The risk of natural disasters in the economy: The case of Albania

M.Sc. Elona Pojani
University of Tirana
Department of Finance
Email: elonapojani@fakultetiekonomise.edu.al
elonapojani@yahoo.com

Abstract

Natural disasters cause major impacts on the economic performance of developing countries and on the livelihoods of millions of poor people around the world. With economic development and growing investment (especially in coastal regions and agriculture), along with growing risk of extreme weather events, disaster and insurance costs are projected to increase rapidly over the decades. Insurance will become much more expensive, or simply unavailable, for people living in areas increasingly prone to fire, flooding, or high winds. An appropriate evaluation of the costs of natural disaster is necessary to guide the decision-making process. Models for disaster losses estimation have already been developed, which might be used for evaluation purposes. Albania is affected by a considerable number of natural disasters. With a changing climate is expected that the frequency of extreme weather events will increase seriously. Thus, the necessity to take measures and prevent the impacts on environmental resources is compelling. Dealing with the consequences requires a multidimensional approach. This paper will discuss approaches for modifying public policies, changing individual behavior, implementing adaptation measures and finding and implementing financing sources.

1. Introduction

This article presents an analysis of the sensitivity level of the Albanian economy in relation to natural disasters. Ways to finance the costs imposed by natural disasters and the chances of the Albanian economy to recover from disasters will be discussed. The different categories of costs related to natural disasters, and the way they affect macroeconomic indicators will be identified, in addition to the means available in financial markets for managing the risk from natural disasters, before and after the event. The article identifies the main extreme events that affect Albania, the main damages caused by each of them, and the main institutions responsible for disaster managing. Based on past experiences, the efficiency and effectiveness of disaster management in Albania is analyzed. Finally, some approaches to finance the aftermath of a disaster, which could be adopted in Albania, are considered.

2. Literature review

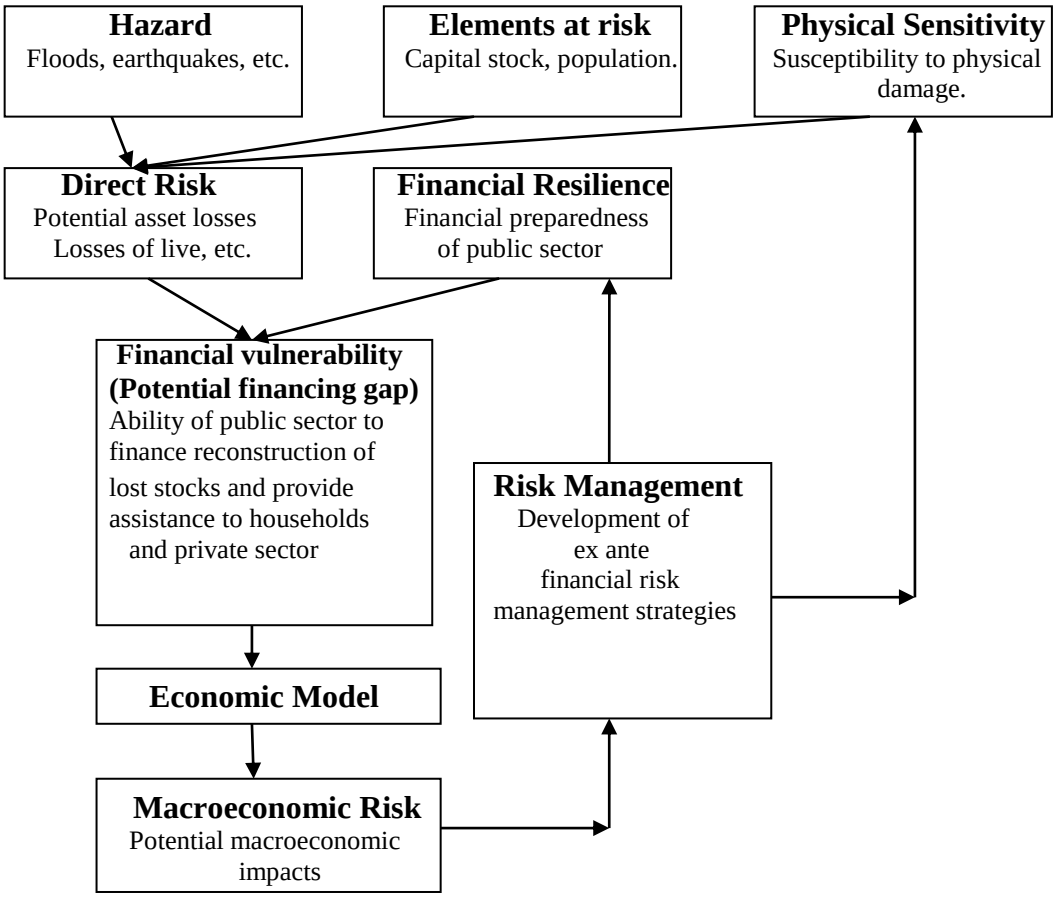
2.1. Macroeconomic risk of natural disasters

