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ECONOMIC INCENTIVES FOR RISK MANAGEMENT
INVESTMENT IN LATIN AMERICA.

The role of International Cooperation

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This work is dedicated to the vulnerable families of the rural community “La Guacamaya”, municipality of Nahuizalco, El Salvador, that through their tenacity in the search of development options inspired the ideas considered here.

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Abstract

Latin America Countries suffer from a huge variety of the wrongly named “Natural Disasters”, damages and losses are especially significant in poor countries affecting mainly the poor segments of their societies. Disaster consequences are covered throughout several risk transfer processes, uninsured poor population in developing countries usually are covered with external resources, -named relief aid- in the aftermath of officially declared disasters. The aid is transferred as grants and loans with the purpose of attending disaster’s cost and, in a lower proportion, to avoid them, or mitigate their potential impact.

Even though international concern tends to focus on large scale disasters, there are thousands of small “forgotten” disasters each year connected with recurring and normal natural phenomena, people living at risk in the local dimension are outside of strategies oriented to release that risk in absence of officially declared disasters.

This paper tries to describe the empirical tendencies followed by international cooperation and Local Authorities in terms of their cooperative effort in risk management investments. Using game theory, a kind of “prisoner’s dilemma” is presented as the paradigmatic outcome of self-interested, rational behavior not leading to a socially optimal result from those both players’ efforts, which is the absence of strategies focused on reducing the actual risk people suffer.

As a second step, this paper explores the possibility of introducing a strategy of international cooperation, local authority and community participation, in order to overcome inefficient situations inside a logic of long term development.

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Introduction

Disasters¹ have destroyed human, social, and physical capital, and they have derailed economic development, as funds are reallocated from ongoing programs to finance relief and reconstruction assistance. (Jovel, 1989). The idea that disasters have had a formidable impact on development and economic growth in Latin America is well-known inside most development agencies; nevertheless in poor countries, this impact seems to be more connected with *underdevelopment* or *unfeasible development* than with real development as such. (Lavell, 1999a).

Most disasters occur in developing countries affecting mainly the poor. According to UNDRO, (1976) 95 percent of fatal disaster's victims are registered inside the 66% of the populations that lives in poor countries. Poverty and disasters are mutually reinforced: in Japan, the annual average disaster's victims is about 63 people, in Peru, with a similar number of disasters registered, this statistics reaches 2900 affected people. (Anderson 1994).

Disasters destroy life and properties in each country, but losses, in relation to national resources, are more onerous in poor States. Absolute economic losses can be superior in rich countries because there are more superior value property, but the reduction of the GDP because disasters is near twenty times greater in developing countries that in developed ones. (Funaro-Curtis, 1982). Poverty increases the probability that a crisis becomes a calamity.

According to the Economic Commission for Latin America and Caribbean (ECLAC), between 1972 and 1999, there were 108.000 dead people and 12 millions of houseless. The economic loses rise more than 50.000 millions of dollars. (ECLAC, 2003).

Those estimations refers to disasters that attracts world or national level attention, Although new information sources and data bases are showing that the problem goes beyond these types of events: Data for nine Latin American and Caribbean counties collected by LA RED² using its DESINVENTAR³ software shows that for every large disaster, hundreds of smaller and medium scale events occur with varying levels of loss and damage. (Lavell and Cardona 2000). See table 1.

Rapid population growth, urban migration, inequitable patterns of land ownership, lack of education, subsistence agriculture on marginal lands, lead to vulnerable conditions such as unsafe siting of buildings and settlements, unsafe homes, malnutrition, unemployment and underemployment, and illiteracy. The poor within the poor countries are the most vulnerable.

Landslides or flooding disasters are closely linked to rapid and unchecked urbanization that force low-income families to settle on the slopes of steep hillsides or ravines, or along the banks of flood-prone rivers. The poor countries that suffer the worst disasters are the same countries in which environmental degradation is proceeding most rapidly. Countries

¹ This paper refers to disasters associated with natural or socio natural hazards, excluding those generated by social phenomena such as violence or terrorism, although it is obvious that these can not be ignored as important sources of insecurity.

² Network for Social Studies in Disaster Prevention in Latin America - La Red - (www.desenredando.org)

³ Software Data base of disasters, managed by La Red (www.desinventar.org)

with severe deforestation, erosion, overcultivation and overgrazing tend to be hardest hit by disasters. (Cuny, 1983).

Table 1: Lives affection between 1988 – 1997 by smaller and medium scale disasters typically no-recognized as such by national authorities in Latin America (selected countries).

Country	Died	Wounded	Homeless	Affected
Argentina	826	30197	112697	18289051
Perú	6247	525201	1503705	924273
Ecuador	953	94	4892	42019
Colombia	1864	2378	402422	1573405
panamá	255	225	4012	15448
Costa Rica	311	60857	80975	5503
El Salvador	395	4984	20893	111697
Guatemala	1388	40729	388554	106097
México	3670	8974	469594	2245961
TOTAL	15909	673639	2987744	23313454

Source: Andrés Velásquez, Cristina Rosales. “Escudriñando en los desastres a todas las escalas”. 1999, LA RED.

During the last decade, the Latin American debate on risk and disaster management moved towards a new tendency more close to the development field and human sustainability. Although management practice is still dominated by disaster preparedness and response issues, the pervasive *relief to development continuum* approach advocated since the beginning of the nineties was expanded, incorporating the notion that development planning must in general be imbued with the notion of risk reduction.

According to this notion, and using game theory, this paper tries to identify a kind of *prisoner’s dilemma*, regarding to the absence of strategies that addresses the poor living in *actual risk*.

This paper also tries to contribute in the task of finding better strategies in terms of risk-reduction activities and explores the viability of them inside a logic of sustainable development and a country / local authority and community participation in the design and the implementation of international cooperation risk related initiatives.

1. Risk Management and Development: A Conceptual Framework

Some definitions:

The United Nations Disaster Relief Organization (UNDRO), formed in 1972 started its efforts in standardization of terms in its publication, *Natural disasters and Vulnerability Analyses*, in 1979. This first attempt was already at that time integrating the views of several organizations within the UN system, as well as non-governmental agencies. These are some of their definitions regarding to the main 4 elements in risk analysis:

Disaster: *A serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of affected society to cope using only its own resources. Disasters are often classified according to their cause (natural or manmade).*

Risk: *Expected losses (of lives, persons injured, property damaged, and economic activity disrupted) due to a particular hazard for a given area and reference period. Based on mathematical calculations, risk is the product of hazard and vulnerability*

Hazard: *A threatening event, or the probability of occurrence of a potentially damaging phenomenon within a given time period and area.*

Vulnerability: *Degree of loss (from 0% to 100%) resulting from a potentially damaging phenomenon.”* UNDRO (1979).

Starting from these basic concepts, other efforts had been made to better define them in terms of constructing useful approaches: Risk is defined as a *potential negative* situation, when risk is not correctly managed it becomes disaster.

Very often international financing regarding risk-disaster interventions is given to Latin-American countries when national governments declare “state of emergency” after the occurrence of a disaster, which means an explicit declaration of disruption or rupture of the normal social order so severe that it requires external assistance. (Quarantelli, 1999).

Hazard and Vulnerability are defined as Risk linked factors: Disasters are the result of the interaction between both physical and social elements. There is no risk if there are hazards where vulnerability is zero or if there is a vulnerable population but no hazardous event.

The equation (1) describes the way hazard and vulnerability are correlated, this is the most widespread known risk function:

$$R = f (H * V); \tag{1}$$

Where R = Risk, H = Hazard, and V = Vulnerability

Most of Latin American and Caribbean countries are subject to a wide range of hazard factors. (See table 2). This not only includes those associated with natural earth forming and transforming processes (considered as “natural hazards” such as earthquakes, floods,

volcanoes explosions, etc.), but also an impressive range of the so called “Socio-natural” hazards, they talk about conditions where the “inadequate relations between humans and their environment create new hazards all of which appear to be natural”. (Lavell, and Cardona, 2000. op. cit.).

Table 2: Natural and “socio-natural” Hazards in Latin American Countries

Main division	Hazard type	Region's presence
Atmospheric	Hailstorms, Hurricanes, Lightning, Tornadoes, Tropical storms	Central America and the Caribbean.
Seismic	Fault ruptures, Ground shaking, Lateral spreading, Liquefaction, Tsunamis	Mexico, Caribbean, Central America and Andean countries
Other geologic/ hydrologic	Debris avalanches, Expansive soils, Landslides, Rock falls	All Latin American countries
Hydrologic	Coastal flooding, Desertification, Salinization, Drought, Erosion and sedimentation, River flooding, Storm surges	All Latin American countries excepting Bolivia and Paraguay from coastal flooding.
Volcanic	Ash rain, Gases, Lava flows, Mudflows, Projectiles and lateral blasts, Pyroclastic flows	Mexico, Caribbean, Central America and Andean countries
Sanitary related	Plagues, epidemics, sanitary emergencies,	All continent mainly bordering cities

Source: Adapted from Organization of American States, 1990.

Given the wide range of hazard types, a large number of countries, regions, zones and families live in *multi-hazard situations*, where concatenation and synergy may occur.

Notwithstanding the term “natural”, a natural hazard has an element of *human involvement*. A physical event, such as a volcanic eruption, that does not affect human beings is a natural phenomenon but not a natural hazard. A natural phenomenon that occurs in a populated area is a hazardous event. A hazardous event that causes an unacceptable large number of fatalities and/or overwhelming property damage is a *disaster trigger phenomena*. In areas where there are no human interests, natural phenomena do not constitute hazards nor do they result in disaster trigger event. This definition is thus at odds with the perception of natural hazards as unavoidable havoc wreaked by the unrestrained forces of nature. It shifts the burden of cause from purely natural processes to the concurrent presence of human activities and natural events.

Although humans can do little or nothing to change the incidence or intensity of most natural phenomena, they have an important role to play in ensuring that natural events are not converted into disasters trigger phenomena by their own actions. It is important to understand that human intervention can increase the frequency and severity of disasters triggered by natural phenomena.

Usually drought, Flooding, landslides and land submergence are associated with inadequately planned urban growth, water basin destruction, deforestation and slope and underground mining. Many others exist and, in general, the overall increase in hazard factors is associated more with these types of process than with nature itself.

The previous idea allows us to affirm that the active element of the risk is the vulnerability. An accurate definition of this concept is presented by Blaikie, P. Cannon, T. Davis, I. and B. Wisner, in the book “*At Risk: Natural Hazards, People's Vulnerability and Disasters*”. (Blaikie, P. et. al., 1994):

“By vulnerability we understand the characteristics of a person or group from the point of view of its capacity to anticipate, to survive, to resist and to recover of the impact of a natural threat. It implies a combination of factors that determine the degree until which the life and the subsistence form of somebody it is in risk by an event identifiable inside the nature or the society”

Hewitt, K. (1997), explains that the exposure to dangerous agents and environment are the basis of all disasters, and agrees with Blaikie when states that the key differentiating factors are found in the conditions of “exclusion and structural social and economic disadvantage for the majority of populations in both urban and rural setting which create the human conditions of weakness, lack of protection and of resilience”. The powerlessness of these vulnerable populations to guarantee safety conditions explain the continuous high “toll paid” by marginal and structurally disadvantaged population in the human and economic impact of disaster.

According to Hewitt, there are several forms in which vulnerability arises:

1. Exposure: to dangerous agents and environments
2. Weaknesses: predisposition of persons, buildings, communities or activities to greater harm.
3. Lack of Protection: against dangerous agents and for weaker persons and items.
4. Disadvantage: lack of the resources and attributes to affect risks or respond to danger
5. Lack of resilience: limited or no capability to avoid, withstand or offset and recover from disaster.
6. Powerlessness: inability to influence safety conditions, or acquire means of protection and relief

The growing bodies of literature on climate change, environmental change and disasters are an illustration of how knowledge systems overlap and using similar words and concepts to describe vastly different processes and issues. More effective integration of natural and social science have been proposed in order to better understand and adapt to a changing and rapidly evolving environmental and social systems.

In the next part of the chapter a succinct discussion of natural and social sciences based approach to the risk and disaster phenomena is presented in order to better define basic characteristics of empirical strategies followed when financing risk management initiatives in Latin America.

Three main types of approaches:

These basic definitions mentioned-above; have been widely used by the three main schools of thought on disasters: (1) Earth sciences, (2) engineering and (3) social sciences:

Initially, the scientists who studied the processes of Earth’s formation and transformation, thought that the causal agents of disasters were the physical-natural phenomena, determined by the dynamics of the Earth (atmosphere, hydrosphere and lithosphere). According to this approach, the occurrence and magnitude of disasters is attributed to the natural phenomena. The term “*Natural Disaster*” has been arisen from this interpretation.

The main objects of study are the natural threats. Policies center exclusively in the elaboration of technical studies for the prediction and control of potentially dangerous natural phenomena arise. This approach is well known as a “physicalistic” interpretation of risk and disaster phenomena. (Hewitt, 1983).

This lecture serves to illustrate a common problem still pervasive in disaster literature. That is to say, the tendency to still consider a disaster to be a physical event that causes damage. Or, in other words, the tendency to consider hazardous events and disasters as synonymous. (Lavell, 2000)

At a second moment, physicists and engineers proposed an alternative reading in which they transferred the responsibility of the occurrence and magnitude of disasters from the simple occurrence of natural phenomena to the existence of nonresistant structures according to the expected energy released by them.

This approach privileges the design and construction of resistant structures against dangerous natural phenomena. The proposed policies are centered in the physical vulnerability of the society through the formulation of norms of construction and measures for the reinforcing of structures.

According to this lecture, the response by many societies to natural hazards has centered on the construction of civil defense or engineering works (such as levies, reinforced structures, earthquake proof buildings, etc.). This is commonly known as *structural mitigation*. These measures are often extremely costly, and of limited effectiveness during particularly high magnitude events in Latin America. (Maskrey⁴, 1993). Other authors suggest that an alternative to these protective measures and civil defense works should rely more systematically on the buffering capacity of natural ecosystems (Smith, K. 1997). There has been a growing tendency to *modify* the natural environment in favor of hazard mitigation, particular in floodplains, coastal lagoons and mangrove swamps.

In the catastrophic 1993 Mississippi valley floods, in the United States, which affected an estimated 6.6 million acres of land, produced between \$12 and \$16 billion in damage and cost 38 lives (Godschalk, D. et. al., 1999), it was clear that strong modifications in natural ecosystems tends to create ulterior vulnerability. (Wilches-Chaux, 1993). In fact, the limited effectiveness and posterior collapse of existing structural mitigation works dramatically increased the destruction potential of the river.

This served to change the way that floodplain planning has been conceived in the United States: A Federal Government report following the disaster, called the “Galloway Report” endorsed the “*gradual move away from structural measures, embraces land use and relocation strategies, and emphasizes protecting and restoring the natural functioning of river systems*”. (Godschalk, p 33).

The final conclusions of the report advocate the wise use of floodplains, echoing the calls since the 1971 Ramsar Convention for the wise use of wetlands. As Godschalk (p. 53) suggests “Wise use of floodplains means enjoying the benefits of floodplain lands and waters while still minimizing the loss of life and damage from flooding and at the same time preserving and restoring the natural resources of floodplains as much as possible”.

⁴ Currently Chief of the Disaster Reduction Unit of the UNDP Bureau for Crisis Prevention and Recovery, based in Geneva, Switzerland. Between 1992 and 1999 he was founder and General Coordinator of La Red.

The magnitude of that disaster and the way heavy technique was criticized served to rethink the -until that date- untouchable physicalistic and technocratic predominant approach. Moreover, after 60-years of silent ideas, Gilbert White's writings from 1936 about the benefits of floodplain land use emphasizing the role of wetlands in flood storage and flood mitigation (White, G. 1936 and 1945) were seriously considered by the first time, just after this *socio-natural* disaster.

The third interpretation proposes a shift of paradigm, a displacement of the attention from the *disaster* towards the *risk*, alluding that both are social constructions, incorporating an historical analysis of identification of social processes that have constructed it. Here, the social practices that generate risk within the development processes are the main subject of study.

Sociologists redefine disasters not as a product, but as a process of combinations of physical, biological or technological hazards and population growth and migration as well as the resulting configuration of human settlement, distribution of wealth and opportunities which create patterns of vulnerability. (Hewitt, 1997, op.cit.).

