RISK GOVERNANCE: ENVIRONMENTAL TOOL TO FACE CLIMATE CHANGE

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INTRODUCTION

Governance has become a benchmark for the various Social Sciences. Concept approached from multiple perspectives, which discuss each other with the intention of becoming the axis of theoretical-practical discussions and application of policies in various orders. In the early 1990s, governance was studied as a result of a decrease in state power and the emergence of various social actors, including multinationals, civil society organizations, and international organizations.

Governance covered various angles of public life and addressed different issues and visions. It was understood as a process that sets priorities and defines objectives (Weiss, 1999; Reinicke, 1998; Pierre and Peters 1998, Sandholtz and Stone, 1998); but also as a concept that can explain phenomena as different as network policy (Rhodes, 1997) public management (Hood, 1990) the coordination of various sectors of the economy (Hollingsworth, 1994) public-private partnerships (Pierre and Peters, 1998), corporate governance (Williamson, 1996), as well as the so-called "good governance", a project promoted by the World Bank and the International Monetary Fund (Leftwich, 1994). In all these approaches, governance functions as a structure, as a process of coordination and directionality and involves a series of arrangements and pacts among multiple social actors where stakeholder participation and deliberation give meaning to social action.

From the Latin American perspective, authors such as Fernando Mayorga and Eduardo Córdoba (2007) stand out; they argue that in this region there is a dispersion in the management of the notion of governance. There is no Latin

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American bibliographic production that synthesizes and systematizes the use of this concept since there are many variations in both approaches and topics addressed. Thus, we can find topics ranging from public policies, health and citizen participation (Celedón and Orellana, 2003), the territorial logic of public policy at the local level (Jolly, 2003), or water resources in the Andean region (Minga Program, IDRC, 2003). Also, environmental governance is addressed in rural communities affected by mining exploitation (Decoster, 2003), urban governance (Stren, 2000), local governance and the fight against poverty (Román and Retolaza, 2001), as well as the relationship between governance and the fight against corruption in public administration (Campero, 2003), and even, governance is addressed as a possibility of regional integration under governance guidelines (Cimadamore, 2007) and an inter-Atlantic governance against social exclusion is also proposed (Fraerman, 2004). Therefore, definitions of the term vary depending on the subject.

On the other hand, and in this same context, the contributions of Luis Aguilar Villanueva (2006) stand out in the field of public administration study. This author considers how the creation of a "new public management" and/or the "new government/governance" allows on one side, the balance of the fiscal and administrative malformations of governments and, on the other, enables a greater capacity for governmental response to the social and economic transformations that contemporary societies experience. This conception of the administration in charge of the State seeks to promote the legitimization of the public exercise, through democratic and socially inclusive practices in the construction of consensus for the resolution of specific conflicts.

From our point of view governance functions as a structure, but also as a process of coordination and directionality. Therefore, it implies a series of arrangements, of agreements between various sociopolitical actors. We agree with Sousa Santos (2007), who conceives governance as a matrix because it is both an absorbent and basic structure and an environment that generates an interconnected network of pragmatic ideas and cooperative patterns of behavior, shared by a determined group of actors and their interests.

Under this logic, this article analyzes how risk governance can be a tool against hydro-meteorological disasters caused by Climate Change (CC) in Mexico. We show how, from various participatory methodologies, we addressed decision-making where multiple social actors intervene. Our analysis focuses on social interactions, the results reflected in extensive deliberations and community actions that are suggested to contain climate variability in the face of cyclones, floods, and droughts in six communities in the country. These approaches will lead us to deepen the importance of social participation

and deliberation in the decision-making on a territory. The central key of this paper is to highlight risk governance as a process of making and elaboration of policies, where the emphasis is on the deliberation and agreements made by a multiplicity of actors, as well as the process of construction and decision-making over their territory.

The first part of the article deals with theoretical aspects of governance and the use that various actors have made of it. Subsequently, we will address the concept of risk governance and analyze from this the connections between territory and environment. Last but not least, we will point out how, based on concrete and specific methodologies, the problems of risk and vulnerability to climate change have been developed and addressed in six communities in Mexico and how risk governance can be an important tool in the prevention of vulnerability to CC that occurs in various territories of the country.

