

2014

Adaptation and Accumulation

Challenges, contradictions and
Implications for territorial
governance in the Central American
Dry Corridor

Author:

Andrew Davis
Oscar Díaz

PRISMA

ISBN: 978-99961-903-9-1

Translation from Spanish into English: Susan C. Greenblatt



This publication is released under the Creative Commons license Attribution-NonCommercial-ShareAlike. For more information: http://creativecommons.org/licenses/by-nc-sa/3.0/deed.es_CL

prisma@prisma.org.sv www.prisma.org.sv
Pasaje Sagrado Corazón, No. 821, Col. Escalón, San Salvador
Tels.: (503) 2264 5042; Fax: (503) 2263 0671

Adaptation and Accumulation:

**Challenges, contradictions and implications
for territorial governance in the
Central American Dry Corridor**

Andrew Davis and Oscar Díaz

Table of Contents

Acronyms	1
Introduction	2
Economic Strategies in the Central American Dry Corridor	5
Logistics Platform	5
Mining	7
Hidropower	11
Agroindustry	12
Turism	16
Discussion: Trends and Implications for Local Governance and Adaptation in the Central American Dry Corridor	19
Vulnerability or Resilience: What type of transformation for the CADC?	19
Territorial Governance for Adaptation	21
ANNEX I. Map Sugarcane Potential in Nicaragua	23
References	24

Acronyms

AbM:	Adaptation-based Mitigation (AbM)
ACH	Action against Hunger
AMI	The Mesoamerican Information Highway
BID	The Inter-American Development Bank
CA-4	Guatemala, El Salvador, Honduras y Nicaragua
CCAD	The Central American Commission on Environment and Development
CIG	Inter-oceanic canal Guatemala
CLN	Northern Highway
CMNUCC	United Framework Convention on Climate Change
CPLI	Consentimiento Previo, Libre e Informado
CADC	Central American Dry Corridor (CADC)
ECADERT	Central American Strategy for Rural Area-based Development
ECLAC	Economic Commission for Latin America
ECODES	Ecology and Development Foundation
FAO	Food and Agriculture Organization of the United Nations
HIID	Harvard Institute for International Development
INCAE	Central American Institute of Business Administration
INETER	Nicaraguan Institute of Territorial Studies
MARN	Ministry of Environment and Natural Resources
MAGFOR	Ministry of Agriculture and Forestry
MFEWS:	Mesoamerican Food Security Early Warning System
OCAD	Austrian Development Cooperation
PIFCARD:	Plan for Investment and Financing for Central America, Panama, and the Dominican Republic
PNUD	United Nations Development Programme
PREP	Program for Ecosystem and Landscape Restoration
PRISMA	Programa Salvadoreño de Investigación sobre Desarrollo y Medio Ambiente
RAAN	The Northern Atlantic Autonomous Region
RAAS	The Southern Atlantic Autonomous Region
RICAM	the Central American Highway Network
SICA	Central American Integration System
SIEPAC	Central American Electric Interconnection System
TIM	International Transit of Goods
UNCTAD:	Conferencia de las Naciones Unidas sobre Comercio y Desarrollo

Introduction

Climate change poses a new set of major challenges for development in Central America. Far from being a future scenario, Central American territories are already experiencing conditions of severe vulnerability, because the impacts of climate change intensify and exacerbate Central America’s existing exclusion and degradation. The many hazards and impacts include temperature changes, new temporal and spatial rainfall patterns, drought, and extreme events, leading to increasingly higher costs for the region’s governments. According to Germanwatch, the CA-4 countries (Guatemala, El Salvador, Honduras, and Nicaragua) rank among the countries with the highest levels of risk in the Global Climate Risk Index¹ (See Table 1).

These phenomena are having a widespread impact on Central American society. Such is the case of El Salvador, which in a very short time (24 months) was hit with three extreme events: Tropical Depression E96/Hurricane Ida, Tropical Storm Agatha, and Tropical Depression 12E. In their wake, these storms destroyed crops, infrastructure, and homes, at a cost of over \$1.3 billion, or 6% of the Gross Domestic Product for 2011 (MARN, 2013).² Events like these are ap-

Table 1. Ranking of Countries Most Affected by Climate Change

Country	2005	2006	2007	2008	2009	2010	2011
El Salvador	34	123	112	91	1	36	4
Guatemala	1	102	52	34	53	2	9
Honduras	7	44	33	20	65	5	11
Nicaragua	21	120	3	24	57	35	14

pearing with increasingly greater intensity and duration in the region, resulting in costs that affect a wide range of sectors and spheres of society.

The numerous hazards and impacts of climate change converge particularly dramatically in the Central American Dry Corridor (CADC), a region that in general corresponds to the areas of Central America’s dry forests.³ Most of Central America’s population lives in this region, home to many of its cities, and also to most of its rural communities. These rural territories are heavily involved in family farming and basic grain production,⁴ contributing considerably to food security both for subsistence and to supply domestic and regional markets. Most small farms are located on hillsides and slopes in the CADC, leaving the valleys in addition to the Pacific coastal plains (a swath 20-30 km wide) to the control of large and medium-sized agroindustrial production units, where mecha-

must develop much more thorough methods for these estimates.

¹ The Global Climate Risk Index is a ranking of countries, showing who suffers the most from extreme weather events. It is based on the number of fatalities per 100,000 population and economic losses in relation to GDP caused by extreme weather events (<http://www.germanwatch.org>).

² Although methods exist, such as one ECLAC has developed, to estimate the economic costs of extreme events, the recently adopted Warsaw International Mechanism for Loss and Damage, under the United Nations Framework Convention on Climate Change,

³ We recognize that there are different geographical definitions of the dry corridor. This study is based on the understanding that regions and vulnerability are socially constructed and therefore we have adopted the broader ACH and FAO (2012) definition as a general frame of reference.

⁴ Family farms in Central America produce over 70% of the region’s food; 80-90% of corn and bean farmers produce 75-80% of these crops (PRISMA, 2013).

nized and intensified monocropping is the norm (ACH and FAO, 2012).

The vulnerability of these communities is being exacerbated by the degraded conditions of natural resources and ecosystem services in the CADC, which have sharply deteriorated due to the expansion of urban areas and to certain farming practices commonly used in the last fifty to sixty years. These included the expansion of monocropping, which required large amounts of water, pesticides, and fertilizers, and depended on vulnerable and low-wage labor. At the same time, efforts to increase short-term productivity promoted the mass adoption of modified seeds, chemical inputs, fertilizer, and land and water management systems with little consideration of the suitability and location of the land. Smallholders were driven onto slopes and hillsides, to farm on ever smaller and more degraded fields. Forced into the agricultural frontier, toward upper watershed forests, this led to a vicious cycle of deforestation, soil degradation, decreased water retention, increased risk of flooding and landslides, smaller harvests, worsening food insecurity, migration, and a loss of social cohesion in these areas and more pronounced vulnerability. All these processes have resulted in highly degraded landscapes, marked by serious asymmetries in access to resources, and extreme vulnerability to climate change.

It is in this socio-environmental context in the CADC, climate change heightens the region's vulnerability, which is expressed in a number of ways. First, temperature changes and drought are threatening the livelihoods of the area's small farmers, decreasing basic grain production for both subsistence and for domestic and regional trade and undermining the region's food security.⁵ These same climate

⁵ It is predicted that climate change could reduce corn yields by 30% or more in some of the region's countries, and that bean yields will also be affected (due to

events raise important implications for hydro-power generation due to the decrease in water capture by the region's watersheds.

Furthermore, extreme events have become particularly intense. Storms now come from both coasts in the region, in contrast to years past when they would only approach from the Caribbean side, and they have been increasing in frequency and duration. The severe degradation of the CADC, with its rugged landscape and steep slopes, has left the land prone to flooding and landslides, and their attendant high human, social, and economic costs. All sectors of society feel these costs, which include damage to physical infrastructure, soil loss and erosion, and sedimentation and siltation of dams, rivers, drainage and irrigation systems, natural channels, and ultimately, maritime harbors along the coast. Thus, climate change is not just a threat limited only to certain areas, but rather cuts across territories and affects a wide range of sectors, including agriculture, energy, infrastructure, health, and environment, and involves policy addressing food security and rural, productive, and territorial development.

