
1993	179.110	57.500	64.446
1994	214.947	76.906	8.910
1995	265.473	98.217	8.895
1996	325.649	122.294	7.479
1997	430.732	150.039	7.500
1998	537.777	181.601	7.500
1999	661.568	218.328	7.500
2000	800.478	260.422	3.000

Source: UN

The preparation of land for illicit cultivations involves burning and carbonization of biomass, which adds to the greenhouse gases and river sedimentation. The cultivation process requires the use of pesticides and fertilizers and it has been estimated that 200 000 gallons of herbicides and 16 000 tons of chemical fertilizer are used every year, ending up in soil and water. The processing of coca to cocaine needs acetone, hydrochloric acid, ethylic ether and potassium permanganate, which also have a negative effect on eco-systems. It has been calculated that some 750 000 tons of all these chemicals have been thrown around in the Colombian tropical forest over the last 14 years.

Last, but certainly not least, the fumigation carried out by the Colombian authorities with support from the U.S. adds damage to damage.

There are similar problems in Peru and **Bolivia**. In these cases, soil erosion caused by coca growing appears be proportionately even more serious, since much of the cultivation here is done on rather steep slopes, which is less common in Colombia.

2.4.4 Environment and national economy

In all the Andean countries, the primary sector plays a fundamental role in the national economies, both in terms of GDP and exports. Venezuela and Ecuador have since long ago been extremely dependent on oil exploitation and export, and Colombia also has a huge oil industry. The environmental problems related to these activities are manageable in principle. If oil companies and governments were to take the necessary technological measures, it is perfectly possible to carry on these activities without causing as great a damage to the environment as is now the case – it is a matter of costs and short-term revenues, more than anything else. The same goes for large-scale mining activities in Bolivia and Peru.

The problem with forestry, fisheries, agriculture and small-scale mining is, to a considerable extent, of another character and magnitude and of more difficult solution. All these sectors involve large segments of the population, including the poor and the extremely poor. A large portion of the population is totally dependant on short-sighted, inefficient and unsustainable exploitation of natural resources, simply because they have no other option for survival under present circumstances. There is a margin for improving this situation by increasing levels of environmental and general education but the problem cannot be entirely solved without profound structural reforms (political, economical and social).

“Sustainable development” is the key term here. It is indeed being pronounced all the time by a lot of experts and politicians as well as written in all manner of plans and strategies, but so far much too little concrete action has been taken. The fundamental reason for this is the historical, cultural, social and political fragmentation in all these countries. An improved collective economic, social and environmental welfare can be achieved only when different groups in a society start to understand that it has to be done through a process of “give and take”, that development is not a zero-sum game and that it requires long-term visions. As a wonderful example of short-term vision (or reverse thinking) one can cite the Peruvian Operational Plan for Forestry Export, which in its strategic analysis lists as a “risk” or “threat” the possibility that there will be “imminent demands for forest certification (green seal) on part of the European Union and some American buyers”.

In any case, there are certain strategies and actions that can be implemented in a short perspective, without need to cause too much hurt to any interested party – rather the contrary. These refer to the allocation and realization of the right prices and value to forestry and other related products, which can be done by putting order into the productive chains; no one stands to loose here, except possibly some unnecessary intermediaries. It also concerns the promotion and introduction of order into the area of bio-commerce or bio-trade. The Andean Community has, in fact, included the latter in its agenda. Eco-tourism is another area with great potential but wit much left to be done both by the public and private sector.

The bottom-line is that both Governments and private sectors will, eventually, have to understand that conservation of the environment is not an expenditure on luxury but an investment with a high rate of return. At present, the general trend is to assign insufficient state budget resources even to central government agencies dealing with the environment. There are some advances, however, of which one could mention Bolivia's external debt swap with the United States (372 million dollars) in order to carry out environmental programmes over 10 years.

3. ENVIRONMENTAL POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

3.1 NATIONAL AND REGIONAL ENVIRONMENTAL POLICIES, LEGISLATION AND INSTITUTIONAL FRAMEWORKS

Venezuela is something of a pioneer country in Latin America as regards formal and official attention to the environment. As early as 1976, the Government and the Parliament approved an environmental law (Ley Orgánica del Ambiente) and, in the following year, created the Ministry of Environment and Renewable Natural Resources, now called Ministry of Environment and Natural Resources (MARN).