In this vision, there is a special emphasis in the connection between *disasters* and *development* beyond the unidirectional, single - predominant vision (disasters negatively affect the development processes), but investigating how certain type of development produces risk. (Box 1). This has been the principal concern of many social sciences⁵. Authors. They propose that the search for immediate economic gain as opposed to sustainable medium and long term objectives is behind a good part of the risk generated by advanced production sectors of the society. Moreover, the risk these sectors create is socially distributed amongst the poor. (Lavell, 2000. op. cit.).

For example, it is common that deforestation for short term economic gain may have negative impacts in terms of flooding and landslides that could affect poorer populations located in risk-prone areas.

Unfortunately, to date this link remains insufficiently established in the region, although things are moving in this direction (See chapter 3).

This interpretation allows foresight of disasters like the *collapse point* of an untenable process of risk accumulation closely linked with a non-sustainable predominant type of development.

The obvious conclusion to be drawn from this is that risk cannot be separated, either causally or in terms of management practices, from development, economic policy and planning. Risk is not a residual factor but rather a major component in the lives of the poor and socially excluded.

⁵ see in particular - La Red - : www.desenredaddo.org

Box 1: *How does “development” produce risk?*

In certain circumstances, development by itself can increase the probability of disasters. We could suppose that a dollar spent in diminishing poverty, which is development, is a dollar spent in prevention of disasters. This is doubtless, but the opposite also happens; for example, the enlargement of the industry increases the possibility of industrial accidents, some of them, such as the accident of Bhopal, India, are disasters. Certain development projects are planned and constructed without knowing local natural threads like many non seismic resistant slums in earthquake-prone areas. Development some times indirectly increases the probability of the disasters. Best health and human and animal nutrition in some regions have contributed to the overpopulation and Earth exhaustion, provoking environmental deterioration and ecological crises. In other parts, populations have been transferred to urban areas in search of productive use, but by lack of planning, they have inhabited susceptible territories of floods and earth slidings. Environment is frequently the point of interphase between development and vulnerability. Each project or program of development in countries prone to the disasters increases or diminishes the probability that these happen. When development increases the capacity of a country to come out ahead (to predict, to handle, to make sure or to defend themselves) in spite of the natural dangers, that contributes to the prevention of disasters. When the development is undertaken ignoring the propensity to the catastrophes, that can increase risk.

Source: Mary B. Anderson, Chapter one, page 5 from the book: “Al Norte Del Rio Grande, Ciencias Sociales y Desastres: Una Perspectiva Norteamericana” Compiled by Allan Lavell. La Red, 1994.

The exposed ideas in Box 1 suggest that development, in the sense that it is commonly accepted, does not necessarily reduce vulnerability. The consequences of Hurricane Andrew (1993) are still being borne by the insurance markets of the United States and the reinsurance markets of the world. In less-developed areas of Latin America and the Caribbean, the social and economic consequences of disaster losses are higher, in relative terms, and longer lasting.

Disaster reduction and sustainable development are mutually supportive goals. Inappropriate development patterns increase risk and vulnerability, which in turn erode human health, welfare, social and economic infrastructures, reducing economic performance and prospects for longer term social and economic development.

On the other hand, economic development models and projects have not factored in hazards or vulnerability; and, consequently, these shortcomings have contributed to increased susceptibility to disasters and have endangered overall economic sustainability. Often development funds are wasted, as projects must be rebuilt after a disaster that should have been avoided.

One of the most important contribution of the social science based approach has been the shifting from the idea of consider disasters as the consequences of natural threads that affect “normal” societies to the idea of societies “in crisis” affected by normal and foreseeable natural phenomena. (Maskrey. 1993. op. cit.).

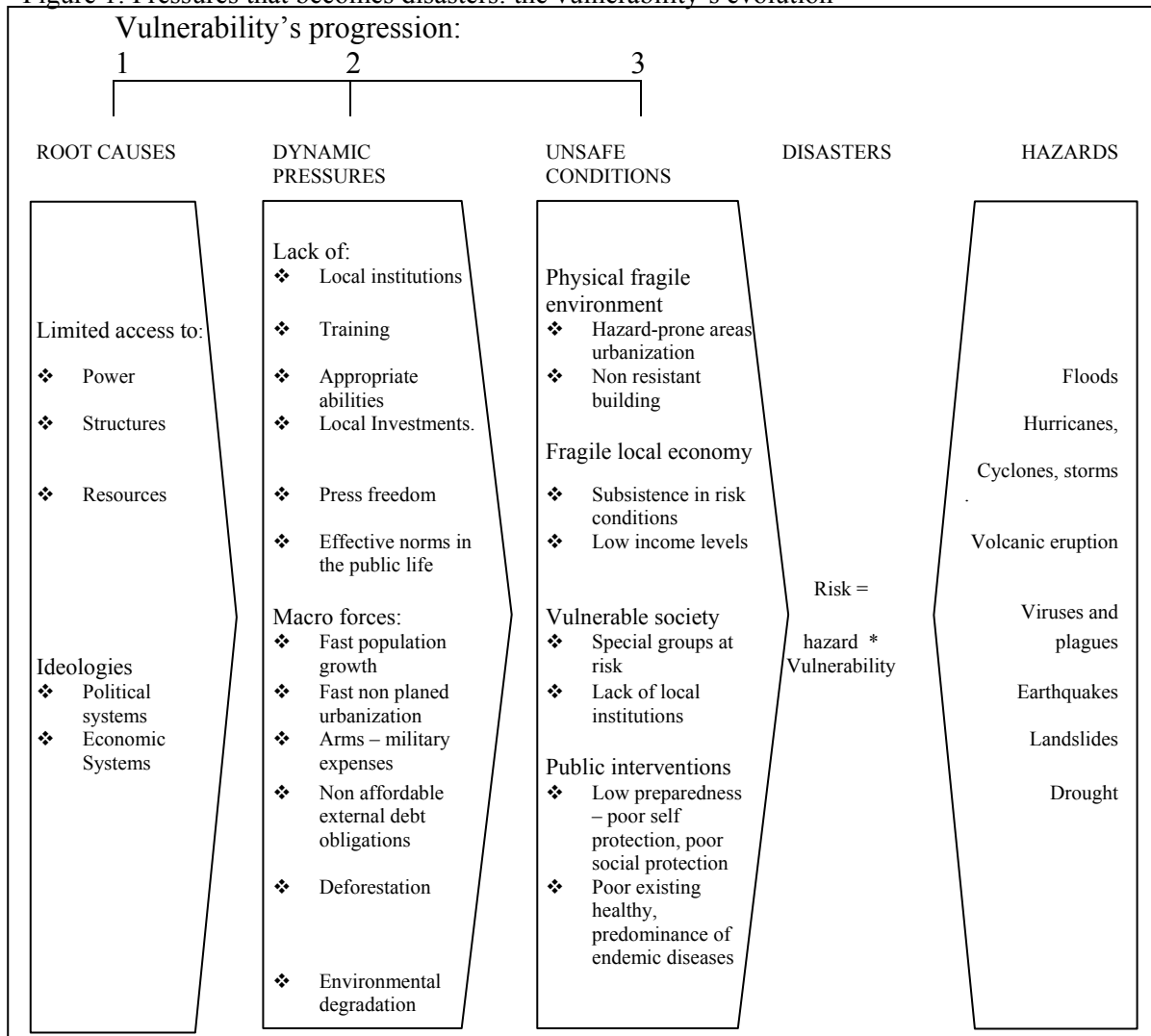
The Pressure And Release (PAR) model: a way to understand disaster’s causes.

Blaikie, P., et. al. (op. cit. 1994) gives emphasis to ‘*the various ways in which social systems operate to generate disasters by making people vulnerable*’. The ‘pressure and release’ model shows the ‘underlying factors’ which give rise to the ‘dynamic pressures’

that create a disaster in conjunction with a ‘trigger’ (geohazardous) event (i.e. an Earthquake).

The idea of the PAR model is that disasters are the accumulation across time of vulnerability and hazard (two forces that generate risk), this accumulation is the result of a transfer process from some *root causes* into *unsafe conditions* through *dynamic pressures* within the framework of models of development, land tenure and rent (figure 1).

Figure 1: Pressures that becomes disasters: the vulnerability’s evolution



Source: Blaikie, P. et. al. (1994).

Dynamic pressures are those which determine the basic health and nutritional status of a population, as well as its access to education and job opportunities, its tenure security and the state of its surrounding environment. It is also the consequence of macro forces such as population growth, rapid urbanization, the increase of the poverty and inequality and the environmental degradation (i.e. deforestation, loss of biodiversity, decline in soil fertility and the relative scarcity of key resources such as water). It also fosters an increase in vulnerable social conditions and livelihoods at risk, because of low income, limited access to resources and weak local institutions.

All these contribute to create *unsafe conditions* in terms of fragile physical environment, in which natural hazards can trigger disasters.

Dynamic pressures are seen as linkages between larger structural causes and local conditions. They “*translate the effects of root causes into the vulnerability of unsafe conditions*” (Blaikie, P. 1994:24).

The root causes are linked to the economic and political spheres which create policies and structures which promote social exclusion and concentration of wealth. The root causes also determine to a large degree the tenure over land and resources.

The “release” idea refers to the possibility of risk reduction, in which it is necessary to address *not only* unsafe conditions but also dynamic pressures and root causes.

In a sense, this model proposes the challenge of introducing development policies into the risk management activities.

The access complementary model:

Another conceptual model is the “Access Model” (Blaikie, et al., 1994). Meanwhile PAR model can be considered as a *structural model*, because in it, vulnerability is measured as the inevitable result of dynamic pressures and root causes, (Sen, 1981; Chambers, 1989; Winchester, 1992) the access model adopts a kind of vision characterized by a lecture *from inside to outward* of vulnerability complex phenomena.

The access model explores the barriers and channels that affect the family’s access to key assets and resources through the time and that can result in an accumulation or scarcity of goods and reserves.

In this model, assets are classified in several types:

1. Human assets: Number of work available members of the family and its level of education and health
2. Productive family assets: House, land, equipment, animals, domestic utensils and so on.
3. Community productive assets: Access to land, fresh water and other community property

Demands: Towards others families, the community, principals, the State, NGO, etc.

Reserves: Saved money in the bank (if any), stored foods, etc.

The model shows that families without assets, available resources or reserves and with little access to community productive assets or redistributive processes have a little capacity to absorb the impact of a threat and recovery of it.

The model emphasizes the existence of *different levels* of family vulnerability inside the same community, even though the hazard and the physical vulnerability is more or less the same.

In the access model, vulnerability cannot be considered synonymous with poverty, this last one refers to unsatisfied needs and vulnerability refers to the lack of means to overcome a crisis. (Chambers, 1989).

The incapacity to convert reserves into assets, the dependency on a single precarious source of income, and the limited access to community-level support nets are examples of factors that determine the vulnerability of a family towards a determined hazard.

What is risk management?

Risk management means reducing (to release) risk to an *acceptable level* defined by the society and coping with the consequences of disaster (when risk materializes). It is a complex set of activities closely related to development in a sustainable way.

Since risk is socially constructed, it may also be socially deconstructed through sane viable policies. That is to say, if it is true that natural hazards cannot be removed or substantially modified as such, socio natural hazards and vulnerability are clearly subject to intervention and reduction. This requires a close association and coordination between environmental agencies, policies and risk reduction promoters and institutions through a reasonable risk management strategy.

The notion of risk management is not a substitute term for disaster prevention and mitigation. Rather, risk management applies to the full range of activities considered under the traditional notion of the *disaster cycle or continuum*. Risk reduction, prevision and control are pertinent in pre impact contexts and also with regards to preparedness, response, rehabilitation and reconstruction. Risk is present in all these stages, and is ever evolving and changing (Wilches-Chaux, 1998), requiring different approaches and types of intervention.

Just for the sake of academic aims, risk management can be broadly divided into two major groups of activities: (1) *Risk reduction activities*, which focus on reducing the risk levels, or, in other words, reducing the levels of socio natural hazards and/or vulnerability and (2) *Risk coping activities*⁶ that focus on reducing the negative effects of disasters once they have occurred. This paper proposes a second level division into seven subgroups of activities. The Figure 2 shows schematically a conceptual framework for those risk management activities.

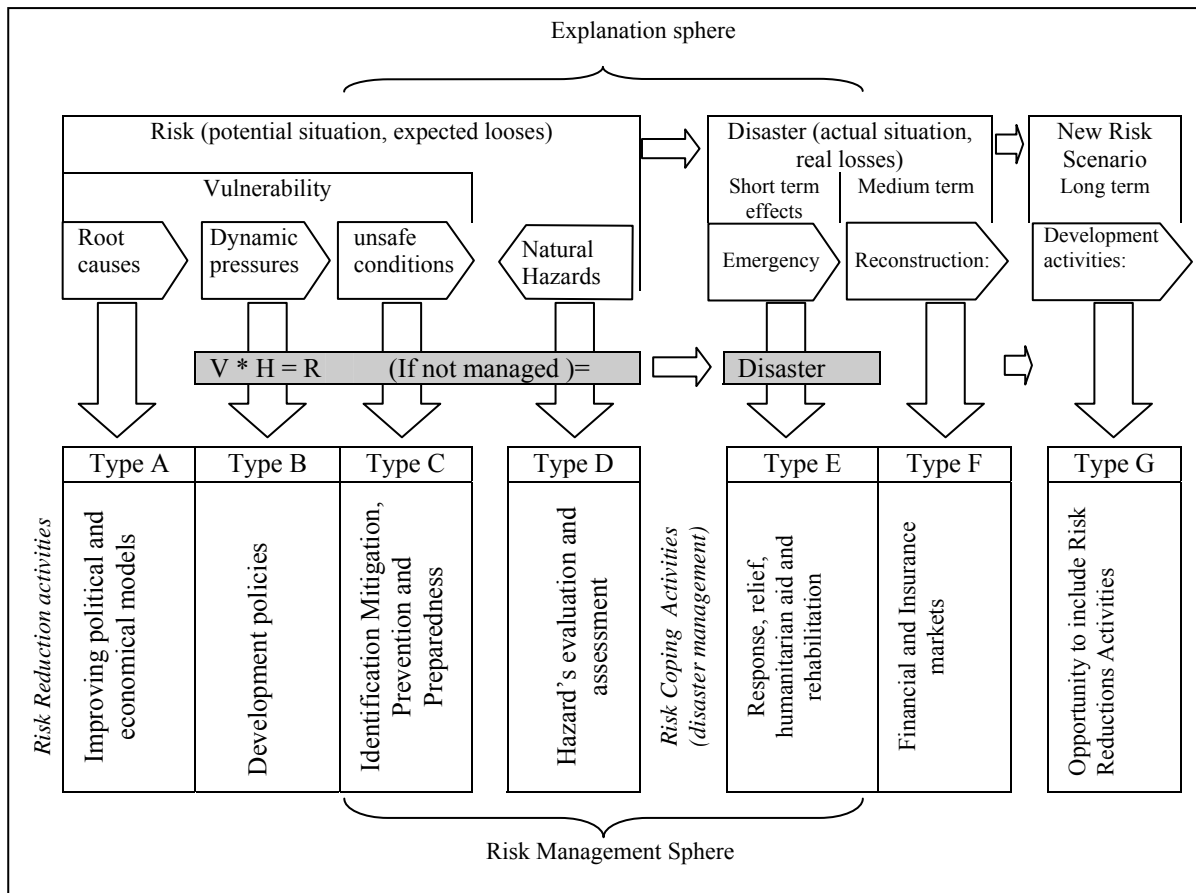
Risk-reduction activities include all kind of activities regarding to reduce risk, and according to the social risk construction approach, it is reasonable to include inside risk reduction activities development issues such as activities types A and B (see Figure 2) which address root causes and dynamic pressures, respectively.

Risk identification, prevention, and mitigation (type C) concern the modification of unsafe conditions. Risk identification is very important in risk management, since risk mitigation, prevention and preparedness directly depend on the original assessment of risk.

Risk identification involves a risk assessment, which quantifies the spatial and time evaluations of natural or socio natural hazards (type D) as well as vulnerability's quantification and whose objective is to calculate the risk level in terms of *expected losses* and its impact, if that risk becomes disaster.

⁶ This paper avoid the use of the term “disaster management” in order to emphasize the risk as the main concern in risk management inside a unique concept, disasters approaches tends to separate both terms in two different moments of the so called continuum of the disaster cycle.

Figure 2: Risk management activities, a conceptual framework



Source: Own elaboration. Risk reduction, explanation sphere based on PAR model

Risk prevention involves those activities focused on to prevent the *future risk* (prospective risk management) which means avoiding specific use of risk-prone areas before its use or urbanization. Sustainable policies inside rural/urban environmental management must include risk prevention such as non-structural instruments: land-use planning, building codes and other regulatory instruments.