This reality raises the need for urgent and decisive responses aimed at overhauling agricultural and production practices in Central America, particularly in the Central American Dry Corridor, where natural resources and ecosystem services crucial to adaptation must be restored. This involves a farm-level approach, whose vision exposes the vulnerability relationships that exist at broader landscape and territorial scales. Several promising efforts in Central America are responding to these challenges, including the Central American Strategy for Rural Territorial Development (ECADERT) and Adaptation-based Mitigation (AbM) (see Box 1 and Box 2).

increased nighttime temperatures), leading to greater food insecurity (Schmidt et al., 2012).

Box 1
Central American Strategy for Rural Territorial Development (ECADERT)

ECADERT (Estrategia Centroamericana de Desarrollo Rural Territorial) is a regional policy that was adopted by the heads of state in June 2010 as part of the Central American Integration System (SICA). This strategy seeks to build creative and innovative capacity in rural communities, public institutions, and civil society across the region, to set up inclusive mechanisms for access to development that lead to social and territorial cohesion.

The strategy highlights the importance of its territorial approach to rural development, aspiring to move beyond a farm-based approach, and foster changes at landscape levels in Central American territories, encompassing environmental, economic and productive, social, institutional, and cultural dimensions. It aims at guiding the development and implementation of rural territorial development policies as well as intersectoral coordination, the territorialization of interventions by public institutions, and dialogue with local-level stakeholders.

The implementation of this regional policy, because of its local-level approach and focus on institutional coordination for territorial development, presents a strategic opportunity to redirect, coordinate, and link efforts aimed at landscape restoration, adaption, risk management, food security and territorial development in Central America. A particularly strategic opportunity exists to achieve specific interventions aimed at particular contexts in the CADC, which continues to be an important topic for dialogue in this regionwide effort.

Source: Based on CAC (2010).

Box 2
Adaptation-based Mitigation (AbM)

The AbM approach aims to respond to the challenges of integrating mitigation, adaptation, and development agendas and responses, moving beyond the sector-based approaches common in Central America. To do so, the AbM approach requires greater interagency coordination, both among governmental bodies and with territorial actors. Similarly, AbM initiatives seek to strengthen local livelihoods, using a landscape-scale approach based on collective action, recognizing their critical role in ensuring locally, regionally, and globally important ecosystem services. Following this line of thinking, it is the adaptation needs at local-territorial and national levels that determine the orientation of mitigation strategies. Whether AbM can gain a strong foothold as a viable regional approach in the current context will depend greatly on the development of incentive and compensation schemes, the implementation of innovation and knowledge management processes, and the design of monitoring and evaluation mechanisms.

The AbM approach has guided the design and implementation of public policies in El Salvador, led by the national Program for Ecosystem and Landscape Restoration (PREP is its acronym in Spanish). This approach, in a country experiencing the vulnerabilities emblematic of the CADC, provides important lessons and learning opportunities for the CADC as well as for Central America as a whole.

Source: Based on PRISMA (2013a).

These and other efforts seeking to halt and reverse vulnerability in the CADC will be compelled to respond not only to the current territorial configurations, but also to the wide variety of large-scale economic projects and proposals that are in the offing for rural areas. Far from being simple, inert recipients of climate change, these areas are engaged in dynamic changing contexts, where disputes

and conflicts arise over the use and management of natural resources and ecosystem services. The outcome of these dynamics could have a significant effect on the future of these areas, the extent of their vulnerability, and their capacity to adapt. Therefore, it is vitally important to assess the status and scope of these dynamics.

Economic Strategies in the Central American Dry Corridor

Present-day economic strategies in Central America arise from much more diverse policy frameworks that are promoting a wide range of new investments, in contrast to earlier stages that revolved around agro-exports. Many of these investments are based in rural areas, such as tourism, energy, infrastructure megaprojects associated with logistics services, agro-fuels, the agricultural maquila, and “non-traditional” export crops (cantaloupe, watermelon, other fruits, etc.), and extractive industries (both minerals and hydrocarbons) (Rosa, 2008; Cuéllar et al., 2011; Cuéllar et al., 2012). This paper presents a preliminary reading of the main economic strategies that are driving the new territorial dynamics in the CADC, with a view to contextualizing the different efforts and initiatives in the CADC in their economic-territorial context in the region.⁶

Logistics Platform

Construction of the logistics platform in Central America is a critically important strategic activity for Central America’s economic ventures, linking new poles of accumulation with transnational trade flows, and bringing Central

America’s territories within the reach of regional and global markets. The commitment to the logistics platform originated in the late 1990s when agencies such as Central America’s INCAE Business School and the Harvard Institute for International Development (HIID) developed a set of proposals on competitiveness and sustainable development in Central America. These involved a number of regional investments and policies to turn the region into a logistics corridor, leveraging its geographical location, the rise in trade, and business sector interest in positioning itself in the emerging logistics services sector (Kandel et al., 2009; Morales et al., 2011). This strategy to become a logistics platform is not limited merely to transportation infrastructure, and is defined as a set of systems, services, and infrastructure designed to facilitate the movement of goods from one place to another and their storage (INCAE, 1999).

This agenda has been adopted as an integral part of the Mesoamerica Project, which has provided a framework for several programs that are very important to the logistics platform in Central America. These include the Plan for Investment and Financing for Central America, Panama, and the Dominican Republic (PIFCARD); the Pacific Corridor; the Central American Electric Interconnection System (SEIPAC); the Central American Highway Network (RICAM); the Mesoamerican Information Highway (AMI); and the International Transit of Goods (TIM) procedure.

Broadly speaking, we see two types of dynamics being generated by this economic and policy

⁶ This study involved a review of secondary sources and qualitative analysis to identify the sectors discussed in this paper (mining, hydropower, agroindustry, tourism, and brief mentions of extensive cattle ranching and conservation). Certain economic activities that have considerable weight in the CADC but do not show the potential to drive *new* processes of territorial change on a large scale, such as coffee and subsistence livestock ranching, are not included. A complementary study analyzes the sociopolitical contexts in the CADC, examining the institutions that mediate, negotiate, and respond to these economic strategies (Elias, forthcoming).

agenda. First, there are a number of physical infrastructure projects and proposed project that are dramatically reconfiguring specific territories, and that have been associated with displacement, dispossession, and the concentration of land, of which there are several examples in Central America (Cuellar et al., 2012; Cuellar et al., 2011). In the CADC we find this, for example, in the northern El Salvador, in the wake of the construction of the Northern Transnational Highway, which has sparked new land speculation with major implications for rights to access and use of natural resources and ecosystem services, and that has been part of new types of social differentiation in the region (families with and without migrants, and with and without access to housing, basic services, and key resources, etc.)⁷ (Cuellar et al, 2011; Kandel et al, 2011).

