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Vol. 2, n. 1, jan./jul. 2020. ISSN 2675-1143.

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REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

SUMÁRIO – *SUMMARY* EDITORIAL ______6 EDITORIAL Eduardo Domingues INTERPRETAÇÃO JURÍDICA: CONSIDERAÇÕES PARA A ANÁLISE DE POLÍTICAS PÚBLICAS 10 JURIDICAL INTERPRETATION: CONSIDERATIONS FOR THE ANALYSIS OF PUBLIC POLICIES Ana Elisa Spaolonzi Queiroz Assis Luis Renato Vedovato DISASTERS AND THE LAW: THE BRAZILIAN CONTEXT AND A PERSPECTIVE ____ DESATRES E O DIREITO: O CONTEXTO E A PERSPECTIVA BRASILEIRA Délton Winter de Carvalho HISTORICAL EVOLUTION OF THE "GREENISATION" OF EUROPEAN GOVERNANCE: THE DEFINITION AND THE APPROACH OF ENVIRONMENT FROM A EUROPEAN UNION PERSPECTIVE 54 EVOLUÇÃO HISTORICA DA "ECOLOGIZAÇÃO" DA GOVERNANCA EUROPEIA: A DEFINIÇÃO E A ABORDAGEM DO MEIO AMBIENTE NA PERSPECTIVA DA UNIÃO EUROPEIA Giulia Parola ENVIRONMENTAL CATASTROPHES LAW AND LITERATURE: MAURICE BLANCHOT'S THE WRITING OF THE DISASTER 79 DIREITO E LITERATURA DAS CATÁSTROFES AMBIENTAIS: A ESCRITURA DO DESTASTRE DE MAURICE BLANCHOT Leonardo Mattietto

Vol. 2, n. 1, jan./jul. 2020. ISSN 2675-1143.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

THE FINANCIAL SUPERVISORY AUTHORITY IN GERMANY 90
A AUTORIDADE DE SUPERVISÃO FINANCEIRA NA ALEMANHA
Margherita Paola Poto
O PROJETO DE LEI N. 3515/2015 COMO POLÍTICA PÚBLICA DE MITIGAÇÃO DOS EFEITOS ECONÔMICOS DA PANDEMIA DE COVID-19 NO
BRASIL 126
THE BILL N. 3515/2015 AS A PUBLIC POLICY TO MITIGATE THE ECONOMIC EFFECTS OF THE COVID-19 PANDEMIC IN BRAZIL
Patrícia Durante
Lúcia Souza d'Aquino
DAS SENTENÇAS DA CORTE INTERAMERICANA COMO FORMA DE EFETIVAÇÃO DOS DIREITOS HUMANOS NA AMÉRICA LATINA 151 THE HARMONIZATION OF PUBLIC POLICIES IN COMPLIANCE OF THE JUDGMENTS OF THE INTER-AMERICAN COURT OF HUMAN RIGHTS Priscila Caneparo dos Anjos
AS CRISES BRASILEIRAS E OS DIREITOS SOCIAIS: COMO AS
DIFICULDADES ECONÔMICAS, POLÍTICAS E SANITÁRIAS AGRAVAM A
POBREZA EXTREMA NO COTIDIANO ATUAL 183
BRAZILIAN CRISES AND SOCIAL RIGHTS: how economic, political and health difficulties aggravate extreme poverty in today's daily life
Renata de Assis Calsing
Hadassah Laís de Sousa Santana
Júlio Edstron S. Santos

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

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DISASTERS AND THE LAW: THE BRAZILIAN CONTEXT AND A PERSPECTIVE

DESATRES E O DIREITO: O CONTEXTO E A PERSPECTIVA BRASILEIRA

Délton Winter de Carvalho^I

ABSTRACT

RESUMO

As a result of many factors (climate Como resultado de muitos change, technological change, land use last decades. Reflecting the worldwide increase in floods. landslides and droughts. My purpose in Part I is to context, their main features, numbers, the increased occurrence of disasters around the world and specifically in Brazil. Part II describes and details the Brazilian Disaster Legal Framework,

fatores (mudanças climáticas, mudanças decisions, economics, population growth tecnológicas, decisões de uso da terra, and demographic trends, among other economia, crescimento populacional e factors), disasters have increased in the tendências demográficas, entre outros fatores), os desastres aumentaram nas pattern, Brazil has and is facing the últimas décadas. Refletindo o padrão mundial, o Brasil enfrenta e está enfrentando o aumento de inundações, examine the disasters in the Brazilian deslizamentos de terra e secas. Meu objetivo na Parte I é examinar os desastres trends, and their relation to the global no contexto brasileiro, suas principais context. It describes climate change and características, números, tendências e sua relação com o contexto global. Descreve as mudanças climáticas e o aumento da ocorrência de desastres em todo o mundo e especificamente no Brasil. A Parte II presenting the legal strategies as well as descreve e detalha o Marco Legal best practices in terms of prevention and Brasileiro sobre Desastres, apresentando mitigation, preparedness and response, as estratégias legais e as melhores práticas

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REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

response to recent major disasters, the Brazilian Government and Congress have passed new statutes, not least of which are: Federal Decree 7.257/2010 and Federal Law 12.340/2010. This legislation focused on response and recovery, paying relatively little attention to addressing prevention and mitigation. It was only with the issuance of Federal Law 12.608/2012 that disaster prevention and mitigation started to be seen as the main goal of the National Policy of Civil Protection and Defense. The aim of Part II is to show that the current legal system seems to adopt a systemic approach to dealing with disasters and their different phases to be described in more detail Part II is divided into three main subjects and functions of Disaster Law: Prevention and Mitigation, Preparedness, Response, and Compensation.

