

PUBLIC GOVERNANCE TO TACKLE CLIMATE CHANGE IN CURITIBA AND THE SURROUNDING AREA

Governança pública para o enfrentamento das mudanças climáticas em Curitiba e entorno

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Resumo

Este texto apresenta uma síntese sobre a discussão do processo da governança socioambiental climática em âmbito local, sem deixar de lado aspectos globais e nacionais. Nestas escalas emergiram, nas últimas décadas, novos atores e novas formas de gestão, tanto no setor público e privado quanto no terceiro setor e em coletivos de ação. O conteúdo explicita uma análise crítica do processo de governança local — nos municípios de Curitiba, capital do estado do Paraná, e de seu entorno, Fazenda Rio Grande e Araucária — especificamente sobre o segmento ligado às instituições públicas. A argumentação foi construída a partir de um mapeamento sobre as ações e políticas de vários órgãos governamentais, estaduais e municipais. Privilegiam-se nessa análise, as categorias de enfrentamento, prevenção e mitigação aos possíveis desastres e perigos associados às condições climáticas futuras e suas inserções no âmbito da Política Estadual para as Mudanças Climáticas, documento que direciona a governança estadual na área.

Palavras-chaves: Eventos climáticos; Governança socioambiental; Políticas públicas; Riscos e perigos.

Abstract

This paper presents an overview of the discussion on the process of socio-environmental climate governance at the local level, without neglecting global and national aspects. In recent decades, new actors and new forms of management have emerged on these scales in the public and private sector, as well as the third sector and collective action. The study makes a critical analysis of the local governance process in the municipalities of Curitiba, the state capital of Paraná and its surroundings, in Fazenda Rio Grande and Araucária, specifically regarding the segment connected to public institutions. The argument was constructed from a mapping of the policies and actions of various state and municipal government agencies. In this analysis preference is given to the aspects of tackling, preventing and mitigating possible disasters and hazards associated with future climate conditions and their insertion into the State Policy on Climate Change, the document that directs state governance in the area.

Key words: Climatic events; Environmental governance; Public policies; Risks and hazards.

Résumé

Ce document présente une discussion sur le processus de gouvernance environnementale climatique au niveau local, sans pour autant négliger les aspects mondiaux et nationaux. Dans ces échelles ont émergé, au cours des dernières décennies, de nouveaux acteurs et de nouvelles formes de gestion dans les secteurs public, privé, le tiers secteur et l'action collective. Le contenu met en évidence une analyse critique du processus de gouvernance locale - dans la ville de Curitiba (Brésil) et ses environs, notamment aux communes de Fazenda Rio Grande et d'Araucaria - en particulier sur le segment relié aux institutions publiques. L'argument a été construit à partir d'une cartographie des actions et des politiques de divers organismes gouvernementaux, de l'État du Paraná et des trois municipalités. L'analyse prend en compte principalement les catégories de luttes, de prévention et d'atténuation des catastrophes et des risques associés à des conditions climatiques futures et leurs insertions dans la politique de l'État sur le changement climatique.

Mots-Clés: Événements climatiques; Gouvernance environmental; Politiques publiques; Risques et catastrophes.

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INTRODUCTION

Global climate change has been prominent in recent decades among the most controversial environmental issues, with scientific, political, economic, cultural, media and environmental repercussions in many different spheres. In fact, in the environmental context, it has been the most recurring theme, internationally, from the mid-1980s to the present day and has generated a ream of studies, indicators and projections of scenarios that in terms of political and scientific organization began with the creation of the IPCC (Intergovernmental Panel on Climate Change) in 1988 and with a proposal for international governance on the issue, formalized by the United Nations World Conference on Environment and Development, Rio-92.

A representative group of scientists from around the world has stated, through the IPCC, in particular from the 4th Assessment Report (IPCC, 2009), that average global temperatures have increased by about 1.5 °C over the last two centuries and there will be an intensification of approximately 2 to 6°C in the twenty-first century. Of interest here is one of the Panel's statements that the residents of large cities will be the most affected by these changes. The National Climate Change Assessment Report (Executive Summary PBMC, 2012), presented by the Brazilian Panel on Climate Change in June 2012, foresaw the intensification of the droughts in the Northeast and North and increased rainfall in the South and Southeast. According to the study, signed by 128 researchers from several Brazilian universities and research institutes, the biomes of the Amazon and the Caatinga will be under extreme threat by the end of the century, while in the Atlantic Rain Forest and the Pampas in the South, rainfall will increase by up to 30%.

In Brazilian cities, marked by the phenomenon of "corporate urbanization" (SANTOS, 1993), risks will be exacerbated according to a global logic that, since the late twentieth century, has displayed the phenomenon of global demographic concentration in urban agglomerations with a process of accelerated urbanization, increasing the number of areas and populations vulnerable to natural or technological risks and socio-environmental disasters.

This situation, which is aggravated in the metropolitan fringe and the peripheral regions of cities such as the Metropolitan Region of Curitiba (MRC), sets up a propitious environment, due to its own vulnerability to the possible harmful effects of accelerated climate change, as indicated by the modeling of future scenarios on climate. Examples of possible undesired side effects include more storms accompanied by flooding, the resurgence of tropical diseases, and changes in habits and cultures.

Given this situation, considered by many as worrying, and by some as alarmist, approaches to the subject have been very varied, divided between those used by scholars to establish the worsening of anthropogenic climate change and "skeptical" researchers who relativize the influence of human beings and their socio-productive system on the process.