I. THE SCOPE OF GOVERNANCE: NEW ENVIRONMENTAL POLICY INSTRUMENT

Governance can be thought of as the construction of new institutions and agencies to solve the problems facing society, but also as social interactions processes between multiple actors where the formulation of debates, deliberation and arrangements takes on a nodal role. It is then about trying to provide directionality to society and the economy. Various positions have applied governance from their vision, their political mission and their interests, highlighting four positions: a) the hierarchical, b) the market, c) the networks and; d) the one that refers to the communities. Each of them responds to undeniable sociopolitical problems, but undoubtedly none of them function as a single panacea, nor a magical solution in complex and heterogeneous societies (Pierre and Peters, 2000). For the interest of this article we will deal with the last two, which may give light to the so-called risk governance.

a) Governance as a hierarchy implies a verticality integrated by state structures and public bureaucracy. The State is conceived as the high point of collective interest, separated from the rest of society and claimed under legal and legitimate precepts. Decisions are made from top to bottom and the State is the center of legal authority. Today, the theoretical and political discussion has abandoned the perspective of hierarchical governance, the emphasis is centered on small scales, the possibility of making channels more flexible, diversifying actors and encouraging informal exchanges, as

well as sharing power between the State and the market and blur and soften the differences between public and private (Pierre and Peters, 2000)[1].

b) The market as a governance mechanism is in vogue and is thought of as the solution to infinite problems, in many cases it is given an omnipotent character beyond its real effectiveness. Under this logic, the rulers chosen by the citizens, must meet their demands and comply with the product offered, so consumers-citizens demand efficiency and quality. In terms of governance, the market is seen as a mechanism for locating resources, as a monetary criterion for measuring efficiency also as an arena for economic actors (Hollinsgsworth, 1994).

c) One of the best-known ways of addressing contemporary governance is from network policy. This form of organization compromises countless actors and its scope varies considerably according to the degree of cohesion. Their demands cover a range that goes from community policies to single-problem solutions. It ensures that the network policy facilitates coordination between public and private interests and, therefore, can guarantee the efficiency of public policies. The interesting thing about these networks is that they have become a concentrated and cohesive sector that resists state attacks (Marsh and Rhodes, 1992). Even though hierarchical governance continues to play an important role in the political and institutional organization of the advanced western democracies, the new circumstances favor the opening in decision-making to horizontal networks that have co-opted both analytical and practical spaces and relevance. In the same vein, cities and regions acquire an effective weight in their decisions and express autonomy, product of the processes of decentralization and subsidiarity (Kettl, 1993).

The networks and the new governance regulate and coordinate political sectors according to the preferences of the actors involved. Public policy is the result of the self-referenced interests of the actors in the network, rather than the collective interest. In sum, while networks efficiently control sectoral policies, citizens monitor the state of accounts of what is happening in that sector (Messner, 1997; Evans, 1998; Rhodes, 1997 and Natera Peral, 2005).

Relations between the networks and the State can be described as mutual dependence. From the state orbit, the networks involve a considerable number of experts. They are the core of an important representation of very valid interests in political processes. The transformation of government

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1 Governance conducted by and through hierarchical mechanisms integrates state structures and public bureaucracy. It has become an ideal decision making model *top-down*.

to governance –the diminishing importance of formal-legal powers– has clearly strengthened the position of network policy.

d) Meanwhile, the vision of community governance has generated a heated debate in the social sciences in the last decade, is based on a socio-economic homogeneity and common interests, which characterize small communities. From this perspective, the key question is whether a government is necessary to resolve its own issues. The general idea is that the community can and should solve its own problems with very limited participation of the State. Community governance is built based on a consensual image about the community and the positive involvement of its members in collective affairs. The State –local government– is from this perspective too large and extremely bureaucratic to deal with these issues. For the community vision, the government generates, at least, the same problems it solves. The community solution to this is to organize governance without government. Authors such as Etzioni, Golden and Weld (1995), argue how a community that acts in a humane, concentrated and enlightened manner can achieve its proposed ends.