KEYWORDS:

Disaster law in Brazil; Brazilian Disaster Direito dos Desastres no Brasil; Marco Legal Framework; National Policy of Legal Brasileiro sobre Desastres; Política Civil Protection and Defense; Federal Law 12.340/2010.

compensation, and reconstruction. In em termos de prevenção e mitigação, preparação e resposta, compensação e reconstrução. Em resposta a grandes desastres recentes, o Governo e o Congresso brasileiro aprovaram novos estatutos, entre os quais: Decreto Federal 7.257 / 2010 e Lei Federal 12.340 / 2010. Essa legislação se concentrou na resposta e recuperação, prestando relativamente pouca atenção ao tratamento da prevenção e mitigação. Foi somente com a emissão da Lei Federal 12.608/2012 que a prevenção e mitigação de desastres passaram a ser vistas como o principal objetivo da Política Nacional de Proteção e Defesa Civil. O objetivo da Parte II é mostrar que o sistema jurídico atual parece adotar uma abordagem sistêmica para lidar com desastres e suas diferentes fases a serem descritas com mais detalhes. A Parte II é dividida em três assuntos e funções principais da Lei de Desastres: Prevenção e Mitigação, Preparação, Resposta e Compensação.

PALAVRAS-CHAVE:

Nacional de Proteção e Defesa Civil; Lei Federal nº 12.340/2010.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

1 INTRODUCTION

As a result of many factors (climate change, technological change, land use decisions, economics, population growth and demographic trends, among other factors), disasters have increased in the last decades. Reflecting the worldwide pattern, Brazil has and is facing the increase in floods, landslides and droughts, mainly. For much of its natural disaster history, Brazil has addressed severe droughts in the northeast of the country, but this has recently been changing in significant ways. There has been an intensification of disasters as a whole, with special concerns recently over floods and landslides.

The road-map for the paper is as follows. My purpose in Section 2 is to examine the disasters in the Brazilian context, their main features, numbers, trends, and their relation to the global context. It describes climate change and the increased occurrence of disasters around the world and specifically in Brazil. This part outlines the key disasters that have occurred in Brazil and introduces the reader briefly to their legal context in the Brazilian setting.

Section 3 describes and details the *Brazilian Disaster Legal Framework*, presenting the legal strategies as well as best practices in terms of prevention and mitigation, preparedness and response, compensation, and reconstruction. In response to recent major disasters, the Brazilian Government and Congress have passed new statutes, not least of which are: Federal Decree 7.257/2010 and Federal Law 12.340/2010. As we will see, this legislation focused on *response* and *recovery*, paying relatively little attention to addressing *prevention and mitigation*. It was only with the issuance of Federal Law 12.608/2012 that disaster prevention and mitigation started to be seen as the main goal of the National Policy of Civil Protection and Defense. The aim of Part II is to show that the current legal system seems to adopt a systemic approach to dealing with disasters and their different phases to be described in more detail.

Section 3 is divided into three main subjects and functions of Disaster Law: Prevention and Mitigation, Preparedness and Response, and Compensation. These are the interconnected strategies, where Law plays a key role, helping society to avoid, prepare

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

for and respond to disasters. Thus, the focus of this paper is to provide an overview over Disaster Law in Brazil as it exists, both in its potential and its weaknesses.

2 DISASTERS IN BRAZIL

Disasters have become a worldwide concern in recent years due to their significantly increased occurrence. The same holds for Brazil. According to EM-DAT - 2007, there were a reported 150 disasters from 1900 to 2006, 84 percent of which occurring since the seventies. Thus, the reality and perception of a sharp increase in the past several decades. In addition to the overly 8,000 human fatalities, the economic losses are estimated at approximately US\$ 10 billion. The Brazilian Atlas of Natural Disasters (*Atlas Brasileiro de Desastres Naturais*) lists as many as 31,909 occurrences of "natural" disasters in Brazil from 1991 to 2010. Although these figures differ from other sources, they corroborate the general sense that a growing number of disasters have taken place (ABDN, 2012).

Brazil recent and rapid economic growth has brought along with it rising numbers of human-made hazards. Legal scholars, emergency practitioners, politicians and government officials have already begun to focus on the role of the legal system in preparing for and responding to such events and their severe consequences.²

Brazil within the global setting. The increasing trend in disaster occurrences in Brazil takes place with the context of a global rising pattern. Figure 2 shows the rising global trend as reported in data from 1900 to 2011.³

² As an example of this increasing interest, see: CARVALHO, Délton Winter; DAMACENA, Fernanda Dalla Libera. *Direito dos Desastres*. Porto Alegre: Livraria do Advogado, 2013; FARBER, Daniel. "Disaster Law and Emerging Issues in Brazil." *Revista de Estudos Constitucionais, Hermenêutica e Teoria do Direito* (RECHTD). 4(I):2-15, jan-jun, 2012. Available at: http://www.unisinos.br/ diversos/revistas/ojs/index.php/RECHTD. Accessed on 03.03.2013.

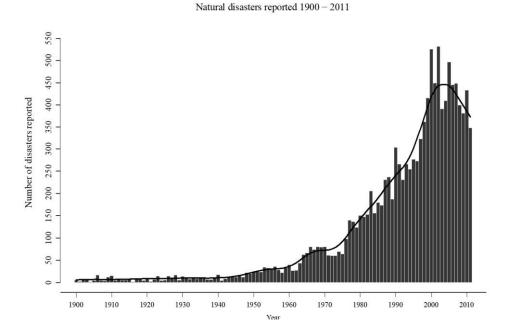
Vol. 2, n. 1, jan./jul. 2020. ISSN 2675-1143.

¹ Available on: http://www.inpe.br/crs/geodesastres/nobrasil.php. Accessed on 03.21.2013.

³ According to EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be – Université Catholique de Louvain, Brussels – Belgium. Available at: http://www.emdat.be/natural-disasters-trends. Access on 04.04.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

Figure 2: Natural disasters reported from 1900 to 2011



Source: According to EM-DAT: The OFDA/CRED International Disaster Database – www.emdat.be – Université Catholique de Louvain, Brussels – Belgium. Available at: http://www.emdat.be/natural-disasters-trends. Access on 04.04.2013.

Notwithstanding the underlying scientific uncertainties⁴, climate change (i) seems to play a prominent role in the rising trends, along with other factors that amplify the risks and costs of disasters, such as (ii) the modern economic conditions, (iii) population growth and demographic trends, (iv) land use decisions, and (v) the existing infrastructures, built and environmental (FABER et all, 2010).