This article addresses social and environmental governance, especially climate governance, relying on the more general views of Viola, Barros-Platiau and Leis (2008) and Borsato (2012), to analyze the public policies and actions that address the issue in the Metropolitan region of Curitiba / PR.

The text presents an inventory of the actions of public institutions in three cities in this region: its hub, the city of Curitiba, and the municipalities of Araucária and Fazenda Rio Grande, which make up the Metropolitan Region (RM). Within this urban area, several authors - including Fritzsos at. al. (2001), Mendonça (2004), Francisco (2005), Lima (2008), Hummel (2009) and Bosa and Lombardi (2011) - have reported environmental problems related to natural or technological disasters. In this sense, climate change can intensify the problems described in the literature.

To complete the proposed inventory some categories were elected for data collection from the list of public institutions identified in the three municipalities: the City Hall, state secretariats of the environment and the Civil Defense of the municipalities and the State, as well as other public



agencies related to the theme in some way. To further the understanding of the logic of public policies that define the actions in progress or proposed actions, the survey included the Government of the State of Paraná and secretariats related to the theme, highlighting the State Secretariat of the Environment and its programs, including the Forum on Global Climate Change of Paraná.

It should be noted that in the public sector in Paraná the Forum was the precursor to the discussions on the subject and it was where the discussions to implement the Coordination of Climate Change in 2007 began, as well as the development and creation of the State Law on Climate Change, which established the State Policy on Climate Change, the basic document to start this research.

Preliminarily, a search was carried out in scientific publications and the information on the topic available on the websites of public institutions and printed documents was examined. Next, a script was written for the interviews with representatives of related agencies, these were digitally recorded and annotated; some interviews were conducted by email. The results were entered into a spreadsheet organized around categories that served to identify whether the actions were of tackling, mitigation and adaptation, deployed in the analytical subcategories described below.

During the field research (2012-2014), most of the actions listed were in the phases of proposition or implementation; there was little emphasis on prevention to deal with problems arising from climate change. Most of the proposed actions appear to have been set out to meet international and national governance recommendations on the subject, that is “top-down”, according to Viola, Barros-Plataiu and Leis (2008). The inclusion of these measures in local and regional public policies ensures resources from various origins for funding, as well as promoting the organization of a market, such as in certifications, including professionals focused on the public-private management of climate change. However, the space for risk governance (Renn, 2008), where the subject under study belongs, still seems to lack practices that favor the active and constructive participation of the different social actors involved in decision-making.

ON THE NEW GOVERNANCES TO CLIMATE GOVERNANCE AND ITS CONCEPTS

The environmental crisis in the modern world emerges in parallel to a crisis of governance, visible almost simultaneously in the last decades of the twentieth century. One of the concepts of governance chosen for this study is that developed by Santos (1997):

Governance refers to the patterns of coordination and cooperation among social and political actors and the institutional arrangements that coordinate and regulate transactions within and across the borders of the economic system, including not only the traditional mechanisms of aggregation and articulation of interests, such as political parties and pressure groups, as well as informal social networks (providers, families, managers), hierarchies and associations of various types (SANTOS, 1997, p.342).

In the panorama of fin de siècle crises that entered the second millennium new forms of governance emerged in all sectors and in the most diverse scenarios at the global, national and local levels, beyond the State and its crises that accumulated in the decade of 1980-1990, with the impact of the neo-liberal vision of the economy and politics. These “new governances” materialized in the private-business sector and advanced on areas previously managed exclusively by the public authorities (SANTOS, 2005). Participatory mobilizing, citizen-based management alternatives also emerged, which in the second millennium began to resist hegemonic modes of management in all social sectors - technical, administrative, political, economic, legal, welfare, health and knowledge, all through social participation.

Borsato (2012) refers to Wapner (1996), to point to the expansion of the governance process, including the environmental area, considered as new governance, which inserted new actors and mechanisms for participation in the global arena, filled with public, private and citizen’s interests:



Understanding the governance process extends the debate on the mechanisms of participation of actors on the international scene, involving several segments, such as the United Nations system, sectorial international regimes, different actors representing the market, and the increasing participation of sectors of civil society, including NGOs, which increasingly play a strategic role in the implementation of environmental policies in the local, regional, national and global spheres; contributing to the global formation of civic policy (BORSATO, 2012, p.20).

International forums like the United Nations (UN) and its various agencies, managers of crises of global concern, illustrate the concept of global governance, a term coined in the areas of law and international relations. According Barros-Platiau et al. (2004), the concept refers to forms of influence and action of non-state collective actors in political processes and the elaboration of international legal standards expressed by these institutions and other regimes operating in the debate and regulation of contemporary international challenges. Thanks to their recognition and representation in different spheres of political, economic, cultural and scientific power, these collective bodies of global society seek to transfer their recommendations, guidelines and proposals for action, agreed at large transnational events, to the governments of the signatory countries, through specific legislation and public policy.

Global and national environmental governance has been guided by the creation of specific forms of articulation and cooperation between various social actors, especially those of the third sector, which strengthened by the State crisis, involve the development of new instruments for environmental management geared to the needs and challenges of maintaining or achieving quality of life in the nature-society binomial in the scenario of the accelerated globalization of market capitalism, which promotes social and environmental injustices. (BORSATO, 2012) With specific regard to climate governance, it should be noted that for many years the issue was restricted to the scientific sphere. The addition of more and more information and readings that allowed the projection of troubling scenarios in terms of risks and hazards to the planet's population, resulted in a shift, especially from the Convention United Nations Framework on Climate Change in 1992, towards the scope of "promoting and supporting public policies that address the need to stabilize climate change" (PINTO, 2012, p.12). Thereafter, the process of global governance regarding the issue accelerated when 166 signatory nations of the aforementioned Convention, a number which subsequently expanded, agreed to annually monitor and report their emissions of greenhouse gases (GHGs) to the international community, at appropriate forums.

