

# Mexico: Country Case Study

## How Law and Regulation Support Disaster Risk Reduction

United Nations Development Programme

June 2014



IFRC-UNDP Series on Legal Frameworks  
in support of Disaster Risk Reduction

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#### About this report

This report was commissioned by UNDP and prepared by Felipe de Jesús Colorado González, Nadja Thürbeck, Valeria González Rangel and Alikea Santiago. It is one of a series of case studies UNDP is undertaking with the IFRC as part of a global research project to learn about how law and regulation support disaster risk reduction. For more information about the project and various case studies as they become available, please visit:

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The IFRC's Disaster Law Programme seeks to reduce human vulnerability by promoting effective legal frameworks for disaster risk reduction and legal preparedness for disasters. It works in three main areas: collaboration with National Red Cross and Red Crescent Societies and other partners to offer technical assistance to governments on disaster law issues; building the capacity of National Societies and other stakeholders on disaster law; and dissemination, advocacy and research. E-mail: [disaster.law@ifrc.org](mailto:disaster.law@ifrc.org).

Website: [www.ifrc.org/dl](http://www.ifrc.org/dl)



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## Table of Contents

Executive Summary .....	1
Acknowledgements .....	3
List of Abbreviations.....	4
1. Introduction, background & project objectives .....	7
1.1 Law & DRR Project Background .....	7
1.2 Country Risk Profile .....	8
2. Methodology .....	11
2.1 Project Objectives .....	11
2.2 Methodology .....	11
2.3 Local and Community Visits .....	11
3. Findings on Regulatory Frameworks for DRR and their Implementation .....	14
3.1 Mexico's Political Structure.....	14
3.2 DRR in Disaster Management Law & Institutions .....	14
3.3 Responsibility for DRM and DDR, Risk Financing and Transfer .....	20
3.4 Early Warning Systems & Risk Mapping .....	24
3.5 Regulation of the Built Environment .....	27
4. Conclusions and Observations .....	44
4.1 Observations on the Overall Legal and Institutional Framework.....	44
4.2 Good Practices and Examples at each Government Level .....	44
4.3 Gaps in the Legal Framework for DRR .....	46
5. Annexes.....	50

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# Executive Summary

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In recent decades, the occurrence of disasters has increased significantly at the global level, especially due to the effects of climate change, a growing world population and the rising vulnerability of development models. The scale of human and economic losses caused by disasters warrants a strong call for governments and society in general to increase disaster prevention efforts through the application of Disaster Risk Reduction (DRR) as a cross-cutting pillar of public policies. In this process, one of the first steps to be taken is to include DRR in legal and institutional frameworks, within relevant sectors and at all government levels. This is the topic of the present case study, which is a joint initiative of the IFRC and UNDP, in dialogue with the Mexican Government.

Given its geographic location and geological profile, Mexico is a country highly exposed to natural hazards, such as earthquakes, hurricanes, floods, droughts and volcanic activity. The country is characterized by regional heterogeneity in terms of economic and social development. In some groups, such as the indigenous population and rural communities, women and children are not only highly exposed to risks, but are more vulnerable to these disasters by virtue of their socio-economic status. In this context, DRR is a huge and complex task that requires decisive political will, technical precision, up to date information and efficient coordination among all stakeholders involved, based on a sound legal framework.

Mexico already possesses high capacity and resources for disaster preparedness and response, whose efficacy have been proven on several recent occasions, for instance during hurricanes Wilma and Dean (2005 and 2007, respectively), and during the floods in the state of Tabasco from 2007 to 2010. In recent years Mexico has shifted the focus of its National Civil Protection System (SINAPROC) from emergency management to DRR, with the overarching concept of Holistic Risk Management (GIR) integrated into its present legal and institutional framework. The measures and proposals announced in early 2013 by the Federal Government are aimed at consolidating this transition process.

The legal framework of SINAPROC is based on the General Civil Protection Law (LGPC) of 2012, which includes innovative provisions that mandate the mainstreaming of DRR into other legal and institutional systems of the country. The LGPC links civil protection with other key areas of DRR, such as urban development, housing and the built environment, climate change and education. By analyzing other sectoral laws, e.g., the General Climate Change Law (LGCC), the National Water Law, the Sustainable Rural Development Law, the General Law for Sustainable Forest Development, the General Law of Ecological Equilibrium and Environmental Protection, and the General Law on Educational Physical Infrastructure, this case study shows how DRR is mainstreamed into the present national legal framework. It also provides examples of good practices already employed in the country and identifies legal gaps as well as opportunities for addressing them, in order to strengthen the progress already made.

Some of the **good practices** identified within this case study are summarized here, and are explained in greater detail at the end of each section:

- Reforming and updating the LGPC with respect to DRR. In particular, the inclusion of provisions for risk transfer, budgeting of DRR resources at the federal and state level, the allocation of responsibilities for the main functions of SINAPROC and its institutional strengthening, and integrating civil protection with other sectors.
  - Mandatory financial allocations for risk financing, such as the FONDEN and FOPREDEN funds, with the latter exclusively allocated for prevention activities, and with a budget ensured by law that enables long-term planning.
  - Legal mandates for risk transfer are reflected in sectoral measures and at all three government levels, as well as in innovative tools such as catastrophic bonds or parametric insurance.
-

- Legal provision for the existence of the National Disaster Prevention Centre (CENAPRED), which, as the technical-scientific unit of SINAPROC, acts in close collaboration with the academy and scientific sector and has the mandate to develop and coordinate early warning systems (EWS) and risk maps (Risk Atlas) at the national, state and local level. Considerable progress has been made in doing so.
- The National Risk Atlas has become the reference for decision makers in urban development and territorial planning, for instance, in the case of construction and land use permissions.
- Mainstreaming of DRR into the education sector, i.e., the new LGPC defines civil protection as a compulsory subject in the curricula of all educational levels, as well as the creation of the National Civil Protection School (ENAPROC).

Some of the **areas of opportunities** which stand out are:

- The regulation of the LGPC. It is essential to define in a detailed manner how the new provisions will be implemented in practice.
- The revised legal framework lacks practical provisions to guarantee the mainstreaming of important topics such as gender equality and indigenous population rights.
- Sectoral and institutional mainstreaming of DRR into other areas of the federal government, creating links and inter-institutional coordination with other sectors (such as urban development, housing and construction, land tenure and human settlements) and reforming the respective legal frameworks.
- Legal harmonization and reform of state civil protection laws and especially local regulations, according to the new provisions of the LGPC and LGCC.

# Acknowledgements

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## Partners:

This Case Study was written in collaboration with the UNDP Mexico Country Office, and the Bureau for Crisis Prevention and Recovery (BCPR), in New York and Panama.

The study is part of a global project on legal frameworks to support disaster risk reduction at the country level, which has been undertaken by UNDP in partnership with IFRC.

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Special thanks to the UNDP-Mexico Disaster Risk Management Programme (PMR) for facilitating local and rural community field trips.

# List of Abbreviations

art./arts.	article/ articles
BCPR	Bureau of Crisis Prevention and Recovery
CENACOM	National Communications Centre of CENAPRED) (Centro Nacional de Comunicaciones del CENAPRED)
CENAPRED	National Disaster Prevention Centre (Centro Nacional de Prevención de Desastres)
ECLAC	Economic Commission for Latin America and the Caribbean
CIASI	Intersecretarial Comision for Drought and Flood Attention (Comisión Intersecretarial para la Atención de Sequias y Inundaciones)
CICC	Climate Change Intersecretarial Commission (Comisión Intersecretarial de Cambio Climático)
CONAFOR	National Forest Commission (Comisión Nacional Forestal)
CONAGUA	National Water Commission (Comisión Nacional del Agua)
CONAVI	National Housing Commission (Comisión Nacional de Vivienda)
CONEVAL	National Council to Evaluate Social Policy (Consejo Nacional de Evaluación de la Política de Desarrollo Social)
CORETT	Commission for Land Tenure and Regularization (Comisión para la Regularización de la Tenencia de la Tierra)
ENAPROC	National Civil Protection School (Escuela Nacional de Protección Civil)
FIPREDEN	Preventive Trust (Fideicomiso Preventivo)
FONDEN	Natural Disaster Fund (Fondo de Desastres Naturales)
FOPREDEN	Natural Disasters Preventive Fund (Fondo para la Prevención de Desastres Naturales)

GAR-13	Global Assessment Report 2013- Informe de Evaluación Global sobre Reducción del Riesgo de Desastre
GIR	Holistic/ Integrated Risk Management (Gestión Integral de Riesgos)
IFRC	International Federation of Red Cross and Red Crescent Societies
INECC	National Ecology Institute for Climate Change (Instituto Nacional de Ecología y Cambio Climático)
INEGI	National Institute for Statistic and Geographic Information (Instituto Nacional de Estadística Geografía e Informática)
LGAH	General Law of Human Settlements (Ley General de Asentamientos Humanos)
LGCC	General Climate Change Law (Ley General de Cambio Climático)
LGPC	General Civil Protection Law (Ley General de Protección Civil)
HFA	Hyogo Framework for Action
NGO	Non-governmental Organization
NOM	Official Mexican Norm (Norma Oficial Mexicana)
OECD	Organisation for Economic Co-operation and Development
PECC	Special Climate Change Programme (Programa Especial de Cambio Climático)
PMR	UNDP Mexico - Risk Management Programme (Programa de Manejo de Riesgos)
UNDP	United Nations Development Programme
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
SAGARPA	Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación)

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SEDATU	Ministry of Agrarian, Territorial and Urban Development (Secretaría de Desarrollo Agrario, Territorial y Urbano)	SINAPROC	National Civil Protection System (Sistema Nacional de Protección Civil)
SEGOB	Ministry of the Interior (Secretaría de Gobernación)	UNAM	National Autonomous University of Mexico (Universidad Nacional Autónoma de México)
SEP	Secretaría de Educación Pública (Ministry of Public Administration)	UNISDR	United Nations International Strategy for Disaster Reduction
EWS	Early Warning System		



# 1: Introduction

## 1.1. Law and DRR Project Background

## 1.2. Country Risk Profile



# 1. Introduction, background & project objectives

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## 1.1 Law & DRR Project Background

In January 2005, a UN conference of over 4,000 representatives of governments, NGOs, the Red Cross and Red Crescent, UN agencies, academic institutes and the private sector adopted the Hyogo Framework for Action (HFA)<sup>1</sup>, which contained a set of commitments and priorities to take action to reduce disaster risks. The first of these was to ‘ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation’, notably through ‘policy, legislative and institutional frameworks for disaster risk reduction’<sup>2</sup>.

In the following years, a significant amount of legislation has been adopted in various parts of the world aimed at strengthening the DRR focus. However, the implementation and impact of DRR, especially on highly risk exposed regions, is still not well known. In May 2013, the Global Assessment Report (GAR-13) reported that damages and losses due to disasters continue their upward trend at the global level. Among the factors that might help to reverse this trend are information, society’s commitment, availability of resources, follow-up and monitoring systems regarding the implementation of preventive legislation at the local level.<sup>3 4</sup>

In 2011, the state parties to the Geneva Conventions took up this issue at the International Conference of the Red Cross and Red Crescent. Their resolution encouraged states, with support from their National Red Cross and Red Crescent Societies, IFRC, the UNDP, and other relevant partners, to review existing legal frameworks for gaps identified in the IFRC report to the Conference, and to assess whether they:

- make DRR a priority for community-level action;
- promote disaster risk mapping at the community level;
- promote communities’ access to information about DRR;
- promote the involvement of communities, RCRC National Societies, other civil society and the private sector in DRR activities at the community level;
- allocate adequate funding for DRR activities at the community level;
- ensure that development planning adequately takes into account local variability in hazard profiles, exposure, vulnerability and cost-benefit analysis;
- ensure full implementation of building codes, land use regulations and other legal instruments, and
- promote strong accountability for results in reducing disaster risks at the community level.<sup>5</sup>

In this context, and given that Mexico was chosen as one of the countries for the case studies, the IFRC, together with the national civil protection authorities, engaged in a first review of the legal framework with respect to humanitarian aid in Mexico. Later, in 2012, UNDP and IFRC agreed to carry out a second study, focusing more specifically on the implementation of preventive elements in the legislation of civil protection, as well as other DRR-related laws.

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<sup>1</sup> ‘Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (Extract from the Final Report of the World Conference on Disaster Reduction)’, World Conference on Disaster Reduction. 18-22 January 2005, Kobe, Hyogo, Japan (Kobe, Hyogo, Japan: International Strategy for Disaster Reduction, United Nations, 2005).

<sup>2</sup> United Nations (2005).

<sup>3</sup> United Nations (2006).

<sup>4</sup> UNISDR (2013).

<sup>5</sup> IFRC (2011).

UNISDR defines DRR as the “the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposures to hazards, lessened vulnerability of people and property, wise management of land and environment, and improved preparedness for adverse events.” This is in line with the Mexican definition, established in Art. 2 XLV of the General Civil Protection Law (LGPC).<sup>6</sup> However, the Mexican Government widely uses the concept of Holistic and/or Integrated Risk Management (*Gestión Integral de Riesgos de Desastres* (GIR), since Art. 3 of the LGPC establishes that the three government levels will try at all times to ensure that programmes and strategies aimed at strengthening the organisational tools and functioning of the civil protection institutions are based on holistic and/or integrated risk management. Within the present report, these concepts are used synonymously.

## 1.2 Country Risk Profile

Due to its geographic location and geological structure, the extensive Mexican territory is exposed to a range of natural hazards. Within this territory, the Mexican population of more than 110 million (80% of whom live in urban zones) are exposed to hydrometeorological, geological and anthropogenic hazards. The country has considerable natural resources including large areas of megadiverse forests, deep rivers and low-lying areas, more than 6,000 kilometres of coastline on the Pacific, Gulf of Mexico and Caribbean Sea, dry zones in the centre and north of the country, and mountainous areas which are susceptible to floods, hurricanes, droughts and landslides.

**Table 1: Exposure of the territory and population to specific risks in Mexico**

Natural Risks	Exposed area		Exposed population	
	Km <sup>2</sup>	% of national territory	Million	% of total population
<b>Storm, Hurricane, Flood</b>	815,353	41	31.3	27
<b>Earthquake</b>	540,067	27	31.0	27
<b>Drought</b>	573,300	29	21.2	19
<b>Wildfire</b>	747,574	37	28.4	25

Source: World Bank, SEGOB (2012), p.14.

On average, Mexico experiences more than 90 earthquakes per year with a magnitude of 4.0 or above on the Richter scale, with a large proportion of its territory highly exposed to seismic risk. Mexico has nine active volcanoes of which Popocatepetl and the volcano of Colima present high risks, combining high activity with proximity to densely populated urban zones. Tsunamis present a significant threat along the Mexican Pacific coast.<sup>7</sup>

However, the most frequent disasters are of hydrometeorological origin, including severe hurricanes along the Pacific, Atlantic and Gulf of Mexico coasts, bringing strong rainfalls and intense storms throughout the territory with consequent floods. In 2011, the number of houses damaged by floods (1,902,352) was higher than those damaged by rains (1,201,552) and earthquakes (324,565).<sup>8,9</sup> On the other hand, during recent years Mexico has been characterized by prolonged droughts. In 2011, 40% of the territory experienced the worst drought in seven decades.<sup>10</sup> The National Water Commission (CONAGUA) registered drought in 1,213 Mexican municipalities (out of 2,547), while the Ministry for Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) reported 2.7 million hectares planted with seven of the main crops damaged in Sinaloa, Zacatecas and Guanajuato.<sup>11</sup> Other emergencies related to extreme hydrometeorological events are wildfires. In 2012, a total of 7,170 forest fires were reported, affecting 347, 225.53 hectares.<sup>12</sup>

<sup>6</sup> UNISDR (2009).

<sup>7</sup> World Bank, SEGOB (2012), p.12.

<sup>8</sup> UNISDR (2011a).

<sup>9</sup> INEGI (2012b).

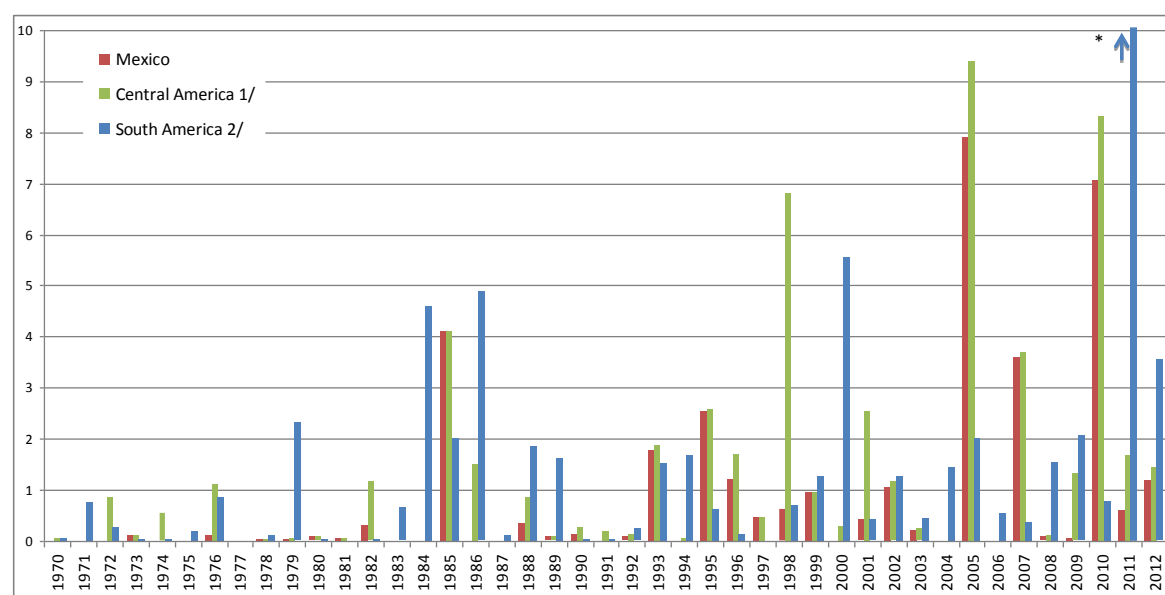
<sup>10</sup> Caballero, J. L. (2012).

<sup>11</sup> INEGI (2012a).

<sup>12</sup> CONAFOR (2013).



