

Regional Environmental Profile

Andean Countries

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2.2 GEOGRAPHY AND CLIMATE

Bolivia is the southernmost of the five Andean countries, with a territory of 1 098 581 km². 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 six natural regions:

- *High mountains* (altitudes above 4 400 m);
- *The Puna region* (mountain plateau – 'puna'; 3 400 – 4 400 m);
- *The Yungas region* (eastern mountain slopes with forests, 1.500 -3 400 m);
- *Inter-Andean ranges and valleys* (1 800 – 2 800 m);
- *Sub-Andean belt* (humid and semi-humid Andean forest);
- *The Beni and Pando plains* (north-northwest – below 500 m);
- *The south-eastern plains* (semi-humid and semi-arid, including Chaco).

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2.3 ECONOMIC TRENDS AND SOCIAL CONDITIONS

2.3.1 Slow economic growth, bad income distribution and widespread poverty

After the so called 'lost decade' in Latin America (the 1980s), the Andean countries saw some macroeconomic 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, emphasis is made here on the poverty issue, since the authors of the report agree with most analysts 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 Table 1, the distribution of income is extremely inequitable and has become even worse over the last three or four years.

There are different ways of measuring poverty (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 conceptual analysis of the subject, but it may safely be said – no matter what indicators are used – 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 (Table 2).

2.3.2 Relationships between poverty and environment

Poverty is neither the only cause nor the only effect of environmental degradation and bad environmental quality in the Andean countries. Like in highly industrialized countries, the general consumption pattern and the large-scale economic activities that sustain it are equally or more to blame for unsustainable environmental trends, for instance uncontrolled mining and oil and forest exploitation. However, since the poor population in the Andean countries is proportionately very large it plays a much more significant role in regard to environment than its counterparts in ‘developed’ countries.

The most notable manner in which poverty has helped to cause environmental degradation in the Andean countries is the historical process by which rural populations, initially in the mountain areas, have exhausted soils and agricultural potential in their original settlements, after which one part of this population has moved the same syndrome to other regions (for instance through directed or spontaneous colonization in sub-tropical and tropical forest areas) and another part has moved to urban areas, contributing to the severe problems there in terms of sanitation. This process in turn is related to the overall political and macro-economical malfunctioning of these countries.

There is no doubt that poor rural populations degrade the environment by short-sighted and unsustainable exploitation of natural resources and that the degradation of the natural resources reduces the economic base for the same population, thereby conserving or increasing poverty – a classic vicious circle. This, however, is not due to any kind of general irrationality among these people, but to their own particular rationality, which tells them that this is their only way to economic survival under existing circumstances. Many examples can be found in the Andean countries of national policies (and historical aberrations in land ownership patterns) favouring large livestock farms in fertile valleys, while most poor farmers are forced to carve out their living on steep slopes, with no perspective of sustainability whatsoever – and much less of improving living conditions. Their only practical alternatives in the short term are to engorge the slum areas in the cities or to try to emigrate to other countries.

Poor people are victims (and originators) of environmental degradation not only in an economic sense but they are also victims in terms of health and security.

An interesting way of quantifying the effects of poor environmental conditions on poor people’s health is to apply the Disability-Adjusted Life Years (DALYs) calculation. A study made in 2001 (Listorti and Doumani), gives the following figures, which indicate a high correlation between poverty and burden of disease from environmental factors but which also suggests that the health problem may be a less serious aspect of poor environment in Latin America than the one of economic opportunity:

Sub-Saharan Africa: 26.5

India: 18.5

Asia & Pacific 17.5

Middle East & North Africa: 14

Latin America 11

In all cases, water supply and sanitation has the highest figure (5.5 in Latin America). In L.A., this factor is followed by urban air pollution (3), agro-industrial waste (2) and indoor air pollution (0.5).

Poor people face a relatively higher degree of insecurity due to natural disasters than does the betteroff

population, mostly because they are forced to live in inappropriate places. There are, for instance, frequent land-slides and inundations in the Andean countries which cause serious damage both in urban and rural areas, although none of them may as yet have reached the proportions of the Hurricane Mitch disaster in Central America in 1998. That one was a text-book example of how land degradation eliminates the soil's capacity for rain water absorption, giving way to flash-flooding.

