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INSURANCE AND DISASTER RISK MANAGEMENT: REDUCING VULNERABILITY AND RISK

Abstract: Financial instruments have been recognized as an important mechanism for the disaster risk management in the field of climat change adaptation. This paper analyzes the importance of insurance as a financial instrument for reducing the socio-economic vulnerability of societies to the impacts of natural disasters caused by climate variability. Inovative insurance solutions have been recognized as a chance for developing countries, in their struggle and efforts to reduce poverty and adapt to constant climate variability.

Key words: Risk, Climate variability, Reducing vulnerability, Risk transfer, Insurance

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1. INTRODUCTION

Potential changes in climate variability are well recognized as a major social concern. Natural disasters, impacting on societies and economies over the last two decades, are constantly increasing and, obviously, it is very likely that this trend will continue, as a result of two complementary reasons: first, it is expected that climate change could increase intensity and frequency of weather related events, and second, financial consequences of natural disasters are increasing due to socio-economic development that include increase of values and growth of population and settlement that are exposed to weather extremes. In the face of predicted growing weather extremes and profound shifts in natural systems, the need is greater than ever to support the most vulnerable people and countries in finding effective strategies to manage risks and unexpected shocks and to build resilience to climate impacts. [1] The need to enhance action to reduce the risk of climate change and manage residual impacts has been recognized in many international agreements and frameworks that guide policy agendas and set the stage for shaping "the trajectory of resilience and sustainable development for the coming decades". [1]

Financial instruments, such as insurance, have been recognized as an important mechanism for the decrease of socio-economic vulnerability of societies. Disaster risk financing and insurance solutions provide efficient means for countries to financially protect themselves from natural disasters as well as foster disaster risk management efforts.[2] This strategies allow countries to increase their financial response capacity in the aftermath of disasters and to reduce the economic and fiscal burden of natural disasters by transferring excess losses to the private capital and insurance markets.[2] Thus, insurance and financial markets have a significant role in prevention and mitigation of the effects of climate change, and also may have a key role in recovery process.

2. VULNERABILITY AND RISKS OF CLIMATE VARIABILITY

Climate on the Earth is constantly changing and it shows the natural variability through the time. Until the beginning of the industrial revolution, the climate was changing as a result of changes in natural conditions. Today, however, we use the term of climate change when we want to talk about changes in climate that have occurred since the beginning of the twentieth century. The changes that have been registered in previous years, and those that are anticipated, are consider that emerge as a result of human activities, not only as a result of natural changes in the atmosphere.

Potential changes in climate variability in sense of increase of the frequency or intensity of extreme events, are well recognized as a major social concern. The consequences of weather pattern change are often extreme and they reflect, through extreme weather events, in all spheres of life. They have impact on the environment, communities and economies, both at global and local level. People are all vulnerable to extreme weather conditions, directly or indirectly through bounds to each other.

For a long time, technical responses to natural hazards have been considered as a key role in disaster risk management, but recently attention has shifted to vulnerability and how disaster risk reduction can reduce vulnerability to extreme events.

Vulnerability to extreme events is measured trough expected damage, but also is the risk. Hazard frequency and magnitude indicate that we are talking about risk and not vulnerability. The most widely accepted theory is that risk is probability of harmful consequences or losses resulting from a given hazard over a specified time period.[3] But, from the standpoint of extreme weather conditions, disaster risk must be viewed as a function of hazard, vulnerability, exposure, and resilience.[4]

Vulnerability to weather events and disasters is result of multitude environmental, social, economic and political factors which leave marks on different levels and in combination whit each other affect vulnerability. Generally, vulnerability to extreme event can be defined as capacity level of natural or social system to cope with a specific hazard, as a result of the impacts of environmental change or extreme event, depending on their nature, structure and exposure to hazard, as well.[4]

Possible effects of weather extremes cannot be understood without knowing social, economic and cultural background of some community. Every disaster starts with a hazard, but hazard per self cannot make disaster. Context in which hazards appears leads to catastrophical consequences. Without people there is no disaster event. In that sense, when analysing the vulnerability of areas at risk, special attention should be focus on the analysis of socio-economical vulnerability.

2.1. Social aspects of vulnerability to weather-related risks

Technical responses related to natural hazards and climate impacts historically have been considered very important, still, over the past decades attention suddenly has shifted to a focus on vulnerability of society. Particular attention is given to reducing vulnerability to climate variability, hazards and extreme events through climate change adaptation and disaster risk reduction.

Social vulnerability is differentiated between and within groups through their institutional and economic position. Variability in social vulnerability comes with changes in living standard (it is likely that vulnerability will be less if there are adequate and sustainable life standard) and poverty appearances or reduction (poor population groups are more vulnerable and less able to recover from catastrophic event).

Institutional and political dimensions are also important in contextualizing socio-economic vulnerability, in sense of public amenities lack, or regulatory gaps and deficiencies on part of government, etc.

