



1: Oxfam, Centroamérica: cambio climático en números, 07/11/2014

BEYOND REACTION

Drought and climate change in Central America

Around 2.5 million people in Central America are suffering from food insecurity due to the drought that has affected the region since July 2014. With climate change, such extreme weather effects are expected to increase in frequency and severity. However, climate change still occupies a marginal place in political agendas, with few exceptions. The topic only gains importance when extreme events result in large-scale disasters, before important international conferences, or when climate change is used to justify deficiencies or irresponsibility of policy decisions.



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1 DROUGHT AND CLIMATE CHANGE

The vulnerability of Central American nations to climate change depends not only on climate threats, but also on many socio-environmental factors associated with the region's developmental model. The latter determines the capacity to adapt to climate change technically and socially. Inequality and vulnerability are therefore closely linked: poor people and poor countries suffer immeasurably more than others from the risks and consequences of natural disasters and climate change. With no access to welfare, protection schemes, insurance, or "something in the kitty" to help them withstand an emergency, while living and working in more vulnerable areas (rural and marginalized, bad access roads, limited or no access to drinkable water and/or electricity...), the poorest are always hit hardest¹.

Inequality is hardwired into crises. Almost anyone who is marginalised – because of their caste, colour, class, age, ability or gender – will likely suffer from shocks more than anyone else. The endemic discrimination that women face – in education, health care, employment, and control of property – inevitably makes them more vulnerable. [...] Power and wealth allow some people, corporations, and governments to mitigate the risks they face while directly or indirectly dumping those risks on people with far less capacity to cope.

Oxfam briefing paper, No accident: resilience and the inequality of risk, 2013

Climate change increases the magnitude and frequency of extreme climatic events², such as droughts, that affect the region. Increased temperatures and changes in precipitation will affect food production, the availability of water and the smaller settlements. The need for adaptation in vulnerable areas is urgent.

The Global Climate Risk Index 2014, presented during the 19th session of the Conference of the Parties (COP19) of the UN Framework Convention on Climate Change (UNFCCC), indicates that Honduras is the most vulnerable country in the world, and the most affected by climate change over the last 20 years. Nicaragua and Guatemala are included on the list of the 10 worst-affected countries (Germanwatch 2013, Oxfam 2014a).

The humanitarian efforts undertaken in Central America by organizations such as Oxfam will have to adapt to more difficult conditions due to climate change, and be oriented towards ensuring the adaptation of vulnerable groups.

Figure 1. Climate risks in Central America

| El Salvador | Nicaragua | Honduras | Guatemala |
|--|---|--|---|
| 83 percent of the 42 disasters that took place between 1970 and 2011 were hydrometeorological. In 2010, the country | More than 80 percent of the country's poor live in rural areas and remote communities. The country is ranked 4 th for its exposure to | The country is the world's most vulnerable to climate risks, and the most affected by climate change over the past 20 years. | The country is in the list of the 10 countries most affected by climate change in the world (Germanwatch 2013). |

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|--|--------------------------------------|---|--|
| <p>was ranked first for its exposure to climate risks.</p> <p>95 percent of its population lives in danger zones.</p> <p>In 2012, the country was ranked 13 in the Climate Risk Index.</p> <p>Sea levels have risen by an average of 1.3mm per year (Oxfam, 2014).</p> | <p>climate risks (Oxfam, 2014a).</p> | <p>The country is ranked first for exposure to climate risks.</p> <p>19 percent of the territory suffers from water scarcity (Germanwatch 2013, Oxfam 2014a).</p> | |
|--|--------------------------------------|---|--|

A report recently published by Oxfam draws attention to the necessity for urgent measures in the technological, social and environmental spheres (Oxfam 2014a):

- Over the past decade, more than 15 million people were affected by floods, more than 3 million by extreme droughts, and almost 5 million suffered the consequences of extreme temperatures in Latin America and the Caribbean.
- Around 2.5 million people in Central America suffer from food insecurity due to the drought that has affected the region since July 2014. In the most affected regions, 70 to 100 percent of agricultural production was lost during the first harvest period (Oxfam 2014b).
- The effects of the drought are especially dramatic in Central America’s ‘Dry Corridor’, where rainfall since the end of June 2014 was an average of 50 to 75 percent lower than usual, which makes it the worst drought in more than 10 years.³
- The governments of Guatemala, Honduras and Costa Rica have declared a state of emergency.
- In August, Oxfam reported that the impact of the long drought had caused food insecurity for more than half a million families (about 2 million people) in Guatemala, Honduras, Nicaragua and El Salvador.⁴ Since that time, a further half a million people have been affected.⁵
- For the October–December reporting period, the US Famine Early Warning Systems Network described the drought affecting the areas of the Dry Corridor in Honduras, Nicaragua and El Salvador as a ‘Stress’ (2CIF), and in Guatemala as a ‘Crisis’ (3CIF) that could last until the next harvest, in September 2015 (Oxfam 2014b).
- The UN World Food Programme (WFP) spoke about a ‘humanitarian crisis’ due to the loss of subsistence crops such as corn and frijol in Honduras, Guatemala, Nicaragua and El Salvador. More than 70,000 tons of food were needed to attend to the needs of one million people during 90 days, but the WFP only dispensed 12,200 tons.

For the construction of new governance under difficult conditions due to the drought and the impacts of climate change, it is urgent not only to allocate financial resources for adaptation, but also to take synergic actions that will implicate the civil society and the governments.