The National Constitution approved in 1999 introduced the environmental rights and has 24 paragraphs, which put environment as a transversal matter. The legal framework is, presently, under review in order to adapt it to the Constitution. New laws, regulations and environmental strategies are coming out. The new approved laws on: "Fisheries and aquaculture", "Administration of drinking water services" and "Solid wastes" are examples of the new legislation.

In addition to being among the first, the Venezuelan environmental legislation is probably the most advanced in the Andean Community. The Government also has proper plans on sustainable management of natural resources, sanitation, social and economic development, and about the cleaning up of damaged environments. Those plans, the legal bodies and the institutional setup are a solid base for the implementation of a sustainable development process that would consider social and economic growth and productive conservation of the natural resources. However, so far, its impact on the physical environment is not what should be expected.

The MARN has the responsibility to define and implement the national environmental policies. The Ministry also provides services with regard to environmental information, technical assistance and cartography. It is organized in three Vice-ministries, each one of them containing various General Directorates. This organization is also present at regional level.

- Vice-ministry for Water:
  - General Directorate River Basins
  - General Directorate Desertification
- Vice-ministry for Environmental Conservation
  - General Directorate Biodiversity
  - General Directorate Forestry
  - General Directorate Environmental Education and Community Participation
  - Environmental Quality
- Vice-ministry for Environmental Planning and Administration
  - General Directorate Control and Monitoring
  - General Directorate Planning and Environmental Organization

At the municipal level, there are commissions in charge of environment with responsibility in the application of the municipal regulations on environment. A number of institutions of private and semi-private character are under the Ministry's umbrella.

The environmental control function (Environmental Police) is in the hands of the National Guard through their environmental division (Dirección de Guardería Ambiental). The academic sector offers courses and careers and carries out research activities that feed the public and private sector with education opportunities and valuable information on the status of the environment.

As shown above, Venezuela has a well-articulated and complete legal body and a structured environmental administration. However, as said in the beginning, this is not reflected in much real improvement in the environment. There is a series of contradictions and incompatibilities between the political rhetoric and the country's environmental performance and achievements. Problems such as

loss of biodiversity, deforestation, water pollution, inappropriate forestry, agricultural and mining systems, industrial and municipal pollution, insufficient management of solid and hazardous wastes are still important issues to be solved.

The Technical Appendix (Tables 20- 22) contains charts on reported policy progress, legislation and signed international agreements in the case of Venezuela.

The Constitution of **Colombia** (1991) and Law 99 (1993) laid the basis for the National Environmental System in Colombia (SINA). It is considered as one of the most advanced institutional set-ups in Latin America, as far as environmental matters are concerned.

The most important achievements of the environmental authority are related to the control of deforestation and destruction of natural resources, through the establishment of National Natural Parks (on 8,5% of the country's territory) and natural reservation areas (more than 15% of the territory). There is also an important advance in the elimination of lead from gasoline and recently in the improvement of quality of life in the cities, particularly Bogotá. In fact, the Ministry currently holds as the most important environmental problems of the country the water and air pollution and the deficient conditions in terms of basic sanitation and hygiene. Evidently in line with this thinking, the present Government has merged most of the functions of the Ministry of Economic Development with the Ministry of Environment to create a new Ministry of Environment, Housing and Territorial Development. This means, in practice, that the Ministry of Environment has been demoted to Vice-Ministry.

As a consequence of the acute fiscal crisis that affects all government activities, and also due to the escalation of the armed conflict, the Government interest in environment and its preparedness to allocate resources to this area are decreasing since a couple of years. Current projections indicate that they will continue to do so. Nevertheless, important regional structures for environmental management are still in place (33 Autonomous Regional Corporations), as well as various research institutions (e.g. the Instituto Humboldt). It would be necessary to start a serious process of re-orienting and strengthening of these institutions in order to put them on the real level of present limitations and opportunities in the country.

Peru decided not to create a Ministry of Environment but established instead a National Environmental Commission - CONAM (Comisión Nacional del Ambiente). The main objective of CONAM is to promote sustainable development and protect the natural resources. CONAM is a decentralized public institution. In practical terms, it acts as a coordinating body that can propose policies, rules and regulations, programmes, projects and interventions related to its area of responsibility. CONAM is not an implementing body and does not have the power to do follow-up or to sanction environmental crimes.