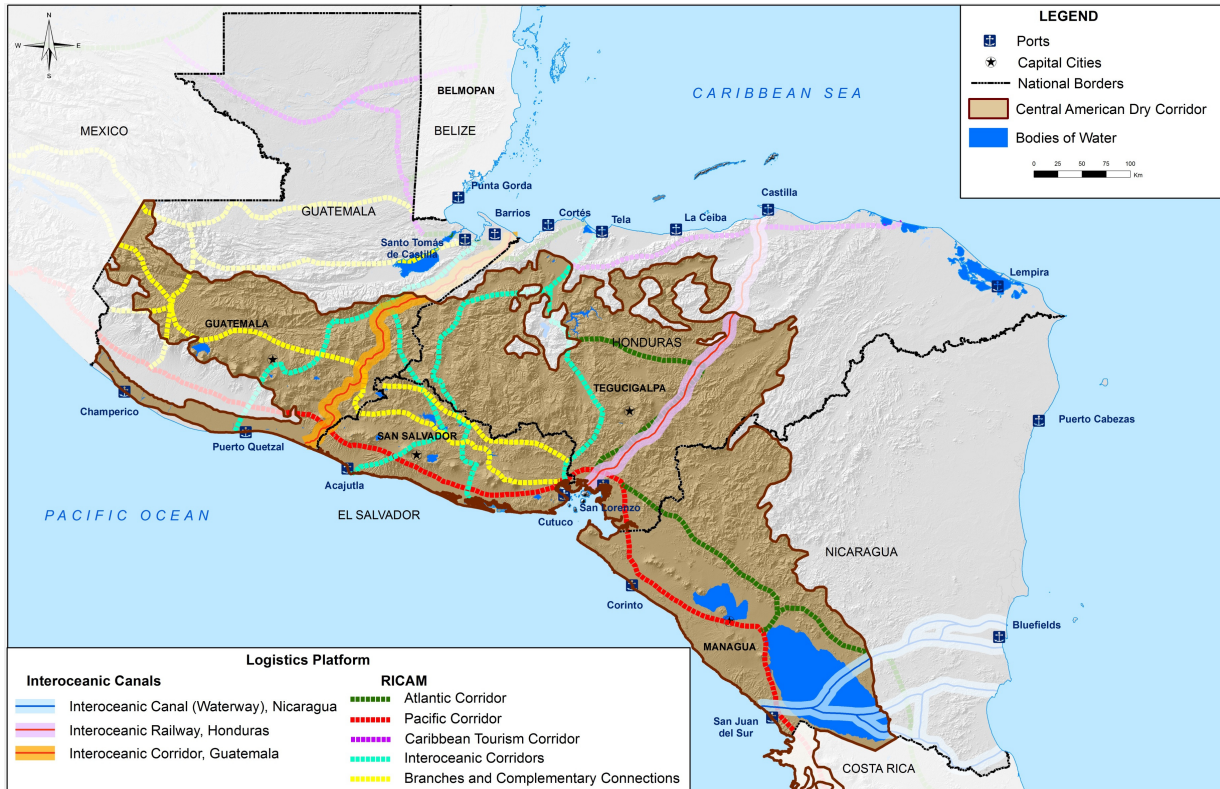
The possibility of other new highways in the CADC with similar implications is reflected in the still undeveloped infrastructure proposed in the Mesoamerica Project. This is accompanied by the recent wave of interoceanic canal proposals, and while there are major doubts about their feasibility, sometimes just the fact that a proposal exists can unleash land speculation. This has been reported in conjunction with at least one of the proposals, in Guatemala (El Periódico, 2013), which is for an interoceanic canal, a \$10-12 million infrastructure project through Jutiapa, Jalapa, Chiquimula, Zacapa, and Izabal. Several remaining challenges have put its feasibility into question; however, meanwhile, the project has been fiercely protested by social and environmental sectors because of its possible socio-environmental effects (Consejo Latinoamericano de Iglesias, 2013; CEG, 2013). In Nicaragua, the Grand Interoceanic Canal has been proposed, with a route

crossing the CADC in the provinces of Rivas, Chontales, and Río San Juan. The proposed construction of this canal, at an estimated cost of \$40 billion, has produced great concern about the impact of these projects on the biodiversity, water, and land and territories of peasant and indigenous communities, provoking major opposition to the project (Baracaldo, 2013; Mesa Nacional de Gestión del Riesgo, 2013; Silva, 2013). In Honduras, construction of an interoceanic railway, at a cost of \$20 billion, includes two new deepwater ports. A second phase would build a four-lane highway. The canal would cross the CADC in the provinces of Choluteca, El Paraíso, Francisco Morazán, and Olancho.

In addition to these very visible dynamics concentrated in specific regions, there is a second type of dynamic characterized by a more subtle, but also widespread process, which involves the continued reduction in transportation costs and time from rural areas throughout the region. This is occurring not only because of physical infrastructure (new secondary roads, expansion or improvement of existing roads and ports, etc.) but also because of institutional reforms to reduce waiting times at customs, modernization of institutions, and improved public and private logistics efficiency, etc. This second trend has the potential to stimulate new poles of accumulation in different territories throughout the region, particularly where transportation costs are a critical factor of production, such as agroindustry and tourism.

⁷ Another notable example includes the processes of exclusion and degradation associated with the construction of the Highway of the Northern Strip of Guatemala (Cuellar et al. 2011).

Map 1. Logistics Platform in Central America



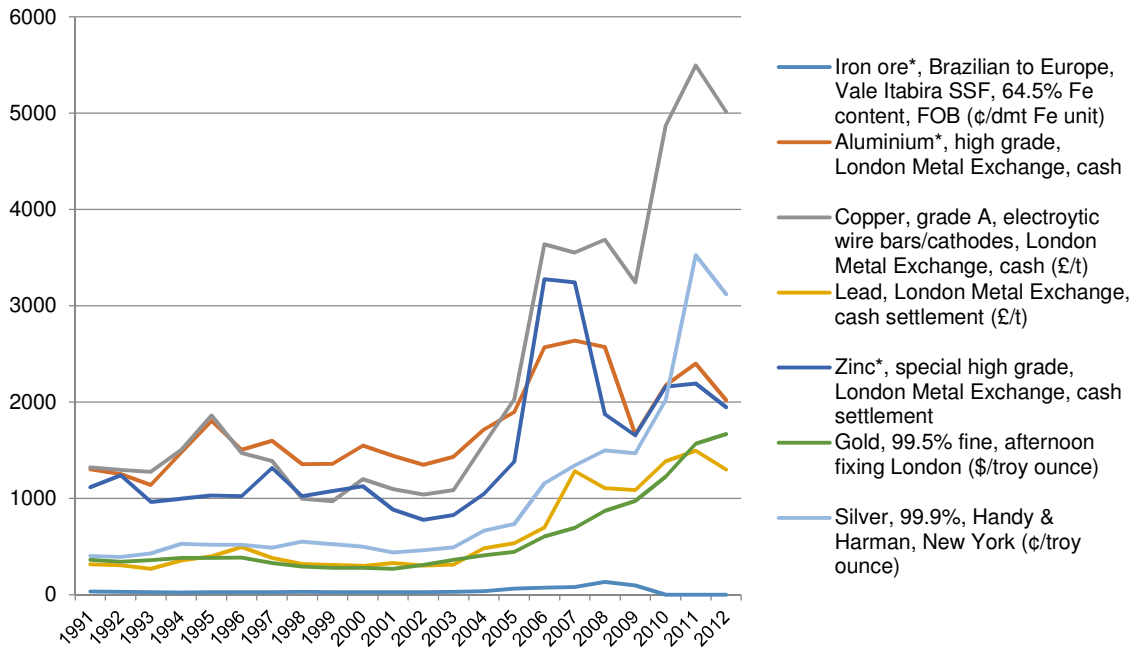
Source: Prepared by authors, based on Proyecto Mesoamérica (2013), Corredor interoceánico de Guatemala (CIG), INETER (2012), Prensa Honduras (2013).