Risk mitigation measures involve reducing human and asset vulnerability, which is the *actual risk* to disasters (corrective or compensatory risk). They include the construction of dams or re-channeling of rivers to regulate river flows and to limit probabilities of floods downstream while reforestation of watersheds and stabilization of unstable slopes can prevent the occurrence of landslides and floods.

Risk mitigation measures also include investing in hazard-resistant technology such as retrofitting of infrastructure using hazard-resistant techniques, building mitigation infrastructure such as retaining walls, and resettling population at risk. This may be complicated by the fact that many households in high-risk areas have “low income and limited relocation alternatives”. (Auffret, 2003). That is why risk mitigation also must include the diversification of income sources, for example through diversification of the types of crops cultivated in terms of harvest seasons, resistance to flood, strong winds and other natural hazard.

Preparedness focuses on *short-term* damage control rather than significant reduction of vulnerability. (Auffret, op. cit.). That is why preparedness is usually considered as a risk-coping activity despite the fact that most of its actions take place before the occurrence of disasters.

Preparedness also means lessening the impact of disasters by structuring in advance the ability to respond to an emergency. Preparedness activities include hazard monitoring, forecasting, early warning systems, evacuation plans and shelters, specialized networks of responders and contingency plans in critical sectors.

In many countries civil defense has focused mainly on monitoring, preparedness and response to disasters (best discussed in chapter 2). These efforts are crucial to mitigating the effects of disasters. However, the core of a mitigation program should consist of more upstream actions such as the safe location, design, and construction of structures, infrastructure, and settlements.

Local authorities carry out a great variety of activities, some of them are clearly identified as risk management activities and are commonly shared with International Emergency Organizations, such as the production of primary information about disaster scenarios, supporting and leading (not always) relief and rehabilitation and reconstruction.

Other types of activities, more connected with development, are in hands of local authorities with external participation in many cases; actually, the NGO sector and international agencies seem to be the more progressive and diverse sector in their strategies oriented to avoid *future risk*, which means sane urban and rural planning which is the considerably less costly and more reasonable risk management strategy.

The clearest example of managing future risk is the formulation and implementation of land planing or territorial ordering that could be developed using own resources in some countries like Colombia and with foreign support in cases such as El Salvador.

The failures in risk reduction activities must be covered by risk coping activities.

Risk-coping activities reduce the negative effects of disasters *once they have occurred*. They do not intend to reduce the amount of physical damages (mitigation), but focus on reducing the consequences on welfare by smoothing the shocks over space and time. The actions are intended to manage the emergency as a result of a disaster.

Risk coping activities engage a large variety of actions from the search and rescue of survivors, to relief and rehabilitation (type E). Even some economic measures are considered as risk coping activities. (type F, Box 2).

From box 2, it is important to underline that insurance has a very important role, but it does not cover the poor⁷, which is the largest of the risk affected people. On a community

⁷ The catastrophe insurance market does not cater to all segments of the economy. For example the proportion of residential and commercial properties covered by insurance is significant in the Caribbean region. However, the vast majority of insured properties are hotels, tourism-related properties, large and medium-size private industrial and commercial businesses while many dwellings and small businesses remain uninsured.

level, there are almost no cases where insurance alone will enable a society to resume its development activities within an acceptable time after a disaster or serious disruption.

Fragile dwellings constructed in hazard-prone, low-lying coastal areas, deep river basins or valleys and along steep slopes are generally not insured. For example, a large segment of the population in Barbados, Jamaica and Trinidad and Tobago lives in vulnerable, uninsurable properties (lacking dug-in foundations, secured frames or bolted roofs) which could be easily dislodged in the event of flooding or strong winds. In Santo Domingo, the Dominican capital, about 300,000 people live in the high-risk, flood-prone and highly polluted Ozama River Basin with no insurance against flood either. (Auffret, op cit).

Box 2: Some Risk Coping Activities from an economical point of view:

Saving and resorting to the financial market are coping mechanisms. Households can accumulate savings and assets in the absence of disasters and reduce them in the aftermath. They may have to deplete their asset base by selling livestock, for example, in order to cope with the shock. At the aggregate level, public transfers in the form of food, shelters and emergency employment programs can play a key role in smoothing the shock for the most vulnerable segment of the population.

Access to financing in the form of grants or loans help alleviate the negative shocks. This includes contingent financing from bilateral and multilateral assistance in the form of grants and concessional or non-concessional lending. Aid can also come as debt relief while countries with better access to international private markets may resort to private financing on the international markets.

Insurance is another coping mechanism. Traditional insurance may be available as an instrument to protect against natural events. Households and firms pay a premium to cover natural hazards and are reimbursed for the damages if a disaster occurs.

New financial instruments such as catastrophe bonds may also provide an alternative to traditional insurance for reinsurers, Governments and large companies.

Seeing as an economic view, the objective of risk-management is to find the policy mix which maximizes welfare among the risk management options available, while the objective of public policy is to intervene when market failures prevent the private sector from maximizing society's welfare on its own.

Source: Catastrophe Insurance Market in the Caribbean Region, Market Failures and Recommendations for Public Sector Interventions. Philippe Auffret, World Bank. 2003.

Finally, disasters are also an opportunity for rethinking development issues, (type G). Very often, the structure of risk management systems is evaluated after the occurrence of disasters, some important improvements in sustainable development were initiated as a consequence of a disaster, such as the “*Sistema Nacional Para La prevención y Atención de Desastres*” of Colombia after the mudflows of the Ruiz Volcano in 1985 that fatefully killed more than 20.000 people (Wilches-Chaux, 1998. op. cit.).

Risk management main responsible

The government appears as the principal agent responsible for risk management in the region, nevertheless, and as presented in the following chapters, this task seems to be difficult under the actual conditions of fiscal deficit, external debt, slowly growing economies, withdrawal of the State from many sectors, privatization and reduction of social compensation mechanisms. It is difficult to see government expending scarce

resources to attack existing risk and the private sector does not have economic incentives to participate.

Much more must be done by the governments in order to reduce vulnerability to disasters in the long term such as strategies about disaster mitigation, creating incentives, and adopting regulations that will encourage individuals and businesses to reduce the risks they face and promote social protection.

The importance of community-based Risk Management approach:

Risk management is best achieved when linked to development processes, when seen as a parameter of development and a cross cutting theme built into development initiatives, in the same way as many environmental and gender initiatives have been approached over the last years.

This idea recognizes that risk is constructed with the normal processes of social change and development. (Wisner, 1993). And, that disaster risk reduction, prevision and control is best approached when considered within the framework of the search for increased overall human security and the reduction of global risk, including daily life style risk associated with poverty. In this way, consideration is not only given to the reduction of existing risk, but also to avoiding the construction of new risk in the future, a product of inadequate development processes and projects.

Risk management then becomes a strategy for social and economic transformation and development and not simply a conservative mechanism for reducing risk where no improvements occur in the basic living conditions and economic options available to the population. (Lavel, 2002).

Disasters are the aggregated result of family or micro level losses. Moreover, every large disaster means hundreds of smaller and medium scale events. Despite the scale appreciation, the impact will hit strongly in the local dimension, and consequently optimal risk liberation initiatives must consider local empowerment as one of their main topics on designing risk management strategies.

This is widely applied in preparedness initiatives and risk-coping because affected communities are those that first helps others victims. Recently risk reduction activities are stressing the importance of micro level initiatives and this topic has become recurrent in best practices literature.

Andrew Maskrey, argues that when disaster-mitigation measures are carried out by community organizations, they are not only more effective, but can lead to a *permanent* reduction in vulnerability. (Maskrey, 1989).

This idea stresses the dual purpose of the community-based approach: (1) managing risk through reducing the vulnerability level of exposed elements in a community connected with a specific hazard, solving immediate community risk problems. And (2), progressively reducing community vulnerability through transformations on the production relations (economic, ecological, social cultural and land related). (Maskrey, 1993. op. cit.).

In other words, a community-based risk management approach means attacking unsafe conditions on one hand; and on the other, attempting to change dynamic pressures.

In addition, the most successful experiences in risk management in Latin America, occur when there are agreements and negotiations between communities and external actors (such as government organizations or NGO) that permit the incorporation of community level perceptions, priorities, needs and imaginary into the design of public policies, programs and projects. (Lavell, 1996).

According to Maskrey, a community-based approach must include at least three types of activities:

1. Orientation d to knowledge and conscience generation of specific hazards and risk presence in the area as well as the characteristics and causes of the associated vulnerability.
2. Orientation to the support and consolidation of different levels of social organization.
3. Orientation to the development and application of instruments and appropriated mitigation alternatives designed to solve specific problems.

The Network for the Social Study of Disaster Prevention in Latin America (La Red), designed, in 1998, a local-level risk management methodology that has been used in more than 11 Latin American Countries. It shows significant improvements in community risk identifications and commitment. (see Wilches-Chaux, 1998. op. cit.).

2. Who finances Risk Management activities in Latin America?⁸

According to the classification presented in chapter 1, risk management can be divided into risk-coping and risk-reducing activities. It is not difficult to evaluate international investments focused on the first group because they are clearly identified as emergency expenditures in organization's reports; the second group presents a higher level of complexity: available data does not distinguish between investments in risk reduction (that is a development issue) from other development investments.

Nevertheless some development issues are more connected with risk-reduction activities than others, (also the opposite happen, see Anderson, 1994. op. cit.). These issues are procedures addressing relevant changes in unsafe conditions, dynamic pressures and / or, root causes. (PAR model)

Also making available scarce resources (Access model) to vulnerable populations contributes on one hand to the development of those groups, and on the other hand, to reducing their vulnerable situation.

This paper proposes a selection of 6 development issues more connected with risk-reduction -part (A), table 3- from the huge list presented in International Development Organizations. This list has been produced taking into consideration available risk management literature. Regarding risk coping activities, International Organizations often present their activity's reports using one or more budget line distinction presented in part (B) of table 3.

Table 3: Budget line classification according to risk management ODA⁹.

Part (A), for risk reduction:	Part (B), for risk coping:
1. Basic education environmental-related projects	1. Reconstruction relief
2. Agrarian reform	2. Emergency food aid
3. Water and Natural resources management projects	3. Emergency disaster relief
4. Employment	4. Emergency assistance
5. Low cost housing focused on poorer vulnerable populations projects	
6. Flood, landslide - prevention/control	

Source: adapted from OECD, on-line Creditor Reporting System. (2003).

Some transversal issues such as gender and local empowerment are intentionally excluded because projects commonly include them.

According to the Organization for Economic Cooperation and Development (OECD)¹⁰, through its on-line Creditor Reporting System (CRS), the major source of information on sectoral and geographical distribution, terms and conditions of official development

⁸ This paper do not pretend to evaluate international agencies or organizations, nor those projects financed by them. The aim is the identification of some basic patters of interventions mainly allied whit the common type of activities historically sponsored in the region. It is not an exhaustive investigation either, the paper does not take into consideration the total amount of projects and interventions developed in Latin America.

⁹ ODA: Official Development Assistance.

¹⁰ OECD Countries, belonging to the Development Assistance Committee (DAC) provided more than 95 percent of international aid in 2000.

assistance (ODA) and official aid (OA)¹¹, and using the above classification, between 1973 and 2002 there were 2,729 risk-management related financing operations between rich countries¹² and Latin America and the Caribbean¹³.

The total amount of those transfers raises more than 4.8 billion US dollars (table 4), 60% of them, almost 3 billion dollars, were loans distributed in only 70 big projects, the other 2,659 projects were grants for smaller short-time projects.

Table 4: Risk-related transfers in Latin America and the Caribbean. 1973-2002. (US\$ 000)

Country name	ODA GRANTS	%	ODA LOANS ¹⁴	%	Grand Total	%
Honduras	358,084	7.5	446,903	9.3	804,987	16.8
El Salvador	372,069	7.7	277,000	5.8	649,069	13.5
Brazil	22,112	0.5	585,260	12.2	607,372	12.6
Mexico	33,956	0.7	417,861	8.7	451,817	9.4
Nicaragua	288,043	6.0	159,000	3.3	447,043	9.3
Peru	94,381	2.0	335,280	7.0	429,661	8.9
Ecuador	28,328	0.6	255,000	5.3	283,328	5.9
Guatemala	126,966	2.6	61,000	1.3	187,966	3.9
Bolivia	74,714	1.6	106,000	2.2	180,714	3.8
Colombia	127,511	2.7	0	0.0	127,511	2.7
Haiti	100,751	2.1	14,500	0.3	115,251	2.4
Argentina	19,010	0.4	85,000	1.8	104,010	2.2
Cuba	97,713	2.0	0	0.0	97,713	2.0
Venezuela	26,947	0.6	60,700	1.3	87,647	1.8
Panama	34,082	0.7	35,000	0.7	69,082	1.4
Dominican Republic	68,186	1.4	0	0.0	68,186	1.4
Costa Rica	29,872	0.6	10,618	0.2	40,490	0.8
Paraguay	4,576	0.1	34,500	0.7	39,076	0.8
Chile	12,172	0.3	0	0.0	12,172	0.3
Uruguay	766	0.0	0	0.0	766	0.0
Grand total	1,920,239	40.0	2,883,622	60.0	4,803,861	100.0

Source: OECD, on-line Creditor Reporting System. (2003). <http://www1.oecd.org/>

As described in more detail in this chapter, and despite the fact that there is a growing concern on shifting paradigm (from emergency to development), available data shows the importance of relief and in general risk-coping activities in comparison with investments in risk-reduction: 61% of total aid was designated to relief and emergency expenditures, moreover, the developed world spent 290 times more money in Emergency Assistance than in job generation projects in Latin America. (Figure 3)

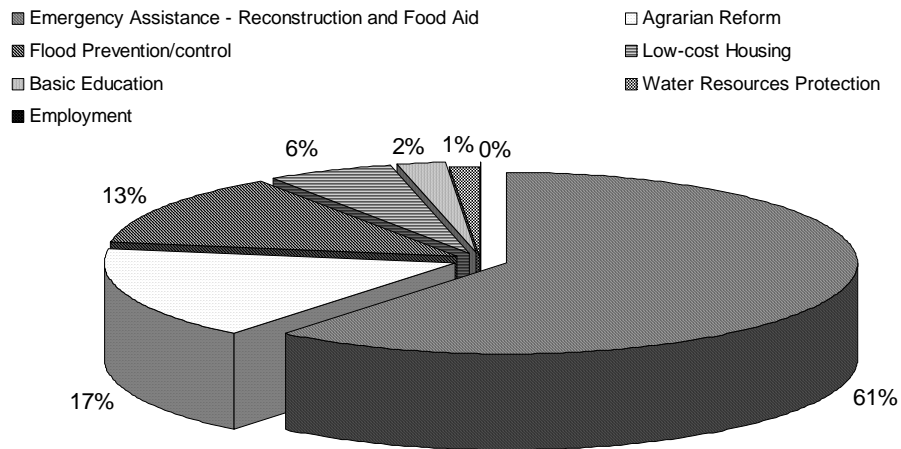
¹¹ The two forms are similar, except that only developing countries listed on Part I of the DAC “List of Aid Recipients” are eligible to receive ODA. Only ODA may be counted by DAC countries as part of their “aid effort,” defined as the donor country’s aid budget relative to its GNI.

¹² The members of DAC are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

¹³ Twenty countries: Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela.

¹⁴ Including Non-Export Credit Loans

Figure 3: Distribution of international risk-related investments in Latin America and Caribbean. 1973-2002.



Data source: OECD. Creditor Reporting System. (2003)

Regarding the more expensive disaster recovery costs, developing countries end up carrying much of it (infrastructure, for example), even though they do not have the capacity to do so and must often rely on access to external resources to finance losses from disasters. According to a World Bank report, in the past 20 years, 56 developing countries have needed to rely on external assistance; the Bank has approved over \$14 billion in lending to assist those countries which have had a dramatic impact on international lending institutions. (Freeman, 1999).

The geographical distribution of risk-related ODA and OA in Latin America were dramatically centered in Central America during the last 30 years, with more than 50 percent of total amount transferred, Brazil is the only South American country with an important amount of aid transferred, but centered in two big loans from the Japanese Government in 1995 that jointly sum up almost 0.5 billion dollars, with the purpose of flood control in Sao Pablo. Practically 90% of the risk-related aid delivered to Brazil were loans. (Figure 4).

There is a radical difference between loans with the purpose of risk-reduction, for example, the case of Basin Management in Brazil, and loans with the purpose of risk-coping activities, such as the case of Central America. The first ones are, in theory, long term investments that give sustainability to the society since economic activities will be developed with a lower level of social vulnerability. The second ones, which mean asking money to face disaster's consequences (the case of Central America investments) is a comparatively ineffective strategy (but necessary when risk is not managed) in order to bring communities security and development.