A reversal of the poverty-environment vicious circle in the Andean countries can be fully achieved only through deep-going structural reforms at the political and macro-economic levels. However, since these are not likely to come very soon, more modest approaches can and must be applied in order to at least decelerate the on-going destructive processes. The most promising way to do this is to work on basis of the environment-empowerment relationship. When communities are empowered and have the possibility to actively participate in the management of their present situation and in the planning of their future, including decision-making on environmental resources, there is a possibility that these can come to serve as a basis of economic opportunity on which social capital can be built. This gives an incentive for sustainable management of the resources. Inversely, environmental activities can contribute to the empowerment of local people. This is the opposite of the vicious circle. However, this kind of strategy should not be considered as a panacea but must be applied sensibly, in accordance with different real situations. Any 'romantic' views on the matter must be avoided. Local populations are not heterogenic; there are class differences and conflicts at this level as well, and there are examples of this kind of approach having led to even stronger pressure on the environment.

2.4.3 Corruption

Corruption in the public sector is rampant in all the Andean countries and there is no doubt that corruption plays a considerable role with regard to the non-compliance with environmental laws and regulations; the illegal extraction and transport of timber is one example of this. 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 improved somewhat over time. Even if Colombia is perceived as the least corrupt of the five countries, indicators here paint a dramatic picture (see Technical Appendix III).

2.5.1 Management of natural resources

2.5.1.1 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 km³, while total internal renewable water is 303,53 km³, subterranean water produced internally 130 km³ and surface water 277,41 km³.

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 2.5.2.2). Also, there have been serious conflicts about water management in recent times, for instance in Cochabamba, between defenders of the privatizing and of the public management approaches.

2.5.1.2 Soils and agriculture

Soil erosion is one of the most serious environmental problems in all the Andean countries. It causes increased risks for natural disasters and dramatically reduces the possibilities for agriculture, which is a very important economic sector in the region; indeed, it is the most important one for the still large rural population. Table 3 gives a comparative overview of the situation.

Table 3

HUMAN-INDUCED LAND DEGRADATION

Country None % Light % Moderate

%

Severe % Very

severe %

Cause Type

Bolivia 51 11 9 23 6 O, D W,N,C

Peru 20 26 21 32 1 D,O W,C

Ecuador 5 66 23 2 4 D W,C

Colombia 10 53 19 18 0 D,O W,C

Venezuela 17 54 8 21 0 D,O W,C

D = deforestation C = chemical deterioration

O = overgrazing N = wind erosion

W = water erosion

Source: Adapted from the FAO Terrastat database

Some interesting similarities and differences between the countries can be easily noted from Table 3. In all of them, deforestation is one of two main causes of erosion. The other cause is overgrazing, in all the five countries except Ecuador. Bolivia still has half of its territory unaffected by land degradation, while Ecuador has next to nothing of the sort. A closer look at the situations in each of the countries gives rise to the following comments.

In **Bolivia**, according to the Land Use Map 2001, the total cultivated area amounts to 3,7 million ha which is only 3,37% of the country's territory. This should be seen in light of the fact that only 2,6% of the national territory has appropriate conditions for intensive agriculture. The Bolivian soils, both in the highlands and the lowlands, have little depth and are fragile and easily eroded. 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 to 42,9 million ha.

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 Bolivia; 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 overexploit soil and vegetation. In the lowlands, where the "latifundio"⁵ prevails, there may be a relative under-exploitation of the land.

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

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 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.

2.5.1.5 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 to get into much detail regarding species and other aspects, but a number of tables on this can be found in the Technical Appendix. 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. **Peru** has 110 endemic bird species and more than 5 000 endemic plant species. **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. **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. **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 km², 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** (on the latter, refer to the previous chapter).

2.5.2 Quality of the environment

2.5.2.1 Air pollution

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.⁶

2.5.2.2 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 nonmetallic ions. Among the most dangerous heavy metals, one can mention copper, zinc, cadmium, chrome, lead, arsenic and mercury.