Mining

Central America is rich in metallic minerals, located primarily in the region’s volcanic mesas and northern mountains, which overlap significantly with the CADC. Deposits include gold, silver, lead, copper, and others (Hall and Pérez Brignoli, 2003). Although tapping these resources is not new in Central America, in the past 20 years, the region has developed a new capacity for extraction of these resources on a

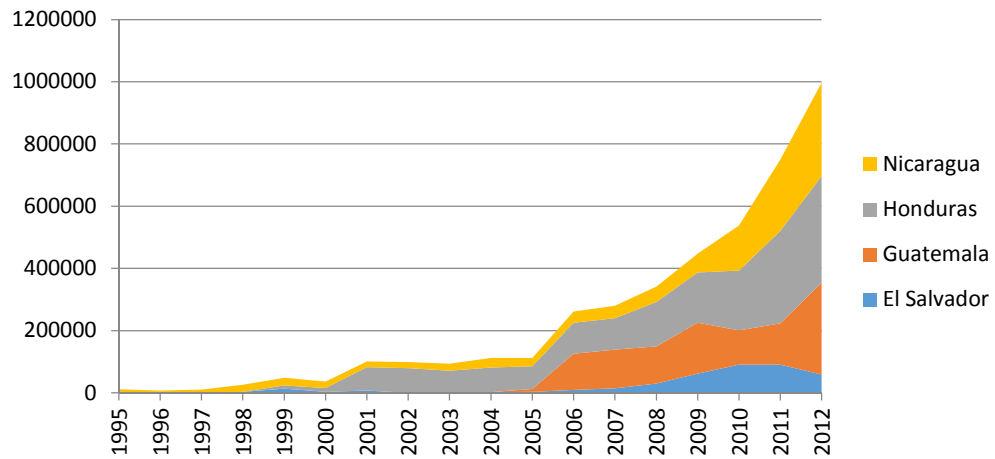
scale that has never been seen before. During the decades of reforms, in the 1980s and in particular in the 1990s, new legal and institutional frameworks were developed to scale up production of these minerals. This new institutional capacity has been combined with advances in infrastructure, permitting expansion of this sector driven by the steady increase in international metal ore prices (see Figure 1), which has led to a true mining boom. Gold mining has experienced particularly dynamic growth in recent years, as shown in Figure 2.

Figure 1. International Metal Ore Prices 1990 – 2012



Source: Based on UNCTAD database⁸

Figure 2. Gold Exports in Central America 1995 – 2012 (in thousands of dollars per year)



Source: UNCTAD Stat

⁸ For clarity, tin and nickel have not been included, although their prices have been increasing as much or more than gold

The social and environmental impact of mining depends on the type, scale, and location where it is performed, along with whether or not mitigation plans and impact monitoring are carried out. Regardless of these factors, mining for ore is usually associated with a number of impacts that can be highly detrimental to natural resources and ecosystem services. Impacts include deforestation, soil erosion and sedimentation, a drop in water quality and quantity, increasing emergence of new diseases, air pollution, loss of natural areas for recreation, decline in crops and forest products, reduction in biodiversity, introduction of exotic species, loss of cultural values and landscapes, acid drainage, and concentration of lands and lack of access to land (OXFAM, n.d.). Some types of mining are particularly harmful, such as open pit gold mining, which has made up a considerable portion of mining operations in the region. The presence of these production activities in degraded, vulnerable areas with scarce water resources where slopes and hillsides discharge into downstream land and communities poses an enormous threat to the adaptation of CADC territories (see Map 2).

Because of these impacts, social groups and individuals across the region have mobilized against metal mining. The production boom of the last few years has collided with growing social and environmental protests, leading to a number of starts and stops in the expansion of mining. In Honduras, despite sharp disputes over mining in recent years—leading to the old legal framework for mining being declared unconstitutional in 2006 and President Zelaya declaring a moratorium—a new mining law was passed in 2013, which laid the legal and institutional foundation for a renewed expansion of mineral concessions that does not substantially modify the previous mining system with regard to its social and environmental

impacts.⁹ This context has spurred a renewal of extractive activities in the country: in January 2014, 110 applications for new extraction projects in Honduras were reported, raising the possibility of a much larger impact than that existing in the concessions already granted than could be reflected on the map.

In Guatemala, mining has been growing steadily for over a decade; the industry grew from a value of 69 million quetzales in 2004, to 1.931 billion in 2009, to its peak of 7.11 billion in 2011 (Dirección General de Minería, 2012). The arrival of President Otto Pérez Molina in 2011 issued in a new era of prioritizing ore production in the country, marking a critical juncture with frequent conflicts over land and natural resources in the country, and triggering a political crisis in 2013. That year, an apparently contradictory situation occurred: while promoting mining in international forums as an important activity for direct foreign investment, the government simultaneously announced a moratorium on the advance or expansion of metal mining.

In El Salvador, a series of clashes between social actors and the mining industry and the arrival of the administration of President Funes led to a de facto moratorium in the country, although it could be reversed if a new political party takes power following elections in 2014.

In Nicaragua, recent years have seen an increase in both production (La Prensa de Nicaragua, 2010) and in mining concessions by surface area, from 5.89% in 2009 to 10.27% in 2012 (Centro Humboldt, 2012). The country's interest in further expanding production is reflected in promotion of the sector in various national and international forums, where the government

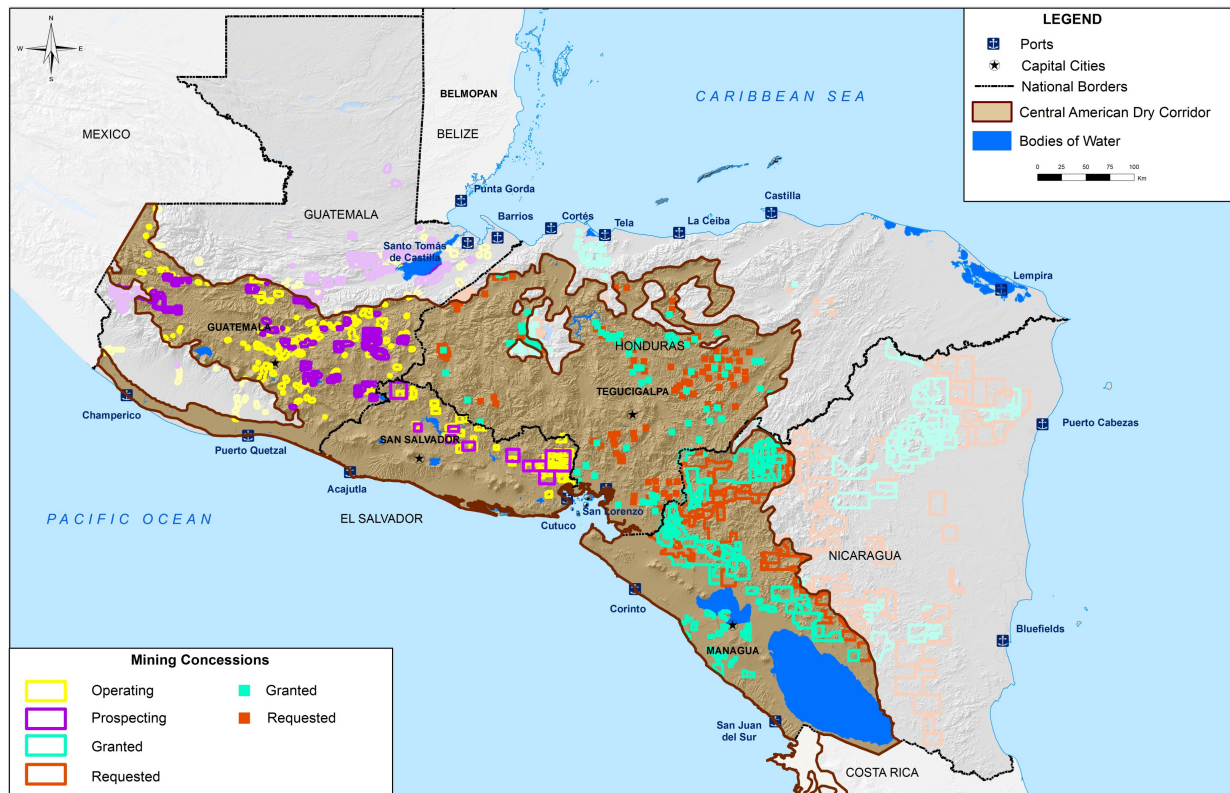
⁹ According to La Prensa (2013), the changes include a reduction in the time needed for granting contracts, while taxes went up slightly and several new taxes were levied.

has announced its intention to “open a modern era of mining” in the country (Central America Data, 2012).