Figure 4: Geographical distribution of Risk Management ODA in Latin America



Data source: OECD. Creditor Reporting System. (2003). Elaboration using Arc-View, licensed to ECLAC, environmental division.

Honduras, Nicaragua and El Salvador, three of the poorest countries in the region, sum up almost 40% of the overall risk-related ODA and OA delivered in all continent, most of that money are loans to cover disaster consequences. It is important to underline that Honduras, the mayor “recipient” in Latin America, is, at the same time, the second most indebted country, actually 55% of the money allocated on it are loans.

The case of loans for relief activities are particularly worrisome since those expenditures have derailed economic development, as funds are reallocated from ongoing programs to finance relief and reconstruction assistance.

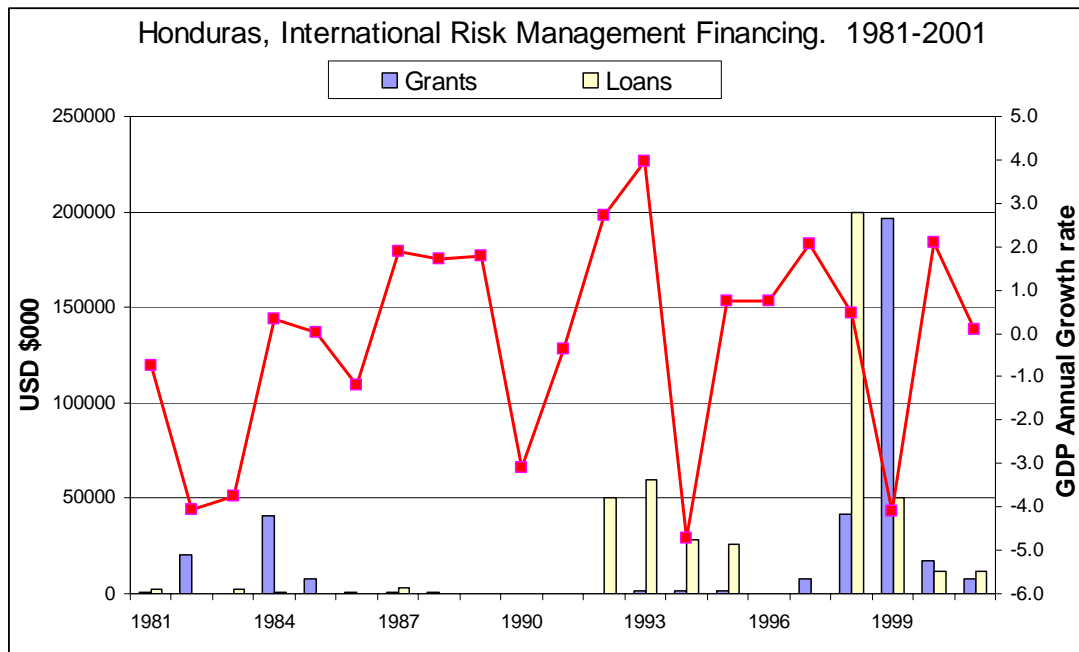
The special concentration of aid resources in Central America during the last 3 decades responds, on one hand, to the international concern with the civil war who affected that region during the eighties and nineties and, on the other hand, the posterior impact of hurricane Mitch at the end of the last decade, the most international relief financed disaster in the history of Latin America.

Most of the international organizations and NGOs presented in Central America that came first with the purpose of involving in peace keeping processes, engrossed international attention in the aftermath of the Mitch associated disaster.

According to the conceptual framework presented in chapter one, development and disasters are mutually connected, and consequently, it is not unexpected to see a special concentration of damages and suffering in those particularly impoverished countries, as a consequence of a large history of US-supported dictatorships, social exclusion, civil war and environmental destruction, that allowed untenable levels of social vulnerability.

During the eighties almost all Latin America countries suffered the so called “debt crisis” namely by ECLAC as the “*Lost Decade*”: Economic growth remained near or below zero and social crisis exploded all over the region harshly affecting the poor. A comparison between risk-related aid and economic growth in Honduras is presented in figure 5. An ulterior economic growth reference for Latin America and the Caribbean is presented in appendix 1.

Figure 5: Comparison between Risk Management Financing and Economic Growth in Honduras. 1981-2001.



Financing data source: OECD. Creditor Reporting System. (2003), GDP growth: ECLAC (2003).

Figure 5 helps to support the idea of a special concentration of international financing in big disasters: practically before Hurricane Mitch (1998) international investments were almost not existent in Honduras, even if social vulnerability was more or less *constant* in the day by day poor population’s life, and economic growth remained below zero

practically during all period. After Mitch, and decreasing during the next 5 years, international financing has been relevant in Honduras in the mechanisms: grants and, principally, loans.

Also the financing distribution among donors has been quite different. The World Bank appears as the major risk-management investor in Latin America and the Caribbean: more than 22% of the total amount allocated during the last 30 years came from it, (Table 5) but this donor had acted exclusively under the figure of loans which means that tax-payers in developing countries are the final risk management supporters, in this way the risk transfer does not touch the international level as such.

United States is the second investor in the region with 19,4% of total investments, but differing from the WB in the sense of flow type: the US strategy is more represented with Grants (65,6%) than with loans (34,4%). Table 5 summarizes donor types of flow and risk management financial orientations.

Table 5: Risk-related transfers in Latin America by donor. 1973-2002. (US\$ 000)

Donor Name	% Risk-Coping	% Risk-reduction	% Grand Total		
			GRANTS	LOANS	
IBRD ¹⁵	44.3	55.7	0.0	100.0	1,071,300
United States	76.3	23.7	65.6	34.4	932,215
Japan	7.4	92.6	13.8	86.2	608,998
EC ¹⁶	84.6	15.4	100.0	0.0	406,552
IDA ¹⁷	70.7	29.3	0.0	100.0	389,230
IDB ¹⁸	47.1	52.9	0.2	99.8	309,903
Sweden	99.9	0.1	100.0	0.0	176,443
Spain	78.9	21.1	51.5	48.5	164,910
Germany	56.2	43.8	96.6	3.4	158,713
IDB Sp F	100.0	0.0	0.0	100.0	134,900
Canada	72.2	27.8	87.7	12.3	86,331
Italy	96.3	3.7	75.3	24.7	77,692
Switzerland	99.6	0.4	100.0	0.0	66,025
Norway	99.5	0.5	100.0	0.0	63,670
Netherlands	72.2	27.8	100.0	0.0	60,316
U.K.	99.0	1.0	100.0	0.0	33,404
France	94.5	5.5	27.8	72.2	24,751
Belgium	93.2	6.8	100.0	0.0	13,395
Finland	99.8	0.2	100.0	0.0	11,030
UNDP ¹⁹	88.8	11.2	100.0	0.0	4,583
Austria	93.7	6.3	100.0	0.0	3,042
Ireland	62.5	37.5	100.0	0.0	2,456
Denmark	13.7	86.3	100.0	0.0	2,041
Australia	100.0	0.0	100.0	0.0	1,345
Luxembourg	100.0	0.0	100.0	0.0	521
Portugal	100.0	0.0	100.0	0.0	95
Grand Total	60.9	39.1	40.0	60.0	4,803,861

Source: OECD, on-line Creditor Reporting System. (2003) <http://www1.oecd.org/scripts/cde/members/>

¹⁵ International Bank for Reconstruction and Development (World Bank Group)

¹⁶ European Commission (managed by ECHO)

¹⁷ International Development Association (belonged to the World Bank Group)

¹⁸ Inter-American Development Bank

¹⁹ United Nations Development Program.

Japan is another “Risk-Management Lender” with 86,2% of participation as Loans, but almost all of that money is spent in the mentioned long-term Risk Reduction projects in Brazil.

In chapter 3 a “socially efficient” allocation of scarce resources will suggest the necessity of overcoming the emergency approach in favor of a more sustainable risk management strategy based on development investments. By the moment, and regarding to donor country strategy it is possible to roughly show an idea of this efficiency considering the purpose and the nature of the transfers, the idea behind this concept alludes that investing in risk reduction as grants can produce more development and self sufficiency in poor countries than investing in risk coping as loans. Table 6 expresses this idea.

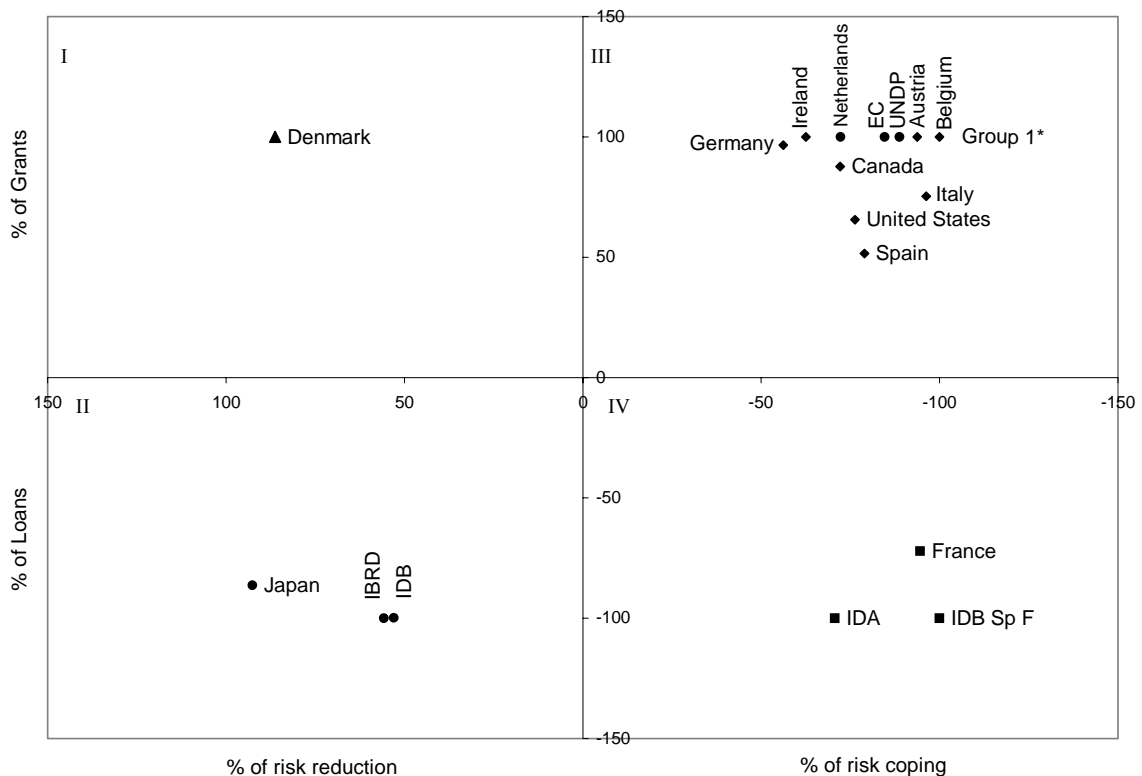
Table 6: donor efficiency matching box:

	Risk Reduction	Risk Coping
Grants	I: Donor entity that can produce more development and self sufficiency in poor countries (the most needed countries).	III: Donor entity that plays an important role in the recovery process, nevertheless, its strategy does not produce development as such.
Loans	II: Donor entity that can produce sustainable trends of development, but viable mainly for transitional economies (those that can pay back the loans)	IV: Donor entity that follows the less efficient strategy since economic development can be derailed, as funds are reallocated from ongoing programs to finance relief and reconstruction assistance.

Source: own elaboration.

According to this matching box, figure 6 shows a ranking of donor country/entity using its relative aid efforts measured as percentage of grants and loans with the purpose of financing risk reduction and risk coping activities.

Figure 6: Donor entity efficiency ranking box



Source: Own elaboration, data from OECD, on-line Creditor Reporting System. (2003).

Note: Group1*: United Kingdom, Norway, Switzerland, Finland, Sweden, Australia, Luxembourg and Portugal.

The European Commission takes part as the fourth major investor in the region; nevertheless, in a world scale EC is by far the major risk-coping activities sponsor in the world. (See ECHO and DIPECHO interventions, page 33)

Contrary to Financial Institutions trends, most European donor countries prefer the figure of grants instead of loans in financing risk-management activities; however, France seems to be the exception on this trend with loans equal to 72% of its “aid effort”.

Finally, it is important to underline that Denmark appears as the European supporter most innovative in this perspective: 86.3% of its transfers are connected with risk-reduction activities, and, besides that, 100% of its ODA is delivered under Grant modality. It is possible that Denmark strategies will overcome the basically described “*Prisoner’s Dilemma*” presented in next chapter regarding the approaches that do not address actual risk.

The next part of the chapter will go more in detail about relevant interventions during the eighties and nineties, but first, it is necessary to describe the way the international financing effort is measured and asked for by governments as a consequence of the economic lecture of the disaster impact.

ECLAC’s Disaster damage assessment

As described in chapter 1 and seen in figure 5 in the case of Honduras, most international interventions are basically connected with big disasters, excluding daily small and medium scale disasters. Also economic evaluations are centered in big disasters²⁰. In Latin America, ECLAC is the maximum authority on disaster impact evaluation.

The importance of these evaluations is based on the fact that they are the starting point for external interventions since developing countries base their requests for external aid on them, also international organizations take into consideration these reports in order to have an idea of the magnitude of the aid needed.

Unfortunately, risk evaluation methodologies are not equally developed inside ECLAC and other United Nations offices as is the case with disaster-based economic evaluations, this could be another obstacle in order to overcome the predominant assistance-based approach.

The 26 year ECLAC’s methodology covers an ample rank of variables such as, macroeconomics, housing and education, affected population, in particular women, health, productive sectors, energy, environment, water, employment and transport.

Since its creation, this methodology has been used, in more than 27 national and international scale disaster, recently the ECLAC’s methodology was updated with the support of the Italian Government.

²⁰ Some exceptions must be underlined, see in particular the software data base of disasters, managed by La Red (www.desinventar.org).

According to ECLAC, a disaster produces effects on assets (direct damages); on the flows for the production of goods and services (indirect losses); and on the performance of the main macroeconomic aggregates of the affected country (macroeconomic effects).

In economic terms, ECLAC's evaluation indicates that some indirect effects of a disaster might generate some benefits to society that must be deducted from the total estimate of damages.

Direct damages refers to complete or partial destruction. This damage may be inflicted on immovable assets and on stock (whether final goods and goods in process, raw materials, materials and spare parts). In essence, this is damage to assets that occurred practically at the time of the triggered phenomena. The main items in this category include the total or partial destruction of physical infrastructure, buildings, installations, machinery, equipment, means of transportation and storage, furniture, damage to farmland, irrigation works, reservoirs, and the like.

Indirect losses refers essentially to the flows of goods that will not be produced or services –expressed in current values – that will not be provided over a span of time that begins after the disaster and may possibly last throughout the rehabilitation and reconstruction period.

Some examples of indirect losses are:

- i. Higher operational costs due to the destruction of physical infrastructure, inventories or losses of production and income.
- ii. Diminished production or service provision due to the total or partial paralysis of activities.
- iii. Additional costs incurred due to the need to resort to alternative means of production or provision of essential services.
- iv. Income reduction due to the non-provision or partial provision of services by public utilities (power and drinking water utilities); losses of personnel income due to loss of employment or to forced part-time working.
- v. Costs incurred in the attention of the affected population during the emergency stage, by all parties involved.
- vi. Additional costs to deal with new situations arising from a disaster, such as the cost of health campaigns to prevent the occurrence of epidemics.
- vii. Lost production or income due to “chain-link” effects, similar to those that occur during a recession, which can be “forward” or “backward”.
- viii. The costs or benefits of external factors; in other words, any repercussion or side effect of the disaster whose costs (or benefits) are absorbed by third parties who are not direct victims (or beneficiaries) of the disaster.

Macro-economic effects reflect the manner in which the disaster shall modify the performance of the main economic variables of the affected country, provided the proper national authorities make no adjustments. Since they reflect the repercussions of direct damages and indirect losses, they must not be added. Rather, the estimation of macroeconomic effects is a complement to the assessment of direct damages and indirect losses, although considering them from a different perspective.

The most important macro-economic effects of a disaster are those that have a bearing on the level and the growth rate of the global and sectoral Gross Domestic Product; the Balance of Trade (due to changes in exports, tourism and services and outflows to pay for imports and foreign services, etc.); the Level of Indebtedness and Monetary Reserves; and Public Finances and Gross Investment. (Box 3).