Following the governance process spearheaded by the UN, the international Kyoto Protocol treaty set global targets to reduce greenhouse gas emissions for developed countries. The conflicts between economic and environmental interests became explicit, clearly expressed by the non-adherence of the United States to the protocol. The modern rationale, where economic reason always prevails opposed the precepts of the environmental rationale advocated by Leff (2006), which perceived it as a new logic engendered by a paradigm shift needed to balance the conflicts between society and nature.

To better understand the issue of climate governance it is necessary to integrate it with the concept of climate security, considered incipient by many authors, which has been in preparation since 2006, with respect to the growing concern about global warming among the list of environmental issues affecting the planet. Maintaining global climate stability, which has ensured civilizational development since the last Ice Age, is an attempt to mitigate the effects of global warming and adapt to a warmer climate with more frequent extreme weather events.

The relationship between climate governance and climate security has established itself in terms of the more objective character (hard) of relationship between human society and atmospheric circulation, setting limits beyond which it is not possible to think in terms of adaptation. Climate security requires



humanity to make a clear choice to prioritize the mitigation of global warming over adaptation (VIOLA et al., 2008, p.8).

According to the authors mentioned above, climate related governance is “marked by official negotiations that slowly construct a regime for the climate”. (VIOLA et al., 2008, p.7). For these authors, so far this governance has shown “disappointing results in the face of the reported future scenarios and has had little participation of non-state actors.”. (VIOLA et al., 2008, p.7). In a very critical view of developing countries and South, a vision shared by Brazilian diplomacy, they highlight that “environmental governance corresponds to an agenda imposed by some rich European countries like the UK, France and Germany on the rest of the world”. (VIOLA et al., 2008, p.7).

In this scenario, the governments of hundreds of countries have put an agenda of recommendations, guidelines and actions into their public policies as a way of coping with environmental issues, creating national forums for environmental governance in specific areas. According to Viola et al. (2008, p.6), this top down governance takes place when public authorities become more accountable and transparent in the eyes of society: “They respond to the demand for greater social control and are accountable to other social and international actors in general.” The publications of government websites giving information on programs, specific legislation, priorities and budgets, such as various sites of government agencies examined in this research, illustrate this form of governance. Whereas bottom up governance forms when “non-state actors take possible solutions to the public authorities or resolve them themselves” (VIOLA et al., 2008, p.7).

From Pittock’s point of view (2005), governance will only be effective if the various social actors act together in the search for positive results in policies related to climate change. Thus, civil society - business people, environmentalists, scientists and other groups - should make joint innovative efforts to reduce carbon emissions and achieve a gradual transition of the whole society to a low-carbon economy use.

In turn, Renn (2008) uses the concept of risk governance - a process that should involve representatives of all social groups - to understand the effective participation of all the actors / stakeholders involved actively and constructively, to create a discourse to establish the possibility of drawing up a common dialogue about the risks to be faced and their management. It is in this sense that Di Giulio and Ferreira (2014) argue that “in situations of risk associated with climate and environmental changes, or potentiated by these phenomena, the practice of a more open and participatory decision-making process, which includes the perceptions, needs and interests of the affected communities, is relevant” (p. 33). These authors understand that due to the complexity and uncertainties involved in these processes, regulatory decisions “cannot only be sought in technical knowledge; they should include the participation of stakeholders and involve the public,” (p. 33).

The empirical outline of this article examines the processes of climate governance carried out by public institutions; the top down approach. Giddens (2010, p.279) argues that public climate governance should “encourage a more widespread awareness of the need for action.” For him, the success of public policies in the area depends on the ability of governments to “get people to admit that the risks are real and pressing,” so that, through attitudes and daily practices, they address the prevention and mitigation of greenhouse gas emissions and other forms of acceleration of anthropogenic global warming as factors of climate change.

Pelling (2003) also advocates expanding the range of actors in the climate governance process, especially in urban areas, affirming the importance of establishing strong partnerships between local communities and their internal grassroots organizations, external governmental and non-governmental organizations, the private sector and between municipal governments and state / national governments.

Thus, the spaces for governance reproduce themselves in terms of the creation of legislation, public policies, programs, measures and actions for the state / regional / municipal areas, with par-



participation in forums and other collectives for action involving mobilized citizens, like management committees, municipal councils, public hearings and specific forums representative of civil society.

Furthermore, as theoretical support to illuminate the analysis undertaken herein, it is necessary to signal the concepts already mentioned; prevention, adaptation and mitigation (VEYRET, 2007; MARANDOLA, 2009). They are considered pillars for climate governance, seen as the risks and vulnerabilities to which the population and the environment are exposed. In addition to the above are the concepts of resilience (MARANDOLA, 2009 and PITTOCK, 2005), now appropriated by the socio-environmental sciences; and transformation, advocated by the Ecuadorian economist Alberto Acosta (2013).