Disasters have a major impact on the living conditions, economic performance and environmental assets and services of affected countries or regions. Consequences may be long term and may even irreversibly affect economic and social structures and the environment. In developing countries fatalities are usually higher owing to the lack or inadequacy of forecast and evacuation programmes. Although capital losses might be smaller in absolute terms when compared to those in developed countries, their relative weight and overall impact tend to be very significant, even affecting sustainability (ECLAC, 2003).

According to Hochrainer 2006, the risk of any natural disaster may be defined as a function of probability (risk), and loss (exposure, vulnerability). This definition does not represent a mathematical formula, instead it serves primarily to express the integration of these different dimensions in the evaluation of risk. When one of these elements alter, the risk itself changes (Hochrainer 2006). Figure 1 represents a way to determine the risk from a natural disaster, according to this relationship.

According to Menchler 2005, economic impacts are usually grouped into three categories: direct, indirect, and macroeconomic (also called secondary) effects. Direct economic damages are mostly the immediate damages or destruction to assets or "stocks", due to the event per se. A smaller portion of these losses results from the loss of already produced goods. Effects can be divided up into those to the private, public and economic sectors. Another category of direct damages are the extra outlays of the public sector for matters of emergency spending in order to help the population during and immediately after a disaster event. The direct stock damages have indirect impacts on the "flow" of goods and services: Indirect economic losses occur as a consequence of physical destruction affecting households and firms. Most important indirect economic impacts comprise: Diminished production/service due to interruption of economic activity; Increased prices due to interruption of economic activity leading to reduction of household income; Increased costs as a consequence of destroyed roads, e.g. due to detours for distributing goods or going to work; Loss or reduction of wages due to business interruption. It should be kept in mind that the social and environmental consequences also have economic repercussions. The reverse is also true since loss of business and livelihoods can affect human health and well-being.

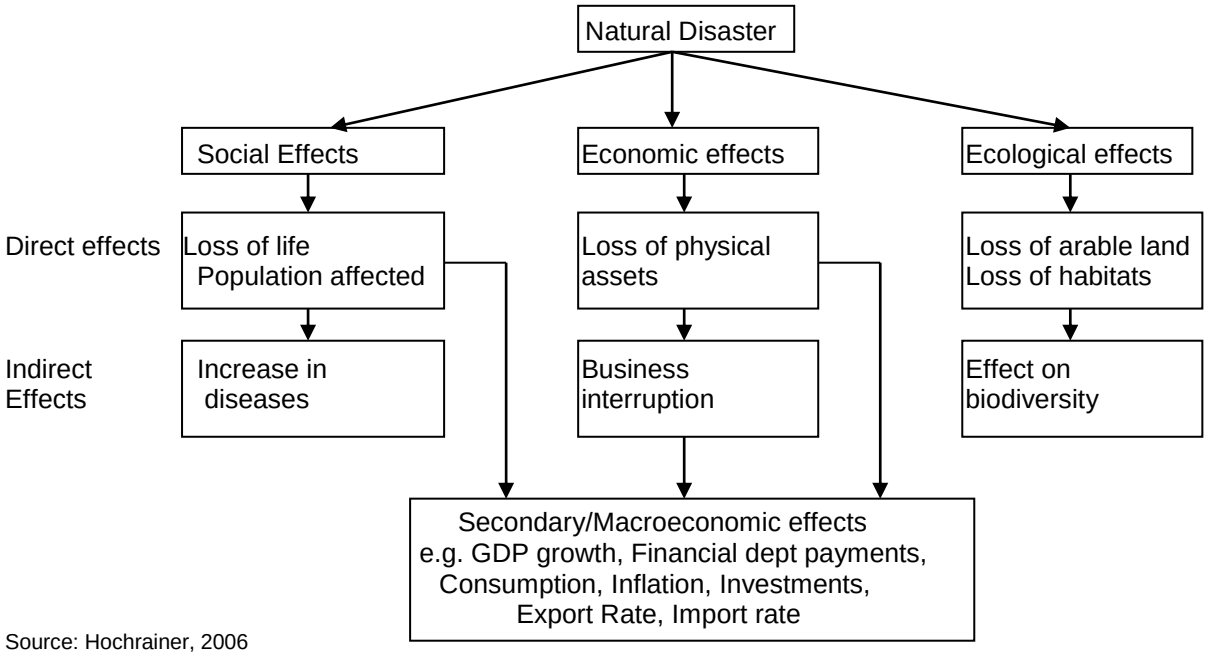
Figure 1: Macroeconomic risk management approach