The *Intergovernmental Panel on Climate Change – IPCC 2007 Report* considered it *very likely* (which denotes a likelihood of 90-100%) "that hot extremes, heat waves and heavy precipitation events will become more frequent." In spite of the scientific

⁴The existence of scientific uncertainties concerning the relation between climate change and the increase in the disasters, particularly natural disasters, are confirmed by GRID ARENDAL/UNEP. Available at: http://www.grida.no/graphicslib/detail/trends-in-natural-disasters a899. Accessed on 03.21.2013.

⁵Available at http://www.ipcc.ch/. Access on 04.11.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

uncertainty regarding climate change and its effects, it seems clear that climate change has been causing an escalation of so-called extreme weather events over the last decades.

As a good representation of the current state of the science, the 2007 Report considers the warming of the climate system to be "unequivocal", since increases can be observed in "global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level".

According to the 2012 Special Report of the Intergovernmental Panel on Climate Change, evidence suggests that some extremes weather events have changed and increased as a result of anthropogenic influences. For the report, there is i) "medium confidence" that anthropogenic influences have contributed to an intensification of extreme precipitation on a global scale; ii) a likelihood of 66-100% probability) of an anthropogenic influence on extreme coastal high water increase due to an increase in mean sea level; and iii) also the likelihood that anthropogenic influences have led to warming of extreme minimum and maximum daily temperatures on a global scale (IPCC, 2012).

In line with accentuating extreme weather events, climate change exacerbates existing vulnerabilities in developing countries due to the fact that economic costs and frequency of disasters have increased in the recent past. Even if the absolute economic costs are greater in developed countries, developing countries face higher mortality rates associated with recent disasters (96% of all disaster-related deaths). [You need a citation for the previous finding and preferably an example, like an earthquake of xx magnitude in developed country y lead to zz deaths but the same magnitude earthquake is developing country yy lead to zzzz deaths]. Also, the financial costs of extreme weather events represent a greater proportion of Gross Domestic Product –GDP (STERN, 2008, p. 115-118). Current experiences with extreme weather events can demonstrate how devastating droughts and floods may be increasing poverty in already vulnerable communities and countries.

In a circular process feedback, there is also "high confidence" (about 8 out of 10) that climate change will impose greater challenges for managing catastrophic risks, thereby making it harder to assess, communicate and manage these risks (IPCC, 2012, p.

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⁶ Available at http://www.ipcc.ch/. Access on 04.11.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

27). Climate change, as a *risk multiplier* (these risks have often existed for a long time, but are now heightened by the consequences of a hotter world), tends to destabilize not only the environment but the social structures as well. As we face more stress over natural resources (such as water, energy, soil, and so on) and among groups (communities, countries, regions, etc), conflicts are prone to arise or to be intensified where they already exist.

Therefore, *climate sensitivity* tends to exert greater pressure with regard to so-called "natural" disasters. They can also exert greater destabilization in social relations, intensifying the possibilities of increased anthropogenic disasters. Thus, the occurrence of disasters and their recent increase is related to a pattern of cumulative exposure, vulnerability and climate events (IPCC, 2012). In this sense, it is important to keep in mind that the occurrence of disasters and their recent growth is in all likelihood linked to the convergence of physical and social factors, resulting in events sufficiently severe to affect human lives, properties, services and environmental resources.

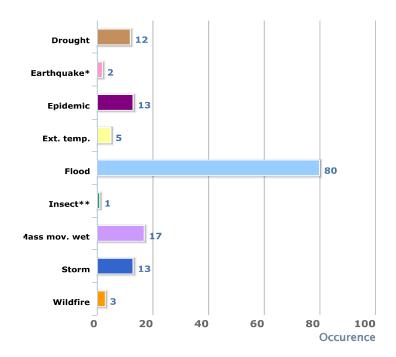
For much of its history of natural disasters, Brazil has mainly limited itself to address severe droughts in the Northeast,⁷ but this long standing pattern has recently been going through a broad and rapid change. There has been an intensification of disasters as a whole, with special concerns over floods and landslides.⁸ Although droughts intensified in the period, floods and landslides were the most constant, hard-hitting and severe natural disasters from 1980 to 2010, as shown below:⁹

⁷ For Margareta Wahlstrom, Assistant Secretariat General for the United Nations International Strategy for Disaster Reduction: "For much of its history, Brazil has been blessed like almost no other country of its size to be almost free of such calamities. Earthquakes, tornadoes, hurricanes, blizzards, erupting volcanoes – none have proved threats to Brazil. *Until recently, the most costly and best known disasters were severe droughts. But in the last few years the increasing frequency of floods, high winds and storms has become part of the new normal of Brazil.*" Available at: www.unisdr.org e http://greeeconomics.blogspot.com/2011/01/adapting-to-natual-risk-case.html. Accessed on 04.18.2013.

⁸ For Swiss Re's head of corporate solutions for Brazil, Fabio Corrias: "Natural disaster will likely become more frequent in Brazil and also more costly in terms of human lives and government expenditures (...). Brazil has traditionally had a very low exposure to natural disaster, but during the last five years the frequency of events such as heavy rains, floods and avalanches has increased (...)." (RINDEBRO, U.. Natural Disasters Likely to Become More Frequent, Costly – Swiss Re – Brazil. Business News Americas. 2011. Available at: http://www.bnamericas.com/news/insurance/natural-disasters-likely-to-becomemore-frequent-costly-swiss-re. Accessed on: 06/04/2013.)

⁹ Available at http://www.preventionweb.net/english/countries/statistics/?cid=24. Accessed on 04.26.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO



Against this backdrop, the strategies adopted by the latest Brazilian laws tend to place more emphasis on the catastrophic consequences of floods and landslides. To that end, recent disaster prevention and mitigation measures have focused on land use plans, contingency plans and risk maps.

3 BRAZILIAN DISASTER LEGAL FRAMEWORK

In response to the recent disasters, the Brazilian Government and Congress passed new statutes, particularly Federal Decree 7.257/2010 (which sets criteria for recognition of *state of emergency*¹⁰ and *public calamity*¹¹ in areas hit by disasters, and for fund transfers for relief efforts, assistance for disaster victims, restoration of essential services and reconstruction); and Federal Law 12.340/2010 (which frames the implementation of response and recovery actions in areas hit by disaster, sets out proceedings for the flow of funds from the Federal, State and Local Governments, and outlines the constitution and management of the Special Fund for Public Calamities). This legislation has focused

Vol. 2, n. 1, jan./jul. 2020. ISSN 2675-1143.