EXPECTED IMPACTS OF CLIMATE CHANGE

Various forecast scenarios for Central America suggest that:

- Temperatures could rise between 1.8 and 4.0°C before the end of the century (IPCC, 2007, CEPAL 2007)⁶.
- Variations in rainfall will be an average of 5 percent, but could be as high as 10–20 percent, which, added to a temperature rise of 1–2°C, could reduce the production of beans, rice and corn by about 10 percent (IPCC, 2007, CEPAL, 2007)⁷.
- Sea levels could rise between 0.4 and 1.2m before the end of the century. If the sea rises by more than half a meter, it would flood 50 percent of the Caribbean's beaches (Landa et al 2010).
- The total availability of renewable water could decrease by 35–63 percent before 2100 (CEPAL, 2010)⁸.
- Water supplies in Nicaragua will be strongly affected by climate change, as will those in El Salvador and Honduras. According to United Nations Economic Commission for Latin America and the Caribbean (CEPAL) estimates (2010), demand could increase by 20 to 24 percent.
- Poor management of water and soils increases the production losses for basic crops, especially during droughts (FAO, 2012)⁹.
- Expected heatwaves will increase the risks of cholera, pulmonary viruses, leptospirosis, encephalitis, dengue and malaria, etc. (Oxfam, 2014)
- It is probable that, because of melting glaciers, in 2020–29, between 7 and 77 million people will be affected by insufficient water supplies. During the second half of the century, this number is estimated to rise to 150 million.
- The increase in the number of people suffering from famine in the region could, according to IPCC estimates, reach 5, 26 and 85 million people for the years 2020, 2050 and 2080, respectively. (Landa et al., 2010)
- The increased frequency and severity of droughts would particularly impact the quality of life for rural women, due to increased difficulty with food preparation and the supply of water for household use. Generally speaking, women are more exposed to the risks created by climate change, a process which magnifies the inequalities already existing (access to natural, financial and productive resources, violence or education.)

THE NEED FOR INSTITUTIONS TO IMPROVE RESPONSE

The expected impacts of climate change will only increase over time, and are irreversible for the ecosystems that sustain the production of food (IPCC, 2014).

If no measures are taken to adapt, there would be grave socioeconomic and environmental repercussions that could hinder the achievement of food security and the wellbeing of vulnerable groups (Oxfam, 2014).

Hitherto, the actions taken to face climate change and droughts were fundamentally reactive, and centred on the declaration of states of emergency and responding to the most immediate effects.

Central America needs mechanisms that learn from disasters. Doing otherwise only limits the capacity to prepare for the future. As it stands, people only become aware of their vulnerability when a large-scale disaster makes that risk evident. We therefore urgently need to develop a culture of prevention so that this is not necessary.

2 CLIMATE CHANGE AND RISK

EXTREME CLIMATE EVENTS AND DROUGHTS

Extreme climate events include hurricanes, droughts, tornados, intense rain and snowfall and frost. (Shepherd et al., 2013)

Disasters are the results of natural or man-made events, and can be unexpected and/or continuous. Disasters have impacts of such severity on a community or sector that extraordinary measures must be taken in order for normal activities to continue. The gravity of those impacts depends a lot of the vulnerability of the systems, which explains that one same disaster will not have the same consequences for everybody: those natural events result in disaster because of human action or inaction.

Droughts are one of the largest causes of disasters around the world. In the last 30 years, an increase in the frequency and intensity of droughts has been noted in the Caribbean region. A drought originates from a deficiency in rainfall over an extended period of time.

Droughts can be of different types:

- **Meteorological**, when rainfall is below normal in a specific place;
- **Agricultural**, when the humidity of the ground is insufficient for cultivation;
- **Hydrological**, when surface- and ground-water reserves are below normal; or
- **Socioeconomic**, when the lack of water affects the supply of goods and services.

Droughts are of enormous significance, and have caused famines, massive migratory movements and tremendous economic, social and political crises. They also have consequences on the possibility for women to access to land, work, education, but also to safety as it has been observed that violence against women tends to increase during a natural disaster¹⁰.

CLIMATE CHANGE ADAPTATION

Adaptation to climate change (CCA) is the capacity of human and natural systems to adjust spontaneously or in an orderly manner to the impacts of climate change, in order to be better prepared.

Preventive actions and policies, especially those with a long-term outlook, offer the best chance to prevent the most damaging effects of climate change for people and activities in vulnerable regions (Landa et al 2010).

CCA involves capacity building, risk management, and the modification of production and purchasing behaviours (Landa et al 2010; Landa and Ávila 2010; Landa 2011; Landa et al 2011; Magaña et al 2011). It also includes collective planning and the promotion of conditions suitable for financing prevention (ONU 2004; UNISDR 2009b, 2010, 2012).

INTEGRATED RISK MANAGEMENT

Drought strategies must be conceived within an 'integrated risk management' model. This involves considering the actions necessary to identify, analyse, evaluate, control and reduce risks, taking into account their many factors within a framework of a changing process that involves governments (local, national and regional) and civil society.

Public policies, strategies and procedures should favour sustainable development, tackle the structural causes of disasters (including inequalities) and strengthen the resilience and resistance of a society. It involves the following steps:

- Identification of risks and/or their causes, and of vulnerable groups
- Prevention and mitigation
- Preparation
- Assistance
- Recuperation and reconstruction

Other relevant concepts include:

- **Vulnerability:** the susceptibility or tendency of a community or group to suffer damage or losses in the face of a disturbance. It is determined by physical, social, economic and environmental factors, although vulnerability itself is socially created. (ONU 2004; Landa et al 2010; UNISDR, 2009a, 2009b, 2010, 2012)
- **Climate risk:** a combination of the threat of extreme climatic events and vulnerability (Risk = Threat x Vulnerability). In short, climate risk exists where there is a possibility that unfavourable changes in precipitation or temperature might cause a disaster in the region. (Landa et al 2010; UNISDR 2009a)
- **Disaster risk management:** the systematic use of administrative guidelines, organizations, skills and capacities to implement policies and strengthen coping capacities, with the objective of reducing the impact of natural threats and therefore the possibility that a disaster might occur. (UNISDR 2009a)
- **Disaster risk reduction:** the systematic analysis and management of disasters' causal factors, including the reduction of the level of exposure to threats, reduction of vulnerability, the sound management of natural resources and the improvement of readiness before adverse events. (UNISDR 2009a)