2.2. Economic aspects of vulnerability to weather-related risks

Except the strong influence of global warming and extreme weather conditions on realization of catastrophic events that threaten human lives and have a strong social influence, these events cause enormous financial losses. Accordingly, global economy are under influence of climate change, and therefore under the influence of weather related risks. Climate change affects the social wealth, availability of resources, energy cost and companies value. Through impact on the availability of raw materials, continuity of production, damage and destruction of production facilities, climate change has an effect on the capital market and stock prices.

According to Stern's report [5] on the impacts of climate change on the economy, predictions are that extreme weather conditions could cause the fall GDP for about 1%, and further increase of temperature by 2 to 3 Celsius degrees could reduce the total global economic output for 3%. If temperature increases for 5 Celsius degrees, this reduction could be around 10% and in the worst-case scenario, a total global consumption per capita could decline by 20%, which would have farreaching negative economic consequences.

The societies that are the most vulnerable to the effects of climate change i.e. weather-related risks are those located in coastal areas and rivers' deltas. But, at the same time, also areas whose economies depends on resources sensitive to climate change and areas exposed to extreme weather conditions, all stressed by process of accelerated urbanization.

3. VULNERABILITY REDUCTION: POSSIBLE ROOLE OF INSURANCE

If natural disaster is an intersection of two opposing strength, processes that generate socio-economic vulnerability (pressure) and appearance of natural hazards (physical exposure), then the idea of disaster mitigation is built on next assumption: pressure can be released on those exposed to risk only by decreasing or eliminating vulnerability.

Holistic management of disaster risk requires action to reduce impacts of extreme events before, during and after they occur, including technical preventive measures and aspects of socio-economic development designed to reduce human vulnerability to hazards. [6]

Managing weather-related risk and therefore also reducing vulnerability can be done using several techniques: risk retention, risk reduction, risk prevention, transferring risk, before disaster occurs and transferring risk, after disaster occurs. One of these techniques is particularly different from other risk management techniques. That is risk transfer, before disaster occurs and refers to risk management through insurance.

Which technique to use, differs from risk intensity. Also, they differ on timescale. Pre-event disaster risk reduction measures are adequate for low and middle layer risk. For high level risk, risk transfer is required (Figure 1).

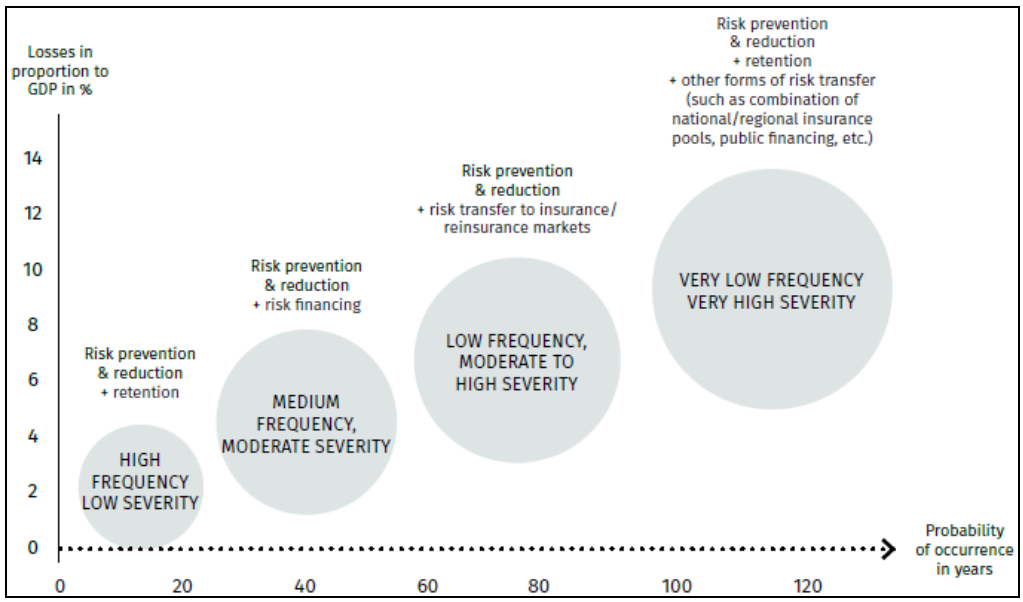

Figure 1. The risk-layering approach [1]

It is very important to notice that both, communities and households benefit when they predict and manage weather-related risks before they occur and cause losses.

3.1. Insurance as a vulnerability reduction financing tool

Risk transfer instruments refer to those adaptation measures aimed at limiting the financial impact of disasters on people by distributing the risk to other players in the market.[1] Risk transfer instruments are particularly effective in the case of low-frequency and high-severity events and are based on transferring part of the risk to a third party (e.g., an insurance and/or reinsurance company or the capital markets), and include both traditional insurance products and alternative risk transfer instruments (e.g., cat bonds).[1]

In its role as risk manager, risk carrier and investor, insurance have been recognized as an important mechanism for the decrease of socio-economic vulnerability of societies exposed to natural hazards. International milestones on disaster risk reduction [7], finance for development [8], new sustainable development goals [9] and a new climate change agreement [10] provide the context for strategic reflection on the policies and partnerships necessary to realize the full potential of insurance.