2.5.2.4 Climate change

Effects of climate change are now very 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, shrunk 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.

3. ENVIRONMENTAL POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

3.1 REGIONAL AND NATIONAL ENVIRONMENTAL POLICIES, LEGISLATION AND INSTITUTIONAL FRAMEWORKS

3.1.2 Bolivia

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.

5.2.2 Recommendations

RECOMMENDATION I. SUPPORT THE CREATION OF A REGIONAL FORUM AND NETWORK FOR

SUSTAINABLE DEVELOPMENT

The forum and the network should be integrated by those public institutions, private organizations and individuals who deal with environment and sustainable development and who represent the 'environmental conscience' of the five countries. The main tasks of the forum and the network would be:

- _ Promotion of research on sustainable development
- _ Dissemination and exchange of information
- _ Lobbying at political levels
- _ Provision of technical advice to private and public institutions in sustainable development matters
- _ Support to the design of educational curricula in sustainable development
- _ Development and implementation of public awareness campaigns on sustainable development and environmental management.

RECOMMENDATION II. IN CONNEXION WITH I, SUPPORT DEMONSTRATIVE LOCAL OR RURAL DEVELOPMENT PROJECTS

These projects should include the concept of productive conservation and, in general, put emphasis on increased income for the population. This kind of approach is not new to the EC; it has been applied with apparent success in the PRO-MANU project in Peru.

RECOMMENDATION III. SUPPORT EDUCATIONAL AUTHORITIES IN THE DEVELOPMENT OF EDUCATIONAL CURRICULA CONTAINING ELEMENTS OF SUSTAINABLE DEVELOPMENT.

Using the European experience, the EC could facilitate the transformation of the educational curricula to include modern concepts of sustainable development and environmental concerns. It will be necessary to advocate and support these changes at all educational levels, from primary school to university. The possibilities to use national parks and nature reserves as a means of education should be explored. As a minimum, the local environment should always be used as a learning laboratory; it is to be kept in mind here, that every school has a physical environment, even in urban areas, and that there will always be something interesting to look at and learn from in the neighbourhood. All of this will require a considerable effort since there is an old and deep-rooted habit in many Latin American countries or regions to apply desk-bound mechanical memorization as the main pedagogical technique.

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5.2 GOVERNANCE

5.2.1 Low levels of governance and political will

Few observers, if any, would contradict the suggestion that environmental issues have a 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.

5.2.2 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).

5.2.3 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.

5.2.4 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.

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5.2.5 Recommendations

First of all it should be pointed out (although it may be self-evident) that Recommendation III above would be an important response not only to the consciousness or awareness problem but also to the governance problem, at least in the medium and long term. In addition to this, the following recommendations are made:

RECOMMENDATION IV. 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 and sometimes rather erratically. 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, to the extent that increased capacities are necessary for an orderly transfer of environmental responsibilities. The entire processes of definition of responsibilities and functions to be decentralized also need technical assistance in many cases.

RECOMMENDATION V. SUPPORT 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 environmental laws, regulations and similar instruments (a sort of environmental law ‘help-desk’). At present, there is a duplicity of efforts in this regard – and not seldom with unsatisfactory results.

5.3 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.

5.3.1 Low educational levels

The scarcity of environmental education in the Andean countries is combined with serious deficiencies in the general education, particularly at the primary and secondary levels. This contributes to the general exclusion of important parts of the population and reduces their possibilities to participate fully in the economic activities, including the ones that are related to sustainable environmental management.

5.3.2 Insufficient political representation and general exclusion

Low educational levels, among other elements, also lead to distortions in political representation and a reduced popular participation at all levels of decision-making. Many political parties in the Andean countries, if not most of them, are no more than election machineries or interest groups which mobilize people at certain points in time for obvious purposes. Uneducated and poor people are easy victims of 'vote-buying' and other expressions of the 'populist' attitudes that prevail in many parties. A common pattern is great enthusiasm at election times, followed very soon by general deception until the whole show is repeated the next time. There is a lot of nearsightedness and much lack of continuity both among electors and the elected, which is a very negative factor in most contexts but especially,

perhaps, in regard to environmental matters which are not only urgent but whose solutions also, in most cases, require long-term approaches.