3 NATIONAL CONTEXTS

EL SALVADOR

In 2010, according to the Global Fund for Risks Reduction around 88.7 percent of El Salvador's territory, 96 percent of its GDP and 95 percent of its population live in risks areas. According to the Inter-American Development Bank (IADB), between 1970 and 2011, the country was affected by 42 disasters, out of which 83 percent were hydro-meteorological (Cuéllar et al 2012). According to the Ministry of the Environment and Natural Resources (MARN), the average national temperature has risen by 1.3°C over the last sixty years, and a further increase of 2–3°C is expected in the coming decades.¹¹

It is estimated that the 2014 drought is the worst in 44 years. The most affected areas are in the east, followed by the coastal region and some of the north-eastern regions. In September, the Ministry of Agriculture counted 103,589 producers affected in 105 municipalities, divided in 12 departments. About 30 percent of annual corn production (4 million quintals), and 90 percent of frijole production (45,000 quintals) was lost across the country, with losses estimated at US\$70.1m. The areas most affected were in the east of the country: Usulután, San Miguel, Morazán, and La Unión (FAO 19/09/2014; Oxfam 2014b).

Consequences of climate change

- The expected change in average temperatures in El Salvador is 0.8–1.1°C by 2020, and 2.5–3.7°C by 2100 (Republic of El Salvador 2000).
- Rainfall is expected to have decreased by 3.5–11.3 percent by 2020, and by 11.1–36.6 percent by 2100 (Republic of El Salvador 2000).
- Over the next 100 years, between 10 and 27.6 percent (149.1–400.7km²) of national territory could be lost if sea levels rise by the predicted 1.1m (*ibid.*; CEPAL 2009). This would be devastating for human settlements, productive and tourism infrastructure, as well as the availability of cultivable land.
- Climate change is predicted to cause a 60 percent drop in sugar cane production. Pasture and livestock production are expected to be affected (80 percent), as is the fishing industry (a 16–23 percent drop in shrimp production is expected). In the coastal region, agricultural production losses due to drought could result in \$3.1m losses in corn by the year 2025 (Republic of El Salvador 2000).

Policies

El Salvador is a member of the Central America Integrated System (SICA), and has been part of the UNFCCC since December 1995. The government ratified the Kyoto Protocol on 30 November 1998. (FOPREL-COSUDE 2013). The country is in a process of designing and restructuring its public policies to respond to socio-environmental, institutional and financial challenges (Cuéllar et al 2012, 2013).

According to the Second National Communication on Climate Change to the UNFCCC (Government of El Salvador 2013), the government's climate change-related efforts over the past five years have included:

- Strengthening climate observations;
- The approval by the Council of Ministers of a National Policy of the Environment (2012) that prioritizes climate change;
- The formulation and launch of the Program of Restoration for the Adaptation to Climate Change;
- The formulation of a REDD+ proposal for forest management with a focus on mitigation-based climate change adaptation (PRISMA 2014);
- The development of a National Strategy on Climate Change focused on adaptation;
- New arrangements to ensure inter-institutional coordination;
- Legislative reforms that promote the integration of climate change into laws related to the environment and education;
- The identification of priority technologies for climate change adaptation and mitigation;
- Energy sector initiatives focused on mitigation;
- Activities to raise public awareness of climate change and its consequences; and
- The creation of a National Plan on Climate Change that will allow the country access to the resources of the Green Climate Fund of the Warsaw International Mechanism for Loss and Damage Associated with Climate Change.

Other climate change-related policies and instruments in El Salvador include (Oxfam 2014a):

The National Policy on Food Security 2011–15

Formalized in May 2011, this policy is designed to protect people living in poverty and other vulnerable groups. Among its objectives are the promotion and securing of women's access to decision-making opportunities regarding productive resources; capacity building in sectors related to food security; and the creation of a monitoring, evaluation and early-warning system for food and nutrition.

The Strategy of the Ministry of Public Works for Climate Change

This strategy details the importance of '*shielding of the infrastructure in the face of climate change*'. This demonstrates the importance of reducing the impacts of climate change for the population and its possessions, including productive infrastructure. The strategy also mentions the necessity to develop 'green infrastructure'.

The Direction for the Adaptation to Climate Change and Strategic Management of the Risk was created with the mission to '*elaborate scientific and technical studies to adapt the social and productive infrastructures to climate change, to design and propose mitigation projects as a preventive strategy, in order to reduce the vulnerability and the impacts on the social and productive infrastructures*'.

The National Program for the Restoration of Ecosystems and Landscapes

This instrument is a key part of MARN's political response to the risks of environmental degradation and climate change. It aims to reduce socioeconomic and environmental vulnerabilities, and increase the mitigation and adaptation capacities of the agricultural sector.

The Environmental Strategy for the Adaptation and Mitigation of Climate Change in the Agricultural, Forestry, Aquaculture and Fishing Sectors, and the Plan for Family Agriculture

The Environmental Strategy is part of the response to the devastating impacts of Tropical Depression 12-E on agricultural production in 2011. It was formed on the basis of the presidential mandate to incorporate climate change into the Plan for Family Agriculture (PAF). Its main goal is to contribute to the adaptation of the agricultural, forestry and fishing sectors to climate change, including sustainable management of hydrological basins.

Among its objectives are:

- the promotion of the integration of environmental actions in productive processes;
- the reduction of vulnerability in rural areas;
- the design of plans for adaptation and mitigation, with a focus on food security; and
- the implementation of environmental management at all the levels of the Ministry of Agriculture (MAG).

The Strategy also envisages the creation of a Division of Climate Change inside the MAG, which would be attached to the Direction Forests, Basins and Rivers (MAG 2012). The PAF is led by the MAG, with the support of the FAO, the Inter-American Institute for Cooperation on Agriculture (IICA) and the WFP.