Box 3: *Macroeconomic impact of Disasters:*

Gross Domestic Product. Losses in the production of goods and services due to the disaster over the recovery time period for each sector under reference. For this purpose data are required that will enable an estimate of the foregone GDP, at constant prices, especially the volume of forecast reductions projected throughout the period required for recovery of the affected production capacity. The evaluation also define how sector's GDP was expected to perform in the year when the disaster occurred on the basis of pre-disaster forecasts. This estimate will provide the basis for the projection of losses to obtain the "before" and "after" results of the disaster. It will have to take into account the possible positive effect on GDP due to the growth in the construction sector due to reconstruction.

Gross Investment. Losses in stock, computed as direct damage, will not be reflected in gross investment for the year because this involves the destruction of preexisting assets. As the process to restore assets is carried out and depending on the availability of resources and the country's engineering construction capacity, gross investment will have to increase during the following year. In any case, in the year of the disaster, the magnitude of this variable will reflect two types of effects: i) suspended or delayed development projects already under execution, because of the disaster, and ii) losses of stock.

Balance of Payments. The current account of balance of payments for the year of the disaster is estimated on the basis of sectoral reports on the following main items: i) diminished exports of goods and services (if the country suffered losses cutting back its tourist activity or affecting its merchant fleet or the production capacity of companies that export services, such as engineering services, etc.); ii) greater imports required for the recovery and reconstruction stage (such as fuels, food because of lost harvests) over a time period that may last from two to five years; iii) donations in kind or money received because of the emergency, iv) reinsurance as the most suitable to complete reconstruction, payments from abroad, and v) any reductions in payments of foreign debt interest obtained through post-disaster agreements with creditors.

Public Finances. This is another of the macro-economic aggregates that must be quantified because the approved budget for the year of the disaster will most probably undergo major changes during the year and those immediately following. In this regard the following possible macro-economic effects must be analyzed: i) lower tax revenue due to decreased production of goods and services, losses in income and less consumer spending, and lower income of public service companies; ii) increased current spending related to the emergency, especially to attend to the affected population's humanitarian needs and the urgent repair or rehabilitation of damaged public services; and iii) higher than expected investment spending required for the reconstruction stage.

Prices And Inflation. Although it is not always feasible or justifiable to measure general inflation levels before and after the disaster, at least an overview must be formulated, based on sectoral reports, of the effect that limitations on supply – due to the destruction of harvests, manufactured goods, sales channels, transportation routes, etc. – might have on the price of certain goods and services that, in such case, will be supplied by alternative means.

Employment. Sectoral estimates must be made in order to provide an idea of the overall effects on employment deriving from: i) the destruction of the production capacity of social infrastructure, and ii) new demands for personnel arising during the emergency and rehabilitation process.

Source: ECLAC, *Manual for the economic and environmental estimation of disasters effects*. Section one: Methodological and Conceptual Aspects. Updated version 2003.

To date, ECLAC has evaluated 29 major disasters between 1972 and 1999 in Latin America and the Caribbean Region affecting 17 countries, 22 of them took place during the nineties. (Appendix 2 and 3). All of them demanded external assistance and hundred of projects were developed by aid charities organizations, bilateral and multilateral cooperation agencies both national and international.

Some remarked actions during the seventies and eighties²¹:

During the seventies Latin America was hit by four great disasters: Those triggered by the earthquakes of Peru (1970), Nicaragua (1972), Guatemala (1976) and hurricane Fifi in Honduras (1974). As a response, International Organizations oriented their efforts mainly to strengthening the national react capacity system in the affected country, some examples of this approach are projects developed by OFDA-AID (Office of US Foreign Disaster Assistance), OPS (American Health Organization by its Spanish acronym); and the International federation of Red Cross and Crescent Societies.

Between 1982 and 1983, Andean countries²² strongly suffered the impact of the “Niño” phenomena. Presidents of those countries asked to the Organization of American States (OEA in Spanish) to run a regional project engage of manage natural hazards and environment and vulnerability reduction. This way the OEA launched its “Natural Risk Project” financed by OFDA-AID.

OPS, OFDA and OEA, were the pioneers in the region during the eighties with preparedness projects, it is important to note that OPS developed several hospital’s emergency and contingency plans in Central America, in addition to structural security, and sanitary programs. In fact OFDA and OPS created a “school of thought” regarding the methods they used to managed disasters emergency and recovery programs (Lavell, 1999b).

Despite the fact that most activities were centered on response and preparedness, some initiatives were developed in terms of risk reduction activities such as the creation of the Seismic and Volcanic Mitigation Project in Costa Rica (MIRVYS) with the support of OFDA in 1984.

The line of preoccupation for preparedness and response was impelled in the region through activities also formulated by the Italian Cooperation such as the Socio-Sanitary Program developed in El Salvador, in collaboration with OMS/OPS and governmental authorities.

The second dimension of the international presence in the region during the eighties and extended until the nineties, is given by the external financing of investigation activities on threats, risks and disasters.

Several hazard assessment institutions received international financing with the purpose of strengthening its internal capacity in developing threat maps and other non-structural mitigation instruments as a result of the impact of national-scale disaster such as the earthquakes in Popayán, Colombia (1983), Chile (1983); México (1985) and El Salvador (1986).

Some national and regional organizations were also created and financed with international support, one representative example in terms of regional integration is the Coordination Center for Natural Disaster Prevention in Central America “CEPREDENAC” created in 1988 as a coordination center for strengthening the capacity

²¹ Based on Lavell, (Op. Cit. 1999b)

²² Colombia, Ecuador, Peru and Bolivia

of the region as a whole to reduce the vulnerability of the population to the effects of natural threats.

CEPREDENAC received important financial support between 1988 and 1993 from The Swedish International Development Agency (SIDA). In May 1995, CEPREDENAC became an official organization belonging to the General Secretary of the System for Central American Integration (SICA) with the Governments of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama as members.

The attention to the problem seen from the perspective of the preparedness and response and the investigation on natural threats were, and continue to be, the dominant preoccupation for international interventions. (Lavell, 1999b. op. cit.).

Others views such as the recognition of risk as a social construction, highlighting the role of the vulnerability approach, are infrequent. The “Natural disasters and Prone-Risk Areas, Conditioners and Options on Prevention and Mitigation in Central America Project”, (1989) is an *exceptional* example of this perspective supported by the Canadian International Development Research Center (IDRC),

The nineties: more participation of development agencies in risk management activities.

One of the results of the growing concern for the development impact of disasters has been an increase in the number and types of institutions involved with the disaster problem. These are no longer limited to the humanitarian preparedness and response organizations, as was essentially the case towards the end of the eighties. Increasingly over the last few years, a number of major “development” institutions have become more closely involved with the problem.

Regional and International disasters that occurred during the nineties in Latin America, such as Mitch and George hurricanes and the Niño phenomena, had a significant impact in terms of the visible presence of a number of the more important organizations concerned with environmental problems; including the World Bank, the Inter American and Asian Development Banks, the United Nations Development Program and Germany's GTZ.

In the context of the U N-designed International Decade for Natural Disasters Reduction (IDNDR), 1990-99, OPS allied with OEA implemented for Latin America the “Disaster Management Training Program” (DMTP) launched by the United Nations Development Program (UNDP) as a worldwide initiative developed in more than 70 countries. The schedule for the region included institutional workshops by country, in 1991: Barbados, Chile, Guatemala and Colombia; in 1992: El Salvador, Honduras, Jamaica, Mexico, Nicaragua, Peru, and Dominican Republic, and in 1993: Ecuador.

Inside the IDNDR appears the pervasive *relief to development continuum approach* which was expanded to incorporate the notion that development planning must, in general, be imbued with the notion of risk reduction. The move towards a broadened scope of management concerns received an additional impulse with the large-scale disasters occurring in Central America and the Caribbean, Venezuela, Turkey, Mozambique and India during the end of the decade. One consequence of these changes is that “risk” has begun to assume a more dominant position in existing conceptual frameworks than

“disaster” as such. (Lavell, 1999b. op. cit.). Although management practice and budget allocation preferences are still dominated by disaster preparedness and response issues.

The increased concern for risk reduction seen as an important facet of development planning has inevitably had an impact within the UN System, particularly in its development agencies. UNDP, UNICEF, FAO, WFP, and WHO, in particular, have consistently widened their concerns and practice in the risk and disaster reduction areas over the last ten years (Lavell, 1999a. op. cit.). All have existing or embryonic policy statements and agency guidelines relating to the topic. On the other hand, the UN System as a whole has moved to reform its programming and planning bases in order to achieve greater levels of coordination within the System and between this and government and civil society actors on the country level.

This is most obvious in the promotion of the Common Country Analyses-CCA and in the formulation of the United Nations Development Assistance Frameworks-UNDAF. Both of these complimentary instruments are cognizant of the risk and disaster problems and their relations to the development challenge²³.

ECHO and DIPECHO interventions:

ECHO, the European Community’s Humanitarian Aid Office was created in 1992, its main objective has been practically untouched across time: “to deliver humanitarian assistance to the victims of disasters in the *most effective* and coherent manner”. (ECHO 2003 guidelines)

Its mission is to fund the coordinated delivery of Community humanitarian assistance and protection through partner humanitarian organizations (NGOs, international organizations,

²³ In January 2000, the Emergency Response Division at UNDP, Geneva, circulated a concept paper amongst interested UN agencies entitled “*Development of a Core set of Concepts, Principles and General Guidelines to Facilitate Inter-Agency Collaboration and Co-ordination in Programming for Disaster Reduction*”. This document offered the basis for the celebration of a first Interagency Meeting on Guidelines for Disaster Reduction held at UNDP in Geneva on the 11th of February 2000. Representatives from UNDP, WFP, FAO, WHO/EHA, and UNICEF attended the meeting. the UNDAF and CCA processes already refer to risk, vulnerability and disaster issues in their guideline documents, in the following direct and indirect terms:

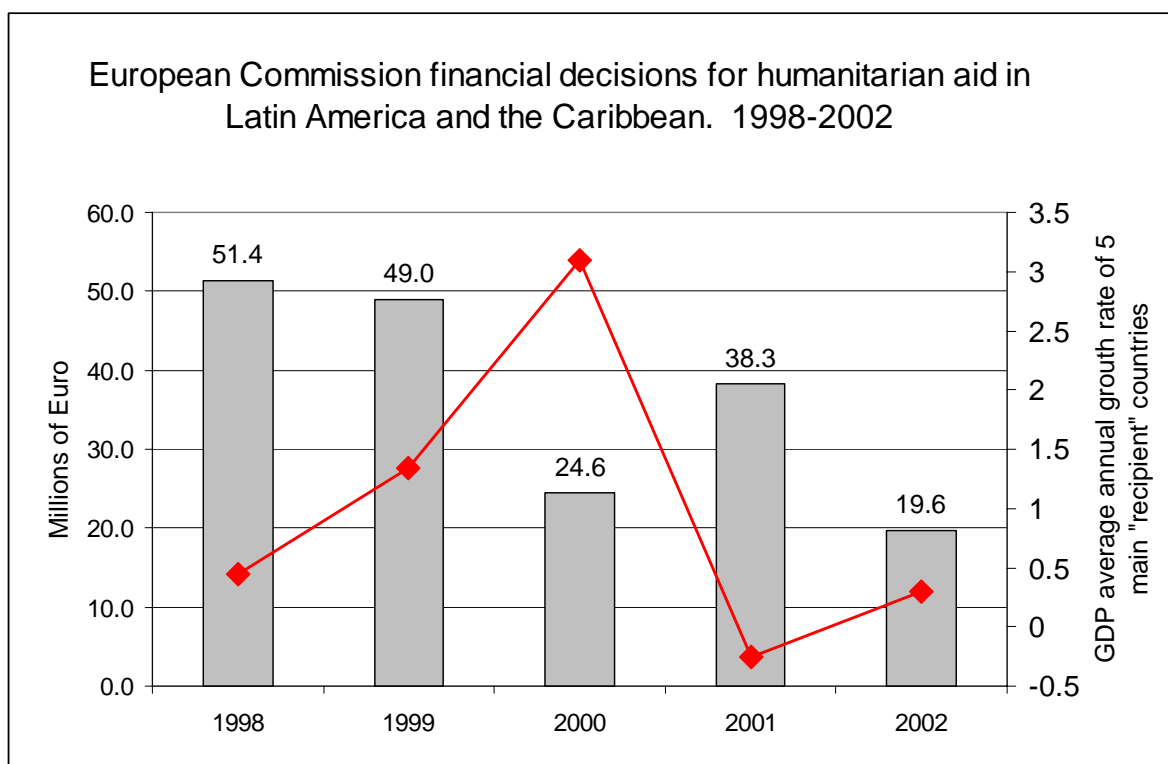
- ❖ The CCA will lead to “improved UN collaboration, strengthened analytical capacity and a common understanding of major developmental challenges and key issues for priority attention, including risk assessment” (Section 2, Objectives and Use of the CCA, p.3).
- ❖ “The CCA can be useful in dealing with the spectrum of issues that link relief and development, such as risk and vulnerability assessment, disaster preparedness and mitigation, and post-conflict and post-natural disaster recovery and rehabilitation....” (Section 2, Objectives and Use of the CCA, p.6).
- ❖ All CCA documents should contain... “an indication of the geographic incidence of poverty and vulnerability...(and) base line data on the key issues including vulnerability analysis”. (Section 3, Contents of the CCA, points a and c).
- ❖ Participation in the UNDAF will “facilitate the involvement of humanitarian and other entities throughout emergency phases ranging from disaster preparedness and mitigation to relief and recovery”. (UNDAF Guidelines, Section 1, Key Partners, p.2.).
- ❖ Co-operation strategies for achieving the objectives of UNDAF include “the identifying of critical areas of vulnerability for the purpose of disaster preparedness and mitigation, working in collaboration with humanitarian agencies”. (Section 3, The Use of UNDAF, Co-operation Strategies, p.5).

etc.) in order to save and preserve life, reduce or prevent suffering and safeguard the integrity and dignity of populations affected by humanitarian crises.

ECHO has participated in practically all declared emergency situations in Latin America since 1995. ECHO is nowadays the greatest humanitarian organization equipped with resources in the world.

According to ECHO's annual reviews, during the last 5 years the total amount of "financial decisions" for humanitarian aid in Latin America reached 183 million Euros; despite the fact that this represents 45% of total EC risk-related aid delivered to Latin America during the last 30 years, the strategic importance of the region in the European Community agenda is very low as it corresponds to money allocation: Latin America and the Caribbean barely represented 3.7 % of global ECHO budget in 2002, 6.3 points lower than five years ago: in 1998 the largest financed year due to the Hurricane Mitch impact, the importance of the region reached the 9.9% of its total budget allocation by that year. (Figure 7).

Figure 7: European Commission Humanitarian Aid Evolution in Latin America and Economic Growth in 5 selected countries²⁴. 1998-2002.



Data source: ECHO's annual reviews.

Again, Central America appears as the principal aggregated EC financed area in Latin America, but in terms of single countries, Colombia is by far the largest financed country with 23% of the overall funds delivered by the Commission in five years. Cuba is the second one with 16.7%. These countries have in common the political nature of their humanitarian crisis, and according to the last EC guideline report, Colombia is projected as the unique priority for humanitarian assistance in the continent in the following years.

²⁴ Colombia, Cuba, Mexico, Nicaragua and Peru.

Seeking a better match between its disaster assistance activities and “prevention” issues, ECHO launched in 1996 a new regional program called DIPECHO (ECHO disaster-prevention and preparedness), intended to increase the impact and improve the effectiveness of ECHO-financed operations.

In the first phase of the program, three regions were selected: Central America, the Caribbean and South-East Asia (plus Bangladesh). After two years, in 1998, Andean Communities were also incorporated

The primary objective of DIPECHO’s policy is to help to reduce “vulnerability” to risk; and according to its strategy, this can be addressed throughout the prioritization of three areas of interest: (i) developing human resources, (ii) organizational and institutional strengthening and (iii) community-oriented pilot projects.

DIPECHO projects had shown a special orientation on preparedness, strengthening the community-based character of its actions (using the modality of demonstrative aimed micro-projects interventions) with the purpose of improving ulterior relief activities.

Prevention is not considered as a wise articulation between human society and natural environment but as the “reduction of the *violence* of potential natural phenomena by using protective infrastructure”. (DIPECHO strategy for the Caribbean, 1998) and vulnerability reduction is considered as avoiding future risk by improving regional planning more than in the sense of attacking actual risk.