The implementation of the environmental proposals from CONAM or any other institution is done through environmental departments in the different sector Ministries, which normally collaborate with CONAM in the preparation of proposals. Furthermore, there are regional environmental institutions in charge of applying and controlling the compliance with environmental rules.

In addition to the government institutions there are a series of other institutions dealing with environmental issues, such as:

- The National Environmental Fund (FONAM) that operates in the areas of transport, water and residues, energy and forest.
- FONDEBOSQUE which is active in the forestry sector.
- PROFONANPE, a private environmental fund that promotes conservation projects in various areas.
- Numerous NGO that operate in different environmental areas

An important actor in sustainable management of natural resources is the National Institute for Natural Resources (INRENA) which deals mainly with protected areas, water resources and forest and wildlife.

The debate on environmental management in Peru, among interested parties, circulates around the difficulties that lie in the fragmentation of responsibilities between CONAM and the sector Ministries. Many observers feel that CONAM has insufficient authority and vouch for the creation of a Ministry, in the belief that this would help to solve the problem. In fact, certain sources have maintained that the World Bank would have tried to introduce a project to this effect, but this information has not been confirmed by World Bank representatives.

There are sensible arguments both for and against the existence of CONAM as an alternative to a Ministry. Some argue that CONAM is (or at least can be) more independent of political pressures while others see the supposed lack of authority as a serious draw-back. In our view, the question of Ministry or Council is not the big issue. The question is rather one of achieving a clear separation between normative and operational functions. At present, sector Ministries deal with both, sometimes in a rather incomprehensible manner and there are overlaps as well as voids between them. There would not seem to be any advantage in compartmentalizing environmental matters by sector in this way. In addition, one problem in each one of the sector Ministries is evidently the unavoidable contradiction between their role as promoters of development on the one hand and the environmental concern on the other hand. As one interviewee put it: “No matter what the Environmental Department wants to do, the Ministry will not do anything else than the Minister wants to do”.

In any case, Peru has achieved import advances in environmental legislation, considering the existence of the National Law on Environmental Management; the new Law on Solid Wastes; laws on forest and wildlife; law on systems for environmental impact assessment; laws on biodiversity; law and regulation on bio-security and access to genetic resources; law and regulation on protected natural areas; regulation on environmental standards of quality; law, regulations and statute on the national environmental fund and law on territorial organization.

CONAM produces a National Environmental Agenda, in collaboration with the ministries, local and regional governments and civil society. The agenda includes three fronts:

- Green front, dedicated to natural resources
- Brown front, dedicated to improvement and control of environmental quality and,
- Blue front, dedicated to environmental education, awareness and culture.

Finally, it is very important to point out that the Peruvian government is working on the implementation of a decentralization policy that should transfer some responsibility for environmental management to the local and regional governments. The decentralization programme has an implicit component of participatory democracy.

The Government of **Bolivia** has established that “since poverty reduction requires energy and materials from the environment, the (environmental) strategy should be placed in the context of sustainable development”. In line with this thinking, Bolivia does not have a Ministry of Environment but a Ministry of Sustainable Development – when created, it was the first of its kind in the world..

Bolivia has an Environmental Law with necessary by-laws since 1995. In 1996, laws on forestry, hydrocarbons, mining and protected areas were approved. The Ministry of Sustainable Development has a National Service for Protected Areas (SERNAP), but since its financing has been scarce, civil society with international support has created a Foundation for National Development of Protected Areas (FUNDESNAP), with the purpose of financing the operations that are defined by SERNAP.

A National Environmental Fund /FONAMA) was created in 1992 in order to provide the necessary funding for the fulfilment of the Environmental Law. It was successful in the beginning, with support

from the international cooperation, but later on, due to political manipulation and loss of its best human resources, it became inoperative.

In the framework of the Bolivian decentralization process, both departmental and municipal governments are in charge of environmental matters in their jurisdictions, according to their respective capabilities. However, in general, there is some lack of clarity regarding the division of responsibilities and competencies between these two levels. And, of course, many municipalities suffer a complete lack of technical and administrative capacity to handle these matters.