The Integral Fiscal Sustainability and Climate Change Adaptation Program

The Legislative Assembly of El Salvador approved a loan with the Bank of International Development that gives financial support to the Integral Program. The Program's principal objective is to *'contribute to the fiscal sustainability and adaptation to climate change through the reduction of the physical and natural vulnerabilities of the country'*.

To achieve this, public policies were consolidated and new capacities were developed in four general areas:

- macroeconomic stability;
- fiscal sustainability;
- institutionalism; and
- resilience and adaptation.

This programme is not only innovative, it also represents an important impulse to consolidate the initial progresses of the relevant ministries. Its logic is to strengthen the conditions necessary to improve the responses to extreme climate events. For example, the programme caused criteria regarding climate variability to be incorporated into the Ministry of Finance's budgetary planning process.

In 2012, the Executive Body submitted to the Legislative Assembly a draft General Water Law that includes six articles necessary to support the generation of information on extreme climate events, and to consider CCA (FOPREL-COSUDE 2013).

Other initiatives that implicitly address CCA at the international, regional and national levels include Policy Actions for Sustainable Agriculture in Hillside Areas, the Law on Irrigation and Drainage and the Regional Agro-environmental and Health Strategy 2009 – 2024 (MAG, 2012 and Oxfam, 2014).

Responses

The strategic design of the PAF in articulation with other instruments on climate change and environmental management plays a fundamental part in El Salvador's national policy priorities.

As a member of the Central America Integrated System (SICA), El Salvador adheres to the Regional Strategy on Climate Change to share efforts between governments. This strategy lays out the challenges of, and commitments to, climate change adaptation, linked to a number of social trials of policy and governance in Central America (Cuéllar et al., 2012 y 2013; Oxfam, 2014).

According to FOPREL-COSUDE (2013), financial mechanisms were designed to react to public and private risks to infrastructure, human settlements and production:

- Financial institutions involved in the reduction of the effects of climate change for the population and the economy, as well as bilateral funds.
- Financial mechanisms such as the Special Fund for Climate Change (FMAM), the Special Fund for Climate Change (FECC), the Fund for the Less Advances Countries (WFP Fund) and the Fund for Adaptation.

Funding for CCA is also being provided by regional and international institutions, including the International Finance Corporation, the World Bank, the IADB, and the Central American Bank for Economic Integration.

There also are ongoing capacity-building plans implemented by municipal and national institutions, including the construction and maintenance of a rain water reservoir in the municipality of Villa El Rosario, Morazán Department (*ibid.*).

Responses to droughts in particular have focused on:

- The supply of seeds packages and fertilizers;¹²
- Water rationing and the distribution of water pipes to make up for shortages;¹³
- Calling for later sowing seasons (July–August is the normal sowing period, with harvests ending in November);¹⁴
- Importing grains to make up for shortfalls;¹⁵
- In September 2003, the Spanish Red Cross, the Salvadorian Red Cross and the Regional Delegation created a project to '*raise the subsistence capacity of the agricultural producers of the country, to respond and recuperate better in the future in the face of bad climatic conditions*'.
- With financial assistance from the Global Mechanism of the United Nations Convention to Combat Desertification, El Salvador developed a National Action Plan to Fight Desertification and Droughts (MARN 2003).

HONDURAS

Honduras lacks a consolidated fund for emergency relief in the case of drought, which makes it difficult to collect information on people affected and the cost of responses. In 2014, it is estimated that around one million people (186,311 families) were affected by the drought across 165 municipalities. The government called for international assistance on 8 September, after declaring a state of emergency.

Consequences of climate change

Projections to 2090 suggest that important changes are going to take place in the months of

July and August, were the rainfall will only represent a 30 to 40 percent of the actual rainfalls. Meanwhile, temperatures will rise by more than 4°C across most of the country. Climate change-related threats are greatest for the agricultural sector, the grounds and food security.

Policies

Honduras signed the UNFCCC in June 1992, and ratified it in October 1995 (SERNA 2000). The government also signed the Kyoto Protocol in February 1999 and ratified it in June 2000 (FOPREL-COSUDE 2013). Therefore, Honduras has committed to:

- Follow up on the agreements made at UNFCCC Conferences of Parties;
- Monitor the fulfilment of Kyoto Protocol obligations and other relevant legal instruments;
- Ensure compliance with the agreements of technical cooperation signed and ratified;
- Follow up and coordinate the Inter-institutional Committee on Climate Change.

The Honduran Secretariat on Natural Resources and Environment (SERNA) created a new National Direction on Climate Change in June 2010. Additionally, SERNA created the Inter-institutional Committee on Climate Change (CICC), whose mandate includes the political and technical implementation of the National Strategy on Climate Change (ENCC). The ENCC is articulated in the government's National Plan (2010–22) and the Country Vision (2010–38). Climate change adaptation and mitigation is included in strategic guideline 7, and risk management and early recuperation processes are outlined in strategic guideline 12. We can also underline the existence of a project of law on climate change that was presented to the Congress in 2011.

The CICC is divided into thematic committees:

1. the Country Negotiating Group (GNP);
2. the Reducing Emissions from Deforestation and Forest Degradation (REDD) National Technical Group (GNT-REDD); and
3. the Directing Board for the Project of the Adaptation Fund to face climatic risks in water resources in Honduras (ENCC).

Honduras has also formulated a mitigation action plan for five years, with the objective of preparing to receive the international REDD+ mechanism. It participated in the preparation of the R-PP Document (Readiness Preparation Proposal) for the Forest Carbon Partnership Facility of the World Bank. It prioritized the activities and actions that would be necessary for a National REDD+ Strategy for 2014–17, and create a framework to implement it (Subnational Committee REDD+ 2014).

There is follow up of the Mechanism for Clean Development. Public education and awareness is promoted through the Technical Secretariat of the designated national authority.¹⁶

Honduras has a National Adaptation Plan for Climate Change that includes:

- public education and awareness;
- trainings programmes;
- the identification of priorities for adaptation measures at national and local levels; and
- a number of climatic and socioeconomic scenarios to assist the formulation of medium- and long-term policies.