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¹⁰ According to article 2, item III, of Decree No. 7.257/2010, *state of emergency* is an "abnormal situation brought about by disasters causing damages that involve the partial impairment of responsiveness of the affected government."

¹¹ According to article 2, item IV, of Decree No. 7.257/2010, *public calamity* is an "abnormal situation brought about by disasters causing damages that involve substantial impairment of responsiveness of the affected government."

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

on *response* and *recovery*, while little attention has been given as of this writing to addressing *prevention and mitigation*.

After the worst natural disaster recorded in Brazil, where 918 people were killed in the hilly region of Rio de Janeiro state by floods and landslides in 2011, a new piece of legislation, Federal Law 12.608/2012, was issued. The importance of this lies in the fact that for the first time disaster prevention and mitigation are seen as the main goal of the National Policy and System of Civil Protection and Defense Act (Federal Law 12.608/12) [is this a minister, a White paper, a formal policy—you need to be clear if you are going to capitalize the phrase]. The statute sets out the: i) arrangement between the Union, the States, the Federal District and the municipalities for disaster reduction and support to the affected communities; ii) systemic approach to prevention, mitigation, preparedness, response and recovery; iii) priority for preventive actions related to disaster mitigation; iv) adoption of the river basin as the unit of analysis for the prevention of water-related disasters; v) planning [processes? procedures? guidelines?] based on research and studies regarding areas of risk and impact of disasters in the country; and vi) participation of the civil society. 12

This *statute's guidelines*, mainly regarding priorities for both the *systemic* (prevention, mitigation, preparedness, response and recovery) and the *preventive approaches* (ii and iii in the preceding paragraph), underscores how the entire system seems structured after a "circle of risk management" (FARBER, 2012, p. 3): "each stage of the circle of disaster is part of society's risk management portfolio." This set of strategies to prevent, mitigate, respond, compensate and rebuild are linked under the need for a *full circle risk management*, unifying Disaster Law (FARBER et all, 2010). This "disaster cycle" also serves as an *analytic heuristic* to assess the efficacy of preventive and response actions, as well as to evaluate what went wrong in these strategies and phases.

¹² According to article 4 of Law 12.608/2010.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

3.1 Preventive and Mitigation Legal Strategies

Despite the importance of prevention in Disaster Law and the key role it plays in the Brazilian legal system, this function only gained significance in the most recent legislation concerning disaster-related issues when Law No. 12.608/2012 was passed. Up to then, only issues under environmental law (environmental damage and risks) were treated preventively. Disasters would become a legal concern only after their occurrence.

Although one objective of the National Policy of Civil Protection and Defense is "disaster risk reduction"¹³, the picture posed in policies and in federal action is somewhat different. In 2012 the Federal Government spent much more in response and recovery (R\$ 279,687,808.96) than in prevention (where the government spent only R\$ 22,841,781.23) and risk management (only R\$ 14,949,888,17). ¹⁴ This demonstrates a considerable financial discrepancy between the law in the books and government action, which in the case of catastrophic events is even worse due to its frequent feature as low probability and great consequences events.

The Brazilian disaster legal system is primarily a land use-oriented strategy, focusing mainly around floods and landslides. For example, *municipalities* have the exclusive competence to legislate building codes and land management codes. Building codes do not play a key role in disaster prevention in Brazil, with no major earthquakes or any other seismic events in the country (INTERNATIONAL RED CROSS, 2012). Floods and landslides, being the most frequent and catastrophic events, are perceived to be better addressed through land management codes (called *Municipal Development Plans*) which are applied by the City Council. Land management codes are also within

¹³ According to article 5 of Law No. 12.608/2012: "The National Policy for Civil Protection and Defense objectives are: I - disaster risk reduction."

¹⁴ Data available at: http://www.contasabertas.com.br/website/noticias/arquivos/887_Tabela%201.pdf. Acessed on 04.29.2013.

¹⁵ These Land Management Codes set urban development policies, determining which areas within the limits of each municipality are assigned for each building purposes (industrial, commercial, housing, leisure, special use areas such as environmental protection and so on).

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

the primary legislative competence of the municipalities¹⁶, which are required to follow some general directives set by Federal Law¹⁷.

Because of their primary competence and responsibilities in land management, municipalities *play a key role in disaster risk management*, especially considering that the main focus and priority of recent legislation is to avoid losses caused by major floods and landslides. Following the issue of the National Policy for Civil Protection and Defense, it is a statutory obligation for the municipalities to "identify and map out disaster risk areas" within their limits. ¹⁹ The information in these risk maps must be taken into consideration in the *land management codes* (preventing new settlements in risk-prone areas²⁰ and, in some special cases, urging the relocation of these communities), and must consider the *basin management plan*²¹. They also are required to *conduct regular drills according to contingency plans for civil defense and protection*. ²²

At the *state level*, these entities are required to identify and map the risk-prone areas as well as draft reports identifying hazards, susceptibilities, and vulnerabilities, in articulation with municipalities and the Union.²³ They are also required to monitor the meteorological, hydrological and geological risk areas, in conjunction with the Union and

¹⁶ According to article 30, item VIII of the Brazilian Federal Constitution of 1988, Municipalities shall "promote, where applicable, appropriate land through planning and controlling the use of fragmentation and occupation of urban land."

¹⁷ As an example, Law 10.257/2001 is one of the most relevant federal laws in setting a general framework for urban management and policy.

¹⁸ Article 8, IV, Law 12.608/2012.

¹⁹ Municipalities included in the National Registry with areas susceptible to high-impact landslides, flash floods or geological or hydrological processes shall i) prepare a risk-prone areas map; ii) draw up a Civil Protection and Defense Contigency Plan; iii) create an implementation plan of public works and services for the reduction of disaster risks; iv) control and monitor risk-prone areas, avoiding new settlements; v) draw up a geotechnical chart for new urban settlements (according to article 3-A, of Law 12.340/2010).