Ecuador has a good background in terms of environmental legislation, strategies and plans, dating back to the beginning of the 1980s. Environmental issues and policies, however, have not been very high on the agendas of recent governments and the Ministry of Environment is extremely weak in all senses. Over the last two years there have been frequent changes of incumbents on the Minister post, with discontinuity in the work as an inevitable consequence. The staff of the Ministry was on strike (on salary matters) most of October 2004 and through the end of this mission in November. Higher level political appointees kept working during this time, from alternative premises, but it turned out to be impossible to interview any of them during the week available.

Like Bolivia and to some extent Peru, Ecuador has formally launched a decentralization process, as far as environmental management is concerned, although it is moving forward very slowly. Nevertheless, considering the overall current political panorama in Ecuador, this is most likely the best prospective for real advance in sustainable development and environmental conservation.

The **Andean Community**, through its General Secretariat, is active in environmental matters. The first common effort of the Member States in this area was the elaboration and approval, in 2001, of the "Guidelines for environmental management and sustainable development in the Andean Community". In 2003, the Ministers of Environment (and equivalents) approved the Andean Plan for Follow-up of the Johannesburg Summit on Sustainable Development. This plan defines specific actions to be taken by 2005 in three priority themes: climate change; biodiversity; and water and sanitation. With support from UNEP, the CAN has produced a good report on the state of environment and perspectives for the future in the member states, under the title GEOANDINO 2003. We find it extremely important, also, to point out that in September 2004, the CAN signed a memorandum of understanding with the Amazon Cooperation Treaty Organization (OTCA). The environmental interdependence between the Andean countries and the Amazon area has been mentioned in different places in this report.

In 2001, the CAN also elaborated the Regional Biodiversity Strategy, with support from the IDB and GTZ. It was approved by the Andean Council of Foreign Ministers in July 2002. At present, the Andean Committee of Environmental Authorities (CAAM) is in charge of preparing the corresponding Action Plan and Project Portfolio. The strategy includes a proposal for the creation of a Biodiversity Institute in Ecuador, which should be in charge of planning and coordinating research between different institutions at the national levels. The office of the Andean Parliament in Quito is currently working on this. This undertaking depends on some degree of success in the mobilization of support from the international community.

The Andean Community, the Corporación Andina de Fomento (CAF) and UNCTAD have jointly designed and Andean Bio-trade Programme, with the aim of promoting investment and trade in products and services derived from biodiversity, under criteria of sustainability. All the five Andean countries have their own national bio-trade programmes.

3.2 EC AND OTHER INTERNATIONAL COOPERATION WITH THE REGION FROM AN ENVIRONMENTAL PERSPECTIVE

The time frame and scope of this consultancy have not allowed the elaboration of any complete inventory of international cooperation activities in the Andean countries, in environmental matters. However, a few interventions, especially of the European Commission itself will be commented.

Bolivia

The EC supports several environment-related projects in Bolivia, of which the most important one may be the "Construction and Rehabilitation of the Bi-national Road Santa Cruz – Puerto Suarez". A part of the EC contribution is specifically earmarked for support to the protected areas along the road. Other co-financers are also participating in a programme for environmental and social protection in the corridor. Hopefully, this will work out; experiences from some similar undertakings in the past, for instance the Brazilian Trans-Amazon Road in the 1960s, have had terrible effects on the environment. Other important EC projects concern alternative development in the coca growing area of Chapare and integrated management of the Pilcomayo river basin.

Colombia

Two EC projects are in their start-up phase: "Conservation and sustainable development of a natural reserve in the Nariño Department (humid tropical forest)" and a similar project in the north-western part of the Amazon basin.

Ecuador

The European Commission is supporting several projects in Ecuador, directly related to environmental matters: Utilization of Mangrove Resources in the Manabí Province; Conservation and Management of Native Andean Forest in the South; Natural Resources Management in the Pastaza Indigenous Territory; and Sustainable Coastal Management in the Machalilla National Park.

By the very end of 2004 it appears that a new project on Decentralization of Environmental Management in the Northern Provinces (Carchi, Imbabura and Esmeraldas) will start execution after a long delay with organizational matters on part of the Ministry of Environment, which is the national executing agency.