Agreements are also passed with investigation institutions, international and national reunions

are organized and dissemination mechanisms are being elaborated.¹⁷

Other relevant projects include 'Identification of forests providing essential ecosystem services for the most socioeconomic sectors most vulnerable to climate change: drinkable water and hydro-energy', which issues policy recommendations. The 'Generating Farming Alternatives to Climate Change' project, implemented by the Foundation for Participative Investigation with farmers of Honduras, aims to investigate opportunities for the generation, development and transfer of technologies as a response to climate change and its effects.

Since 2011, the project 'Facing climatic risks for the water resources in Honduras: increasing resilience and reducing vulnerabilities in poor urban areas' has resulted in advances in training and the incorporation of climate change, disaster risk management and watershed management into regional development plans. The project 'Adaptation to climate change in the municipality of Tatumbla' also stands out due to its protection of mixed forests, actions in favour of the most vulnerable neighbourhoods and those in the forested corridors around Tegucigalpa, where more than \$2,950,000 was invested (Project Fund for Adaptation 2013). As part of this effort, 53,418ha of forested corridors were protected, farmers were trained in better cultivation methods, and more general training was offered on controlling forest fires.

Responses to the drought

- Activities that have been financed since 2010 include the management of water rationing and distribution, awareness campaigns and sanctions against those that do not comply with the law (UNAT 2010).
- The National Bank for Agricultural Development joined other institutions to allocate almost 2bn lempira (around \$90m dollars) of credit for the sowing of basic grains and other crops.
- Following Executive Decree PCM 32-2014 (Drought Emergency) on 8 September 2014, the government called on the international community for help during the G16 (Oxfam 2014b).
- The Permanent Contingencies Committee (COPECO) reacts in cases of emergency, demanding the alliance of the institutions to deal with the consequences of drought.
- The government initiated the distribution of food through a fund managed by BANASUPRO. The WFP also planned to distribute food (*ibid.*).
- In the southern municipalities of Francisco Morazán Department and in the south of El Paraíso, the government has begun viability studies for the construction of rain-water collection infrastructure. PRASA (a project led by Oxfam Quebec in Honduras with funds of the Canadian government) has facilitated research that has already sped up such projects (*ibid.*).
- Starting on 8 September, the UN Office for the Coordination of Humanitarian Affairs (OCHA), together with the Humanitarian Network (NGOs, civil society, UN systems and COPECO), has begun the preparation of a Strategic Response Plan to coordinate the drought response and to serve as the base for the CERF funds. The plan estimates that to help the 64 most affected municipalities (around 38 percent of the affected population), \$13.9m is necessary, out of which the CERF mechanism hopes to raise \$3.4m (*ibid.*).
- The COPECO has established food distribution programmes and a 'food for work' programme.¹⁸
- Technological packages have been distributed to increase yields at the next harvest.¹⁹
- Financial investments to reactivate the agrifood sector were made.²⁰
- The government announced the creation of a trust fund of \$71m in August 2014 to help the agricultural sector.

NICARAGUA

In Nicaragua, drought is a recurrent phenomenon that has intensified since the 1950s, and until the nineties, and that occurred in 1991, 1994, 1997, 2000 and 2001. In 1972, around 57.7 percent of corn, 42.2 percent of frijol and 56.1 percent of rice was lost. In 1997–98, harvests of sorghum, frijol, corn and rice were bad affected (23, 22, 13 and 9 percent respectively) were lost, for an amount of 20.8 million of dollars (OPSA 1997).

The departments most exposed to droughts in the North-Central region are: Nueva Segovia (Santa María, Ocotal, Dipilto, Macuelizo, Mosonte y San Fernando); Madriz (San Lucas, Somoto, Yalagüina, Palacagüina, Totogalpa y Telpaneca); Estelí (Condega, La Trinidad, Pueblo Nuevo y Estelí (Parte central); Jinotega (La Concordia) and Matagalpa (San Isidro, Sébaco, Ciudad Darío y Terrabona). The area affected by droughts becomes more extensive each time.

The 2014 drought is considered one of the worst in the last 30 years in Nicaragua. Of the country's 156 municipalities, 112 have reported losses and damage to crops. According to FEWSNET, the affected regions are in a situation of 'Stress' (2 CIF) between October and December 2014 (Oxfam 2014b).

The drought has particularly affected Nueva Segovia, Madriz and Estelí, resulting in corn harvest losses of around 75 (*ibid.*). However, the government has not yet declared a state of emergency, and there is no clear information about which areas and how many people are affected. However, it is known that the rural and poor populations are most vulnerable (*ibid.*; MAGFOR 2000). The agricultural land of the Pacific and North regions affected by the drought constitute the base of the national economy (Gutiérrez 1994).

The increased average temperatures would also impact the fishing sector (EU 2014; Oxfam 2014b).

The impacts of the drought also have to be added to the derives of the advances of the agricultural frontier, soil degradation and the loss of forested areas, which will in its turn affect the water cycle and microclimates.

Consequences of climate change

A 3–4°C rise in average temperatures is also expected by 2071–99, while precipitation is expected to decrease by 50–60 percent. The municipalities in the north region, already considered 'dry areas', would be the most affected and would become drier by 2100, which would worsen the shortage of water and quality of life for the population (Oxfam 2014a).

The most important change in rainfall patterns is expected in the already dry regions in the north of the country and in the municipalities of Chinandega and León. Those areas will annually receive 500mm less of rainfalls than usual, which will significantly impact agriculture and the livestock. Most of the Central Pacific and South regions could go from 1400–1800mm per year to 800–1000mm.

Policies

The government of Nicaragua signed the UNFCCC in June 1992, and ratified in October 1995. It is also part of the Kyoto Protocol, which it ratified in July 1999. With the help of the UN Development Programme, it appointed the National Organization for Clean Development

(ONDL) as the National Operative Entity, which legally depends on the Ministry of Environment and Natural Resources (MARENA). The ONDL is coordinated by the Directive Board which is involved in various state institutions. Its mission is to contribute to the mitigation of climate change using environmentally sustainable investment in carbon emission reduction. It also works on national inventories of greenhouse gas emissions and National Communications (*ibid.*; FOPREL-COSUDE 2013).