Despite the dramatic uptick in production, metal mining still makes up only a small part of the nations’ economies. However, these investments do have an important role in generating foreign exchange. For example, in Hon-

duras, mining is among the commodities that generate the most revenue, after coffee and tilapia (La Prensa, 2013). In Nicaragua, gold has become the main commodity sold abroad, generating income of US\$341.4 million in 2012 (El Nuevo Diario, 2013). This situation augers continued disputes and territorial reconfigurations revolving around mining, with a considerable impact on the CADC, as shown in Map 2.

Map 2: Mining proposals and operations in Central America¹⁰



Source: Prepared by authors, based on Ministerio de Economía de El Salvador (2003); Ministerio de Energía y Minas de Nicaragua (2013); CEICOM (2010); Ministerio de Energía y Minas de Guatemala (2013)

¹⁰ Current geographic information was not available for new mining proposals in Honduras. The proposed mining sites (en trámite) in this map are from 2009 (Nolasco y Ramos, 2010, citing ASONOG, 2009). In addition, the data from El Salvador is from 2003, it is included for indicative purposes.

Hydropower

Central America's topography and climate make it especially conducive to the generation of electricity by hydroelectric power plants. The region's subtropical and tropical climates provide sufficient water to be captured in the different landscapes; approximately 80% of Central America's land area is made up of mountains, hills, and the valleys between them (Hall and Pérez Brignoli, 2003). Hydropower production potential in Central America is high (22,068 MW), far greater than other renewable sources, such as wind (2,200 MW) and geothermal (2,298 MW) power (Programa Estado de la Nación, 2011).

The impact of hydroelectric power plants varies depending on the size and location of the dam. However, hydropower plants have been associated with the displacement of communities and their livelihoods and the destruction of local ecosystems and biodiversity, and have affected water resources used by local communities. These impacts are posing serious threats to communities in the CADC, since they are already living with water scarcity, degraded land and landscapes, and severe vulnerability. For these reasons, hydroelectric plants, like mining, have been the cause of major conflicts and social protests.

Virtually all Central American countries have strategies to increase hydropower production. Guatemala's energy policy for 2013-2027 lays out ambitious goals for increasing renewable energy production, which would be achieved largely by hydroelectric plants (Ministerio de Energía y Minas, n.d.). In Honduras, promotion of new hydroelectric plants has been a constant in recent years, including megaprojects on indigenous lands without application of mechanisms such as Free, Prior, and Informed Con-

sent,¹¹ despite widespread resistance by the indigenous peoples of the country. In El Salvador, the Chaparral and Cimarrón megaprojects are part of the strategy to increase electricity generation. Nicaragua is investing in renewable energy, looking to expand from 25% in 2007 to 94% in 2017, and this strategy includes a large role for hydroelectric plants (Gobierno de Reconciliación y Unidad Nacional, 2012).

This move to reliance on hydropower stepped up when oil prices began to rise in 2005. Central America's countries, with the exception of Costa Rica, depend on oil to sustain their energy grids. This increase not only led to inflation, but also provoked an imbalance in the balance of payments: in 2006, 2007, and 2008, the oil bill grew from 15.8%, to 17.3%, and eventually to 22.5% of export earnings in those years, respectively (CEPAL, 2009). Likewise, out of all petroleum derivatives imported in the region, 23% goes to generating electricity (CEPAL, 2008). From a macroeconomic perspective, hydropower generation is still perceived of as a necessary condition for sustained economic growth, in addition to being considered a preferable option for mitigation of climate change. For this reason, hydropower has gained strategic importance in the region's public policy arenas, aided by different multilateral banks and by regional initiatives such as the Alliance for Energy and Environment.¹² Hydropower

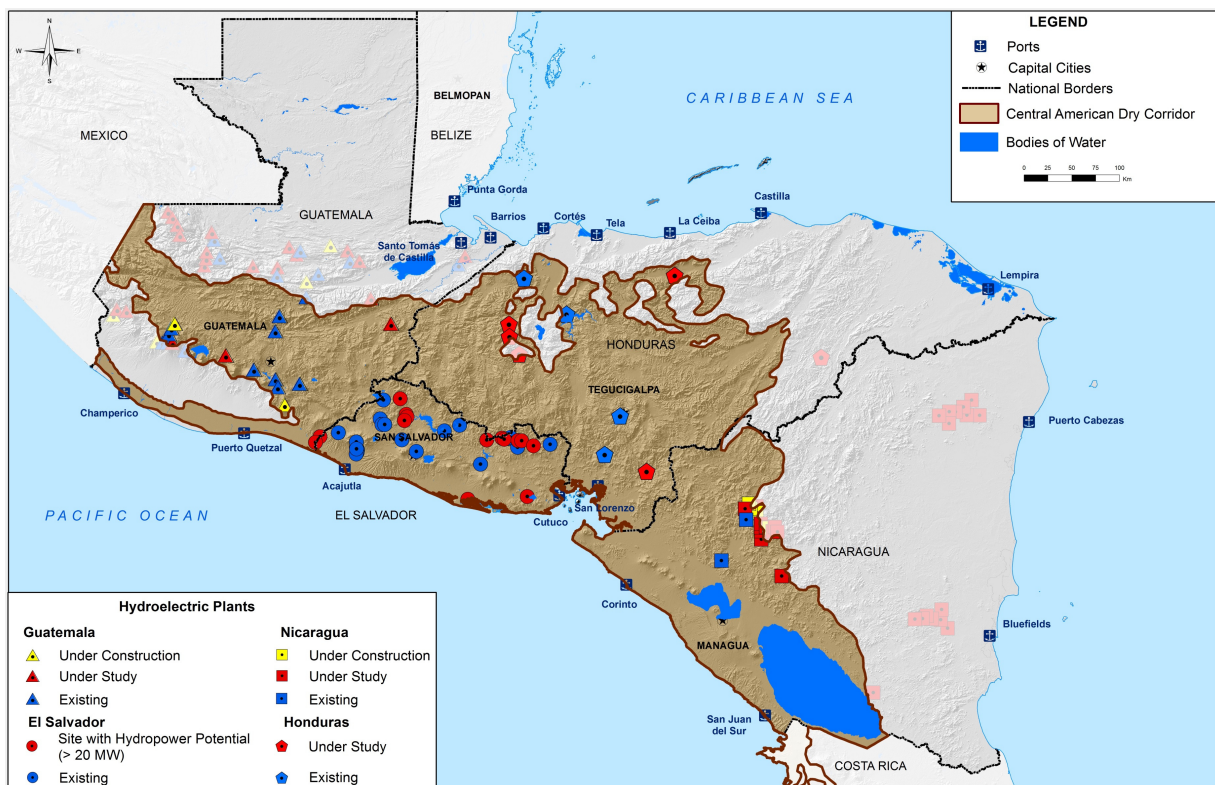
¹¹ This occurred with projects funded by Chinese capital through the Sinohydro state enterprise, with the Patuca III dam, and with the Agua Zarca project on the Cualcarque River in the CADC.

¹² This initiative began at the United Nations World Summit on Sustainable Development in Johannesburg in 2002, with the objective of promoting renewable energy in the countries of Central America. This effort was launched with support from Finland's international cooperation agency in coordination with the Central American Integration System (SICA) and the Central American Commission on Environment and Development (CCAD). Since 2007, it has received support from the Austrian Development Cooperation (SICA, 2014).

production is also important to other megaprojects, especially mining, which demand high levels of energy at relatively low prices (energy availability and price tend to be a determining production factor for mining). This is not always feasible in the rural areas where these mines operate, due to a lack of adequate infrastructure in national electricity distribution

networks. Due to all these factors, the construction of large hydroelectric generating plants (over 20 MW), at present, is seen as one of the major medium- and long-range strategies that have the potential to drive reconfiguration of Central America's territories, and which would have a major effect on the CADC (Map 3).

Map 3. Hydropower dams and proposals en Central America



Source: Prepared by authors, based on SNET (2009); INETER (2010); Plaza Pública (2012); ENEL (2013).

