

# Inter-Agency Technical Committee of the Forum of Ministers of the Environment of Latin America and the Caribbean

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Inter-American  
Development Bank

**Environmental strategies for  
sustainable development in  
Latin America and the Caribbean: 1999**

**Territorial and bioregional  
basis for planning**

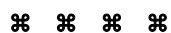
*Environmental strategies for sustainable development in Latin America and the Caribbean: 1999 - Territorial and bioregional basis for planning*

This document was prepared by the Inter-Agency Technical Committee on the basis of the mandates of the Eleventh Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean (Lima, Peru, March, 1998). The work was carried out by the Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Environment Programme (UNEP) as the lead agencies, in coordination with the United Nations Development Programme (UNDP), the Inter-American Development Bank (IADB) and the World Bank (WB). The purpose of the document is to provide the Forum with support for discussing and approving courses of action in the sphere of the Regional Action Plan for the period 2000-2001.

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## Inter-Agency Technical Committee background

Since 1982 the United Nations Programme for the Environment (UNEP) has regularly organized meetings in various cities of the region, where those responsible for the environmental policies of the countries of the region, high level experts, Secretaries of State, Ministers and government delegates discuss their viewpoints, exchange opinions, reach agreements and promote caring for nature and the environment.

During the Ninth Meeting of the Forum of Ministers of the Environment held in Havana, Cuba in 1995, it was decided to establish an organization in charge of giving continuity and consistency to the meetings that had been taking place until that date. And after many negotiations, opinion exchanges and the experience of various institutional agents and parties interested in the topic, it came to be that the Forum of Ministers of the Environment in Latin America and the Caribbean was established. Its functions were determined during the Eleventh Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean, held in Lima, Peru in 1998.

Another two instances were admitted to support the work of the Forum; the Inter-Sessional Committee made up by the representatives of nine countries of the region) and the Inter-Agency Technical Committee made up by five organizations: World Bank, the United Nations Development Programme (UNDP), the Inter-American Development Bank (IDB), the Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Environment Programme (UNEP) that acts as Committee Coordinator.

Amongst the Forum's function we find:

- a) Analyze, seek agreement, asses and carry out a follow up of those issues that are relevant to sustainable development in areas of the Forum's competence,
- b) Orient and assess regional cooperation in environmental issues in the context of sustainable development actions
- c) Assess, discuss and achieve consensus on regional positions on topics related to the International environmental agenda,
- d) Consider international funding issues to carry out the commitments of Agenda 21 in the region
- e) Asses agreements, compliance and objectives of previous ministerial meetings
- f) Approve the Action Plan to be implemented in the period 1999-2003, on the basis of the proposal submitted by the Inter-Sessional Committee
- g) Give specific mandates to the Inter-Sessional Committee to implement the project for 1999-2000, and formulate the project proposals that can be submitted to the Twelfth Meeting of the Forum (Barbados, March 2000)
- h) Orient and asses UNEP's actions in the region, in the terms indicated by the Board of Directors of that organization.

So, in addition to determining the Forum functions, during that meeting of the Forum of Ministers of the Environment of the region, the representatives of the various governments agreed on those theme lines that they consider as priority for the Forum.

1. *Institutional Framework and instruments for environmental management*, that include environmental education and training, citizen participation themes, the presence of environmental issues in government policies, the inter relation between trade and the environment, finding the mechanisms and innovative economic and legal instruments like exchanging decentralization experiences in environmental management;
2. *A comprehensive management of basins* that will consider environmental regulations of coast zones and oceans, as well as the integral management of river basins;
3. *Biologic Diversity* and protected areas that talk about institutional strengthening of the national parks service and other protected areas in the region, In addition to bioregional planning and management of protected areas in selected eco regions in the region; and
4. *Climatic change*.

In their nineteenth period of sessions (February, 1999) the governments that are part of UNEP's Board of Directors identified the areas of concentration for their actions at a global level, which for Latin America and the Caribbean are :

1. *Environmental information, research and evaluation*: environmental evaluations, developing the capacity to manage environmental information, response to environmental emergencies, biologic diversity elements, protected areas and desertification
2. *Improving the coordination between environmental conventions and formulating the policies* environmental management, environmental law, multilateral environmental policies and agreements, climatic change and conventions implementation
3. *Fresh water*, integral management of water resources and implementation of a global action program in the region
4. *Transfer of technology and industry*, transfer of technology and industry ozone, environmental education and training, environmental marine -coastal management, environment oriented citizens, trade and the environment.

Assisted by the Inter-Sessional Committee and the Inter-Agency Technical Committee, the Forum of Ministers continues to work actively. Its next meeting of the Forum will be held in Bridgetown, Barbados, from 2<sup>nd</sup> to 7<sup>th</sup> of March 2000.

# I. Territorial and bioregional planning

## I.1. Introduction and conceptual framework

Governmental planning was in boom in Latin America and the Caribbean in the sixties. Despite the important role played by planners, planning offices, and many methodologies applied in different territories, at different national regional and local scales to different sectors of activities, the truth is that the world has changed more rapidly that the arsenal of theories and tools available to orient the future of the Latin American and Caribbean societies, So in latter decades planning has not been capable of meeting all the expectations of anticipating the future and orienting the host of social forces towards higher levels of well being, Planning disciplines and practices have been seriously questioned in their credibility, while its strategic tools have been set aside.

However, the reality of the profound world transformations, globalization itself and the need to re-orient the current development styles towards sustainability makes it important to formulate long term public policies with the resulting re-evaluation of strategic planning, The main lesson has been the imperious need to give it a *participated, consensed, articulated and integral nature* to the new planning modalities (see Renard, 1999) Voluntarism can no longer be part of the plans and programs designed, from central offices, isolated from the social and environmental realities and on the basis of sectoral compartments technically defined and applied to administrative borders that are not necessarily relevant to guarantee the flow of environmental services and resources, that are the basis for the feasibility of human activities.

On the other hand we have seen the emergence of new and innovative initiatives in Latin American and the Caribbean, where the many social actors (producers, local communities, government agencies, and NGOs, scientists and technicians, businessmen or church) of a locality, micro region, region or a whole country achieve unimaginable consensus, having as the axis or matrix respect for the processes, elements or dynamics of nature. These consensus have a dual nature that is they can be ecologic and social, containing original very important elements that must be analyzed and understood.

This report introduces a detailed analysis of and reflects on a group of cases existing in the region, which were selected for their paradigmatic value. The purpose is to obtain valuable lessons in bioregional planning and territory management (see section 30.2 for the detailed study of each case). The report starts with the theoretical assumption that all space planning and territory management is the outcome of a natural and social interaction process where "the forces of nature" and the different social actors of a certain region confront their visions, interests and action capacities. Therefore, bioregional planning is a type of naturo-social vector, that is to say, it is the synthesis or the outcome (with its spatial expression) of an encounter between the different social sectors and the natural forces participating within a determined region (TOLEDO, 1999). It as a process where space is being constructed pursuant to the given set of games and sub-games between social and natural factors capable of "having a voice" and, therefore, having a presence within the scenario that is going to be built.

**Restoration of Degraded Watersheds with Native Species:  
The Experience of the Power Company of São Paulo, Brazil**

The construction of dams, the flooding of reservoirs and the subsequent changes in land-use practices in their surrounding areas usually impoverish local plant and animal communities. In the state of São Paulo, where only 5 percent of the original forest cover remains, hydroelectric power accounts for 89 percent of the state electricity need. The São Paulo Power Company (CESP) oversees 22 hydroelectric plants with reservoirs covering 7,500km<sup>2</sup> and a combined shore length of 15, 000 km, all within the state of São Paulo. CESP's current power-generating capacity is close to the total potential hydroelectric capacity of the state's major rivers. Further expanding capacity will require building many smaller dams and reservoirs that could undermine regional flora and fauna.

Since 1989, CESP has run an innovative program with the University of São Paulo's Institute for Forestry Research using secondary succession principles as a basis for restoring degraded lands bordering its hydroelectric dams and reservoirs to their natural condition. Although the company had been involved in restoration activities since the mid-1970s, its previous attempts to rehabilitate disturbed lands have been hampered by high costs and limited success in reintroducing native plant species. As a result, the restored ecosystems differ significantly for the original ones.

The first step in the new, improved restoration process now under way is the evaluation of the area's regeneration capacity. This involves quantitative and qualitative analysis of the existing seed bank, an assessment of germination constrains, the evaluation of remaining vegetation and its stage of succession, the identification of dispersal poles, and a determination of the level of degradation suffered by the area. The researches re-introduce plant species, taking care to use species appropriate for specific successional stages and to optimize the timing of planting. Once the reforested areas have stabilized, animal reintroduction activities are initiated. These include studies to identify pollinators and understand their interrelationships.

As of July 1991, CESP had restored 5,000 hectares of publicly held shorelines and islands and had plans to rejuvenate 500 hectares per year. In addition, the company has helped restore 29 hectares of private land (with a target of 1,000 hectares per year) and 900 hectares of bulldozed land (with a goal of 300 hectares per year). CESP maintains five nurseries that can produce 8.5 million seedlings per year.

The cost of restoring degraded lands ranged from \$8,980 per hectare for completely bulldozed land, to \$3,450 per hectare for agricultural lands. CESP realized a 50% savings by using the secondary succession techniques instead of traditional reforestation methods. Time savings have also been considerable: traditional reforestation had taken up to five years, compared to two to three with the new method.

**Source:** L.F.Galli and J.C.Gonclaves, *Recuperação de Áreas Degradadas através do Reflorestamento com Espécies Nativas: A Experiencia da CESP-Companhia Energética de São Paulo*, São Paulo, CESP, doc. mimeo. 1991, citado en MILLER, 1999

Under this perspective, the new experiences that have surfaced in the region are of great interest; very novel exercises not only because they have been able to dissolve and harmonize inter-social conflicts, but have also done so between the local and regional society and their nature, which is presented in the "immediate" plane such as are the surrounding natural resources and their services. Although blanketed under the such terms as "sustainable development", "self-development", "participative development", "endogenous development", these experiences gather differences that are necessary to explore

Bioregional planning and management are identified as an approximation to environmental management that has shown to have special strengths and potentials (see RODRIGUEZ-BECERRA, 1999). And so, we propose to identify and see if it's possible and desirable to increase the application of this approximation in Latin America and the Caribbean when searching for paths aimed at achieving sustainable development. The basic assumptions needed to get close to the new reality of a bioregional planning can be summarized as follows:



- A country's environmental protection capacity cannot be limited to centralized policies and, in a growing fashion, ever more dependent upon different-natured social forces.
- A successful environmental protection is the outcome of the interaction of a set of influences and cannot be explained from an isolated factor, a planning strategy nor from a particular environmental administration, a provincial management instruments, a determined actor nor from a singular context condition.

The selection has been made with the purpose of having materials worthy of reflection and discussion; therefore do not express any classification, assessment or preference. Most of the materials are widely known in the respective national contexts. Beyond the landscape of uneasiness that some of the analyses reveal oftentimes, in reality, the region has been converted into a laboratory and into a seedbed of countless ecological or environmentally inspired social movements, whose successful experiences must be taken very seriously. Here are two examples: in Brazil, the Ministry of the Environment and the Amazonia Legal asked for a survey which identified 250 successful and duplicable experiences in Sustainable Development at the national level; in Mexico, about 2,000 farming communities or indigenous fishermen participate in some type of productive projects bearing an environmental trend

## **1.2. Evolution of the environmental agenda in a global world**

Opening spaces for sustainable development is very closely linked to the last decade's evolution of the situation, to the agenda and to the environmental challenges found in Latin America and the Caribbean and to the deep changes humankind has experimented, particularly after the intensification of the globalization process (ECLAC, 1999). This has reinforced the later part of the '80s trendy notion concerning the depletion of economic models and the society's prevailing organization alongside the insufficiencies of the developmental styles needed to respond to the new challenges, as stated in Resolution 44/228 of United Nations General assembly which summoned the Rio Summit.

Styles, to which now the environmental and ecological requirements and limits needed to achieve Sustainable and equal growth in the next century in complex globalization contexts, are added to the traditional problems of poverty and inequality. If, on the one hand, the needs to increase national wealth considered necessary to satisfy the basic needs of a growing population can represent even more severe pressures placed on the environmental base –the natural resources- of the region, on the other hand, the increase of extra active and industrial activities provoke an even more acute deterioration in the recovery capacity and regeneration of those eco-systems that supply the environmental services.

A substantive evolution of the environmental agenda has also led, once more, to perceive the risks of considering the 42 countries of Latin America and the Caribbean as a single homogeneous and uniform area. In this regard, the singularity of the environmental reality of these Caribbean insular countries stands out (Renard, 1999). Of course, this sub-region is set apart from the continent by its sheer size. The countries that make up this region possess relatively small territories, populations and economies, although they hold high demographic densities. Facing extremely vulnerable human and natural systems, many of the local institutions and organizations have limited human, material and financial resource capacities.

Moreover, the Caribbean distinguishes itself by a profound *interrelation and interdependency*. Insular natural systems are intimately connected, and activities carried out in a territory impact other areas and environments. Similarly, as a result of a high degree of integration between economic and social sectors, changes undergone in a sector or country generally produce immediate impacts in other sectors and national realities.

The Caribbean is characterized by its great ***openness and exposure*** to external dynamics, specifically, as regards its social and environmental systems. The natural formation of the Caribbean itself has taken place with the arrival of animals and plants from other regions. The Caribbean countries' economies are exposed to the external market fluctuations and predominantly depend on foreign investments, while historically their respective societies are more open to outside influences than are the other Continental regions. This aspect coats the Caribbean's English-speaking countries and territories with a special meaning. It is precisely in this reality, insular but open and integrated into the international currents, that the globalization process reveals itself with a hew differing from the rest of the Continent, thus forming a *cultural* process par excellence. While globalization is normally shown as the integrator of economies and societies leading them into a new and prosperous wave of global growth, this has turned out to be more of a marginalizing agent, instead of an incorporating one for the insular Caribbean countries. This reinforces the dependency relationships vis-à-vis the more advanced countries on the Planet and produces social and cultural changes that place important challenges on the resilience and cohesion process of insular societies. Changes in productive systems have been produced via the introduction of foreign technological innovations and via a drastic reduction in labor requirements. Agricultural competition, within international patterns, now requires production and productivity levels that can only be reached by way of an intense technological usage. By the same token, the new dependency relations, as the Windward Isles' banana industry has shown, have introduced mechanisms that allow external actors to control and guide the workforce without necessarily including commitments made neither towards sustainability nor towards environmental and social production costs.

Trade liberalization has also brought about important repercussions to the Caribbean, negatively impacting its economic access to traditional markets to export manufactured and farm products. Oftentimes, this has led insular countries to not be able to compete with other regions in environmental conditions and social and economic factors more congruent with the new international trade courses.

In this sub-region, illegal drug trafficking has transformed itself into an important sector, becoming the preferred route for drug transportation between the South and North American Sub-Continents and Europe. This sector has produced an important impact on the social fabric of the Caribbean countries and can be made responsible for the meaningful increase in delinquency and corruption.

Lastly, any situation and environmental perspective analysis of Latin America and the Caribbean must bear in mind the extreme ecological, socio-cultural and economic diversity found in the insular countries. What's more, it is precisely that *capital* that allows one to meet the Caribbean reality with a lot more optimism during the upcoming years.

All and all, the evolution undergone in how current challenges are perceived and in the specific actions that have resulted in the "new" global agenda lets us put together a positive balance of the international surroundings regarding the sustainable development. New concepts have been incorporated: a shared but deferred responsibility, the "he who pollutes, pays" principle and precautionary principles. New

non-state actors have also been incorporated, with a special preference towards the scientific community and the private sector; the roles of the NGOs and the civil society have been reinforced in search of solutions for environmental challenges within sustainable development. It is important to highlight that surfacing of new actors does not necessarily mean the improvement nor the diminishing of the State's role. Quite the contrary, there is a growing recognition that in spite of the ebb and flow of ideologies of the last few years, the State continues to have a very particular responsibility in regulatory matters and in articulating the diverse productive, community and social sectors, specially in the areas of education, citizen safety and the environment (WB, 1997).

From a not so positive point of view, we would have to remember the warnings that surfaced during the mid-eighties: avoid the concerns for environmental problems at a global scale to give rise to the introduction of new 'conditions' for international developmental cooperation. Additionally, we would also have to avoid the tendency to replace developmental aid with trade only, issues which were summarized in the 'trade, not aid' proposal in Rio. Unfortunately that cooperation modality was close to mid-level, thus promoting the inclusion of a so-called "recover the Stockholm commitment" in the Rio Declaration. In spite of this, five years later, during the United Nations Special meeting summoned in 1997 to evaluate the progress made since Rio, aid to development had reduced even further, reaching a percentage close to barely 0.2% of the developed countries GDP. This allows one to affirm that the speech and the commitment made of having new and additional resources made available to developing countries be in direct opposition to reality which gave less resources than the ones existing before Stockholm -72 itself. What's more, the resources are fewer than the ones granted during the between-wars period.

On the other hand, it is worthwhile taking into account the new reality of the globalization process, which has intensified in the last decade. Pertaining to this point, there are those who have stated that globalization seems to be a true contemporary **mantra**, a chapter in a certain sacred (and unknown) book about the fin-de-siècle's society; a chapter which includes almost any imaginable issue: demography, economy, international policy, technology, ecology, healthiness, etc. such as, analogically speaking, the true Veda mantras (sacred Hindu books) contain prayers, poems, oracles, music, choreographies, recipes, etc. It seems that globalization is the *summa tecnologica* of contemporary capitalism, a capitalism that is precisely technological, not commercial anymore, not industrial anymore and not financial anymore (BOISIER, 1999).

For the time being, the globalization process encloses differentiated phenomena, which can be interpreted differently, and oftentimes in contradictory ways. Some define globalization in purely **economic** (growing homogenization and internationalization of consumption and production patterns), **financial** (the growing magnitude and interdependency of capital movements), and **commercial** terms, (growing external exposure or aperture of national economies). However, others underline the globalization's character in its **policy** (propagate liberal democracy, enlarge individual freedom settings, new forms of citizen participation) and **institutional** dimensions (predominance of market forces, growing convergence in regulation mechanisms and instruments, more flexibility in the labor market). There are those who would like to enhance the speed of **technological change** (its impact on the productive base, the work market and on the power relations and structures) and **mass media** (information access and readership massing, greater perspectives for decision decentralization, possible erosion of national cultural identities).

Approximating the globalization phenomena differently, in the form of **process**, and not in the form of a group specific **vectors**, there are an important number of analysts who study the process from the **international relations** perspective, coming from the emergence of new economic, trade and political blocks, which are based on the changes that took place in the polarity that characterized the cold-war world and on the transformations that took place in the dominating power centers.

This report approaches globalization from development's **sustainability**. It questions, for example, the economic rationality of the globalization process vis-à-vis the logic and times of natural processes (capital has globalized; yet neither work nor natural resources have done so). It also questions the possibility of a globalization that is based on an ascending and unlimited economic growth model, happening under circumstances where many of the natural resources are depleting (non-renewable sources of energy, fauna, flora, etc.) and where the vital processes weaken the planetary ecosystem's stability (ozone, climate, etc.). Furthermore, fingers are pointed at the social unsustainability of the current developmental style used in situations of growing exclusion, which is provoked, or at least exacerbated by globalization itself.

What's more, it could be stated that precisely, the **environmental** challenges in international relations agendas are the ones that reveal the most genuine and central aspect of the "globalization" concept (GUIMARAES, 1999). On the one hand, environmental problems are transformed into international concerns only when they manifest the **global** process impacts. If, it can be truthfully stated that they are **local** processes, for example as seen in the burning of fossil fuels, which produces global dynamics such as the greenhouse effect, which in turn affect the entire planet, including the vast majority of countries who do not contribute to the greenhouse gas emission, we see how impacts are borne more significantly by these countries, such as the ones borne by the Caribbean insular countries.

More importantly, if it is true that no country is immune to the provoked disturbance consequences of nature's vital cycles, it is also true that environmental problems depend on the coordinated actions of **all** countries. A point in case was the smoke cloud that covered a large portion of the Bolivian territory in 1996, extending from Santa Cruz de la Sierra to La Paz, almost provoking the El Alto airport to close (+3,000 mts. in altitude). We cannot forget that that had been a year in which the Bolivian authorities had been particularly successful in avoiding disasters. Yet, since the 'slash and burn' practices that took place in Mato Grosso in Brazil had been particularly intense that year, the border between the two countries was neither wide nor big enough to prevent the smoke from crossing over. The phenomena were repeated in 1998, when forest fires in Rondonia affected Bolivia, Peru and Colombia. In global terms, the fires in Malasia and Indonesia at the end of 1997 provoked disturbances throughout Southeast Asia, possibly even being responsible for airline accidents.

In the socio-environmental arena, it is worthwhile rescuing the conceptual tangle that darkens the globalization debate, namely some sociopolitical issues (GUIMARAES, 1996). During the last century, the market was not seen as a model that opposed the State; rather it was an instrument of social relations transformation towards higher sociability levels. In this century, however, the State is precisely the one that is now considered as the kind counterpoint which stops the markets' blind forces that, if abandoned to themselves, would be incapable of producing happiness for humanity, although it seems they could, in as much as they are considered synonyms of freedom and democracy. Market economy, which, under different hues, in reality has always been with us, is an excellent generator of riches, although is also the producer of profound asymmetries. For this precise reason, the State (or whatever name one wishes to give to the **public** regulation, extra market) cannot relinquish its

responsibilities in the key areas of education, scientific and technological development, environmental conservation and biogenetic heritage and forward them to the market. It does not contradict the tendency towards the expansion of economic liberalism, which also obeys to a historical evolution more than to an ideological tantrum, yet supposes an adaptation of the market economy to the developing world's real conditions and possibilities.

The State will even be more important when governance is recognized. Until recently, it was defined in light of the transition made from authoritarian regimes to democratic ones, or in light of the challenges that go before a hyperinflation and economic instability. Governability today interacts with the possibilities of overcoming inequality and poverty. As the 1994 edition of the UNPD Human Development Report states, no one should be condemned to live a neither a brief nor miserable life only because they were born into the wrong class, the wrong country or the wrong sex. The new good-fellowship bases which provide the political system with governability require a new **development paradigm** that places the human being in the middle of the developmental process, that considers economic growth as a means and not as an end, that protects life's opportunities for this and future generations and hence, that respects the natural systems integrity which allow the existence of life in this planet.

### **1.3. Modernness, environment and ethics, roots of the paradigm of development**

Modernity should be understood as a social project –oftentimes confused with a **national** project-, which intends to face up or answer to profound social changes (GUIMARES, 1999). There is no other reason than the fact that societies have experimented successive **modern times** throughout their project as humanity. Thus, it can be suggested that the relations between **modernity, environment and ethics** represent the true **tensions** lived at the century's end, provoked by the boom in the Western civilization's trajectory. "Tensions" in a wider sense than the one Thomas KUHN (1977) used to designate the need of having a **converging** knowledge in order to transform scientific reason and rise above current paradigms. If environment and modernity have nursed from the same civilizing womb – one where the human being occupies the center of the scenario – and went on to structure the true "dilemmas" or "challenges" of the new millennium, it is the value content or ethics of that questioning that operates as an amalgam bestowing meaning and sense to that "tension". Just as towards the middle part of last century the appearance of the "social question" represented a limit placed against the dominating "industrial" modernity, the emergence one hundred years later of environmental and ethical concerns clearly point towards the insufficiency of today's "consumerism".