Source: Hochrainer 2006

The public sector has in most of the cases the responsibility to bear the cost of damages caused by a disaster. The ability of the public sector to respond to the event is determined by several factors. The economic resilience represents the possible internal and external resources available to the government to respond to the event. Access to these resources has limitations and costs that must be taken into account as feasible values according to the macroeconomic and financial conditions of the country. In this evaluation the following aspects have been taken into account: the insurance and reinsurance payments; the reserve funds for disasters that the country has available during the evaluation year; the funds that may be received as aid and donations, public or private, national or international; the possible value of new taxes that the country could collect in case of disasters; the margin for budgetary reallocations of the country, which usually corresponds to the margin of discretional expenses available to government; the feasible value of external credit that the country could obtain from multilateral organisms and in the external capital market; and the internal credit the country may obtain from commercial and, at times, the Central Bank, when this is legal, signifying immediate liquidity (Cardona et al, 2008).
The abovementioned factors compose and affect the macroeconomic risk of a country from a natural disaster. The assessment of this risk will help form the main strategies for risk management.
Assessing the macroeconomic impacts involves taking a different perspective and estimating the aggregate impacts on economic variables like gross domestic product (GDP), consumption and inflation due to the effects of disasters, as well as due to the reallocation of government resources to relief and reconstruction efforts (ECLAC 2003). The relationship between the effects of a natural disaster is shown in figure 2.

Figure 2: Relationship between the effects of the ND and macroeconomic indicators



Source: Hochrainer, 2006

2.2. Approaches and instruments for financing the risk of natural disasters

Risk financing instruments against disaster risks can be categorized into risk transfer and risk spreading instruments. While the dominant risk financing instrument is risk transfer by insurance and reinsurance, other non-market risk transfer instruments, e.g. collective loss

sharing, are also available (Mechler 2005a cited in Hochrainer 2006). Table 1 illustrates the main risk management approaches and instruments.

Table 1: Risk management approaches and instruments

Approaches	Examples of Instruments
Non-market risk transfer	Government assistance (taxes) for private and public sector relief and reconstruction funding Kinship arrangements Some mutual insurance arrangements Donor Assistance
Market risk transfer	Insurance and reinsurance, Micro insurance, Financial market instruments: Catastrophe bonds, Weather derivatives
Inter-temporal risk spreading	Contingent credit (financial market instrument), Reserve fund, Microcredit and savings

Hochrainer, 2006

According to Hochrainer 2006 post disaster government assistance can be seen as one of the most important arrangements of non-market risk transfer. The government plays a key role in loss financing after a disaster in developing and emerging-economy countries, and even in high-income countries. Governments have principally four possibilities to ease their financial burden in the context of natural disaster losses: First, they can continue as before and recover from the effects of a disaster event as best they can, using available resources; Second, they can eliminate the risk, e.g. by locating infrastructure out of hazard prone areas; Third, they can reduce the risk (mitigation), e.g. by retrofitting existing facilities and the last and fourth option is to transfer risk to other levels (Burby 1991cited in Hochrainer, 2006).