Agroindustry

Although the agricultural sector has lost relative weight on the region's political and economic agendas, the expansion of new areas of accumulation through crops such as oil palm, sugarcane, and other nontraditional crops has

set in motion new territorial dynamics in the CADC.

Sugar Cane and African Palm

The expansion of both sugar cane and African palm has been fueled by climate change policies that encourage the use of biofuels (ethanol from

sugarcane or diesel from African palm) due to the need for cleaner energy in response to problems from greenhouse gas emissions, and from the continued rise in international oil prices. These crops also are used for a wide variety of other products, such as food oils and soap (palm) as well as sugar, molasses, and different types of alcohol (sugar cane). Through these different markets, Central America is betting heavily on these crops, as is reflected in The Mesoamerica Project, whose biofuels program aims to install more biofuel plants across the region with support from countries such as Colombia and with funding from the Inter-American Development Bank (Proyecto Mesoamérica, 2013).

Both sugarcane and oil palm have been expanding dramatically in recent years. At the same time, due to their growing needs, they are highly concentrated geographically, since they require flat land with supplemental irrigation. Transportation costs to mills and processing plants are also a crucial factor in the equation. African oil palm has not had as extensive a direct impact on the CADC as sugarcane. In Guatemala, oil palm is primarily grown in the provinces of Izabal, Alta Verapaz, and Petén, though it is also found in San Marcos, Retalhuleu, Suchitepéquez, and Escuintla (El Periódico, 2011; Solano, 2010). In Honduras, it is found mainly along the northern coast, in the provinces of Colón, Atlántida, Yoro, and Cortés (Secretaría de Agricultura y Ganadería de Honduras, 2011). In Nicaragua, the most dramatic growth has occurred along the San Juan River and in the southern Atlantic autonomous region (RAAS) (Baumeister, 2013).

Industrial sugarcane production in Guatemala is concentrated along the southern coast, though in recent years it has been expanding into Izabal and Alta Verapaz. In El Salvador, most production is tied to the location of the sugar mills: the western municipalities of Izalco

and Sonsonate are served by the Central Izalco mill; the municipality of El Paisnal in the province of San Salvador, is served by La Cabaña mill; Apopa by El Ángel mill; San Vicente by Jiboa mill; and in eastern El Salvador, San Miguel by Chaparrastique mill (MARN, 2012). In Honduras, sugarcane has been expanding primarily in the provinces of Choluteca, Francisco Morazán, Santa Bárbara, Cortés, and Yoro.¹³ In Nicaragua, expansion has been occurring mainly along the Pacific coast (Chinandega, León, and lately in Jinotepe and Masaya). Sugarcane has also been associated with forest plantations which seek access to carbon credits, further extending its use of land (Baumeister, 2013).

The expansion of these crops shares certain characteristics that translate into a number of specific impacts at the local level. First, this expansion shows certain similarities to previous agro-export expansion cycles, such as dispossession of basic grain producers, concentration of land, deforestation, and the destruction of fragile ecosystems. Oil palm and sugarcane production are also associated with a number of other serious environmental impacts, including increased use of agrochemicals and crop ripeners that may affect nearby communities, the burning fields prior to harvesting that affects the health of nearby communities (in the case of sugarcane), contamination of surface and ground water, an impact on water availability at the territorial level, and soil degradation (MARN, 2012; Cuellar et al., 2012; Alonso-Fradejas et al., 2011). These impacts have been observed in a number of occasions in the region, in Guatemala (Cuellar et al., 2012; Alonso-Fradejas et al., 2011; Solano, 2010; MFEWS, n.d.), Honduras (MFEWS, 2005), El Salvador (MARN, 2012), and Nicaragua (Baumeister, 2013).

¹³ Identified based on sugar mills, in Agroindustria Azucarera de Honduras, 2013.

Map 4. Sugar cane (Guatemala and El Salvador) and Sugar Mills in Central America¹⁴



Source: Prepared by authors, based on MAGA-UPGR (2006); SAG-PRONAGRO (2010); MARN (2003).

The particular forms of social organization of production for these crops affect the configuration of the territories. There is a high level of vertical integration in the industrial production of these crops, in which the sugar mills or processing plants provide a variety of service for this production (seed, credit, soil preparation, planting, organization of the harvest, transportation, marketing, etc.), which translates into more concentrated control over the production process (Cuéllar et al., 2012; MARN 2012).

Due to the favorable market conditions for these crops, their continued expansion and significant direct and indirect impact on the CADC is likely. Nicaragua in particular could become a target for growing investment in this sector. Greater availability of land, and at lower prices, in Nicaragua, along with the relative lack of conflict compared to the other CA-4 countries, has spurred interest in investing by regional economic groups (Guatemala’s Grupo Pantaleón is an example), although continuing institutional and legal weaknesses may be a disincentive to potential investors (Baumeister, 2013).

¹⁴ According to MARN (2012) the average distance of sugar cane production to the processing plants is 70km in El Salvador, 25 to 35km in Guatemala, 20 to 30km in Honduras and 20 to 25km in Nicaragua.

“Non-traditional” agricultural and aquaculture export products

Non-traditional agricultural export products emerged in the 1980s and 1990s as part of a transition to more diversified economic models. A variety of new specialized agricultural (and some aquaculture) products have been developed in the region, with the active (direct and indirect) support of government, international cooperation, and multilateral banks (Robinson, 2004; Robinson, 2007), while also figuring as strategic components in frameworks such as the Mesoamerica Project. Thus far, these crops have been the most dynamic in Guatemala and Costa Rica. However, interest in them also remains strong in official agencies and in the private sector at the regional level, as seen in the Regional Policy for the Development of the Fruit Sector (POR FRUTAS) (Consejo Agropecuario Centroamericano, n.d.), adopted by the ministers of agriculture in March 2011 and part of the Project Mesoamerica agenda. These products have been developed to tie into niche markets with high demand from U.S. and European supermarket chains, and also increasingly in Central America’s large cities. These products include cantaloupe, watermelon, pineapple, avocado, papaya, oranges, apples, peaches, and cucumbers, among others. In aquaculture, shrimp and tilapia are being supplied for export. A key aspect behind the logic to their expansion relates to taking advantage of the diversity of agro-ecological conditions in the region, which provides them, in principle, with a relatively broader geographical reach.

Because these crops and their production practices vary widely, it is impossible to generalize about their impacts and implications for the Dry Corridor. However, this clearly raises a number of questions about their impact on local areas, since they can ultimately lead to some competition for land for basic grains, competition over the use of water, as well as soil-

degrading practices and biodiversity loss. The scope of these crops, along with their associated productive practices varies greatly, which implies a broad diversity of territorial scenarios. In Guatemala, traditional coffee growing areas, such as the southwestern corridor, are undergoing transitions to new crops, such as citrus, avocado, and rubber, the expansion of which could mean a loss of biodiversity and a negative impact on soils. In other areas, these crops coexist and compete with other agroindustrial crops and deepen processes of exclusion, as in the case of cantaloupe and watermelon in Choluteca, Honduras (MFEWS, 2005).

In other rural areas, these crops can play a central role in territorial configuration, as with the production of pineapple, citrus, and others in Guanacaste, Costa Rica, leading to exclusion, disputes over water resources, and major impacts on the environment (Cuéllar et al., 2011). Likewise, cantaloupe production in Zacapa, Guatemala is a dominant activity in the region’s valleys, where they are experiencing serious land degradation, food insecurity, and the threat of drought (PNUD, 2013; MFEWS, n.d.). Similar trends can also be seen in vegetable production in Comayagua, Honduras (MFEWS, 2005). In the Gulf of Fonseca, the dramatic expansion of the shrimp industry has been associated with the destruction of mangroves, a loss of biodiversity, and increased coastal vulnerability (Elias, forthcoming).

Favorable conditions for the expansion of non-traditional export products suggest that they could become increasingly important in the CADC. This includes the various projects and programs to support these sectors; however, the different efforts to expand the logistics platform previously mentioned are also crucial, since reductions in transportation time and costs are critical to their production. Therefore, the expansion of these products and the oppor-

tunities and threats they pose in the CADC landscapes require greater consideration.