**Figure 1: Economic Losses due to Natural Disasters in Mexico, Central America and South America, in million USD, 1970-2012**



Source: Figure elaborated with data from EM-DAT.

\* Due to graphical representation, losses are only shown up to USD 10 million. It should be noted that in 2011, South America registered losses of USD 32,086,700.

1/ Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama.

2/ South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela.

Figure 1 shows that, albeit with significant fluctuations, economic losses have followed an upward trend in both regions, registering record levels during the last decade. Furthermore, it is evident that Mexico is a country highly affected by natural disasters, given that on several occasions economic losses for the whole region are almost entirely made up of losses registered in Mexico alone, and in some years Mexico registered higher economic losses than that of the total region of South America.

In line with the findings of GAR-13, within a group of 40 countries analyzed, Mexico had the highest number of direct economic losses in the period from 1981 to 2011, followed by Indonesia, Chile, Iran, Argentina and Colombia.<sup>13</sup> Between, 1970 and 2009, approximately 60 million people were affected by natural disasters in Mexico.<sup>14</sup> During the last 10 years, 90% of losses were generated by hydrometeorological phenomena, with a further 9% caused by earthquakes.<sup>15</sup> In Mexico, during the last decade 1,700 people died due to disasters emanating from natural hazards, with material losses exceeding USD 13,600 million.<sup>16</sup> Within these statistics, the social and economic vulnerability faced by the indigenous population and other vulnerable groups stands out.

<sup>13</sup> UNISDR (2013).

<sup>14</sup> UNISDR (2011).

<sup>15</sup> SINAPROC (2013a).

<sup>16</sup> SINAPROC (2009).



## 2: Methodology

2.1. Project Objectives

2.2 Methodology

2.3 Local & Community Visits

## 2. Methodology

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This case study was supported by federal, state and local contacts of the Disaster Risk Management Programme (PMR) of UNDP Mexico, as well as the BCPR, which allowed for the formation of an interdisciplinary team of specialists with more than 15 years' experience in DRR, legal frameworks and public policies.

### 2.1 Project Objectives

The purpose of the case study is to contribute to an initiative of IFRC and UNDP to prepare a multi-country report on DRR and legislation. The information will also be used to inform the parallel development of a Checklist for Lawmakers. The multi-country report will be available as a tool for states and international actors, including UNDP and the IFRC, by providing comparative data and examples of good legislative practices and implementation. It will be used to develop other tools as the basis for advocacy and capacity building in DRR. This case study will also provide information on legislation and DRR in Mexico, and it seeks to contribute to the national process of strengthening resilience in Mexico through DRR. Recent progress made as of early 2013 in terms of mainstreaming the prevention and DRR perspective into the national legal framework will be identified, as well as the main gaps and areas of opportunity that should be addressed.

### 2.2 Methodology

Research conducted between April and July 2013 included the compilation and review of federal, state and local laws, as well as field trips, interviews and focus group discussions in Mexico City and several states in the centre and south of the country. Given the short time frame, this case study does not seek to be exhaustive in terms of all legal and institutional DRR-related frameworks in Mexico. However, a considerable number of the main laws and regulations at the federal, state and local level were reviewed, along with relevant agreements, guidelines, rules of operation, programmes and other legal instruments.<sup>17</sup> This report aims to provide a general overview and analysis of the DRR-related framework in Mexico, presenting specific examples of good practice, as well as the main areas of opportunity regarding legislation and its implementation.

Interviews with key stakeholders were fundamental to review the direction, performance and progress made in the implementation of DRR-related laws, regulations and agreements (see complete list in Annex A), and included government officers at the federal, state and local level, as well as representatives of national and international NGOs, UN agencies and rural communities. The interviews were conducted using questionnaires structured by topic and adjusted according to the area of expertise of each interviewee. These were generally based on the information and orientation provided by the terms of reference for the project. The interviews included questions about DRR in Mexico and its implementation, aimed at identifying good practices and areas of opportunity. The interviews were mostly conducted in the Federal District, Yucatán, Campeche, Chiapas, Guanajuato, Oaxaca and Quintana Roo, at the offices of government officers, NGOs, academic institutions and UN agencies.

### 2.3 Local and Community Visits

Given that one of the main objectives of the project is to analyze the implementation of laws at the community level, this case study also focussed on gathering the views of municipalities and communities, i.e., the opinions, perceptions and concerns of communities, civil society and academics on topics related to federal, state and local legislation, as well as non-legislated topics. The field trips to the south-southeast of Mexico aimed to:

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<sup>17</sup> See Annex.

- identify and obtain copies of DRR-related laws and regulations, e.g. laws that could not be found during the law desk survey, such as municipal plans and regulations.
- review the existing DRR legal framework in states and municipalities, their functioning, financing and resources for effective implementation.
- identify good practices and areas of opportunities in the legislation and its implementation.

The project consultant visited the municipalities of Jalapa, Emiliano Zapata and Teapa in the state of Tabasco, as well as the municipalities of Merida, San Felipe, Maxcanú and Chacsinkin in the state of Yucatán, conducting interviews with local government officers and representatives and members of 12 rural communities, mostly indigenous (Mayas or Chontal), which formed focus groups based on project topics. Yucatán and Tabasco are among the regions highly exposed to hurricanes and floods respectively, and thus, the community participants are experienced in disaster management.

These micro-regions were chosen based on the operation in the region of the UNDP Risk Management Programme (PMR) for more than 10 years. Focus group discussions were carried out using qualitative techniques, gathering interviewees' opinions within an open discussion format. In states and municipalities, meetings were conducted with government officers and NGOs. The questionnaire included questions on DRR-related legislation, its implementation and opportunities for improvement.

### Focus Groups Details

- Merida, Yucatán – focus group – governance, civil protection, DRR, risk transfer, preparedness and response, land planning, local civil protection council.
- San Felipe, Rio Largartos, Tizimin, Panaba, Chemax, Yucatán – group on civil protection, regional round table discussion - DRR, fires, preparedness and response, local risk maps.
- Maxcanu, Yucatán – community focus group – droughts, preparedness and response, risk transfer, local land planning.
- Jalapa, Tabasco – local focus group – local legislation, building codes, municipality plans.
- Chacsinkin, Yucatán - community focus group – gender, food security.



## 3: Findings on Regulatory Frameworks for DRR and their Implementation

- 3.1 Mexico's Political Structure
  - 3.2 DRR in Disaster Management Law & Institutions
  - 3.3 Responsibility for DRM and DDR, Risk Financing and Transfer
  - 3.4 Early Warning Systems & Risk Mapping
  - 3.5 Regulation of the Built Environment
  - 3.6 Regulation of the Natural & Rural Environment
  - 3.7 Drought and Food Security
  - 3.8 DRR Education & Awareness
- 

### 3. Findings on Regulatory Frameworks for DRR and their Implementation

#### 3.1 Mexico's Political Structure

The Constitution of the United Mexican States of 1917 (the Constitution), last reformed on July 19, 2013, is the central tenet of the Mexican legal regime. Art. 40 states that it is the will of the Mexican people to constitute as a representative, democratic, secular, federal republic, composed of states, which are free and sovereign in all matters related to their internal affairs, but united in a federation established according to the principles of this fundamental law. Mexico is composed of 31 states and the Federal District, which, in turn, are divided into 2,441 municipalities and 16 boroughs respectively.<sup>18</sup> Art. 49 of the Constitution establishes the three branches of government (Executive, Legislative and Judicial). Each state has a similar division of power. There is a hierarchy between the federal and state laws, as per Art. 133 of the Constitution, however, states also legislate autonomously and have their own congress of state deputies. According to Art 73 XXIX-I, at the federal level “congress has the power [...] to enact laws that establish the basis on which the Federation, the states, the Federal District and the municipalities coordinate their actions on civil protection [...]” Art. 122 states “the Legislature, under the terms of the State Government, shall have the following powers [...] i) Regulate civil protection, civil justice on petty misdemeanours, good governance, security services provided by private companies, prevention and social rehabilitation, health and social care, and social provisions.”

The powers delegated to the municipalities are outlined in Art. 115 of the Constitution, including the management of potable water distribution, disposal and treatment of sewage, garbage collection, public safety, land zoning and urban development plans, as well as regional development plans, creation of land reserves, monitoring of land use, granting of construction licenses and permits, participation in the creation of ecological reserves and creation of good governance proclamations and regulations; the latter being the legal instruments of local government. This article is the foundation for decentralization in Mexico and is linked with the principle of subsidiarity,<sup>19</sup> as also applied in the National Civil Protection System (SINAPROC).

#### 3.2 DRR in Disaster Management Law & Institutions

In a country as large and diverse as Mexico, with such a broad risk profile (see chapter 1.3.), DRR is a complex task that requires efficient coordination among all stakeholders involved, based on a sound legal framework. The present institutional and legal DRM and DRR structure in Mexico initially developed in response to the severe consequences suffered from the earthquake in September of 1985. Since then, Mexico has implemented an efficient civil protection system, the functioning of which, especially with regard to its response and coping capacity, has been proven on several occasions.

During the last decade, Mexico has made important progress in incorporating a DRR perspective in its legal framework at the federal, state and local level. The evolution of SINAPROC and its components demonstrates a change from the traditional approach of civil defence (preparedness and response) towards a more contemporary DRR approach, creating links with development plans, and emphasizing prevention strategies. The framework that constitutes the legal and institutional basis for DRM and DRR is the new General Civil Protection Law (LGPC),

<sup>18</sup> INEGI (2005).

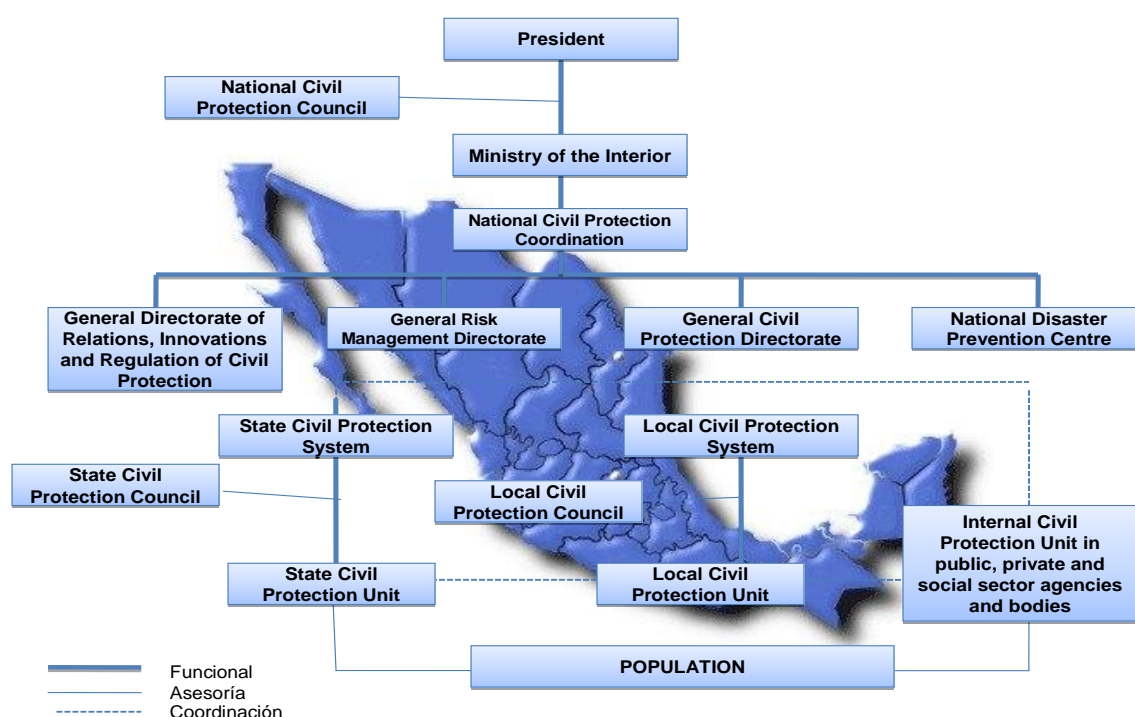
<sup>19</sup> Agreement on the issuance of the Manual of Organization and Operation of the National Civil Protection System, 23-10-2006, p3

published on June 6, 2012, coordinating civil protection and DRR activities at the three government levels and among the stakeholders that form SINAPROC. The main elements of SINAPROC and the legal framework are described below, with emphasis placed on those relevant to DRR and prevention.

## Disaster Management Institutions

According to Art. 27 XII of the Organic Law of the Federal Public Administration (*Ley Orgánica de la Administración Pública Federal*), the Ministry of the Interior (*Secretaría de Gobernación, SEGOB*), through SINAPROC, is the federal agency in charge of regulating and implementing actions on civil protection and DRR. Its organizational structure is shown in figure 2.

Figure 2: Organizational Structure of SINAPROC



Source: Elaborated based on Internal Regulation of SEGOB (2013).

SINAPROC is composed of all agencies and units of the federal public administration,<sup>20</sup> the civil protection systems of the 32 states and their municipalities and boroughs, volunteer neighbourhood groups, civil society organizations, fire departments, the army and the navy, as well as representatives of the private and social sectors, media and research centres, and education and technological development groups that participate in civil protection measures in Mexico.

<sup>20</sup> The main federal ministries with responsibility for DRM and DRR are: Legal Council of the Federal Executive (*Consejería Jurídica del Ejecutivo Federal*), the Agriculture, Livestock, Rural Development, Fisheries and Food Ministry (*Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, SAGARPA*), the Communications and Transportation Ministry (*Secretaría de Comunicaciones y Transportes*), the Attorney General's Office (*Procuraduría General de la República*), the Ministry of Foreign Affairs (*Secretaría de Relaciones Exteriores*), the Health Ministry (*Secretaría de Salud*), the Ministry of the Public Service (*Secretaría de la Función Pública*), the National Security Commission (*Comisión Nacional de Seguridad*), the Public Education Ministry (*Secretaría de Educación Pública*), the Ministry of Economy (*Secretaría de Economía*), the Navy Ministry (*Secretaría de Marina*), National Migration Institute (*Instituto Nacional de Migración*), the Ministry of Labor and Social Welfare, (*Secretaría de Trabajo y Previsión Social*), the Ministry of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público*), the National Defense Ministry (*Secretaría de la Defensa Nacional*) and the Tax Administration Service (*Servicio de Administración Tributaria*) and Customs Service (*Aduanas*) of Mexico.

The largest deliberative forum of the system is the National Civil Protection Council (*Consejo Nacional de Protección Civil*) (Arts. 26 – 31, LGPC).<sup>21</sup> There is also a National Emergency Council (*Comité Nacional de Emergencias*) and a Standing Advisory Council on Civil Protection (*Consejo Consultivo Permanente de Protección Civil*) which provide advice to SINAPROC.<sup>22</sup> Executive coordination is the responsibility of SEGOB through the National Civil Protection Coordination (*Coordinación Nacional de Protección Civil*) (Art. 19 LGPC), which, in turn, is divided into the following units:<sup>23</sup>

- **The General Civil Protection Directorate (*Dirección General de Protección Civil, DGPC*)** supports the National Civil Protection Coordination in the integration, coordination and supervision of SINAPROC, with the states and municipalities and in consultation with private and social sector institutions and bodies. It also leads the National Civil Protection Communication and Operation Centre (*Centro Nacional de Comunicación y Operación de Protección Civil, CENACOM*), which is the operative body for communication, alerts, information, ongoing support and liaison between the members of SINAPROC, and preparedness, relief and recovery tasks (Art. 24 LGPC).
- **The General Directorate of Relations, Innovation and Regulation of Civil Protection (*Dirección General de Vinculación, Innovación y Normatividad en materia de Protección Civil*)**, is responsible for elaborating, developing and promoting the Official Mexican Norms (NOMs) on Civil Protection matters. It is also responsible for coordinating between the three levels of government that align with the National Development Plan and the National Civil Protection Programme. The Directorate also promotes agreements between the social and private sectors, resolves queries related to the rules of civil protection from individuals as well as other Federal Government departments and agencies, and participants in international forums to exchange experiences of DRR.
- **The General Risk Management Directorate (*Dirección General para la Gestión de Riesgos, DGGR*)** (previously called: *Dirección General del Fondo de Desastres Naturales*), supports the National Civil Protection Coordination in the operation of risk management financial instruments, such as the Natural Disaster Fund (*Fondo de Desastres Naturales, FONDEN*), Disaster Prevention Fund (*Fondo para la Prevención de Desastres Naturales, FOPREDEN*), Preventive Trust (*Fideicomiso preventivo, FIPREDEN*), and the Emergency Fund (*Fondo Revolvente*) (see Chapter 3.2.)

The **National Disaster Prevention Centre (*Centro Nacional de Prevención de Desastres, CENAPRED*)**, is an administrative independent agency of SEGOB with technical and operative autonomy. It is the technical-scientific institution of the National Civil Protection Coordination with responsibility for creating, managing and providing public policies on risk prevention and DRR through research, monitoring, training and dissemination. Other important tasks include the integration of risk maps, i.e. the National Risk Atlas (*Atlas Nacional de Riesgos*), leading the National School of Civil Protection (*Escuela Nacional de Protección Civil*), coordination of risk monitoring and alerts and the promotion of resilience in the society as a whole (Art. 23 LGPC).

The State and Municipal Civil Protection Councils and Units are responsible for civil protection at the state and local level. According to the SINAPROC coordination manual<sup>23</sup>, each level of government has responsibility for civil protection under the principle of subsidiarity, i.e., the first authority to take action is the local one or the boroughs of the Federal District. If its capacity is exceeded or it cannot respond, the authority of the state or Federal District is in charge of both material and financial matters.

Furthermore, the National Defence Ministry (*Secretaría de la Defensa Nacional*) and the Navy Ministry (*Secretaría de Marina*) play an important role within SINAPROC since they implement Emergency plans (*Plan de Auxilio a la Población Civil*) in the case of disasters (art. 21 LGPC), known as “*Plan Defensa Nacional III*” and “*Plan Marina*”, which includes new technologies, simulations and technical and scientific research in order to control risks and avoid and mitigate the destructive impact of disasters.<sup>23</sup>

<sup>21</sup> The National Council consists of the Mexican President, chair of the Council, and the heads of the federal ministries, the governors of 32 states, and the boards of civil protection commissions of the Senate and House of Deputies.

<sup>22</sup> Internal Regulation of SEGOB (*Reglamento Interior de la Secretaría de Gobernación*) (2013)

<sup>23</sup> Agreement on the issuance of the Manual of Organization and Operation of the National Civil Protection System. 2006, p3.