From these four perspectives, governance allows us to understand the role of various actors in formulating intricate policies, dealing with various conflicts and producing decisions. Therefore, governance is directly linked to the making of policies (*policy-making*) and to the formulation of policies (*policy formulation*), a process where decisions adopt a deliberative, consensual, cooperative and creative perspective (Farínos Dasí, 2008, p. 13).

Several European authors (Kohler-Koch and Eising, 2007; Hewson and Sinclair 2009; Benz and Eberlain, 2000; Weizz 2012, among others) establish how the government is less and less powerful and this gives rise to alternative visions. The central argument is that society and the market have developed their own autonomy, their self-organization to avoid any attempt by the government to control them. Intense socio-political processes are then generated, where the government has moved from a conventional corporatism to a recognition of the social interests represented by networks and groups (Kickert, 1994).

Whilst in Latin America, the normative dimension and the analytical dimension of governance tend to be distinguished. The first refers to "must be" and therefore to "good governance" and, the second, to a "new way of addressing politics" away from classical perceptions strongly focused on the political and legal analysis of the State. This expresses the need to consider that the State is not the only one, nor the main development actor. Next to it is the market (represented by the company, institutions, and individuals, consumers

and producers) and the role of the so-called civil society, which encompasses non-governmental organizations (NGOs), cooperatives, mutual societies, and unions and community-based organizations, foundations, social and sports clubs, among others. It can then be argued that from the Latin American vision the four currents raised at the beginning of this section are represented: both the hierarchical vision, as well as the market, the networks and the community, with their own characteristics and accents, since it is noteworthy as the history, geography, culture, among others, give a bias to the conception and use of the concept and its implementation

Thus, governance is an instrument of directionality, with a State that coordinates from a distance. The social and economic actors are autonomous and establish and recreate a framework for action to achieve their goals. A strengthening of self-organization and autonomy that makes it possible to swell democratic processes in decision-making, and at the same time, achieve the effectiveness of the demands raised.

II. RISK GOVERNANCE

So, governance implies coordination and process management. Construction of policies based on deliberation and negotiation; formulation of consensus based on cooperation in order to avoid conflict and promote the social agenda. Autonomy and self-organization of projects from the society that reinforce the potential to influence political decisions, renewed state management, as well as decentralized and flexible management. Therefore, new channels of dialogue between government and civil society are opened. Dialogue and joint action under agreement. Fluid, flexible and participatory political management, a long-range process. Interactions between State and society to solve specific problems and seize opportunities. A process by which decisions are made and the terms of participation are established (actors involved and scope of their proposals). Dissemination of power at the sub-national, supra-national level and the self-organization and autonomy of multiple social actors (networks, communities and private sector) with the intention of making and formulating public policies.

In this same logic, risk governance implies the implementation of forms of planning and management of socio-spatial dynamics in the face of phenomena that can cause disasters in socially vulnerable communities. Actions shared among multiple actors that give rise to innovative policies with environmental and territorial repercussions. Negotiations between multilevel *stakeholders*, in the search for consensus against environmental changes and climatic

phenomena of serious consequences. Participatory, deliberative and negotiation processes at the local level, where environmental policy is reinvented and top-down decisions are combined, along with those issued bottom-up, to give rise to consensus formulated side by side.

For Renn (2008) and Klinke and Renn (2006), one of the most serious problems regarding risk and its management is that its study is perceived as a fortuitous and determined event and prevents a comprehensive and preventive vision. For this reason, risk governance becomes relevant, which attempts to develop an analytical-conceptual framework that includes both the effective participation of interested parties and decisions against risks. This analytical framework has been developed under the direction of the International Risk Governance Council (IRGC) and published as IRGC White Paper (2005). Thus, the concept of risk governance includes a broad view of it that not only includes what has been called "risk management" or "risk analysis", but also analyzes how decision making takes place, how a variety of actors are involved, who coordinates the actions and communication between roles, perspectives, goals and activities. This vision is innovative because it includes both the social context (structure and interaction of the different actors that deal with risks, their perception and concerns of probable consequences) and a new categorization of risk-related knowledge (simple, complex, uncertain or ambiguous). Classification directly related to the cause-effect between risk and the consequences, the reliability of this relationship and the degree of controversy that can be generated in those affected (Renn and Klinke, 2013). Renn (2008) y Klinke y Renn (2006).