Nicaragua's civil war concluded in 1990, and the focus on post-war development has limited the opportunities to build a strong environmental policy, reduced attention upon climate change, and hampered the generation of knowledge required to adapt to the effects of climate change (Oxfam 2014a).

The National Commission on Climate Change was formed in 1999. This is a governmental body for the management and implementation of the CMUCC. The first National Communication was released in 2001, and was considered the first national inventory of greenhouse gases. The National Action Plan Against Climate Change was created in 2003. This detailed sectoral vulnerabilities and laid out a planning matrix for response (Centro Humboldt 2011).

The second National Communication was presented in 2008 by the MARENA. This concluded with a raft of practical proposals for the reduction of greenhouse gas emissions. It also dedicated a chapter to CCA programmes (*ibid.*).²¹ Then, in 2010, the National Environmental and Climate Change Strategy and the Action Plan 2010–15 was presented. This considered CCA and risk management (Gobierno de Nicaragua 2010). It included five sets of guidelines:

1. Environmental education for life;
2. Environmental defence and the protection of natural resources;
3. Conservation, recuperation and recollection of water;
4. Mitigation, adaptation and risk management in the face of climate change; and
5. Sustainable use of land.

Documents such as 'Adaptation to climate change of the water and sanitation sector' (Gobierno de Nicaragua 2012) and the 'Plan for the adaptation to the variability and climate change of the agricultural sector' contain the basic elements for launching the Action Plan (Ministry of Agriculture and Forests 2013).

The Plan was elaborated with the participation of the Ministry for Family, Communitarian, Cooperative and Associative Economy, INTA, INAFOR, MEM, SINAPRED, SESSAN, INPESCA, INETER and MARENA. The Plan proposes to encourage the adaptation of productive systems and livelihoods by fostering sustainability and competition, with the hope of strengthening productive capacity by 2020 (Oxfam 2014a).

Guideline 12 of the National Plan for Human Development 2012–2016 encourages 'the protection of Mother Earth, the adaptation to climate change and the integral management of disaster risk' (Ministry of Agriculture and Forests 2013).

Nicaragua participates in the framework of the UNFCCC to the Latin America and Caribbean Group and adhered to the Special Declaration on Climate Change in Otavalo in 2010 that encouraged the results of the first World People's Conference on Climate Change and the Rights of Mother Earth that was held in Bolivia. Those principles and those expressed by the Bolivian Alliance for the Rights of Mother Earth have been constitutionally upheld. The SICA is also working on a common agenda on climate change, even though it has publicly declared

that it did not support the opening of the carbon markets (Oxfam 2014a). Nicaragua was elected to the Committee for the Establishment of a Green Fund for Latin America (Centro Humboldt 2011).

Policies for the Caribbean coast

Strategies and actions for CCA in the autonomous regions of the Caribbean coast include:

- Protection and development of the basin of Lake Nicaragua or Lake Cocibolca as a principal water reservoir for human consumption in Nicaragua.
- The Program for Sustainable Use of Land in the departments of León, Chinandega and San Francisco Libre in Managua.
- The Crusade for National Reforestation to protect water sources and counteract the negative effects of deforestation. The campaign began in 2007 and to the date has planted 150,000ha of forest (70 percent of its five-year objective).
- National plans against forest and non-forest fires.
- The Zero Hunger and Zero Usury programmes influence poverty reduction and strengthen food security.
- Programmes for Decent Housing, with provision based on risk reduction priorities.
- The elaboration of educational materials, *The ABC of Climate Change*, the *Guide to Understanding Climate Change* and an environmental document about climate change for secondary education.
- National campaigns on sanitation, disease-vector eradication and disease control.

Examples of climate change-related projects

Interesting adaptation projects were developed in Matagalpa, Jinotega and Estelí, Nueva Segovia, the Estero Real and León. Other projects were developed in Apanas Asturias, and Adaptation Plans were adopted in 34 municipalities. The Cooperation UCA-MARENA works in the Gulf of Fonseca. The Humboldt Center mapped the risks, public policies and national actors, while the FUNDENIC focuses on water resources. The NGO Fauna & Flora International has implemented a CCA project in the Biosphere reserve on the island of Ometepe (FOPREL-COSUDE 2013).

Nicaragua has set up the National System for the Prevention, Mitigation and Attention to Disasters (SINAPRED), whose mission is to reduce the vulnerability of people exposed to disaster risks. The relevant laws passed by the legislative assembly include provisions for the mitigation and adaptation to climate change.

Financing programmes have been implemented by the Nordic Fund to strengthen technical capacities to respond to the effects of climate change. One such programme is the Environmental Programme for Risk and Disaster Management in the Face of Climate Change (PAGRICC), which includes training for municipal employees, the design of payment mechanisms for environment services, and risk management provisions, CCA projects and simulation studies for the Lake Apanas basin. A MARENA/PNUD programme for climate change vulnerability reduction in the transport sector in the Real river basin (MARENA and PNUD) will run until 2015 (FOPREL-COSUDE 2013). The Nicaraguan Red Cross, with funds from the European Union, also developed a project for reducing the vulnerability of communities in northern Nicaragua in the face of climate change (Milán and Martínez 2010).

Responses to the drought

- The government of Nicaragua and the WFP have distributed food to the population affected by the drought.²²
- In August and September 2014, the WFP through SINAPRED distributed food packs of 170g in 66 municipalities, reaching around 46,000 families (Oxfam 2014b). The distribution continued through October and November.
- Government recommendations were formulated to encourage the consumption of iguanas.²³
- Credits were approved to mitigate the impacts of the drought.²⁴
- Microfinance institutions declared that they dispensed \$55m to agricultural enterprises. In September 2014, the Nicaraguan Association of Microfinance Institutions signalled that they would focus on the worst affected areas.
- In the face of the food crisis, the government authorized tax-free imports of red frijol, rice and corn. In the case of red frijol, the import of 10,000 tons was authorized (in addition to the 20,000 tons authorized in June)²⁵.