There is a broad network of international cooperation, particularly The Ministry of Foreign Affairs (*Secretaría de Relaciones Exteriores*) oversees compliance with international agreements on civil protection, and proposes the establishment of modalities for cooperation and international assistance in the case of disasters.<sup>23</sup>

## DRR in Disaster Management Legislation

Mexico has made significant progress during the last decade in terms of DRR within its legal framework. With the publication of the General Civil Protection Law on May 12, 2000, and the National Development Plan 2001-2006, the focus has shifted from a reactive civil protection system to a preventive system. Thus, in 2003 the Natural Disaster Prevention Fund (FOPREDEN) was created<sup>24</sup> and authorities started the development of Risk Atlases. In the context of the reform of the General Law on April 24, 2006, an agreement on the issuance of the Manual of Organization and Operation of the National Civil Protection System was published (*Acuerdo por el que se emite el Manual de Organización y Operación del Sistema Nacional de Protección Civil*), aimed at setting the baseline for the coordination, organization and operation of SINAPROC. The manual has a holistic and modern perspective and defines the responsibilities of the stakeholders at the three levels of government. Another advance was marked by the redefinition of the civil protection approach towards a Holistic/Integrated Risk Management approach, as stated by the National Civil Protection Programme 2008-2012, recognizing that the generation of risks comes from multiple factors, such as political decisions, land use planning and cultural aspects. This approach is to be mainstreamed throughout government levels, as well as social and private sectors.

The new General Civil Protection Law (LGPC), published on June 6, 2012, repealed the 2000 law and its latest reform in 2006. It marked another important step in terms of DRR, by incorporating several new provisions to strengthen the resilience concept and DRR mainstreaming into other sectors. Table 2 shows some of these new DRR-related provisions.

**Table 2: DRR related Provisions in the LGPC (2012)**

Article	Description
Art. 4 VII	<b>Climate Change:</b> Among the priorities of civil protection is that public policies are informed about adaption to climate change.
Art. 10 VI, VII	<b>Broadening of DRR (GIR) Approach,</b> by including the following phrases: the development of a greater understanding and awareness of risks, and the strengthening of society's resilience.
Art. 16	<b>Access to information:</b> SINAPROC shall share with a competent authority that requests and justifies its use, technical information related to EWS, risk monitoring, forecasting and measuring systems.
Art. 18	<b>Mandatory Insurance for States:</b> States are responsible for establishing insurance and other risk management and transfer instruments.
Art. 19 XXII	<b>Risk Atlas:</b> The Risk Atlas constitutes the reference framework for the elaboration of policies and programmes at all stages of Holistic Risk Management (GIR).
Art. 20	<b>Sector Mainstreaming:</b> to improve its performance, the National Coordination may set up Inter-institutional Committees.
Art. 23	<b>CENAPRED Competency:</b> Integration of the National Risk Atlas, conduct of ENAPROC, coordination of EWS and monitoring, etc.
Art. 24	<b>SINAPROC Coordination:</b> creation of CENACOM

<sup>24</sup> Agreement that establishes the rules of operation of the Natural Disaster Prevention Fund (FOPREDEN), 10-10-2003.

Arts. 39 – 40	<b>Safety/Mainstreaming Built Environment:</b> Obligation to consult with an Internal Civil Protection Programme and Unit for public, private and social sector buildings.
Art. 39	<b>Safety/Mainstreaming Built Environment:</b> Hospitals shall consider the guidelines of the “Safe Hospital Programme” when developing their internal programmes.
Art. 41	<b>Community Participation:</b> Populations at risk have the right to be informed and to participate in risk management actions.
Art. 43 II	<b>Education Mainstreaming/ Civil Protection as a compulsory subject:</b> The corresponding authorities shall incorporate Civil Protection curricula in all public and private educational levels, considering it as a compulsory subject.
Art. 49	<b>Education Mainstreaming:</b> Creation of National Civil Protection School (ENAPROC).
Art. 66	<b>State Civil Protection Funds:</b> Each state shall create and manage a State Civil Protection Fund.
Art. 79	<b>Individual Responsibility:</b> Private sector individuals that deal with hazardous materials, hydrocarbons and explosives shall present an internal civil protection programme to the corresponding authority.
Art. 84	<b>Risk Atlas/Mainstreaming Built Environment:</b> The construction of buildings, infrastructure and human settlements without a risk analysis and without the authorization of the relevant authority is a felony/offense.
Art. 86	<b>Risk Atlas/Mainstreaming Built Environment:</b> The National Risk Atlas shall be considered by competent authorities for the authorization of any type of construction, infrastructure or human settlement.
Art. 87	<b>Settlements in Risk Zones:</b> Authorities, considering specific risks, will determine the realization of public infrastructure construction necessary to mitigate risks and elaborate relocation plans.
Art. 90	<b>Responsibility:</b> The authorization of land use permits by public servants without approval is a severe conduct that will be punished.
Arts. 91 – 94	<b>Rural Sector:</b> The Government assumes responsibility for addressing the negative effects of disasters in the rural sector/ Special Funds for rural sector.

Source: LGPC 2006, 2012

These new provisions show the prioritization of mainstreaming DRR into the sectors of construction and housing, environment and climate change, and education. It also delegates responsibility for the implementation and enforcement of the law to state and municipal governments, as well as public officers directly.

The focus on prevention, DRR and safe development by the new Mexican federal government, as shown in the recently published National Development Plan 2013-2018, is the most comprehensive since the creation of SINAPROC. However, although the government has undertaken extensive actions focused on relief and recovery in the case of disaster, through the operation of SINAPROC (primarily through the armed forces), preventive actions need to be strengthened in order to reduce risks. The government established priority strategies for a six-year period, including: the consolidation and homogenization of Risk Atlases at the federal, state and local level; DRR as an integrated policy at the three government levels with the participation of private and social sectors; and the strengthening of existing policies on human settlements in at risk zones.

All states have a State Civil Protection Law and according to the INEGI census of municipal governments 2011<sup>25</sup>, 1,005 out of 2,457 municipalities have a local civil protection regulation. This represents only 41% of all

<sup>25</sup> INEGI (2011).

municipalities, which can be in part be explained by a lack of resources and capacities, especially in small rural municipalities.

Other laws that include a DRR perspective, and that demonstrate progress in mainstreaming DRR, are the General Climate Change Law (LGCC) (see Chapter 3.6.), the General Law on the Provision of Services for Child Care and Integral Development (LGPSACDI) and its regulation (related to the topic of child protection, sanctions and temporary shelters), and the Organic Law of the Army and Air Force that regulates, amongst others, the role of the army in the case of disasters. Another example is the International Development Cooperation Law (LCID), under which the Mexican Agency for International Development Cooperation (*Agencia Mexicana de Cooperación Internacional para el Desarrollo*, AMEXCID) was created, promoting disaster management as one of its international cooperation programme lines, including topics such as the provision of humanitarian aid in cases of emergency. The recent approval of these federal laws, which include a DRR perspective, represents good practice. It also presents an opportunity to further include DRR aspects within the programmes that will be derived from these laws.

### Good Practices and Areas of Opportunities in DRM Legislation and Institutions

Regarding the legal and institutional framework of SINAPROC, Mexico possesses a strong and sound system, whose proper functioning has been proven on several occasions, with the inclusion of all DRM-relevant stakeholders. The existence of a special technical-scientific agency (CENAPRED) and a fund (FOPREDEN), explicitly directed and earmarked for prevention, is a very positive aspect of Mexico's DRR system.

The incorporation of the National Defence and Navy Ministry into SINAPROC stands out as good practice, both due to the efficiency of intervention of highly trained armed forces in the case of a disaster, as well as the clear line of coordination and information sharing with SEGOB's National Civil Protection Coordination. Another favourable practice is the level of international collaboration with other countries in the region.

However, interviewees from state governments and NGOs mention that SINAPROC also faces diverse challenges, e.g., the strengthening of its capacity to coordinate with three government branches, which could be facilitated by an increased specification in SINAPROC's Coordination and Operation Manual and the establishment of clear responsibilities within the description of each profile, functions and an allocation of resources.<sup>26</sup> Another challenge is the strengthening of civil society's participation within the system, considering that the absence of a detailed regulation in this matter has resulted in sporadic attempts at coordination between the government and civil society organisations. As a possible solution, it has been proposed to create inter-institutional and multi-sectoral teams that involve stakeholders from academic institutions and NGOs in the prevention phase.<sup>27</sup> The third challenge is to improve the relationship between these actors and the institutions associated with climate change in order to establish DRR as a cross-cutting issue.<sup>28</sup> According to the opinion of the academic analysts interviewed during this case study, the strengthening of the interface between DRR and climate change adaption will help to clarify the specific measures needed by sector and by territory in order to achieve "safe development," by increasing the governance<sup>29</sup> between different actors, who are in charge of implementing preventive programmes and projects in their areas of legal responsibility.

During the last decade, significant progress was made in strengthening the legal framework, which, to a great extent, provides the necessary foundation for implementing holistic civil protection policies. The recently published General Civil Protection Law clearly considers the importance of linking DRM and DRR with other sectors, such as urban development, housing and construction, informal human settlements and education (see Chapters 3.5., 3.6. and 3.7). It can be concluded that the contemporaneous DRR perspective is mainstreamed within the existing legal framework.

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<sup>26</sup> Panel Group Work - Mesa de Trabajo Sectorial México en Paz, Consulta Ciudadana, Plan Nacional de Desarrollo 2013-2018 (2013)

<sup>27</sup> To this end, there is an advisory council for the National Civil Protection Coordination that represents an opportunity for resolving this problem.

<sup>28</sup> González, González, F. (2008).

<sup>29</sup> Governance is the sum of numerous forms of how private and public individuals and institutions manage common affairs. It is a continuous process of addressing conflicts or diverse interests and taking cooperative action. Lucatello, Simone (2012).

On the other hand, some areas of opportunities were detected, for instance, the homogenization of the legal framework at the state and local level, as well as the sectoral laws according to the new provisions of the LGPC. The publication of a regulation to support the LGPC also remains outstanding. Without this regulation, certain administrative, political and legal measures contained within the LGPC remain unspecified. These are essential for enforcement, and, without them the previous civil protection regime remains in force.<sup>3031</sup> Finally, some interviewed researchers considered that the LGPC contains important gaps with respect to human rights, gender and indigenous peoples' perspectives, which could also be addressed by publishing the respective regulations. For instance, Early Warning Systems (EWSs), alerts, risk maps and declarations in the case of disasters should strongly include a gender perspective, not only in their design, but also in their implementation and training activities. Regarding the indigenous communities, given their cultural conditions and higher marginalization, civil protection authorities need more training in order to understand cultural processes and should make information available in indigenous languages.

### 3.3 Responsibility for DRM and DRR, Risk Financing and Transfer

The issue of responsibility and accountability for DRM and DRR is related to the assumption of costs caused by natural disasters and the mechanisms, public policies and financial policies of risk transfer (i.e. federal funds, programs and insurance). In legal terms, this matter is linked to the civil and/or criminal responsibility that volunteers, private agents and public officials might face when implementing actions within their mandates, e.g. risk analysis, provision of preventive measures in public actions and constructions, erroneous alerts or failure to issue warnings.

#### Responsibility

Legally, the basis for responsibility for DRR is established in the Constitution, which, although not explicitly for civil protection, indemnification or protection against disaster losses, defines, inter alia, in Arts. 1, 4 and 6, human rights and individual guarantees such as the right to adequate and safe housing, a healthy environment, non-discrimination, health protection and access to public information. These rights imply responsibilities for the State in terms of civil protection, DRM and DRR.

In general, the responsibilities of the State and public officials are defined in the Federal Law on State Responsibilities (*Ley Federal de Responsabilidad Patrimonial del Estado*) and the Federal Law of Administrative Responsibilities of Public Servants ([Ley Federal de Responsabilidades Administrativas de los Servidores Públicos](#)), which, according to Art. 113 of the Constitution, determine obligations in order to safeguard legality, honesty, loyalty, fairness and efficiency in the performance of their duties, jobs, charges and commissions; as well as the sanctions applicable for acts or omissions, and the procedures and authorities for imposing them. This article also states that the responsibility of the State for the damage caused due to irregular administrative activity to the property or rights of individuals will be objective and direct. Individuals have the right to compensation in accordance with the regulations, limits and procedures established by these laws. Thus, the government can be made accountable administratively, but the public servant can become criminally liable. Art. 13 of the Federal Law of Administrative Responsibilities of Public Servants lists the main sanctions. The penalties for public servants for rendering incorrect reports and the improper exercise of their public duties are defined in Art. 214 of the Criminal Code. For example, according to Art. 397, public servants who cause flood or fire of a building face 5 to 10 years in prison in addition to fines. Art. 414 of the Criminal Code includes provisions on crimes against the environment and environmental management such as the illicit transportation of hazardous substances. The responsibility of individuals for damage caused to third parties or their properties due to the misuse of substances is established in Arts. 1913-1915 and 1931-1934-BIS of the Civil Code.

The LGPC also includes provisions on accountability. Art. 91 specifies that it is the responsibility of the federal government and the states to address the negative effects caused by extreme climatic events in the rural sector. However, according to Art. 65, it does not assume responsibility for the costs caused by anthropogenic phenomena, since they are caused by human activity, and are therefore not within the competency of the Risk Management

<sup>30</sup> Berlín Valenzuela, F. (1997).

<sup>31</sup> LGPC 2012, fourth transitory article. "the regulative and administrative provisions continue to be applied, as long as they are not contrary to this Law, until the new regulation(bylaw) is published."

Financial Instruments. The LGPC includes a new provision assigning explicit responsibility to public servants that authorize land use permits without approval, which is considered serious misconduct punishable in accordance with the Law of Responsibility of Public Servants, besides being an offense in terms of other applicable regulations (Art. 90 LGPC). With respect to individual personas, the LGPC transfers responsibility to territories who receive a massive influx of people (Art. 78) and individuals or corporations in the private sector, which engage in the handling, storage, distribution, transport and use of hazardous materials, hydrocarbons and explosives (Art. 79). These articles of the law oblige them to have an internal civil protection unit and to develop an internal programme which they must present to the respective authority. It also provides that any person or entity shall inform the competent authorities of any high risk, damage or disaster that arises or may arise (Art. 81).

However, the law does not specify sanctions, consequences and procedures in the case of non-compliance with the assigned responsibilities. This is an issue which could be addressed in the outstanding regulation of the LGPC. It should be noted that Art. 17 of the Constitution establishes the right of free access to the courts for everybody, and Art. 2 does so for the indigenous population in particular. Given that the damages of disasters are often not limited to individuals, but rather affect a community or municipality as a whole, the right to bring a class-action claim represents an important legal tool established in the Federal Civil Procedure Code (*Código Federal de Procedimientos Civiles*) (art. 585) and the Federal Civil Code (*Código Civil Federal*) (art. 1934).

## Risk Financing and Transfer

Mexico has a considerable capacity for financial resilience and disaster response<sup>32</sup> based on a wide range of financial instruments for risk management and risk transfer, among which several different insurance schemes (see below) and the following funds and trusts stand out:

- **Natural Disaster Fund** (*Fondo de Desastres Naturales*, FONDEN), consisting of the Emergency Fund (*Fondo para la Atención de Emergencias* FONDEN), the Natural Disaster Fund Programme of Branch 23 of the Federal Budget and the Natural Disaster Fund Trust.<sup>33</sup> The Emergency Fund is a financial instrument for immediate and timely disaster response, providing relief, aid and assistance to severely affected populations;
- **Natural Disaster Prevention Fund** (*Fondo para la Prevención de Desastres Naturales*, FOPREDEN) includes the Preventive Trust (*Fideicomiso preventivo*, FIPREDEN), aimed at promoting and strengthening preventive actions for DRR, diminishing the effects and impacts of natural phenomena, as well as fostering DRR research.<sup>34</sup> FIPREDEN provides resources to the agencies, federal and state units for unscheduled preventive actions.<sup>35</sup>

Civil protection is within the direct competence of the federal government. However, through a system of coordination with the states, it allocates a national budget for disaster response which is distributed based on predetermined conditions. Art. 37 of the Federal Budget and Fiscal Responsibility Law (*Ley Federal de Presupuesto y Responsabilidad Hacendaria*) establishes that the Expenditure Plan shall include a budget for the FOPREDEN, FONDEN and the “Fund for the Assistance of the Rural Population Affected by Climatic Contingencies,”<sup>36</sup> equivalent to at least 0.4% of the total programmable expenditure (i.e. in 2013, FONDEN expenditure amounted to Mex\$5,507,887,975, and FOPREDEN expenditure was Mex\$322,920,000). This shows the importance placed on DRR and the measures for reducing risks to development. To earmark a fixed percentage of the national budget for DRM and DRR ensures functionality and allows, especially in the case of FOPREDEN, research, development and investment in new technologies, including early warning systems and risk maps, as well as the formation of capacities and institutional transformation, generating and strengthening resilience capacity. However, regarding FONDEN and

<sup>32</sup> Maskrey, Andrew (2013).

<sup>33</sup> Agreement that issues the General Rules of the Natural Disaster Fund (2010) and Agreement that establishes the Guidelines for the FONDEN Emergency Fund (2012).

<sup>34</sup> Agreement that establishes the Rules of Operation of FOPREDEN (2010), art. 4

<sup>35</sup> Agreement that establishes the guidelines for the operation of the preventive TRUST (FIPREDEN), art.1

<sup>36</sup> Fund to Assist Rural Population affected by Climatic Contingencies (*Fondo para Atender a la Población Rural Afectada por Contingencias Climatológicas – o Fondo de Apoyo Rural por Contingencias Climatológicas*), is operated by SAGARPA within the Programme of Assistance to Natural Disasters in the Agriculture and Livestock and Fisheries Sector; as a component of the Disaster Prevention and Management Programmes. Agreement that announces the Rules of Operation of the Programmes of SAGARPA (2013).



FOPREDEN, it should be noted that the proportion of resources assigned to each fund is unequal; for each 3.1% of budget assigned to FONDEN only 0.1% is allocated to FOPREDEN.<sup>37</sup>

States can access these funds under certain conditions. They are jointly responsible for planning local budgets within a *pari passu* system for resource allocation. This scheme has proven to be efficient, especially in the case of hurricanes and meteorological phenomena, for which Mexico has earned a good reputation at the international level. In addition, Art. 66 of the new LGPC states that each state shall create and run a State Civil Protection Fund to finance training, equipment and the establishment of the Civil Protection Units of the states, municipalities and Federal District boroughs.