Risk governance is a tool that refers to both the institutional structure and the policies that guide the actions of society, the State and the international community for optimal risk management and strengthening resilience to disasters. Risk governance has changed its hierarchical and centralized vision to a structure that encourages the participation of multiple actors. Therefore, for Renn (2008), risk assessment faces three challenges: complexity, uncertainty, and ambiguity. The risks are related to the quality of available knowledge, mental constructs that depend on the accuracy and validity of the predictions, which will lead to certain policies.

For Vesurri (2009), complexity refers to the difficulty of identifying and classifying causal links among a multitude of potential agents and observed effects. Uncertainty refers to cause-effect modeling, and always incomplete recognition of human knowledge and, therefore, the lack of clarity. While ambiguity is the result of divergent or competitive regulatory perspectives. It is proposed as one of the outputs to these serious questions, the so-called precautionary principle.

In Latin America, authors such as Ramírez (2015), return to Kooiman (2004) and Mc. Ginnis and Ostrom (2014) to indicate how risk governance must include both the socio-political system (SSP) vision that identifies structures, interdependencies and interrelations and articulations between multiple actors, both public and private; as well as the understanding of the complexity of the territory as a socio-ecological system (SSE) that makes it possible to see the relationships between social processes, the form and use of natural resources and the ecosystems that sustain them. For Latin Americanists, it is about planning and managing both systems on a territorial scale that allows risk governance to be put into practice. This commitment is based on the governance of networks that can articulate important relations between the State and Civil Society from the increase in legitimacy and trust.

Authors such as Carabine, Chesterman, and Wilkinson (2016) go further and establish how risk governance should include institutional arrangements and political processes at the local level that consider disaster financing, climate awareness and SSE care that cushion, provision and regulate the weather. These three elements function as a strong structure to promote the equitable and resilient development of communities by identifying five characteristics of significant risk governance systems to develop resilience: diversity; polycentricity in institutional agreements and connectivity; decentralization and flexibility; community participation and commitment; and finally learning and innovation.

Then, talking about risk governance implies developing and increasing resilience and recognizing the complexity of the dynamics of social interactions at different scales; people adaptation decisions; individual and collective preferences, perceptions and norms; social processes at local and global level; geography and history and local knowledge and culture, among many others, all resulting from the extensive literature on socio-ecological resilience (Bedoya Prado and Ruiz, 2008).

Therefore, increasingly, those responsible for making decisions recognize that multilevel governance is required to manage the range of risks faced by communities in developing countries. These risks do not relate solely to climate change and disasters, but also attack its consequences: conflict, environmental degradation, land-use change, food insecurity, migration and human displacement (Hunter and Lorentz, 2017).

To summarize, we can point out that risk governance offers two important innovations: the inclusion of the social context and risk-related knowledge (Renn and Klinke, 2013). In relation to social inclusion, in addition to the generic elements of risk assessment, risk management and communication,

the importance of contextual aspects that include the structure and interaction of different actors, their perceptions and concerns regarding the probable consequences, their organization, roles and the capacity for an effective risk governance.

Regarding knowledge related to risk, a risk classification is proposed, distinguishing between simple, complex, uncertain and ambiguous risk problems. The characterization of a particular risk depends on the degree of difficulty in establishing the cause-effect relationship between a risk agent and its possible consequences, the reliability of this relationship and the degree of controversy regarding what risk really means for those affected. Authors such as Sector, Sellke and Renn (2009) suggest the implementation of a) pre-evaluation or test, b) risk assessment, c) tolerance criteria and d) acceptance and risk management.

a) The pre-evaluation allows capturing the variety of stakeholders' opinions about a given risk. Existing indicators, routines and conventions that can be reduced prematurely or act as a filter to prevent risk. The truth is that risk may be different for different groups of actors. The first step of the pre-assessment implies the need for all stakeholders to share a common understanding of the risk issues addressed.