²⁰ Article 8, V, Law 12.608/2012.

²¹ As another National Civil Protection and Defense Policy guideline: "the adoption of the watershed as a unit of analysis of disaster prevention actions related to water bodies." (article 4, IV, Law 12.608/2012).

²² Article 8, XI, Law 12.608/2012.

²³ Article 7, IV, Law 12.608/2012.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

Municipalities.²⁴ It is the statutory duty of each state to prepare its *State Plan for Civil Protection and Defense*.²⁵

To this end, the Federal Government role is to support the states, federal districts and municipalities in identifying and mapping out the risk-prone areas and draft reports identifying hazards, susceptibilities, and vulnerabilities in close coordination with municipalities and the Union.²⁶ One of the main duties and roles of the Union in the National Policy of Civil Protection and Defense System is to keep a national register of municipalities with respect to the areas that are susceptible to high-impact landslides, flash floods or disasters related to geological or hydrological processes.²⁷ The federal government created the Center for Natural Disasters Monitoring and Alert (Centro de Monitoramento e Alertas de Desastres Naturais - CEMADEN), headed by the Ministry of Science and Technology. 28 Located in the city of Cachoeira Paulista (São Paulo State), the center is responsible for managing information from data issued by radar, rain gauges and weather forecasts. Among the duties of CEMADEN are: i) developing natural disaster alerts concerning protective actions and civil defense in the country; ii) conducting and disseminating research and studies aimed at producing information needed to plan and promote preventive action to avoid natural disasters; iii) operating computer systems needed for the preparation of natural disasters warnings; iv) promoting capacity-building, training and support activities for education in its areas of expertise; and v) providing natural disaster alerts for the National Center for Risk Management and Disaster (Centro Nacional de Gerenciamento de Riscos e Desastres - CENAD²⁹), which

²⁴ Article 7, V, Law 12.608/2012.

²⁵ Article 7, III, Law 12.608/2012.

²⁶ Article 6, IV, Law 12.608/2012.

²⁷ Article 6, VI, Law 12.608/2012.

²⁸ According to Federal Decree 7,513/2011.

²⁹ This center (CENAD) was created by Federal Decree No. 5.376/2005, and its main function is to improve disaster response by the State. This organization has a multidisciplinary team with instruments to integrate and gather information from many other governmental agencies to monitor critical situations and manage the preparation for and the response to disasters.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

integrates the Ministry of National Integration, in support of the National System of Civil Protection and Defense.³⁰

In other words, this promising system presents some operational and implementation limitations, especially in view of the fact that the disaster-related public policy tradition in the country has previously been focused on response and recovery rather than on prevention and risk management. It is clear that there is still an absence of a national, let alone regional, risk prevention culture in the country, again as a result of the low level of perceived risk and few preceding disasters in the national and collective memory. Likewise, there is no nationwide risk management planning in the country: actions and plans are associated with the Civil Defense and are applied in isolation, both at the state and municipal levels (PNGRD, 2012, p. 66). Although the new legal framework has a systemic approach to the disaster circle and uses prevention as its guideline, there is not as yet a consolidated culture of management or a public policy for disaster risk reduction, especially in terms of prospective action.

There is a striking lack of data in the country to support analysis and define standards and technical criteria for monitoring processes and analyzing events associated with disasters. The databases are individually designed, maintained and updated by each organization, with not enough data being shared among them to fully integrate important information for disaster risk management (PNGRD, 2012, p. 79).

Finally, the main focus of this structure enacted by law 12.608/2012 is to deal above all with "natural" disasters (floods, landslides, tropical storms, and droughts). The main risk management strategies in this legal system include, among others, raising awareness, creating an information system, drawing up contingency plans, and controlling land use, all of which is focused more on consequences (C). This legislation, therefore, is at risk of not giving as much attention to preventing the probability of disasters (Pf) – by using approaches such as landscape reconstruction, ecosystem services (green infrastructure), built infrastructure, and so on – as to dealing with their consequences of failure (Cf). If the tools and strategies to prevent and mitigate probability

³⁰ According to information available at the *Center for Natural Disasters Monitoring and Alert* (Centro de Monitoramento e Alertas de Desastres Naturais - CEMADEN) website: http://www.cemaden.gov.br. Accessed on 02.05.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

and consequences are not balanced, this means risk, as Pf x Cf, are not being fully evaluated, let alone managed.

However, the focus shift from response strategies to prevention and mitigation strategies is an improvement of the Brazilian legal system for disaster risk reduction. Some practices have been successful.

There has also been an improvement of better practices used for disaster prevention and response, in light of lessons learned from the latest occurrences. In the state of Santa Catarina many projects have raised the awareness of disaster risks in the communities living in risk areas, a joint effort by the Santa Catarina Civil Defense and CEPED -University Center for Disaster Research and Studies of the Federal University of Santa Catarina (PNGRD, 2012, p. 47). In the state capital, Florianópolis, an urbanization project supported by the three levels of government – union, state, and municipality – has been implemented, where the state is in charge of setting up the sanitation network (for sewage and collection of rain waters, among other functions), putting in place a drainage system, as well as opening and/or paving streets within the area (most existing streets in slums are in general too narrow and tight to allow for adequate mobility). After the construction of some mud retaining walls, these were painted by the community in an attempt to bring people together and encourage them to voice their views. This project covers engineering works, relocation of families, building of new houses, according to the situation on the ground (INTERNATIONAL RED CROSS, 2012, p. 45). Another city, Blumenau, has mapped out its risk areas, implemented a warning system for intense rain, carried out slope stabilization works and removed poorly-built houses from risk-prone areas. In this city, soil assessments provided by the Municipal Secretariat of Geology are required for the release of all permits for new constructions (PNGRD, 2012).