The “risk society” (BECK, 1997; GIDDENS, 1991), is characterized by its high degree of reflectivity. Due to various factors it has a greater perception of the increased occurrence of socio-environmental problems and as a result, the perception that society is more exposed to risks and vulnerabilities. It is understood that the risk (peril, danger, threat) is socially constructed and that “for the first time humanity has known and accomplished the means of its own destruction” (VEYRET, 2007, p. 15). Although it refers exemplarily to technological risks, the author’s statement may also be related to climate change intensified by anthropogenic activities.

Vulnerability, in turn, refers to “the magnitude of the likely impact of a peril on the targets” (VEYRET, 2007, p. 24), which may be human, socioeconomic and environmental. It is also possible to refer to the degree of exposure or susceptibility to risks and disasters, the “weaknesses and capacities of people and systems to go through the experience of danger” (MARANDOLA JR. 2009, p.37). A risk event, whether it occurs or not, can be regarded as “how population groups, places or institutions can withstand the impacts of danger, absorbing the impacts (vulnerability), recovering to the state prior to the event (resilience) or changing behaviors, norms or territorial planning itself (adaptation)”. (MARANDOLA JR., 2009, p.37, emphasis added). Therefore, resilience is understood, as “the ability of a system to adapt to changes resulting from a crisis and improve its responsiveness taking future disasters in to account” (VEYRET, 2007, p.43). These authors’ concept of resilience provides an opening giving new meaning to a concept with its genesis in mathematics, biology and psychology, regarding the capacity to return to the situation prior to the impact. For them, the concept of resilience is close to the concept of adaptation.

Another concept raised by Marandola Jr. (2009) is the adjustment associated with adaptation. However, although it also deals with change it does so more subtly, in the short and medium term, it is generally perceived and / or stimulated in the pre-event. However, adjustment does not cover a complete transformation, but instead the small adjustments to processes, which differentiates this concept from mitigation, a broader adaptation strategy, which refers to the existence of demand where there is specific damage that must be mitigated.

In addition to resilience and adaptation, the risks and vulnerabilities arising from socio-environmental problems such as climate change can be addressed from the governance point of view - in the most rational and important way in the process under discussion - by prevention, taking measures to impede their concretization as events that result in danger, risk or vulnerability, a possibility divulged in the environmental field by what is called the precautionary principle. If already in progress, climate change and its effects can also be addressed by mitigation measures and actions.

A brief overview of Federal public policies and those of the State of Paraná, which cover the municipalities involved herein in the context of climate change management, verifies how public governance provides ways of confronting the issue, through the understanding of prevention, adaptation and mitigation.

PUBLIC POLICIES AND CLIMATE CHANGE

Before addressing federal and state public policies on climate change, it is important to emphasize Pittock’s (2005) view that governments have a duty to set equitable standards, goals and

rules of behavior with respect to policies related to the area in question. This equity in countries, between countries and between generations is what will facilitate the achievement of the objectives of these policies, although its success always depends on the effective participation of the whole of civil society: businesses, consumers, investors and innovators. For the author, policies and laws are only effective if civil society want them to work and it is crucial to consider the urgency of the measures and how they can be successful, avoiding hazards and reducing the risks of natural disasters related to climate change, both in the near future and for future generations.

The National Policy on Climate Change - NPCC (BRAZIL, 2009) was established by Law # 12.187 / 2009, enacted on 15/09/2010. In Article 12, the law states that to achieve its goals the country will adopt actions to mitigate greenhouse gas emissions as a voluntary national commitment, with a view to reducing projected emissions between 36.1% and 38.9% by 2020.

In assessing how the state and local government initiatives are connected with each other and with national policy through evaluation of various public policies, Albuquerque (2012, p.96) states that “it is clear that until now passing state laws on climate change has occurred in an autonomous and disconnected way in the country. “ The author points out that state policies established after the adoption of national policy “maintain this pattern of non-alignment with the NPCC, with some specific exceptions” (ALBUQUERQUE, 2012, p.96), according to data of the Ethos Institute, 2012. The document *The challenge of harmonizing public policies on climate change* states: “If on the one hand, this characteristic values initiative and particular process in each State, on the other, the lack of coordination and standardization can entail difficulties in the governance of state climate change policies.” (CLIMATE FORUM, 2012, p.16).

The State Policy on Climate Change of the State of Paraná - SPCC-PR (Paraná, 2012) established by Law 17.133 of 25/04/2012, guides the development of a State Plan on Climate Change and other projects, programs and actions in the area, most still under development / implementation in 2013. For the purposes specified in the State Law it is stated that in addition to terms used in national policies (adaptation, adverse effects of climate change, emissions, source, greenhouse gases, impact, mitigation, climate change, sink, vulnerability) the Nationally Appropriate Mitigation Actions (NAMA), defines appropriate mitigation measures in each developing country in the context of sustainability, with technological and financial support, and adequate training to ensure they can be measured, reported and verified (Art.2, I). In national legislation, the term is only mentioned. State law also spells out the expressions extreme weather events; inventory of emissions of greenhouse gases; and “climate system”.

In both laws the understanding of adaptation refers to initiatives and measures to reduce the vulnerability of natural and human systems in view of the current and expected effects of climate change. Thus, as the understanding of mitigation is standardized, referring to the technological changes and substitutions that reduce resource use and emissions per unit of production, as well as the implementation of measures to reduce emissions of greenhouse gases and increase the sinks, the SPCC-PR extends the concept of mitigation to the act of mitigation, using the aforementioned Nama definition. Regarding the understanding of vulnerability, under the two laws, there is only an inversion in the word order of the text, leading to a similar concept (art.2 of the respective laws).