Insurance is preventive but also and corrective measure. The main principle of insurance is risk dispersion in space and time. Risk is transferring from individual to professional insurer. By insurance policy between the insurer and the insured, known as the policyholder, insurer undertakes that will compensate losses that may or may not occur. From that viewpoint,

insurance is preventive measure for individuals. Still, if insured event occurs, insurance indemnity will cover the loss and facilitate recovery process.

The essence of insurance, as an economic category, is that the owners of assets, who are exposed to certain risks, are joining, directly or indirectly, for the purpose of joint damage risk carrying, that eventually, could strike one of them, due to realization of a risk. Insurance has three fundamental functions: assets protection; financial function and social function. [11] By knowing these functions and principles of insurance, it is very easy to link insurance with disaster risk reduction and to comprehend benefits from that connection.

Insurance provides security opposite to economic shocks that occurred as a result of droughts, floods, earthquake, tropical cyclones and other weather extremes. The benefits of insurance, as a financial instrument, offer the possibility for developing countries to reduce poverty and to adapt to climate change. It also creates new business opportunities. New mechanism for transfer of catastrophic risk to global financial markets is opening new perspectives for reinsurers.

In terms of reduction of weather-related risk with catastrophic consequences, insurance activities need to be realized as part of a climate risk management strategy that includes activities that prevent human and economic losses from climate variability and extremes (Figure 2). The *Bali Action Plan* [12] calls for "consideration of risk sharing and transfer mechanisms, such as insurance" to address loss and damage in countries particularly vulnerable to climate change, i.e. developing countries.

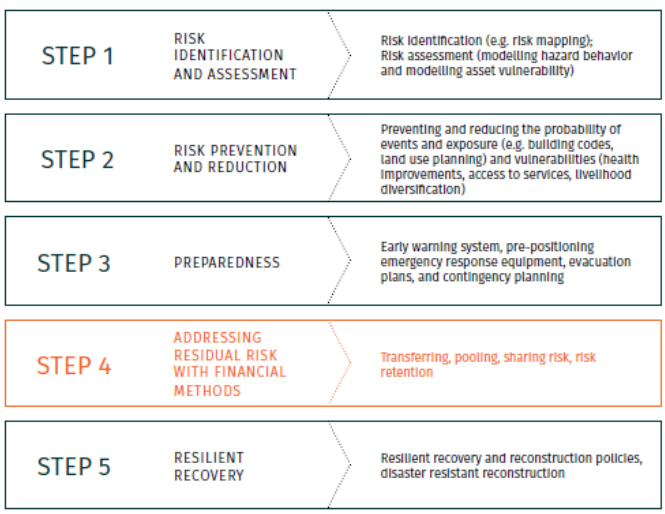

Figure 2. Insurance in the process of comprehensive climate risk management [1]

3.2. Insurance for developing countries vulnerability reduction

Possibilities for developing countries, if they incorporate insurance process of adaptation to climate change, are numerous, but still insufficient for all challenges that they are facing to. Slow climate impacts such as desertification or a sea-level rise are foreseeable and generally not suiteable for insurance companies. These foreseeable risks need to be addressed as prevention issue. Additional risks, such as floods and storms can and must be addressed to insurance.

In order to ensure that climate risks insurance became more accessible to the poor in developing countries, Index Insurance has been developed. Index Insurance is a good mechanism for reducing vulnerability to natural disasters in developing countries, where other, traditional insurance products are not always applicable, due to the underdevelopment of the insurance market, or because of the inaccessibility of financial mechanisms for managing risk from poverty. [1]

Index Insurance is most often used in agricultural insurance and has been developed as an alternative to traditional yield insurance of a number of risks. However, it is also applicable to insurance of property and investments from the consequences of natural disasters.

Unlike traditional insurance based on loss assessment and payouts after an extreme event occurs, Index Insurance pays out the agreed sum insured after an index has been triggered by exceeding a predefined threshold (e.g. a certain air temperature over a period of time or a certain amount of precipitation).

Index Insurance not requiring a claims assessment process. Insurance contracts are transparent and operating costs are considerably lower than for traditional insurance. The possibility of adverse risk selection and the emergence of moral hazard is completely excluded. Accordingly, considerable funds have been saved. This creates the conditions for reducing insurance premiums and therefore increases the availability of insurance in those environments where the insurance market is not sufficiently developed or not at all.

4. CONCLUSION

Insurance solutions have been recognized as one of the basic instruments for adapting to climate change and reducing the impact of natural disasters on exposed societies. Well-designed insurance instruments can provide powerful incentives for reducing risks and also societies vulnerability to weather variability. By reducing the effects of climate variability and extremes on national economies and providing security to escape poverty, insurance could have critical role in climate change consequences mitigation. All insurance and disaster risk management related activities can be take up as an important component that contributes to the sustainable development goals, as well as the quality of life on individual and population level. Accordingly, insurance must be seen as part of climate risks management and climate change adaptation strategy, which means, above all, actions that prevent human and economic losses due to weather extremes.

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