EXECUTIVE SUMMARY

SESSION I: "Disaster Risk Reduction Through Environmental Management"

Floods are the region's greatest threat. Strategic actions to fight floods include: fighting deforestation; reforesting; sustainable integrated waste management; integrated water resources management; rational environmental management of land and slopes; and protecting vulnerable infrastructure.

Other great threats are concentrated in certain sub-regions: Earthquakes in the western area of all countries on the Pacific coast (Andes), in Venezuela (Andean Coastal area) and parts of the Caribbean (Cuba, Jamaica and the Dominican Republic); hurricanes in the Caribbean and Mexico; volcanic eruptions in the Andes, next to the Pacific Ocean, in Peru, Ecuador and Colombia, and in Central America and Mexico; and landslides in the Andean countries and in Brazil's Atlantic coast.

In order to create a picture of the socioeconomic vulnerability to natural disasters of some countries in the region, and group them according to their vulnerability level, a vulnerability matrix has been created of these countries, taking into account five variables: (i) social situation; (ii) economic performance and situation; (iii) science and technology capacity; (iv) environmental management quality; (v) environmental situation. To facilitate the comparison of countries, a cluster analysis has been done which resulted in the rating of five groups:

- *Very slightly vulnerable:* (Group 1: Argentina, Brazil, Chile, Costa Rica, Panama and Uruguay);
- *Somewhat vulnerable* (Group 2: Mexico and Trinidad and Tobago);
- *Vulnerable* (Group 3: Colombia, Jamaica, Perú and Venezuela);
- *Highly vulnerable* (Group 4: Bolivia, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay and Dominican Republic);
- *Extremely vulnerable* (Group 5: Haiti).

Between the late 20th century and the early 21st century, noticeable progress has taken place in Latin America and the Caribbean regarding the conceptual, legal and institutional base, leading to sustainable environmental management. For example: (i) introducing in National Constitutions the concept of sustainable development and its close connection with sustainable environmental management; (ii) creating national councils for sustainable development, or equivalent bodies; (iii) creating environment ministries, national commissions or equivalent entities; (iv) passing environmental management laws.

Nevertheless, the environmental situation in most countries is worrying and the general trend shows an increasing, negative effect on ecosystems and natural resources, as well as an increasing environmental urban decay.

Several analyses have been conducted in order to classify the region's countries according to their environmental management, with regard to the activities that may affect risk reduction:

- *Countries which have a good conceptual, legal and institutional base, and environmental management above the regional average:* Argentina, Chile, Costa Rica and Uruguay;
- *Countries which have a good conceptual, legal and institutional base, and average environmental management for the region:* Colombia, Cuba, Trinidad and Tobago, Panama and Jamaica;
- *Countries which have a good conceptual, legal and institutional base, and an environmental management below the regional average*: Mexico, Bolivia, Brazil, Ecuador, El Salvador, Honduras, Guatemala Nicaragua, Peru, Dominican Republic and Venezuela;
- *Countries with an incomplete conceptual, legal and institutional base and average environmental management for the region:* Bahamas, Barbados, Santa Lucia and Suriname;
- *Countries with an incomplete conceptual, legal and institutional base, and environmental management below the regional average*: Guyana, Paraguay and Haiti.

Governmental policies and actions to face natural disasters management in connection with environmental degradation:

- Hazard assessment and threat recurrence: Vulnerability evaluation;
- Territorial planning;
- Management plans for areas within special administration systems;
- Environmental impact analysis and manuals;
- Plans for industrial environmental adaptation and supervision;
- Sectoral regulations: construction codes design; safety of services infrastructure;
- Information and communication;
- Cooperation networks for environmental assistance, surveillance and control;
- Institutional aspects: Revision of environmental management regulations, in order to update them and include aspects that lead to risk reduction; encouragement of decentralization.