Another example [of what?] is where the Geological Survey of the State of Rio de Janeiro has been carrying out landslide analyses and diagnoses since 2007, providing emergency assistance to municipalities and mapping out all geohazards within their area. In the city of Rio de Janeiro, the *Rio Alert System* has been implemented, featuring rain gauge stations set up to monitor rainfall and to issue warnings to the public through the press and city agencies responsible for the removal of families from areas of geological hazard, in addition to other preventive actions.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

Brazilian courts have a very intense litigation over environmental issues. Such actions can be filed by a single person (for individual injuries, such as health and property) or, in case of collective and diffuse interests (suits similar to class actions, called Ação Civil Pública³¹), by entities such as the Prosecutorial Office (Ministério Público), NGOs, the Office of the Public Defender (Defensoria Pública), among others. To that end, recent decisions of the courts have demanded demonstration of a "concrete risk" (CARVALHO, 2013)³².

In one particular case, the Prosecutorial Office sued the Municipality of Petrópolis and the State of Rio de Janeiro, arguing that they had failed in their constitutional duty to supervise the occupation of urban land and enforce their environmental responsibility. The Prosecutorial Office wanted the court to impose on these entities the adoption of measures to restore the urban environmental balance, thereby preventing further occurrence of landslides. In preliminary injunction and final judgment, the Prosecutor requested the Civil Defense to: i) report to the Court the technical and regulatory criteria used for classifying a given area as being a high-risk, medium and low-risk area for landslides; ii) carry out such risk ratings at the area which was the object of the proceeding; iii) present in court the report and timetable for any work to be carried out on site; iv) remove residents living in at-risk or environmental conservation areas and relocate them as an emergency measures; v) and levy a daily fine for non-compliance with the measures. However, the lawsuit was dismissed in the first-instance judgement and in the Court of Appeal. According to the Rio de Janeiro State Court decision: "The existence of a concrete risk on the site which is the object of this action has thus not been proved."³³ Yet, in another case, the same decision was upheld:

> "Notwithstanding the widely publicized tragedy in the mountainous region of the State of Rio de Janeiro, [with] evident omissions on the part of Public Authorities concerning environmental degradation and

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³¹ Law 7,347 of July 1985.

³² In Brazilian Environmental Law, *concrete risks* are those which are specific, quantifiable and known. This terminology is used in distinction to *abstracts risks*, or uncertain risks.

³³ BRASIL. Tribunal de Justiça do Rio de Janeiro. *Apelação Cível No. 014588-95.2011.8.19.0042*. Décima Terceira Câmara Cível. Des. Agostinho Teixeira de Almeida Filho. Ruling on: 28/03/2012. "Prosecutors (...) filed more than 300 civil suits, all designed to prevent landslides in several areas of the city of Petrópolis. No causal link demonstrated. Distinct causes of action. Initial petition does not mention the real risk in the area indicated. Responsibility of each federal entity and other defendants unspecified. Initial petition correctly rejected. Precedents of the House. Appeal Dismissed."

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

uncontrolled settlement of areas that should have been preserved, the risk intended to be prevented must be pointed out, in a concrete manner, in the initial petition."³⁴

On the other hand, many decisions imposing preventive measures concerning uncertain risks in Environmental Law issues have been taken under the Precautionay Principle. It should also be pointed out that courts are very sensitive to the irreversibility argument. When a serious environmental risk imposes some kind of irreversibility, and this is reasonably demonstrated, many courts use the *Precautionary Principle* to impose injunctions.

For instance, under the Precautionary Principle, the *Paraná State Court* prohibited a hazardous waste disposal facility to settle above the Guarani Aquifer. In its decision it was sustained that "this facility for ultimate hazardous waste disposal cannot be installed in an area located on the Guarani Aquifer, one of the largest water reserves in the world (...). [E]ven when employing high technology, respecting all the expertise available at the current stage of development of science, it is still possible that failures will occur, which (...) in this specific location would cause an immeasurable ecological catastrophe, since the waste to be treated on-site is extremely hazardous."³⁵

3.2. Preparedness and Response

Preparedness as a phase of the disaster cycle is meant to organize and plan strategies to respond to a disaster when it occurs. Preparations seeks to reduce risks and consequences for individuals and communities, often realized in the form of *emergency* plans. These mechanisms identify and determine the organizational structures, functional authorities and bodies called upon to intervene in a disaster at the regional, local or community level for coordination and resource management (ARAUJO, 2000, P. 15-18). The main preparation activities are Emergency Plans and Training Initiatives.

³⁴ BRASIL. Tribunal de Justiça do Rio de Janeiro. *Apelação Cível NO. 0015114-62.2011.8.19.0042*. Décima Oitava Câmara Cível. Des. Helena Cândida Lisboa Gaede. Ruling: 13/03/2012.

³⁵ BRASIL. Tribunal de Justiça do Paraná. *Reexame Necessário e Apelação Cível No. 347935-4*, Quinta Câmara Cível, rel. Des. Leonel Cunha, j. 18/12/2007.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

The plans are meant to cover prevention, mitigation, preparedness, response, rehabilitation and reconstruction. Among the main points to consider are defining the roles for the participating agencies, identifying threats and vulnerable area, preparing an inventory of physical, human and financial resources, stipulating a strategic location for resources and supplies, determining and marking out evacuation routes and areas for temporary accommodation, and establishing a public network of internal communications and public information. Training and provisioning first responders and the community are crucial for taking action and mitigating the disaster. This includes informing the community about the threats of the area and how to act in disaster, conducting simulation exercises and disaster situations, and training the personnel involved in emergencies.

In Brazil, all levels of government (federal, state, federal district and municipalities) must have a Plan for Civil Defense and Protection, according to the new statute issued in 2012.³⁶ Noteworthy in this context is Recommendation No. 40 issued by the National Council of Justice in Brazil on June 13, 2012, urging State Courts to draw up action plans to address and resolve situations arising out of natural calamities and environmental disasters, whenever facing an emergency or when a state of emergency is declared.³⁷ This document serves as an Emergency Plan for state courts, assuring them guidance to maintain their operational work during and after a disaster takes place. Some of the suggestions of the National Council of Justice are: i) to establish a crisis cabinet (including ideally prosecutors, public defenders, the Brazilian Bar Association – OAB, and the Civil Defense); ii) to concentrate provisionally all operational activities and public services (prosecutors, public defenders, the Brazilian Bar Association - OAB) in one place, making it easier for the public to access the judiciary; iii) to authorize reciprocal assistance among district judges where the calamity took place, so as to forestall any restriction of competence during the exceptional period of time; iv) to extend the number of judges and civil servants on duty; v) to suspend procedural deadlines; vi) to regulate the possibility of requesting movable and immovable property essential for responding to emergency and crisis situations (without prejudice to future compensation claims against

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³⁶ According to articles 6, VI (Union), 7, III (States), and 8, III and XI (Municipalities), of Law 12.608/2012.