Even so the low ambitious character of the DIPECHO interventions in terms of managing actual risk by achieving sustainable levels of development, its strategy gives enough space for ulterior improvements in that sense. Unfortunately the DIPECHO relevance in the general ECHO strategy seems to be less important than relief and in general risk coping concerns, at least in terms of budget allocation: DIPECHO programs in Latin America represented barely the 7.1% of the regional financial decisions approved during the last 5 years, and in a global scale, DIPECHO programs sum up to only 1.2% of overall EC aid budget.

The link between Relief, Rehabilitation, and Development, (LRRD) the EC response to the actual juncture.

The link between relief, rehabilitation and development is the first of a number of horizontal issues that concern different Commission services and that also directly touch upon ECHO’s work. It has to do with the coordination of different funding instruments.

Council Regulation (EC) No 1257/96 of 20 June 1996 concerning humanitarian aid states in the recitals: “humanitarian assistance may be a prerequisite for development or reconstruction work and must therefore cover the full duration of a crisis and its aftermath; in this context it may include an element of short-term rehabilitation aimed at facilitating the arrival of relief, preventing any worsening in the impact of the crisis and starting to help those affected regain a minimum level of self-sufficiency.”

In 1996, the Communication from the Commission to the Council and the European Parliament on linking relief, rehabilitation and development (LRRD) stated: “humanitarian

aid will seek *where possible* to bear in mind and remain compatible with longer-term developmental objectives”.

An assessment of the Community’s policy on the linkage issue, presented on 23rd, April 2001 in a new Communication from the Commission to the Council and the European Parliament, made suggestions to facilitate international coordination on a more systematic basis and proposed measures to further streamline the Community’s working methods. Evaluations of Community external aid instruments repeatedly confirmed the persistent need to improve linkages between relief and development, this “pressure” is related with other international level initiatives developed under the IDNDR, in particular the “*Relief to Development Continuum*” (UN-System) and the “*Development-oriented Emergency Aid*” (Germany GTZ).

Beyond the direct response to humanitarian needs in such situations, ECHO's policy also aims at contributing positively to the establishment at international level of a more integrated and sustainable approach to the solution of crises/problems of a complex nature.

Even though ECHO has not establish a particular procedure in addressing the LRRD, it is clear that this approach does not change in essence the *reaction-oriented* character of the traditional ECHO and DIPECHO procedures: The start-up moment for development in the LRRD is not the *risk* scenario but the *disaster* one, in other words, the LRRD pretend to contribute to development in the aftermath of disasters, which means addressing development issues when the level of development has reaches its higher critic moment of unsustainability: which is the emergency moment.

In chapter three, a deeper discussion of this approach is presented as one of the possible constraints in shifting paradigm, as well as the necessity to give more attention to risk instead of disasters in order to achieve a more effective strategy in releasing actual risk people suffer.

*The community level approach in Central America*²⁵

Prior to the 1998 impact of Hurricane Mitch in Central America, local level risk management had been promoted on a very limited scale. Initiatives with community or local level preparedness, early warning systems and risk reduction had been promoted by such organizations as the International Red Cross, GTZ Germany, and The Latin American Network for the Social Study of Disaster Prevention-LA RED, but this was not a generalized fact. (Lavell, 1999b. op. cit.).

Some initiatives had also been taken by the national disaster organizations in the framework of recommendations emanating from the IDNDR, while a limited number of community-based organizations had also taken up on the problem in disaster prone areas.

Hurricane Mitch and the earthquakes in El Salvador in 2001 stimulated a rapid increase in the saliency of local level risk reduction management and measures. This was not only promoted by the evidence thrown up by the events themselves but also by policy dictates

²⁵ Central America is considered by most authors in risk and disasters literature as a “living laboratory” for investigations on international risk related interventions, not only because its multi-hazard presence that characterize the region, but, mainly because it contains the poorest countries in Latin America and it was the scenario of recent political transformation that brought a lot of international interventions.

emanating from Central American government resolutions in the framework of the Central American Integration System, and follow up to those by CEPREDENAC.

Following Mitch, a relatively large scale investment has been made in local risk management concerns, financed by a large number of international organizations and institutions. These include OFDA-AID, DIPECHO, the Swiss Collaboration-COSUDE-, UNDP and UNICEF, the World Bank and Inter American Development Banks. Schemes have been implemented by a wide variety of international and national NGOs, including CARE, CHF, Action Aid, Oxfam, CARITAS, Plan International, the Humboldt Center in Nicaragua and the Center for Disaster Prevention in El Salvador. Moreover, government based institutions promoting municipal development and decentralization have taken up the challenge and developed local level risk reduction programs or concerns.

A recent rapid inventory exercise promoted by a UNDP-CEPREDENAC²⁶ project in the region has identified over 150 local level initiatives in the seven Central American countries, all promoted since 1998. These cover a large array of topics and approaches, where different aspects of local level risk reduction come into play. Undoubtedly, a more methodical inventory process would reveal a considerable number of additional efforts by smaller NGO and community based groups.

One interesting and relevant aspect that can be discovered in regards to the new interest in local risk management concerns, relates to the way an important number of the initiatives are promoted by *development* NGO's involved with the promotion of local development, decentralization and environmental management. This diversification of schemes and approaches, which compliment initiatives developed by risk and disaster institutions, responds to the prevailing belief that increasing resilience and going from coping to thriving then assume their due position in the overall risk reduction process.

There are some examples of national and international cooperation projects towards this aim. The Inter-American Development Bank financed project in the Lempa Valley River in El Salvador is an example of a successful local-risk reduction project that combines objectives of increased development options and disaster risk reduction inside a strategy of local community participation. (Box 4).

²⁶ Available in http://www.cepredenac.org/03_proye/pnud/1proyectos/inventario.htm

Box 4: *Integrated local-based Rural Development as a Risk Reduction experience.*

The lower reaches of the Lempa River in El Salvador covers an area of some 850 km² and has a population of approximately 40.000 persons. 80% of the population live below the poverty line and half of them is prone to suffer direct flooding of homes and agricultural lands due to their flood plain location. Disastrous flooding is a recent phenomenon in the zone, resulting from recent land occupancy by poor families under a land distribution program promoted by government and civil society following the signing of peace agreements between guerrilla FMLN forces and government in 1992. This led to the assignation of land to immigrant families, much of this in the flood plain area. The most important flooding incident was associated with Hurricane Mitch in 1998.

The impact of the hurricane served to raise the consciousness of local organizations as to the need for more integral approaches to flood prevention and mitigation beyond the early warning and emergency response mechanisms developed to date. Certain organizations in the zone realized that increased physical protection was only part of the problem and that without increases in human welfare and economic options in the area such measures were only palliatives. Coping through flood protection mechanisms was seen to be insufficient. Risk reduction required the simultaneous promotion of rural development and risk management schemes in order to increase sustainability and simultaneously reduce flood risks. Following these basic premises one of the local organizations actively participated in the promotion of an Inter American Development Bank (IADB) financed project coordinated with the National Ministry of Environment and Natural Resources. At the end of the ten month (commenced in July 2000) project, a strategic document had been produced, identifying future intervention parameters and postulating a series of prioritized development and risk reduction projects for future financing.

The Strategy introduced notions of intra zonal integration and postulated the development of eight priority projects at the local level that combined objectives of increased development options and disaster risk reduction. These included the consolidation and amplification of natural woodlands on river banks in order to offer natural protection from flooding and the opening up of new economic opportunities, the extension and maintenance of the existing dyke system, the strengthening of local early warning and emergency procedures, improvements in potable water supplies, the strengthening of local and zonal service centers, improved commercial systems and agricultural storage facilities and extension of the secondary rural road system. Continuity would be given to the ongoing commercial and diversified family lot agricultural developments. The strategy included the elaboration of an integral participatory diagnosis of development options and needs and risk scenarios in the zone, the celebration of local level risk management workshops with the local population, and the elaboration and discussion of intervention scenarios in the search to dimension the most adequate intervention for the near future.

As regards continuity, the IADB provided around 10 million dollars for the development of priority projects in the zone. Although the zone has not been affected by any major flooding incident since the beginnings of the project, evidence with the local response to earthquake damage during the 2001 events in El Salvador suggests the important role of the development of social capital and real decision making process inside local organizations.

Source: Lavell, A. “*Local Level Risk Management. Concepts and Experience in Central America*”. Paper presented at the Disaster Preparedness and Mitigation Summit, 21-23 November, 2002, New Delhi, India. La Red, 2002.

3. Actual approaches that do not address actual risk, the case of the prisoner's dilemma.

In the previous chapter it was clear that there are almost no examples of relevant international interventions in risk reduction activities in absence of a recent disaster scenario, in others words, agencies of international aid and cooperation addresses risk management activities *mainly when risk has become disaster*, which seems to be the most costly and socially inefficient procedure.

When addressing risk management activities, international agencies engaging in emergency or development issues and local authorities are more likely to cope with *disaster response* and *future risk reduction*; little emphasis was placed on mitigation, that is to say, reducing *actual risk*, which is the origin of both situations.

This paper proposes the representation of strategies²⁷ addressing risk management using *game theory*, which means a setting of strategic interdependence between “*players*” where each individual welfare depends not only on his own actions but also on the actions of other individuals.

According to Mas-colell, (Mas-Colell, Andreu., et. al., 1995) a *game* is composed by 4 main elements:

- a) The players: who is involved?
- b) The rules: who moves when? What do they know when they move? What can they do?
- c) The outcomes: for each possible set of actions by the players, what is the outcome of the game?
- d) The payoff: what are the players' preferences over the possible outcomes?

In general, there are two major players in risk management: local authorities and International organizations named in this paper as International Cooperation. National NGO are excluded from this analysis because in the region, most of those national NGO engaging in risk management activities are financed and roughly oriented by international organizations as *counterparts*.

The game of international financing of risk management activities can be considered as a “simultaneous-move” game, which means that all players move simultaneously, players' move may not precede one another.

In general, strategies follow players' approaches to the problem, their behavior will also depend on previous experiences and common behaving despite the fact that some of them are not clearly manifested or officially recognized, such as the corruption phenomena in some Latin Americas' local and / or authorities.

The first assumption needed to represent this game, argues that in poor countries, where social vulnerability is enough to provoke disasters in presence of trigger natural phenomena, such as most Latin American Countries, Governments and International

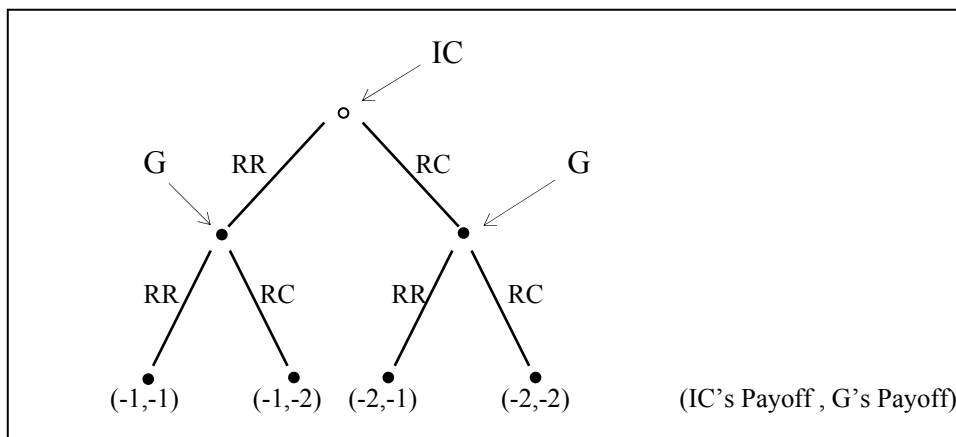
²⁷ For “strategy”, this paper consider the complete contingent plan or decision rule that specifies how the player will act in every possible distinguishable circumstance.

Organizations have some strategy -explicit or implicit- that follows their way of understanding the problem inside their logic of operation and reproduction.

There are two main strategies: choosing investing *more* in risk reduction (RR) (attacking actual risk) or choosing investing *more* in risk coping (RC) activities. It does not mean that there is only one-exclusive *good* strategy since both must belong to a unique global risk management general strategy, and also both are necessary. This distinction pretends to elucidate the “weight” players give to each one in terms of social efficiency²⁸.

Figure 8 describes the game tree²⁹, note that international cooperation (IC) is placed in the initial decision node (represented by an open circle), as described in this chapter, this refers to the *dominance concept* of the international cooperation decisions; each of the two possible strategies is represented by a branch from this initial decision node. At the end of each branch is another decision node (represented by a solid dot), at which the Government (G) can choose between the two strategies, risk reduction or risk coping, after seeing IC’s choice.

Figure 8: Extensive form for risk management investments game.



Source: Own elaboration.

As described more in detail in the next section of this chapter, the difference in the payoffs emerging for RR and RC strategies can be evaluated as -1: *lower effort* and -2: *higher effort*, in order to address the same scope of risk management. In other words, this distinction emphasizes the relatively more costly effort of risk coping in comparison with risk reduction strategies.

The outcome: social efficiency in Risk Management Activities

In the previous chapter it was clear that, despite those initiatives that addresses future risk, the actual large financed strategy focus on preparedness and response. Actual risk is still the less financed strategy however some projects and empirical cost-benefit relations are

²⁸ Here it is important to underline that the attainment of securer living conditions for the poor and a substantial reduction in their vulnerability is more a case of ethics, equity and social justice, than economic rationale and efficiency. The economic criteria used in this paper responds to academic needs, and recognize that these ideas must be translated from the exclusive economy sector to the poor and traditional sectors that make up the majority of the victims of disaster.

²⁹ Note the treelike structure of figure 6: it has a unique connected path of branches from the initial node (also called the root) to each point in the tree. See chapter 7 “Basic elements of non-cooperative games” from the book “Microeconomic Theory”. Mas-Colell, A., et. al. 1995.

showing more efficiency on reducing risk strategies in comparison with costly coping activities such as the case of the recent evaluation performed by the World Bank, in which it was demonstrated that one percent of property value on vulnerability reduction measures can reduce the estimated maximum loss from a category 3 hurricane by at least 30 percent. (Auffret, op.cit).

Investment in risk reduction can help to provide a secure environment, reducing insurance losses and avoiding the need to divert scarce public funds from social development to emergency relief.

Investments in risk reduction and risk coping activities are, in a sense, *mutually excluding*: the more you invest in reducing risk the less you have to invest in coping with disasters' consequences. The risk function presented in chapter one serves to schematically show this relation:

From function (1): $R = f(H * V)$, and according to the *PAR* model, disasters (D) appears as a consequence of unsustainable *levels of risk* accumulated through time and connected to a particular trend of unsustainable *development*.

Then disasters (D) are a function of unsustainable levels of risk (R_u):

$$D = f(R_u) \tag{2}$$

The higher level of R_u the higher magnitude of D (higher level of damages and losses).

According to the idea of risk release, reducing hazard (H) (when possible) and vulnerability (V), will decrease the R_u and will avoid the occurrence of D, or at least minimize its magnitude.

Risk reduction (strategy RR) will decrease the level of risk and consequently the expected magnitude of damage and losses in disasters' scenario, risk coping (strategy RC) investments will be higher when RR is absent or inefficient:

$$\downarrow H, \text{ and/or } \downarrow V = \downarrow R \Rightarrow \downarrow D \tag{3}$$

Then, it is reasonable to assign a relative higher cost (-2) to those activities centered in RC in comparison with those centered in RR (-1). (see figure 8).

This does not mean that investments in preparedness and risk-coping activities must not be developed, but those efforts must be included in a second priority line of investments in order to achieve a coherent risk management strategy.

The payoff: The prisoner's dilemma in risk management activities

Unlike a pure economic analysis, players in risk management activities are not consider as competitors but cooperative actors towards common scopes, at least in theoretical terms. Nevertheless, the little amount of internationally financed projects in attacking actual risk, in comparison with those oriented in risk coping and preparedness (in terms of budget line allocation) suggests that cooperation between players following their own strategies are

not sufficiently correlated in terms of maximizing social welfare which means releasing risk through risk reduction instead of coping with disaster consequences.

Since strategies do not depend on the other players behavior (simultaneous-move game), each player is doing the best he can given the paradigm that follows, neither player has an incentive to change its strategy.

According to the data shown in the previous chapter, international cooperation is following a strategy centered on risk-coping activities as a first concern (strategy RC). This player is willing to intervene in disaster scenario as first preoccupation and reducing future risk as a second one which is the essence of the LRRD approach.

Since reducing actual risk means development, humanitarian and aid organizations are more likely *to wait* until that risk becomes disaster because its mandate does not addresses directly development issues.