GUATEMALA

More than 87.5 percent of the territory of the Republic of Guatemala is susceptible to droughts (MAGA 2011). The longest periods of drought have occurred in the Dry Corridor, located in the east of the country. The drought of July 2012 caused agricultural damage in 919 communities, across 18 of the country's 22 departments (MAGA, 2012), and severe damage was reported in 178 communities. The most affected sectors were corn and frijol production.

In 2013, 53,297 families living in 66 municipalities across 10 departments suffered significant losses in their frijol and corn harvests, causing more than 83m quetzals (around \$11m) in damage, and major increases in food prices (Polanco 2013).

The national weather service labelled the 2014 drought as the most severe in the last 40 years, with the shortfall in rain during the first harvest affecting 16 of the 22 departments. The Food and Nutritional Security Secretariat (SESAN) estimated losses in corn and beans production of around 80 and 70 percent, respectively. The SESAN estimated that 1,375,518 people (around 291,000 families) were highly susceptible to food insecurity and in need of help. Half a million boys and girls are at risk of food and nutritional insecurity (Oxfam 2014b).

Consequences of climate change

Guatemala has suffered the impact of the climatic variability, with periods of drought affecting the entire country, but mostly notably the Dry Corridor. Additionally, significant damage has been caused by Hurricane Stan (2005), Tropical Storm Agatha (2010), and tropical Depression 12-E (2011), (Oxfam 2014a; Polanco 2013).

Projections suggest that, in the most positive scenario, temperatures would increase by 2.5°C, and rainfall by 9 percent. A normal scenario predicts an increase of temperatures by more than 2.6°C, and a 2 percent reduction in rainfall. Under a pessimistic scenario, temperatures would rise by 3.3°C, and rainfalls would drop 28 percent.

Policies

The government signed the UNFCCC in 1992, and ratified it in December 1995; it signed the Kyoto Protocol in July 1998, and ratified it in October 1999. The Office for Climate Change within the Ministry of the Environment and Natural Resources (MARN) has prepared an inventory of greenhouse gas emissions and two National Communications (FOPREL-COSUDE, 2013; Hengstenberg, 2008).

The Unit for Climate Change within MARN was created through Ministerial Agreement 5-2011, with the objective of coordinating the working tables on climate change organized by civil society.

Legislative Decree 6-2013 permitted the approbation of the Framework Law to Reduce the Vulnerability, Mandatory Adaptation to Climate Change and Mitigation of Greenhouse Gas. This law establishes regulations to prevent, plan and respond in a fast, organized and sustained way to the impact of climate change. Notably, it allows the participation of civil society, NGOs, indigenous communities, farmers' authorities, private initiatives and academics in the National Council on Climate Change (FOPREL-COSUDE, 2013).

Other relevant programmes include:

- The national policy on climate change;
- The national policy on water;
- The action plan against desertification and droughts;
- The agenda for climate change of the National Council of protected areas;
- Governmental Agreements that created an inter-institutional commission on climate change;
- The ratification of conventions on climate change, biological diversity, the fight against desertification and drought, as well as the Stockholm agreement and the Montreal agreement;
- The national policy on risk management and disaster reduction;
- The national strategy on climate change,²⁶
- The Guatemalan System for Protected Areas (SIGAP);
- The Programme for the Strengthening of Environmental Governance risk in Guatemala;
- The creation of the National Office for Clean Development;
- The unite of fight against desertification and drought; and
- The multi-sectoral plan for environment and water.

The Strategic Plan for Food Security 2012–2016, which later became Plan Zero Hunger, and the Strategic Plan of the MAGA brought climate change into the political mainstream. The sectoral policies on social, health and population issues also started to incorporate elements of CCA. Importantly, the policy on disaster risk included:

- Territory planning that focuses on risk prevention;
- The development of better agricultural practices through the construction of terraces in areas vulnerable to landslides and/or near settlements, and through reforestation, especially of slopes and headwaters (Government of Guatemala, 2011).

Policies implemented in the municipalities of the Dry Corridor are very diverse, ranging from

agriculture—more than 10 projects are based on food security—through to normative elements at various governmental decision levels (Joint Program 2011).

The Climate, Nature and Communities in Guatemala (CNCG) project is important within the mitigation sphere. Around \$25m is to be invested for the 2013–2018 period in this initiative of the US Agency of International Development (USAID), working with the Rainforest Alliance, the Foundation Defensores de la Naturaleza, the University del Valle of Guatemala, the Guatemala Association of Exporters, the Nature Conservancy and the World Wildlife Fund. A national strategy for the reduction of deforestation is also in the planning stages.

Responses to the drought

The government has announced that it would give nutritional assistance to 250,000 families affected by the drought over a five-month period. The monthly ration includes corn for 15 days and frijol for 30 days. However, the available budget of \$15m can only cover 17 percent of needs (Oxfam 2014b). The WFP received \$3m from USAID and a further \$900,000 from the Canadian government. These funds will be distributed by the Guatemalan government (MAGA/SESAN) (*ibid.*).

NGOs operating in the country do not have drought-response programs, mostly because no financial decision has been taken by donors to respond to the crisis. World Vision and Save the Children Guatemala have provided food assistance to about 500 and 425 families, respectively. However, these responses ended in October (*ibid.*).

4 STATUS OF CLIMATE CHANGE POLICIES

INSTITUTIONAL ADAPTATION

The establishment of relations with the UNFCCC and the creation of CCA policies has been rapidly achieved. However, there is weakness in the integration and articulation of climate policies with other sectorial policies (i.e. mainstreaming) and with macroeconomic policies. Indeed, some sectorial policies are opposed to the needs for adaptation in agriculture, where there is a marked focus on production and enterprise needs instead of sustainability. In short, while governments have developed planning instruments, substantial implementation has, thus far, been lacking.