On the other hand, households, businesses and governments can transfer their catastrophic risk by insurance and/or reinsurance. According to Bayer and Mechler 2008 insurance and other risk-transfer instruments are justified by the concept of risk aversion. In addition to reducing direct and indirect losses, insurance provides economic security. For businesses, insurance removes risks from balance sheets, meaning that higher-profit and higher-risk activities can be pursued. For governments, insurance assures timely assistance and recovery, which can attract more investment to the country. (Mechler 2008).

However, according to Hochrainer 2006, there are several problems on supply and demand side in insurance market. The low insurance density in the developing world is not surprising. On the demand side, for low income households, commercial insurance is unaffordable and has high opportunity costs. Many low income countries are highly exposed to natural disaster risk and therefore even fair premiums would be quite high. As a consequence, residents of such countries cannot pay the price for such risk transfers and therefore require support from the non-risk communities or internationally (Hochrainer 2006). On the supply side, insurers are reluctant to promote coverage because of the intrinsic problems of insurability of catastrophe risk, the lack of formal titles to property of firms and individuals in developing countries, without which no formal proof of holdings can be established and therefore no premium calculations can be done, high transaction costs, unstable business environments and insufficient risk assessment and mitigation amongst others (Andersen 2001 cited in Hochrainer 2006). Hence, in developing countries, instead of insurance, households usually rely on family and public support. Furthermore, they use traditional coping mechanisms to protect themselves from the economic impacts of natural disasters: diversification of crops and livelihoods, different sources of income, remittances from family members who are living abroad or spatial diversification of family members. (Hochrainer, 2006).

In addition to traditional insurance and reinsurance there is emerging interest in other alternative risk transfer instruments, e.g. catastrophe bonds and weather derivatives. Weather derivatives are index based, e.g. physical indicators such as rainfall measured at a specific location are used to define trigger events. Weather derivatives and index based insurance are seen now as promising risk transfer instruments for the developing and emerging economy countries, especially in the agriculture sector (World Bank 2005a cited in Hochrainer 2006). Catastrophe bonds emerged as instruments primarily for reinsurers; however, there are also governmental efforts in some countries (e.g. Mexico) to transfer their risk with this instrument (Hochrainer 2006).
Finally, Inter-temporal risk spreading is another approach for risk management. On the household level risk spreading over time can be achieved in the form of savings. On the country level governments can establish catastrophe reserve funds, usually financed by taxes, which are depleted only in the case of a disaster event. Contingent credit arrangements allow borrowing money after an event whereas the post-event annuity payments are smaller in comparison to a regular credit. Borrowing is also a kind of inter-temporal risk spreading of losses, because payments will be made in the future. As one can see, a contingent credit is a mixture of saving and borrowing (Hochrainer 2006).

3. Natural disasters risk in Albania

3.1. Overview

According to the report of the Ministry of Local Governance and Decentralization (today Ministry of Interior) and UNDP 2003 Albania has a high exposure against natural disasters. The causes of natural disasters are various: 1) Natural causes (geological, hydrological, atmospheric, biophysical); 2) Anthropogenic causes (floods caused because of dams break, intentional fires; 3) Ecological causes. Moreover, with a changing climate is expected that the frequency of extreme weather events will seriously increase (UNDP, 2009).
In general, the natural disasters are unpredictable events. But, they occur according to a specific frequency and are located in specific areas. However, in many occasions, especially in the case of floods, the statistics regarding the possibility of occurring of the event have failed (Ministry of Interior, 2010). Table 2 shows some predictions regarding the frequency of occurrence of different disaster events.