Other cooperating agencies also have important activities in environmental matters. As mentioned elsewhere in this report (2.4.1.4) the Galápagos is an attractive area both for multilateral and bilateral official and private cooperation. It is interesting to mention here, with reference to the institutional and governance problems in the islands, that UNDP is involved in a study to redesign the procedures for appointment of Director of the Galápagos National Park; over the last two years, there have been no less than nine Directors there. In addition to this, it should be mentioned that German, Belgian, Spanish, Dutch and Italian cooperation agencies are acting in various environment-related projects. The Netherlands, however, will withdraw official technical cooperation with Ecuador as of 2005, which is a matter of considerable concern for some NGO, which have had support from this end.

UNDP, with GEF funding, works in matters of climate change and natural disaster prevention. A large IADB programme on sustainable management of coastal resources is about to start. IADB is also involved in projects for supply of drinking water in cities of intermediate size, while the World Bank handles the same matter in cities with a population of less than 50 000.

Peru

There are a few interventions supported by the EC through NGO. Among these, the following can be mentioned:

- PROMANU; support to the conservation and sustainable management of the Manu National Reserve in the Cuzco area;
- Support to CESBI (an Italian NGO working with non-wood products from the Amazonian forest)
- Support to the Peruvian Amazon Research Institute

The World Bank has a low profile in Peru, as regards the environmental sector, since the country has not sought any credits for this. Two studies are under implementation, however: Environmental Profile of the Mining Sector idem for the fishing sector.

The Inter-American Development Bank cooperates with Peru in the following fields:
- Credit for the development of the Camicea natural gas project (600 -700 million dollars)
- Colonization and land administration in order to protect indigenous groups.
- Rural roads (150 million)
- Lima clean transport system
- Support to INRENA in forestry management
- Environmental baseline study in Lima

UNDP, with GEF funding, works the following fields:
- Biodiversity
- Sustainable use and management of the biodiversity
- In situ conservation of native agricultural products
- Management of the Lomas ecosystem in Arequipa
- Rural electrification using solar power
- Regional institutional building
- Renewable energy

Venezuela

The European Commission has no environmental project or programme with the government of Venezuela but has been supporting a socio-economic development project in the Municipalities of Libertador, Uracóa, y Sotillo. Presently most EC projects are implemented through NGO in close collaboration with local governments and communities.

Environmental issues are a priority for UNDP, which supports institution building and minor interventions in natural resources management, environmental education and in supporting Venezuela in accomplishing the international conventions on the environment. Generally the interventions are funded by the GEF and are implemented in association with a number NGO and private companies, but always with the participation of the MARN. Two interesting programmes from the environmental perspective are: “Conservation and Sustainable Use of the Biodiversity in the Biosphere Reserve and Wetlands of the Orinoco Delta” and “Biodiversity Conservation in the Productive Landscape of the Los Andes of Venezuela”

The World Bank's portfolio of pipe-line projects, currently under discussion, includes several projects regarding environmental management and water and sanitation
- Water and sanitation in rural and urban areas in eight states. This includes i) institutional strengthening, infrastructure and community participation.
- Solid waste management.
- Land information system and eco-regional planning
- Management of protected areas
- Environmental management including integrated management of hydraulic resources in four river basins
- Rural poverty, with the Ministry of Agriculture and Lands, including micro enterprises, clean production, education and inter-ministerial information system.

In Venezuela, as in the all Andean countries, the NGO community is quite big and the organizations cover a number of different sectors, having each of them a specific field of activity. They cover from the protection of particular species of fauna or flora to comprehensive programmes for environmental protection and socioeconomic development. Their main characteristic is the close contact with the daily reality of the local communities, the deep knowledge of what is going on in the environmental and their commitment to a sustainable development. Their main concern in Venezuela seems to be the loss of biodiversity, water pollution and indigenous populations.

In conversations with numerous representatives of international cooperating bodies in the different countries, it has been said many times (and this is certainly nothing new, but it has to be repeated time and again) that coordination between them is usually between unsatisfactory and poor. This syndrome is combined with the fact that the government bodies in these countries, which are supposed to coordinate international cooperation are also – usually – very weak. For instance, in Peru, the EC itself is currently supporting the Peruvian International Cooperation Agency (APCI) in the establishment of a data base on cooperation projects (at the moment it is not possible to obtain an inventory of projects from APCI). In Ecuador, the UNDP is doing the same thing with the Ecuadorean Institute for International Cooperation (INECI). However, coordination is of course not only a question of preparing inventories but rather one of daily dialogue between the actors themselves. The EC country delegations might play a stronger role in this regard, at least as far as Member States' cooperation is concerned.