Interviewees mentioned several areas of opportunity to improve the performance of FONDEN. This included reviewing its operating rules in order to: 1) simplify access to funds, in particular, allowing for more flexible time periods after a emergency is declared; 2) guarantee that all investments are of low risk; 3) replicate good practices in the state civil protection funds, by means of increased participation in its regulation and linking its availability with the update of state civil protection laws, and 4) create modalities which are open for local proposals.

In addition to FONDEN and FOPREDEN, there are two other funds relevant to DRR:

- **The Fund for Rural Assistance to Climatic Contingencies** (*Fondo de Apoyo Rural por Contingencias Climatológicas*) is operated by the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) within its Natural Disaster Assistance Programme for the agricultural, livestock and fisheries sector (*Programa Atención a Desastres Naturales en el Sector Agropecuario y Pesquero, CADENA*) as one of the components of the Disaster Management Prevention Programme (*Programa de Prevención y Manejo de Desastres*).<sup>38</sup> This fund aims to provide assistance, by means of insurance, in order to limit the negative effects caused by natural disasters on agriculture, livestock, aquaculture and fisheries activities (see below).<sup>39</sup> The legal foundation for this fund is established under the Sustainable Rural Development Law, e.g., Art. 129, among others.
- **The Fund for Assistance to Micro, Small and Medium Enterprises (Fondo de Apoyo para la Micro, Pequeña y Mediana Empresa (MIPYMES) (Fondo PyME))**, among many other modalities, provides resources to relieve the effects caused by disasters to affected firms.<sup>40</sup> In comparison with the majority of support provided, this assistance to affected firms is considered an exceptional case. Considering the complexity of providing financial aid via public calls it has to be authorized through a special modality. This facilitates timely attention in the case of an emergency. The National Entrepreneur Institute (*Instituto Nacional del Emprendedor, INADEM*) operates the PyME Fund and provides help to damaged firms through the Special Programme for Economic Reactivation in the case of contingencies (*Programa especial de reactivación económica por contingencias*). This is legally mandated under the Law for the Development of Competitiveness of the Micro, Small and Medium Firms (*Ley para el Desarrollo de la Competitividad de la Micro, Pequeña y Mediana Empresa*) (e.g., Arts. 4 and 10), as well as under the Agreement that regulates the organization and internal functioning of the INADEM. Art. 8 XX of this agreement states that the Directorate of General Coordination of Planning, Strategy, Evaluation and Follow-up of INADEM has the following responsibilities: to promote, design and coordinate assistance schemes or programmes for the reactivation of economic activity of MIPYMES affected by natural disasters. Previously, this assistance was granted directly by the Ministry of Economy through the Emergency Assistance Programme, supporting 50,969 damaged MIPYMES in the period from 2007 to 2011.<sup>41</sup>

<sup>37</sup> SINAPROC (2013), p 10.

<sup>38</sup> Agreement that announces the Rules of Operation of the Programmes of SAGARPA (2013).

<sup>39</sup> In the period 2003-2007 operated the Fund to Assist the Rural Population affected by Climatic Contingencies (*Fondo para Atender a la Población Rural Afectada por Contingencias Climatológicas, FAPRACC*); from 2008 to 2010 it was called the Climatic Contingencies Assistance Programme (*Programa de Atención a Contingencias Climatológicas, PACC*); in 2011 initiated the operation of the Natural Disaster Assistance Component (*Componente de Atención a Desastres Naturales, CADENA*), as part of the Risk Prevention and Management Programme (*Programa de Prevención y Manejo de Riesgos*). –Source: SAGARPA (2013)

<sup>40</sup> Rules of Operation of the PYME Fund 2013, 21.

<sup>41</sup> Secretaría de Economía (2013)

The risk transfer instruments developed and implemented in Mexico, is regarded as the most outstanding example of good practice in this area at the international level. According to the World Bank, Mexico was the first country worldwide that issued government catastrophic bonds. Specifically, through FONDEN, the bond CAT MEX was issued in 2006,<sup>42</sup> covering three zones exposed to seismic activity. In 2012, the bond was renewed, expanding coverage to include tropical storms.<sup>43</sup> Other innovative instruments are parametric catastrophic insurances, designed and operated by AGROASEMEX to cover climatic contingencies as part of the Risk Prevention and Management Programme (CADENA) operated by SAGARPA.<sup>44</sup>

The legal framework takes into account the importance of these financial instruments for risk management and transfer. One of the main changes established by the new LGPC (Arts. 18 and 88) is the transfer of responsibility for risks from the federal government to the states by means of obligatory insurance contracts and other instruments for risk management and transfer in order to cover the damage caused by natural disasters to properties and infrastructure in the respective state.<sup>45</sup> In line with Art. 19, it is the responsibility of the federal government, through the National Coordination, to give advice to local governments about the acquisition of insurances and risk transfer mechanisms.

The risk financing and transfer instruments, including their operating rules, represent examples of good practices which are recognized at the international level. For example the World Bank stated that Mexico is 'at the vanguard of initiatives aimed at the development of an integrated disaster risk management framework, including the effective use of risk financing and insurance mechanisms to manage the fiscal risk derived from disasters'.<sup>46</sup>

### DRR and Law on Specific Hazards (Sectoral laws)

In Mexico, there are no sectoral federal laws to address specific hazards such as cyclones, storms, earthquakes, tsunamis, floods, volcanoes or droughts. This may be partly explained by the great heterogeneity of its territory. However, the LGPC addresses these issues implicitly and explicitly. For example, Art. 2 lists all of the risks that the country may face, classifying them as anthropogenic, natural, geological, hydro-meteorological, chemic-technological, sanitary-ecological or social-organisational.

As mentioned in Chapter 3.1, SINAPROC, which includes all agencies and units of the federal public administration, state and local civil protection systems, voluntary and neighbourhood groups, civil society organizations, fire forces, the army and the navy, as well as representatives from the private and social sector, the media, research, educational and technological development centres, establishes the national platform and the optimal multi-sectoral forum for the management of any type of emergency.

With regard to volcanic activity, Mexico has operative plans, such as the Plan Popocatepetl, the Plan Colima, the Operative Plan of the Volcano Chichón and the Operative Plan of the Volcano Tacaná. These plans coordinate the actions of various SINAPROC units and local actors in the case of an emergency. Another important aspect is the organization of meetings between the different stakeholders that form SINAPROC related to preparation for volcanic activity, as well as the increase in the documentation of processes in the case of emergencies.<sup>47</sup>

Regarding the risks of insect infestation, the General Health Law (*Ley General de Salud*) establishes in Art. 134 VI and VII that the Health Ministry and state governments, within their respective competencies, shall realize activities of epidemiological monitoring, prevention and control of the following transferable diseases: VI.: yellow fever, dengue and other arthropod-borne viral diseases, and VII.: malaria, typhus, louse-borne relapsing fever, other rickettsial, leishmaniasis, trypanosomiasis, and onchocerciasis. The specific regulation is defined by the Official Mexican Norms (NOMs), which, in this case, are sanitary provisions issued by the Health Ministry. For example, NOM-032-

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<sup>42</sup> World Bank, *SEGOB* (2012).

<sup>43</sup> OECD (2013).

<sup>44</sup> Agreement for the issuance of the Rules of Operation for the Climatic Contingency Insurance Programme by the ministries of Finance (2013)

<sup>45</sup> SINAPROC (2012).

<sup>46</sup> World Bank, *SEGOB* (2012).

<sup>47</sup> Norlang García, A. (2009).

SSA2-2010 defines specifications, criteria and procedures to reduce the risk of infection, disease, complications or death caused by diseases transmitted by vectors. It is jointly developed with diverse official actors in the area of sanitary risks, federal and state social security institutions and related international and academic institutions.

This NOM establishes that the federal and state health systems hold the main responsibility for its application. However it does not specify how it is to be financed or who is liable in the case of omission in the implementation of the NOM. One of the preventive measures established by this NOM is to disseminate to the public basic information about transmission mechanisms, risk of infection and the social and economic consequences of such. The purpose of this measure is to garner acceptance of the National Programme on Prevention, Supervision and Control of vector-transmitted diseases, as well as to promote participation in individual, family and community activities.

Regarding the risk of insect infestation in the agricultural and livestock sector, the Federal Law of Vegetal Sanitation, the Federal Law of Animal Sanitation and the General Law of Sustainable Fisheries and Aquaculture establish the corresponding regulations, including campaigns, risk analysis and sanitary measures in order to prevent, control, fight and eradicate diseases and plagues (Art. 19, Art. 16, Art. 109, respectively). In particular, there are a variety of NOMs that regulate specific cases. The implementation of these laws corresponds in the first place to SAGARPA and, specifically, as an independent administrative body, to the National Service of Health, Food Safety and Quality (*Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria*) (SENASICA).<sup>48</sup>

There is no specific law in Mexico regarding the risk of drought and food security, although the National Water Law and the Sustainable Rural Development Law include some relevant provisions. In the second quarter of 2012, the Decree for the creation of the National Crusade against Hunger (*Cruzada Nacional contra el Hambre*) was published, along with several guidelines to coordinate related inter-sectoral councils and commissions (see Chapter 3.6.4).

In general, in most of the plans, programmes, decrees, laws and NOMs the DRR process, and specifically emergency response, is well developed. Thus, opportunities for improvement are related to the need for increased coordination between different government levels, interaction with development plans in highly risk-exposed zones, the participation of urban and rural communities, the mainstreaming of gender equality, and the inclusion of indigenous and vulnerable groups, e.g. people with disabilities.

### 3.4 Early Warning Systems & Risk Mapping

An early warning system (EWS) which is known to the whole population, with standardized colour codes and symbols, and established media for dissemination of alerts from the federal to community level, is one of the most important elements for reducing human and economic losses during a disaster. Mexico has made significant progress in designing and implementing EWS. Art. 19 IX of the LGPC delegates responsibility for the operation of networks for detection, monitoring, forecasting and alerts to SEGOB, through the National Civil Protection Coordination, in coordination with the responsible agencies and requires incorporation of the efforts made by other public and private monitoring systems.

Some of the main EWS in Mexico are the Seismic Warning System (*Sistema de Alerta Sísmica, SAS*), Seismic Warning System of Oaxaca (*Sistema de Alerta Sísmica para el Estado de Oaxaca, SASO*), and the EWS for Tropical Cyclones (*Sistema de Alerta Temprana para Ciclones Tropicales, SIAT-CT*). A Hydro-meteorological Warning System (*Sistema de Alerta Hidrometeorológica, SAH*) is planned at the local level, as well as a National Tsunami Warning System.

Since 2000, Mexico has operated an EWS for Tropical Cyclones, as well as an inter-institutional group (advisory scientific council) to support decision-making in the case of metrological threats such as storms, rains and cold fronts. This EWS uses a “traffic-light scale” that prompts the necessary actions and facilitates the adoption of anticipated measures to be taken during each phase of a crisis situation. This monitoring model has been applied to other hazards

<sup>48</sup> Internal Regulation of SAGARPA (*Reglamento Interior de la Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación*), (2012).



such as landslides, volcanic activity, epidemiologic monitoring, flooding of rivers, increased water-dam levels and tsunamis. For instance, the state of Tabasco has a local EWS for floods<sup>49</sup> and the state of Chiapas implemented an EWS adjusted to its specific geographic and socio-economic profile called *Procedimiento Estatal de Alerta por Lluvias (PROCEDA)*.<sup>50</sup>

The financing for the implementation of EWS is derived from Art. 7 III of the LGPC. This article establishes that the Federal Executive in civil protection is in charge of allocating resources for the optimal performance and operation of the Financial Risk Management Instruments within the Expenditure Budget Plan of the Federation for each fiscal year, in order to promote and support the implementation of preventive actions, as well as relief and emergency response actions.

As mentioned in Chapter 3.1, the operative unit for communication, warning, information and standing assistance is the National Civil Protection Communication and Operation System (CENACOM) (Art. 24 LGPC) and CENAPRED is the technical-operative unit that coordinates the monitoring and warning of hazards (Art. 23 LGPC). In the opinion of the interviewees (state and local governments, NGOs and academics), there is effective cooperation between the scientific sector and the EWS agencies. Academia and civil society also participate in EWS. For example, the Centre for Seismic Instrumentation and Record (*Centro de Instrumentación y Registro Sísmico, CIRES*) and CENAPRED in collaboration with the geophysics and engineering institutes of UNAM (*Institutos de Geofísica e Ingeniería*) the U.S. Geological Survey, and the Volcanic Observatory of the University of Colima collaborate in the monitoring of the Popocatepetl volcano. Academic specialist interviewees also mentioned that, although the SIAT and SAS have proven their efficiency to reduce human losses, other systems need improved consolidation and adjustment, as well as greater participation by communities. In this context, CENAPRED considers the creation of the National EWS Centre, which will coordinate all existing EWSs in one location, as the main challenge over the next six years.<sup>51</sup>

The LGPC does not specify community participation in the development of EWS or data collection. However, Art. 41 prescribes that the federal, state and local authorities foster a civil protection culture within the population by means of individual and joint participation. The authorities shall establish adequate mechanisms to facilitate the participation of the public in the planning and monitoring of civil protection in terms of the LGPC, its regulation and other applicable laws. Vulnerable and risk-exposed populations have the right to be informed about these risks and to participate in risk management.

The consulted communities recognize the progress made by the civil protection units in terms of preparedness, response and EWS. In particular, the widespread dissemination of alerts, by means of different communication media, facilitates the real participation of communities before, during and after a disaster. In some states visited during this research there are campaigns to distribute warnings and procedures in indigenous languages, which enables the adequate transfer of information to rural, indigenous communities. Yucatan has implemented a good practice during hurricane season that consists of sending cell-phone messages to keep the population updated about the level and state of hazards.

## Risk Maps

Effective risk analysis at the national, state and local level is one of the main components of DRR, since it facilitates the identification of hazards and vulnerabilities of the country and the population, as well as the calculation of the effectiveness of certain mitigating measures to reduce and eliminate these risks. This is illustrated in Table 3, which shows a comparison of municipalities in the southeast of Mexico with and without community plans for DRR and risk maps.<sup>52</sup>

<sup>49</sup> Civil Protection Master Plan of Tabasco (*Plan Maestro de Protección Civil de Tabasco*) (2011), p.59.

<sup>50</sup> Interview with the Disaster Risk Management Civil Protection Institute of the state of Chiapas

<sup>51</sup> Interview with CENAPRED's national director, conducted on July 12, 2013.

<sup>52</sup> The UNDP Risk Management Programme (PMR) has a coverage of 194 municipalities and 1034 communities in the South-Southeast of Mexico.

**Table 3: Importance of DRR community plans**

Municipalities without DRR Plans and Risk Maps	Municipalities with DRR Plans and Risk Maps
<ul style="list-style-type: none"> <li>• Early warning only to municipal head</li> <li>• Evacuation sometimes of &lt;50% of the population</li> <li>• About half of the infrastructure and equipment in income-generating activities are destroyed</li> <li>• Preliminary Damage Assessment slow, inaccurate and generalized</li> </ul>	<ul style="list-style-type: none"> <li>• Timely warning disseminated to all communities with messages differentiated by gender and ethnicity</li> <li>• Voluntary evacuation of 97% of the population</li> <li>• Protection of 98% of vessels and eco-tourism projects, 80% of livelihoods</li> <li>• Rapid auto-evaluation of damages and needs, with disaggregated proposals.</li> </ul>

Source: UNDP - PMR

This importance attached to risk maps is reflected in Mexico's legal framework; Art. 23 of the LGPC names CENAPRED as the technical-scientific institution of SINAPROC, with responsibility for the National Risk Atlas and Risk Atlases at the state and local level.

The Risk Atlas incorporates information provided at the national, state and local level, including databases, geographic information systems and tools for analysis and simulations, as well as the estimation of losses caused by disasters. Given the dynamic nature of risks, these maps should be updated regularly (LGPC; Arts. 82 and 83). In this context, data published by the National Institute of Statistics, Geography and Information (*Instituto Nacional de Estadística Geografía e Informática*, INEGI) is critical, as it establishes a fundamental base and strong pillar for the development of the Risk Atlases. The proper functioning of INEGI is widely recognized as good practice by interviewees, due to the quantity of information INEGI officially disseminates and its availability to the population and the three government levels.

Furthermore, the new LGPC reinforces the importance of the Risk Atlases. Art. 19 XXII establishes that they constitute the main reference for the development of policies and programmes in all phases of DRR. Art. 84 states that the construction of infrastructures and human settlements without having conducted a risk analysis based on applicable norms and the local, state and national Risk Atlases, and without the authorization of the corresponding authority, is an offense. Art. 86 obliges the authorities to consider the Risk Atlases in the authorization of any type of construction or human settlement. These provisions are of the utmost importance for the mainstreaming of DRR into the housing and urban development sector.

Mexico has made considerable progress in this area, as it has a National Risk Atlas, and according to the Study of the OECD on SINAPROC, 28 out of 32 states have a State Risk Atlas developed by state governments (the two missing Atlases are in process).<sup>53</sup> At the local level, 175 municipalities have already developed their own Risk Atlas.<sup>54</sup> CENAPRED developed and runs the System for Risk Analysis and Risk Scenario Visualization (*Sistema de Análisis y Visualización de Escenarios de Riesgo*, SAVER), which allows for the spatial analysis of the territory, including information about the evaluation of the economic and social impact of disasters and hazards, and indicators of the vulnerability of the population, infrastructure, economic units and properties exposed to multiple risks. FOPREDEN has invested MXN 20.2 million to develop the missing State Risk Atlases.<sup>55</sup> The objective is that by the end of 2013 all states will have a risk atlas and that these will be integrated into the National Risk Atlas, which requires constant effort and emphasis by the authorities in charge of investment planning.

The interviewed academic specialists and state government officials stated that more risk analysis at the community level is required to incorporate the specific vulnerabilities of the population into the Municipal Risk Atlases. The development of local and community risk maps is hampered by a lack of resources and capacities of local governments. There are federal programmes that provide technical and financial assistance, such as FOPREDEN and

<sup>53</sup> OECD (2013).

<sup>54</sup> Inter-ministerial Climate Change Commission (*Comisión Intersecretarial de Cambio Climático*) (2012).