For the understanding of climate change, both laws adopt a similar concept, but with some differences in word choice and composition. The text of the NPCC is cited that understands climate change as able to be attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is added to changes caused by natural climate variability observed over comparable periods.

The two laws have precaution and prevention as principles (Article 3 in both laws) within the broad condition of sustainable development, although what each of these principles and conditions means is not defined. The principles of citizen participation and common but differentiated responsibilities are still adopted. In state law, the principles are only named, without definitions,



which presupposes knowledge on the part of the legislator / legislated regarding: the protection of the climate system, prevention, caution, the polluter pays principle, the conservers-beneficiary, sustainable development, information, transparency and participation, and common but differentiated responsibility. As well as the lack of a definition, the law mixes principles linked to general conditions such as sustainable development and protection of the climate system, with specific principles like polluter pays or conservers-beneficiary.

The two laws establish their respective instruments in quite a correlative manner, contrary to what Albuquerque (2012) states. At the state level, governance should be organized through a State Environmental Fund and State Water Resources Fund; a State Plan on Climate Change (with the following structural axes: mitigation, vulnerability, impact and adaptation, research and development, education and outreach); with financial and economic mechanisms, related to mitigation and adaptation to climate change (Biocredit), which connects with the instruments defined by national law; an inventory of emissions; of monitoring and environmental standards systems, establishing measurable targets.

In short, the governance of the State of Paraná on Climate Change in the period in question (2012-2013), was defined as follows: Department of the Environment and Water Resources (SEMA), under the direction of the Coordination of Climate Change and the State Council on Climate Change, with representatives of the State executive branch for the environment, water resources and sustainable development; the Legislative Assembly, the municipalities and social entities related to water resources. The Climate Forum Document (2012) points out the following commitments in the State law: the objectives are the control and progressive reduction of anthropogenic emissions by sources and the strengthening of anthropogenic removal of greenhouse gas by sinks in the state territory (Art. 4). It provides for the creation of the State Fund for Climate Change (Femuc), to be administered by the State Council on Climate Change, chaired by the State Secretary for the Environment and Water Resources (Art. 7) and the creation of a Climate Entrepreneur Seal aimed at organizations that can prove a net reduction of emissions by emission reduction or neutralization (Art. 14, § 3).

A close reading of the two documents demonstrates that the national and the state governance of climate change is in line with policy national with respect to the technical concepts originating in scientific understanding, the PEMC-PR, differing only in small conceptual details and the peculiarities of each of the federal agencies, particularly regarding GHGs emission control and their forms of financial compensation, a mitigation measure. By prioritizing mitigation, state policy is in line with the view of Viola et al. (2008), on the understanding that mitigation actions can also be possible preventive actions.

METHODOLOGY: EXAMINING DOCUMENTS AND CHECKING SOURCES

The three municipalities defined as the area covered by this study, located in the southwest portion of the MRC - Curitiba, Fazenda Rio Grande and Araucaria - around the Upper Rio Iguaçu Basin / PR, are exposed to risks and socio-environmental vulnerabilities arising from floods, precarious sanitation (water availability, sewage treatment), occupation of watershed areas, and generation and disposal of solid waste, among other factors. The three municipalities have very different socioeconomic characteristics from each other.

Two stages of data collection were carried out to identify, in the context of public governance, actions to tackle and mitigate the disasters and risks associated with extreme weather events by the public institutions of these municipalities, as well as actions at the state and federal level.

The first consisted of the analysis of secondary data from official websites and documents published by public institutions, in addition to the legislative aspects at the local, state and federal levels, surveyed in a series of institutions. The data and information on each institution were orga-



nized on Excel spreadsheets, although not all the institutions investigated are part of the reflections in this text. The sheet was divided into the categories: infrastructure, legislation, management and financial aspects, technical and scientific aspects, forms of communication / dissemination / environmental education. These categories served to organize information in order to investigate the actions taken against natural disasters and possible increases due to climate change.

The second phase of the research comprised a deeper identification and analysis of the actions of some institutions: municipal Secretariats for the Environment and Civil Defense, the Global Climate Change Forum and the State Secretariat of the Environment at the state level. In each institution selected for the second phase interviews were conducted with technical representatives to verify their account of the institutional point of view of the issues in question, using the following points: 1) Natural Disasters in general (preventive and corrective actions); 2) Climate change (understanding and importance of the issue in the institution, identification of problems and associated consequences, interest and preparation of the institution on CC, preparation and government support; discussion of the topic in other municipal agencies). The analysis of documentary information found in the first stage, plus the analysis of the responses obtained in interviews, allows some conclusions about the state of the art of public governance in the three municipalities in question.

INFORMATION AND INSTITUTIONAL ACTIONS ON TACKLING CLIMATE CHANGE

The analysis of the information obtained from the websites gave an insight into how the institutions implement the actions against the foreseen climate changes, in addition to a first assessment of the preparedness of the government sector in relation to risks and vulnerabilities arising from extreme weather events, through legislative, infrastructure and / or management actions.

The ways the internal discussion of issues related to climate change in these institutions were also examined, leading to the conclusion that the disclosure of information on the issues under examination was done mainly through institutional websites or by promoting events and commemorative dates. Next, to a lesser extent, was disclosure made by means of databases, training, printed materials (books, technical bulletins, brochures, articles, etc.) and publication in the media in general. It is worth noting that except in specific instances, such as the Coordination on Climate Change and the corresponding Forum, the issue is little discussed, with no greater effort to involve the different representative community groups in the debate around the issue. This lack of inclusion of the different social actors involved, as evidenced by the government sites consulted was even more pronounced in municipal institutions.