Table 2: Predictions regarding natural disasters occurrence in Albania

Nr.	High possibility	Medium possibility	Low possibility	Variable possibility
1.	Fog	Erosion	Earthquake	Avalanche
2.	Hail	Drought	Lightning	Infection of crops
3.	Slide of soil	Flood		Snow storm
4.	Fire in Forest	Ice storm		Wind storm
5.		Intensive rain storm		
6.		Sinking		

Source: Ministry of Interior Albania, 2010

The threat from disaster in Albania is high, but not all regions are exposed to the same risk. Even though, if a disaster occurs, it causes: damages in people and livestock, damages on property, damages in agriculture sector, damages in infrastructure and on environment. The consequences of disasters in different groups of society may reach serious levels. The levels of vulnerability have significantly risen with the increase of the number of population and with transition tendencies of migration (concentration of population in main urban areas, which are exposed to high risk of natural disasters). A typical example is the fast increase of

population in Durres region, which is exposed to high seismic risk. Furthermore, the value of damages from a natural disaster is conditioned by: the economic situation, the state of infrastructure, means of communication, and environmental factors, such as deforestation, weak management of water resources and land, and environmental pollution.

3.2. Management of natural disasters in Albania

The responsible institutions for natural disaster management in Albania are: The Council of Ministers, Inter-Ministerial Committee of Civil Emergencies, Ministry of Interior, Department of Management and Response to Civil Emergencies, Line Ministries, Operational Forces, The Leader of Operations in Central Level, The National Operational Center of Civil Emergencies. For the full description of their duties and responsibilities see Civil Emergency Plan, Ministry of Interior 2004. This document also identifies several measures and actions which should be undertaken before, during and after the extreme event. These measures are summarized in the following paragraphs.

Each measure to prevent a civil emergency is called prevention action, while mitigation consists in undertaking of measures to decrease the social, economic, and environmental vulnerability from hazards caused by natural or anthropogenic factors. The general measures for prevention and mitigation consists mainly in exchanging information between national and regional structures in order to plan, monitor, assist and support the units of civil emergencies. This exchange is important to identify the first signals of hazard, to inform the public in time, and to start organizing all units of action plan. In order to achieve these goals, specialized staff, capable of sustaining the situation, has to be trained, and prevention emergency plans have to be compiled previously. The warning of the risk has to be announced through different means, such as campaigns, media, posters, and educative processes. Despite the general measures that have to be undertaken, the identification of other complementary measures is crucial, depending of the kind of disaster that a specific region is exposed. Moreover, every department and institution of public sector, private sector and NGOs should have an individual emergency or contingency plan, in order to protect their assets and to ensure the best services and fast recovery.

During alert situations organizational and technical measures have to be undertaken, in order to prepare the inhabitants to withstand the consequences of possible risk. Additionally, protection measures are foreseen in order to physically protect the inhabitants, the livestock, the properties, the institutions, the cultural heritance, and the environment from the possible risks.

Response is a further phase of the cycle of a disaster, and it consist mainly of actions for saving the lives of people, protecting the property in the area affected by the disaster and ensuring the basic living conditions for the affected population.

The last phase is recovery. It concerns with the full recovery of all the assets affected by the disaster. Specialized working groups make the evaluation of damages and instant and long-term needs. During this phase, future plans and projects for infrastructure recovery and development are elaborated.

Coordination is a process which is not easily defined but which is very important during all the cycle of a disaster – before, during and after the event. Its importance consists mainly in a fast reaction to undertake measures during the different phases. Responsible for coordination are all the abovementioned institutions.

3.3. Problems of management

Even though a detailed plan of action, which identifies all the measures to be taken during the whole cycle of the disaster, is available, its implementation reveals several problems,

especially in the phases before the event occurs. During these phases, environmental management pays a crucial role, because many of the causes of natural disasters, especially those related to flooding and mudslides, are associated mainly to environmental problems. In fact, the country faces many environmental problems. Many of these problems have resulted from the retreat of the state from its regulatory role, the increasingly individualistic behavior of the populace who is interested in making quick profits in the new market economy, and the low level of awareness about environmental issues, which was not a discussed topic under communism. In some areas, the environmental situation is dire, while in others problems are just surfacing. Some of these problems are: (i) loss of biodiversity (deforestation, loss of flora and fauna); (ii) massive deforestation; (iii) inefficient land management and land erosion; (iv) air, land and water pollution; (v) high risk areas (hotspots), related to environmental pollution (MLGD and UNDP 2003). Generally, environmental problems become important only when disaster events, such as floods, earthquakes, and drought, occur. Environmental policies and measures are only short-term plans. Therefore, a long-term plan of management is still missing.