4. CONCLUSIONS

The descriptions and analysis made in the foregoing chapters ought to show that there are a number of differences between one Andean country and another, as regards the state of the environment as well as approaches to the solution of environmental problems. However, it should also make it sufficiently clear that the similarities are even more important.

The following conclusions refer to topics on which some statements of general validity can be made. They turn out to be, mostly, a series of references to weaknesses and problems. This does not mean that there are not some success stories in these countries, but those stand on their own feet. To define possibilities and orientation of external support, what has to be known in the first place are the holes that need to be filled – they are many and deep.

- **Low levels of governance and political will**

There can be little discussion about the suggestion that environmental issues have a rather low rank on the agendas of current and recent governments in the Andean region. This does not mean, that these governments do not sign international conventions, write strategies, emit laws and create institutions for environmental management. But it does mean that when the moments come to allocate resources and to take practical decisions, the environmental issues (among others) take a sort of Cinderella position. One reason for this is that, very often, any meaningful and effective intervention would hurt one economic interest or other, and some of those interests have a considerable political leverage. Another reason is that Andean government consists to a high degree in a reactive solving of emergency problems and the environmental problem is usually not considered of sufficient urgency to compete for attention with most of the others. So, as has been said elsewhere in this report, there is a considerable gap between rhetoric and action.

- **Weak social cohesion**

Despite the fact that there are many communities in the Andean countries which do take initiatives of their own and do solve problems by their own efforts instead of just waiting for the government to take care of them, there is no doubt that social inequities, injustice and conflict are factors that reduce the potential for popular initiative and participation in environmental management, in the larger perspective. One eye-striking example of this syndrome, that can be seen in many densely populated areas, is the general throwing around of garbage; evidently, nobody feels that he or she should carry it to a proper place, since there is always somebody else around who should rather do it (but does not).

- **Lack of an integrated or holistic view on the connections between environment, natural resources, sustainable development, economic growth and social justice**

In the whole region, there is a tendency to see environment and environmental issues as a separate subject (or sector) with little relation to economic and other activities. The first things that come to the minds of most people, when the environmental issue is brought up, are matters such as air and water quality and waste management, especially as they concern urban areas. It is much less usual for anyone to see environmental issues in a context of sustainable management of natural resources and - even less so – as related to sustainable development in general. Also, very often, the financing of activities regarding the protection of the environment is seen as cost and a burden instead of being understood as an investment in future development.

- **Insufficient knowledge and conscience on environmental management**

There are, indeed, many persons and organizations in the Andean countries who have a high level of knowledge and awareness about environmental management. But they are still too few and too powerless and do not constitute a critical mass. When people in general (and many political and

business leaders in particular) are not sufficiently educated and aware of the danger of an inappropriate environmental management and of the benefits of the opposite, it is very difficult for any government (even a very good one) to enforce laws and regulations and implement recommendations.

- **Insufficient general comprehension of the concept of sustainable management of natural resources**

Here again, the concept of sustainable management of basic natural resources (soil, water, vegetation, air, sun-light etc.) is understood within a limited group of intellectuals, but it has not reached the leaders, the civil servants and the population in general.

- **Deficiencies in the legal frame-work and its practical application**

Andean parliaments are very productive, as regards the number of laws they approve; this includes the area of environment. However, to a considerable degree, law-making in these countries – particularly in "new" areas such as environment - is often not much more than a question of copying laws from more "advanced" countries, which make some of them inapplicable from the beginning, for economic or other reasons. Even when this is not the case, there is a serious absence of consultation with interested parties when laws are formulated and there is insufficient public information about them. Often, it is assumed that by publishing a new law in the Official Gazette, everybody should know about its existence. Nevertheless, we believe that the legal frame-work is rather sufficient as it is, even in qualitative terms. It is not a priority task to produce more laws. What needs to be done is, in some cases, to emit the bylaws and detailed regulations that are needed to convert existing laws into useful practical instruments and, in most cases, to dedicate more effort to making the citizenry in general aware of them.