b) Risk assessment is to provide knowledge for risk decision making and if so, to ask how risk can be reduced or contained. Therefore, the risk assessment includes a scientific evaluation of both the risk and the questions that stakeholders may have about its social and economic implications. Depending on the attainable state and the quality of knowledge, risk assessment faces three main challenges mentioned above: complexity, uncertainty and ambiguity.

c) The most controversial phase of risk management is to judge the acceptability and/or tolerability of risk. A risk that is considered acceptable is usually limited in terms of negative consequences, so it is accepted without mitigation or reduction measures. Meanwhile, a risk that is considered tolerable links the performance of an activity, which is considered valuable for the added value or benefit it provides, with specific measures to reduce and limit the probable adverse consequences. This trial is based on two distinct, but closely related, efforts; collect and compile the necessary knowledge that must support the mitigation and risk reduction measures required.

d) The risk management phase designs and implements actions and solutions necessary to address the risks in order to avoid, reduce, transfer or retain

them. Therefore, it is based on a sequence of four steps that facilitates systematic decision making, namely: the knowledge acquired in the risk assessment phase; acceptability and/or tolerability; the range of possible options and the evaluation of criteria such as effectiveness, efficiency, minimization of external side effects and the implementation of sustainable processes.

This route allows us to point out that today there is a series of highly interesting contributions regarding risk governance, knowledge, context and challenges. All of them provide a new research context where network and community governance management play an important role; SSPs and SSEs find intersections that allow resilience to be pointed out as a normative objective in risk management systems of highly uncertain events or processes. The connection between the inclusion of risk governance (based on the participation of multiple stakeholders), and the need to improve resilience (understood as the ability of a socio-technical system to deal with events that are uncertain and ambiguous) allows to generate processes of adaptation, coping and deliberation against increasingly frequent risks.

No one has all the answers to such complex phenomena as Climate Change. However, this conceptualization allows the creation and devise of appropriate methodologies for each context to face variability and promote economic, social, political and environmental adaptation increasingly urgent in underdeveloped communities. Thus, three principles should be assumed: a) an approach focused on concrete and tangible problems; b) the co-participation of the common citizen affected by certain problems and the authorities involved, and c) the deliberative development for the search for common solutions. These three principles modify the political practice by returning authority to the locality, by creating formal links of citizen responsibility and by distributing resources and information to articulate the various actors among themselves and with the authorities.

From this perspective, today new civic environmentalism is generated based on the protection of the environment, with bottom-up actions, from side to side and approaches where the territory occupies a key role. Risk governance models imply less hierarchy and more collaborative forms of government to solve environmental dilemmas (Hegger, *et. al.,* 2016).

III. CASE STUDIES

Based on the research project called "Análisis de la Vulnerabilidad y Resiliencia al Cambio Climático en Zonas Periurbanas" funded by SEMARNAT/CONACYT (2016-2018), we had the opportunity to test the validity of risk governance in six communities to throughout the national territory. Fundamentally, we worked in an interdisciplinary way and it was decided to work three hydro-meteorological phenomena: cyclones, floods and droughts and develop various participatory methodologies in peri-urban areas, where the community had a key role in the generation of information, but above all emphasize the solutions that the population itself developed in the face of disaster risk, caused by the CC.

At first we decided to use the CONANP-GIZ method (2014), to understand the perceptions about climate change of the inhabitants of Progreso (Yucatán), San Pedro, El Saucito (Hermosillo), Las Pargas (Aguascalientes), Las Golondrinas (Delegation Álvaro Obregón, CDMX) and Esterito and Chametla (La Paz) and establish how they had used risk governance against the recognition of vulnerability to climate change.

One of the most important elements found in the six communities visited is the role played by the family in the event of a disaster. It was reported how family or neighbors support and house people or families in conditions of disaster and loss of housing. On several occasions, the aid consists of material goods, food, and clothing. In the different workshops on social perceptions of disaster risk, the existence of some religious missions that supported construction materials and food to refugees was mentioned. In all cases, it is recognized that government assistance is scarce, reduced, inefficient and inadequate in disaster situations. Risk management by governments is slow and the need to strengthen civil protection programs and creation of risk maps is recognized by the community.