Pre-disaster risk management is also prevented because of some demographical developments (migration, fast urbanization), related especially to the period of transition. According to MLGD and UNDP 2003 some consequences of these tendencies are as follows.

- Increasing population, with resulting increased densities of inhabitance and investments in marginal lands (e.g. increasing use of unstable and unsafe lands, lands downstream from dams, etc.);
- Rural-urban migration and urbanization pressures that concentrate population habitations in unsafe areas;
- Weak institutional capacity to solve migration problems;
- Unsustainable development practices, especially in marginally productive lands;
- Degradation of natural resources;
- Increasing poverty which increases the number of people exposed to disasters;
- Inadequate and incomplete communication and transport infrastructure;
- Problems with forecasting techniques;
- Needs for further training of emergency staff;
- Uncompleted participation of local communities in risk and emergency management;
- Inadequate market mechanisms to finance costs of disasters.

Additionally, the way risk is perceived form the public, the reason of this perception and the way people respond to it are very important issues which should be taken into account by the government while developing public policies for disaster risk management. In Albania, the level of reaction is very low and once the public discussions about the event terminate, people tend to forget what happened, until a next disaster takes place. The reasons for this behavior can be found in the tradition and mentality inherited from the past, especially from the pre-transition period. The government has the full responsibility of what happens, and it is still the government the one that knows what is best for the population. The lack of public pressure regarding issues which affect the population directly or indirectly is very problematic, since prevention starts with the single individual and then spreads into the whole society.

Currently, disaster events are present every year, and the measures for solving situations include only reaction to the consequences. Prevention plans for natural disasters and their implementation are still not efficient.

3.4. Economic consequences of natural disasters and problems of financing

After flooding events of the beginning and end of 2010, which affected the north areas of Albania, it became clear that the risk of natural disasters have to be taken into account while compiling public policies and programs in central or regional level. It is obvious that many of the consequences of disaster events will be transmitted to the future generations. The disaster will affect different sectors in varying degrees and thus will be reflected in the macroeconomic performance of the country's economy. Table 2 illustrates some potential impacts of a disaster event and its possible timeframe.

The damages in infrastructure and measures which have to be undertaken require a complete financing plan which should take into consideration financing possibilities before and after the event. The financial risk of a natural disaster is born by individuals, communities and businesses. Traditionally, in case of an extreme event in Albania the first resource to be used is the civil emergency fund[1] accorded to the Ministry of Interior, second is the Council of Ministers Special Fund. This funding is not earmarked for a special purpose, but becomes available whenever such an event occurs. Therefore, in many occasions, financial contribution are collected through alternative resources, such as local units (municipalities, districts and county), different government institutions, non-profit organizations, foreign donors and other societies, businesses, and individuals. However, the funding sources for damages in case of future disaster events remain uncertain.

Table 3: Potential impacts of a disaster event to macroeconomic indicators

Macroeconomic Indicator	Expected change
GDP	Immediate drop in GDP growth in the year of the event Rise in GDP growth in the year after the event Slow down in second and/or third year
Agricultural sector	Significant fall in production
Manufacture Sector	Decrease in activity due to disruption of transportation, reduced production capacities
Service Sector	Decrease in activity due to disruption of transportation and payment system
Exports of goods	Reduction in the rate of growth in the year of the event In the year after return to the previous levels In subsequent years continuation of the year after
Imports of Goods	Considerable increase in the rate of growth in the event year A return of pre-disaster level a year after In subsequent years a further drop, possibly caused by reduced incomes
Gross Formation of Fixed Capital	Sharp increase in the year following the disaster
Inflation rate	Short increase caused by the disruption of production and distribution and increasing transportation costs
Public financing	Worsening of deficit due to a shortfall in tax revenues and increase of public expenditures
Trade balance	Deficit due to decrease in exports and increase in imports, associated with the decline in production capacities and strong public and private investments for reconstruction

Source: Adapted from Hochrainer, 2006

It is clear that other financing possibilities have to be considered. Based on international experience, the following options can be considered:

1 Low nr.8756, date 26.03.2001 "For Civil Emergency"

Insurance and reinsurance payments are considered as one of the main alternatives in the literature but their implementation in Albania has several problems. First, there is a very low level of private insurance in the country. This is caused mainly by the low income per capita level of the population, especially in most risky areas, which makes the insurance payment unaffordable. Moreover, the mentality inherited from the past, that the public sector should be responsible for protection and reimbursement of damages in these occasions, may be another cause. In fact, no policy or obligation exists for insuring property in the risky areas. Other problems, especially related to the supply side, affect the lack of private insurance in the country. In many cases, the high risky areas, especially those affected by flooding events in the north-western part of the country, are informal areas. The property rights in these areas are often missing. Thus the insurance companies are unwilling to sell insurance to the population.