<sup>55</sup> SINAPROC (2013).

the Programme of Risk Prevention in Human Settlements (*Programa de Prevención de Riesgos en los Asentamientos Humanos, PRAH*), where the federal government, through the Ministry of Social Development SEDESOL, finances up to maximum of 65% and the state or local government at least 35% of the cost of developing the Risk Atlas. However, the development of these maps at the local level faces considerable challenges and remains an outstanding task.

The following areas of opportunity have been identified: 1) homogenize the contents and technical features of state risk atlases in order to move from a Hazard Atlas to a Risk Atlas in some states; 2) provide and strengthen financial help, training and technical consultation for the elaboration of the local Risk Atlases, e.g., through FOPREDEN and PRAH. In this context, it is noteworthy that the Risk Management Programme (PMR) of UNDP Mexico supported the development of 1,050 community plans that include risk analysis in the south-southeast of Mexico. Some states, such as Chiapas, also incorporated the methodology used by UNDP to carry out community risk analysis in 2,600 communities of the state.<sup>56</sup>

In sum, it can be concluded that Mexico has made significant progress in this area, developing an effective EWS and a series of Risk Atlases at the federal, state, and to a lesser extent, also at the local level.

### 3.5 Regulation of the Built Environment

The built environment plays an important role in the area of civil protection and disaster management. In particular, the quality of construction, the provision of basic services as part of urban development, the planning of land use and territory, certainty over land tenure and property rights, and water and sanitation infrastructure are key considerations in reducing vulnerability and preventing and mitigating the impact of disasters.

In the National Development Plan 2013-2018, the Mexican government recognizes the importance of an holistic sectoral approach and describes the issue as follows: each year, the human and material losses caused by natural phenomena and man-made disasters represent a high social and economic cost for the country. The conditions of seismic activity in large areas of the country, the impact of natural or man-made phenomena, the effects of climate change, human settlements in high risk zones and incorrect land planning represent risks that threaten the physical integrity, well-being, development and the properties of the population, as well as public properties. Thus, the government states in this plan that it will prioritize preventive actions to reduce risks and mitigate the adverse consequences caused by them.<sup>57</sup>

#### Building Codes

Building codes and regulations play an important role in the prevention and reduction of disaster risks, since the magnitude of the impact of disasters on buildings and houses greatly depends on their quality, the use of adequate materials, appropriate architectonic designs and the implementation of safety measures.

Mexico has a broad range of regulation on construction and housing, derived from Art. 4 of the Constitution which establishes the right of all families to adequate housing. At the federal level this issue is regulated by the Housing Law (*Ley de Vivienda*), which assigns the National Housing Commission (*Comisión Nacional de Vivienda, CONAVI*) as the responsible government unit that supports all state governments to issue their respective housing laws, and that the municipalities formulate, approve and manage their local land and housing programmes (Art. 17). In line with Art. 115 of the Constitution, specific building codes are established at the local level, with a legal basis in the state housing laws. At present, statistics provided by INEGI<sup>58</sup> show that at the end of 2010, only 794 out of 2457 municipalities had a building code, meaning that two thirds of all municipalities lack such legal provisions. This is largely due to a lack of resources and capacities in many municipalities for developing and designing this regulation.<sup>59</sup>

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<sup>56</sup> Interview with Disaster Risk Management Civil Protection Institute of the state of Chiapas

<sup>57</sup> National Development Plan (*Plan Nacional de Desarrollo*) 2013-2018, p.37

<sup>58</sup> INEGI (2011).

<sup>59</sup> OECD (2013).

At the national level, the Housing Law includes some general DRR provisions, stipulating for example that criteria for disaster prevention are to be contemplated in the design of an adequate house (Art. 2); that in the case of a disaster the Federal Government shall establish programmes of emergency housing for affected populations (Art. 40); and that the National Housing Programme (*Programa Nacional de Vivienda*) shall include strategies to develop actions for the relocation of the population residing in at risk areas of disaster-affected zones (Art. 8 XVI). At the local level, the majority of building codes also cover DRR-related topics, such as provision for emergency prevention, fire, criteria for seismic and storm-adequate design and construction. They also include mechanisms and procedures for granting licenses and building permits, as well as inspection mechanisms.

According to the academic specialists and NGO representatives interviewed in this study, in urban zones, especially in the Federal District in response to the losses caused by the earthquake in 1985, there has been considerable progress with regard to building codes in the legal framework.<sup>60</sup> This can also be observed in other cities with high seismic activity, such as Mexicali in Baja California. However, some of the interviewees mentioned deficiencies regarding the implementation and enforcement of building codes, especially regarding the authorization of building permits (particularly in the case of residential and business projects, which often do not comply with these norms and which can be located in risk zones) and regarding inspection, supervision and sanction mechanisms. Thus, there is a high level of auto-construction without observing and/or knowing safety measures. Despite the progress made in the last 20 years<sup>61</sup>, according to the census of INEGI in 2010, there are 35.6 million residential houses in the country, of which 9 million register some type of weakness and 2.8 million need to be replaced.<sup>62 63</sup>

Another problem is the lack of resources and capacities at the local level, due to which many municipalities adopted building codes similar to that of the Federal District<sup>64</sup> without considering their specific local risk profile.<sup>65</sup> Considering this, CONAVI created a Housing Code (*Código de Edificación de Vivienda*, CEV) that establishes criteria and general construction guidelines. Although not mandatory, this code may facilitate the process of designing and adopting a building code for municipalities with low resources, including elements for risk management.<sup>66</sup> In a recent study about SINAPROC<sup>67</sup>, the OECD proposes the elaboration of a register of 4 to 6 specific building codes at the federal level from which the municipalities can choose and adjust to their local risk profile. Meanwhile, in practice some municipalities, e.g. Jalapa in Tabasco, addressed the problem of missing building codes by incorporating some provisions regarding the safety of buildings into their civil protection regulation, and local government and police plan (*bando de policía y gobierno*),<sup>68</sup> which could be a way of efficiently using limited resources, and at the same time assuring an integrated and inter-sectoral approach to risk management.

The new LGPC represents significant progress regarding the integration of DRR into the housing sector. It defines construction without authorization and without having conducted a risk analysis by means of the Risk Atlas as a felony (Arts. 84 and 86). It stipulates that the authorization of land use permits by public servants without gaining the necessary approval is a severe offence, punishable according to the Law for Responsibility of Public Servants (art. 90 LGPC). These new regulations are of utmost importance since they seek to address the most urgent problems in the housing and land use planning sector and represent an advance in mainstreaming DRR into these sectors. The next recommended step is to include these provisions in the Federal Housing Law, building codes and urban development regulations, as well as to implement inspection and monitoring mechanisms.

<sup>60</sup> According to OECD (2013), the earthquake of 1985 in Mexico City caused 4,541 victims, destroyed 412 buildings, damaged 3,124 and caused more than USD 4 billion in damages.

<sup>61</sup> From 1990 to 2010, the share of population without basic housing services went from 44% to 19% (INEGI).

<sup>62</sup> UN-Habitat (2011). A housing backlog is considered: overcrowded dwellings (two or more households), houses built with damaged materials and those whose roofs or walls were built with regular materials but have a duration of less than 30 years.

<sup>63</sup> National Development Plan (*Plan Nacional de Desarrollo*) 2013-2018.

<sup>64</sup> CONAVI (2012). The building code in the Federal District is the oldest and due to the experience from the earthquake in 1985, the most complete.

<sup>65</sup> For instance, the building code in Mérida, Yucatán, is based on the regulation of the Federal District, although the structural design should focus on measures against hurricanes, instead of earthquakes, etc. (interview with SEDUMA).

<sup>66</sup> First Edition 2007, second edition 2010-2011.

<sup>67</sup> OECD (2013).

<sup>68</sup> Civil Protection Regulation of the municipality Jalapa, Tabasco, art.29, XXV.

Another advance in terms of mainstreaming DRR is reflected in the importance attached to the safety of schools and day care centres, as the General Law of Physical Educational Infrastructure (*Ley General de la Infraestructura Física Educativa*) and the General Law of the Provision of Services for Child Attention, Care and Development (*Ley General de Prestación de Servicios para la Atención, Cuidado y Desarrollo Integral Infantil*), and to the safety of hospitals through the Safe Hospital Programme. In particular, one of the objectives of the General Law of Physical Educational Infrastructure is the establishment of guidelines for the creation of mechanisms that allow prevention and response to emergencies resulting from natural hazards (Art. 2 IV). Art. 11 of this Law establishes programmes and projects for the construction, equipment, rehabilitation, reinforcement and reconstruction of educational spaces, taking into account the needs of vulnerable groups and indigenous communities.

The Safe Hospitals Programme was developed by the Pan American Health Organization (PAHO/WHO). It aims to safeguard the capacity of hospitals to continue functioning in the case of disaster or emergency.<sup>69</sup> Since 2006, Mexico has participated in this programme, through which the safety measures of Mexican hospitals were evaluated and improved, resulting in 200 hospitals certified as “safe and prepared in the case of an earthquake.”<sup>70</sup> The new LGPC also takes into account the success of this programme, by stipulating in Art. 39 that hospitals shall consider the guidelines established in the Safe Hospital Programme when elaborating their internal civil protection programme.

The objectives of the new government regarding the housing sector, as defined in the National Development Plan 2013-2018 and which are relevant for DRR include: i) the achievement of increased and improved interinstitutional coordination, and ii) the transition towards a sustainable and intelligent urban development model.<sup>71</sup> In this sense, the recent creation of the new government agency, the Secretary for Agricultural, Territorial and Urban Development (*Secretaría de Desarrollo Agrario, Territorial y Urbano*, SEDATU), is noteworthy, since it will be in charge of leading the interministerial commission which will implement the National Housing Plan. This measure was evaluated positively by interviewees from all government levels, the academy and NGOs, since it will facilitate increased and better coordination among the agencies responsible for housing, land planning, urban development, and land tenure, which will all be located under the same roof.<sup>72</sup>

## Land Use Planning Laws

Land planning is a fundamental basis for urban development. The clear definition of geographic borders, identification of risk zones and allocation of land use are essential for the prevention and mitigation of disaster risks.

Mexico, along with many other Latin American countries, has experienced a strong and accelerated urbanization trend during the last 30 years. This has generated huge challenges regarding the increasing demand for land, housing and basic services. Due to a lack of experience and capacity, urban development was poorly planned, leading to disorganized urban growth patterns. The cities in the region expanded spatially at a higher rate than their demographic growth. In Mexico, for instance, the population grew on average 1.43 times and the urban surface 5.97 times over the same period (1980-2009). Half of the population live in 56 metropolitan zones. It is estimated that in 2050, Mexico will have 20 cities with more than 1 million inhabitants. Thus, a new urban development model and sustainable land use planning are imperative.<sup>73</sup>

At the national level, based on Arts. 27 and 115 V, VI of the Constitution, the General Human Settlement Law (*Ley General de Asentamientos Humanos*, LGAH) establishes that states (Art. 8) and municipalities (Art. 9) are responsible for formulating, approving and managing the state urban development plan and local urban development regulations, respectively. It is also local competency to regulate, control and monitor reserves, the use and destination of zones and

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<sup>69</sup> This initiative was supported by 158 countries, including Mexico, in January 2005 during the World Disaster Reduction Conference in Kobe, Japan. The initiative was incorporated in the Hyogo Action Plan 2005-2015. SINAPROC (2013b)

<sup>70</sup> SINAPROC (2013a), OECD (2013).

<sup>71</sup> National Development Plan (*Plan Nacional de Desarrollo*) 2013-2018.

<sup>72</sup> Rubí, M. y Torres Y. (2013)

<sup>73</sup> UN-Habitat (2012). p. 147



properties in population centres, to administer zoning, issue authorizations, licences and permits for land use, and to intervene in the regularization of informal settlements.

According to the INEGI's Local Government Census 2011<sup>74</sup>, at the end of 2010, 708 out of 2457 municipalities had enacted a zoning and land use regulation (29%) and 890 out of 2457 had a local cadastre regulation (36%). These figures show that, as in the housing sector, many municipalities lack this regulation due to limited resources and capacities. In other cases, the lack of updated legal measures is observed, which is a common problem in Latin America and the Caribbean, where, as stated by UN-HABITAT, several countries have 30 or 40-year old legislations on human settlements.<sup>75</sup>

Interviewed specialists and consultants mentioned that the topic of land planning is regulated by several different legal instruments, which complicates intersectoral coordination. Although there are many laws on the issue, they frequently are not observed in practice; enforcement is discretionary and it does not confront underlying factors such as the supply of land, economic problems, lack of supervision and transparency.

At the national level the LGAH includes some general provisions regarding the DRR perspective. For example, it establishes that land planning shall improve the level and quality of life of the urban and rural population by means of prevention, control and attention to urban and environmental risks and contingencies (Art. 3 XII), and that zoning shall consider the allowed, prohibited and limited uses and destinations/purposes (Art. 35 III). However, it does not mention concrete measures, such as the mandatory consultation of Risk Atlases when developing land use policy. Specialists and consultants in that area commented that a lack of integration between land planning instruments and the Risk Atlases is one of the most relevant issues for risk prevention.<sup>76</sup>

The new LGPC represents considerable progress in this area, as it establishes in Art. 84 that construction and building of public infrastructure and human settlements, without authorization and without having carried out a risk analysis using Risk Atlases, is a felony. As explained before, the responsibility to carry out this risk analysis is held by public servants. Among others, the interviewed academics mentioned that these are key provisions because they hold decision-makers accountable when granting building permits. However, the majority of municipalities have not finished their Risk Atlases (see Chapter 3.4), which establishes the legal basis to enforce these provisions. Thus, the development of Risk Atlases at the local level and their adequate integration with land use planning is an important area of opportunity in order to reduce structural risk in rural and urban zones. As in the housing sector, another opportunity for improvement is the updating and standardization of state laws and local regulation on land use and urban development planning by incorporating the new LGPC provisions, as well as the design and implementation of monitoring and follow-up mechanisms.

Integrating these land planning instruments with the Risk Atlases will require intersectoral and interinstitutional coordination. The recently created ministry SEDATU will play an important role, since it will coordinate the National Housing Commission (CONAVI), the Land Tenure Regularization Commission (*Comisión para la Regularización de la Tenencia de la Tierra*, CORETT) and the National Trust Fund for Popular/ Social Residential Housing (*Fideicomiso Fondo Nacional de Habitaciones Populares*, FONHAPO).<sup>77</sup>

## Land Tenure

Land tenure is one of the key elements required for human development. Without certainty over land property rights, investment and co-responsibility in development planning is discouraged and the right to housing and property is

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<sup>74</sup> INEGI (2011).

<sup>75</sup> UN-Habitat (2011).

<sup>76</sup> CONAVI (2012).

<sup>77</sup> Rubí and Torres (2013).

perceived to be at risk. This directly affects DRR, since certainty over your property motivates the maintenance of safety measures and investment in remodelling and reconstruction.

This topic is also considered in the new National Development Plan 2013-2018, which states that in the rural environment there are severe restrictions that inhibit the development of the rural population, e.g.: property fragmentation, not only in social property, but even more so in smallholdings, as well as the lack of transparency in agricultural property, persisting conflicts over land rights, an aging agricultural population and a high share of women living and working the land due to migration. These are some of the problems that need to be addressed in order to achieve fair and equitable rural development.<sup>78</sup>

In 1910, 97% of the land was owned by landowners and ranchers. The agricultural reform of 1917 resulted in the redistribution of 50% of the national territory to ejidos and similar communal property schemes.<sup>79</sup> In 1992, Art. 27 of the Constitution was modified and the Agrarian Law (*Ley Agraria*) was published, which opened the doors for the privatization of the ejidos land, i.e., to adopt the full ownership of ejido plots. The Ejidal Rights Certification Programme (*Programa de Certificación de Derechos Ejidales y Titulación de Solares Urbanos, PROCEDE*), aimed to facilitate the recognition of ejidatarios land rights. New institutions were created, including the Agrarian Attorney's Office (Procuraduría Agraria), the Superior Agrarian Court and the Unitary Agrarian Tribunals (arts. 27 and 9 XIX), and the National Agricultural Register (*Registro Agrario Nacional*).<sup>80</sup>

The legal framework that regulates land tenure is broad and complex. As shown in the following table, there are a variety of laws that are relevant within the regulation of land tenure, depending on the type of property.<sup>81</sup>

**Table 4: Land Property Types and their Legal Framework**

Type of property	Definition	Legal Framework
Public Property	Land originally owned by the State and land assigned to public institutions	Constitution, Art. 27 Agrarian Law, Arts. 157 – 162 General National Property Law ( <i>Ley General de Bienes Nacionales</i> ), Art. 3, 4, 6- 13
Social Property	Ejido and communal land, assigned or restored to the community.	Constitution, Art. 27 VII Agrarian Law, General Human Settlement Law, Arts. 27, 28, 38, 39
Private Property	Smallholdings (in rural and peri-urban areas) and urban private property.	Federal Civil Code Arts. 830-853, 938-979; State Civil Codes General Human Settlement Law, Arts. 27, 28 Constitution, Art. 27 (XV) Agrarian Law, Arts. 115- 124, Regulation of the Agrarian Law on Rural Property

Source: UN-HABITAT, 2005

Some experts in land rights issues interviewed during the study mentioned that, although these laws are generally well designed, in practice they are difficult to apply to the great diversity of agricultural situations in the country. In general, uncertainty persists regarding the scheme of ejidos property titles and the processes of privatization. Furthermore, there is confusion about the rights derived from parcel titles, since they do not apply to ownership of the property itself, but rather to the right to use it. The Agrarian Law outlines the procedures for obtaining full

<sup>78</sup> National Development Plan, (*Plan Nacional de Desarrollo*) 2013-2018, p. 43

<sup>79</sup> Art. 27 (9, VII) of the Constitution recognises communal holdings of land (*ejido*). An *ejido* can either be a group of peasants that holds the land, or a portion of land granted to an *ejido* group. From 1917 on, *ejido* has been the land granted by the Mexican state to *ejido* groups, who have collective rights over the land. Before 1992, communal land was similar to *ejido* land, the main difference being that communal land was land returned to traditional communities of peasants or indigenous groups, in recognition of the fact that they had possessed this land before the agrarian reform of 1917. UN-HABITAT (2005), p.36

<sup>80</sup> UN-HABITAT (2005).