5.3.3 Lack of economic opportunities

The most direct cause of poverty is the lack of economic opportunities. As discussed rather thoroughly in this report, this connects to the management of natural resources especially in rural areas. In urban areas it is related to environmental quality.

5.3.4 Recommendations

RECOMMENDATION VI. SUPPORT EDUCATIONAL AND AWARENESS CAMPAIGNS ON ENVIRONMENTAL MATTERS FOR ADULTS AND THE PUBLIC IN GENERAL.

This is an important complement to the formal education mentioned in recommendation III. At present, environmental authorities in the Andean countries spend very little resources and effort on this kind of activities, the main reason being the lack of funding. This recommendation is relevant not only to the poor segments of the population but also to the necessities mentioned under the consciousness and governance components.

RECOMMENDATION VII. INTEGRATE PROJECTS FOR POVERTY REDUCTION WITH PROJECTS FOR SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

For quite some time, poverty reduction programmes and projects have constituted an important component of international cooperation and so has environmental conservation projects. There are already examples to be seen of integration of these two areas but a more conscious effort should be made in that direction.

5.4 IMMEDIATE OR SHORT-TERM APPROACHES

The solution of the most fundamental problems, described in 5.1-3 above, is a long range undertaking. In the meantime, more direct interventions have to be made to help solve the problems (or eliminate symptoms of problems) that have already been created as a consequence of insufficient education, awareness and governance as well as those due to poverty.

Even though, as said from the beginning of this report, the diversity of environmental situations and problems in the Andean countries require national and local efforts for their solution, more than regional ones, it is possible to make a common ranking for the region, with regard to the seriousness of the problems and the urgency of action. In the opinion of the authors of this report, the ranking is, from more to less seriousness/urgency (top to bottom):

- Deforestation
- Soil destruction (erosion)
- Loss of biodiversity

- Water and soil contamination
- Inadequate management and use of water resources
- Inadequate solid waste management
- Air pollution
- Climate change

The following recommendations relate to the first five of these problems.

5.4.1 Recommendations

RECOMMENDATION VIII. SUPPORT RIVER BASIN MANAGEMENT PROGRAMMES

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.

It should be underlined here that bi-national river basin management initiatives should be taken with Brazil very much in mind. Like the Pilcomayo project which involves one Andean country and two 'extra-regional' countries (Argentina and Paraguay) there are many river basins that involve one or more of the Andean countries in the upper water-sheds and Brazil in the lower parts.

In geographical terms, there is a very big number of potential areas of intervention, both small and big. The selection of river basins for new projects of this sort should be made on basis of a good and solid dialogue with concerned actors in the countries. This is a task in which the EC Delegations (with their special knowledge and experience of the different countries) should play an important role.; it is hardly recommendable to do it only by means of short consulting or other missions.

Technical Note A (Technical Appendix II) contains a separate analysis of practical approaches to river basin management.

RECOMMENDATION IX. SUPPORT INVOLVEMENT OF LOCAL POPULATIONS AND APPLICATION OF A PRODUCTIVE CONSERVATION APPROACH IN PROTECTED AREAS

The many so-called protected areas in the Andean countries which are, in reality, unprotected due to lack of resources could be put into a better situation if local populations were to become involved as active supervisors and, at the same time, users of certain resources in the areas. There are positive experiences of this approach in other parts of the world, for instance Brazil ('extractivista' reserves in the Amazon forest). If combined with application of traditional knowledge of herbal medicines, use of non-wood products, etc., this approach could be very important both for conservation of biodiversity and for bio-trade and eco-tourism. Technical Notes B and C contain additional comments on productive conservation and management of protected areas.

RECOMMENDATION X. SUPPORT ESTABLISHMENT OF MULTI-PURPOSE ENVIRONMENTAL INFORMATION SYSTEM (S)

The existing databases and information systems are insufficient and uncoordinated, 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.