International emergency assistance is largely unconditioned on the implementation of risk-reduction measures; this may provide a disincentive for countries to adopt policies toward risk-reduction activities. Moreover, some authors suggest that this approach should be viewed as a form of *market failure* since neither the Governments nor the international organizations can credibly commit not to fund disasters after the fact, since the political incentives to do so ex-post are overwhelming; this reduces the incentives to invest in risk-reduction activities (and also to buy private insurance contracts against disasters). (Auffret, op. cit.).

It also creates an incentive for some segments of the population (mostly poor, those without access to safe land) to settle in risk-prone areas since they know that the Government or the International Cooperation will bail them out eventually.

The overwhelming attraction of disaster preparedness and response approach affects not only official aid given to governments, but also a growing number of international NGO that are practically becoming *emergency corps* due to the easier procedures international agencies give to relief financing in comparison with the slowest and painful procedures established by the same “donors” to obtain financing for development initiatives³⁰.

On the other hand, governments act according to a short term perspective in a context where privatization and reduction of social compensation mechanisms are the rule. It is difficult to see, in this context, government expending the resources to attack existing risk. Moreover, there are no cases of government plans in which risk reduction activities are consider among governments’ main concerns, despite the fact that disasters are recurrent and its impact increases across time.

Governments are more likely to desire that the trigger natural phenomena do not occur during their mandate. This can be explained as a result of the way governments and international cooperation read risk and disasters phenomena, the paradigm of Natural Disasters generates a vision in which the task to manage the causes of disasters seems to be difficult and costly, the only activity privileged is preparedness. (physicalistic approach. See Hewett, 1983. op. cit.)

³⁰ EC procedures for emergency projects can be approved in hours, contrary, approbations for development fund requests, in the same organization, may last several months.

Because of this, risk reduction, disaster prevention and mitigation, are difficult to get into public and private family “policy” development formats, (Lavell and Cardona 2000. op. cit.) given the still overwhelming attraction of disaster preparedness and response. Moreover, the search to promote a paradigm change in favor of risk reduction is also hindered by institutional inertia and its *status quo* (Box 5).

Aid-dependent and corrupt states can, in fact, “welcome disasters”. (Wisner, 2003). The impression of a good coping action gives visibility and added value to local authorities, good emergency and contingency plans can help governments to successfully raise up their images in the aftermath of a difficult disaster scenario.

Governments often also get an opportunity for improving their images accessing to fresh reconstruction resources. Negotiation of external debts is also on the books in crisis situations. (Honduras was almost absent of international financing before Mitch: figure 5, page 25).

Box 5: The status quo of emergency institutions as a possible constraint on shifting paradigm

While development agencies are still not fully imbued with their risk reduction role, existing disaster response organizations do not look very kindly on the idea that prevention and mitigation be dealt with by some other organization, structure or system.

The tendency has been to operate in a syncretic fashion expanding the legal prerogatives of existing agencies to promote risk reduction, but at the same time denying them the resources and political hierarchy to do this. Undoubtedly, the transition in favor of civil headed disaster response agencies may help in eroding this anachronism, but this is a long way off being reality. Moreover, with the present state of “unemployment” of the armed forces in the region, combined with the role of organizations like the US Southern Command, the armed forces are being thrown back into the disaster (and also environmental) arena with unforeseen consequences in terms of hierarchy and control in the future.

Status quo, images of traditional roles and images of what disasters are all about don’t help in changing existing contexts. Experience reveals many real but maybe anomalous situations as regards disaster response. In general, with a big disaster the established coordinating organization is normally pushed into a secondary position and the President or a Ministerial Committee takes over.

In the recent case of El Salvador control was placed in the Armed Forces and in a private sector grouping whilst the already weather beaten national disaster organization, COEN, all but heard the death knoll. In the end the established agencies are generally marginalised in large disasters, and are too centralized and unwieldy to efficiently operate in the context of the myriad of small and medium level events that affect numerous areas every year.

Source: “Considerations on the Economic, Social, Political and Institutional Context and Challenges for Integrated Risk and Disaster Management in Latin America. Allan Lavell and Omar Dario Cardona.. Page 4. La Red, 2002 (http://www.desenredando.org/public/articulos/2000/cespi/CESPI_mar-1-2002.pdf)

RR also means correcting past errors accumulated during previous mandates, this is economically less onerous than relief and reconstruction, but not necessarily politically viable as yet. Latin American authorities managing scarce resources are more likely to use them in a *visible* way, according to the nature of competitive democracy. Attacking actual risk is a long term investment and its future outcomes will produce welfare for people that cannot vote in the present.

International cooperation *thinks* that RR is more likely to be addressed by Governments, (actually this is correct and promulgated on government mandates), and they prefer to invest in RC: if governments fail doing their responsibility, IC will act. This is a common *Aid* practice.

It is important to underline that strategies designed by IC are *dominant* strategies: they do not *seek advice* from governments when defining budget allocation. Moreover the figure of “donor and recipient” leaves no space for real feedback-based horizontal agreements.

This can be explained as a consequence of lack of trust: most IC agencies prefer to work directly with beneficiaries, it is a common believe that governments in poor countries suffer corruption and there are no guaranties of fair resource allocation. In a disaster scenario it is easy to work directly with the affected people, whereas it is difficult to get rid of government or local authority participation in risk reduction complex projects.

Some international aid organizations avoid direct government intervention on their projects; this also supports their preference on effortless emergency approaches rather than complex and more ambitious risk reduction alternatives.

Governments *thinks* (actually there are sure) that international cooperation will get involved in a disaster scenario despite corruption or other structural and political failures (that negatively affect the financing of development projects), since these aspects are not relevant in deciding to finance or not a manifested humanitarian crisis.

There is an obligatory question that helps us to understand better government preferences: What would governments do with scarce resources in disaster-prone areas if there were not *guaranteed* international available resources for relief and reconstruction?

Probably they will make a higher *effort* in risk-reduction. This is not the case in Latin Americas’ most vulnerable countries where government strategies are *dominated* in the sense that they already know IC behavior and design strategies consequently.

Table 7 summarizes best players’ preferences both the government and international cooperation according to the expressed above.

Table 7: best players’ preferences.

	First best	Second best
International Cooperation	Successfully risk coping activities	LRRD
Government / Local Authority	No occurrence of disaster during current mandate	Successfully risk coping activities

Source: Own elaboration.

Investing in RR for both players will reduce the amount of money necessary to cover RC activities, but both prefer to design strategies based on RC instead of RR because some common reasons such as the described physicalistic approach as well as different reasons such as –between others - lack of trust for IC, and lack of political incentives for G.

As a consequence, there is a kind of *prisoner's dilemma* in the game of risk management investments in the sense that the outcome we expect to arise, it is not the best outcome for the players *jointly*; both players would prefer that neither of them invest in RR. For this reason, this prisoner's dilemma can be considered as the paradigmatic example of self-interested, rational behavior *not* leading to a socially optimal result.

Now, there are enough elements to draw the normal form for a Risk Management investments game. (Figure 9)

Figure 9: The normal form of risk management investments game.

		Government / Local Authority	
		RR	RC
International Cooperation	RR	-1,-1	-1,-2
	RC	-2,-1	-2,-2

Source: Own elaboration.

Figure 9 shows the expected observation in risk management investments game played by rational players who are fully knowledgeable about the structure of the game and each others rationality.

In a Nash equilibrium (from Nash, 1951), each player's strategy choice is a best response to the strategies actually played by his counterpart. Figure 9 shows the possible combinations of Nash equilibrium: (RC, RC), strategy profile (RC, RR) cannot be a Nash equilibrium because G would prefer to deviate to strategy RC given that IC is playing RC.

When IC chooses to invest more in RC, governments with scarce resources tends to do the same, following the reactive emergency approach. This Nash equilibrium (RC, RC) is the privileged one in Latin America international investments. The more optimal outcome (socially less costly) which is to choose the strategy (RR, RR), proposes a shift of paradigm that goes beyond the intermediate stage proposed as LRRD.

How to manage the constraints that avoid a shifting from this Nash equilibrium towards strategy type (RR,RR)? This will be the question that guides the next chapter discussion, in which this paper will try to find the needed elements to move forward strategies based on risk reduction according to a logic of sustainable development and a country authority and community participation approach.

4. Towards an alternative model of interventions: economic incentives for Risk Management Investment

The argument behind shifting the way risk management interventions are developed leans not only in the realm of *social efficiency* described in previous chapter, but also in the fact that this task is difficult but not impossible to address in Latin America, moreover the actual juncture suggests a kind of *opportunity window* supported by a large and growing number of development agencies. (See chapter 2).

In the actual model, the risk faced by the poor is not reduced, then it is released by the natural trigger phenomena (it becomes disaster), and the damage costs are covered by affected families, national/local authorities and in a bigger proportion, by the international cooperation (generally, only in the context of officially declared disasters). In a sense, this model resembles the private insurance market performance that covers the portion of the affected insured population; here, the international cooperation is like a *principal* or insuring actor that often provides financial compensation to the poor, after the event, for a physical, or related loss, transferring the disaster cost from “recipient” affected country to taxpayers in developed countries.

The crucial element in the model is the *risk transfer concept*, which means the process by which the financial impacts of disaster damage are transferred to a larger portion of society than those immediately impacted – through insurance, government taxation, or risk financing in the private market; and through International Cooperation in the uninsured poor population sector.

For a variety of reasons, the application of these risk transfer options in developing countries has proven difficult. In developed countries, this issue is not as significant since they are able to absorb most or part of the risk through their power of taxation (Auffret, op. cit.). For most developing countries that is not the case since they are limited in their ability to transfer the risk to their citizens³¹ (through taxation). This helps to explain the heavy reliance on access to external resources presented in chapter two.

The shifting from RC to RR strategies initially could be supported by the same flow of external resources, then; this shifting means a *better allocation* of existing resources more than changes in the sources where those transfers came from. Nevertheless, in the long run, governments in developing countries must design self sufficient risk management policies in order to achieve sustainable levels of development.

Keeping in mind that risk is, by definition, a socially constructed problem connected with macro-forces and economic and political models, it is necessary to develop a comprehensive set of immediate constraints (Table 8) on shifting strategies from RC to RR and possible options (recommendations for public sector interventions) to overcome them, within the borders of achievable tasks oriented also to changes in dynamic pressures and even root causes.

³¹ There are some exceptions in Latin America, sometimes under the figure of permanent reserves such as the “*National fund of Calamities*” launched by ministerial law in Colombia in 1984; others could be temporal such as the Venezuelan landslide emergency fund created in 1999.

The next part of this chapter presents a simplified model of risk management based on a strategy of risk reduction in a micro level intervention. Even though this is a hypothetical exercise, its outcomes can be considered basic elements for ulterior discussions on shifting policies.

Table 8: Principal constrains on changing strategies from RC to RR and recommendations.

Constraint	Implication	Recommendations
<i>From the point of view of the Government</i>		
The physicalistic approach	Tendency to see preparedness and emergency as very attractive issues.	Governments must create legal frameworks based on the social character of risk and the disaster phenomena
	Confusion between key terms, especially the common idea of seeing Natural Phenomena and disasters as synonymous.	
The short-term way of managing public investments	Tendency to visible short-run activities instead of long-run initiatives such as those proposed by RR strategies.	Governments, jointly with vulnerable communities must formulate long term plans for Risk management
Institutional inertia and its status quo based on emergency assistance.	Incentive for some segments of the population to settle (and resettle) in risk-prone areas since they know that the Government or the International Cooperation will bail them out eventually.	Governments must create, (better with the support of the International Cooperation) decentralized <i>systems</i> for risk management activities, discriminating then, the particular role of emergency and response corps
	Disaster response organizations do not look very kindly on the idea that prevention and mitigation must be dealt with by some other organization, structure or system.	
The figure of "recipient - donor"	Lack of participation in the definition of IC risk management strategies.	Governments must promote their lobby towards IC policy makers.
<i>From the point of view of the International Cooperation</i>		
Constraint	Implication	Recommendations
Unconditioned relief.	Disincentive for countries to adopt policies toward risk-reduction activities	In absence of disasters, IC must ask for Risk Management defined strategies as a precondition for relief assistance in case of disaster.
Emergency and development are not considered in the same logic of problem explanation	Procedures for emergency projects are easier to fulfill and money allocation process follows fluent channels, conversely, development projects have complicated management procedures.	IC must recognize that disasters are the consequences of untenable levels of risk, and, consequently, it is necessary to focus on risk phenomena instead of disasters.
	Disincentive for NGO to work with risk reduction strategies. (most of them are practically becoming emergency corps)	All emergency projects must be clear in the ulterior long term continuity process as a precondition of their financing.
	Humanitarian organizations are more likely to wait until risk transforms in disaster to get involved.	The start-up intervention moment must be shifted from the disaster one to risk.
Lack of trust in G capabilities to transparent manage resources	Disincentive to make real alliances with Governments and Local Authorities, affecting mainly long term initiatives, such as RR projects.	Transparency agreements, endorsed by beneficiary communities through their root organizations must be signed as trust brokers.

Source: Own elaboration.

Preconditions for creating economic incentives

To develop this micro-level based model (municipally), it is necessary to follow 4 main steps before the creation of the incentives, but initially, and with the purpose of simplicity, we are considering the next list of assumptions:

1. The community is affected by a single hazard risk context (no multi-hazard environment).
2. The community, in general, has a significant level of risk perception, and they want to overcome their risk situation.
3. There is a minimal well-functioning level of social organization among the community.
4. There are some international organizations willing to intervene in releasing the risk throughout commonly constructed risk management strategies.
5. There is a relevant level of political commitment towards risk management.
6. All of the three parties: community, local authority and International organizations are rational and know all relevant information about each other.

Three Party Agreement for Risk Management.

Initially, Local Authority and Community Organizations must get in touch with each other with the purpose of make alliances addressing risk problems in the affected communities. One of the first actions will be the risk assessment and the risk management plan elaboration; both products require a set of activities, some of them will demand different levels of resources. Here, a certain level of management capacity to involve external actors, mainly national or international agencies engaging on development issues is required. Three party agreements must be signed in this first stage of the process, before moving on to following steps.

Step one: Risk Assessment:

Initially, the local authority, with the support of national or international sponsors, must carry out the assessment of the municipality's actual risk, which means a relatively precise sizing of the amount of loses and damages expected in case of disaster occurrence. Table 9 presents a list of key questions for the local level risk assessment:

Table 9: Key questions in evaluating actual risk

Sphere	Specific question
Hazard	What is the hazard type? What is the occurrence probability? What is the influence area? (hazard map) What is the probable recurrence period?
Vulnerability	What are the exposed elements? (unsafe conditions), number, value, characteristics. What is the resiliency's level of the exposed elements? What is the historic explanation of those unsafe conditions? (dynamic pressures and root causes). What are the <i>accessibility</i> conditions of the exposed families?

(Continue)

(Table 9 continuation)

Risk	<p>What is the geographic distribution of expected losses and damages? (risk map = hazard map + unsafe conditions).</p> <p>What is the expected amount of losses and damages? = direct and indirect cost if the trigger phenomena occurs without doing anything for releasing the risk level identified. (elaboration of a disaster scenario).</p> <p>What is the acceptable level of risk? (when disaster costs can be covered without external assistance)</p>
Main product (A)	WHAT AMOUNT OF RESOURCES ARE NEEDED TO COVER THE DISASTER CONSEQUENCES IF THE ASSOCIATED RISK IS RELEASED BY THE NATURAL OR SOCIO-NATURAL TRIGGER PHENOMENA?

Step two: Risk Management Cost:

This step attempts to evaluate the amount of resources, needed to release the identified risk level (step one) throughout risk management. (Table 10).

Table 10: Key questions in evaluating risk management viability

Sphere	Specific question
Risk reduction alternatives	Plan elaboration: What are the risk management measures needed to release the evaluated actual risk level until the socially acceptable dimension?
Prevention activities	What are the prevention measures (focused on <i>avoiding future risk</i>), and their implementation costs?
Mitigation activities	What are the mitigation measures (focused on the reduction of vulnerability – unsafe conditions- of exposed elements, and their implementation costs?
Preparedness and response activities	When the risk level has released until socially acceptable levels, what are the emergency and contingency measures designed to cope with <i>this new and lower level</i> of expected disaster consequences, and their implementation costs?
Main product (B)	WHAT RESOURCES ARE NEEDED TO DEVELOP A RISK REDUCTION STRATEGY FROM ITS ACTUAL DIMENSION TO THE PREDEFINED SOCIALLY ACCEPTABLE LEVEL?

Step Three: Endorsing the institutional and the community frameworks for the risk reduction strategy

The risk management plan (developed as risk reduction strategy), will be sustainable only if it has been jointly produced by the three parties. Special attention must be given to the real community participation component of the process.