<sup>81</sup> The table only shows a summary of the relevant laws. More information, see UN-HABITAT (2005).

ownership, however in practice these procedures are rarely used due to difficulties in meeting the requirements and a lack of knowledge in this area.<sup>80</sup> Experts recommend that the Agrarian Attorney's Office should promote educational programmes to inform the ejido communities about their rights and the procedures for obtaining property titles.

In order to provide the necessary inputs for the elaboration of the urban development plans, it is important to know the legal status of land in the corresponding register. At the state level there are Public Property Registers, founded in the state laws on public registry of property and commerce. The ejido and community properties are documented in the National Agricultural Register at the federal level (Art. 148 Agricultural Law). The creation of the latter (as per the reform of Art. 27 of the Constitution in 1992), is considered important progress, although this needs to be completed and updated. These registers should be linked with the Risk Atlases.

Another component that was implemented with the 1992 reform was the creation of the Agrarian Attorney's Office and the Agrarian Courts. The interviewed experts consider this a favourable evolution, given that prior to this institutional change all procedures and conflict resolutions were the responsibility of the Agricultural Reform Ministry (*Secretaria de Reforma Agraria*). However, it was also mentioned that legal defence capacity could be improved. In some more conflicted states, where more legal defence is required, they have reached the limits of their capacities. It is recommended that public lawyers receive improved academic grounding in the agrarian courts, especially in more conflicted states.

Regarding women's and indigenous people's rights, considerable challenges persist. Women had been excluded or disadvantaged historically with regard to accessing ejidal land. The average age of female ejidal owners is 57 years, because most of them have access only in the case of heritage (55%) and free transfer (23%). However, as a consequence of migration and urbanization women play an increasingly important role in the agriculture and rural sectors and thus, their rights to land and property should be safeguarded. Specialists in gender issues propose a scheme of co-ownership in the acquisition of land and housing properties to strengthen women's rights. Single mothers and female heads of households should be registered as legal owners. A similar challenge is identified with regards to indigenous people's rights. Art. 27 VII 2 of the Constitution establishes the right to land for indigenous groups, however there is no specific law to regulate these rights.

Difficulties in guaranteeing the land rights of ejidal and indigenous people are compounded by pressure from the urban development sector, i.e., the increasing demand for conurban land due to urbanization.<sup>82</sup> Interviewed consultants from the agricultural sector stated that there is a strong debate on the subject. For instance, national and international businessmen and investors from the construction, (agro-)industry, mining and tourism sectors argue that the ejido property limits the urban and economic development of the country, while others believe that the sustainable use of natural resources necessitates guaranteeing the property rights and participation of local populations in decision-making (especially agricultural land right owners). Interviewed analysts agree that a system of checks and balances within the rule of law and where social conflicts are managed and minimized is the best environment for safe and disaster resilient development planning.

Given this information, the present study recommends the explicit inclusion of DRR in the agricultural legal framework, in accordance with land use planning at different government levels. These agrarian laws should aim to provide for simplified administration and should be particularly accessible to indigenous people, rural women and other groups that might experience discrimination. Furthermore, good coordination is an important requirement for the implementation of different legal frameworks (agrarian, land use and development plans). In this context, the creation of SEDATU, which has the responsibility to address these issues, and to implement inter-ministerial coordination and adjust the legal framework, is a significant advance.

## Informal and Precarious Settlements

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<sup>82</sup> CIDOC, et al. (2012). It is estimated that approximately 65% of the land with potential for urban development stems from ejido or community land. Likewise, estimates SEDESOL that 70% of the land necessary for urban expansion during the next decades will come from the ejidos.



The problems described above, i.e. urbanization, insufficient land and housing availability at prices accessible to low-income populations, disorganized land use and urban development, as well as the complexity of agrarian laws and the difficulty in obtaining formal land ownership, led to the formation of irregular human settlements. It is estimated that 90,000 households are established each year in zones not adequate for living, in precarious conditions, and where the introduction of basic services costs two to three times more than in other zones.<sup>83</sup>

Informal settlements have arisen due to a variety of reasons such as the absence of legally recognized possession or property documents, non-compliance of building codes or the occupation of public land or high risk zones. There is no specific law in Mexico that regulates this issue. The housing law, human settlement law, urban development and agrarian laws do not sufficiently consider the problem of informal settlements in Mexico. Rather they include some general provisions regarding the regularization of those settlements, e.g., that this should be an action for urban improvement, and that the federal, state and local governments shall take coordinated action for urban development and housing aimed at the reduction of irregular land occupation (Art. 45, LGAH). However, various aspects are not uniformly regulated by law, e.g. procedures for risk analysis, eviction procedures, compensation, provision of alternative housing, protection of human rights of evacuated residents and other actions are common in practice and, according to the interviewed persons, are regulated on a case by case basis.

The interviews revealed examples in the Southeast of Mexico where the absence of regulation and sanction mechanisms led the authorities to tolerate these situations, such that they only react and implement relocations or evictions in the case of a disaster or because of pressures to incorporate land into urban development. This also discouraged informal occupants from regularizing their living situation, since it would imply long, complicated and expensive procedures and the payment of property taxes.<sup>84</sup>

During the interviews carried out in this study, it was commented that the government has tried to solve this situation with a corrective approach instead of a preventive one, by means of the creation of the Land Tenure Regularization Commission (*Comisión para la Regularización de la Tenencia de la Tierra*, CORETT) (Art. 3, Organic Statute) that executes the programme of regularization of social land through expropriation for reasons of public interest. This solution, which implied long expropriation proceedings, the issuing of contracts and deeds for lots, turned out to be more expensive. Even though the creation and existence of CORETT can be considered a positive development given that it allowed many Mexicans to obtain legal certainty over their property, the exercise of its functions is challenged by the pressure and urgency implied by urban development in terms of land demand.

As to the DRR approach, although the official regularization rule established that the regularization process requires a risk analysis by means of a certificate or record on land use and risk profile, the interviewed consultants commented that this requirement is not always fully met in practice. Therefore it is recommended that this programme is linked with the Risk Atlases, and that capacities and simple methods for realizing a mandatory risk analysis are developed before regularizing any type of land.

The new LGPC seeks to confront some of these problems. Art. 87 states that in the case of human settlements established in high risk zones, the competent authorities, based on specific risk studies, shall determine the realization of infrastructure construction that might be necessary to mitigate existing risks, or shall formulate relocation plans and financing mechanisms. The Mexican government reiterates the importance attached to DRR in the new National Development Plan 2013-2018, including among its strategies the promotion of mechanisms to strengthen existing regulations in the area of human settlements in risk zones in order to prevent human and material losses.<sup>85</sup>

## Urban Water and Flood Management

The management of water resources is a central component of DRR. The reduction of disaster risk caused by extreme hydrometeorological phenomena requires an adaptation strategy that integrates different priorities ranging from the

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<sup>83</sup> UN-Hábitat (2011).

<sup>84</sup> UN-HÁBITAT (2005), p. 68

<sup>85</sup> National Development Plan (*Plan Nacional de Desarrollo*) 2013-2018, p.112

management and preservation of water for the provision of water and sanitation services, irrigation and efficient food production to the ecological use of water for ecosystem protection and biodiversity, the optimization of water use for hydropower generation, and the strengthening of synergies between water, land use and urban planning.<sup>86</sup>

In 2010 the second highest rainfall level was registered since records began. The economic losses from flooding in 2010 represented 34% of total disaster losses reported that year, equivalent to MXN 22051.5 million. In 2007, the floods in the state of Tabasco caused damages of about MXN 31,800 million.<sup>87</sup> In an economic impact evaluation study, ECLAC identified these floods as one of the 20 most expensive tragedies in the world. Together with the floods in 2007, Tabasco was affected by three further disasters in 2008, 2009 and 2010, with total economic losses reaching more than MXN 46,000 million<sup>88</sup>. This clearly demonstrates the importance of efficient water management and the need for a DRR strategy.

Art. 4 of the Constitution establishes the right to the provision and sanitation of water for personal and domestic consumption. At the national level this right is regulated by the National Water Law (*Ley de Aguas Nacionales*) and its respective regulation. The National Water Commission (*Comisión Nacional del Agua, CONAGUA*) is the main authority in charge of promoting the coordination of planning, implementation and administration of water resource management at the river basin or hydrologic region through the Watershed Councils (*Consejos de Cuenca*), along the three government levels and with the participation of consumers and society (Arts. 4 and 5).

At the regional level, each state has its own respective water law. However, at the local level there is an important difference between the competencies of the three government levels compared to the housing and urban development sector (as previously described, see Chapters 3.5.1 and 3.5.2). CONAGUA is the main agency which regulates and coordinates the sector at the federal level. CONAGUA has broad competencies in terms of management of water resources. However according to Art. 115 of the Constitution, the municipalities are in charge of public services, such as the provision of water supply, drainage, sewerage, treatment and disposal of wastewater.

The existing regulation represents considerable progress in terms of mainstreaming DRR. The reformed version of the National Water Law (June 2012) includes several relevant provisions. Art. 83, for instance, establishes that CONAGUA, through the watershed bodies, is responsible for the construction of necessary infrastructure in flood zones, the classification of high-risk zones, the establishment of insurance against floods, the administration of risk-related funds and coordination with the watershed organizations. The National Water Law establishes CONAGUA's mandate in the area of hydro-infrastructure in general, in the face of natural disasters and for the protection of flood zones. CONAGUA is also in charge of declaring disaster zones (Art. 38), as well as classifying high risk flood zones and the development of risk atlases (Art. 9 XLIII). CONAGUA also coordinates the National Weather Service (*Servicio Meteorológico Nacional*) (Art. 9 XLIV).

The General Climate Change Law (*Ley General de Cambio Climático, LGCC*), published in June 2012, also includes provisions about water management and corroborates the importance of this sector within public policies (Arts. 9, 29 and 30). This is also reflected in the Special Climate Change Programme 2009-2012 (*Programa Especial de Cambio Climático 2009-2012, PECC*), approved in 2009 by the Interministerial Climate Change Commission (*Comisión Intersecretarial de Cambio Climático, CICC*). The CICC is a cross-cutting structure, formed by the heads of 13 federal ministries.<sup>89</sup> This programme is considered an important advance because it is the first step towards a national climate change policy with specific objectives, and it involves an important number of agencies of the federal public administration. In terms of water resources, it establishes 11 goals, several of which are particularly relevant to DRR including providing services like early warnings for extreme hydrometeorological events, designing prevention plans, construction and maintenance of infrastructure, and the establishment of seven regional emergency centres to support states and municipalities in the provision of water and sanitation during an emergency. At present there are 21 centres in Mexico, five of which have been built under the PECC.<sup>90</sup>

<sup>86</sup> Miralles-Wilhelm, F. (2010).

<sup>87</sup> CENAPRED (2012).

<sup>88</sup> Civil Protection Master Plan of Tabasco (*Plan Maestro de Protección Civil*) (2011).

<sup>89</sup> SEMARNAT, SAGARPA, SALUD, SCT, SE, SECTUR, SEDESOL, SEGOB, SEMAR, SENER, SEP, SHCP and SER.

<sup>90</sup> Interministerial Climate Change Commission (2012).

At the state level, an example of a good practice to address flood risks was implemented in the state of Tabasco, where, after having experienced severe floods in 2007 and 2010, the government developed a Master Plan of Civil Protection (*Plan Maestro de Protección Civil del Estado de Tabasco*) with support from UNDP Mexico. The Plan aims to generate a permanent and dynamic system of prevention, operation, evaluation and reconstruction for any risk or disaster.<sup>91</sup> Likewise, in collaboration with CONAGUA, UNAM and the state government, an Integrated State Water Plan (*Plan Hídrico Integral del Estado de Tabasco*, PHIT) was developed to prevent and mitigate flood risks.

The new government regards water resource management as a topic of national security. Included among the goals of its National Development Plan 2013-2018 are: sustainable water management to ensure sufficient and adequate quality water for human consumption and food security; strengthening of the legal framework for drinking water, sewerage and sanitation; reduction of meteorologic and hydrometeorological phenomena-related risks; and relief and response.<sup>92</sup>

Among the recent initiatives of the new government regarding DRR-related water management, the creation of the Interministerial Commission to address Droughts and Floods (*Comisión Intersecretarial para la Atención de Sequías y Inundaciones*, CIASI) in April 2013 stands out as good practice. In the same month, CONAGUA established among its priorities the provision of timely information to SINAPROC, as well as the detection of flood zones in the country, and their incorporation in the National Risk Atlas in coordination with CENAPRED.<sup>93 94 95</sup> In addition the priorities defined by the government and CONAGUA also address the risk of droughts and food security, which had not previously been considered as national strategy (see Chapter 3.6.4).

In sum, these actions, together with the broad legal framework described above, show the positioning of DRR and climate change adaptation, in the water management sector. The commitment to treating water management as a topic of national security and the creation and functioning of CONAGUA stand out as good practice in legal terms. However, according to the opinions of consultants and specialists on the topic, the greater challenge facing Mexico is improving the coordination between the environmental and water sectors, as well as the inclusion of risk and climate change indicators in investment programmes and projects.

## 3.6 Regulation of the Natural & Rural Environment

### Human Risks in Environmental Change

Climate change is one of the greatest challenges faced by humanity, and addressing it implies the revision and modification of development practices in rural and urban areas to address the associated changes and extreme climatic phenomena. Mexico is responding to the challenges posed by these scenarios. However, the strategy to combat climate change began only six years ago and there is still a long way to go.

The legal framework which regulates the natural and rural environment in Mexico is broad, mainly covered at the national level by the General Law of Ecological Equilibrium and Environmental Protection (*Ley General del Equilibrio Ecológico y la Protección al Ambiente*), the Law on Sustainable Rural Development (*Ley de Desarrollo Rural Sustentable*), the General Climate Change Law (*Ley General de Cambio Climático*, LGCC), the General Law for the Prevention and Integrated Management of Waste (*Ley General para la Prevención y Gestión Integral de los Residuos*), the National Water Law (*Ley de Aguas Nacionales*), the General Law of Sustainable Forestry

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<sup>91</sup> Civil Protection Master Plan of Tabasco (*Plan Maestro de Protección Civil*) (2011).

<sup>92</sup> National Development Plan (*Plan Nacional de Desarrollo*) 2013-2018.

<sup>93</sup> According to art. 1 of the agreement for the creation of the Interministerial Commission for Addressing Droughts and Floods (*acuerdo por el que se crea la Comisión Intersecretarial para la Atención de Sequías e inundaciones*), April 5, 2013, the objective of the Commission is the coordination among the federal public administration agencies and entities, in charge of risk analysis and implementation of prevention and mitigation measures of extraordinary meteorological phenomena and the effects they cause.

<sup>94</sup> SEMARNAT, SEGOB, SEDENA, SEMA, SHCP, SEDESOL, SENER, SE, SAGARPA, SCT, SALUD, SEDATU, CFE and CONAGUA

<sup>95</sup> CONAGUA (2013).

Development (Ley General de Desarrollo Forestal Sustentables) and the new Federal Environmental Responsibility Law (Ley Federal de Responsabilidad Ambiental); and their respective regulations and NOMs. Given the objective and scope of the present report, only three laws, relevant for the context of this study, are analyzed.

The General Law of Ecological Equilibrium and Environmental Protection stipulates the right to live in a healthy environment; the principles of the environmental policy and its implementation; the preservation, restoration and improvement of the environment and biodiversity; the sustainable use, preservation and restoration of soil, water and other natural resources; the prevention and control of air, water and soil pollution. It also contains provisions which establish mechanisms of coordination, induction and consultation between authorities and the social and private sectors in environmental aspects and which facilitate the responsible participation of the population (Art.1).

Article 5 (Sections VI, VII, X) of this law establishes the regulation and control of highly risky activities, and the generation, handling and disposal of hazardous materials and waste, as well as participation in prevention and control of emergencies and environmental contingencies. Furthermore, it provides for the Environmental Impact Assessment (EIA) of construction and activities. However the criteria do not consider human risks derived from environmental change, or natural hazards that affect communities. The law also fails to assign responsibility to an authority for the regulation of natural resource exploitation from a human safety perspective during natural disasters.

The Sustainable Rural Development Law includes provisions to boost policies, actions and programmes in the rural environment, such as: i) promoting the social and economic well-being of producers, communities, farmers and other rural stakeholders; ii) correcting disparities in regional development by paying special attention to the most marginalized regions; iii) contributing to food sovereignty and food security; and iv) biodiversity conservation (Art. 5).

With respect to the DRR perspective, Art. 126 prescribes the development of insurance and price coverage services in order to help producers and other stakeholders in the rural sector. This type of insurance includes tools to cover production, meteorological emergencies and sanitary risks. It further establishes the creation of a fund to assist the rural population impacted by climatic emergencies (Art. 129). On the other hand, it provides for the development of a Risk Card in watersheds to establish disaster prevention programmes (Art. 131).

The General Climate Change Law, published on June 6, 2012, includes aims to guarantee a sound and healthy environment, regulate climate change mitigation and adaptation measures, establish the faculties of the three government levels, and reduce the vulnerability of the population and the ecosystem in the face of adverse climate change effects by creating coping and response capacities (Art. 2).

The LGCC not only considers risks, but also establishes a cross-cutting DRR approach. Art. 28 explicitly mentions Holistic Risk Management (*Gestión Integral de Riesgos*, GIR) as one of the areas where governments shall take action to modify public policies. Art. 30 specifies that these adaptation actions are directed by the following provisions: i) development and publication of Risk Atlases that consider vulnerability scenarios, with a special focus on the most vulnerable populations and the most risk-exposed zones; ii) use of information provided by these Risk Atlases for state and municipal development plans, building codes and land planning regulations; iii) financing for the protection and relocation of the most vulnerable human settlements; iv) development of protection and environmental contingency plans in highly vulnerable zones; and v) development of specialized human resources for extreme meteorological phenomena. Other DRR-relevant provisions include the reinforcement of epidemiologic risk prevention programmes and the improvement of early warning systems and capacities to forecast present and future climatic scenarios.