Environmental And Risk Management Interphase Matrix (Latin American Average)

Environmental Management **Risk management ("Cycle")** **Political areas**	**Urban Environmental Protection** **Interconnection**	**Infrastructure Environmental Planning** **Interconnection**	**Accounts Management** **Interconnection**	**Soil Conservation** **Interconnection**	**Forests Protection** **Interconnection**	**Coastal Resources Management** **Interconnection**	**Sustainable Agricultural Production** **Interconnection**	**Hazardous Materials And Waste Management** **Interconnection**
Country commitment in risk management								
1. Decentralization of disaster risk	High	High	Med.	Med.	High	Med.	Med.	Low
2. Institutional empowering	Med.	Med.	High	Med.	Med.	Low	High	Low
Risk Identification								
1. Information availability on threat magnitude, frequency and probability	High	High	High	High	High	High	High	High
Prevention and Mitigation								
1. Territorial Planning.	High	Med.	Med.	Med.	Med.	Med.	Med.	Low
2. Threat prevention measures	Med.	Med.	High	Med.	Med.	Med.	Med.	Low
3. Natural resources management and protection.	Med.	Med.	Med.	Med.	Med.	Med.	Med.	Med.
Preparedness								
1. Early warning systems	Med.	Med.	Med.	Med.	Med.	Med.	Med.	Low
2. National disaster response networks	Med.	Med.	Med.	Med.	Med.	Med.	Med.	Low
Risk transference								
1. Risk transfer instruments	Med.	Med.	Med.	Med.	Med.	Med.	Med.	Low
Rehabilitation & reconstruction								
1. National performance	Med.	Med.	Med.	Med.	Med.	Med.	Med.	Low

The high, medium, and low level rating criteria, derives from an interpretation of the characteristics and situation of environmental and risk management of the countries in the region.

EXECUTIVE SUMMARY

SESSION II – Identification Of Economic Instruments For Environmental And Disaster Risk Reduction

From an economic point of view, disaster risk management may be understood as a group of medium and long-term investments with uncertain profits. The costs of such investments are current and well known. As an investment, it should be competitive in the light of alternatives, particularly given the financial scarcity and the urgency of other short-term priorities. There is a series of factors which, translated into signs (laws and their enforcement level, prices, humanitarian aid), influence the decision-making process. They are defined as the "*incentives framework"*. In the case of risk management, the existing framework tends to overshadow "profitability", making it unattractive for authorities and for society as a whole. Part of this incentives framework may be reoriented towards risk management through the introduction of economic instruments. The most frequently used ones are subsidies and tax exemptions.

Schemes based on rates and tariffs are applied on the use of natural resources and polluting emissions. The application of tariffs on environmental services, and contributions for public expenses in environmental services, is a common practice. *Green* taxes are also being introduced to support environmental policies.

Many of the instruments that imply fiscal collection (taxes and tariffs) have so far had a limited success, since the funds collected are not always assigned to environmental investments, and many of the taxes are not influential on the use of resources, since they do not cover all the costs implied in extraction or conservation. The following chart shows categories of instruments used in countries in the region.

Type of Economic Instrument	**Countries where it has been applied**
Direct Control	
Regulations and sanctions	Brazil, Venezuela
Market Orientation	
Charges, taxes and tariffs	Mexico, Guatemala, Honduras, Costa Rica, Barbados, Jamaica, Brazil, Argentina, Colombia, Bolivia, Chile, Ecuador, Venezuela
Subsidies, tax relief and financing aid.	Mexico, Guatemala, Costa Rica, Panama, Nicaragua, El Salvador, Barbados, Jamaica, Brazil, Bolivia, Argentina, Colombia, Chile, Ecuador, Peru, Venezuela
Markets creation	Mexico, Guatemala, Costa Rica, Honduras, Barbados, Jamaica, Brazil, Argentina, Bolivia, Colombia, Chile, Ecuador, Venezuela.
Final demand intervention; "informal regulation"	Guatemala, Brazil, Chile, Ecuador

In Latin America and the Caribbean, there have been positive experiences concerning economic instruments which, having been used in environmental management and natural resources, favor disaster risk management, since the main goal is not to increase profits, but to carry out actions that will ensure sustainable development management.

The following are suggested strategic actions that exist in environmental management, which reduce the risk of disasters through economic instruments:

Planning:

(i) Integrated programs of environmental management which promote land use planning, resources management, and the evaluation of the environmental impact of investments, reinforced by the application of a legal framework that promotes risk management;

(ii) Utilizing hydrographic basins as a planning unity that will direct political decisions;

(iii) Strengthening assistance networks between countries to improve the efficiency of the environmental policy and the economic instruments for environmental management;
(iv) Encouraging the technical strengthening of the system's main actors, so that they manage the same concepts and understand the mechanisms of environmental and risk management;
(v) In Central America, the Strategic Environmental Analysis is being used, which might be very useful in other countries in the region as well.