So, if one were to maintain that human beings form the center and the 'raison d'être' of the developmental process, then it is important to advocate for a new style that is **environmentally** sustainable in its access and usage of natural resources and in the conservation of biodiversity; that it be **socially sustainable** in the reduction of poverty and social inequalities and in the promotion of social justice, that it be **culturally** sustainable in the conservation of the system of values, practices and identity symbols that determine national integration through time; and that it be **politically** sustainable when it deepens democracy and guarantees the access and participation to all in public decision making. This new style has, as its bearing, a new developmental **ethics**, ethics in which progress's economic objectives are subordinated to the functioning laws of natural systems, to the respect criteria towards human dignity and to an improvement in the quality of people's lives.

Of course, the recently introduced formulation refers to a **developmental** paradigm and not to a growth paradigm, as a result of two fundamental reasons. Firstly, the new paradigm highlights the fact that for development to happen it is necessary to have **qualitative** changes take place in people's quality of life and happiness, which differs from having a mere accumulation of goods and services take place. These issues include social, cultural, and aesthetic dimensions and satisfy the material and spiritual needs of people, more so than only having merchant dimensions transacted in the market. Secondly, in addition to what has just been stated, the sustainability of a developmental process will only happen when we can preserve the integrity of the natural processes thereby guaranteeing the flow of biosphere energy and materials and at the same time, guaranteeing the preservation of the planet's biodiversity. An **Environmental** sustainability of development refers to the physical base of the growth process, making it a point to preserve the natural resources while incorporating development into productive activities. In as to the ecosystem's capacity of support, the intention is to keeping nature's potential in good condition for it to absorb and nurse itself back to health, recovering from the aggression and the wastes of productive activities.

It is not enough for development to promote qualitative changes in humankind's well being and to guarantee the integrity of the planet's ecosystems in order to consider development as sustainable. Development implies, specially for the outer-lying countries that have severe problems of poverty, inequality and exclusion, that **social** foundations of sustainability be used as the basic criteria of public policy making, justice in goods and services distribution, and in providing full, universal coverage for global policies used in education, health, housing and social security. The same thing applies to the criteria of equality in genders, recognizing as a value in itself and therefore surpassing economic considerations, the full incorporation of women into the economic (market), political (vote) and social (well-being) citizenry of a country.

In fourth place, the new paradigm also puts forward the preservation of diversity in its widest sense –**socio**diversity besides **biodiversity**- meaning the maintenance of the value system, identity practices and symbols which permit for the reproduction of the social fabric to happen, and therefore, guarantee national integrity through time. It includes, the promotion of the minorities' constitutional rights and their incorporation into concrete policies such as bilingual education, territorial demarcation and autonomy, religiousness, community health, etc. The **cultural** component in a sustainable development also point the same direction as it proposes to introduce agricultural conservation rights, equivalent to the rights recognized linked to the biogenetic heritage's rational use and preservation, with the desire of establishing intellectual property economic criteria so both the biodiversity "users" and the " legal holders" partake in their benefits, thereby transforming both parties in co-responsible players for its conservation. In an ever-growing globalized economic and commercialized world, this process leads to a growing specialization in agriculture based on the most productive species or varieties, with the consequential loss in diversity. It means that, in pursuit of the cultural sustainability of agricultural production systems, the extra-market criteria have to be applied so it can incorporate the "externalities" of the low productive production systems, from the short-termed economic criteria stances, but that guarantee agricultural varieties and species and that guarantee the permanence in time of the culture that supports the specific economic organization used in production.

In fifth place, the **political** foundation of sustainability is very closely linked to the process of deepening democracy and building the citizenry. It intends to guarantee the full incorporation of people into the developmental process. Privilege granting is then due more so to an ideological motivation within the political dimension of sustainability,

where State democratization prevails over the market democratization. As has been pointed out before, the State bears **unwaivable** responsibilities, including environmental issues. The truth is that the State continues offering a contribution to capitalist development, which is at the same time, indispensable. **Unique** because it transcends the market's logic by way of safeguarding social justice and, equality values and practices and incorporates the defense of the so called citizen diffused rights; **necessary** because capitalist accumulation logic requires from the "common goods", tender goods that cannot be produced by competing actors in the market; **indispensable** because it is directed to the future generations and deals with aspects and processes characterized as either non-substitutable or impossible to incorporate financially into the market.

Lastly, what unites and gives a sense of comprehension that is sustainability-specific is the need of new **ethics** in development. Besides important moral, aesthetical and spiritual elements, this concept keeps a relationship with at least two ground rules of social justice: a **productive** justice and a **distributive** justice. The first one is directed to guarantee those conditions that will permit the existence of opportunities in equal forms so people can participate in the economic system which will then offer the real possibility to satisfy basic needs and have a generalized perception of justice and treatment that is in accordance to their dignity and rights as human beings. Ethics, as it relates to the materialization of a distributive justice system that is oriented to guarantee that each individual receives the development benefits as per their own merits, needs, possibilities and those of the other individuals as well (WILSON, 1992).

Consequently, sustainability's ethical growth keeps close relationships with the needs that the economic theories and practices have in wanting to rescue their identities and initial purposes, rescue their roots as oikonomy, the study in the usage of oikos, or the human home; happily, this word has the same semantic root as the word ecology. Unfortunately, with the acceleration of the modern times, economy has ceased studying the means to help achieve well being for people; it has turned into and end in itself, a science in which anything that does not possess monetary worth, and with all due respect, anything that can not have a price established, lacks worth or value. This is turning into one of the most pernicious fetishes of modern times, in spite of warnings coming from economists such as Economy Nobel Price Winner of 1999, Amartya SEN (1986: 202: "*an ordering of choice is assigned to a person, and when necessary, supposedly this ordering reflects his/her own interests, represents his/her well being, summarizes his/her idea of what should be done and describes his/her choices... in effect, the purely economic man is nearly a dunce from the social point of view. Economic theory has taken up much of this foolish rationale and has settled comfortably in its unique ordering of choices for all purposes.*")

Empirical reality also shows that wealth amassment, that is to say, economic growth, does not constitute and has never done so, a requirement or precondition for the development of human beings. Humane welfare options are projected well beyond economic welfare. Wealth in itself is not the decisive factor rather it is the usage the collective gives to its wealth. Just as a person can spend all of his/her income on drugs or on his/her children's educations, so can countries spend their riches on weapons or invest in improving the quality of life of its populations. Numbers clearly indicate that countries with equivalent levels of economic riches have radically different welfare levels.

According to the different Reports on Human Development published by the United Nations Development program (UNDP, 1990, 1999), this decade has seen riches concentrate in a way that have never been seen before. If in 1960 the 20 percent wealthiest people held 70 percent of the world's product, this percentage increased to

82.7 and 86 percent in 1990 and 1998 respectively. While the 20 percent that is the poorest one saw their income fall from 2.3 percent to 1.3 and one percent of the world's products during the same period. Said differently, in 1960 the gap was 30 times, and increased to 63 times when the decade began. By 1998, the difference was 86 times. If in the sixties 358 people were the owners of possessions equivalent to 45 percent of the world population, in 1998, this select group was reduced to 283 people. What's more, the 3 richest people enjoy a wealth equivalent to the GNP of the 43 poorest countries. If we were to add the product of all developing countries, we would barely reach the assets of the 300 largest transnational companies. This reality has led the UNDP (1999) to state that "*the new globalization rules – and the actors that write them – are aimed at integrating global markets, neglecting the needs of the people that the markets cannot satisfy. This process is concentrating power and is marginalizing poor countries and people.*"

#### **I.4. Territorial and bioregional fundamentals of sustainability**

We are currently living in a paradox, whereby we can be witnesses to the acceleration of economic growth which goes hand in hand with a de-acceleration in development: while macroeconomic indices improve, we see the indicators that measure the qualitative evolution between sectors, territories and people decrease (BOISIER, 1997). In a context of growing trade commercialization and growing capital mobility produced in real time, it would seem as if growth depends more and more on **exogenous** factors.

Many have even suggested that globalization, through the Scientific and Technological Revolution, leads to an industrial deterritorialization, as the importance of a territory devalues into an industrial production mode, which is almost virtual in nature. What's more, **denationalization** is now being confused with **de territorialization**; while what is taking place is a territorial re evaluation that will efficiently support process segmentations. If it is possible to place a parts and component plant within a country or elsewhere, and it is possible to place other plants in different and distant territories, the careful evaluation of those places, of those territories, or even of the twin bond processes will be particularly relevant for the temporal sustainability of the new model.

The key to understanding the dialect between the process's exogenous and endogenous dimensions of **growth and development**, lies in that globalization can effectively give birth to a single **space** (transnational in nature) but does it through multiple **territories** (sub-national) (BOISIER, 1999). According to this reasoning, and without contradicting growth's exogenous nature, regions can complement this tendency in an endogenous fashion. Territorial promotion strategies can follow the capital flow of the transnational logic that would promote the accumulation of scientific knowledge about the territory itself. This would strengthen local scientific and technological systems as well as imply changes in other areas such as in knowledge communication infrastructures, improvement of the social infrastructures and others.

Logically then, in strictly economic terms, the territorial context is the decisive factor in the generation of competition between the economic units inserted in globalization. On the other hand, in a world with globalized communications, in the "global village", it is essential to keep the cultural differences apart in order to daily stimulate a sense of belonging within a concrete society. The globalization's political geography leads local governments to acquire a revitalized political role in consonance with the organization's and power structural crisis that the national states now have with the new global



system. These national states are too small to attend global issues yet are too large to attend local issues. Thus, a space opens for territorial meso-governments.

The growing economic internationalization highlights the role of placing companies in certain areas when the trade barriers like those protecting the inner companies and sectors are eliminated. This means that when the degree of exposure of these companies or sectors is increased, competitively and territory are linked if they are capable of creating a innovative environmental force and productive perfection. The definition that Fernando FAJNZYLBER (1988) used to describe competition, and which is the one behind the ECLAC's position in this issue, states that competitiveness of a region is equivalent to its capacity of supporting and expanding its participation in international markets and is capable of simultaneously elevating the population's level of life, which demands the incorporation of technical progress.

All in all, experts that state that an organized territory to set it apart from the purely geographical areas) also constitutes a direct actor of competition in keeping with the fact that it is a space that holds its own culture which translates into formulating goods and/or services that are indissolubly linked to that culture, and from which specific international niches can be built precisely in those moments when globalization leverages the homogenization of trade. This is another one of globalizations apparent contradictions.

We must underscore the fact that a small, yet growing proportion (if measured via the population), of the international market that represents the elevated rent proportion, is showing consumer patterns that are strongly geared towards consuming particularized goods, either due to their design, or irreplicability or quality or originality. This demand opens windows of opportunity to the regions that are capable of producing luxury items (perfumes, leather goods, handkerchiefs, garments, shoes, watches and others). These in themselves make up the second or third entry item of France's exports, some of them being the outcome of territorial cultures, as can be clearly appreciated in the wine and liquor segments.

A textile coloring known as molas produced in Panama by an ethnic group known as the Kuna of San Blas's Archipelago gives another example, among many, of a product that is very closely tied to a culture (manufacturing the product) of production while having symbolic representations (shown in the weave of the fabric) at the same time, and while being the territorial culture of a region that may well qualify as bioregional. Adventure tourism or ecological tourism represents other examples of well-established niches based on natural resources that historically have been transformed into the base of autochthonous cultures.

There are few victors in the fierce fight for trade space positioning, yet there are many losers; analysts are trying to understand which characteristics and strategies turn countries, regions, cities and enterprises, winning organizations. The title of a book written by two French renown academicians, Georges BENKO and Alain LIPIETZ is no coincidence: (1994) *The Regions that Win* (Chart 1). Several considerations can be drawn from the upcoming quotes, namely that; winning territories are urban in nature, are large, are inserted in international commerce by way of products and services with high knowledge contents, and are inserted in a symbiotic relationship with their own National State. In synthesis, ***they are territories that articulate well with their surroundings*** because they have similar degrees of complexity.

**Chart 1. Winning Regions**

"Regions that win are urban; factories and offices influence towards the large cities, towards megalopolis" pg. 19.

"Regions that win are before anything, producers of exportable goods, that is to say, manufactured goods or of manufacturable services" pg. 21.

"On the other hand, what is a 'winning region'? A region that gets on (from the point of view of jobs, riches, the art of living) through its own activity or a region that lives off the ones that have lost, including a part of its own inhabitants?"

"Thus, it is not possible to have a determined type of 'region that wins' (or better said a determined form of winning, for a region) but a frame of a determined type of national State and these States will not 'win' in international economic competition unless they know how to create this type of regions that win..."

That win economically speaking, it doesn't even have to be said. We will not enter into the debate about political, social, ethical nor ecological criteria of the 'victory' in the subject" pg. 372.

G. Benko and A. Lipietz: **The Regions that Win**, Valencia, Spain, 1994, quoted in BOISIER 1999

From the sustainability's perspective, we could add the **ecological** dimension of development's endogeneity. Definitely, all dimensions previously pointed out are conditioned by an endowment of natural resources and of environmental services, which have also been previously define. If, it is **not** the natural richness that guarantees development's endogeneity (the states that are enormously rich in natural resources but are poor economically and politically-wise can affirm this), without her, there is no way of placing 'command controls' on development within its own social web. What's more, if there is something that the relationship between human beings and nature has taught us is precisely that the human being has gradually become independent from the resources base, this being a determining factor in his well being (among others, by way of incorporating environments that are outside and far from his own). Taking into account that that is precisely the facet of human evolution that has undermined eco-political foundations ( i.e. western civilization's ecological and institutional), the transition towards sustainability should also lead towards a higher gravitation of the local natural wealth for the process of development.

In the first place, the blooming of the agricultural revolution over nine thousand years ago, when it established the bases for the first **territorial ordering** in the strictest sense, allowed populations to depend less on their immediate environment for their survival. This gave rise to consumer patterns that favored human agglomerations, then villages, then cities then megalopolis. In second place, thanks to the generation of surpluses, it has been possible for human beings to adopt consumer patterns and accumulate goods that are less and less related with biological survival. Thirdly, and as the result of the two precedent dynamics, society at large was capable of becoming more independent from the immediate environment. Being able to perpetuate consumption patterns that although could be unsustainable in the long run, in the short run they could be maintained via the incorporation of environments that were foreign and/or far from the local community – through war, commerce or technology.

The above description of evolution is important because it leads to the revelation that what definitely determines the quality of life of a population and therefore, its sustainability, is **not** only the natural environment, but is the **frame of relations** by and between five components that make up a determined model of territory occupation. Oneiric beauty, almost ludic in the way of studying environmental challenges, proposes that the sustainability of a community depends on the **interrelations** of the **POETS** that inhabit the territory (GUIMARAES, 1994), described as follows:

<b>Population</b>	(size, composition, density, demographic dynamics)
<b>Organization</b>	(production patterns, social stratification, conflict <i>resolution patterns</i> )
<b>Environment</b>	(physical and built environment, environmental processes, natural resource)
<b>Technology</b>	(innovation, technical progress, energy usage)
<b>Social aspirations</b>	(consumption patterns, values, culture)

The mesh containing the POETS equation allows one to understand why a country like Japan, which should be within the poorest ranking countries from a strictly environmental and demographic point of view, is not. It possesses among other things, a very dense demography for its territory and is extremely poor in natural resources and in traditional sources of energy; yet, Japan is located amongst the most developed countries of the world thanks to its social organization and technology web. It could almost be speculated that the type of Japanese social organization, with its high levels of social homogeneity and the characteristics of social aspirations of its inhabitants, with a high component of equality, explains in part the historical 'need' of the Japanese society to have to reach high efficient energy levels with growing technical advance contents within its production patterns in order to satisfy its population's consumption needs.

Said differently, the Japanese consumption patterns responds, and at the same time, determines the existence of the production patterns that are in agreement with the Japanese social aspirations and adapts, or better yet, surpasses its own environmental and territorial limitations. It is the perfect convergence between production and consumption that grants Japan its sustainability. It is also the possibility of incorporating other territories, which are very far from its own, that bestows an apparently harsh sustainability sign to a development style that, if done any differently would be very *fragile* (PEARCE AND ATKINSON, 1993; MARTINEZ-ALLIER, 1995).

The insertion of historic patterns of peripheral economies in a world capitalistic system heightens the developing countries difficulty to achieve sustainability. In endogenous growth situations, as is that of the central countries, technical progress promotes capital accumulation and both lead to the consumption of a supply that will more or less determine the demand for goods and services. And so it is that in such economies, someone invents the internal combustion engine for automobiles. In other words, it is the technological innovation process, intimately related with the production pattern that starts the capital accumulation process and winds up conditioning society's patterns of consumption.

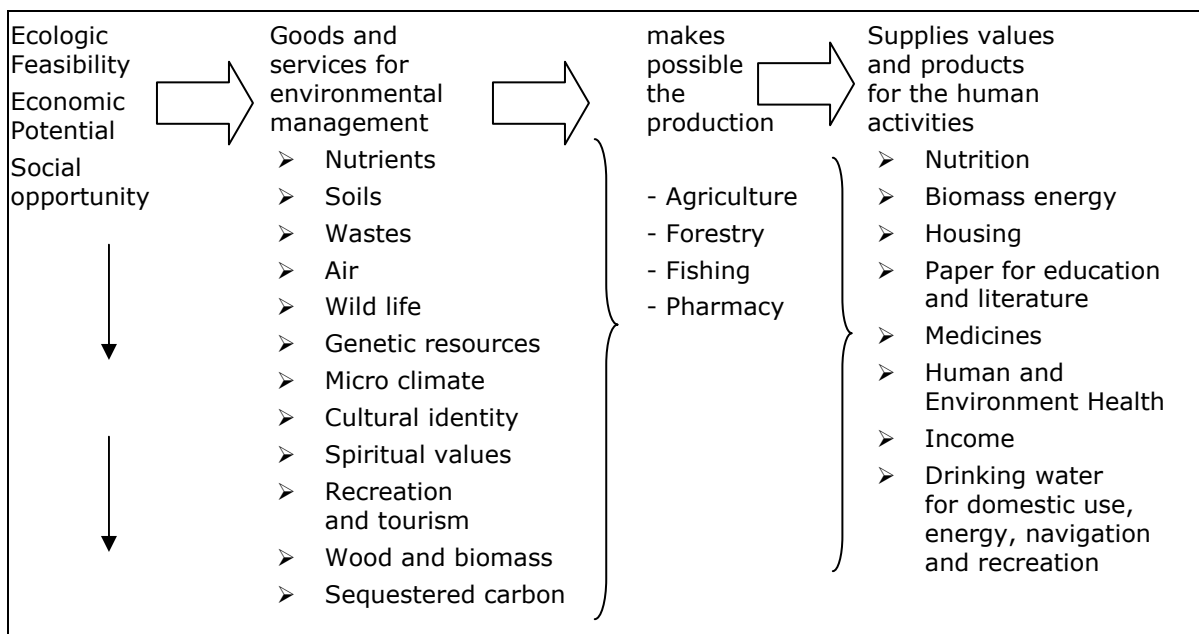
In the meantime, in late, peripheral and dependent industrialization situations, the productive process behaves as a dog that is moved by its tail. In those countries, the first thing to come alive is the demand structure. Historically, such countries have inserted themselves in the world economy as exporters of basic products and natural resources. Being strongly dependent on industrialized imported products, the demand, or better yet, the consumer pattern is a simple reflection of the consumption patterns of the elite living in industrialized countries. Based on this demand (de)formation, imitative of the elite's and bearing no relation to the basic needs of local populations, the economic system proceeds to form capital and in most cases, an export-based income, or income from external debt (internal savings is insufficient). Technical progress, which is the true endogenous growth engine, is imported into the dependent countries in the form of a closed package, without giving rise to a genuine national technological innovation process.

The evolution on the planet's occupation pattern is characterized by an authentic revolution in the production and consumption patterns, which has made us less tuned to our biological needs, made us be more alien to ourselves and to our partners in nature, while at the same time making us more insistent in using power resources to guarantee the incorporation (and destruction) of extra-national environments that guarantee the satisfaction of current consumer (unsustainable) patterns. In this sense, sustainability of a certain territory is given, in its ecological expression, by the guarantee of the natural resources supply and the flow of basic environmental services needed for the survival of the community; in terms of environmental safety, by a dependency level it has on foreign environments, and in socio-environmental terms, by the distance seen between the satisfaction of basic needs of the inhabitants in that territory and the consumers patterns that are conspicuous of the elite (see Guimaraes and Maia, 1997).

The **bioregional** focus of planning presents important advantages relative to the tools and traditional concepts of planning development, specially for the formulation, practice and evaluation of public decisions and policies (see Miller, 1999):

- It makes up a strategic process that permits the decision maker to center its attention on those issues that are crucial for sustainability such as ensuring the water demand (**Figure 1**). From the bioregional perspective, food safety is seen in the context of the flow of nutrients and prevention of soil degradation.
- It lets rural poverty be eradicated when establishing ecological and cultural corridors with multiple objectives, among which we see the promotion of regional and national integration of local communities.
- It permits one to formulate policies simultaneously using different geographic and institutional scales. To guarantee the quality of water, for example, we would have to take care of the spring conservation that oftentimes extrapolates a community's political-administrative borders. In other opportunities, empowerment of autochthonous populations or of NGO's can be a better environmental management alternative as the Oaxaca example suggests, which will be introduced further on.