The community perceives apathy among them to organize and establish strong and permanent networks in the face of their various problems. There are several figures that act as intermediaries between the community and the government, in our cases, block chiefs, commissariats and *ejidatarios* were registered. They all meet with public officials to address local problems. It is interesting that workshop attendees recognize that this information between authorities and delegates does not reach all the neighbors and often stays within the helms.

It can be said that the culture of prevention is a process under construction in which the authorities have an important role. Prevention has been triggered by experiences such as the arrival of cyclones, floods, and droughts. It is

from these events that communities "learn" to live with the phenomenon. The information and forecast of the weather and early warnings or alerts are prevention tools that must be maintained and perfected, as they give the community an opportunity to face, in the best way, disaster risk.

There is little social organization, although in the case of hurricanes, early warning has had important successes, especially in populations such as Progreso in Yucatán and Esterito and Chametla in La Paz. In the rest of the cases, it is women's organizations related to government programs such as "Prospera" of the Ministry of Social Development and some neighborhood organizations that lead the way in the social organization. In the workshops on the perception of climate change, the need to strengthen networks and community organization was evident. Alliances, not only to deal with disasters but also as a tool to exchange knowledge and experiences and consolidate common interests to improve their living conditions. In all cases, the communities aspire to the community organization as the means to manage the options or actions they consider necessary to address their condition of vulnerability. This element is reinforced by the constitution of social networks with exchanges of information and work with government institutions close to the management of impacts that are associated with the CC. It is about developing adaptation strategies in line with the conservation of natural resources and their environmental services.

Adaptation of these peri-urban areas is based on their own ecosystems, to the extent that they potentiate access to natural resources for their conservation, maintenance and recovery, although many of them have undergone radical changes, forcing the population to adapt to new economic activities. Fundamentally, the primary sector (agriculture, livestock, and fisheries) is the one that presents the greatest impacts by CC, forcing residents to modify their jobs, but also to stop producing and consuming typical products of their region (badgers, rabbits, Cactus, maguey, etc.). There are expectations that range from reforestation as an option to retain soils and avoid flooding, dig deeper wells to recover water due to high temperatures, implement renewable energy actions and/or undertake sustainable tourism businesses, as well as the built of artificial reefs. There is a conviction in the various visited communities that CC is a reality, the need to adapt to it, the conviction that the monitoring of the SSE is vital to allow to continue taking advantage of resources for the community, as well as the modification of productive activities that strengthen the economic capacity of families. These communities manifested themselves for the sustainable use of water and its use, as well as soil management. In addition, they were interested in creating demonstrative spaces to exchange experiences on clean technologies and food production in urban or home

gardens. However, there is no permanent and constant social organization against disaster risk, most are reactive actions against disaster risk, there are no cohesion relations with various social organizations or expert knowledge (local and federal universities) that is the SSP structure It is weak, if we measure it in these aspects and if we consider the community's dependence on state agencies in disaster-risk situations (Table 1).

TABLE 1. GOVERNANCE

Peri-urban Zone	Actions and relations	Governance Topics
Progreso, Mérida	Neighborhood Solidarity. Support to neighbors in unfavorable situations. The state government is perceived as a close and collaborative entity. Relationship of some community leaders with the government to obtain construction materials and domestic sanitary service and evacuation in case of floods.	Coordination and process management. New channels for dialogue between the government and civil society to solve problems. Decentralized and flexible political management.
Las Golondrinas, CDMX	Help from neighbors and relatives when the home is at risk. High risk of housing collapse leads to relocation with support from the Delegation. Block Chief, first filter to contact the delegation government.	Coordination and process management. New channels for dialogue between the government and civil society to solve problems. Decentralized and flexible political management.
Esterito y Chametla, La Paz	In light of floods there are missions by religious communities, such as the Mormon, who provide support and distribute materials. The neighbors who live in the canal area are supported with material and clothing. Government support is reduced and inadequate. It provides insufficient or inefficient materials. Recognition to CFE for its work in the face of hurricane "Odille". There are representatives of apples that make agreements with public officials.	Coordination and process management. New channels for dialogue between the government and civil society to solve problems. Decentralized and flexible political management.