³⁷Available at http://www.cnj.jus.br/atos-administrativos/atos-da-presidencia/322-recomendacoes-do-conselho/19843-recomendacao-n-40-de-13-de-junho-de-2012. Acessed on 05.21.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

the State); vii) to develop a protocol for decisions concerning burial authorization applications, with guidelines to deal with difficulties faced under environmental disaster situations; viii) to develop a protocol for decisions concerning cases where it is impossible to fully identify the claimant, given the loss of official documents; and ix) to install a Childhood and Youth Court in order to deal with situations involving children and youth, such as deciding about temporary custody and other situations involving minors at risk.³⁸

The response to disasters is the step that corresponds to the implementation of the actions set out in the preparation stage. The fundamental objective is to save lives, reduce suffering and protect property. To this end, the pre-established emergency plan must be put into practice. This step is critical to coordinate interagency actions specified in the emergency and contingency plans, thus bringing about a greater degree of integration between bodies responsible for organizing disaster (Civil Defense / Civil Protection). This is the moment to carry out activities such as the search and rescue of victims and the provision of medical assistance to the affected population. At this stage of a disaster, the role of law is to define and provide, under the rule of law, clear guidelines for responses to emergency conditions, which also requires planning and appropriate training. The relief efforts consist of immediate actions to respond to disasters in order to assist the affected population, including search and rescue, first aid, pre-hospital care and medical and surgical emergency, among other measures established by the Ministry of National Integration.³⁹ This phase further comprises the actions of providing assistance to victims and restoring essential public services.

An interesting example of better practices in disaster preparedness and response was implemented in some municipalities in the state of Rio de Janeiro, where SMS messages were used to alert community leaders, set up meeting points for emergency situations, enable volunteers to gain access to ambulance-boats and rainfall data from the Center for Civil Defense (NUDEC), conduct educational campaigns and survey techniques.⁴⁰ This practice proved to be efficient, improving disaster risk communication,

³⁸ Article 1, CONSELHO NACIONAL DE JUSTIÇA. *Recomendação n. 40*, de 13 de Junho de 2012. (NATIONAL COUNCIL OF JUSTICE. Recommendation No. 40, of June 13, 2012). Available at http://www.cnj.jus.br/atos-administrativos/atos-da-presidencia/322-recomendacoes-do-conselho/19843-recomendacao-n-40-de-13-de-junho-de-2012. Acessed on 05.21.2013.

³⁹ According to article 2, V, Decree no 7.257/10.

⁴⁰ Information available at www.rio.rj.gov.br/defesacivil, visited on May 13th 2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

accelerating the evacuation procedures and helping to improve public awareness (and behavior) by providing information about the disaster situation to the most vulnerable community members.

3.3. Compensation Legal Strategies

3.3.1 Governmental Assistance for Response and Recovery

In the Brazilian legal system, there are two kinds of government financial support for disaster response. One is a compulsory federal funding and another a voluntary shared fund.

Financial transfers by the Union to the States, Federal District and municipalities are compulsory for the purpose of assisting in the *implementation of relief efforts,* providing assistance to the victims and restoring essential services. [don't you need to say "under xxx authorizing legislation" or something like that?] These transfers are conditioned to the prior declaration of a state of emergency or a public calamity situation by the public entity affected by a disaster, and its recognition by the Federal Government through the Ministry of National Integration.⁴¹

n the other side, *The Special Fund for Public Calamities - FUNCAP*⁴², is a fund constituted by shares paid annually by the Union, States, Federal District and Municipalities. The main purpose of this fund is to pay for *reconstruction actions* in areas hit by disasters in the federated entities and is, therefore, also conditioned to the declaration and recognition of a *state of emergency* or *public calamity situation*. All payments made into this fund by the States, Federal District and municipalities are voluntary. If payments are carried out, the Union undertakes to pay three shares for every fully paid share.⁴³ The entity that has paid shares into the fund may only withdraw resources after two years of payment, but in case of a disaster, withdrawals can be made at any time, adding up the amounts paid by the federal entity affected by disasters and the

⁴¹ According to article 8, Law 12.340/10.

⁴² Created by Decree Law 950/69 and reshaped by Law 12.340/10.

⁴³ According to articles 9 and 11, of Law No. 12.340/2010.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

amounts paid proportionally by the federal entity. That is, in case of a disaster, for every one Brazilian Real (1R\$) paid by the entity, this entity would be entitled to withdraw four.

3.3.2 The role of Tort

Brazil has a *Civil Law tradition* and its Tort Law is deeply influenced by the European Civil Liability Theory. The role of Tort Law is an increasing field regarding disasters and compensation of disaster-related damages. In the Brazilian Legal System, the general rule for civil liability is the Negligence Standard, though "dangerous activities" are ruled under strict liability.⁴⁴ Environmental damages in general are also ruled under a strict liability regime⁴⁵, as well as some specific damages such as oil spills⁴⁶, nuclear accidents⁴⁷ and other, mainly industrial activities.

In cases of so-called "natural disasters", the Municipalities often tend to be sued for damages recovery, while in "industrial accidents" the activity itself is liable for the damages. Brazilian courts and legal scholars have refused to accept any reason to exclude civil liability for environmental damages, such as *act of God*, if the causality between the fact and the activity is proven.⁴⁸

In cases of such disasters, many Municipalities are being held liable for damages arising mainly from floods and landslides. Although some courts use the negligence liability standard and others use strict liability, the main argument to hold local government liable is the breach of duty of care and protection. While under the negligence standard courts consider as duties only those obligations expressed in the legal texts, the use of strict liability takes into account whether the public officials had the information about the risk, whether this risk was foreseeable, whether it would be reasonable to expect

⁴⁴ According to article 927 of the Brazilian Civil Code (Law 10.406/2012).