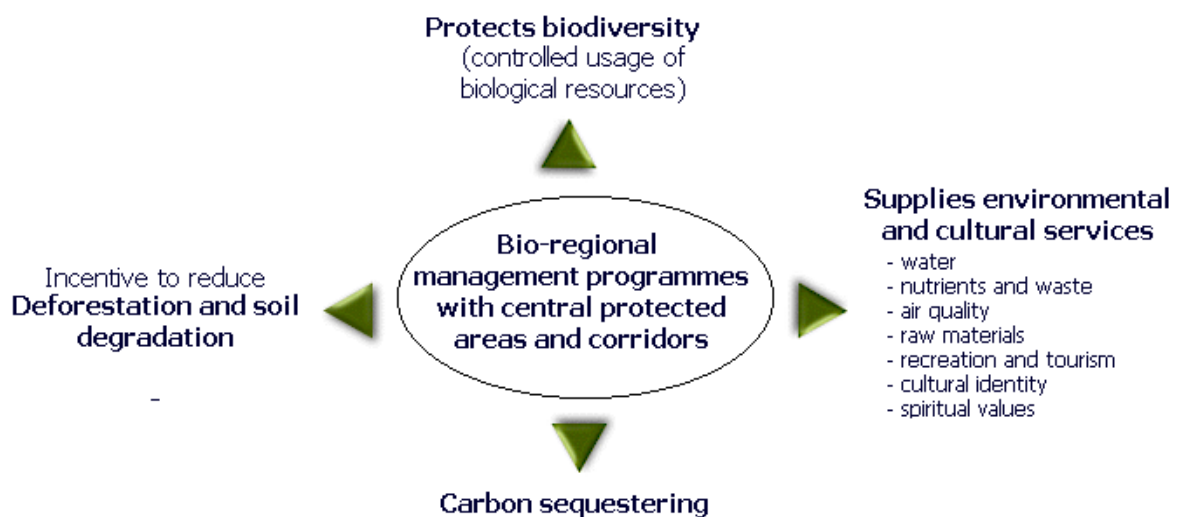
**Figure 1. Relations between Human basic needs and environmental services ( Miller)**



Offering concrete alternatives to implement a good part of the Rio Conference agreements, particularly decisions on climatic change and conservation of biologic diversity (**Figure 2**). This to identify *in situ* proposing corridors to anticipate the movement of species as a result of climatic change, promoting the restoration of degraded waters and soils and finally, to identify investment opportunities to strengthen the sustainable use of those territories.

Increases the technical knowledge, perfecting human resources and consensus alternatives between state, non-state, private and the scientific community. The use of tools like geographic information permit a more effective integration of between the interests, knowledge and capacities of local communities, indigenous groups, rural and forestry, extension services, universities, research and advisory centers and local and regional governments.

**Figure 2. Sinergics potential from a bioregional focusing**



### **1.5. Bioregions, bioregionalism and sustainable development**

The argument that has been developed up to this point allows the suggestion to be made that there exists a *bioregional* focus to plan and manage the protection of environmental services and biodiversity. In this sense, bioregion can be defined the same way the World Resources Institute, the International Union for the Conservation of Nature and the United Nations Program for the Environment did (quoted in Miller, 1999:5):

*"Water and soil territory whose limits are defined by the human community geographic limits and ecological systems. Such an area should be wide enough to maintain the integrity of the biological communities, habitats and ecosystems of the region; sustain the essential ecological processes such as the cycles of nutrients and residues, migration and flows; satisfy the territory requirements for the key species; include human communities in the management, use and comprehension of biological resources. They must also be small enough so local residents can consider it their home."*

A bioregion can, therefore, include extensions measuring thousands and thousands of hectares. It may be no bigger than a small spring or it can be as large as a province or department (state). A bioregion can extra-limit the borders of two or more countries where human communities and ecosystems go beyond political limits. Normally, a bioregion covers a small or medium size watershed (such as the Arenal conservation area in Costa Rica), a mountain range (such as the Sierra Nevada de Santa Mónica in Colombia), or a coastal zone (such as Paracas, Peru).

The bioregional planning and management methodology has its objectives set in establishing the political and institutional frame in which government, community, co-operations and other non-state and private interests feed the incentive to cooperate keeping in mind the territory's sustainable development. Here, it is possible to identify six basic elements (Miller, 1999):

- geographic scale and scope
- the communities with the interests in question
- science, technology and information
- institutional mechanisms and governmental arrangements
- facilitating incentives and policies
- Administration, monitoring and assessment

#### **Chart 2. Bioregions and Bioregionalism**

"Bioregions are geographic areas having common characteristics of soil, watershed, climate, native plants and animals...A bioregion refers to both the geographical terrain and a terrain of consciousness – to a place and the ideas that have develop about how to live in that place." Peter Berg, bioregional philosopher.

Bioregionalism seeks to mend the shredded fabric of life, re-weaving the web of relationships between people and place. The core of the human experience, historically and in the bioregional vision, is the relationship of human communities with their matrix of local and regional nature. Bioregions re-unite nature and society within the context of specific places. The bioregional approach returns to a sense that form much of the human experience, and was oscured only recently in the industrial era. Bioregionalism aims for a balance in which humans live room to other species, and mesh their activities into natural ecosystems. Bioregionalists are practitioners par excellence of Aldo Leopold's land ethics, the first rule of which is, 'Save all the parts'.

Bioregions are a social as well as a natural experience, and awarness that comes from relating over time with the particular terrain and landscape. While much human awarness is drawn into an increasingly abstract global world, bioregionalists pay attention to the macrocosm of the world as manifested in the microcosm of the life-space. This is regarded as crucial to any long-term human habitation of earth.

From CASCADIA PLANET, citado en BOISIER, 1999

"Bioregions encompass diverse cultural areas, homelands, biodiversity, spiritual and ideological canyons, reveal economic practices, territories of the mind, uniques histories of the place, and geographically discrete parts of the earth".

"Bioregionalism is a grass-roots doctrine of social and community-based activism that has evolved wholly outside of mainstream government, industry and academic institutions. Bioregionalism is defined as a body of knowledge that has evolved to inform a process of transformative social change at two levels – as a conservation and sustainable strategy, and as a political movement which calls for devolution of power to ecologically and culturally defined bioregions".

M.V.McGinnis, Bioregionalism, Routledge, Nueva York, 1999, citado en BOISIER, 1999.

From the point of view of planning for sustainable development, it is important to stop at the first element, the geographic scale and scope of bioregions, as it lets us describe the four elements that make up a bioregion (MILLER, 1999).

- *Central Areas*, identified as the sites that generate environmental services and that possess a lot of biodiversity and consequently, must be submitted to the maximum degree of preservation.
- *Transition Zones*, that surround the central areas and whose purpose is to filter and lessen negative impacts from and towards central areas.
- *Ecological Corridors*, strips of land or water to connect the central areas and the transition zones with adjacent bioregions so they can be used as routes for migration and to disperse plants and animals during their time of growth and evolution.
- *Matrix*, consisting is most of the land and surface water in most of the ecosystems in which the areas, zones and corridors are located.

A bioregion represents the sum total of these four elements. It is the geographic area that governments and communities consider as the administration unit. This statement allows one to underscore the sign of homogeneity when defining regions, and at the same time, allows for a better understanding of the issues described before regarding the way occupation has evolved in the last ten thousand years.

It wasn't until recently that in the history of mankind the center of human experience could be accepted as being the relationship between communities and the local and regional matrix alongside the bioregional vision. Modernity and modernization split, separating the individual's destiny and the destiny of the territory by way of introducing a series of artifacts that made up the production and consumer patterns of human communities. It is true that today we see a return to the territory, particularly to the local things. Territory revaluing predominates above total alienation, above the outcome of globalization and above the need to have roots.

The bioregion's potential, as an instrument for sustainable development is strictly linked to the value that the world market bestows to the products and environmental services, an issue on which you can bet and win hands down. Its strongest point lies in its character as biodiversity safekeeping zones. As shown below, the population safeguards regarding the use of industrial products (pesticides, preservatives, etc.), in the food chain, provide good business opportunities for territories such as the bioregions.

### **Payment for Environmental Services**

The recent proposal developed in Costa Rica to pay for environmental services represents a significant movement forward in the search for income generating mechanisms to help guarantee the conservation of nature. Here is a synthesis of the main advances the Country has had on this subject:

Payment for environmental services in Costa Rica is an economic policy instrument to make the economic development be compatible with social equality and nature preservation. This mechanism appears recognizing that the economic and social development of the Country cannot be isolated from the availability of natural and environmental resources. Furthermore, efforts to preserve nature can only be furthered and be made permanent if there is a flow of financial resources associated with the sustainable use of the biodiversity. For this reason, there is a national and government support program to promote payment for environmental services. This program is discussed as a priority subject in national forums.

To operate this system in Costa Rica, Forrester Act 7575 of 1996 and the Biodiversity Act approved in May 1998 were passed. They define environmental services as those that are rendered by the forests and forest plantations and have a direct bearing on the

environment's protection and improvement. The four environmental services that the Acts recognizes are: regulation of greenhouse effect producing gasses; protection of water resources, natural scenic beauty and biodiversity. Besides these, there are many more services that are starting to be indirectly recognized such as biodiversity research, pollinating, biological control of plagues and disease, soil formation, organic agriculture, sustainable usage of wood and of other products that come from the natural forests, flow of genetic materials in agricultural and husbandry areas and production of raw materials to develop other products<sup>(1)</sup>.

In environmental service provisions, the main actor is the landowner, whether he be public or private. They are the ones who should receive the respective payments.

The Costa Rica experience in environmental service payments has developed more towards gas fixation and environmental water services. In gas fixation issues, a price of US\$10 was set per metric ton in forests, while the price for water services was calculated at US\$0.01 per cubic meter as production input; forest-water recapturing at US\$0.003 per cubic meter. In the case of water resources, a survey was made and society expressed their interest in paying four times more than the calculated values. This important indicator was used to establish a price policy for the usage of water resources.<sup>(2)</sup>

Payment for gas fixation has generated the Country an approximate income of US\$2.0 million; an initial US\$20 million is expected from the bonds that were placed in the Chicago Stock Market. In environmental water services, once collection takes place, estimates indicate that annual income will be about US\$300 million, of which US\$230 million would result from collecting the value of water as product input after it is recognized as an economic good; US\$ 70 million of the value of water capturing that the forest has will be used to compensate landowners in the high areas of the watershed for their preservation efforts.

In more general terms, the economic contributions that the wild biodiversity generates to the Country through the usage of some environmental foods and services were calculated. For example, in scenic beauty, about US\$9.5 million per year; biodiversity associated research projects, US\$9.6 million. Although this income is undervalued because all the environmental services and products have not been accounted for, the numbers indicate that biodiversity is an important factor in the Country's economic and social development.<sup>(3)</sup>

The Costa Rica experience in environmental services has made it necessary to develop a properly trained institutional agency to collect, manage and distribute the financial resources. The Forest Financing National Fund was created precisely to answer this need, yet its scope of action is limited to the funds that come from gas fixation. For the other environmental services, different resource management choices are being discussed. Some of these include the creation of trusts, which just goes to show that besides placing a value on the technical requirements, payment for environmental services imply an improvement in the Country's legal and institutional devices.

On the other hand, the main weaknesses that bioregions show are linked to the absence of solid institutional structure, mainly in their development (insufficient

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<sup>(1)</sup> Catro, E. Y G. Barrantes, 1999. Income Generation through the Biodiversity's Sustainable Use of environmental Services (INBio) Development Ecological Economy Services (S:E:E:D© Heredia, Costa Rica.

<sup>(2)</sup> Barrantes, G. Y E. Catro, 1998. Ecological Economic Valuation of Water in Costa Rica: Internalization of the Environmental Services Value. MINAE: Heredia, Costa Rica.

<sup>(3)</sup> Barrantes, G. Y E. Castro, 1999. Contributions to National Economy from the areas of Conservation Wild Biodiversity. National Biodiversity Institute (INBio)- Development Ecological Economic Services (S:E:E:D© Heredia, Costa Rica.



number of agencies similar to the National Commission on the environment, more protector than promoters) and the scant degree of social organization for the pure and simple reason of an absolute scarcity of population (i.e. the Aysen region in Southern Chile) or because they are dispersed or because their native character is more attached to their own social organization than to a westernized or moderns one.

Territorial limits and demarcation of the bioregions do not normally match the political one and this makes up a serious pitfall because the solution significantly rises the level of interagency coordination. As is well known, coordination is a positive exponential function in the sense that the coordination of four agencies requires twice as much effort as is needed in coordinating only two agencies and decentralized coordination procedures are still rather precarious. If you place Kenton Miller's precise characterization bioregional map on top of a politically defined map (i.d. the five CORPES regions in Colombia, the 13 constitutional regions in Chile, the five macroregional one in Brazil, etc) you will devise a true territorial kaleidoscope.

For example, in Cuba, interesting approximations are showing up when applying these concepts. The Territorial and Watershed-Specific Councils were designed in 1997, 1998 and 1999 through the provincial governmental agreement, through the Ministers' Council of 1997 and through the National Board on Hydrographic Basins, taking into account the economic, social and environmental points of view. The hydrographic basin is being treated as a basic unit for environmental management in light of the sustainable development. Along the same lines, since 1994, the government approved the creation of Special Sustainable Development Regions (SSDR), making these match up with wetlands and mountain ecosystems. Both the Basin Councils as the SSDRs are units built up in physical terms that go beyond provincial and municipal political-administrative divisions. The State Board is in the last phase getting ready to approve the Law-Decree that defines the National System of Protected Areas.

It is difficult to provide an exact idea of the problem's complexity, but it could be assumed that a bioregion *is a region whose systemic structure has an ecologic character that over determines or that conditions nature and the regional performance*, for example it determines the flora, fauna, production mode social relations, goods and services produced and the region's external insertion form, including the culture. According to this type of definition, a good example of a bioregion would be the Brazilian Northeast, a region defined in the political and administrative plane, and has a dominant element in its structure: drought ("the Das Secas Polygon) configured as the regions structuring element around which everything is defined. Perhaps if the Atlantic Coast in Colombia could be a bioregion if the Atrato Swamp were treated as the dominant element in the structure, or, if the Guajira aridity were the dominant element. The Chilean Norte Grande – the Tarapacá and Antofagasta Regions – can be considered as bioregions as well if we think about the omnipresent desert.

What is definitely being proposed here is tentatively true: try to accommodate the bioregions to the limits of the development regional policies in such a way that it reduces the inter-regional coordination and uses the institutional structures and the region's social matrix in favor or their bioregional "component". Biodiversity preservation would be more easily achieved using this scheme than using another one that would maintain the bioregion's singularity. It is interesting to examine the proposal the Social Foundation of Colombia issued, which has built a typology of natural regions in Colombia as per the environmental development and sustainable index. This work states:

*"...municipal typification has been framed within the concepts environmental demand, supply and conflicts, the results already having been examined. For the regionally process, we opted to group municipalities according to their predominant environmental characteristics, especially in reference to environmental supply with the known limitations as are political-administrative limits, because rarely do they match up with the provincial environmental limits or with equivalent potential areas, from the natural point of view..." (Fundación Sol, 1998:376)*

The 19 regions were determined using a certain degree of homogeneity in natural potential, with vague limits that do not have much to do with the five regions CORPES defined, nor with the six regions defined using their environmental and social sustainability and development degree.

After all, we should take into consideration whether the validation of the bioregion concept, for public action purposes, will be attained easier from the supply or from the demand. To validate it from this last point of view, would mean to expect that consumers (from the only space or market of globalization) will set a clear preference for the consumption of goods and services coming from the bioregions; goods and services marked with the "bioregional" label, so to speak. We cannot ignore the growing importance of the demand oriented to the consumption of "clean" agricultural and livestock products. For example, it seems that there is a great concern among the North American farmers and exporters of genetically modified products, due to negative reactions by European consumers. The United States is the main supplier worldwide, and it has attained a great penetration in the domestic market. 45 per cent of the cotton sowing area, and 25 per cent of corn, and 40 per cent of United States production of soy grains belong to these, as a result of the genetically modified seed usage. Therefore, there is a clear example of opportunities for bioregions that do not work with transgenetics, an interesting case coming from demand.

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## II. Opportunities for territorial and bio regional planning

Before even analyzing the indispensable mechanisms and instruments to strengthen the possibilities of using a bioregional approach to the planning of sustainable development it is advisable to reconsider the argument of the empirical features that regions considered as winning regions share in the international context, You can identify at least five traits typical of a winning region ( Boisier 1999)

- Decision making speed
- Response flexibility
- Answer flexibility before environment variations (demand).
- Complexity (in the emerging sense, complexity paradigm), enough to compare the global scenario complexity.
- Cultural identity and identification with its territory
- Resilience of the productive and social pattern for self reconstruction after damages caused by external agents ( from agricultural to packaged T,V. messages ")

It is easy to appreciate the logical chaining of these features from an only concept, as development, If synergy is recognized as the main element of the process leading to development, we must agree that it is manifested more intensely in small spaces, where inter-personal relations, the exchange of information and trust is expressed more clearly, From the stand point of the sustainability that intrinsically accompanies development, Ronnie LIPSCHUTZ 8 1997:32) says *There is no global solution, neither social peace nor sustainable practices can be legislated from the top, Quite the contrary, these must be imagined and taken to the ground, where people live their daily lives and work "*

The daily territory, referred to by Lipschutz is called *local* in the development vocabulary. It is evident furthermore, that in this case the quality of the collective subject, and therefore with autonomy derived from *decentralization* is sought to be acknowledged in the territories (seen as the social weave). Obviously, these characteristics are enough to completely reject the idea of a development "from the center - downwards" (this concept belongs rather to economic growth), and to sustain the *capillary action* process, this capillary action will not necessarily show a continuous spreading in the territory (the style of "urban zones"), proceeding rather through leaps that make development geography "become archipelagos". The result would be a development *out of focus* or with many locus. We can still add *democracy* (as understood in the Western Hemisphere), as an essential characteristic of every well understood development. It is always appropriate to remind Pope Paul VI phrase: "*development is the new name of peace*". It is understood that growth does not ensure social peace, both national and international, but development, entails equity.

## II.1. Institutional Mechanisms, actors and criteria for policy formulation

If it was said that globalization was like a real **mantra** of contemporary times. What can we say about competitiveness? With regard to the international competitiveness " it is said that you can see a certain degree of inaccuracy of the concept ( BOISIER, 1999) On the one hand you find interpretations that see competitiveness as a macro economic phenomenon, whose most influential elements are the exchange rate, interest rate, or public deficit, Likewise you see arguments that make competitiveness depend on the existence of a rich supply of natural resources or cheap labor, On the other it is also mentioned that competitiveness depends on the existence of global government policies, oriented to the promotion of exports or industrial protection and, Finally other explanations that point at the importance of competitiveness in different managerial practices.

As we said before, Fernando Fajnzylber's definition used by ECLAC would seem more appropriate to the purposes of bio regional planning, in saying that the competitiveness of a region is equivalent to its capacity to expand its insertion in the world market and improve the quality of living of by incorporating technical progress, that would also permit increasing the sustainable use of resources and environmental services in the territory, It is a matter of obvious importance that the export of a region are a factor of economic growth, and that necessarily requires to become inserted in external markets, *Mutatis mutandi* can be applied to regions, it is the same argument used to justify external or global openness in small countries, that have the need of escaping the restrictions imposed by a small market.

As proven by the Chilean Case, the inexorability of supporting economic growth in the national exporting sector, at least in the short and mid term, tends to show a those regions or territories that already had a territorial ordering based on exclusively economic variables, as "winners", thus increasing inequalities between territories and people and deepening the over exploitation of the environment, In other words, if the criterion to establish winning positions in globalization is only based on exporting success and competitiveness, this could only perpetuate an inequitable territorial ordering.

Nonetheless, despite the important evolution of world thinking regarding the crisis of development, solution alternatives for the crises assume changes that are still marginal in the institutions and rules of the international economic and financial system while the evolution of the world debate points at the need to print a profound change in our social organization and interaction with nature's cycles; In sum, the force gathered by the sustainability discourse holds many paradoxes.

To begin, sustainable development assumes importance at the very moment in which world power centers declare the failure of the State as an engine for development and propose its replacement by the market, while they also declare the failure of government planning, When you carefully review sustainability's basic components I,e maintaining the stocks of resources and environmental quality to meet the basic needs of current and future generations – meanwhile you can see that development sustainability precisely needs a regulated market and long term horizon for public decision making.

On the other hand sustainable development is suffering from a pathology common to any formula to change society too loaded with meaning and symbolism, In other words behind all that unanimity there are real actors that agree on very particular visions of sustainability, Let us take an illustration, very close to the hearts of the proponents of

sustainability : Amazonia what I just suggested would enable us to understand that a **wood businessman** can decide on the need for sustainable management" of the forest and be referring to the replacement of the forest cover for homogeneous species, that is to guarantee the " sustainability " of return on investment in wood extraction activities while the leader of a **preservationist entity** would ardently defend the means to ban any type of economic exploitation and even human presence in extensive primary forest areas, that is to guarantee the sustainability of natural biodiversity.

All of the above could be happening while a **union leader** would be thinking just as emphatically and sincerely as the businessman and the preservationist, in favor of vegetable extraction activities in Amazonia, as the means to guarantee the "social-economic sustainability " of his community ( for example to so called extractivist reserves " that were made famous by the struggle of Chico Mendez in Brazil). Finally in some place close by where you can find the aforementioned actors talking to the people where we can also find an **indigenist** talking about the importance of Amazonia for the cultural sustainability of practices, values and rituals that give a sense of identity to all the diversity of indigenous population groups.

In summary, the challenge both for the government and for the society, for decision makers and for actors who define public agenda, is precisely to make sure there is a transparent, informed and participatory process for the debate and decision making process in pursuit of sustainability. This is in order to be able to develop development policies, which would ideally promote a social and environmentally adequate model of natural resources use, both to meet basic needs and to improve quality of life of the current population, as well as to increase opportunities so that future generations improve their own quality of life. At least, and taking as the starting point the verification that social interests are, by definition, differentiated and many times contradictory to allow to draw up development policies that project an aim for society, and based on this vision of the future, they should establish priorities and criteria to justify the selection of an alternative that meets certain needs of specific actors, and not others.

It is unavoidable to suggest, basically from the reality of developing countries, that the paradigm of sustainable development can only become a public policy alternative to the extent that it is possible to distinguish its real components, that is its sectoral, economic, environmental, and social contents, No doubt, i.e that one of the current style pillars is precisely the automobile industry with its results of urban crowding,, fossil fuel burning, etc. Now, what businessmen would consider as sustainable would be more economic vehicles with catalytic converters) not necessarily from the standpoint of society (efficient public transportation). The same happens with natural resources, For the furniture production or exporting sector forest exploitation could be considered as sustainable to promote the replacement of the natural cover with homogeneous species, since the market responds to the incentive of industrial competitiveness base on optimal profitability of the resources. While for the country what is sustainable is precisely the preservation of the same forest resources, guaranteeing its diversity for genetic research, for maintaining the culture of local indigenous groups etc, giving less weight to the profitability of wood or furniture exports.

It would seem timely to, outline some sustainability operational criteria, according the suggested definition, This procedure would enable us to bring the paradigm of sustainability to the concrete kingdom of public policies, which in turn allows us to differentiate actors and interest in a more accurate way, Due to specific limitations the presentation will be limited to the non comprehensive statement of criteria that are

only applicable to environmental and ecologic sustainability dimensions (for other dimensions see Guimaraes, 1997).

**Ecological** sustainability of development refers to the physical base of the growth process, and it objectifies the maintenance of natural resources included in the productive activities. Making use of the proposals made by Herman DALY (1996), we can identify at least two criteria for its operation through public policies. For the case of *renewable* natural resources, the use rate should be equivalent to the resource recomposition rate. For *non renewable* natural resources, the use rate should be equivalent to the resource substitution rate in the productive process, for the period of time forecasted for its exhaustion (measured by current reserves and use rate). Taking into consideration that its "non renewable" character prevents an indefinitely sustainable use, we should limit the resource use pace to the estimated period for the appearance of new substitutes. This requires, among other aspects, that in order for investments made for the exploitation of non renewable natural resources to be sustainable, they should be proportional to investments allotted for searching substitutes, particularly investments in science and technology.