The LGCC provides for an operative structure and coordination to execute its mandate. The National Ecology and Climate Change Institute (*Instituto Nacional de Ecología y Cambio climático*, INECC) develops and coordinates the National Climate Change Strategy (Art. 15). In this sense there is a National Climate Change System that acts as an established mechanism of coordination, collaboration and communication between the three government levels, composed of the Interministerial Climate Change Commission (*Comisión Intersecretarial de Cambio Climático*, CICC), with representatives from 12 federal ministries, the Climate Change Council, INECC, state governments, national associations, local authorities and Congress representatives (Art. 38). The INECC and the CICC are bodies

that have proved their capacity, i.e. coordinating, implementing and evaluating a series of actions under the National Climate Change Strategy and the Special Climate Change Programme. Recently, the “National Climate Change Strategy – Vision 10-20-40” was published, including a long-term vision that governs and guides national policy, establishes national priorities and defines criteria to identify regional priorities.

According to the Local Government Census 2011 conducted by INEGI, at the end of 2010, 876 out of 2,457 (35.6%) municipalities had an ecology and environmental protection regulation. On the other hand, 672 out of 2,457 municipalities had an ecologic planning regulation, equivalent to just 27%. The new LGCC establishes that the municipalities are responsible for the formulation, implementation and evaluation of local climate change policy in line with national and state policy (Art. 9). However, the incorporation of climate change adaptation measures into local policies and regulations presents a challenge due to budgetary constraints at the local level.

It can be concluded that there are several relevant environmental laws that include DRR-related elements, some of which even contain a cross-cutting DRR approach. Especially noteworthy is the new LGCC, which fully incorporates the DRR perspective and concept. However, the regulation of the LGCC is outstanding, thus representing a area of opportunity to strengthen DRR at the national level. The creation of the CICC is important in this context, as it will be in charge of coordination efforts among sectors and government levels. In addition, there is a need for better organization, systematization and dissemination of climate change-related information, generated by academic and government entities, in order to make such information available to decision-makers and planning actors at all government levels, as well as to civil society and the private sector.

## Forest Management and Exploitation

The topic of forest management and exploitation is regulated at the federal level by the General Law of Sustainable Forestry Development (*Ley General de Desarrollo Forestal Sustentable*, LGDFS). The responsible institutions are the Environment and Natural Resources Ministry (*Secretaría de Medio Ambiente y Recursos Naturales*, SEMARNAT) and specifically the National Forest Commission (*Comisión Nacional Forestal*, CONAFOR).

The LGDFS broadly includes the topic of wild and forest fire prevention. In particular, chapter III, –titled Prevention, Combat and Control of Wildfires, (Arts. 122-125) is relevant. Art. 123 specifies the duties of different government agencies in preventing and controlling fires. In the first instance, the local authority is responsible for combating and controlling fires. However if its operative emergency response capacity is exceeded, the state authority shall intervene.

Regarding prevention measures, the owners and users of forest land are obliged to take actions to prevent, combat and control forest fire. Furthermore, all authorities, firms and individuals engaged in extraction, transport and transformation are obligated to report to CONAFOR the existence of detected forest fires (Art. 124). The owners, holders and users of forest land are required to carry out, in case of fire, the restoration of the affected area within a maximum period of two years, with special attention given to the prevention, monitoring and control of pests and diseases (Art. 125). The consultants interviewed during the present study comment that this article is of utmost importance, because it establishes a measure against the intentional alteration and destruction of forests, which in the recent past were burned by their owners to justify changes in land use, especially when placed in proximity to population or tourist centres.

The law also broadly recognizes community practices (Art. 147), as well as the importance of holistic fire management, considering the positive and negatives effects of natural fires and planned burnings versus programmed and controlled fires, from a social, environmental and economic perspective, in forests, grassland and agricultural land.

In order to strengthen the National Strategy for Fire Management, two research projects were carried out during 2011 in collaboration with the National Commission of Natural Protected Areas (*Comisión Nacional de Áreas Naturales Protegidas*, CONANP) and U.S. Forest Service, titled “Fire regimes” and “Physical characteristics of combustibles/fuel”. Furthermore, the national coordination group for fire management was launched and the final version of the National Fire Management 2010 was integrated.



At the state level, there is no standardized legal framework on fire management and related topics. However, in some states<sup>96</sup> there are specific fire clearance laws, which emphasize the elaboration of fire-cutting lines during January and February to prevent the spread of fires (e.g. Art. 6 of the Fire Clearance Law of Campeche). The law also provides for and regulates the scheduling of fires and the methodology to be used according to different types of land. Art. 14 defines the responsibilities of individuals for the supervision of fires, while Arts. 10 and 28 define the responsibility of local authorities for the authorization of fires and application of sanctions, without prejudice of sanctions by criminal codes, etc. In other states, this subject is addressed by the state civil protection law (such as Sonora), in the local sustainable forest development laws (such as Durango), or in environmental laws and laws on public events (as in the Federal District). The successive modification of local fire management and clearance laws similar to those in the south-eastern states is an area of opportunity for reducing forest fires in the north of Mexico.

Regarding community participation, the REDD+ Vision<sup>97</sup> is noteworthy. It provides an open, participative and plural space for citizens, by means of a Technical Advisory Council (CTC REDD+), constituted by more than 70 representative of civil society, including indigenous people, forest and agricultural organizations, representatives of local communities and land owners, educational institutions, and governmental representatives. The aim is to promote and issue recommendations for public institutions in order to favour the implementation of REDD+ in Mexico.<sup>98</sup> REDD+ is a strategy that seeks the integration of rural communities and indigenous people into REDD+ actions, under the guidance of CONAFOR by means of consulting forums.<sup>99</sup> Among the priority measures are the promotion and stimulation of sustainable forest management and the regeneration of important biological corridors and marginalized areas and communities.<sup>100</sup>

## Rivers & Watercourses in Rural Areas

Art. 27 of the Constitution grants to the Nation the property of national lands and waters, in particular, the waters of the territorial seas under terms and extension fixed by international law; inland marine waters, those of the lagoons and estuaries that are permanently or intermittently connected with the sea; the inland lakes of natural formation that are directly connected to steady currents; the river and its tributaries direct or indirect, etc. The underground waters can be freely used for artificial works and acquired by the owner of the respective land, unless they are required for reasons of public interest or are needed for other purposes, in which case the Federal Executive may regulate its extraction and use, and even establish prohibited areas, as well as for other national waters.

More specific provisions are included in the National Water Law. For instance, it establishes that the granting of a concession or assignation for the exploitation or use of surface national waters requires an environmental impact assessment (Art. 23), in line with Art. 28 X of the General Law of Ecological Equilibrium and Environmental Protection, which foresees this assessment as a requirement for infrastructure close to rivers.

The National Water Law also establishes that the “water authority” shall regularly review the validity of and compliance with concessions granted to public or private individuals or firms (Art. 113). Furthermore, it provides for penalties in the case of occupation or use of vessels, courses, canals, federal zones and protected areas without concessions, as well as in the case of modifying or redirecting them if they are national property without the corresponding permission. A penalty is also imposed if a hydraulic work/infrastructure of national property is damaged or destroyed or if a river or other watercourse is contaminated (Art. 119 IV, XIV, XX).

The law also includes response measures. For example if there is a definite change in the course of a national water body due to natural causes, the affected landowners have the right to receive, by substitution, the proportion of surface

<sup>96</sup> Initially, the laws of the states of Campeche, Quintana Roo and Yucatán, since they are the zones of major incidence of wildfire affecting forests of high biodiversity.

<sup>97</sup> In line with the National Climate Change Strategy (2013), the Vision of Mexico about REDD + towards a National Strategy, is part of a plan to reduce emission through the reduction of deforestation and forest degradation and restoration, P. 74

<sup>98</sup> REDD Plus México, SEMARNAT, CONAFORT. *REDD+ en México*, p. 2.

<sup>99</sup> SEMARNAT (2011).

<sup>100</sup> SEGOB, SEMARNAT and CONAFOR (2010).

available outside the river bank or federal zone, taking into account the amount of land that would have been affected (Art. 115). This provision is important in terms of DRR.

In general, Mexico has some legal provisions in relation to rivers and watercourses. However the participation of rural communities in the handling and use of this natural resource should be specified, especially in light of increasing demographic and economic pressure over these resources. There are some examples of watershed management in the municipalities.

### 3.7 Drought and Food Security

There is a risk of famine in Mexico due to droughts and other factors related to poverty and underdevelopment. Malnutrition is an endemic condition in the country that affects millions of people. According to data published by CONEVAL in 2012, 10.4% of the population live in extreme poverty and almost 25% face shortages in terms of access to food. Combined, this implies that 7.4 million people live in extreme poverty and face food shortages.<sup>101</sup>

#### Droughts

As illustrated by Mexico's risk profile (see Chapter 1.3.), droughts represent one of the highest environmental and economic risks in Mexico, provoking severe losses and prompting transformation processes in the agricultural and water sectors.<sup>102</sup> The drought in 2011 was the worst in the last 70 years, affecting 40% of the national territory.<sup>103</sup> According to the Special Report of the intergovernmental climate change expert panel, droughts are likely to intensify in the 21<sup>st</sup> century in Mexico and other countries, due to a decline in rainfall and/or an increase in evapotranspiration.<sup>104</sup>

In the face of this outlook, the fact that Mexico does not have any legislation exclusively related to food security and/or droughts is a matter of concern. The National Water Law mentions necessary public infrastructure and construction that are required for the prevention of floods, droughts and other exceptional situations, without mentioning specific criteria (Art. 96 bis 2). Other provisions are related to the use of this natural resource in the case of droughts in order to avoid overexploitation of national waters. Another law that includes relevant aspects from a preventive perspective is the General Climate Change Law, which establishes that the authorities at the three government levels, by implementing climate change adaptation measures, shall consider the diagnosis of damages to water ecosystems; the volume of water available and its distribution in the country's territory; the promotion of sustainable use of surface and underground water sources; the promotion of groundwater recharge; the automation of surface irrigation, sustainable agriculture and farming production practices; replacement of short-cycle crops; and early warning systems for seasonal forecasts of abnormal rainfall or temperatures (Art. 30). Finally, the Sustainable Rural Development Law prescribes the promotion of a programme for the creation of a culture of water stewardship, including programmes for the modernization of irrigation systems, with special attention to be paid to regions of overexploitation of underground water resources or degradation of water quality (Art. 168).

In January 2012, in response to the exceptional drought of 2011, an "agreement to take action for the mitigation of the effects of droughts in diverse states" (*"Acuerdo por el que se instruyen acciones para mitigar los efectos de la sequía que atraviesan diversas entidades"*) was published,<sup>105</sup> to be implemented by five federal agencies.<sup>106</sup> In June 2012, the "Guidelines for the establishment of criteria and mechanisms to issue general agreements in emergency situations caused by droughts, as well as the preventive and mitigation measures to be implemented by national water users to provide for efficient water use during a drought" were approved. In April 2012, the Mexican President Enrique Peña

<sup>101</sup> Cruzada Nacional Contra el Hambre (2013). CONEVAL (2013).

<sup>102</sup> Neri, C. and Briones F. (2012).

<sup>103</sup> <http://eleconomista.com.mx/sociedad/2012/01/22/mexico-umbral-sequia-historica>

<sup>104</sup> Intergovernmental expert panel on Climate Change (2012). PICC UN

<sup>105</sup> The Chamber of Deputies provided MXN 33 billion to confront the contingency, together with the resources from FONDEN. In line with Annex II of the FONDEN guidelines, the states have access to the resources if they prove to be in a state of severe drought and that local resources and infrastructure is not sufficient.

<sup>106</sup> SEDESOL, CONAGUA, SSA, SAGARPA and National Commission of Arid Zones

Nieto issued the “Agreement for the creation of the Inter-ministerial Commission to address Droughts and Floods” (*Acuerdo por el que se crea la Comisión Intersecretarial para la Atención de Sequías e Inundaciones*). This commission initiated working sessions to develop strategies to formulate a national policy on the matter. In early 2013, the National Programme Against Drought (*Programa Nacional Contra la Sequía*, PRONACOSE) was implemented. This programme is directed towards the combat and prevention of droughts. At present, the Watershed Councils are commissioning the first reports on a biologic, environmental and socio-demographic description of watersheds and a historical analysis of the impact and response to droughts in Mexico. 19 out of 26 Watershed Councils have approved the PRONACOSE agreement.<sup>107</sup> According to the opinion of some interviewed researchers, proposals for the incorporation of an Early Warning System into this programme have been made, which could be an important step forward in terms of developing DRR for droughts.

Despite these initiatives, according to the opinion of interviewees from federal agencies, this issue continues to be a great challenge. It should be noted that traditionally the government’s efforts in this area have been retro-active, focusing on mitigation instead of prevention measures. Thus, it is necessary to establish a clear and uniform public definition of drought, backed up by a legal framework and a national policy that forms the basis for standardizing the respective laws and legal instruments of related sectors (rural development, nutrition) and corresponding laws at the state and local level, thereby implementing a holistic DRR-inclusive system and strategy.

## Food Security

Art. 4 of the Constitution establishes the right to nutritious, sufficient and good-quality food guaranteed by the State. This right is not supported by a specific law at the federal level. However, the Sustainable Rural Development Law defines the concept of food security as the timely, sufficient and inclusive supply of food to the population (Art. 3 XXVIII) and includes a chapter on Food Security and Sovereignty (Art. 178-183), in which the responsibilities of the State for the provision of food and basic and strategic products are defined. Art. 183 states that in order to meet the requirements of food security and sovereignty, the Federal Government shall foster the identification of food-related risk factors, among which drought could be included, although there are no details specified.

In turn, the General Social Development Law (*Ley General de Desarrollo Social*) establishes nutrition as one of the human rights for social development (Art. 6), however this right is not elaborated. Although Mexico does not have a specific law to ensure food security at the national level, some states (like the Federal District) implemented a respective legislation, e.g. the Food and Nutrition Safety Law of the Federal District in 2009.

At the national level, important progress was made with the release of the “Decree for the establishment of a National System for the Crusade against Hunger” (*Decreto por el que se establece el Sistema Nacional para la Cruzada contra el Hambre*), which is a strategy of social inclusion and well-being to be implemented by means of a comprehensive participatory process, directed at persons who live in conditions of extreme multidimensional poverty and who lack access to food (Art. 1). In the first phase, this strategy is being implemented in 400 municipalities (Art. 3). It is still too early to evaluate the adopted measures, but the prioritization given to this “crusade” is an encouraging sign for the reduction of one of the most present and urgent risks for the Mexican population. So far, out of the 400 priority municipalities, the strategy has focused on 80 municipalities.<sup>108 109</sup> The Crusade against Hunger, in its decree, is in line with best international practices by considering that food security requires a policy that links the legal framework and the programming of actions that mainstream DRR, instead of focussing on retro-reactive interventions. In this sense, the review of agriculture systems, their linkage with probabilities and climatic scenarios in crop areas, as well as the generation of knowledge and practices on resistant crops present areas of opportunity to establish sustainable solutions to the problems of famine.

<sup>107</sup> CONAGUA (2013b).

<sup>108</sup> SEDESOL (2013).

<sup>109</sup> In this prioritization are not included, municipalities, such as: Cochoapa el Grande, Guerrero, where 82.6% of 12425 inhabitants are in extreme poverty and food shortage, or San Simón Zahuatlán, Oaxaca, where 80% of the 2784 persons live in extreme poverty, although they had been examples of intervention by this strategy.. CORETT, (2013).



### 3.1. DRR Education & Awareness

Education is an essential tool for promoting a prevention culture in the country (as considered by the Mexican Government as the third priority for Civil Protection in the National Development Plan). The legal framework for education in Mexico includes several DRR-related provisions. For example, Art. 7 XI of the General Education Law provides for the inclusion of DRR topics in the school curriculum, specifying that education imparted by the states, decentralized bodies and individuals shall provide basic elements of civil protection, mitigation and adaption to climate change and the effects of natural phenomena.

In line with this law, the LGPC also specifies in Art. 43 that in order to promote this culture the corresponding authorities within their competencies shall incorporate teaching on civil protection into every public and private education level as a compulsory subject. The latter part of this article was amended in the new LGPC. In practice, the incorporation of the subject of DRR into school plans has been mainly focussed at the primary level to date, remaining outstanding at high school, technical school and university levels. According to Art. 19 XVI, SEGOB which conducts National Coordination, has an important role in this process, since the management and coordination of the integration of civil protection into education is one of its tasks.

In general, the LGPC includes three related chapters. Chapter VII on Civil Protection Culture (Arts. 41-45) defines the participation of the authorities at the three government levels and contains measures that will contribute to the strengthening of a civil protection culture within the population, by means of individual and collective participation. Chapter VIII denominates the Professionalization of Civil Protection and includes Arts. 46 - 48, which relate to the professionalization of the public sector. Finally, Chapter IX of the LGPC (Arts. 49-50) includes provisions about the National Civil Protection School, training, accreditation and certification.<sup>110</sup>

The National Civil Protection School (ENAPROC), formed in 2011, offers two educational modalities: 1) a school system and 2) a job-level certification system, validated by the Public Education Ministry (*Secretaría de Educación Pública*, SEP), and governed by the rules of the National Labour Competencies Standardization and Certification Council (*Consejo Nacional de Normalización y Certificación de Competencias Laborales*, CONOCER).<sup>111</sup> The creation of ENAPROC represents important progress in terms of DRR, since it will contribute to the formation of a culture of security and resilience. However, the development of ENAPROC is still in its initial stage. At the state and local level, the challenges are huge, thus the creation of a “state campus” of ENAPROC is an important strategy. Some entities already have similar agencies in operation, e.g. Chiapas y San Luis Potosí. In particular, ENAPROC faces four operative and budgetary challenges. According to the federal interviewees there is a shortage of teachers and trained staff with pedagogic and practical experience in civil protection. Only by engaging real experts can progress be made in strengthening the culture of prevention. Likewise a high standard of training for instructors is imperative in order for the students and civil population to acquire and internalize the relevant knowledge. Another challenge faced by ENAPROC is the allocation of resources, as established by the second transitory article in the Agreement that generates the National Civil Protection School (*Acuerdo por el que se genera la Escuela Nacional de Protección Civil*). The third challenge is to pass the regulation required to move forward the development of schooling and certification schemes. Finally, there is a need for strategic planning to promote the international recognition of ENAPROC, mainly in Latin America.

Education is just one part of promoting a civil protection culture. As established in Art. 43 of the LGPC, it also involves the development of programmes and campaigns, as well as community participation. In this context, the functionality of the laws is also related to the generation of efficient programmes. The 2013 OECD study on SINAPROC in Mexico referred to the functioning of neighbourhood councils in Mexico City and Chiapas (going from door to door to promote a civil protection culture) as an example of citizen empowerment. It also mentioned that the Regional Civil Protection Days contribute to the creation of a preventive culture and that they are efficient in order to impart knowledge on risks. Likewise, the existence of initiatives by CENAPRED for the community and those funded by FOPREDEN are evaluated positively.