Box 3
Extensive Cattle Ranching

Cattle ranching is one of the main uses of land in the CADC; Central America is home to 46 million herds,¹⁵ a good proportion of which live in this region (PRAT, 2013). In several of the region's countries, extensive ranching continues to be a dynamic force driving territorial reconfiguration, and in several countries it is supported and encouraged by various policies and programs. However, evidence suggests that most of the expansion of large-scale cattle ranching is occurring outside the CADC, although there are exceptions.¹⁶ This trend in part responds to a strategy to look for large tracts of land with abundant water in areas that usually lack developed infrastructure. For this reason, this study does not delve deeply into the dynamics of livestock ranching. In Guatemala, the livestock production that has existed on the southern coast is giving way to inroads by African oil palm and sugarcane. Some ranchers have opted for increasing mechanization, while many others have decided to branch out into other areas of the country, including Izabal, Alta Verapaz, and Petén (MFEWS, n.d.), and even into Nicaragua (Baumeister, 2013). In Honduras, expansion is occurring primarily in Olancho and Mosquitia, while ranching on the Atlantic coast is yielding to African palm and sugarcane. In Nicaragua, according to agricultural census data from 2001 and 2011, ranching in the CADC has remained relatively stable (despite sharp growth in production nationally); the main expansion areas are in the north and south Atlantic autonomous regions (RAAN and RAAS) and along the San Juan River.¹⁷

Tourism

Tourism has become one of the focuses of strategic accumulation for the region, appearing as a strategic agenda item of all of Central America's governments, who have a Regional Tourism Strategy. It is becoming one of the sectors

¹⁵ FAOSTAT, 2011.

¹⁶ For example, new, large-scale investments in León and Managua, Nicaragua (Baumeister, 2013).

¹⁷ Based on data from the Censo Agropecuario of 2011.

that generate the most foreign exchange (ECODES, n.d.).¹⁸

Tourism as an economic activity encompasses various strategies, types, and purposes. The dominant model in Central America has been foreign tourism, often associated with mega-projects, packages, and resorts, which for the most part have been controlled by small elite groups (although there are significant efforts underway to reorient this approach¹⁹) (Cañada, 2010). The impact of this type of tourism can have profound implications for areas in the CADC, according to Cañada (2010), including their gentrification, concentration of lands, and dramatic impacts on natural resources, ecosystem services, and territorial governance (deforestation and destruction of mangroves, water pollution, accumulation of solid waste, and destabilization of employment and living conditions in rural communities).

Of particular interest to the expansion of this type of tourism are the region's coastal areas, with a large proportion of "all inclusive" tourism megaprojects, and with particularly close ties to real estate development and land speculation. Guanacaste, Costa Rica has been one of the first areas to be reconfigured as a result of huge investments in tourism over the past 15 years, together with development of the agricultural maquila for pineapple and other fruits. Both of these activities have relied heavily on Nicaraguan laborers with poor working conditions. This dynamic has extended to the south-

¹⁸ For example, in Guatemala, where it brought in 44% of all foreign exchange in 2011, according to El País (2013) <http://www.ecodes.org/documentos/cooperacion/PM-febrero-2008.pdf>

¹⁹ Intra-regional tourism, rural tourism, and community tourism have made progress in recent years, primarily in Costa Rica and Nicaragua. It has also been shown that small and medium-sized tourism enterprises can be viable, for example, in La Fortuna (Costa Rica), Catarina (Nicaragua), and the Peace Route (El Salvador), according to Cañada (2010a).

ern Pacific coast of Nicaragua (which has seen new waves of dispossession), where tourism is centered on the coasts and Lake Nicaragua and appears to be a possible model for “sun and sand” tourism megaprojects in the region. The latter has been extended across a good part of the coast of the CADC, as seen in new tourism ventures in the Gulf of Fonseca, a new area of interest as part of the “Model Region” in Honduras, and as part of the first joint tourism project in the region (El Salvador, Honduras, and Nicaragua) (El Nuevo Diario, 2013). These initiatives have been joined by mega-investments such as PROMAR in El Salvador, which plans to develop several tourism mega-projects in the country, including in eastern El Salvador, from the Gulf of Fonseca to Jiquilisco Bay. In Guatemala, tourism developments along the southern coast stand out: Monterrico Multipurpose Reserve, Sipacate Naranjo National Park, Champerico Beach, and Tulate Beach (the last two are part of a new package of adventure, fun, beach, ecological, rural, and archeological attractions for tourists called “Guatemática” in the coastal department of Retalhuleu) (La Prensa Libre, 2012).

Alongside these projects, as a part of efforts to diversify tourism in the region, tourism ventures are popping up not only along the seashores, but also along Central America’s volcanic mountain range and in colonial sites. Throughout the region, there are new projects offering landscape and historical tourism, along with “green” and “cultural” destinations. Regionally, the Central American “Colonial and Volcano Route” provides a framework for new investment in locations throughout the CADC, many of which have not previously had tourism strategies. Guatemala has been promoting landscape and historical tourism, along with “green” and “cultural” tourism with a significant impact on CADC locations, including Antigua Guatemala (the country’s second most popular tourist destination), and the “Volca-

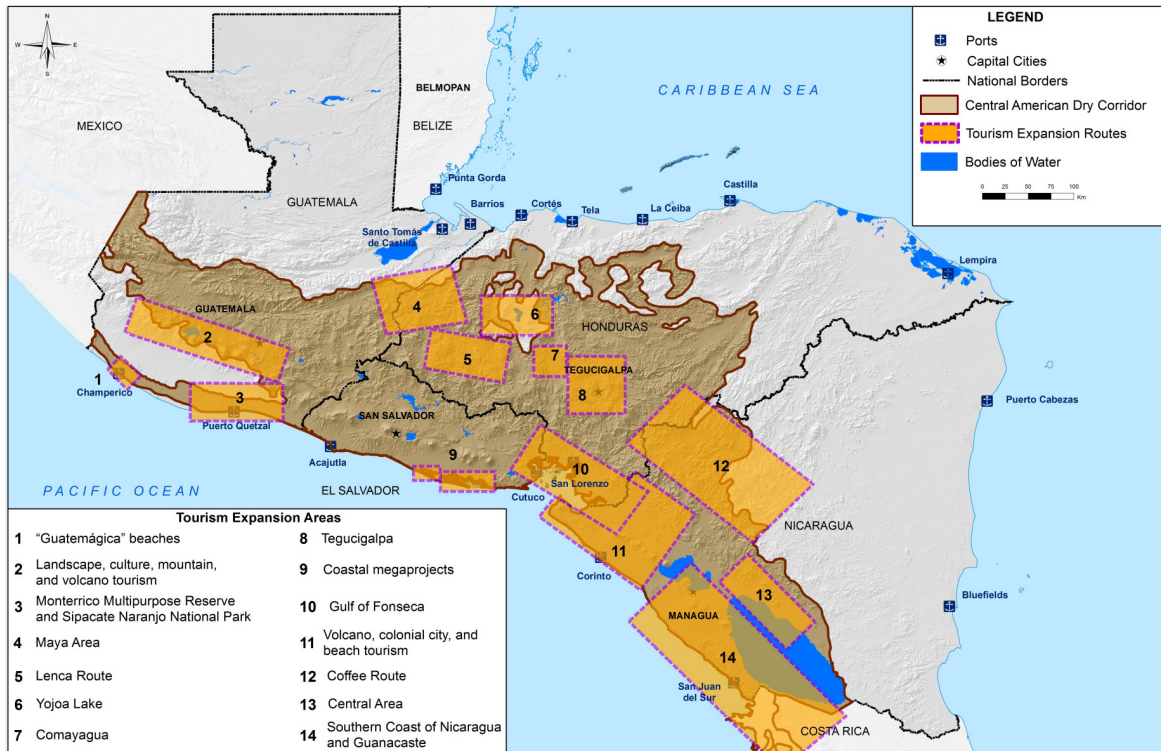
noes, Mountains, and Beaches” and “Landscapes and Culture” routes (see Map 5). In Nicaragua, hotel investment,²⁰ is currently very dynamic in tourism areas that revolve around the country’s volcanoes and the city of León, and that could expand more broadly toward the coasts of León and Chinandega. In north central Nicaragua, the “Coffee Route” is being promoted in the Segovia Mountains (in Jinotega, Matagalpa, Estelí, Nueva Segovia, and Madriz),²¹ along with several projects aimed at increasing tourism in central Nicaragua near Lake Nicaragua (Boaco-Las Canoas, Juigalpa-Archipielago Nacional) (La Prensa de Nicaragua, 2010). In Honduras, Lenca territories are being promoted as the “Lenca Route,” along with other sites including the “Maya Area” (cultural and archeological tourism and ecotourism), Yojoa Lake, Comayagua, and Tegucigalpa (Instituto Hondureño de Turismo, 2013).