Financial Markets[2]. This is a very valuable tool insurance company and governments can rely on. The problem with Albanian insurance companies is that because of their size, such financial instruments may be very expensive to purchase. Moreover, the way this contract will be regulated and other related issues may pose some barriers to this finance opportunity.

Aid and Donations. This financial source is not always predictable in size, so it is better to be careful while calculating its portion. However, it has played an important role in past disaster events during the transition period.

New Taxes. This is a very sensitive measure, since it relies on the solidarity of those who are not directly affected by the disaster event. This mean might be particularly problematic in Albania, because the population reacts easily to new taxes. Moreover, the way the new tax revenues will be used might be put into question, since the confidence of the population on the tax system is very low.

Internal and External Credit. These are alternative financial recourses on which the state can rely in case of disaster event. However, these means have to be carefully considered, since their cost will be borne by future generations. New taxes and loans as means of financing for public sector are considered by many economic theories as substitutes of each other. They transfer the cost from a part of the population to another or from the current moment to the future, but basically they do not change the behavior of economic actors. While other theories imply that a loan will positively affect the economy in the short-run, since it will contribute to the recovery of damaged areas, but its negative effect will be felt in long run. Particularly in Albania, this resource might cause a strong public reaction, since the public deficit is relatively high. Therefore, such contracts have to be carefully considered, and the decision has to involve different influence groups.

Budgetary relocations. This may be the most difficult issue. This possibility of financing poses a very delicate concern. Different governments, based on the importance and awareness on such problems, allocate differently the state budget to different sectors. The 2010 figures of civil emergency fund compared to total state budget and Ministry of Interior budget are shown in table 3. However, considering the high potential of extreme events caused by problems in water resources, a more detailed allocation in the budget might be taken into account.

[2] Albania has underdeveloped financial market. In this case, in the short-run perspective, we are referring to international financial markets.

Table 4: Budgetary allocations and figures regarding civil emergencies

Budget figures	Expenditures (in ALL)	Budgetary allocations	Expenditures (in ALL)	% to total budget and MOI budget
Total budget	256267280	For civil emergencies	757600	0,2956
Total budget for MOI	17457088	For civil emergencies	757600	4.3397

Source: Ministry of Finances, 2010

4. Conclusions and recommendations

The causes of natural disasters in Albania are several, including: land management, deforestation, uncontrolled urbanization, incomplete infrastructure, problems of water management, and human activities. Environmental damage is becoming a critical issue in Albania, as it can acerbate conditions in case of a disaster event. Social awareness regarding these problems is still very low. The assessment of the costs imposed by disasters is a very complex issue and Albania lacks forecasting measures and techniques.

Financing possibilities for the damages caused by disasters are becoming a very important concern in public policy. So far, the costs of natural disasters have been covered by public (central and local) budgets and vulnerary contributions. The insurance system is still very weak, particularly in terms of private and voluntary insurance. Other market financing options have not been introduced yet. Under these circumstances, natural disasters will increase the poverty within the country and will be a burden for future generations. The author's recommendations include:

1. Consideration of disaster consequences in government programs and policies;
2. Improvement of institutions ability to implement environmental law;
3. Restructuring of the present legal systems and institutions responsible for land use and management policies;
4. Implementing measures for risk management and preparing a strategy to assess and manage the risk of more frequent extreme events in the future;
5. Designing a national finance strategy of natural disasters, where insurance policy modifications are involved;
6. Making property insurance obligatorily in areas more at risk from extreme events, considering also subsidies of insurance cost for the poorest groups of the society.
7. Encouraging environment education among the population.

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