Policy instruments

Country members of the SICA adhere to the Regional Strategy on Climate Change and commit to take action for CCA. In the Strategy, six programmatic areas can be found:

1. Vulnerability and adaptation to climatic variability and risk management;
2. Mitigation;
3. Capacity building;
4. Education, awareness, communication and public participation;
5. Technology transfers; and
6. Negotiations and international management.

However, the Strategy has not had enough impact on vulnerable sectors. Significant investment directed to the poorest areas affected by climatic events are required to facilitate access to land, credit and technical assistance (Polanco 2013). There is a contradiction between the expressed political will and the lack of measures and financing for adaptation.

Climate change still occupies a marginal place in political agendas, with few exceptions. The topic gains importance when extreme events result in large-scale disasters, before important international conferences, or when climate change is used to justify deficiencies or irresponsibility of policy decisions.

There is a general recognition of the key importance of civic participation, the role played by women and the incorporation of a gendered approach in the design of policies. However, more information is required on the characteristics, relevance, objectives and mechanisms of participation, as well as the conditions used to assess the legitimacy and representativeness of social participation in the design of climate change policies.

The actions taken in the face of droughts are fundamentally reactive and limited to the distribution of food. These are responsive measures in the absence of an integrated risk management strategy that would take in consideration the accumulated impacts of repeated events.

There is still no concrete application of climate information in the design of policies across the

board. There is confusion between doing well what correspond to each sectors and redesigning the sectorial policies taking in consideration the new necessities created by climate change.

Figure 4. Comparative synthesis of the main indicators and barriers

| | Guatemala | Honduras | El Salvador | Nicaragua |
|---|------------------|-----------------|--------------------|------------------|
| <i>Information on climate change and adaptation</i> | * | ++ | ++ | * |
| <i>Index of climate risk</i> | ++ | +++ | + | ++ |
| <i>Hierarchy of themes and political prioritisation of environmental management</i> | + | ++ | +++ | + |
| <i>Institutional adequacy</i> | * | * | * | * |
| <i>Specificity of climate change policies</i> | + | | ++ | + |
| <i>Legal or normative achievements</i> | * | * | * | * |
| <i>Decentralization</i> | * | | | * |
| <i>Access to adaptation finance</i> | | | * | * |
| <i>Inclusivity, e.g. considering women and vulnerable groups in agricultural and environmental policies</i> | | | * | |
| <i>Social participation, e.g. incorporating civil society in policy design</i> | | | * | * |
| <i>Implementation disadvantageous of the REDD for AFC</i> | | | | |
| <i>Environmental sustainability of the design and development of the agricultural sector</i> | + | + | ++ | + |
| <i>People displaced by extreme climate events and high-vulnerability conditions</i> | | | * | * |
| <i>Risks of limiting or closing of NGOs' activities</i> | | | | * |

* detected

+ limited ++ medium +++ high

5 CONCLUSIONS AND RECOMMENDATIONS

- The vulnerability of Central American countries to climate change and variability has been recognized globally.
- Climate change will result in an increase in the severity and frequency of droughts across the region.
- The governments of the most affected countries are demanding that climate change be addressed urgently, as well as requesting financial resources to counteract the threats they face.
- The risk of climate change in Guatemala, El Salvador, Honduras and Nicaragua surpasses national capabilities to respond, and the economic possibilities, even with international help, to mitigate the effects of drought.
- Central America contributes very little to climate change, but will soon endure the worst consequences.
- The provision of international cooperation funds and help from developed countries is a matter of environmental and climatic justice.
- National and international strategies to support these countries must not focus on solving emergencies by distributing food in disaster situations. It is urgent to channel resources to develop integrated risk management strategies that incorporate long-term preventive visions that consider the accumulative effects of repeated events.
- In Central America, many communities face problems with limited access to, and poor quality of, water, in addition to suffering the effects of drought.
- The continued expansion of agricultural land in the region threatens environmental degradation, the loss of biodiversity and hydrological resources, and will increase populations' vulnerability to climate change.
- The promises of developed countries for the Green Climate Fund must reach \$15bn by the UNFCCC's 20th Conference of Parties in Peru in December 2014, so that it can be equally divided for adaptation and mitigation efforts. Both are essential to accomplish the international goal of limiting global warming to 2°C, which is the threshold for adaptation.

It is necessary:

- For decision makers, both national and regional, to be willing to modify their actions in response to predictions of climate change.
- To prioritize climate change in the international agenda, and to take in consideration a gender perspective.
- Resilience-building work must address inequality, power, and rights (Oxfam, 2013).
- To treat or decree the Dry Corridor as a zone for strategic planning that needs to be treated integrally so that dedicated resources and efforts are optimized and risk management for droughts is improved.
- To investigate and make use of ancestral practices and knowledge of indigenous populations for the adaptation to climate change (Centroamérica vulnerable, unida por la vida 2014).

- To identify the characteristics of drought and its impact on the production of basic grains (corn and beans) and on food security.
- To strengthen regional capabilities for the measurement and interpretation of drought, including the Center of Integration of Meteorological and Hydrological activities in Central America (Global Water Partnership 2013).
- For all countries to promptly declare a state of national emergency, in order to fast track changes to budgets, international loans, and agricultural policies.
- To guide state policies to prevent deforestation, due to its impact on the severity of drought.
- To give greater importance to the consequences of drought on public policy, microeconomic stability and the price of food.
- To guide actions to face migrations and internal displacements registered in some countries as a direct consequence of drought; particularly for the most vulnerable population that lives in conditions of rural poverty.
- To strengthen institutions, so that drought and its impacts are considered from a risk management and disaster reduction perspective.
- To approach drought with the perspective of sustainable development, given its implications across all dimensions of development.

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