Continued Table 1.

Los Pargas, Aguascalientes	In the town hall, there is an operational structure with delegations that work at the community level. Organized groups of women to follow up on government programs such as PROSPERA.	New channels for dialogue between the government and civil society to solve problems. Decentralized and flexible political management.
San Pedro, El Saucito, Hermosillo	Important social organization from the ejido. Government support is granted to those who have resources and not to those who need it. Government programs do not fit your needs. Bribes to get help. SEDESOL and SAGARPA, provide social support and informative talks. CONAFOR's work in the management of forest fires is recognized, it is a close instance to the community. Union of breeders and former farmers.	Coordination and process management. New channels for dialogue between the government and civil society to solve problems. Decentralized and flexible political management.

Source: Own elaboration with the data collected in the participatory workshops.

As a second moment of the investigation, we developed an analysis to cross-link social perceptions with hard data obtained from various scientific sources. The central point was to understand how close or distant the perceptions of the communities are against data obtained by "scientific sources, in order to interweave possible action strategies based on these two matrices to build actions between the current state and the objective and finally determine the plans and actions required to achieve the desired status.

For example, we found that the "Declaratorias de Emergencias y Desastres" issued by CENAPRED (organ directly linked to the Ministry of the Interior, 2006) and economic, social and environmental variables of the study areas, showed no statistical evidence of a linear relationship between the number of deaths by natural factors or the total number of Declarations and the variables mentioned. The second result indicated that some Declarations are not related to the vulnerability characteristics of the communities, nor to the areas of high recurrence to extreme weather events. What leads us to think that there is no disaster risk prevention action, there is a reaction when it occurs and

there are states that know the political way to have extra funds, while others do not receive it, even when they experience situations of high vulnerability. The Declarations have become a political instrument of governors who have "learned" the *modus operandi* to demand extraordinary funds.

Also, we inquire about the main social organizations of environment type that exist at the municipal level, with the intention of knowing the degree of organization and communication between the community and various Civil Society Organizations (CSOs) that would allow us to find cooperation ties, because one of the strengths to prevent disasters from disaster-risk is the organization and empowerment of society. The construction of a discourse that allows participation and deliberation on environmental topics.

INDESOL-SEDESOL (Commission for the Promotion of the Activities of Civil Society Organizations, 2017) was consulted as a source of information, in order to know how many and which CSOs work in each municipality, with the intention of enriching networks between community and them. It high-lights the case of Mérida (151) and Álvaro Obregón Delegation (177) as those with the largest number of organizations interested in three basic activities, namely: a) civic organizations, focused on promoting citizen participation in matters of public interest; b) cooperation for community development in the urban or rural environment; and c) support for the use of natural resources, the protection of the environment, flora and fauna, the preservation and restoration of the ecological balance, as well as the promotion of sustainable development at regional and community level, in urban and rural areas.

The rest of the case studies show a number between eighty and eighty-five organizations. It is key to note that a robust social organization allows us to face disaster risk with greater possibilities to prevent, contain and rebuild everyday life. In this sense, the communities expressed a preference for family and neighborhood solidarity in the face of disaster and adherence to tradi-tional ways of making decisions, which are related to the "attachment" to their territory and to "tolerate" any type of situation before leaving your location and belongings. The perception of the community is that they organize when the catastrophe arises and traditional organizations are used to deal with the disaster (municipality, churches, neighbors, family). The truth is that from the data collected in INDESOL, an important number of CSOs can be shown that can generate bridges of joint action with the studied communities and strengthen the so-called risk governance, which can pave the way to generate a robust, constant and permanent organization that reduces social vulnerability to risk.

The third and last part of the study consisted of the delivery of results on the perceptions workshop and the report of "hard" data obtained from the

different studied communities. This led to important dialogues between the municipal authorities, the heads of blocks, community leaders and academic staff that allowed to begin a process of community empowerment that was complemented by two workshops in two areas that present opposite hydro-meteorological phenomena: for a side droughts (San Pedro-El Saucito) and floods by cyclone (Progreso). In the first case, the Q Method (QM) was used to obtain adaptive community preferences against CC; in the second, a participatory mapping workshop was developed so the community could identify the risk areas and prepare proposals in front of CC.