**Environmental** sustainability is related to the maintenance of the ecosystems burden capacity, it is to say nature's ability to absorb and to repair itself from entropic aggressions. Using the same reasoning above, there are two obvious criteria that illustrate the concept operation forms. In the first place, the waste emission rates, as a result of economic activity should be equal to regeneration rates, which are defined by the ecosystem recovery ability. For example, the domestic sewerage of a 100 thousand inhabitant city produces dramatically different effects if its is launched and dispersed to a water body such as the Amazon, than if it were deviated to a lagoon or estuary. If in the first case the drain could be only primarily treated, and that would contribute as a nutrient for the aquatic life, in the second case this would cause serious disturbances, and it would have to be subject to more complex and more burdensome treatment systems. The second environmental sustainability criterion, would be the industrial restructuring, emphasizing the reduction on entropy, it is to say, giving priority to the conservation of power, and the use of renewable sources. The above mentioned means that both "recomposition rates" (for natural resources), and the "regeneration rates" (for ecosystems) should be treated as the "natural capital". The inability to sustain them as time goes by should be treated, therefore, as the capital consumption, it is to say, as **non** sustainable.

#### **Public opinion surveys as a tool for environmental policy**

The *Human Development Report 1998* stated that the growth of consumption is placing increasing pressure on the environment (UNDP, 1998). As environmental quality is more and more affected by the consumption pattern, daily lives of individuals became increasingly involved in determining the environmental sustainability. In this light, improvement of environment urgently requires the pro-environmental behavior of individuals, such as people's participation in recycling of household waste or more use in public transport.

In many cases, environmental policies do not directly induce people to take actions for environment since there are information and knowledge gaps between the policy and his/her daily life style. It is also true that citizens, who are busy struggling with everyday life problems, may not think beyond their immediate surroundings and may not understand remedial measures in theoretical terms or in practical sense. However, as environmental issue urge the participation of mass, it is important to examine the reality of citizens' perception, knowledge and actual behavior in respect to environment. In short, the public opinions of citizens regarding environmental issues need to be understood to implement the policy more effectively. The information obtained from public opinion would enable to detect the flaw in the policy and permit to adjust the policy accordingly. For these reasons, the use of public opinion may become a valid and effective policy tool in improving environmental quality.

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*Public opinion surveys as a tool for environmental policy (continued)*

In fact, several studies based on public opinion on environment demonstrate interesting features of people's perception towards environmental issues:

- The study of American public opinion poll on environment (Dunlap, 1991) demonstrated the shift in American interest toward environmental issue become from short lived "phenomena" to "continued interest." According to Dunlap's study, the environmental interest unlike other social issues did not go through the cyclical fluctuation in the intensity of people's interests and disappeared but persisted. This illustrates that priorities given to the environmental issues by people over other issues and justifies the needs for political measures.
- The cross national opinion surveys on environment, such as Harris's *Public Leadership Attitudes to the Environment in Four Continents* of 1989 and Gallup's *Health of the Planet Survey* of 1992 demonstrated several important trends on environmental opinion at global level from the comparative perspective. The results of both surveys indicated increase in interest towards environmental quality in developing and developed countries. Moreover, the results showed only a slight difference between developed and developing countries in existence of proportion of people who are willing to pay for a cleaner environment. These facts contradicted with conventional thinking on environmental issues in developing countries such as: economic growth as a pre-requisite for higher environmental concerns and environment as a 'luxury goods' for developed countries. These results confirm that shift in people's perception toward environment in developing countries has already taken place. In fact, Dunlap and Metig (1995) have rightly stated that people in developing countries come to consider the environmental problems as a "basic threat to human survival rather than the quality of life" because the threat of environmental degradation affected them more in terms of natural disasters and health problems.
- The public opinion survey has never been considered as a possible tool for the environmental policy. However, if it were used correctly, it would be the quickest way to reflect future trends of environmental quality at the same time would serve as a tool to build up consensus among citizens. Also, the incorporation of public opinion to policy tool would contribute greatly in complementing the existent economic and legal instruments by filling their shortcomings (see table). In fact, global trends after the Agenda 21—increasing role of citizens' participation on global agenda, growing importance of environmental issues, and rapid development of information technology that facilitate the communication- all indicate and support the introduction of a new mechanism. The use of public opinion in policy formulation would induce participation of citizen's, at the same time, support the formulation of consensus among them.

It must be emphasized, still referring to the environmental sustainability, the importance of utilizing the marketing mechanisms, such as estimates and tariffs that incorporate to the private expenditure the costs of environmental preservation, through means of mechanisms that satisfy principles such as "precautary" or "polluter-pays". Among many mechanisms, it can also be mentioned the "markets of wastes", where industries of an specific area accommodate the wastes of their activities, most of the time converted in inputs for other industries; and the "negotiable rights of contamination".

**TOOLS TO CHANGE BEHAVIOURS**

	<b>Legal</b>	<b>Economic</b>	<b>Information</b>
Type of effect	Coertion	Positive motivation	Awareness
Techniques	Prohibition, norms, legislation	Tax, subsidies, etc.	Education, publication, mass media
Aims of techniques	Material disincentives, social pressure, legal mandates	Material incentives	Creating social norms
Duration of effect	Shorts	Medium	Long
Speed of change	Medium	Quick	Slow
Cost of implementation	High	Medium	Low
Durability of change for environment	Weak	Relatively weak	Strong

**Source:** Based on De Young, 1993 and World Bank 1998

Even though there are important constraints in many market instruments, proposed nowadays -among which we can mention, the uncertain future externalities, and the difficulty of being awarded the ownership of some environmental resources and services- mainly when a generalized character is ascribed to them, such as the solution of all environmental unsustainability problems, the rights of pollution have the advantage of allowing, thorough intra-industry transfer, that the State decreases enforceable regulation by establishing emission limits per production unit, and that it regulates regional borders, based on the ecosystem recovery ability.

Thus, a significant part of the preservation of the environmental quality would go to the market, to the extent that the marketing of such rights stimulate technological modernization and stop penalizing the industries that at the present technological level do not have the conditions to reduce their levels of emissions, In the current system, where the inspection per productive unit and the application of fines unit is privileged, In addition to making degradation of the environment costs difficult to enforce, enterprises are penalized when even if using the state of the art technology in the market, still exceed the limits established, while those that are still operating within them and refrain from improving their productive processes are rewarded.

## **II.2. Significant bio-regional planning experiences**

### **Case 1 – The Mesoamerican Biological Corridor**

The Mesoamerican Biological Corridor (CBM, as per initials in Spanish) is a multinational bioregional planning process, implemented in an ecoregion of interest to human beings due to its high environmental and cultural values. Besides the fact that it was been prepared for several years and that it is highly dynamic, the very positive attitudes that I have awakened nationally and internationally, the multiplicity of public and private actors involved in its conception and implementation, and the ambition and broad scope of its goals are important characteristics. In the territories in which it is developed, complex and often times contradictory social, economic and political processes take place, in a deteriorated general scenario

The CBM is project of which Mexico and all the Central American countries are part of – Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama. It is supported basically by three pillars: the existing integration institutions in Central America, national capacity to implement the actions agreed upon therefore, and the positive reception given to it by the international community.

Some of the project's basic strengths are the following: (i) the dynamism shown by intergovernmental regional institutions, basis for its construction, promotion, planning and co-ordination; (ii) several innovative experiences and pioneers in the international environment, which in environmental protection matters have been leaders in the region, specially in Costa Rica; (iii) the growing support to CBM of several sectors of the citizenship; (iv) financing and international technical assistance. As some protagonists have noted: "The most positive thing is that CBM is a train in movement which can hardly be stopped. This is so much so that even without having created an administrative structure to move it, it started rolling. But we are not certain yet as to where we want to go". We would have to add that its uncertain path results from the fact that perhaps the train is moving too fast, as an answer to the social, economic and ecological challenges in the region.

At the highest political level the course to be followed is given in a Statement issued by the Presidents of Mexico and Central American countries.



*"A territorial ordering system formed by natural areas under special administration regimes, core zones, dampening zones, of multiple use and interconnection areas, organized and consolidated that give society a series of environmental goods and services to the Central American and world society, providing spaces for social understanding to promote investment in the Sustainable use of natural resources. This in order to contribute to improve the life of the region's inhabitants".*

We have arrived at this official definition of the project after an evolution process, and it has been conceived as an orthodox strategy for the preservation of bio-diversity through the interconnection and cleaning of protected areas, in order to then establish the proposal of core areas and corridors. Finally, we have understood the Corridor to be a territorial ordering process, that integrates the Sustainable use and the conservation of the environment, meeting the population's needs.

All CBM key social actors and groups agree in stating that one of CBM's objectives is to guarantee the flow of Life between Mexico and the cap at Darien, the origin of the Corridor's initiative. The Corridor is also considered a strategy to reduce the vulnerability of the region, a conviction that has increased with experiences prior and subsequent to Hurricane Mitch. But actors and groups of some of the countries that integrate it today have highly differentiated conceptions about its fundamental objective. Besides the official definition, some other definitions are:

- Protect biodiversity starting from the interconnection and strengthening of the protected areas in Mesoamerica.
- Become the axis of the sustainable development strategy of the region.
- Recognize and disseminate conservation practices and the good use of natural resources by peasant and indigenous communities, and recognize their established rights to the land.

It is obvious that by accepting any of these objectives as fundamental guidelines, a consequence of it would be the establishment of different goals and actions. Hence a project's first challenge would be to initiate a genuine social understanding process, as a mean to little by little agree on its mission, objectives and goals. Although it can be understood that in the initial stages the governments' initiative played a key role, and in many cases an excluding one, it is apparently necessary to increase actions to incorporate the different social groups, and very specially the indigenous and peasant communities. The role that the governments shall reserve for themselves is not clear. Neither is the role to be played by the aforementioned groups of civil society clear, nor that of universities, NGOs and the private sector in CBM's development.

There is a general opinion on the fact that the CBM still has a predominant conservationist orientation at the countries level. In part this is something that stems from its origin in the management responsible public agencies of the protected areas and the national environmentalists NGOs. And in the influence that some international government and non-government organizations, with clear environmentalist orientation have had. This is not strange, because in many government agencies in Latin America responsible for the protected areas, this kind of vision has prevailed. Eventhough it is changing, CBM's government system and administration favor an "environmental sectorial vision". In effect, CBM's government is the responsibility of the Environmental Ministers of the eight countries that are part of this project that orient and supervise it through their Directors of the Thematic in Protected Areas and Forests.

Therefore, a second challenge starting up the project faces is becoming inter-sectorial. Agriculture Ministers have been practically absent from CBM. The search for environmental sustainability of agricultural and livestock breeding activities in the multiple use areas, dampening areas, and the interconnection areas, included in the official definition require intense actions from this sector. Not only will it have to prefer an environmentally sound agriculture in the estates, but it will also have to establish strategies to identify and spread Sustainable environmental technologies of indigenous and peasant origin.

The intervention of agriculture ministers and from the other government entities that have competence in the use of the soil is also key in the clarification process in the Corridor areas, of the property titles and the rights of the indigenous communities over the territory. These are two fields in which there is legal insecurity in most of the Central American countries and it has been one of the causes for the acute social conflicts the region has experienced. The degree to which CBM is a Sustainable development project shall depend upon the degree to which the agriculture ministries make this one of their priorities and face the problems mentioned.

Transportation and mines and energy are two other areas where it is necessary to begin clear inter-sectorial actions. In the first case because of the obvious reason of the ordering power of the territory that has the roads drawings. In the second case, in view of the coincidence there is between the CBM zones and a great portion of those that have been established as mining and oil exploration areas in the countries in the Region, or where concessions have already been granted.

A third challenge is that of strengthening the national environmental management institutions. In most of the countries human, economic and technical resources engaged in environmental management are far from satisfying the requirements to solve many of the problems they face. This phenomenon is severely seen in almost all the agencies responsible for protected areas. In turn the management capacity is reduced due to the approaches of the predominant administration of parks, which excludes communities, NGOs and other civil society groups. Proof of this last statement is the greater frequency of forest fires that broke out in the region's protected areas during 1998, in comparison with that of the forest areas outside of those where the communities participate in their management.

CBM is then a mean to try to obtain the strengthening needed by these agencies and to establish a priority order on environmental policy and to review some of their approximations. The emulation created between the countries to comply with CBM's regional commitments and to benefit more from the opportunities it provides, is visualized as a trigger for these agencies to overcome many of their fallacies, and obtain a better political rating in the concert of public administration. The task faced by these agencies is formidable: it implies the management of 393 areas and the eventual creation of 390 new areas. Of the existing areas approximately 50% have a minimum or non-existent state presence and 67% has a smaller than 10,000 hectare area. They should also respond to the growing community, private companies, NGOs and other groups' demands, to participate in the management of these protected areas. Naturally the feasibility to strengthen these areas' management will depend somehow upon the success achieved in directing new economic resources for that purpose. Therefore, it is necessary to generalize in the Region, the kind of economic instruments that are being applied in Costa Rica.

Multiple co-ordination problems are mentioned: between Central American Commission for Development (CCAD as per initials in Spanish) and the national governments; and amongst them and the international co-operation agencies and multilateral banks –

World Bank, GEF, UNDP, donor governments – and also multinational environmental NGOs. Also, amongst international entities there are also problems of the same kind and, eventually, a lack of consensus on CBM's conception. These are typical situations of international co-operation, but in this case they are magnified due to the complexity of the project in relation with the number of governments and interested parties involved.

#### INBio and the valuation of bio-diversity

In Costa Rica the initiatives to preserve the bio-diversity of the country are based on the premise that the best way to reach this goal is by proving how bio-diversity has and can be, even to a greater extent, a human development promotion instrument. In other words it is to show how we all depend upon the biological wealth of the country and how it can generate dividends that benefit society at large in the economic, intellectual, spiritual and cultural fields.

To maintain bio-diversity it is necessary to **save** representative samples of this bio-diversity, to **know** what it is, where it is and what functions it meets, and develop intelligent ways to **use** that bio-diversity, making sure that the benefits of its utilization are distributed in a fair and equitable manner.

The Costa Rican State has been consolidating the saving action for several decades now thanks to a process that has led the country to establish a National Conservation Area System (SINAC, as per initials in Spanish), that divides the national territory in eleven areas which in essence include three different categories of use of land: protected wild areas (national parks and other protection categories); areas dedicated to agriculture and livestock breeding, forestry and fishing exploitation and urban areas. The SINAC is a first effort in managing bioregions.

INBoi (The National Biodiversity Institute) directly supports the state effort to save bio-diversity, focusing their efforts in the generation of knowledge and in the search and promotion of sustainable and new ways of utilization. Working together with SINAC, INBio generates in the first instance information and knowledge on the bio-diversity of the country, focusing its work basically in the state protected wild areas. The institution obtains data and information both from the field as well as from the laboratory, gathers specimens and surveys and at the same time integrates the information generated by other institutions.

All the data, information and knowledge are immediately processed, stored and managed in such a way that it can be placed in the appropriate formats depending upon the needs of the various users. Examples of presentation formats are the data bases, Web sites, scientific and dissemination articles, books and field guidelines, strategies and plans, audio-visual productions or samples and chemical extracts for the industry.

The ensuing fundamental step is that of sharing knowledge with society and all the range of bio-diversity users that integrate it. It is necessary that all the information is transmitted and shared in a dynamic manner through a whole variety of processes such as advisory work; distribution of publications; non formal education for students, politicians and decision makers, technicians or tourists and businessmen; exhibitions, commercial products and business developments. One of the most efficient ways in which to share information and knowledge is through the establishment of strategic alliances with entities and organizations formed by the users, such as the ones previously described both in the government sector as well as in the private sector or the civil society.

The INBio also supports other initiatives developed by legal entities, and that in a parallel manner contribute to value bio-diversity. Special interest has been given to the Costa Rican Government's initiative on the payment of environmental services provided by forestry areas, such as the setting of carbon dioxide, the production of water for urban consumption or power generation, the preservation of bio-diversity and the protection of the scenic beauty. The payment for these services is directly contributing to **saving** the bio-diversity outside the protected wild areas, and at the same time is attracting direct economic benefits to small, medium and large owners of primary forest areas, in the regeneration or arborization process.

The objective of the initiatives described in the paragraphs above is that the Costa Rican society upon knowing its bio-diversity, may then value it fully, in the economic, intellectual, spiritual and cultural fields. Upon being useful in many different manners, the awareness of its value shall lead to a conscious decision that this bio-diversity should be maintained continuously, for the benefit of this and future generations.

## **Case 2 - The Organic Coffee Producers in Mesoamerica**

Despite the fact that coffee is a plant native of the Northeast Africa's mesophile forests, after it was brought to America in the 18 century, the largest production volumes (62 per cent) is produced in this continent. Today, 16 countries headed by Brazil, Colombia and Mexico produce and export coffee. There is a strong trend in Latin America and the world to change the traditional coffee production carried out under the shadow of native trees and in combination with other useful species, into highly technical specialized systems of mono-crops in the sun. This technological change has severe direct and indirect effects on the environment; (a) contributes to deforest rain and temperate forests; (b) drastically reduces bio-diversity; (c) generates erosion and soil deterioration; (d) affects hydrological cycles; (e) produces pollution from the agro-toxic material, and (f) contributes to global climate unstability because it eliminates forest areas that act as carbon receivers.

Each coffee producing Latin American country has experienced in a different degree and depending upon its own agrarian and social history, this technological change. For example, while in Brazil coffee is produced, with a few exceptions, in large private farms located in flat or almost flatlands and under the modality of agro-industrial mono-crops without shadow, in Mexico the aromatic is produced by thousands of small coffee growers, almost always indigenous, in mountain areas and under the canopy of original trees (traditional shadow poli-crops or "coffee gardens"). Between these two extremes are the rest of the producing countries. Each one of them has a specific percentage of its coffee growing surface under the diversified modality and of shadow or specialized, and under the sun. Especially important in this context are the Mesoamerican area countries (Mexico and Central America), where still today the traditional coffee production systems prevail and where an interesting conversion towards the so-called organic coffee has been generated.

From the organic products harvested in Latin America, coffee is the most important product surface-wise and production volume-wise; Mexico is the largest producer and exporter in the world and with a largest number of organic producers. If you look at the global figures of coffee growers who participate in the strictly organic agriculture throughout the world, you will find that currently Mexico has practically the same number of organic producers (approximately 13.000) that all the European Community countries, and represents less than half of the total number in the USA, which is approximately between twenty five and thirty thousand.

To produce coffee in an organic manner has meant not only to keep the shadow systems diversified, with all the ecological advantages brought by them, but it also forces the utilization and integration of a series of conservation practices, and also the improvement of the entire productive process, as well as a series of commercial and social changes. The work related to the coffee agro-ecosystem preservation practices imply the substitution of agro-chemical products for organic elements, the employment of household fertilizers to recover the fertility of the soil, practices related to soil erosion control (making terraces and live barriers), recycling of organic waste like pulp, the biological control of plagues, diseases and weeds (manual weeding), the mandatory use of diversified shadow with native and introduced species, bio-diversity preservation and the rational use of aquifer resources. Regarding the integral improvement of the productive process would imply a series of cultural practices such as the use of native resistant varieties, turnover and diversification of crops, rest, increase genetic diversity and energy efficiency and introduce other practices such as livestock breeding, forestry, and horticulture. Also, the organic coffee-culture method implies the appropriate tasks for the benefit, storage and transportation in order to obtain a high quality product. In economic and social terms, it includes elements with

more democratization, community participation, high self-sufficiency, economic efficiency and profitability, and also a better distribution of resources and increase in the quality of life of the coffee-growers.

From the total surface that Mexico designates to the production of more than 30 organic products, coffee represents ninety per cent, and the net income for the country is estimated to be more than 20 million dollars per year. Despite the fact that the percentage of land planted with organic coffee represents today approximately 3.4% of the total coffee growing surface, the importance of this crop lies not only in the strong expansion that it has experienced during the last eight years in world markets, but also in the expectations generated from basically industrialized countries' consumers' changes in behavior, as they are demanding healthier and more environment friendly products.

The most successful experiences of organic coffee production in Mexico are found amongst small indigenous producers organizations, and jointly they group close to two thirds of organic coffee producers in Mexico. The most important organic Central American country coffee producers are: Nicaragua, Honduras, El Salvador and Guatemala, which processes have been linked to various national NGOs and/or European or American consumers.

### **Case 3 – The Sustainable Development Plan at the Sierra Nevada de Santamarta**

Colombia is starting up the Sustainable Development Plan in the Sierra Nevada de Santamarta (PDSSN, as per initials in Spanish). This is an ecoregion with an incredible natural wealth and scenic beauty, habitat of millenary cultures and half-caste (mestizo) populations, that has undergone severe social and political unrest and a big environmental deterioration process in the last decades.

The Sierra Nevada de Santa Marta (SNSM, as per initials in Spanish) is a solid Andean mountain that climbs from the Caribbean coast up to 5775 meters over the sea level, and has 2.115.000 hectares. Thanks to the altitude variation, it concentrates the ecosystems that represent Tropical America with a rich variety of flora and fauna species (approximately 3.000 species of superior plants). Only 15% of the area occupied by the bio-mass of SNSM has not been altered, that means that 320.000 hectares of primary forests have been preserved. It constitutes a hydrographic system with thirty main rivers that contribute two billion cubic meters per year to irrigate the neighboring valleys and plains.

Its population is 944.000 inhabitants. Of them 211 correspond to rural population; 33.000 indigenous and 168.000 peasant settler population. Amongst the indigenous population, the Kogui and some Arhuacos groups distinguish themselves for their strong cultural identity and capacity to maintain their traditions in view of the half-caste's settlement in the territory that has taken place especially during the last five decades. It is possible to differentiate two specific peasant groups and settlers: the first one represented by those who migrated during the decade of the 50s. They carry out a stable agricultural activity and normally have the property writs accrediting them as owners of the land. The second group is formed by settlers that arrived to the solid mountain attracted by the boom of marihuana harvesting and that – in some cases – settled in areas created as indigenous reservations and natural parks; sites for which, in accordance with the law, they cannot obtain a property title. The marimba triggered deforestation and the most severe environmental damages to the Sierra.

The Kogui, Arhuaco and Arzario indigenous populations have collective property rights on the land under the modality of reservations that include 393.000 hectares, 320.000 hectares and 128.000 hectares, respectively. There are two protected areas in the

Sierra: The SNSM natural park, with a 383.000-hectare extension and the Tayrona National Park with 12.000 hectares. Three departments and thirteen municipalities, as well as three regional autonomous corporations have jurisdiction over the region as the maximum environmental authorities. Some of the areas in the Sierra are controlled by guerrilla and paramilitary groups; which is one of the political and social conflict expressions that has taken place at the SNSM during the last decades, and is related to territorial control and made more severe by the presence of illicit crops.