Economy and Finance:
(i) Including in national budgets a specific account that would show the profit and expenses resulting from the use of economic instruments;
(ii) Fiscal transformation oriented to decentralization, strengthening environmental authorities and guaranteeing the financial sustainability of its programs;
(iii) Economic instruments should be designed with a long-term, systemic vision;
(iv) Measures related to the payment of environmental services should be applicable to areas which supply sectors that are likely to acknowledge them and pay them;
(v) The use of resources coming from economic instruments, will have to be assigned to concrete actions for sustainable development and risk reduction;
(vi) To achieve an efficient assignation of economic instruments, it will be necessary to reach international agreements concerning the harmonization of fiscal systems or tax policies regarding environmentally sensitive sectors.

The following are suggested economic instruments related to environmental and risk management, which would be applicable to Latin America and the Caribbean:

(i) *"Tradeable Development Rights" -"TDRs":* The owner of a property would renounce to certain rights in exchange for incentives or compensation. These faculties are called "TDRs", which can be transferred as "tradeable rights" to third parties that could use them in the market. This operation is carried out through zoning schemes that restrict the use of land in certain areas and expand density in others. This might mitigate the risk of floods and landslides.

(ii) *Compensation for environmental services*. The most versatile instrument for environmental services users in basins or "micro-basins" is the rate, which, as an "adjusted" price, allows for the internalization of maintenance costs. This mechanism's advantages are the new revenue source for suppliers of environmental services and the diversification of income sources. The system also allows the risk management to be more competitive with alternative activities, which often increase an area's risk. This instrument might mitigate the effect of landslides, droughts and floods.

(iii) *Contamination bonds* The State assigns emission quotas, maximum limits for contamination in each source of pollution. If an industry introduces technological changes and emits less than allowed, the difference would be transformed into a bond which may be sold in the market. If the industry contaminates more than what is allowed and cannot reduce its emissions, it would have to go to the market and buy a bond. This could mitigate the greenhouse effect.

(iv) *A combination of regulatory and contractual mechanisms with economic instruments for risk transference*. Combining the effective application of construction codes with insurance policies' reduction. According to the mitigation effort shown by clients, getting insurance policies would be encouraged, as well as tax cuts, to boost the capital accumulation of local insurance companies, and reduce their dependence on reinsurance firms. Another possibility would be to diversify risk through capital markets (e.g.: catastrophe bonds). With these instruments it would be possible to mitigate the effects of any insurable risk.

EXECUTIVE SUMMARY

SESSION IV: Strategies For Disaster Risk Reduction Through Environmental Management And Economic Instruments: Recommendations

The economic instruments mentioned in Session II can be integrated to the processes of territorial planning, environmental management, and risk reduction for certain threats. The strategies are suggested for each group of countries according to their classification in Session I:

In the *Territorial Planning Process* (Environmental and disaster risk, territorial planning, management plans for areas under special administration regimes):
Group 1 (Argentina, Chile, Costa Rica, Uruguay): Developing the complete process of planning and territorial ordering application, strengthening the inclusion of risk management in the legal base);
Group 2 (Colombia, Cuba, Trinidad and Tobago, Panama, Jamaica): developing the planning process through the use of a legal and institutional base that would permit it; executing a program to apply priorities, especially in the areas under special administration regimes;
Group 3 (Mexico, Bolivia, Brazil, Ecuador, El Salvador, Honduras, Guatemala, Nicaragua, Peru, Dominican Republic, Venezuela): Identifying risk and defining areas under special administration regimes; selecting areas whose management may represent a significant contribution to risk reduction; designing and applying management plans;
Group 4 (Bahamas, Barbados, Santa Lucia, Suriname): Since the main threats to these countries are floods and hurricanes, it would be convenient to focus all aspects of planning to areas threatened by these risks;
Group 5 (Guyana, Paraguay, Haiti): In Haiti, an ambitious special forestation program in the most vulnerable areas might be a substantial strategy. Guyana and Paraguay could focus their efforts on hydrological conservation.