The results were extremely interesting. In summary, we can establish that in the case of San Pedro El Saucito, dialogue ties were established with the State Attorney for the environment in Sonora (PROAES), with the National Forestry Commission (CONAFOR), with the Electricity Trust (FIDE) and with the State Water Commission. The challenge was to recover the waste water from a treatment plant that is located inside the community for its own use; second, the donation of five hundred trees to start a reforestation campaign; as well as the possibility of building solar cells and promoting ecotourism.

In Progreso, the community recognized the risk areas and began talks with the Municipal Civil Protection office to put into practice the construction of an artificial reef, the construction of a fence to protect the Cienega of the garbage, place a fence so that crocodiles do not enter the area of the houses when floods occur, lift sidewalks around the houses, crawl streets, unhook wells and boost the ecotourism area "El Cochito" that has recovered the Cienega, as well as its flora and fauna. And propose the construction of shelters in the area, because as these do not exist, the population is transferred to Mérida.

RESULTS AND CONCLUSIONS

This study has allowed us to verify the importance of the implementation of risk governance as a tool for disaster risk prevention. The governance issues that we believe were reflected in the actions and relationships reported by the communities can be classified into three central issues: coordination and process management; the new channels of interlocution between government and civil society to solve problems and, decentralized and flexible political management. However, there were other issues related to risk governance that were not expressed in the workshops, including: participation and deliberation of actors to reach agreements in the formulation of consensus-based cooperation to avoid conflicts; the process of building policies based on decision-making and the autonomy and self-organization of projects from society.

There are thus areas of opportunity to promote actions and strengthen relationships between the various *stakeholders,* whether in the governance issues that were addressed, but mainly those that were not expressed. For example, forums for participation and deliberation can be implemented to allow the discussion of the different social actors to reach agreements and reduce conflicts between them and with other agents, as well as look for organizational mechanisms allowing the design of policies that increase governance in risk management and resilience of their communities.

Specifically, the study communities show a high degree of social, economic, political and cultural vulnerability that, in the face of CC, sharpens their precarious situation. Joint decision making between various *stakeholders* provides the opportunity to address the complexity, ambiguity and uncertainty caused by disaster risk in advance. In our country we have done little in this area, usually both local and federal governments act when the weather phenomenon occurs and, for their part, communities applying their local knowledge and skills have implemented solutions that do not solve the problem, but that in the face of the disaster represents small barriers (high sidewalks to prevent flooding at home, water retaining walls, use of "coolers" against high temperatures, etc.).

Today, the importance of the consultation by local governments of perceptions against CC of the communities and the importance of working side by side with them to recognize adaptive and resilient changes is recognized internationally. The permanent dialogue, the interaction between actors such as CSOs, local governments, universities, and communities becomes a key point to combat disaster risk and set goals, activities and solutions against CC. One of the key issues found in this study regarding risk governance is the recognition of social perceptions, knowledge and local culture to identify climate variability, adaptation possibilities, and resilience building. It is necessary to recognize the complexity of disaster risk in vulnerable communities, their empowerment based on the information they can obtain and generate, as this places them in a very important negotiation situation with the authorities.

Recompose and establish more functional and feasible relations between multiple actors allows strengthening SSPs, achieving institutional arrangements, successful political processes at the local level and financing that reach the real problems. From our perspective and retaking the authors about risk governance, knowledge of the SSE and the strengthening of the SSP, decentralization in decision-making, joint construction between various *stakeholders* of risk maps, knowledge of "scientific" of climate variability by the community, disaster risk prevention, recognition of local culture and values, the need for flexible plans, as well as recognizing that prevention

and the precautionary principle are vital axes in the face of complexity and risk uncertainty Therefore, participation and commitment to integrate, as an environmental management tool, risk governance in the national territory, becomes a priority in the face of clear evidence of CC.

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