<sup>110</sup> SINAPROC (2013a).

<sup>111</sup> CINU (2012).

According to Art. 69 j of the General Education Law, each public basic education school shall operate a school council of social participation that carries out actions of participation, coordination and diffusion necessary for civil protection and school emergencies. Similarly, according to Art. 70 h, each municipality shall operate a local council for social participation in education, which supports civil protection and emergency activities at the local level. The interviewees at the state and local level confirm that these school councils, formed by parents, teachers and local authorities, also reach rural communities and strengthen preparation and response to emergencies. Furthermore, significant progress was made in simulations in schools. In the central and south-southeast areas of the country, school plans for risk reduction have been implemented as a pilot project with an intercultural and child protection perspective promoted by UNICEF, UDP and the SEP.<sup>112</sup>


The existence of a broad legal framework in Mexico for the design of plans, programmes and projects related to education on civil protection is commendable. It is important to continue focussing on DRR-related education in the phase of prevention in order to reduce and mitigate vulnerabilities and to promote the approval and the assumption of responsibility by the local population. The preventive and civil protection culture shall also contribute to increasing the participation of civil society in the generation of public policies in the long run. In turn, these policies shall ensure the inclusion of the most vulnerable sections of the population, such as children, women, the elderly, indigenous people and people with disabilities.

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<sup>112</sup> Interview with UNICEF Project Unit in the Peninsula of Yucatán, which carried out around 450 DRR school plans, in Tabasco 700 with CONAFE, in Chiapas around 12500 plans.



## 4: Conclusions and Observations

- 4.1. Observations on the overall Legal and Institutional Framework
  - 4.2 Good Practices and Examples at each Government Level
  - 4.3 Gaps in the Legal Framework for DRR
  - 4.4 Effectiveness of Community Level Implementation
- 

## 4. Conclusions and Observations

### 4.1 Observations on the Overall Legal and Institutional Framework

From the above analysis it can be concluded that there has been significant progress in developing the legal and institutional DRR framework in Mexico during the last decade and that this has facilitated the implementation of efficient measures for the preparation, response, mitigation and prevention of disasters. The pillar of this framework is the new General Civil Protection Law (*Ley General de Protección Civil*, LGPC), which includes innovative provisions for mandatory enforcement at the three government levels (federal, state and local). While there have been important improvements in monitoring, alert, humanitarian aid and response, and post-disaster recovery, the most innovative and challenging aspect of the LGPC is the incorporation of new DRR and DRM elements in the sectors most relevant for disaster prevention, including urban development, housing, human settlement, sustainable rural development, environmental conservation and education. In this sense, the research findings include some important advances regarding the DRR perspective in various federal, state and local laws and regulations.

Regarding the institutional framework, the LGPC and most of the respective state laws provide a design that promotes interinstitutional coordination under the umbrella of the National Civil Protection System (SINAPROC), thereby facilitating the exchange of information and joint decision-making in the case of a disaster. This structure enhances the response capacity of SINAPROC at the federal level. It is replicated in all states of the country, and to a great extent, in the municipalities, through state and local civil protection councils. The legal mandate of SINAPROC is also extended to prevention, which could be used by the present government to implement the mainstreaming and institutionalization measures defined in the National Development Plan 2013-2018.

Several good practices associated with DRR in Mexico which were identified by the study are outlined below. Also highlighted are several areas of opportunity, which are in the process of being developed and addressed and which offer great potential for effective disaster risk reduction in the next five years and beyond.

### 4.2 Good Practices and Examples at each Government Level

#### DRR in DRM Legislation and Institutions

The new LGPC provides for the mainstreaming of DRR into the legal framework, creating linkages with other sectors such as housing and construction, urban development, human settlements, environment and climate change. The structure and functioning of SINAPROC is also noteworthy. It was designed as a decentralized and interinstitutional system that facilitates the coordination of all sectoral stakeholders, government levels and the community in the implementation of DRR.

#### Risk Financing and Transfer

The instruments used for financing holistic risk management and DRR in Mexico are derived from the LGPC and related laws such as the Sustainable Rural Development Law. Based on their legal foundation, resources are earmarked for preparation, response, reconstruction and recovery (FONDEN, Rural Assistance Fund for Climatic Contingencies, FONDO PYME), and even specifically for disaster prevention (FOPREDEN). This demonstrates the commitment to DRR and to risk reduction measures in the development of the country. The allocation of a fixed percentage of the national budget assures functionality and facilitates, especially in the case of FOPREDEN, research, development and investment in new technologies including Early Warning Systems (EWS) and Risk Atlases, as well as the development of capacities and institutional transformation, thereby generating and strengthening resilience

capacity. On the other hand, the legal basis for risk transfer instruments in mechanisms such as catastrophic bonds and parametric insurance is an outstanding issue. Additionally, the new LGPC obliges the states to create state civil protection funds and to purchase insurance against disasters, which will facilitate their response and recovery capacity by decentralizing resources and responsibilities for DRR.

### Early Warning System (EWS) and Risk Maps

The existence of a technical-scientific unit (CENAPRED) with the legal mandate to develop preventive measures and systems, as well as to collaborate with the academic and scientific sectors, constitute key elements that facilitated the significant progress made by the country in the development of EWS. Likewise, CENAPRED, as the institution responsible for the coordination of DRR, has overseen the development of the Risk Atlas at the three government levels. At the national level and in most states, the risk atlases have been completed and updated. This will allow Mexico to comply with those provisions of the new LGPC that legally establish the Risk Atlas as the reference framework for the elaboration of policies and programmes in all phases of DRR, as well as its mandatory use for granting land and construction permits.

### Housing, Construction and Urban Development

Since the earthquake of 1985, Mexico has promoted the inclusion of antiseismic construction measures and rules in urban zones. This legislation is linked to and builds upon others such as the operative rules of the “safe hospital” programme under which 200 hospitals have been revised and certified. In particular, the specific laws related to infrastructure and the safety of schools and child care centres stand out. The new LGPC links the housing and urban development sector with DRR, since it establishes penalties for public servants that grant construction and land use permits without having performed a risk analysis. The creation of the Agrarian, Territorial and Urban Development Ministry (SEDATU) is an important starting point for improving the coordination of these sectors.

### Environment, Climate Change and Water Management

The new General Climate Change Law is another example of good practice in the Mexican legal framework for DRR. As with the LGPC, it seeks to mainstream DRR into all sectors of the three government levels. It includes important provisions that will influence DRR and the reduction of vulnerabilities in the face of extreme climatic events. The recently established National Ecology and Climate Change Institute and the Interministerial Climate Change Commission (CICC) play key roles in planning climate change adaption processes, thereby contributing to DRR. Another positive element is the participation of civil protection units in the CICC, as well as the integration of environmental authorities in the national and state councils of SINAPROC.

Mexico has a solid legal framework for the management of national waters, rivers and watercourses. In particular as established by the National Water Law, the legal mandate of CONAGUA and the integrated management of watersheds makes Mexico a pioneer in the creation of such inter-institutional councils.

### Droughts and Food Security

Although Mexico still does not have a specific law on drought and food security, recent initiatives such as the creation of the interministerial commission to address droughts and floods (*Comisión Intersecretarial para la Atención de Sequías e Inundaciones*, CIASI) in 2013, and the National System for the Crusade against Hunger (*Sistema Nacional para la Cruzada contra el Hambre*, SNCH) establish important starting points for the holistic management of these risks.

## Education

The legislation that governs the inclusion of the subject of civil protection in the curricula of all private and public school levels is commendable. This is already being applied at primary school level. The new LGPC strengthens this practice, by establishing this subject as compulsory for all levels of formal education.

Considering the existence of a significant amount of formal and informal DRR-related educational programmes in Mexico which lacked efficient coordination, another good practice established by the new LGPC is the creation of the New National Civil Protection School, which will be strengthened in 2013.

## 4.3 Gaps in the Legal Framework for DRR

### DRR in DRM Legislation and Institutions

Regarding the legal framework, the regulation of the new LGPC, as with that of the LGCC, represents an opportunity for improvement because it will explicitly define how the new provisions will be implemented in practice. In addition, the regulation could specify some elements that are part of the National Development Plan, and that are still not considered in the legal framework of SINAPROC, such as gender equity, intercultural aspects and the participation of vulnerable groups, such as people with disabilities.

### Risk Financing and Transfer

The continuing revision of the operating rules of FONDEN and FOPREDEN is important in order to simplify and facilitate access to these resources. Regarding funds and insurances at the state level, the inter-institutional coordination to set common criteria and exchange information will lead to a better design, lower costs and increased coverage and responsiveness in the establishment and functioning of these mechanisms. The dialogue between state governments and its facilitation by the federal government also represent areas of opportunity.

### Early Warning Systems (EWS) and Risk Maps

Good practices established in the design of existing EWSs should be replicated in the development and implementation of systems for other risks, such as tsunami or drought. This is critical to the improved capacity of SINAPROC to manage various natural hazards.

Standardizing the contents and functionality of the State Risk Atlases and creating electronic connections with the National Atlas for its continuous and mutual update and input is an important opportunity for improvement. Likewise, it is important to incrementally extend the coverage of the local Risk Atlases, using financial and technical support from the Federal Government. Collaboration with academia, state governments and civil society will also play a key role in this regard. An adequate technical design for the approximately 1000 small and highly or very highly marginalized municipalities, located in less than 10 states in the centre and south of Mexico, will contribute to the earlier achievement of comprehensive coverage by these important instruments. Furthermore, the creation of legal provisions and institutional arrangements for the use of the Risk Atlas in development planning at the three government levels, as well as its integration with ecological and land use regulations, represents an opportunity to increase disaster risk reduction efforts in the country.

### Mainstreaming and Sectoral Institutionalization of DRR

An important challenge which is common to all sectors analyzed is the harmonization and updating of other federal, state and especially local laws that still do not include DRR according to the new provisions of the LGPC and the LGCC. It would be advisable to consult with DRR-expert groups in the federal and state agencies when conducting

the respective sector-specific risk analysis. Some areas for improvement include the inter-institutional linkage and coordination of the sectors of urban development, housing, land tenure and human settlements, and the update of the regulatory frameworks to assure, for instance, the use of the Risk Atlas within decision-making, as well as the establishment of monitoring and sanctioning mechanisms in the case of non-compliance with assigned responsibilities.

## 4.4 Effectiveness of Community Level Implementation

In Mexico, legislation is enacted at three government levels (federal, state and local), implying a broad and complex legal framework. However, this also facilitates notably positive aspects regarding the promotion of community participation in DRR-related issues. The institutional structure of the country enables the application of laws. Some good practices at the community level, identified in the laws and during the community visits, are described below.

According to Art. 115 of the Mexican Constitution, municipalities are granted a certain degree of autonomy, which allows for decentralized responsibilities and establishes that communities' basic needs are addressed by the municipality. The principle of subsidiarity within the LGPC assigns responsibility to the municipality as the unit of first response to communities in the case of an emergency. In this context, Local Civil Protection Councils were established. The consulted communities stated that they know the structure of these councils and this legal space allows them to communicate with the local authorities before, during and after a disaster.

The civil protection structure enables access to remote communities during the different phases of the risk management cycle (prevention, preparation, response, recovery and reconstruction). For each phase there are federal funds to address the state, municipalities and rural communities (FONDEN, FOPREDEN and FIPREDEN, etc.). The consulted communities have received support from FONDEN for reconstruction, or special state funds to pay for harvest losses caused by a disaster. These mechanisms of risk transfer that reach the communities can be considered good practices that allow the implementation of DRR in the communities of Mexico.

The visited communities recognize the progress made in civil protection on issues such as preparation and response, EWS and the dissemination of alerts through the different types of media, allowing the real participation of communities in the case of an emergency. In some visited states campaigns for prevention, preparation and response are translated into indigenous languages thereby enabling the information to be transmitted to indigenous populations in remote rural areas.

The analysis and elaboration of risk maps at the community level, as promoted by UNDP's Risk Management Programme (PMR), allowed community actors in several states of the country to identify vulnerabilities, their causes, and the degree of exposure to hazards, as well as the planning and execution of processes to reduce the conditions of vulnerabilities to risks and the effects of climate change, which, in turn, strengthens SINAPROC. For instance, the Civil Protection Institute for the Integrated Disaster Risk Management of the State of Chiapas, through the Preventive Programme PP5 has replicated the UNDP-PMR methodology in 80 municipalities and 2,578 communities.

## Areas of Opportunity

The need for greater consideration and linkage between the Risk Atlas and communities' risk perceptions was mentioned as an area of opportunity for local, state and federal civil protection by the consulted communities. This would allow for better understanding of the chronic risk faced by these rural and indigenous communities in Mexico<sup>113</sup> in order to generate projects and actions that will facilitate the reduction of structural vulnerability in the country and that will reinforce community resilience.

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<sup>113</sup> A component of the definition of underdevelopment, poverty and unsustainability; a condition that drives the social construction of disaster risk conditions, both in terms of threats and vulnerabilities; an important point to consider and a component in the process of disaster risk generation. Lavell, A.(2011)

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The regulations of Good Municipal Government (*Bandos de Buen Gobierno*) that control the governance of the territory, face a legislative challenge in the area of DRR, promoting the participation of different sectors of the municipality and the elaboration of building codes that include measures to reduce the vulnerability of communities. Local plans should include prospective risk management, thereby anticipating future risks, for instance, with investment in the construction of infrastructure that guarantees risk minimization. The local development planning councils (*Consejos de Planeación del Desarrollo Municipal*, COPLADEMUN) represent an opportunity to mainstream DRR into development plans where civil society, communities and local authorities participate.

The creation of the National Civil Protection School, besides training professionals, experts and technicians in DRR, should also consider the building of local capacities, training promoters that help rural and indigenous regions to implement legislation and DRR-relevant actions.

The inclusion of civil society organizations in the different phases of DRR will undoubtedly assist SINAPROC with its mandate to reduce the vulnerability of communities and municipalities while increasing their resilience.





## 5. Annexes

Annex A: List of persons and groups consulted

Annex B: Bibliography

## 5. Annexes

### Annex A: List of persons and groups consulted

#### National/Federal Government

- National Disaster Prevention Centre, CENAPRED - Enrique Guevara Ortiz, National Director
- National Housing Commission, CONAVI – - Institutional Response
- National Civil Protection Coordination - Enrique Gómez Oliver
- Ministry of Environment and Natural Resources, Subministry for Environmental Planning and Environmental Policy - Jonathan Ryan, GEF coordinator
- Mexican Petroleum PEMEX - José Oscar Oliva García, Subdirector for external relations (civil protection)

#### State Governments

- Civil Protection Institute of Disaster Risk Management Chiapas - Institutional Response
- Civil Protection of the State of Guanajuato - Luis Antonio Güereca Perez, Executive Coordinator
- Ministry of Urban Development and Environment of the Government of the State of Yucatan - Eduardo Batllori, Secretary of Urban Development and Environment
- Ministry of Urban Development and Environment of the Government of the State of Yucatan - Jose Arellano Morin, Head of Department of Special Projects and Programs

#### Local/Municipal Governments

- Civil Protection Direction for the Municipality of Emiliano Zapata, Tabasco - Pascual Pérez Carlos Jasso, municipal civil protection director
- Civil Protection Direction for the Municipality of Teapa, Tabasco - Iran Guadalupe Lopez Tzab, Municipal Civil Protection Chief
- Jalapa, Tabasco - José Cabrales González, Former Director of Civil Protection-
- Government Secretary of the Municipality of Jalapa, Tabasco - Wilbert Narvaez Narvaez, Former Secretary of Government
- Government Secretary of the Municipality of Jalapa, Tabasco - Eugenio Solis Ramirez, Former Head of municipal regulations
- Municipality of Jalapa, Tabasco - Luis Francisco Deya Oropeza, Former Mayor
- Ministry of the Interior of the Municipality of Mérida, Yucatán - Mimenza Ms. Lizette Herrera, Director of Government
- Ministry of the Interior of the Municipality of Mérida, Yucatán - Dzib Juan Gabriel Chan, Deputy Director for Operations Directorate of the Interior
- Civil Protection Unit of the Municipality of Mérida, Yucatán - Fernando Estrada Novelo, Municipal Civil Protection Chief
- Government Department of the Municipality of San Felipe, Yucatan - San Lorenzo Ignacio Briceño, Mayor
- Treasury of the Municipality of San Felipe, Yucatan - Roberto Coral Marrufo, Municipal Treasurer
- Civil Protection Direction of the Municipality of San Felipe, Yucatan - Feliciano Montoya Bello, Director of Municipal Civil Protection

## NGOs

- Mexican Red Cross - Mario Bustillos Borges, National Councillor and State Delegate Tabasco Red Cross
- Research and Popular Education Autogestiva AC - Guillermo Alonso Ângulo, General Coordinator - Delivery Partner Yucatan UNICEF expert on Disaster Risk Reduction in Children and intercultural approach
- Missionaries, B.C. - Margarita Noh Poot, General Coordinator
- Citizens Movement for Justice June 5 AC - Jose Francisco Garcia Quintana, President
- OXFAM Mexico - Rodrigo Galindo, OXFAM Management Programs Mexico
- World Vision - Aldo Pontecorvo, Technical Secretary of the Consortium UNDP - Action Aid - World Vision Risk Management

## UN Agencies

- United Nations Development Programme - Xavier Moya Garcia, Director of the Office for Yucatan Peninsula and Tabasco
- United Nations Development Programme - John Paul O'Farrill, National Advisor on Disaster Prevention

## Consultants

- Lawyer and expert on land issues - Ruben Avila Marin
- Consultant and expert on gender issues and environment - Itzá Castañeda Camey
- Independent Consultant on Disaster Risk Management - Arturo Lopez-Portillo Contreras

## Academic

- Research Centre for Higher Studies in Social Anthropology - Fernando Briones Gamboa
- *El Colegio de Mexico*, B.C. - Sergio Puente
- *Instituto Mora* - Simone Lucatello
- National Autonomous University of Mexico - Juan Carlos Mora Chaparro

## Community Focus Groups

- Focus group with four communities in the Northeast Coast of Yucatan
- Focus group with four communities in the North Central part of Yucatan

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