The Regional Environmental Council of SNSM, integrated by 32 members is responsible for the coordination of institutional actions and the execution of the PDSSN. It is relevant to list its composition because it offers a portrait of all the government and civil society organizations which integrate the SNSM: The Environment and Agriculture Ministers; a President of the Republic representative; the directors of the National Natural Parks System, of the National Land Adaptation Institute, of the Agrarian Reform Institute, and of the National Indigenous Matters Office; the governors of the Guajira, Magdalena and Cesar Departments; a representative of the municipalities with jurisdiction over the Sierra per Department; the director of the Atlantic Coast Regional Planning Board; a representative of the town hall governor of each one of the following ethnic groups: Arzaria, Arhuaca, Kogui; a town hall representative with seat at the SNSM of the following ethnic groups: Wayuu and Kankuamo; a representative for each one of the Departments with jurisdiction from the SNSM of peasant organizations; a representative for each one of the three Departments with jurisdiction from SNSM of the NGOs; and three representatives of the production guilds.

The Board was created in March 1998 within a framework of the SNSM Forum with the participation of approximately 600 representatives from all the social and institutional sectors that made a series of recommendations on the PDSSN. Currently there is a broad range of projects from various government and non-government organizations involved. But the Plan is being studied again by the indigenous communities who are trying to harmonize it with their own proposals. In the Plan definition process these communities participated extensively, but they thought it was pertinent to review it again. They have been working on this process for more than a year.

The Plan is the result of a gradual construction agreed upon with several government and civil society factors that has been promoted by the Pro-Sierra Nevada de Santamarta Foundation. We could say that this is an initiative generated at an NGO that has been creating the conditions for these sectors to become the owners of its design and implementation and generate the capacity to do so, which include the strengthening of civil society organizations and the appropriation and exchange of knowledge on the Sierra. The Foundation has played the role of an instrumental institution to create and consolidate equity in the Region.

The process that finally led to the PDSSN has been based in the participation of all the SNSM actors and also on a very broad strategy range. This has made evident the specific situation of the relationship between poverty, social inequality and environmental deterioration in the region. These can be perceived by various phenomena, such as deforestation, the loss of traditionally indigenous territory, illicit crops, armed confrontation and the violation of human rights that have taken place especially during the last four decades.

The Plan includes five major actions with their corresponding programs: preservation of ecosystems, strengthening of indigenous cultural identity, stabilization of peasant sectors, strengthening of the fundamental rights, and administrative modernization. Also, it tries to articulate many initiatives that had already been started and had progressed thanks to several public agencies and non-government organizations, and suggests new actions, financed with national and international resources. Within the

latter, a credit has already been obtained from the World Bank for US\$5.000.000 and a GEF project is being processed at a US\$15.000.000 value, the latter of which would be carried out by the Foundation.

The tremendous amount of time invested in generating this ecoregional plan, with more than twelve years of history, is basically explained by the need and the problems of having consensus in a region where there is conflict and that for many years has been a victim of the drug traffic activities. And it is also explained due to the indigenous sense of time, which runs slower than that of the "minor brothers". This is the name the Kogui give those inhabitants who live beyond the Sierra.

In a not too distant future the increase of indigenous territorial conquests has led to the confirmation of its traditional organization forms and its cultural rights, and also the strengthening of the organizations directed to establish relationships with the government and other civil society groups that recognize them as their legitimate speakers. These organization elements constitute one of the strengths of the basis of the PDSSN. As a contrast, peasant organizations are relatively weak. This situation has always made more difficult the presence of representatives with sufficient legitimacy in the consultation and agreement processes that may lead to the conservation strategy.

But the indigenous reservations are the stage of current and potential conflicts that constitute both a limitation as well as an opportunity to implement the PDSSN. There still are some peasants who were already inhabiting some of the reservations territories' area when they were reserved, or who settled afterwards during a migration wave that took place during the sixties. The improvement acquisition process carried out by the Agrarian Reform Institute has been progressing very slowly regardless of the fact that a large number of settled peasants are quite willing to sell them. Although in the recent past, there have been some conflicts between the indigenous in the reservations and the peasants settled there, today they are living in relative peace. This situation could change easily.

There is a similar situation at the National Natural Park of the Sierra Nevada de Santa Marta, where there are large peasant settlements in part of the territory. The peasants settled in the park are there "illegally" because, in accordance with the law, the only inhabitants allowed there are indigenous communities and no agrarian activities can be advanced there. By all means this is a hostile situation that does not favor the protection of natural resources. Also, the "cleaning" alternative does not seem to be convenient or feasible in some of the park's areas. This case point at the need to reform the rigid Colombian legislation over protected areas and new categories be created so that there is a difference established between these areas with very high restrictions (today national parks under the legislation) from those where a certain kind of productive activities may be carried out.

One of the biggest institutional obstacles to start up the PDSSN is the insufficient coordination between public agencies, which becomes even worst due to the large number that have jurisdiction in the region. The underlying participation process in formulating the Plan has tried to solve this problem. Another big limitation is the little integration of environmental dimension in the management of critical entities to implement the PDSSN. This is especially acute in the Ministry of Agriculture, in which the environmental sustainability of the agriculture and livestock breeding topic has a very low priority. For example this is reflected by the lack of resources the office has on environmental matters. It is not clear, then, if it is possible to start a broad program to try to have Sustainable agriculture, without leaving asides the accurate interesting experience in organic agriculture promoted by various entities.

### **Strategic Ecoregions – the Colombia case**

The environmental component the *National Development Plan* of Colombia, called *Collective Environmental Project*, establishes as general objective the restoration and preservation of priority areas in *Strategic Ecoregions*, promoting and fostering the sustainability of economic and social development in specific territorial environments, as an essential contribution to make peace. Water has been identified as the core axis of politics due to its importance in the integration of natural, social, economic and cultural systems in the country. Also because it is very important to recover and guarantee its supply in a sustainable manner for the benefit of the human population.

*Strategic Ecoregions* are those that guarantee the supply of basic environmental services and the maintenance of ecological processes for the performance urban and rural population activities. This concept supplies a space to the environmental problem, integrating in the territory a series of social, economic, environmental and cultural aspects that have traditionally been treated in a sectorial manner. This vision allows to prioritize international as well as regional areas in order to guarantee the sustainable development of the most vulnerable ecosystems in the country, such as the cities and areas degraded by anthropoid actions in the rural sector. It is also vital to achieve an integral approximation to the bio-diversity sustainable conservation and use.

*Strategic Ecoregions* have been established based on a global vision of the Colombian continental and maritime territory. Criteria that play a fundamental role in establishing and maintaining the basic ecological processes in the national context have been taken into account, as well as the economic, social, cultural and environmental aspects. There, water is the environmental policy core axis. The strategic ecosystems comprise regions that comply with the following principles:

- a) National importance to obtain drinking water, hydro-energy and hydro regulation.
- b) Presence of sole ecosystems for the Bio-diversity sustainable use and preservation.
- c) High risk due to the presence of disasters caused by natural or man-produced phenomena.
- d) Severe landscape degradation problems caused by the implementation of inadequate use of the land: soil erosion and degradation caused by livestock breeding use; areas degraded due to mining activity.
- e) Possibility to articulate actors and resources in the management of the same territory.
- f) Cultural value for the nation.
- g) Territorial articulation of the different thematic areas of the environmental collective project.
- h) Integral work of the entities that form the National Environmental System (Regional Autonomous Corporations, Sustainable Development Corporations and Urban Environmental Authorities) with the Departments, Territorial entities and civil society.

These areas are: Macizo Colombiano, Sierra Nevada de Santa Marta, Sierra Nevada del Cocuy, Eje Cafetalero, Piedemonte Amazónico and Magdalena Medio.

The *Regional Ecoregions* have been defined in the regional environment following the same principles mentioned above but with greater detail. Also, other criteria established during workshops carried out between public and private entities and civil societies have been taken into consideration.

These criteria have been the following:

- a) Western Andean Region: Territorial articulation of the Environmental Collective Project Programs; articulation of economic sources and resources; progress in regional environmental management processes; presence of cultural identity and territorial settling and the presence of biological corridors.
- b) Eastern Andean Region: Presence of bio-diversity rich ecosystems; restoration priority areas; presence of cultural diversity in the territory; high population density; social pressure over the ecosystems for environmental services and infrastructure projects; possibility to articulate the ecoregion to the biological network ecoregion; existence of information, plans and regional projects in process.
- c) Caribbean Region: regional, national and international importance; strategic areas to manage the hydro resource of continental and maritime water; high levels of natural and cultural bio-diversity.
- d) Orinoquia: Strategic areas to manage the hydro resource; with high presence of conflicts derived from inappropriate use of the soil; high bio-diversity; contribution to the continuity of biological corridors and the possibility of articulation with the Environmental Collective project.
- e) Pacific Region: Privileged areas where the various ethnic, cultural and historic processes meet. And based on their different visions, allow them to reach environmental management consensus; high ecological vulnerability areas and presence of risks; articulation of sustainable productive dynamics that trigger regional and national impact technological developments by the contribution of traditional knowledge and production systems; potential alternative environmental services.
- f) Amazon Region: Areas with social and political conflicts; areas culturally important and with biodiversity.

The Ministry of Agriculture should play a central role in the stabilization process of peasant sectors and the territorial consolidation of indigenous reservations and



protected areas. The major challenge the Agrarian Reform Colombian Institute and the natural parks face has to do not only with relocating the settlers dwellers in the reservations and the natural parks, but also of those who settle in land that is appropriate for agricultural activity. The environmental sustainability of the Sierra shall be linked to a large extent, to these last actions that are also needed to attain peace.

#### **Case 4 – Indigenous communities and 5 star hotels in Oaxaca, Mexico**

Oaxaca is the bio-cultural richest state in Mexico, classified in the first place both by the conservationists, given its extraordinary wealth in fauna and flora as well as the anthropologists because 70% of its territory is in the hands of indigenous communities of 12 main cultures, who speak 104 languages and dialects. Oaxaca is also one of the poorest and less “modernized” areas in the country. It constantly proves the reiterated incompatibility between the industrial modernization principles and the high landscape, biological and cultural diversity regions of the planet.

Oaxaca’s coastline is crossed by the Sierra Sur, which abruptly descends over a narrow coastline plain strip, which is normally between 10 and 20 kms. wide. The Sierra Sur mountains continue to be a refuge area for hundreds of indigenous communities. The coastline plains are used for irrigation agriculture, coastline fishing and in the last decades, to develop new tourist poles. In this manner, this Section’s inhabitants have seen the emergence of new tourist poles: Puerto Escondido, Puerto Angel and more recently Huatulco, an impressive international level mega-tourist resort.

Before today, Huatulco was and continues to be the region that has been inhabited from immemorial times by various indigenous cultures. In this manner, besides impressive five star hotels, the region has approximately 50,000 indigenous inhabitants grouped in 150 communities who live in approximately 700,000 mountainous hectares and in the form of small fishing settlements in the coastline. Hardly impacted by the activities of subsistence agriculture, the forests surrounding the high parts of what today is the mega-tourist Huatulco pole, remained more or less unaltered. However, during the last two decades, the forest mantle was seriously affected by different deforesting phenomena. The result has been that to date only one fifth of the forests maintains its original structure. To complicate things further, in 1997 Hurricane Paulina demolished approximately 6 to 7 million trees, increasing the deforestation around the course of the main rivers and affecting 66 per cent of the peasants’ houses. As a result of this panorama, the water supply in the coastal area decreased 28 per cent between 1986 and 1992, and condemned the Huatulco Bay to be without water in approximately the year 2020, unless the conditions were modified or reverted.

The Ecological Support Center (CSE, as per initials in Spanish) sponsored by a regional NGO, during the last years has created an interesting water supply regional project. In it, the indigenous communities of the high basin area, the inhabitants of the areas where water is produced, and the urban and tourist consumers of the low lands, have been able to reach agreements and find the mechanisms that guarantee permanent water supply. These consensuses have been achieved by the implementation of fair market mechanisms, by which the indigenous communities bind themselves to maintain and improve the “natural water plants”, including their quality, through reforestation actions, erosion control and cleanliness and care of the affluent. In turn the hotels (and other urban users) that use the water, offset these actions by contributing in kind, support to preservation and agro-ecology projects and the purchase of organic products (fruits and vegetables) at preferential prices.

This fact is significant because it is unheard of. Water, an element of nature, has made possible the negotiation between the Sheraton and other Hotels and the Zapoteca

indigenous communities. This agreement amongst the parties has been made outside Mexican laws (hydraulic resources constitute Mexico's patrimony and it can only be negotiated through government agencies) and directly (without intermediation or official sanctions). But this also exemplifies a case in which culturally very distant neighbors living in the same territory, are able to set the basis to manage a bioregion, in this case, a hydrological basin.

#### **Restoration in the Peruvian Amazon: An Indigenous Response**

AIDSESEP, an association of 28 federations of indigenous peoples from Peru, has launched a program to restore the productivity and diversity of degraded fields and forests in their ancestral domain. The project site is near Pucalpa, which lies at the end of the Pucalpa-Lima highway, the only road linking the Amazon Basin to the rest of Peru.

Since the highway was built during the mid 1960s, waves of colonists and land speculators have cleared the forests for farming and cattle ranching. In the process, the local indigenous peoples lost access to their ancestral lands. In response, AIDSESEP has launched a campaign to secure land titles for those still living in forested areas and to reclaim their ancestral domain, much of which is now a wasteland of abandoned farms and low productivity cattle pastures.

In 1985, AIDSESEP launched the HIFCO project to reclaim a 7.5-hectare parcel of abandoned cattle pasture—an experiment in wresting food crops from marginal lands. German ecologists provided technical assistance during the first year. Since then, HIFCO has been totally managed and developed by the indigenous community, with modest international financial support. The abandoned pasture had become ecological "Garden of Eden" that enjoys year-round production. Acidic soils have been restored, and crop yields have increased each year, surpassing those of nearby farms employing "modern" non-organic agriculture.

The HIFCO farming system is best described as a "hybrid," built on a model of the forest canopy's strata, but also drawing on both modern and traditional agriculture. It focuses on improving soil structure and nutrient content through a system of raised beds and drainage canals. Rejecting the recommendation of extension agents from the Ministry of Agriculture to scrap the whole project, HIFCO began working organic crop matter—crop residue, leaf litter, animal manure—into the planted beds. By 1990, farmers' experiments with different mixes of traditional cash crops with trees had turned 4.5 hectares into productive agricultural land.

The species diversity of the beds is very rich, with a kaleidoscope of 42 annual and perennials intercropped among trees. The system is laced with leguminous plants (e.g., various "pole" beans and pigeon-pea bushes) that serve as green mulchers and soil enrichers. Trees in the system support "climber" crops (various beans), fix nitrogen, bear fruit, and provide timber and specialty products. By integrating trees into the system, especially as "live" posts, both vertical and horizontal spaces are optimized, so yields per hectare are high. The immediate area encircling the garden is being replanted with trees to mimic a natural forest. To date, 63 different tree species have been tried, most of them endemic from local forests.

A number of aromatic plants and species are cultivated among the food crops to repel insect pests, and the HIFCO staff also brew its own "agrochemical"—a reportedly effective fertilizer and pest repellent made from more than 14 local ingredients mixed together in precise ratios. Fish stocked in the water-filled ditches also help out by eating insect eggs.

Eighteen varieties of fish raised in ponds and ditches, along with a variety of domesticated animals, are also part of the HIFCO system. Guinea pigs, geese, ducks, pigeons, and guinea hens are raised in stalls. Residual food crops and aquatic plants provide feed for the animals, which in turn provide the manure that fertilizes the raised beds. (HIFCO has exiled cattle, pigs, goats and chickens—all environmentally notorious—from this Eden.)

The project even has a crop-improvement program. Seeds are collected from the most promising crop varieties, dried in a solar oven, and stored in the project's seed bank for out-planting and field trials. They are sowed in germination flats and later transferred to nursery beds made of logs and located under the forest canopy or to containers fashioned out of cross-sections of hollow plantain stems, palm trunks, or bamboo. Once planted in the soil, the containers decompose quickly.

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*Restoration in the Peruvian Amazon: An Indigenous Response (continued)*

The HIFCO demonstration farm serves as a training center for AIDSESEP's member federations. By 1990, four intensive training courses had been held for 36 families from 18 federations. The training program spans three months of classroom instruction, conducted entirely with graphic materials, and field practice. Entire families, mothers, fathers and children, participate in the course, residing in the HHIFCO "dormitories." So far, graduates have launched five "mini-HIFCO" demonstration projects in their communities.

AIDSESEP hopes eventually to do away with the centralized training center in Pucalpa, and instead help each federation to train its own members locally. To this end, AIDSESEP initiated a scholarship program in 1985: the 20 students currently enrolled are working toward degrees in agronomy, engineering, and law.

The mere fact that AIDSESEP has been able to bring degraded lands back into agricultural production and maintain it has wide-ranging implications. Continuing high rates of tropical deforestation is producing an ever-increasing amount of degraded and unproductive land. Reclaiming these lands to feed a growing population and support biodiversity conservation presents a major global challenge. The HIFCO project appears to offer one creative and perhaps replicable solution.

*Source:* B. Cabarle, *Ecofarming in the Peruvian Amazon: An Indigenous Response*, Wasington, D.C., WRI, doc. mimeo. 1990, citado en MILLER, 1999

## **Case 5      The reordering of Cuba towards sustainable development**

Since the Cuban revolution in 1959, until the collapse of trade relations with the socialist block at the end of the 80s, Cuba's economic development was characterized by a fast modernization, and a high degree of social welfare and social ease as well as a strong foreign dependence. Although most of the quality of living indicators were placed in a very positive range, Cuba depended on his trade partners in the Socialist block for the supply of oil, equipment, and industrial supplies, agricultural inputs as fertilizers and pesticides and even food products. Possibly as much as 60% of the total calories consumed by the Cuban population came from imports.

Cuban agriculture was based on large scale, capital intensive monocultures, closer to the Central California Valley than the typical small plot of Latin America. Over 90% of the fertilizers and pesticides or ingredients to make them were imported. This shows the great dependence of this style of agriculture and the vulnerability of the island economy to international market forces. When the trade relations with the socialist block fell in 1990. fertilizers and pesticide imports declined three fourths and oil availability drop to half. Suddenly an agricultural system almost as modern and industrialized as the California system was confronted with a double challenge; the need to double food production with less than half the inputs and at the same time keeping up the production of exports so as to not erode further the already difficult exchange position of the country

Although the present agro technology changes can be seen pessimistically by some as a short term answer to the crisis, other Cubans ascertain that this is really a structural transformation that should have been made a long time ago Planning authorities mention that the new development of agriculture is based on what they call " the alternative model " in contrast with the " classical model" of modern agroindustrial agriculture. The classical model " is represented by extensive monocultures of foreign species basically for exports, highly mechanized and that require s continuous supply of imported technology and inputs, The mechanization leads to massive migration of people from rural areas to cities, And finally, the model quickly degrades the natural base of its own productivity, through the erosion, compacting and salinisation of soils and by developing resistance to pesticides of pests and diseases. On the other hand the alternative model "tries to promote ecologically sustainable production by replacing the strong dependence on the use of heavy machinery and chemical inputs with the use of animal traction, or the turn over of grasses or cultures, soil conservation,

organic fertilizers, biologic pests control, What the Cubans call biofertilizers and biopesticides, which are microbial formulae that are not toxic for human beings. The alternative model promotes the incorporation of rural populations to agriculture through their work and knowledge of agricultural practices, and their active participation in the generation of new more appropriate technologies. This model is designed to stop the flow of rural migrations and to provide food security for the population.

The model is virtually identical to the alternatives proposed in the United States, Latin America, Europe and other places, It only differs in a key element, While this represents the utopic vision or a marginal reality in those countries now it has become a government policy and agricultural practice in Cuba, In sum, despite the many limitations including the U:S trade embargo. Cubans have started a technological change never heard of before in agriculture, in Latin America, the mass conversion of a conventional agriculture, dependent of foreign inputs to an agriculture based on internal, biologic and local resources

The agricultural reconversion is nothing but the beginning of a series of actions that together seem to outline a substantial change in Cuban society, From the beginning of the 90 s things have been happening in Cuba like other phenomena worthy of being recorded, The energy crises for example, has leftmost buses in Cuba stagnant due to lack of gasoline So now bicycles have become a basic transportation vehicle in Havana, By 1995 Cuba had imported from China, around 1 million bicycles to be used in major cities. Likewise in Havana and other cities the so called " urban orchards " have grown taking advantage of empty land plots and areas that have not been built to plant vegetables and where vermin- culture has played a major role. This immediately reminds us of the small peasant production which is a sector that remained marginal, it almost disappeared in the State conventional plans that today is the only one that is getting productive surpluses by the intensive use of human and animal energy, small scale; Of course it is the Cuban version of the typical small plot that is prevalent in a good part of Latin America today

You can not but mention, the new ecologic tourism programs that have recently emerged in the island, The interesting integration of the sugar cane industry and cattle breeding or agriculture recycling wastes and particularly the broad network of natural protected areas that have been built in that country and make Cuba one of the leader nations in biologic conservation.

#### **Case 6- The Soufriere Marine;Management Area ( SMMA) in St. Lucia**

Coastal areas in most countries of the Caribbean are characterized by intense conflicts among a wide range of resource users and uses, Because in the historical concentration of many activities, infrastructures and settlements in the coastal area, important economic and social uses compete for small and scarce resources, This situation has been aggravated in recent years by the rapid growth of tourism and changes it has brought to coastal environments and economies. It also has been made worse by the continued degradation of coastal ecosystems as a result of the sedimentation from run-off pollution of coastal waters and over exploitation of economically important organisms.

The littoral zone of Soufriere, a small town on the southwest coastal island of St, Lucia in the eastern Caribbean provides a good illustration of these problems, With the construction of hotels in the seventies and eighties, with the progressive diversification of tourism activities ( notably through the development of diving and other water based activities) new conflicts progressively arose, between fishers and dive operations over the use of coral reefs, between yachts and fishers over anchoring in seining

areas, among fishers because of increasing competition over a dwindling resource base, between local residents and hotel owners over beach access and use, and between fishers and local planners over development plans for the area.

The first set of responses to this situation took place in the late eighties, when conventional approaches to conflict resolution and resource management were used, Marine Reserves and Fishing Priorities Areas were established by the government, but with the limited consultation with local users and community agencies, As a result, enforcement became difficult, and these management measures were not implemented. Meanwhile, pressure on the fishing community continued to increase, exacerbating the conflicts to the point where public opinion and local community leaders began to demand that action be taken to address these various issues.