Within the municipal institutions, the analysis of the information suggests that the city of Curitiba, as expected due to its status as the state capital, had stronger legal and institutional bases and presented broader forms of dissemination of the topic in relation to natural disasters than the other two municipalities. The work of the Institute for Urban Research and Planning of Curitiba (IPPUC) was noteworthy, with a level of elaboration and implementation of public policies far superior to the other municipalities of the MRC. However, with the exception of mitigation actions undertaken in partnership between the Municipal Secretariat for the Environment (SMMA) with the Public Housing Company of Curitiba (COHAB-CT) and the municipal Civil Defense, aimed at the removal, relocation or resettlement of families living in risk areas for natural disasters (floods, landslides) in the municipality, the other departments follow the same pattern as Araucaria and Fazenda Rio Grande. They only have a coping potential that allows preventive or corrective actions, depending on the political will (ARAUCÁRIA, 2013; CURITIBA, 2013; FRG, 2013). In other words, these municipalities have laws (organic laws and master plans) and minimum infrastructure to promote prevention, mitigation and adaptation; however, this depends on the priorities established by each government administration.



At the state level, it can be inferred that the State Secretariat on the Environment (SEMA) together with the Civil Defense of Paraná is one of the most active institutions in relation to issues related to climate change, working in the spheres of legislation, management and infrastructure, as well as coordinating a series of programs focused on environmental issues.

The State Civil Defense focuses most of its actions on the issues of prevention and relief of natural disasters and / or accidents. The main programs that have been developed are: Community Fire Service; Integrated Command and Emergency Operations Systems (SICOE); preventing forest fires; hazardous products and the state network of emergency radio amateurs. There are preventive actions against influenza, first aid, rains, floods, leptospirosis and lightning (PR CIVIL DEFENCE, 2013). It should be noted that the issue of climate change does not appear in the data collected on Civil Defense.

In turn, an analysis of interviews with representatives of the institutions in question, who were able to respond on the issues, made it possible to understand what has been done in relation to actions against natural disasters in the region and the prospects for actions to deal with the threat of climate change.

All the interviewees from Civil Defense agencies (one state and three municipal) stated that preventive measures were carried out for the risks involved, especially training, lectures and contributions to the formation of public policies or the action plans of the respective administrations. In terms of the mitigation process, corrective actions seem to be the most common. From the replies it is clear that these actions occur every time there is some kind of disaster, when the civil defense is called they diagnose the problem and trigger several departments that are mobilized to support the actions. This usually involves distributing disaster kits, such as tiles, plastics, cleaning supplies, among others, provided by governments and clothing / utensils often donated by the population. Another common action is the temporary removal of people from risk areas.

As for infrastructure and management, it can be said that the State Civil Defense, which underwent a process of restructuring in 2013/2014, is the institution that has the best structure to deal with the issue of natural disasters. The Civil Defense of Curitiba also has a structure that may be considered appropriate to its purposes. However, the civil defense structures of Fazenda Rio Grande and Araucária are quite poor, offering minimum working conditions.

Representatives of the municipal secretariats of Araucária and Fazenda Rio Grande, in turn, state that their departments elaborate public policies to deal with natural disasters, which was confirmed by the information on their websites, highlighting the action by the Civil Defense and the preventive removal of the population from risk areas.

Preventive actions are incipient and precarious in the three municipalities, reproducing the national reality. In conclusion, what predominate are migratory coping actions that occur whenever there are disasters; predominantly corrective actions. There are only preventive actions when removing the population from risk areas, which are not on the scale needed to prevent further disasters. The State Civil Defense is the most active body in terms of prevention, training and the development of guidelines that support laws and contingency plans.

According to the interviewees the main disasters that occur in the region in question are floods, heavy rains including hail, windstorms, landslides, intense waves of cold and / or heat. The most listed causes of risks and dangers caused by such disasters are related to the increase of the population and the occupation of risk areas, caused by unplanned urbanization, which is typical of peripheral areas.

Some of the interviewees, all technical specialists linked to government agencies, stated that, from their point of view, climate change is responsible for the increase in natural disasters, but others do not establish such a relationship, a ratio of 50%. When asked whether their institutions make a correlation between the local natural disasters and climate change, there is basically a division of



opinion: some of the interviewees said that in their institutions the view that climate change is the cause of local problems with natural disasters is predominant. Others claimed not to know of such a correlation in their institutions and some did not address the merit of the discussion. This division of opinion seems to resonate among technical staff and managers at the local level, as in the scientific field, between those who warn about the dangers of climate change with respect to the intensification of extreme events and those who are skeptical about their interrelations with these events.

With reference to natural disasters, all the interviewees admitted participating in events and / or discussions on the issue of natural disasters and their prevention / mitigation. However, in particular, on global warming and climate change, most do not notice or participate in internal discussions. Only one interviewee said that they “only follow the discussions” and two others stated that, in some way, they discuss the matter internally. On the website of the interviewees respective organizations there was almost no discussion or events related to the topic. However, the interviewees were unanimous in stating that if the IPCC scenarios were confirmed, local extreme weather events would intensify, both in the frequency of occurrences and their force, causing various losses, with the need for urban readjustment.