The enforcement of laws is often seriously hampered by lack of personnel and economic resources in the responsible entities. Also, traffic of influences and general corruption are important obstacles.

- **Institutional weaknesses**

In most cases, environmental authorities are not given sufficient resources to fulfil their numerous tasks. Despite all the efforts made in the area of decentralization, environmental management is still too concentrated in central Ministries (or equivalent). In some cases, too many institutions are involved in certain aspects of environmental management, leading to duplication of efforts, voids and inter-institutional conflicts. In at least one case, there is an artificial break-down of environmental management in sectors, which does not seem to have any advantages but several disadvantages. There is also need for clearer separation between normative and operative functions.

- **Poverty**

The poverty in the Andean countries is both a cause and an effect of environmental degradation. These two problems can only be mitigated together.

5. RECOMMENDATIONS

The European Union as a whole, and the member states in particular, have a long experience and a solid knowledge in the environmental area. This includes sustainable development and management of natural resources, management of cities, management of sewage and solid wastes and cleaning up of polluted environment. Furthermore, the EU has a long experience in organizing administration systems and in the formulation of applicable laws and regulations. The following are the main fields where the European Commission could support the Andean Community in the area of sustainable management of natural resources and in the improvement of the quality of the environment.

- **Introduction or reinforcement of the concept of integrated and sustainable natural resources management rather than the limited concept of environmental conservation**

As a starting point for policy development, the EC could help in driving discussions at regional and country level about the links between natural resources management, sustainability, economic growth, environmental degradation, poverty, social equity, education, health, industry, mining, use of energy, management of human settlements, etc. EC can also support local or rural development projects that put emphasis on increased income for the population, based on more effective and at the same time sustainable exploitation of natural resources.

- **Support to decentralization and participative democracy through institutional strengthening at regional and local levels**

There are decentralization plans and processes under way in all the Andean countries, but they are – on the average - moving slowly. Regional and local levels are the proper ones to handle the operational aspects of environmental management. There is a clear will in many provincial and municipal governments, and even at lower levels, to assume responsibilities for the environment, but the necessary technical capacity is not always in place – especially, maybe, where poverty and remoteness have already created some of the biggest needs and problems. The EC could support institutional strengthening at all levels, especially at the provincial and municipal ones.

- **Quantitative and qualitative improvement of environmental education**

There is an urgent need to introduce themes of sustainable development in the curricula of formal education at all levels. This should be complemented with public awareness campaigns and informal training activities in order to reach most of the population.

- **Establishment of environmental monitoring and evaluation systems**

Increased environmental education should go hand in hand with improved monitoring and evaluation of environmental programmes and projects as well as with the control and enforcement of environmental laws and regulations. These elements are mutually supportive. When communities, entrepreneurs or the citizenry in general can understand and directly observe the benefits of adequate environmental management they will have the necessary incentive to collaborate in its additional strengthening.

- **Establishment of environmental information systems for different purposes, including prevention of natural disasters**

The existing databases and information systems are insufficient, which makes it difficult to distinguish problems and priorities and to analyze risks and prevent disasters. The introduction of a complete Geographical Information System would be a great help in resources management and an important tool in creating and providing information to the public. These techniques are highly developed in the European countries. This is an undertaking that could preferably be located at the Andean Community level, rather than on a country-to-country basis.

- **Creation of procedures to develop more useful laws, regulations and environmental standards**

The EC could assist the General Secretariat of the Andean Community in the establishment of better models and procedures for the drafting and sharing of laws, regulations etc. At present, there is a duplicity of efforts in this regard – and sometimes with unsatisfactory results.

- **Participation in river basin management**

One excellent way of concretizing all the previous recommendations in practical action, all or most of them together, is to work with river basins as areas of intervention. This can be done by EC on its own or in collaboration with other cooperating agents. Here it is important to recall that a large number of the Andean river (and lake) basins are bi-national. Some important initiatives have already been taken in bi-national basin management (e.g. the Lake Titicaca Bi-national Authority and the Ecuadorean-Peruvian Catamayo-Chira project). Much more needs to be done here; in addition to their direct effect on the environmental and economic levels, these projects should be important for the general strengthening of regional integration.