The public demand was made possible, in part by the fact that the community of the Soufriere had been engaged, two years earlier in a comprehensive strategic planning process termed " Soufriere 2000" a local development organization named Soufriere Regional Development Foundation, which had been created in the early nineties, as a result of the planning activity described above, took the initiative to initiate a participatory planning process to guide the use of coastal and marine resources in the area, It joined forces with the Department of Fisheries and the Caribbean Natural Resources Institute, and facilitated a series of meetings and consultations which resulted in an agreement among stakeholders on the use and management of marine and coastal resources in the region,

The agreement, which was formally approved by the Cabinet of Ministers, was essentially a zoning plan that maintained multiple uses whenever possible, and established marine reserves, fishing priority areas, recreational zones, and mooring areas for pleasure boats, It identified a number of programs aimed at promoting the sustainable use of the area's resources, It left management authority in the hands of government agencies but placed responsibility for day-to-day implementation in the hands of the local NGO. The Soufriere Foundation, It also created a Technical Advisory Committee, a broad based group of stakeholders with the coordination of management activities.

The first phase of the implementation of the Soufriere Marine Management area achieved much (improved management of reefs and reef resources, enhancement of local tourism products, increased public awareness and participation) But, in late 1996 and 1997, new conflicts began to emerge which seriously threatened the very existence of the management agreement.

In response to these new concerns, the Government of St, Lucia, under the leadership of the Department of Fisheries decided, in late 1997, to conduct a detailed review of the institutional arrangements for the SMMA, as it was convinced that the root causes of these problems were to be found in the structure and organization of the management arrangement: The main results of the review were:

- One of the weaknesses of the original planning process was that it had failed to develop a clear consensus on vision, mission, and objectives. In a way, the intent had been to resolve or reduce the conflicts, but without a common purpose, without a common direction. When new conditions began to create new conflicts, the partners in the agreement did not have a common goal to adhere to, and moved in separate directions.
- The institutional arrangements which we had put in place originally were too loose to guarantee the rights and responsibilities of the more powerless parties in the arrangement, It showed that without safeguards, the powerful groups will always take advantage of their position, if only because of their

commitment to efficiency and their need to obtain results, As a consequence, a new agreement had been negotiated, which involves all government and civil society organizations which have a recognized management authority in the Area ( a total of 11 agencies). A broad based Stakeholder Advisory Committee is being established to provide an on-going mechanism for consultation and participation

There are a number of other experiences in the insular Caribbean ( for example, Program Sibarimar in Cuba, The Negril marine Park in Jamaica, and the work of the Coastal Zone Management Unit and the Fisheries Division in Barbados) which use similar approaches and methods, and serve to demonstrate the value of planning and management initiatives which integrate all aspects of development, involve people and institutions in decision making and implementation processes, and respect the natural and cultural integrity of the areas under management.

### III.3. Lessons of successful experiences

Experiences examined are successful and of very diverse nature, They represent, territorial planning experiences ( participative or self suggestive) where interests of various sectors at stress and/or conflict can be harmonized, articulated and integrated as a function of a common objective, Each one represents a particular combination of efforts of all or some of the social sectors, and most represent local, micro regional, and regional experiences and even some national and sectoral ones as in the case of Cuba,

- a) Local actors or producers
- b) Universities and research centers
- c) Private corporations
- d) Churches
- e) Consumer organizations
- f) NGOs
- g) Government organizations
- h) International agencies

Which are the didactic elements that can be derived of the compared analysis of these experiences ?

- The first fact that pops out, is that all experiences emerged as the result of **recognizing the ecologic crises** that is perceived as immediate and concrete: deforestation, loss of water an inappropriate management of natural resources, inefficient agriculture, However this crisis becomes an opportunity to change ( term derived from the Andean Indians philosophy) but in reality where the other common denominator is the social crises, But in this environmentalism clearly bio regionalist, local actors and those who go with them not only identify in the overcoming the ecologic crises the right path to overcome their own social situation but also they go to the offensive in becoming internalized into the reality of a global world.
- Of course the process is a supposed **multi sectoral exercise** where there are two ingredients that seem to be essential : the NGOs that work as facilitators, catalysts, orchestrators and connectors of the process and the direct or indirect use of scientific and technological information, that is by

having researchers and technicians, or using data derived from field or similar experiences, Very closely followed by institutional or material supports coming from government agencies or international agencies.

- The main lesson is very significant; any social sector seems potentially subject of becoming an actor- consciously addressing a planning effort (explicit or implicit) whose purpose is the **recovery of balance between the group of social actors and natural systems**. The emergence of this (collective awareness " of bio regional nature is seen in the development or acknowledgement of a certain belonging to a functionally articulated space, that is also common, community territory, a region, hydrological basin, a country and therefore the planet itself. In a certain way it is a recovery of the a species consciousness or planetary consciousness, the one which was lost with the arrival of contemporary industrial civilization. From the above we see the emergence of innovative phenomena of space solidarity ( the inhabitants of a basin or region) productive solidarity (producers, transformers and consumers of a certain good or service) epistemological solidarity (as the church; scientists. and indigenous groups that participate in different initiatives).
- In the aforementioned phenomena, **information resources** coming from academic circles play a major role as much as the skills of communicating and disseminating agencies ( regularly represented by NGOs) to make it accessible to the rest of the social sectors, so they can be operational, Without scientific information, or data to recognize a territory or interpret a regional or technological situation, the designs or formulae to overcome productive or management problems, This experiences become un achievable or repeatable. Likewise, without social engineering " that is without the participative democracy mechanisms, dialogue of knowledges and actors, effective communication means and consensus

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### III. Challenges for territorial and bioregional strategic action

The first approach to the subject of the challenges faced by bio-regional planning is to find a proper answer to two basic questions.

The first is, what is the *priority* that nations should give to sustainability?

Since it has already been mentioned that sustainable development is the one that meets the needs of current generations, without jeopardizing the ability of future generations to meet their own, the need of building two *levels* of consensus may be emphasized: *structural* development priorities for society as a whole; and *specific* priorities for public policy-making based on sustainability.

In this sense, a *macro-systemic* sense if you will –where human beings are the core and purpose of the development process– society must recognize the urgent need for a new style of development which would be **environmentally, socially, culturally, politically and ethically sustainable**.

When a stance closer to public policy is adopted, with a view to changing the social consensus mentioned into daily reality, it is essential to set *specific* priorities to make development sustainable. For the sake of brevity, one of many priorities is suggested, simply to illustrate the path to be followed. Thus, one of the major errors of neoclassic economy lies in assuming that the *natural capital* (natural resources and environmental services) can be easily replaced by the *constructed capital* (technology, machinery and equipment). Hence, for instance it is assumed that if a community can refine its ships or buy more vessels, they will catch more fish. However, this is a half truth because once the limit of fish available is reached, the enlargement of a fishing fleet or the inclusion of new technologies will only deteriorate the maritime ecosystem faster, until it is exhausted. Therefore, the alleged replacement is useless, because in fact, it will have led to the economic ruin of the community. This is why a sustainable policy for exploring natural resources must on the one hand, restrict the extraction rates to the ecosystem's recovery rates. On the other hand, it will be necessary to strengthen the so-called "economic clusters" in order, more than to restrict the extraction of resources, promote industrial and service activities that will add value to the resource and promote inter-sectoral and personal distribution of wealth.

Nevertheless, if the above can be easily proven insofar as *renewable* resources (forests, marine resources, water, soil, etc.), an even more specific priority is required with respect to *non-renewable* resources. For example, it would not be advisable to take the extraction of copper (accounting for roughly 40 percent of Chile's exports) to its limit, if perfectly suitable substitutes for all the uses of copper were available. In this instance, the country's sustainability would be partly measured, by the ability to make copper production more efficient and make available reserves last longer. What will eventually ensure the sustainability of an economy like Chile's, in this particular aspect, will be the ability, like in renewable resources, to "sow copper". In other words, Chile will be sustainable in copper to the exact extent in which, for example, it is able to invest in the research and development of copper substitutes (e.g., fiber optics), amounts equal to the investments made to improve and make the current extraction of copper more efficient and profitable. Thus, by "sowing copper", Chile will continue to develop its economy even when, in the worse scenario, the resource is exhausted.

In the second place, satisfactory answers must be found to the question **of which are the major potentialities available for confronting this challenge**.

Of course, most of the countries of the Americas and the Caribbean have relatively an abundant supply of *natural capital* composed of forest, fishing, mineral and energy resources. This would be more than adequate to meet the welfare requirements of the people, provided that meeting the basic needs of the population over the simple stockpiling of wealth is considered more important, and the above priorities are adopted. Furthermore, the *cultural capital* of the countries of the region has reached a high degree of national identity, despite the persistence of significant difficulties related to ethnic integration and regional identities. Many nations also have an important "stock" of institutional capital in terms of a system of laws, incentives and penalties that regulate social life, together with a network of organizations to ensure that these standards are observed.

The *social capital* of the countries of the region bases its strength on organized social players, on very significant historical levels of participation and social compromise, which makes it feasible to attain, what is called in economic language, more efficient margins of "transaction costs", so that *inter alia*, productivity in the use of resources is increased. In this regard, perhaps the only obstacle to maximizing the important social capital has to do with the most recent consumer espionage that has torn the fabric of trust among citizens and the features of solidarity that had been present in the past. Thus, it is a matter of recovering endowments of latent social capital and promoting its consolidation.

Latin America's and the Caribbean's main potential to put a style of sustainable development into practice is their very important *human capital*. Indeed, it is precisely the human capital of a community that enables it to make the best possible use of its other capital endowments, maximize its economic and social benefits and thus, produce greater well-being over and above the simple accrual of wealth. In this regard, it will be necessary to change and make the access to the region's educational systems more universal, in order to increase the possibility for all to obtain the knowledge and skills necessary to fully contribute to development.

In the meantime, an aspect of human capital must be explored to effectively reinforce the synergetic relationships between the various "stocks" of capital available in the countries and in turn, ensure the implementation of the above public policy priorities. It will be essential to concentrate efforts to increase the *endogenous* capacity to accumulate knowledge and technical progress. In other words, it is urgent to expand the huge potential of existing social, scientific and technological research, providing human, material and technological resources for the educational system, from the base to the top of the pyramid of knowledge. It should be repeated at this time the important role of the State in this area, even more so when one recognizes that knowledge is the engine of development in a globalized world. It is not simply a matter of ensuring, via the marketplace, access to education, but of strengthening community practices to meet the social needs of knowledge accumulation.

Furthermore, underscoring the above, development is increasingly considered as an *endogenous* process, that depends on the ability the territory has to change the thrust of development growth, i.e., the ability to move from an abstract institutional level to the concrete level of individuals, the ability to mobilize and coordinate the internal resources of the territory itself, resources that on the one hand, progressively take on an intangible, non-material dimension. Therefore, it has been suggested that one of the fundamental challenges to ensure that a bio-region is in fact constituted, is to create the conditions so that development results from an appropriate synergetic linkage among several factors (BOISIER, 1997, 1999), such as:

- Resources, both material and, more importantly, non-material
- Individual, corporate and community players
- Institutions, regulatory systems and the organizations to ensure their enforcement
- Management, administrative and information procedures
- Culture or a system of values and practices that bestow identity
- External inclusion ensuring the community's economic survival.

All these factors lead to the notion, that in order to become a relevant player, the region requires a *political project for development*. The presence of a real regional political project for development may be a determining component in success. From this viewpoint, examining discourse is more important than studying figures, of course, provided that this discourse represents social consensus.

The concept of sustainable region could be applied to any region where development is adjusted to sustainability patterns; it is not the region itself that is "sustainable" but the form of intervention in it. Here sustainability indicators can be included, such as those proposed by Guimaraes (1998), in addition to a listing of the structural components of sustainable development, as applied in the current sustainable development strategy of Northwest Brazil derived from the ARIDAS Project (1995). According to this suggestion, sustainable development "involves the reconciliation of economic efficiency, social equality, political freedom and preservation of the environment in a comprehensive process of social evolution which, considered globally, will mean:

- *More growth*, sustained and *shared* by all
- *Productive modernization* and competitiveness, in addition to the region's wider and more dynamic involvement, both nationally and internationally
- *More education* and qualification and more *health and housing*, leading to a more productive life and greater well-being.
- *Less poverty* and *fewer inequalities*, conditions for more freedom, more democracy, more social justice
- *More development* today and also more development tomorrow, i.e., development envisaging the *rational and equitable use and the preservation of natural resources*.

As in other areas, it is possible to reason in strategic terms, emphasizing strengths, opportunities, weaknesses and threats of the bio-regions. The potential of bio-regions as a tool of sustainable development policy is closely tied to the value that the world market gives to environmental goods or services, an issue on which one can "bet on the winner". Hence, its greatest strength lies on its nature of areas for the protection of biodiversity. Likewise, the protection of the population in the use of industrial products (pesticides, preservatives, etc.) in the food chain give significant business opportunities to territories like bio-regions.

In addition to the above factors, which by themselves are very significant challenges, the challenges for territorial and bio-regional strategic action can be summarized as follows (see MILLER, 1999, RENARD, 1999 and RODRIGUEZ-BECERRA, 1999):

- Establish institutional and political frameworks, where governments, communities, corporations and other private interests are encouraged to cooperate in the process of sustainable development
- Identify and assess leadership and management initiatives. Experience has shown that the promotion and strengthening of bio-regional programs usually come from government agencies, community leaders or NGOs. In the long term, it is important for the community to become involved early in conducting and managing the project.
- The need for social acceptance of the project, because projects seen as external to the community or imposed from the top to the bottom are unlikely to succeed in the long run.
- Give the project a multi-sectoral nature, involving, state, private and non-state players living or working in the area and thus dependant on the environmental resources and services it provides. The challenge to build local, regional and even international (for the case of cross-border bio-regions) partnerships is also fundamental.
- The two issues above lead to particularly emphasize the need to ensure conditions to make some of the core components of the bio-regional approach come true, the participatory nature of planning sustainable development. In a nutshell, to enable:
  - the comprehensive mobilization of the latent natural, human and social capital in the community.
  - that, when including the cultural dimensions that go hand in hand with participation, increase the feeling of belonging of local players and therefore, deepen the levels of inter-sectoral trust, essential for the bio-regional notion of development.
  - counteract some of the negative effects of globalization, i.e., empower the local community and revalue the importance of identities rooted in their specific environment.
  - increase the degree of organization and independence of non-state agents and thus strengthen the modern notions of "environmental citizenship".
  - In contexts of strong social and political impoverishment, promote the direct control of the community in the use of environmental resources and services whose preservation and sustainable use, in spite of being situated at the local level, ensure the viability of national society.
- Unrestricted access to **information** and to possibilities of refining the **analytical skills** of community players, without which the imbalance between players prevents real participation and lasting compromise.
- **Take the differences of scale**, environment and social, economic and cultural factors into account. Clearly, the challenges of environmental management faced by an island country of the Caribbean or a Central American nation are different to the ones confronted by a continental country in South America. In turn, there are great differences between the challenges of the countries located in the tropical belt and those of temperate areas. However, even more dramatic differences can also occur inside countries. The requirements for environmental management in some

place of the Amazon basin are very different from the ones found in the Andean region.

- Identify **command and control tools**, such as regulations and standards for the use and exploitation of natural and environmental resources (water, air, forests, solid wastes, spills into the atmosphere or water, etc). Despite the important constraints of command and control tools in the current context, they have served as a major base for studies on environmental impact, which has been one of the favorite management tools in many countries of the region. It has also served as a basis for territorial organization and the creation of protected areas.
- Removing those market errors that give rise to environmental deterioration, including complex structural situations and whose removal would demand a high dose of political will. To illustrate this, the inequality in income distribution and land tenure, lifestyles and consumption and transportation patterns can be mentioned. But it also includes others that in view of their nature can be removed, such is the case **of subsidies harmful for the environment**, such as those granted to gasoline, electric power and farming inputs.
- Implementing **tools like royalties, fees for the use or impact** of the environment, **tradable emission permits** and **"green" taxes**. The introduction of these tools is associated with concepts of environmental management and economic liberalization policies entered into with free trade. Although at the beginning of this approach it was assumed that the establishment of economic instruments replacing command and control tools would lead to a lower demand for personnel and resources, it has been proven that economic tools require strong institutions for their design and implementation.
- There is a notion nowadays of **self-financing of protected areas** through the economic acknowledgement of the services they provide. In the case of national parks, particular importance is given to hydrological services, coal mining, supply of biogenetic resources and ecotourism. The tax rate set by Costa Rica for protection is a practical expression of this idea and deserves a more detailed examination to determine the possibilities of generalizing it to other national realities.
- The **payment of global services of forest ecosystems and in particular the preservation of biodiversity** and the mitigation of climatic change are another source of special importance for their conservation. Several efforts to benefit from the economic potential of biodiversity have been seen in the region. Costa Rica, based on the INBIOS Project, has been a pioneer nation at the global level. However, as in the case of extracted reserves, the expectations of significant economic returns for this concept seem lower than those announced early in the decade. Furthermore, tools like the *Clean Development Mechanism* as a financial window at the global level shows great potential for protecting developing countries is suggested.

Finally, from a "super-structural" perspective, as we did with the globalization process, all the different *regional, national and local* rationales of current integration dynamics should be clarified. From a purely **regional** viewpoint, most of the on-going processes respond to a *trade-customs* and markedly *defensive* rationale.

While evolution, for instance, in European countries, had a *political* integration project (still incomplete, it is true) early on, initiatives in the Americas and the Caribbean still

seek to respond, almost exclusively, and as a reaction, to the appearance of new trade blocs at the global level. This could perhaps be explained by successive devastating wars on the European continent, an experience that until now Latin America and the Caribbean have been able to escape. This could also explain why the region has perhaps the most integrating potential (an historical matrix of social, cultural and language education that is far more homogenous than in other regions of the world), has not yet "undergone" enough "incentives" (basically strategic security military ones) pushing it towards a genuine integration.

In this context, the ***national*** rationale to board the wagon of integration belatedly, responds to the need to improve the *inclusion* of national economies into the world economy. This is why criteria of competitiveness prevail over criteria to preserve the social, cultural and environmental integrity of the region. To sum up, it is important to integrate provided that this means to reinforce the possibilities of inclusion, otherwise, it is no longer interesting to integrate, irrespective of social and environmental considerations. Thus, for example, the adhesion of Mexico into NAFTA has involved a significant loss of natural capital insofar as to corn and other agricultural produce, unable to compete against U.S. corn, although from an ecological, energy and social view, Mexican production represents a contribution for feeding mankind that is higher than that of the United States. The same thing is bound to happen to, for instance, the diversity of potatoes in Chile that will tend to decrease once this nation becomes fully integrated into Mercosur.

The interest of ***local*** communities is only marginally due to questions of trade, customs and economic competitiveness; although they may become relevant once integration becomes a reality and generalizes. The community is interested in keeping its *social organization*. In very basic and "primary" terms (in their "grass-roots" meaning), this is where the heart of the nation lies, from where blood is recycled in the culture, social relations and resolution of conflicts defining national identity. Therefore, what ensures health and vitality is not only the fabric of provincial and national "bodies", but the local "cells" containing the nation's genetic code. Likewise, it is at the local or sub-national levels that the foundations of maintaining biodiversity and phytogenetic diversity are found.

Therefore, based on the above, it seems possible to propose that it is precisely a ***territorial and bio-regional*** approach that permits a harmonious and integrating relationship among the three rationales mentioned above. In ecological terms, bio-regional issues lead to a "*sharing*" relationship (where everybody "wins") among human communities, economic activities and natural cycles, while traditional, Cartesian and compartmentalized planning along guidelines of bureaucratic spheres, leads to a *parasite-like* style of growth. More than being a metaphor, this image contains the components of a reality that increasingly demands more cooperation in order to survive in a globalized world.

Before the Utopia derived from a Cosmo vision where harmony prevails (usually found only in the imagination of researchers), the metaphor of bio-regionalism meets the need for subordinating competition to cooperation. Before the Darwinist motto of "competing to survive", bio-regionalism reveals that it is indeed the competition (of means) with a view to substantive cooperation (of ends) that ensures the survival of *human* communities in the *economic* and productive world. After all, one does not live to produce, but produces to live, in spite of the fact that many apostles of post-modernness have lost the teleology of life from sight.

In the meantime, it is necessary to come down from the super-structures and approach meso and micro-structural reasons that warrant the bio-regional wager. In a reality of dramatically declining public sector budgets, new planning and cooperation

approaches should be explored. In this regard, a bio-regional approach can make it possible to have new partnerships and forms of collaboration among governments, the private sector, communities and NGOs. This may perhaps allow confrontation of the most complex of the challenges common to all Latin American and Caribbean countries in a more suitable fashion, that is, the search for pathways towards sustainable development in a region where over half the population lives in extreme poverty.

Furthermore, it is urgent to ensure the integrity of shared or deeply interdependent ecosystems, from where the need to create multinational biological corridors arises, a purpose where a bio-regional approach is justified. Naturally, globalization and the demands of further regional integration in all areas, including the institutional-environmental, should be argued. International cooperation between neighboring authorities which operate in the many geographical and institutional scales, in ecosystems that cross different boundaries (municipal, provincial and/or national) is also a fundamental challenge in ensuring the sustainable use of these resources. Finally, the use of bio-regional planning as a basis for cooperation may strengthen the possibilities of implementing the so-called "Rio Accords" in terms of conserving biodiversity, attachment of carbon and the reversal of land degradation processes. The simultaneous implementation of the three accords, thanks to bioregional approaches, may mean more efficiency and effectiveness, preventing duplication of efforts and budgets.

Taking into consideration that in this decade environmental management institutions have been established or strengthened at the regional and sub-regional levels, it is worth mentioning a few of the most significant examples of cooperation in this area, particularly the Central American Alliance for Sustainable Development, the Andean Community, the Treaty of Amazon Cooperation and the Organization of American States and the Bolivia Summit for Sustainable Development (see RODRIGUEZ-BECERRA, 1999).

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## IV. Evolution and trends towards sustainability

This section, which will be **permanent** and thus included in all the reports, will have a small group of general sustainability indicators and/or rates, in addition to basic statistics allowing for the introduction of an analysis of environmental trends (positive and negative) and their impact both on the integrity of natural assets and the improvement of the conditions and quality of living of the population and the outlooks for development in the region (see Guimaraes, 1998).

A number of criteria guide the preparation of this part of the report. *First*, indicators should not only reproduce data available in other sources (WB, IDB, UNEP, UNDP, WRI and others), but include and supplement the main statistics available, thus helping to expand dissemination and access to the same. *Second*, one must emphasize indicators that have as much diversity as possible in economic, social, environmental and institutional terms. *Third*, taking the diversity of environmental concerns in the region into consideration (marine resources are much more relevant for Chile, Peru or Caribbean countries than for land-locked countries like Paraguay or Bolivia, while deforestation is higher on the environmental agenda of the countries of the Amazon Basin, than in countries such as Cuba, Argentina or Uruguay); indicators that allow for establishing sub-regional categories of environmental trends must be carefully chosen.

*Fourth*, this section must contain statistical information that are sectorally relevant, to allow Ministries of the Environment to promote dialogue and influence the decision-making process in economic (Treasury, Planning), productive (Industry, Tourism, Agriculture) and social (Education, Health, Housing) areas of the governments. *Fifth*, the set of indicators must establish a close relationship with decision-making in governmental and inter-governmental spheres. *Finally*, anticipating situations where information is not available on all countries or that it reveals low levels of reliability, even so the Report should underscore the need to collect statistical information in areas relevant for sustainable development strategy-planning.