In terms of legislation, prior to the interviews, it had already been verified that the three municipalities have fairly consistent legislation on prevention - the respective municipal organic laws and master plans ensure the support of the quality of life of their respective populations. However, the existence of legislation alone does not offer guarantees, because political will is required to make these laws complied with in full. Many of the actions planned are not implemented.

Most interviewees said that neither the institutions nor their respective governments were prepared to deal with the worsening of disaster situations due to climate change; some said these preparations had been made, but it was clear that these replies were unfounded, acting as “politically correct” discourse. However, all admitted that their institutions were “interested” in the issue.

According to most of the interviewees government support “is insignificant”. Two civil defense representatives stated that their institutions are only remembered when disasters occur. The State Civil Defense is the one that has received the most attention from the government. The support involves training, support for mitigation works and financial resources. All the interviewees from municipal institutions admitted that when there are local natural disasters various sectors are mobilized to support solving immediate problems. Asked whether the issue in question was discussed, for example, in City Councils or local NGOs, all said they had no knowledge of this.

Although this study intends to analyze local realities, the data collected and the interviews in the State Secretariat of the Environment were decisive in understanding how public governance of the climate in Paraná, with its municipal overlapping, was being organized. The institutions dealing with this management process and that have their administration in the State and the municipalities are: the State Secretariat of the Environment (SEMA), through its Coordination of Climate Change (CMC) and the Forum on Global Climate Change of Paraná, which works within the above secretariat, emerging as the only institution in which, more effectively, some form of direct participation of civil society can be observed through representatives of specific segments. The State Council in the area, which could also have this representation, though in a more technical way and more closed to participation, had not been installed during the 2012-2013 biennium.

The Forum on Global Climate Change of Paraná was the forerunner of the discussions of this issue in the context of Paraná since its creation in 2005 (regulated by Law # 16,019 of December 19, 2008). The Coordination on Climate Change (CMC) was created from this forum in 2007. According to interviewees from the CMC, the Forum resulted from a demand from society. As verified, this collective can be considered a hybrid governance entity, but with a governmental emphasis; the scope of the representation of the population is still limited. The Forum is composed of representatives from various Secretariats and State Councils, the Chief of Staff, the State Coordination



of Civil Defense, the State Attorney General, the State Prosecutor, several institutes, universities and companies from Paraná, among others ([http //: www.forumclima.pr.gov.br](http://www.forumclima.pr.gov.br))

Between 2005 and 2010, the Forum organized and participated in a series of events, with an increasing number of actions (CHANG, 2012). In this period there were important disclosures of the IPCC reports, with a strong impact in the national media and the Paraná Forum tried to discuss and pass on the results of these reports in the context of Paraná, having developed various actions such as events and debates. However, according to interviewees from the CMC, between 2010 and 2012, the Forum hardly acted at all, due to political changes generated by alterations in the state government. This is a typical feature of governance in Brazil, where there is a lack of continuity of public policies, which should be transformed into State policies. The change of governments almost always involves a lack of continuity in the implementation of public policies and development actions, which could be avoided through greater engagement and participation of representatives of civil society. Only in 2013 did the CMC undergo restructuring and new actions were programmed.

Despite this decline in its activities in the period recorded, in the opinion of interviewees connected to the collective, the Forum is the place where there is the most dialogue with civil society, as it is the appropriate environment for it. The interviewees also indicated that there are issues and minor tasks that are the responsibility of the Coordination body, but is the Forum that has a more constant dialogue with the productive sector and with organized civil society, making it a more democratic space. The Forum is the binding element in the whole process of governance of climate change in the state.

One aspect which hinders actions in the area, according to one interviewee, lies in the fact that climate change is not visible and is intangible, so that working with the precautionary principle requires a process of continued education, not just at the base as he believes that environmental education on climate change is a process that must reach as far as the elderly, because it is intangible and very difficult to internalize. Thus, the lack of real understanding of climate change, still very intangible in Paraná, and the lack of internalization of the concepts and processes by society, could be contributing to the lack of more significant political positions on the issue.

Among the actions underway in the CMC during 2013 are: a working group to regulate the State Policy on Climate Change (the requirement by the Government of Paraná is in line with National Policy); the formalization of the coordinating body in an internal regulatory phase; the use of the budget allocation to monitor air quality in Curitiba, Londrina and Maringá; preparation of a system for industrial monitoring; a review of the resolution that establishes air quality standards; preparation of an inventory of greenhouse gases; and completion of the diagnosis of vehicle pollution.

SEMA carried out the project “Roads with Araucárias” in partnership with Embrapa Forests for the afforestation of rural roads, especially with the Araucária species. The CMC’s next actions are: diagnosis of greenhouse gases in the State; strategic planning for the next 20 years, with a set of programs, projects and actions to be established; production of five educational booklets for the general population on the subject; drafting of a resolution to monitor greenhouse gases; formatting of an integrated system of information and partnership between the Department of Planning and Sema; Elaboration of the State Plan for Vehicular Pollution - renewal of the fleet, no tampering, annual control, mobility and creating a work plan for the Forum; launching releases that require certain productive sectors to carry out greenhouse gas inventories, requesting membership and launching seals certifying the inventory, to be sanctioned by the state.

Sema was also setting up (2013-2014) a State system of integrated information on environmental management with World Bank funds (ring-fenced for Climate Change). The Secretariat of

Agriculture and Supply leads a working group called the Low Carbon Agriculture Program, which also mobilizes the issue of climate change.