In the *General Environmental Management Process, including the risk management variable* (Impact analysis and environmental instructions; plans for environmental adaptation and supervision in industries; information and communication; cooperation networks for environmental assistance, surveillance and control; institutional aspects):
Group 1: Complete and integrated application of the aspects mentioned in this process; focusing on the introduction of the environmental dimension, including the topic of risk;
Group 2: Complete and integrated application of the aspects mentioned in this process; focusing on all stages of the environmental dimension, including risk;
Group 3: It would be preferable to face these aspects through the design and execution of a special management program that would include the main elements that are absolutely necessary, and establish its execution through concrete project stages and instruments;
Group 4: In order for these countries to continue improving their environmental management process, it would be convenient to focus on an action program to reduce risks related to the main threats;
Group 5: It would be convenient for Haiti to concentrate its efforts in the proposed reforesting project to reduce the risk of hurricanes, floods and droughts. Guyana and Paraguay should expand their actions within a more integrated vision of environmental management.

In the *Risk Reduction Process for certain threats* (Sectoral regulations)
Group 1: To aim at 100% coverage of efficient services regarding potable water and sanitation at a national scale; efficient waste management; protection and integrated management of hydrographic basins; combating deforestation, desertification, droughts and global warming;
Group 2: Similar to Group 1;
Group 3: Every country will have to carry out a detailed assessment of the priority areas for risk prevention and mitigation, according to their economic and operative capacity. A regional program could be established to fight floods;
Group 4: It would be convenient for these countries to focus on an action program to reduce risks regarding hurricanes and storms;

Group 5: Haiti's strong institutional, operative and financial limitations, imply it would be better to focus efforts on reducing risks related to hurricanes, floods and droughts, with social components. Guyana and Paraguay could expand their efforts with a more integrated vision to combat floods, their greatest threat.

Conclusions and recommendations

It is not possible to make a general statement on the situation of all countries, and suggest which environmental or natural resources policies and activities would work out best in risk reduction.

There being a direct interest in risk management from the public and private sector, a negotiated agreement should be established for joint action, through co-direction and co-management mechanisms, adapted to each country's features, avoiding the imposition of one sector over another.

The balance between regulatory measures and economic instruments should include a rationalization effort, and use all social, institutional and economic elements necessary. Economic instruments can only work when the people affected by them, accept them as a way to capitalize and ensure their wellbeing.

Recommendations on economic instruments applied to environmental management and natural resources may contribute to disaster risk reduction. For instance: tradeable development rights, environmental services compensation, contamination bonds, and a combination of regulatory and contractual mechanisms with economic instruments for risk transference.

Three main factors must exist in order to increase institutional capacities oriented to the design of environmental policy instruments that contribute to disaster risk management: political will, institutional predisposition, and the selection and promotion of actions that coincide with the privileged interest of the institutional actors involved.

Proposal: Regional Cooperation Program to Reduce the Risk of Floods

Floods are the only threat that covers all the region, each and every country, thus being both a regional and a national threat.

The threat of floods demands and allows significant actions for prevention and mitigation, with noticeable, positive socioeconomic and environmental effects, which encourage governmental decisions, as well as the population's support.

To finance a program like the one proposed, several of the economic instruments mentioned in this study can be applied, such as: (i) payment for environmental services; (ii) services for carbon sequestration; (iii) environmental added value tax, to be assigned to the protection of water sources or integrated basin management, (iv) tradeable development rights.

The proposed program: "Regional Cooperation for Floods Risk Reduction" would define, coordinate and execute actions in the region's interest, likely to raise cooperation between countries, aimed at reducing the risk of floods in the following aspects:

- Identifying the characteristics and scope of topics of interest in regional cooperation in order to reduce the risk of floods, and the best way to confront them;
- Cooperation in scientific research to determine causes and the best way to deal with them;
- Cooperation in early warning systems;
- Interchanging experiences and horizontal assistance for prevention and mitigation actions;
- Designing a special model for the prevention and mitigation of floods risks, which may be adapted, in each case, to particular conditions of priority threatened areas.