### IV.1. Measuring development sustainability

The concern to assess non-economic aspects of development through quantitative indicators has been present for almost two centuries, since the pioneering efforts like that of Jean-Charles Leonard Sismondi, whose book *New Principles of Economy* was published in 1819. In regard to social matters, the most important framework was without any doubt, the publication of William Ogburn's book in 1933 which included the results of the work done by the commission established in 1929 by President Herbert Hoover to study social trends in the United States. These gained fresh momentum during the sixties, culminating in the publication of the first set of social statistics by the U.S. Department of Health, Education and Welfare in 1969. The interest of governments to measure the *environmental* dimensions of development was further reinforced by the report on the quality of life prepared by the U.S. Environment Protection Agency in 1973 (see GUIMARÄES, 1982) for a general introduction to the subject).

In the mid-eighties, systems of comprehensive statistic collection and design of domestic environmental indicators became stronger. In 1988, the G-7 meeting took the initiative to request the OECD to develop a system of indicators. Indeed, by the

late seventies, efforts were being made in the region to collect statistics on the environmental situation (see, for example, ECLAC, 1979). Since that time, the progress of knowledge and public and private interest in the area of environmental statistics and in the design of development indicators measuring non-economic issues of progress has been impressive (see, for example, EKINS and MAX-NEEF, 1992, DALY and TOWNSEND, 1993, WINOGRAD, 1993, HAMMOND et. al., 1995, TRZYNA, 1995, CONSTANZA et.al., 1997, SEJENOVICH et.al., 1991).

In terms nearer to the purposes of this report, one may say that it has been recently in this decade, especially after the United Nations Conference on Development and the Environment held in Rio de Janeiro in 1992, that the attempts to design *environmental* sustainability indicators have been definitely included on the international agenda. The efforts undertaken by the World Bank in 1988, the UNDP in 1990, the OECD in 1991, the United Nations Statistics Office and the UNEP in 1992 and HABITAT and the United Nations University in 1995 are pioneer examples in this area (ECLAC, 1997).

All these initiatives have been strengthened and consolidated since the United Nations Sustainable Development Commission (SDC) was established as a result of the Rio Conference. So much so that the SDC in its Third Session held in April 1995, approved the launching of an ambitious working program to establish common and compatible national statistical information collection systems leading to the preparation of sustainable development indicators comparable for all the countries of the world. The basic purpose of the program is to reach by the year 2000 a set of indicators that can be used by the decision-makers of national governments, and roughly 130 indicators have already been identified (see SDC, 1995). The approach approved in 1995 that has guided all the initiatives since that time, allows for the organization of the various indicators according to the chapters of Agenda 21 approved in Rio in 1992 and according to the rationale of Driving Force – Status – Response. In sum, the traditional concept of *pressure* (environmental) indicators has been replaced by *force* (human activities and processes impacting sustainability) to be able to include social, economic and institutional indicators and the idea of *status* indicators has been preserved –to suggest the present situation in relation to an indicator of force- and the indicators of *response*, that serve to point to policy choices in response to changes in the current *status* of sustainable development.

Included in the process described above, but without question among the most important exercises and with the greatest international impact for measuring national indicators more in keeping with the idea of sustainable development are: the **Human Development Index** (HDI), proposed by the UNPD in 1990, **the Genuine Domestic Savings** of the World Bank and the **Index of Sustainable Economic Welfare** (ISEW) developed by Herman DALY and Clifford COBB in the late 80s (1989, 1994). The HDI covers a scale of 0 to 1 and represents the aggregate of three indicators: **longevity**, measured by life expectancy at birth, **knowledge**, measured by the adult literacy rate and the average years of schooling, and the **control over resources**, measured by the per capita Gross Domestic Product adjusted according to purchasing power. The main criticism made of the HDI is that this index is built up through *national averages*, without taking into account regional, personal and inter-sectoral inequalities in the distribution of wealth, although by including “life expectancy at birth” and “literacy”, the index indirectly includes the effects of resource distribution. While it is true that the HDI means considerable refinement to the traditional growth indicators, it does not allow an evaluation of the environmental situation of countries. In other words, there may be situations of increased life expectancy or an increase of the literacy rate of the adult population based precisely in the over- exploitation of natural resources or by permitting the pollution of its ecosystems. All this will represent a deterioration of the standards of living in the future.

The Index of Sustainable Economic Welfare that will be discussed in detail in the next section is a more comprehensive indicator than the HDI because it measures not only consumption but also distribution issues and those related to environmental degradation. The starting point of this index is **private consumption** taken from national accounts and includes successive positive and negative adjustments, based on the **distribution of income** (Gini's coefficient), **services outside the market and the formation of constructed capital**. The ISEW also adjusts private consumption based on so-called **defensive expenses** (that increase private expenditure but do not necessarily increase welfare and thus must be subtracted from the index), **non-defensive expenses** (that increase both private expenditure and welfare and must be included in the index). Finally, the index includes **the costs of environmental degradation**, the **loss of natural capital** and **long-term environmental damage** (such as the costs of the destruction of the ozone layer and those associated with the greenhouse effect).

In view of its growing acceptance, particularly in European countries, this brief revision of the initiatives to build sustainability indicators must also include the notions of **Ecological Imprint** and **Environmental Space**. The former was developed by Mathis WACKERNAGEL and William REES (1996) and stems from the basis that each human being, community, region, country or set of countries make an impact on the planet when consuming the goods and services produced by nature. Therefore, it is likely to determine our Ecological Imprint, i.e., **measure the amount of biologically productive area necessary to provide, over time, the resources necessary for human activities and, in turn, absorb the waste generated by them**. Actually, the ecological imprint is a variant of the traditional ecological concept of *support capacity*, that is, the maximum number of individuals of a given species that a territory can support indefinitely without compromising the total productivity of the natural or modified habitat.

As suggested by its proponents, EI means to place the support capacity "**PUNTA CABEZA**". It is a matter of determining the terrain requirements for all categories of consumption and waste, and also determining the maximum number of inhabitants that a territory can support, since the latter depends on variables such as social consumption expectations, the technology available in the use of energy and materials, etc. Furthermore, the very rationale to estimate the EI implies that it does not necessarily match the territory "physically" occupied by a population, including "virtual" territories, usually appropriated from other communities. Finally, the notion of EI can be extended for many evaluations of sustainability. For instance, the Ecological Imprint of inter-regional trade can be measured by calculating how much biologically productive area a region is appropriating through its imports and how much of its own support capacity is being lost through exports.

The indicator of **Environmental Space** proposed by the Wuppertal Institute and the environmentalist NGO Friends of the Earth is closely related to the concept of EI. In a few words, the ES can be defined as **the total amount of ecological absorption capacity, of energy, of non-renewable resources, agricultural land and forests we can use globally without decreasing their availability for future generations** (SPANGENBERG, 1995). In addition to this definition, the proponents of Environmental Space also suggest a set of **principles** associated with the use of the indicator, such as the principle of **equality** (all individuals are entitled to use the same space of resources), that of **social impacts** (sustainability requires values such as democracy, transparency, participation and solidarity), the principle of **proximity** (environmental issues must be solved as near as possible to their source) and the precautionary principle (when the risk of a situation is uncertain, but its consequences are serious, and difficult to reverse, it is justifiable to adopt corrective measures ahead

of a more complete knowledge of the problem). Estimates about Environmental Space include data in the following categories: **energy, raw material of non-renewable resources, land use, wood and water.**

Having concluded this brief overview of the most important experiences in the design of development indicators, a summarized version of the Index of Sustainable Economic Welfare for a few countries of the region is given below.

## IV.2. The Index of Sustainable Economic Welfare

The Index of Sustainable Economic Welfare (ISEW) was designed by Daly and Cobb (1989). It attempts to overcome some of the limitations of the Gross Domestic Product as a measure of welfare through the introduction of corrections to the values of "Final Private Consumption" calculated according to conventional procedures. In some cases, this index takes into consideration certain aspects that affect welfare which are not included when calculating GDP, such as income distribution or the value of domestic labor; in other aspects, such as the loss or degradation of natural capital, these data are treated differently in the GDP. In this section, the ISEW method of calculation is applied to several countries of the region.

Since the sixties there has been a debate on what would the effects of economic development be on social welfare, how economic growth can help to improve social welfare (Nordhaus & Tobin, 1972), and if economic growth will be restricted by the shortage of natural resources and high levels of pollution (Boulding 1966, Georgescu-Roegen 1971, Daly & Cobb 1989, Daly & Townsend 1993). When trying to answer these questions, Daly and Cobb (1989) developed the 'Index of Sustainable Economic Welfare', ISEW, as the best indicator of welfare that includes these and other topics.

Until now, the most commonly used indicator to measure economic progress of a country is the Gross Domestic Product, GDP, through the national accounts system. However, a country can deplete its mineral resources, fell its forests, degrade its soils, pollute its aquifers and exploit its fishing resources until extinction, but income is not affected when these assets disappear (*Repetto, et.al., 1990*). GDP growth is associated with higher levels of welfare, but the GDP increases both with investments in new schools and with the expenditure on cleaning up toxic spills (Hawken, 1997) or resources allocated to fight crime. The treatment of natural resources in conventional systems of national accounts reinforces the false dichotomy between economy and the environment and validates the idea that high economic growth rates can be attained and sustained by destroying the base of resources; the result may be short-lasting gains of income and permanent losses of wealth (*Repetto et. al., 1990*). In developing countries where there is a strong relation between poverty and the environment and where economic growth is based on natural resources, the omission of these values may send erroneous signals about the actual economic growth of a country (Lutz, 1993) and its sustainability.

The ISEW was thought as a better and more appropriate measure of welfare<sup>(4)</sup>. Part of the value of private consumption, PC, that includes all final expenses incurred by consumers, excluding government expenditures and international trade and the first step is to make an adjustment for income distribution. Later, a number of components

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(4) The calculation of the ISEW, in its complete version, proposes information needs difficult to meet, even in developed countries. Some of the topics involving welfare included in the ISEW which are not considered in this calculation in any country of the region are: value of volunteer labor, cost of crime (except in the case of Chile), cost of family disruption, loss of leisure time, cost of underemployment, cost of noise pollution, loss of wetlands, net changes in the international debt/loan position, etc.

representing social and environmental costs or benefits are added or subtracted. Services provided in the economy, but without monetary expression, such as domestic work are added, as well as services provided by the State for which fees are not usually paid (the use of streets and highways is considered the most important one). Moreover, part of the government expenditures on health and education increase individual welfare. In the case of durable consumer goods, such as refrigerators or cars, which provide services for periods of more than one year, the welfare they generate during their useful life is distributed annually<sup>(5)</sup>.

Among the components subtracted from the value of private consumption are private defensive expenses, the social costs of several activities and depreciation of environmental assets and natural resources. Defensive expenditures taken into account are those made by families, for example for preventing crime (alarms and other security devices), expenses for commuting to work and percentage of private health expenses. Social costs include those derived from air and water pollution and others that can be attributed to population increases and congestion such as traffic accidents. The PC is also adjusted by taking the degradation and loss of natural capital into consideration.

The last adjustment is made by considering net capital investment. One of the elements of economic sustainability is maintaining or increasing capital per worker (buildings, machinery and other infrastructure). The ISEW estimates the change in capital stock such as the difference between the minimum capital required to keep the same level of capital per worker and the new capital incorporated to the economy during the year.

### **The ISEW in developed countries**

Until now, there are seven papers of the calculation of this index in developed countries: United States (Daly & Cobb, 1989), United Kingdom (Jackson & Marks, 1994), Germany (Diefenbacher 1994), the Netherlands (Rosenberg & Oegema 1995), Austria (Stockhammer et. al., 1995), British Columbia (Gustavson & Lonergan, 1994) and Sweden (Jackson & Stymne, 1996). Six of them can be seen in **Figure 3**. In general terms, the per capita GDP and the per capita ISEW have similar values until the 70s, when they begin to diverge; the per capita GDP increases while the per capita ISEW is maintained or decreases through the years. It seems that environmental variables (pollution and depletion of natural resources) are the ones that account for this divergence. The only instance where the per capita ISEW is over the per capita GDP is the case of the Netherlands, because health, education services, roads and most defensive costs are fully funded by the public sector.

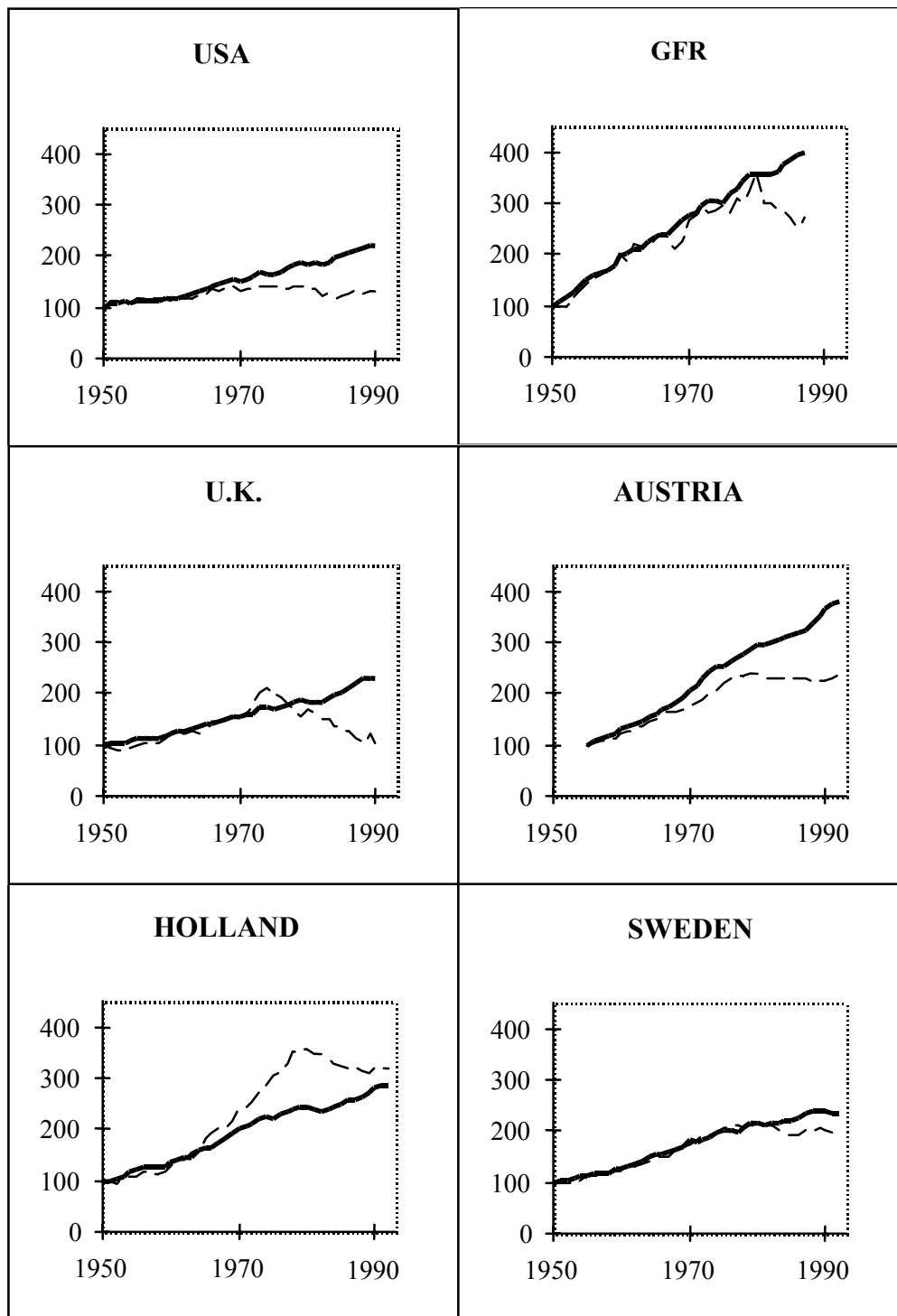
In the case of the United States, using 1982 dollars, while the per capita GDP rose from \$7,866 to \$17,147 between 1950 and 1994, the per capita ISEW dropped from \$5,659 to \$4,068. The main factors accounting for this divergence are adjustment for income distribution (income disparity increased between 1973 and 1994), the depletion of non-renewable energy resources and long-term environmental damage.

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(5) For this, a yearly depreciation rate is considered as well as a capital opportunity cost. Since private consumption includes spending on this type of goods (measured by its value at the time of purchase), it is necessary to subtract it later to prevent double accounting.

**FIGURE 3.** Index of per capita Sustainable Economic Welfare (ISEW) vs. per capita GDP for the United States, the Federal Republic of Germany, United Kingdom, Austria, the Netherlands and Sweden (1950-1992, 1950 = 50)

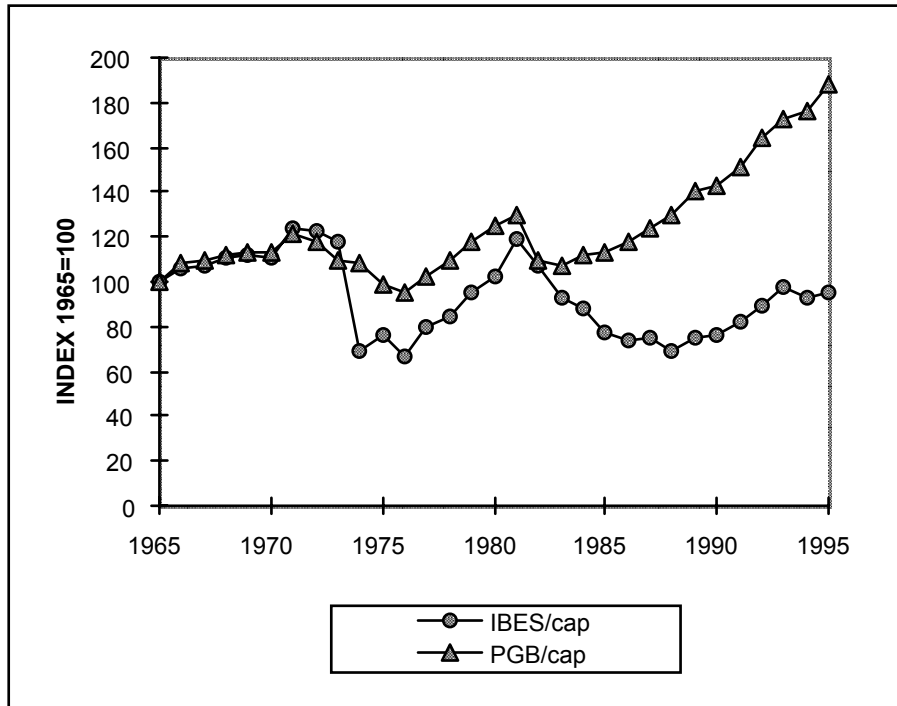
-- = ISEWBES, — = PIB



### The ISEW in Latin American and Caribbean Countries

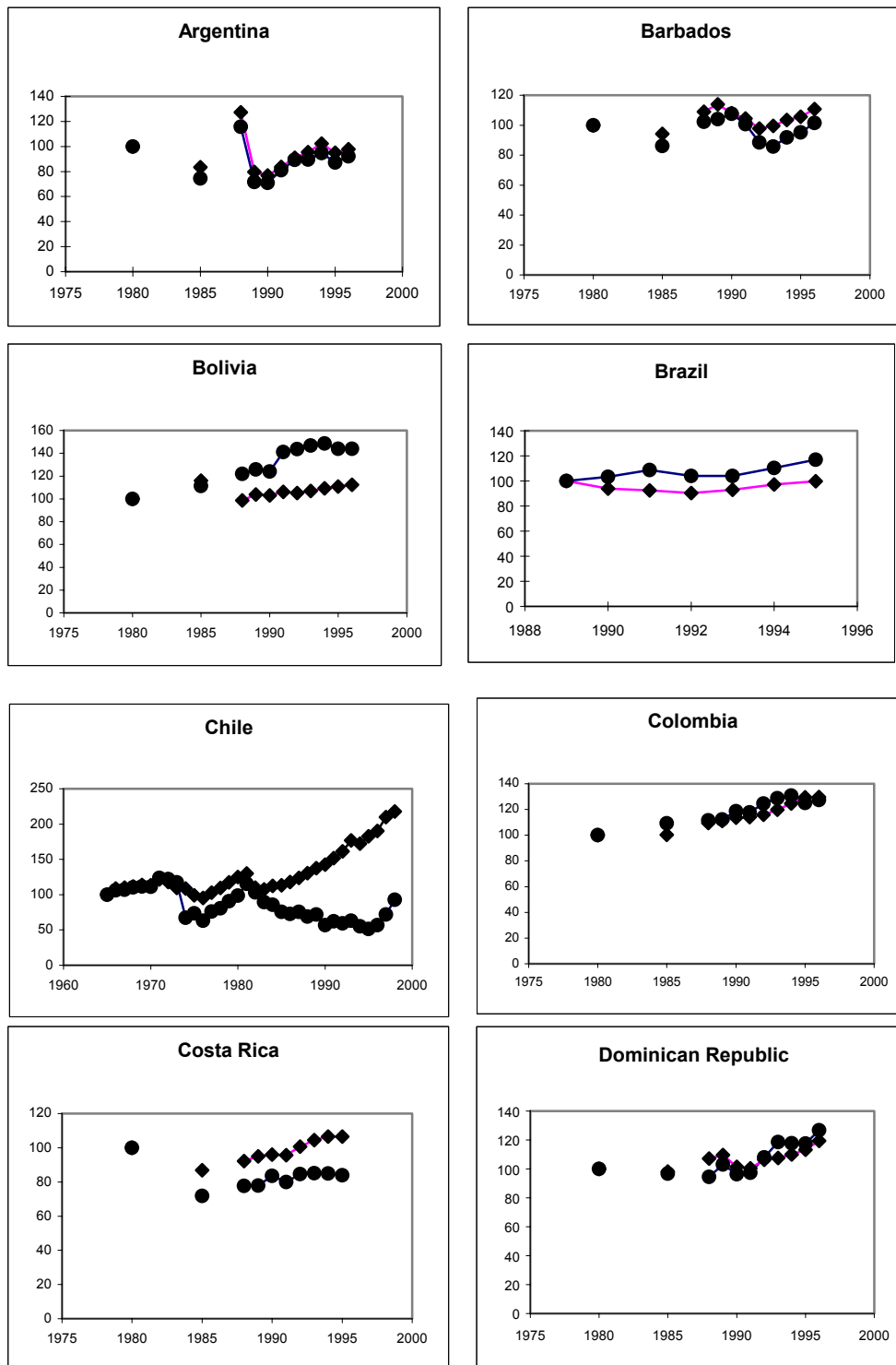
For the countries of the region, there is a study on Chile (Castañeda, 1997) during the 1965-1995 period, where per capita GDP grew 89% and per capita IBES dropped 5% (Figure 4). Both indexes evolve in parallel until the 80s, when a huge gap begins to open between them mainly caused by the evolution of income distribution towards greater inequality and because of the negative effects of productive specialization on the environment and natural resources. Section B.II.5, includes a summary of the methodology used in this study.