⁴⁵ Article 14, First Paragraph, Law No. 6.938/1981.

⁴⁶ Article 21, Law No. 9.966/2000.

⁴⁷ Article 4, Law No. 6.453/1977.

⁴⁸ Some Brazilian authors who adopt this theory: MILARÉ, Édis. *Direito do ambiente*. São Paulo: Revista dos Tribunais, 2011; BENJAMIN, Antonio Herman. "Responsabilidade Civil pelo dano ambiental. *Revista de Direito Ambiental*. No. 09, ano 03, São Paulo: RT, 1993; LEITE, José Rubens Morato; AYALA, Patrick de Araújo. *Dano Ambiental: do individual ao coletivo extrapatrimonial*. São Paulo: RT, 2010.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

them to act, and whether they would have been able to avoid damages had they taken action.

For instance, the Court of Justice of the State of Rio Grande do Sul decided:

"CIVIL APPEAL, LIABILITY, FLOODING OF RESIDENCE. FLOOD. OBJECTIVE LIABILITY OF PUBLIC ENTITY. FAILURE TO CARRY OUT MAINTENANCE AND CONSERVATION WORKS ON RAIN WATER DRAINAGE AND CONTAINMENT OF WATER COURSE FLOW. (...) State liability for Omission. When dealing with liability of the State by omission, the theory of objective liability applies, according to which the citizen must prove the omission, damage and causal link. The omission able to generate the duty to indemnify is related to the breach of a legal duty to act. Enforceability of conduct examined from the principle of proportionality and the circumstances of the particular case. In case of floodings or floods, the responsibility of the Public Administration is the administrative omission in carrying out the works necessary for the prevention, reduction or mitigation of the effects resulting from floods of public waters, in spite of the verification of strong and continuous rains."49

In another case, the *Court of Justice of the State of Rio de Janeiro* demonstrated some limits, considering some kind of moral hazard, as in the following decision:

"Risk area. Refusal of the plaintiffs to leave the site. Objective liability." No causal link demonstrated. Case dismissed. Maintenance. Claim that the city of Rio de Janeiro be sentenced to supply housing provided with minimal infrastructure (living room, two bedrooms, kitchen, bathroom and garage), located in the vicinity of the community where the plaintiffs reside, in addition to compensation for moral and material damages. Undeniably the right to housing is enshrined in the Constitution of the Republic with the status of a fundamental social right. Nevertheless, the Municipal Development Plan of the city of Rio de Janeiro does not support the claim to impose on the local authority the provision ofhousing in the manner intended. The plaintiffs irregularly built on a risk area, and regardless of the fact that their residence had been hit by the landslide that occurred in 2006, chose to remain on the site, building another property, not accepting the relocation option suggested by the municipality, according to the terms found under the social assistance report attached to the present case file. Any damages arising out of such a decision cannot be imputed to the

⁴⁹ BRASIL. Tribunal de Justiça do Rio Grande do Sul. *Apelação Cível No. 70042861070*. 9ª Câmara Cível, rel. Des. Leonel Pires Ohlweiler, j. Outubro 2011.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

municipality, which carried out the necessary containment works on the site."50

Thus, the Municipality has broad duties of care towards the citizens, but once it demonstrated that the only reason of the damages were due to the plaintiffs refusal to move out of the risk-prone area, the case was dismissed.

4 THE LACK OF INSURANCE

Despite the importance of an insurance system to deal with disaster damages and risks, mandatory insurance schemes to reduce disaster risks do not exist. The only case on record of insurance for damages caused by *extreme weather events* was the program called "Emergency Action", which was set down by Decree 6.910/2009 and covered small-scale farmers hit exceptionally hard by floods and droughts.⁵¹

There is another related insurance scheme for family-based agriculture, Family Farming Insurance (SEAF – Seguro da Agricultura Familiar), which covers natural events that cause crop losses, such as excessive rain, frost, hail, drought, excessive temperature variation, strong wind and cold winds, among other events. Under this scheme, family-based farmers may additionally receive 65% of the expected net income prior to destruction of their crop by natural events.⁵²

The third scheme, valid for the Northeast region and covering incidences of drought or excessive rain, is named "Crop Guarantee" (Garantia-Safra) and aims to foster familiar agriculture in the region.⁵³

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⁵⁰ BRASIL. Tribunal de Justiça do Rio de Janeiro. *Apelação Cível No. 0193579-61.2007.8.19.0001*. Segunda Câmara Cível. Relator: Des. Elizabete Filizzola. Ruling on: 15/08/2012.

⁵¹ Available at: http://www2.camara.leg.br/legin/fed/decret/2009/decreto-6910-22-julho-2009-589830-norma-pe.html. Accessed on: 05.26.2013.

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⁵³ Available at: http://www.mda.gov.br/portal/saf/programas/garantiasafra. Accessed on 05.25.2013.

REVISTA DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIREITO DA UNIRIO

5 CONCLUSION

Responding to an increase in the occurrence of disasters, the Brazilian Government and Congress issued several statutes concerning the role of government and the law in terms of response, compensation and recovery. Recently, however, the National Policy for Civil Protection and Defense (Law No. 12.608/12) was passed, shifting the gravitational center of the legal system for disaster management from a mainly disaster response model towards a model focused on prevention.

From now on, the legal system is meant, at least in policy, to follow a systemic approach, where prevention (risk management) must link all phases and strategies, interconnecting prevention and mitigation, response, compensation, and rebuilding. Given its recent issue and markedly shifting approach, there is still a lack of tradition in disaster risk reduction. As an example, nationwide integration of information about disasters, as well as strategies to prevent and respond to these events, are still missing. Some successfully implemented practices remain very isolated, while shared experiences, information and actions are still absent.

Nevertheless, the Brazilian legal approach concerning the prevention and response to disasters seems quite promising, not only because of its focus on some interesting interconnected land use tools (dealing with probabilities such as land use development plans, watershed plans, risk mapping, information systems, warning systems), but also because it has encouraged the development of an institutional structure (Civil Defense, CEMADEM) that allows for more efficiency when it comes to preparedness and response to disasters, while fundamentally enforcing disaster prevention.

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