According to CMC interviewees there were partnerships with other secretariats, such as Planning, with bodies such as the IAP (Environmental Institute of Paraná) and IA (Institute of Water); these two agencies were responsible for monitoring / inspections and the creation of an Interdepartmental Committee in the area.

The participation of municipalities in the process will occur through a questionnaire to be sent to their authorities in the area and through their representation in the Forum. The latter is implementing an agenda to fulfill the State MC Policy through thematic chambers and working groups (Environmental Education, Research and Climate Policy). In addition, it is working on two fronts, mitigation and adaptation, that cover prevention, thus not distinguishing between the concepts. As for the industrial sector, the intention is to expand the control system in the industries, with inspection activities and monitoring of emissions, and with decentralization of the control network currently established in Curitiba. There is a cooperation agreement between Sema and the Federation of Industries of Paraná (Fiep), covering not only climate change, but all environmental areas.

The interviews indicate that the government's internal bureaucratic process ends up delaying the progress of actions, which never flow in a single agency - there is always dependence on this or that secretariat, which ends up delaying and sometimes even distorting the process. One example is the Vehicular Pollution Plan that has been submitted by the CMC, but in 2013 the processes that accompanied the maintenance and inspection of the fleet continued in the time consuming and complicated bidding process. When the process of raising funds occurs, there is often a dispute between the secretariats, with the resources being diluted and no longer serving the planned actions satisfactorily.

FINAL CONSIDERATIONS

In general, it appears that the State Government and Curitiba's City Hall have a physical infrastructure and more and better prepared staff than the municipalities of Araucária and Fazenda Rio Grande to act when faced with natural disasters, whether caused by climate change or not. It is inferred, therefore, that both material support and human resources are, with few exceptions, most precarious at municipal government levels (except for the municipality that is the state capital). There is almost zero interest and discussion on the topic in both metropolitan municipalities examined, which seems rather contradictory, since, possibly, these municipalities through the characteristics inherent to the periphery phenomenon, are the most vulnerable in environmental and population terms to the occurrence of drastic phenomena produced by potential climate change. A scenario of increased risk would concern the municipality of Fazenda Rio Grande in particular, as it has complex environmental and urban issues, being the poorest of the three municipalities.

However, in the three municipalities coping actions against natural disasters occur in a similar manner, with corrective actions predominating and few preventive / mitigation actions. However, it is emphasized that when there are natural disasters, there is an intense mobilization of support from government agencies, especially the Civil Defense that responds directly with the first actions to be undertaken.

Regarding the category of analysis of climate governance, with reference to the top down process of Viola et al, 2008, it is clear that public authorities seem to carry out some coping and mitigation actions (even though very precarious), especially in Curitiba, as already mentioned, but they do not aim for a broader accountability or transparency, characteristic of the governance process, that should always seek to gain legitimacy among the population. The forms of social participation are not encouraged, as recommended by several authors, despite the existence of a Forum



in the area, albeit with very limited social representation. Broadly, local climate governance still appears unconcerned with Giddens' view (2010, p.279) that its role is to "get people to admit that the risks are real and pressing" and "foster a more widespread awareness of the need for action." This fact can be confirmed in localities in the municipalities, in which according to reports, despite some mitigation actions in progress regarding the seasonal occurrence of floods and heavy rains, the increase in the population occupying risk areas continues to occur.

In the eyes of some interviewees, issues related to climate change are intangible and require continuing education processes and programs to make working on the precautionary principle possible. There are also bureaucratic issues that hinder the flow of processes, as well as the fact that prevention / mitigation actions are less intense than emergency corrective actions thus greatly increasing the state of vulnerability of the affected communities.

The various internal restructurings of public institutions during changes of government and the acknowledged unpreparedness of these institutions to deal with disasters and climate change also compose the aforementioned evidence that the Environmental Public Governance programs are out of step with the predicted accelerating pace of climate change events, which is, to say the least, very disturbing for local and global societies.

It should be stressed once again, that the prevalence of potential tackling actions of a corrective nature in almost all the institutions surveyed, at the expense of more hard-hitting prevention, adaptation and mitigation actions, with some closer to the term adjustment, addressed by Marandola (2009). One can even go further: Alberto Acosta (2013), the Ecuadorian economist and critic of neoliberalism, at the opening of the II Interdisciplinary Meeting of Environmental Communication, held at the Federal University of Sergipe in Aracaju, added to the theoretical and practical classes of coping - prevention, mitigation, adaptation and adjustment - a step that he considered the most important in the process of governance of environmental problems: transformation. That is, how to transform - by communication, information and education in the environmental field - the social attitudes, behaviors and habits that result in risks and environmental vulnerabilities, and especially in this article, those generating climate changes. These instances of transformation - communication, information and education - although mentioned in public policies, have not yet emerged as effective actions in the collection of documents and testimony about the coping policies against climate change under scrutiny and deserve specific research.

Finally, we must also emphasize that the main point highlighted by authors like Pelling (2003), Pittock (2005), Renn (2008), Di Giulio and Ferreira (2014) is the expansion of the participation of different social actors in the decision-making processes involving climate governance or risk governance. In this sense, it is clear that public, national and state policies in the area, as well as the municipal ones examined here, are extremely timid and there are not, to date (2014), more forceful actions that allow for governmental initiative and motivation, the inclusion of a range of social actors who can act in a more committed and therefore efficient way in the process of prevention and transformation in view of a possible confirmation of the effects caused by extreme climate change.



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