Before doing the crucial four step –external fundraising-, it is necessary to develop a set of possible solutions to overcome the constraints presented in table 8 using on hand local resources. Table 11 presents a series of questions useful in guiding the process of raising local resources intended to guarantee external flows, which means reducing the uncertainty of the international cooperation on financing the risk reduction strategy.

Table 11: Key questions for raising local resources

Sphere	Specific question
Community	<p>What is the level of social organization inside the risk affected community?</p> <p>What is the “weight” the affected community places on the risk problem in comparison with other social problems?; is the <i>risk perception</i> level relevant?</p> <p>Is the Risk Management Plan properly known and accepted by the community?</p> <p>What are the resources affected families are willing to allocate for a general strategy of risk management?</p>
Local Authority	<p>Are there legal frameworks based on the social character of risk and disaster phenomena?</p> <p>Is there some legal institution engaging in risk management issues, different from those engaging in emergency attention?</p> <p>What is the real power of those institutions? (its hierarchical level)</p> <p>Is there an institutional system working towards risk management inside a logic of sustainable development?</p> <p>What are the available institutional resources and the political commitment for supporting – leading – the risk management strategy?</p>
Main product (C)	TRANSPARENCY AGREEMENT BETWEEN LOCAL AUTHORITY AND LEGITIMATE SOCIAL ORGANIZATIONS, ENDORSED BY BENEFICIARY COMMUNITIES (TRUST BROKERS) WHERE THE ROLL OF SUCH IN THE RISK MANAGEMENT STRATEGY BECOMES EXPLICIT

Step Four: Fundraising of External Resources

According to empirical evidence, (See, Auffret, 2003), **(A) must be higher than (B)**; the sustainability of the process will entirely depend on this *fatal assumption*: the difference between both budgets will compound the overall economic incentive for changing strategies.

This is certainly the most challenging step of the process, where a crucial shifting of budget allocation takes place: Local Authorities and Community based Organizations must *detect* International Organizations motivated to invest **reserved relief and reconstruction resources in a context where there is no disaster declared situation, but unsustainable levels of risk.**

In other words, this step aims to develop a process of *risk transfer* to cover risk reduction activities, using (partially) the resources that *would be necessary* to cover the disaster consequences if we do not release that risk.

The challenge consists of convincing international cooperation agencies that, before being victims of *disasters*, people are victims of *risk*; and this basic argument allows defining risk reduction activities as an **effective and coherent manner** to deliver *assistance* to the victims of disasters. The difference is that we are not waiting for the shock to participate.

International cooperation agencies must recognize that disasters are the consequences of untenable levels of risk, and that, it is necessary to focus on risk phenomena instead of disasters.

Regarding to the common argument of lack of trust in Government procedures, alluded to by some International Organizations who prefers to finance only relief projects, the

produced transparency agreements, (C product) will be the main tool for shifting finance preferences.

*Economic incentives for risk reduction activities focused on the poor*³²

Once detected and involved the financial actors, the project starts with the creation of a fund for the risk reduction strategy of the locality.

Reasonably, International Cooperation would be willing to invest in the project because this represents a smaller effort:

Without the risk reduction project: (A)
With the risk reduction project: (A-n)

Where (n) is equal to the incentive for the international cooperation Agency. Here it is important to underline that this incentive wouldn't be too big, because from the remaining amount of money will be discounted also the economic incentive for the Local Authority.

For international cooperation agencies, the incentive must be more philanthropic than economic, in the sense that shifting strategy could create sustainability inside community's development, despite the fact that risk reduction could be less costly.

Another strong argument for shifting strategy urges that risk reduction contributes to avoid the *aid dependence syndrome* of some countries that has been extensively warned by a large number of international cooperation agencies. Waiting for the next disaster such as vicious circle will never bring development to the poor.

Then, the money allocated in the fund will be equal to (A-n), and with a correct (n), this product must be higher than (B). Through scheduled transfers for prevention, mitigation, and preparedness activities designed in the risk management plan, the risk reduction strategy will be developed using (B) resources.

When (B) is totally transferred and –according to the designed guarantees-, well invested, the level of actual risk in the community must reach its acceptable dimension.

The remaining money in the bank would be equal to:

$$[(A-n)-B] = (r)m \tag{4}$$

Where (m) is the amount of money transferred to the Local Authority as an incentive for their *effort efficiency*, (designed as *r*) in the risk reduction strategy. This premium will be given in the aftermath of the expected natural trigger phenomena that, for the first time, will not provoke a disaster.

The effort efficiency factor, (*r*) represents the success of achieving the risk acceptable dimension and its possible values oscillate from zero, total failure, to one, total success: $[0 < r < 1]$. This factor must be calculated in the aftermath of the foreseeable natural trigger

³² As a matter of simplicity, this paper does not introduce *probability functions* in the design of the incentive. The aim of this initiative is linked to the generation of alternative lectures to the risk management problem more than with the production of an exhaustive and precise economic model.

phenomena by a genuine evaluation institution. The ECLAC methodology for disaster economic and environmental effects estimation could be useful in order to calculate the (r) factor.

There is a strong incentive for the Local Authority to design innovative and smart risk reduction strategies: the lower (B), the higher (m); and to develop efficient activities: the higher (r) (maximum, $r = 1$) will also increase (m).

If the risk reduction process does not reach the predefined risk acceptable level, ($r = 0$) which means the failure of the strategy, no money will be transferred to Local Authority and the remaining funds (m), will be used in relief actions as usual.

In other words, the failure means returning to the normal assistance-oriented model. Obviously, in case of failure, the remaining funds, (the incentive m) will not be enough to cover the expected disaster consequences (A), because (B) had been wrongly invested. This is the risk international cooperation agencies must accept when evaluating the quality of the community and Local Authority proposal.

Seeing as the point of view of the beneficiaries, there is also an incentive to participate in the process: they wanted to overcome their risk situation. (Second assumption)

Here it is essential to highlight that during the first round of meetings between external and internal actors, there must be a kind of *imaginary negotiation* in which the community's desires and aspirations are placed at least with the same *weight* of those scopes followed by the Local Authority and the external NGO at the negotiation table. Special attention must be given to the right people have to choose *not to* release their risk level, not because of a matter of excessive community esteem, but because this model cannot be imposed on beneficiaries, their willingness to get involved could be negotiated, not forced.

Simplest example:

The expected losses in the community “La Curva” composed by low-income families settled on the slopes of steep hillsides on the west of Pereira, Colombia, that could be affected – as it was last year – by a landslide that could be triggered by moderate rains (between 10 - 15 mm of rain daily) during the next rainy season, (from July to August) are calculated to 100 Euro displayed as follows:

Table 12: Hypothetical expected disaster cost in the community “La Curva”

Cost type	Description	Value EURO
Direct damages	Total destruction of 20 houses (and house articles), infrastructure (main road, electricity posts, aqueduct and sewage system), equipment (telephone cabins) and means of transportation.	20

(continue)

(table 12 continuation)

Indirect losses	Higher operational costs due to the destruction of physical infrastructure, inventories or losses of production and income. Diminished production or service provision due to the total or partial paralysis of activities. Additional costs incurred due to the need to resort to alternative means of production or provision of essential services. Income reduction due to the non-provision or partial provision of services by public utilities (power and drinking water utilities); losses of personnel income due to loss of employment or to forced part-time working. Costs incurred in the attention to the affected population during the emergency stage, by all parties involved. Additional costs to deal with new situations arising from a disaster, such as the cost of health campaigns to prevent the occurrence of epidemics.	10
Relief	Primary attention to the victims, food aid, emergency relief, shelter construction and sanitary emergency activities.	20
Rehabilitation	Reconstruction of main road, electricity posts, aqueduct and sewage system.	30
Reconstruction	Construction of 20 houses in a safety area (land purchase, house material, construction contracts, etc.),	20
Total (A)		100

The local root organization “Parceros de la Curva” accompanied by the Pereiran Urban Planning Office, developed a risk assessment and produced an integrated Risk Management Plan with the support of the Italian NGO “COOPI” (5 years of continued development work in that area). The estimated costs for the implementation of the risk reduction strategy are equal to 60 Euro detached as follows:

Table 13: Hypothetical risk management cost in the community “La Curva”

Cost type	Description	Value EURO
Prevention Activities	Construction of water conduction and landslide protection works	20
Mitigation Activities	Re-settlement of 20 houses in a safety area (land purchase, house material, construction contracts, etc.),	20
Preparedness	Training in risk-coping activities, early warning system,	10
Other	Education campaigns, works’ maintenance, reforestation of released areas (prevention of new high risk settlement)	10
Total (B)		60

Throughout negotiations between Local Authorities, local and International NGOs and the European Commission representative in Bogota, it was possible to obtain the ECHO participation in the risk reduction strategy, since this institution has shown its willing to deliver assistance to the victims of risk in an effective and coherent manner.

ECHO agreed to transfer 90 Euro from the financial decisions for humanitarian aid, 10 less than from the money the Commission would spend without the project.

This 10 Euro are also accepted as a kind of guarantee in case of process failure (a lower r factor).

$$A = 100$$
$$(A-n) = 90; n = 10$$

The expected incentive since the point of view of the Local Authority is defined as:

$$[(A-n)-B] = (r) m$$

At the end of the rainy season, ECLAC sent a mission to evaluate the efficiency of the strategy and discovered that the risk reduction activities successfully achieved the risk acceptable dimension (there was no disaster at all because the expected natural phenomena did not overcome the accepted risk level), giving to (r) the maximum value of 1.

$$[90-60] = (1) * m.$$

$$m = 30$$

Then, the remaining 30 Euro were transferred to the Local Authority as a premium for its successfully risk management process.

Possible outcomes of the economic incentives

Even though the theoretical basis of this model can be considered as *correct assumptions*, there are some possible negative outcomes that goes beyond the theory and make reference to the complex and uncertain character of the risk phenomena.

First case: B is higher than A

It could happen that the expected resources for risk reduction exceed those needed to manage disaster consequences. When the natural phenomena release the risk level until its marginal value (near to zero), there is no more risk as such in the aftermath of the disaster; then, relief and reconstruction are not particularly expensive activities.

This is especially true in high mortality disasters, where the proportion of homeless is low; then, the amount of resources needed to rebuild new houses is lower than the resources that had been necessary to resettle the whole population at risk.

The most famous example of this type of relation in Latin America is the fatefully experience of the city of Armero, Colombia, devastated by mudflows triggered by the eruption of Nevado del Ruiz in November 1985. The mudflows destroyed everything in their paths and killed about 20,000 people, almost 90% of the total population. The number of homeless was so low that most of the external resources that came to the national fund created for the reconstruction were –paradoxically- allocated in other initiatives, more connected with development than relief as such.

Even though, it is important to underline that the disaster consequence are always paid by someone, in the case of Armero, the people who died paid the risk discharge with their own lives, and this cannot be considered as an efficient manner to reduce risk.

If we calculate the cost³³ of those 20.000 dead people, surely the cost they paid will exceed the money that would have been necessary to release their risk. Then, the efficiency character of the model we are proposing as common (A higher than B), is correct when considering the *life price* as a component of the (A) risk-coping equation.

Unfortunately, it seems to be that some policy-makers in Latin America are seeing risk reduction through disasters as a *valid option* when the level of vulnerability is so high that there is an incentive to *not intervene* through sane risk management strategies; such as the cases when Governments choose risk coping strategies as the unique concern for risk management resources allocation.

Second case: The hazard assessment uncertainly.

Some risk scenarios can be connected to complex hazardous natural and socio-natural phenomena, and the task of assessing the actual level of risk becomes difficult; consequently, the expected level of damages and loses is highly uncertain.

Most seismic related phenomena, such as high magnitude earthquakes can present a lot of variants in the way they impact the vulnerable social context, and some natural variables such as deepness, origin, type of wave, and superficial conditions (that can amplify or reduce the destructive potential of the wave), can trigger different disaster scenarios, with extremely dissimilar levels of damage even though the physical conditions of the exposed elements is more or less the same.

Moreover, some risk scenarios can be constructed under the presence of a *multi-hazard* situation, where concatenation and synergy may occur: an earthquake can produce a landslide, which, can as well produce a river obstruction and later on, floods and avalanches.

The economic incentives presented in this paper, are more connected with micro level risk scenarios related to recurrent and *normal* natural phenomena. Spectacular and extreme hazardous events are, less significant³⁴ and less recurrent in the large history of disasters in Latin America, even if people and mass media tend to remember them most.

The model is based on the idea of disaster not as the consequences of natural threads that affects “normal” societies but societies “in crisis” affected by normal and foreseeable natural phenomena³⁵.

Then, it is important to see and read carefully the community disaster’s history in order to evaluate the real pertinence of threat assessment, and give priority attention to the micro level of the risk management strategy.

³³ In the case it would be ethic.

³⁴ According to Desinventar statistics, the overall sum of losses provoked by recurrent and little magnitude phenomena raise above spectacular extreme events related losses.

³⁵ Idea described in chapter one inside the current of thought of social sciences, see in particular Maskrey, 1993.

Third case: the risk evolution

Since risk, because of its social nature, is a changing phenomena, it could happen that the acceptable risk level, achieved at the end of the B transfer period, is unsustainable in the long run, and the natural trigger phenomena can produce a disaster. Then, the economic incentive will not be allocated as a premium but used in relief and rehabilitation.

This is the natural outcome of strategies centered exclusively on transforming unsafe conditions, without attacking dynamic pressures and root causes.

The unique possible option for the sustainability of any development strategy is the self-sufficient orientation. People living at risk can improve their condition through the presented model, but if some macro transformations are not achieved, such as employment, health and education oriented to the poor, it would be difficult to maintain the risk level at its acceptable dimension in the long run.

That is why, inside the logic of the risk reduction strategy, dynamic pressures must be included, at least in part, inside the scheduled activities of risk management.

Concatenation with other development initiatives can create synergy inside the affected community, in this sense, risk liberalization can be considered as a startup moment of a longer development process.

Also Local Authorities have much to do in order to achieve continuity; they have an incentive to maintain the level of risk as low as possible, then, it is reasonable to include permanent social work in vulnerable communities in the government agenda.

5. Conclusions

- i. There is a focus on relief and in general risk-coping activities in comparison with those oriented towards investments in risk-reduction in the patterns of international official aid flows to Latin America.
- ii. Most of the official aid has been delivered as loans for relief activities. This investment priority implies that poor countries necessary must derail economic development, as funds are reallocated from ongoing programs to finance relief and reconstruction assistance.
- iii. The small number of internationally financed projects in attacking actual risk, in comparison with those oriented in risk coping and preparedness (in terms of budget line allocation) suggests that cooperation between Governments and international cooperation agencies, are not sufficiently correlated in terms of maximizing social welfare which means releasing risk through risk reduction instead of coping with disaster costs.
- iv. As a consequence, there is a kind of prisoner's dilemma regarding to the lack of strategies focused on attacking the actual risk faced by the uninsured vulnerable population, mainly the poor. The expected outcome, from the interaction between international cooperation agencies and Governments strategies is not the best outcome for them jointly; both would prefer that neither invest in risk reduction.
- v. International organizations could have a larger impact on development by switching their role from providers of disaster-related assistance to initiators of the implementation of risk-reduction measures.
- vi. The argument behind shifting the way risk management interventions are developed leans not only in the realm of *social efficiency*, but also on the fact that this task is difficult but not impossible to address in Latin America. The actual juncture suggests a kind of opportunity window supported by a large and growing number of development agencies.
- vii. The shifting from risk coping to risk reduction must start by the recognition of before being victims of disasters, people are victims of risk; and this basic argument allows the definition of risk reduction activities as an effective and coherent manner to deliver assistance to the victims of disasters, even though there is not an officially declared disaster situation.
- viii. Municipalities are very weak in general and the scarce resources available to them are barely sufficient to cover basic services, letting alone provide real options for risk assessment and development of coherent and integrated intervention strategies. Even though, there is a strong incentive for Local Authority to design innovative and smart risk reduction strategies through economic compensation for the development of efficient activities using the resources that would be necessary to cover disaster's consequences.

- ix. It is important to recognize that localities can not resolve the problem of risk without integration of regional, national and even international policy making levels.
- x. Without relevant changes in root causes the task of shifting strategies from risk coping to risk reduction activities seems to be wasteful. Nevertheless, it is possible that risk reduction strategies (even if centered on unsafe conditions) will go first and will positively influence dynamic pressures and root causes. Human development has demonstrated that structural changes often materialize after well oriented singular small efforts.

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