Figure 4: Evolution of the per capita IBES and per capita GDP, 1965-1995

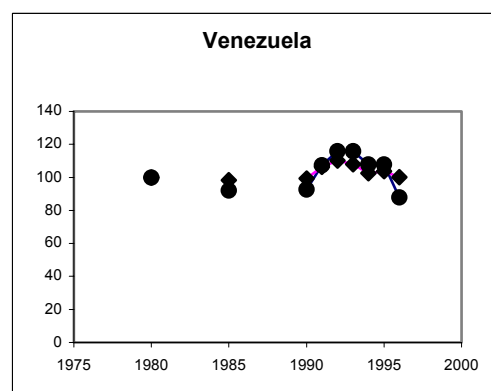
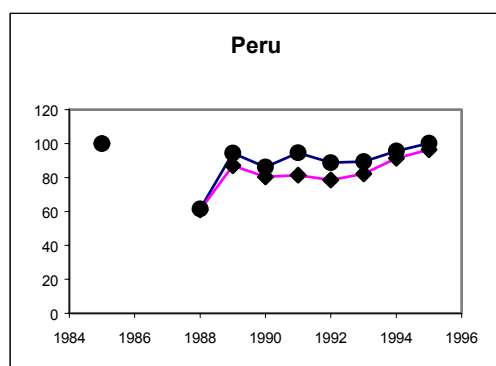
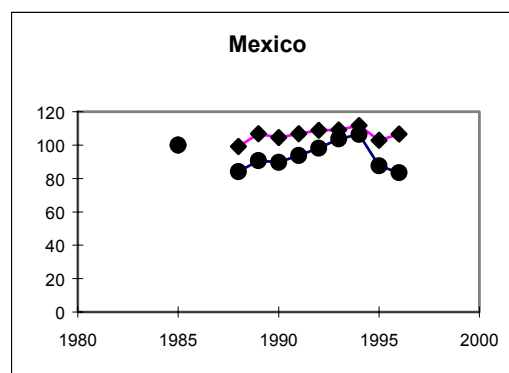
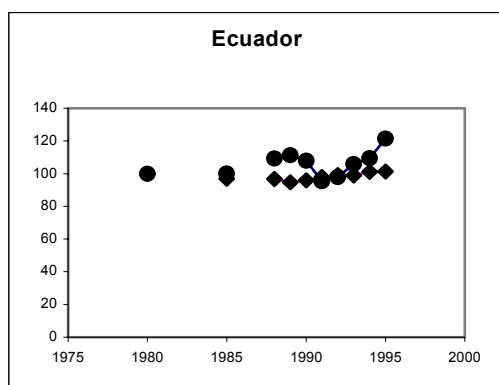


Taking into account the limited information available, a summarized version of the ISEW for a few Latin American countries is given in this report: Argentina, Barbados, Bolivia, Brazil, Chile, Costa Rica, Colombia, Ecuador, Mexico, Peru, Dominican Republic and Venezuela. The study described above was up-dated to 1998 in the case of Chile. It is important to point out that the data of the countries given below are only a first approach to the calculation of alternative indicators of welfare and sustainability and should not be considered as welfare approaches which are "better" than the GDP. In addition, the data do not allow for a comparison between countries because results depend to the availability and quality of the information to a large extent.

**Figure 5: ISEW/cap Vs. GDP/cap indexed to the first year of the study**  
 • = ISWE/cap, ♦ = PIB/cap







**Table 1: Comparison between the percentage of variation of the per capita GDP and the per capita IBES in the years of the study**

Countries	Years (Start-End)	Variación (%) GIP per cápita	Variation (%) IWES per cápita
Argentina	1980-1996	- 2,14	- 7,79
Barbados	1980-1996	+10,69	+ 1,56
Bolivia	1980-1996	+12,44	+43,87
Brasil	1989-1995	+ 1,85	+21,30
Chile	1965-1998	+83,00	- 7,00
Colombia	1980-1996	+29,70	+27,48
Costa Rica	1980-1996	+ 6,61	-16,06
Dominican Republic	1980-1996	+ 1,28	+21,40
Ecuador	1985-1996	+19,46	+26,71
Mexico	1985-1996	+ 6,48	-16,55
Peru	1980-1996	- 3,65	+ 0,16
Venezuela	1980-1996	+ 0,02	-12,21

**Figure 5** and **Table 1** show the studied countries' results. Adjustments made had a different weight per country. It is possible to group countries whose results responded to the same factors. Section B.II.4 shows the detail of the methodologies used and the sources of information.

For Argentina and Barbados, public spending on education and health have a higher weight within positive adjustments and oil depletion has negative adjustments. In the case of Bolivia and Ecuador, the main adjustment made that explains the results is the work value of women at home; other adjustments were not significant. Colombia and Venezuela present positive adjustments similar to those of Bolivia and Ecuador, but the natural capital depletion costs become more important in the last few years, specially the long term environmental costs for Colombia and the oil depletion for Venezuela.

In the case of Chile, the depletion of natural resources (copper and forests) is the main item that explains the results. In Costa Rica, in spite of giving women at home a significant and positive impact, long-term forest depletion and environmental costs surpass it as the study's years go by. Surprisingly, for Brazil, forest depletion did not have the expected significance; the most important adjustments were seen in public spending in education and health and long term environmental costs. The same outcome can be appreciated for the Dominican Republic.

In Mexico, the loss of agricultural lands is the heaviest adjustment made on the negative side, while public spending on education and health are the most important positive adjustments. Lastly, in Peru, the absence of the adjustment on account of income distribution and public spending on education and health are the principle factors that explain the ISEW evolution per capita.

The ISEW has to be improved. This index still depends on market prices and can be criticized or discussed, specially in the value calculations of environmental and natural resources. On the other hand, it is an index that was created for a developed country, and this in itself manifests some problems: i) it requires a lot of information, much of which generally is not available in many of the region's countries; ii) it emphasizes some problems that could appear to be less important for the Latin America and Caribbean countries; and iii) the way it deals with some of the subject matters (forest loss for example) does not adapt to the reality of the region's countries.

Regarding natural capital, because the index uses market prices, the results underestimate the real costs of depleting natural resources and environmental degradation because it does not include environmental services such as biodiversity maintenance and other aspects that are relevant if we want to consider quality of life and future choices. For example, Hotelling rents used for the forests does not take into account its own local consumption, whether it be wood used as firewood, building or to transform agricultural soil; normally these numbers are not recorded in the production values. Nevertheless, for Latin America and the Caribbean the loss of forests that is linked to this type of processes can be much larger than the loss caused by the commercial production of wood. This is the main reason why in several countries that show high deforestation rates, the adjustment due to the loss of renewable resources is lower than expected.

An alternative to the Hotelling rent is to use the replacement cost, which allows one to have the same level of consumption in the future. This methodology was used to calculate the loss of non-renewable resources in developed countries. In these studies, for every equivalent barrel of consumed oil, a replacement value is assigned in exchange for another form of renewable capital, which will ensure the same consumption in the future in a perpetual manner (Jackson and Marks, 1994). This is how these countries used a US\$75 replacement value (1972 dollars) per consumed

equivalent barrel of oil, with a 3% annual increase. This value is higher than the current oil price and is also higher than some of the current renewable technologies, but this value does not reflect the marginal price of renewable energy options, rather only the cost of replacing the entire production of fossil products for that period. This type of adjustments, for example, have a higher impact relative to the Hotelling rent, which goes to show how sensitive the IBES index can be when using different methodologies.

On the other hand, the ISEW00 calculation supposes that wellbeing depends directly on the consumption level. Calculations made relative to the human capital are omitted (enormously important in increasing the workers productivity) and the 'happiness' values that are correlated with the relative wellbeing levels. The value given to the lowering of free time, which is omitted in this calculation, can reveal, in indirect costs, a decrease in quality of life (not measured in money).

Another adjustment that could locally be included is the cost of crime. For example, in 1994 Chile had a cost of \$548,000 million Chilean pesos (equal to a 2.2% of the GNP) that was spent in prevention, control and investigation of crime acts (Guzman 1994), without considering the loss of human lives. During 1991 and 1992 in Colombia, it was estimated that the cost of violence reached 4.3% of the GNP. The part of these values that correspond to private consumption may have an important impact on the final ISEW outcome. Just as the cost of crime can provoke significant adjustments to the local level in the ISEW index, so can the costs that provoke alcoholism and other drugs (includes direct and indirect costs).

One of the characteristics of this index is the possibility of observing the trends in a same country through time, while expressing the most important local processes. In spite not being able to use the ISEW to make international comparisons, at least qualitatively, it would be very interesting in the future, and after the IBES for each country has been completed, to see how the trends behave in each country within the Latin American reality.

The relationship between economy and environment is crucial for developing countries. The main concern for the countries in the region relative to the natural resources is how to treat the natural resources as a form of capital, or an economic good that has the potential of contributing to the productivity and the long-term well-being. At the same time, another concern is how to account for the true social value of the goods and services that are outside the market. In this way, the main purpose of this exercise has been to show the importance that the environment has had in national economies, considering all methodological restrictions and studying the alternate growth and economic well-being indicators inasmuch as sustainability. There is a lot to be done in the future regarding the IBES, specially if we take into account those aspects of every country that are relevant to the quality of their peoples lives and the local sustainable development.

In sum, the construction of measures closer the real measure of welfare and sustainable development as IBES represent a considerable progress for decision making, not just in the environmental arena but also in public policies, in general. Amongst other aspects, it permits establishing a closer, clearer relation between the so called explicit environmental policies and those that are implicit, of social and economic nature.



## Methodology and Sources of Information Used

The following methodology was used in all countries studied (see Table 2) with the exception of Chile. For the case of Chile, there is a study made by Castañeda, 1997 that already has many of the IBES adjustments that Daly and Cobb developed. A summary of the methodology used for Chile is described in Section B.II.5.

### **A - Years**

The study period included the years 1980, 1985, the period 1988-1996, with exception of Brazil ( period 1989,1995) Chile ( period 1965-1998), Mexico and Peru ( year 1985 and period 1988-1996)

### **B - Private Consumption**

Here, the starting point is the final private consumption. Data was obtained from ECLAC's Yearbook Statistics (1997). Argentina was the exception. The data from the Argentinean national accounts include final private consumption in the public consumption, therefore a series of ECLAC accounts were used for the 1993-1997 years where both consumptions are separated extrapolating the same consumer structure to complete the studied series. All data is expressed in 1990 national currency, using the implicit price deflector (ECLAC, 1997).

### **C - Income Distribution**

This column reflects the importance of welfare income distribution. The Gini coefficient calculates the area between the current income distribution and the straight line represents income equality. This coefficient gives zero and one values; zero is income equality and is indexed to the first year studied (1980 in general) to show the change through time.

Gini coefficient values used were the ones from the Latin American Social Outlook (ECLAC 1998 and 1994) for different years for each country. For the years that do not have data, the values used were those of the nearest year, supposing that income distribution did not vary in those years. These values were indexed afterwards.

### **D - Weighed Personal Consumption**

The final private consumption was adjusted, dividing it by the indexed Gini coefficient and multiplied by 100.

### **E - Housekeeping Work**

Services given to homeowners such as childcare, cooking, etc, have historically been omitted from the economy's productive sector; therefore have never been included in national accounts, in spite of their importance. To place a value to these services, an opportunity cost average is used for the woman that stays at home, supposing that in general, they are the ones that perform as homeowners.

This column was calculated using the values from the female work force from every country (Latin American Women, 1995) for the 1980 and 1990 years. An extrapolation is made for other years supposing a linear tendency.

Wages correspond to the average income for women (Tzannatos and Psacharopoulos, 1992) in different years. This value was transformed into local currency in 1990 and extrapolated for previous and later years using a percentile variation of the real mean payment between 1991 and 1997 (supposing the same variation for the years between 1980 and 1991). Afterwards, these values were extrapolated for the entire female labor force and converted to yearly wages.

#### **F - Road and Highway System Services (Country's Capital)**

This adjustment calculates the services the government gives to roads and highways and that are not included in personal consumption, yet have a positive impact on wellbeing. Cobb and Cobb (1994) used the USA Road, Street and Highways Stock Values, supposing that 2/3 is net stock, of which 3/4 is unrelated to work transportation and only 10% belongs to the consumer's real service, therefore it is added to personal consumption. This same logic was applied in this study using the Transport and Communications GNP's (ECLAC Yearbook Statistic, 1997).

#### **G - Public Spending in Health and Education**

Public spending on health and education represent investments made in human capital that is generally excluded from the IBES. Daly and Cobb (1989) argue that there is no clear-cut evidence that these investments increase productivity. Furthermore, it is very difficult to determine what proportion effectively increases wellbeing. In spite of this, this column supposes, as does previous research that 50% of public spending on health and education goes directly to welfare. Data was obtained from ECLAC's Yearbook Statistics National Accounts (1997).

#### **H - Loss of Agricultural Lands**

This adjustment tries to incorporate the loss of agricultural lands and their productivity due to two reasons: urbanization processes and degradation (mainly caused by erosion). When a decrease in agricultural lands is produced while increasing population continuously, this is translated into an intensification of remnant lands, thus increasing depletion possibilities, excess use of fertilizers and chemicals, etc.

To make this adjustment, we first got the productivity value per hectare by dividing the agricultural GNP by the number of hectares (ECLAC's Yearbook Statistics 1997). To calculate the loss of agricultural lands due to urbanization, we used the Winograd Study (1995). This study details the change in land usage patterns in Latin America and the Caribbean between 1980 and 1990. This percentage change was assumed to be constant throughout the study and was multiplied by the GNP/ha value. Information for loss of cultivatable lands due to erosion was taken from two sources: the first one from the same Winograd study (1995), reflecting the percentage change in untilled lands (highly eroded lands) for Bolivia, Brazil, Dominican Republic and Venezuela; and from some of the ECLAC studies for Argentina (Brzovic (a), 1990), Colombia (Leyva, 1998), Costa Rica (Lutz and Daly, 1990), Ecuador (Brzovic (b), 1990), Mexico (Toledo and Anta, 1995) and Peru (Brzovic (c), 1990). These percentages also were assumed to remain constant throughout the study and were multiplied by the GNP/ha value. Both adjustments are added and subtracted from the weighed private consumption

## I - Depletion of Non-Renewable and Renewable Resources

To obtain the welfare sustainable measurement, we should also include the loss of future benefits due to resource exploitation today.

Depletion values used in this column reflect the amount of production rent of a resource that should be reinvested to create a permanent flow of the same service deriving from a renewable resource (Daly and Cobb 1989). In this study, we analyze the forests (renewable) and oil or copper (non-renewable) using the Hotelling Rent estimate.

To calculate this column, we used a modified version of the El Serafy formula (Vincent 1995, 1996). From the economic efficiency point of view, for most of the goods, the optimum level of production is located at the point where the production marginal costs and the price intercept.

However, in the case of natural resources, optimum production takes place at a lower level than production and the opportunity costs of not producing in the future should be considered, besides the direct production costs.

Hartwick's Law (Hartwick 1977) suggests a form of determining if a country is investing enough to maintain its levels for future consumption. Hotelling rent is the portion that must be invested to maintain the consumption and the inframarginal rent must be consumed. To achieve higher levels, a country should invest at least the Hotelling rent. We obtained the formulas to calculate these values as follows:

The marginal cost of producing a quantity  $q(t)$  in the period  $t$  is:

$$CM(t) = a q_t^b$$

On the other hand, the stock available at the beginning of the period  $t$  is  $S_t$ , and the unit price of the extracted resource is constant in  $p$ ; the discount rate is  $i$ . Under an optimum extraction program, the marginal cost equals the average cost at the moment the stock finishes in time  $T$ , without growth. Average cost equals:

$$Cm_t/(1+b)$$

That is only equal to the marginal cost (CM) if  $q_t$  is zero, when CM also is equal to zero. Then, due to Hotelling rent:

$$P = (p - CM_t)(1+i)^{T-t} \quad (1)$$

$$CM_t = p[1 - (1+i)^{t-T}] \quad (1)$$

Hotelling rent cosine relative the resources total rent equals the marginal rent's cosine and the average rent or:

$$(p - CM) / \{p - CM_t / (1+b)\}$$

substituting by (1), and approximating the depletion years  $(S_t + G_t) / (q_t - 1)$ , where  $G$  is growth.

$$HR/TR = (1+b) / [1 + b(1+i)^{(S_t + G_t) / (q_t - 1)}] \quad (2)$$

This is how a special case for the formula El Serafy (1989) is arrived at. This formula is applied in this adjustment and subtracted from the weighed final consumption, using the forest and oil resources (or copper in the case of Chile).

We did the following to convert total rent into Hotelling rent:

To get the total earnings we multiplied the unit value of exported forest products and oil by the amount produced. For Forests we suppose that 2/3 is resource rent (Vincent

1996) and used ( $b=1$  and  $i=10\%$ ), therefore, estimating Hotelling rent, which is the amount that should be invested to allow the same consumption for the future.

We got the production and export values from the FAO (1994 and 1997, and from the databases we downloaded from their internet page) in cubic meters ( $m^3$ ), transformed into 1990 local currency. This value includes pulp, chips, lath and others without differentiating between forests and the forest stock used in the FAO surveys, which were added and converted to  $m^3$ , using average values for each country (FAO 1995). We assumed that natural growth is already included in the stock values, which is partially correct because there is growth that does not increase surface, but at the same time there is exploitation that does not decrease.

When looking at oil, we followed the same methodology, using 8% of the resource's real rent (Vincent 1995). We got the production data from the Yearbook of World Energy Statistics (1980), the Energy Statistical Yearbook (1995), and the stock values from the energy Statistical Yearbook (1995). We got the unit prices from the World Bank, oil prices (\$/bbl). All values were converted to metric tons and 1990 local currency.

## **J. Long Term environmental Costs**

This column shows the present value of future expenses related to global warming and climatic change. To give a value to this cost, Daly and Cobb (1989) arbitrarily assigned an accrued damage value equal to US\$0.50 (1972 dollars) per oil barrel equivalent to consumed non-renewable fuel (coal, oil, gas and nuclear). The reason is that greenhouse gasses remain in the atmosphere a long time and contribute to environmental damage for many years to come.

We used the final energy consumption in this column, including oil, gas, coal and firewood, getting the information from the US Energy Information Administration in BTUs. These were transformed to equivalent oil barrels multiplied times 5.8 million BTU per oil barrel. Afterwards, the US\$0.50 was converted to 1990 currency of each year's consumption plus the cost of the previous year.

$$\mathbf{IBES = D+E+F+G+H+I+J}$$

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### Summary Chart of adjustments made per country

3= Included

• = Not included

\* Calculated using unitary prices of Peru

Country	Years	Private Consumption	Gini	Public Spending on Transport	Public Spending on Education and Health	Women's work at home	Loss of Agricultural Lands	Forest Depletion	Mineral resource Depletion (oil and Copper)	Long-term Environmental Costs
Argentina	80-96	3	3	3	3	•	3	3	3	3
Barbados	80-96	3	•	3	3	•	•	•*	3	3
Bolivia	80-96	3	3	3	3	3	3	3	3	3
Brazil	89-95	3	3	3	3	•	3	3	3	3
Colombia	80-96	3	3	3	3	3	3	3	3	3
Costa Rica	80-95	3	3	3	3	3	3	3	3	3
Chile	65-98	3	3	3	3	3	3	3	3	3
Dominican Republic	80-96	3	3	3	3	•	3	3	•	3
Ecuador	80-95	3	3	3	3	3	3	3	3	3
Mexico	85-96	3	3	3	3	3	3	3	3	3
Peru	85-95	3	•	3	3	•	3	3	3	3
Venezuela.	80-96	3	3	3	3	3	3	3	3	3

### Methodology Summary used to calculate the ISEW - Chile

	Adjustments		Objective	Methodology
<b>B</b>	Consumer Final Expenditure		Starting Point	Taken from national Accounts
<b>C</b>	Income Distribution		Takes into account income inequality	Gini Coefficient
<b>D</b>	Adjusted Final Consumer Expense	B/C -100	Index starting point, adjusted	
<b>E</b>	Women's Housekeeping Services	+do	Takes into account the value of the services given to the consumer	22.5% of the total expense of the durable goods
<b>G</b>	Road and Highway System	+do	Takes into account the services given to the consumer	% of Transport and Communication GDP (10% depreciation, 10% is a real service to the consumer)
<b>H</b>	Public spending on health and education	+do	Incorporates non-defense expenses	50% of the government's final expense on health and education (CN)
<b>I</b>	Private spending on durable goods	-do	Takes into account the defensive cost or replacing goods stock	Total spending on durable goods (CN)
<b>J</b>	Private spending on health and education	-do	Takes into account defensive costs	50% of the final spending on health and education (CN)
<b>K</b>	Work transportation costs	-do	Subtracts private defensive costs	36% of total expense for work transportation, Zegras (1997)
<b>L</b>	Car accident costs	-do	Subtracts private defensive costs	Average value/accident in US by the # of accidents in CHile
<b>M</b>	Cost of delinquency	-do	Subtracts private defensive costs	1994 costs extrapolated using number of cases (Guzman 1994)
<b>N</b>	Water contamination costs	-do	Subtracts environmental degradation	1992 costs of typhoid fever cases extrapolated using # of cases
<b>O</b>	Cost of air pollution	-do	Subtracts environmental degradation costs	Health costs in 1992 extrapolated, associated with an increase in PM10 (Ostro et al 1994)
<b>P</b>	Cost of acoustic pollution	-do	Subtracts environmental degradation costs	Omitted
<b>Q</b>	Loss of wetlands	-do	Takes into account the loss of natural capital	Omitted
<b>R</b>	Loss of agricultural lands	-do	Takes into account the loss of natural capital	Productivity (GNP Ag/total surface Ag) per 1000 ha lost/year due to urbanization, minus 1% of Ag surface considered as eroded (CN)

	Adjustments		Objective	Methodology
<b>S</b>	Depletion of non-renewable resources	-do	Takes into account the loss of natural capital	Cost of replacement per equivalent oil barrel (US\$75) consumed, by a renewable source of energy (Daly and Cobb 1989, (NE)
<b>T</b>	Depletion or renewable resources	-do	Takes into account the loss of natural capital	Hotelling rent (Vincent 1996, Cloude & Pizzarro 1995, FAO 1994-1995)
<b>U</b>	Long-term environmental damage	-do	Adjusts due to environmental costs	Energy consumption per value of accrued damages (US\$0.50) (INE)
<b>V</b>	Costs of the ozone layer destruction	-do	Subtracts environmental degradation costs	Omitted
<b>W</b>	Fixed Capital Net Growth	+do	Takes into account formation of built capital	Minimum capital per worker required for consumption in the following period (CN)
<b>X</b>		+do	Takes into account international stability	Omitted

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