Sun and sand megaprojects are clearly the largest tourism ventures in the CADC, with major implications for vulnerability. As has been seen in Guanacaste and along the southern coast of Nicaragua, this kind of megaproject can provoke the destruction of mangroves and coastal ecosystems, the concentration of lands, and lead to a lack of access to key resources including land, rivers, and the sea for fishing (Cuéllar et al., 2011; Cañada, 2010). The new ventures in the volcanic mountain chain and colonial cities also offer new opportunities, but also serious threats; the growing trend toward large-scale foreign tourism could also spur greater degradation and exclusion from land and natural resources.

²⁰ The provinces of Rivas, Managua, Leon, and Chinandega have attracted the majority of hotel investments in recent years, according to the Nuevo Diario (2013).

²¹ <http://m.laprensa.com.ni/activos/92099>

Map 5: Tourism projects and proposals in Central America’s Dry Corridor



Source: Prepared by authors.

Box Conservation and Protected Areas

Responding to serious degradation occurring in mountainous regions, which are important sources of water, conservation policies have played an important role in the region, both through the creation of protected areas, and in the implementation of other environmental policies. In several cases, attempts are being made to sustain the viability of protected areas by linking them with potential carbon markets, or with new types of tourism—not only “green” tourism, but also “cultural” and “adventure” tourism—which is why these conservationist forces have important ties to other strategic sectors. These policies could reconfigure territories in the CADC, with the potential to support or to undermine local natural resource management institutions. Repeatedly, exclusive conservation policies have been developed by individual sectors and remained detached from economic policy at the local level. Thus, rural communities, whose traditional practices often have a high conservation value (Perfecto et al., 2009), have been caught between agroindustrial expansion, on the one hand, and exclusive conservationist policies on the other, as we have seen in the Sierra de las Minas Biosphere Reserve in Guatemala (Grandia, 2006). In other CADC areas, local community management institutions have been eroded by conservation policies, resulting in the marginalization of local communities²² and the loss of institutions, practices, and knowledge crucial to the sustainable and inclusive management of these areas, as has been seen in the CADC in Maya K’iche communities in Guatemala,²³ and in Lenca communities in Honduras (Tucker, 1999).

²² For example, as has been analyzed at the national level in Honduras in ForestTrends, 2013 and in Larson and Ribot (2007).

²³ For example, in the Lake Atitlán Multipurpose Area and the Altos de San Miguel Regional Municipal Park (Elias, 2010).

Discussion: Trends and Implications for Local Governance and Adaptation in the Central American Dry Corridor

Vulnerability or Resilience: What type of transformation for the CADC?

Upon review of these economic strategies, it can be clearly seen that there is a discrepancy, at times dramatic, between proposals for a massive overhaul in practices to benefit food security, vulnerability reduction, and adaptation on the one hand, and on the other hand, the territorial reconfiguration that implementation of these economic strategies would involve. Failure to include the new realities imposed by climate change in the sector policies that guide these strategies (jobs creation, promotion of investment, rural development, and even food security, among others), threatens to drastically increase vulnerability in the Dry Corridor.

The previous sections also enable us to more closely understand the nature of the vulnerabilities that could be generated by these projects and proposals, as well as their contradictions, disputes, and conflicts over the future role of these territories of the CADC. Since the nature of the vulnerability experienced in the CADC is closely linked to the region's social, productive, and physical geography (relationships among the coasts, plains, hillsides, and middle and upper watersheds), it is useful to reflect on all the economic strategies as a group in their geographical context in the CADC. Our starting point for this discussion are the upper and middle watersheds in the region, where subsistence family farming predominates, with major activity in basic grains, coffee, subsist-

ence cattle ranching, and the fragmented forest ecosystems that remain. In the valleys between the mountains, there are more extensive cattle ranching and agroindustrial activities. It is in the upper and middle reaches of these watersheds where most of the proposals for metal mining and large hydropower plants are located, supported by policies to promote investment, jobs creation, and economic growth. These projects are threatening basic grain production and the livelihoods of these communities, and may involve the destruction of key ecosystems, causing greater vulnerability. This is further compounded because mining is often a source of greater competition over water resources in a context of water scarcity, while dams intervene dramatically in water resources and their distribution. Given the heavy demand for energy required by mining activities, sometimes the implementation of both types of projects is interrelated, posing a dual threat to rural areas.

Besides these common characteristics, there are also considerable differences between mining and hydropower. In addition to those already mentioned, hydropower is also supported by policies to transform the electricity sector to make the electric grid sustainable. Many of these projects, despite being associated with the destruction of ecosystems, worsening access to resources, and increasing vulnerability, are also attaining access to international mitigation mechanisms, in scenarios that can be categorized as mitigation that undermines adaptation. Thus, there is an enormous need for a discussion about the reorientation of adaptation-

based mitigation policies, including the development of local-level dialogue and negotiation mechanisms, as well as exploring alternative energy production methods (mini-hydropower plants, for example), systems that recognize and compensate ecosystem services management by smallholders upriver, important for power generation, as well as the management of these projects as defense against flooding and constituting benefits for downriver communities and sectors. These opportunities do not seem to be present in the mining sector, whose projects and proposals in the CADC are widespread, and the potential harmful impacts go far beyond their production sites.

Additionally, in upper and middle watersheds, there are ventures that perhaps do not have same scale as mining or hydropower, but that certainly can be important forces for territorial reconfiguration. On the one hand, these involve non-traditional crops that can be grown in areas that are less flat and have less water, and at higher altitudes than the crops that dominate the plains, such as oil palm and sugarcane. The steady reduction in transportation time and costs is another element further encouraging these crops. While the implications vary depending on the local context, the expansion of these crops is raising questions about their capacity to promote or undermine vulnerability, food security, sustainable soil management, water resources, and biodiversity in CADC landscapes.

On the other hand, new tourism ventures are also moving into these same areas. Although they represent an opportunity, they can also mean competition for resources such as land and water in the context of severe shortages and changing patterns of demand for labor. Thus, greater dialogue is needed to discuss the potential in these two sectors, which are being promoted by rural development policies.

Box
Economic diversification in coffee areas

In both cases (tourism and non-traditional export crops) there are evident examples of new economic ventures that seem to be having a major impact on coffee growing areas, in particular, considering the recent crisis in coffee production due to market volatility and plagues. As previously discussed, Guatemala is seeing major competition to coffee plantations from new non-traditional crops. However, new tourist routes are also emerging: the Coffee Route in Nicaragua (Jinotega, Matagalpa, Estelí, Nueva Segovia, and Madriz), the Lenca Route and Maya Route in Honduras (in areas where there is considerable subsistence coffee production), and the “Volcanoes, Mountains, and Beaches” and the “Landscapes and Culture” routes in Guatemala (in areas known for coffee production by large landholders). Given the relative benefits of ecosystem services that certain types of coffee production provide, and its strong presence in the CADC, this potential trend deserves further study in the regional context of climate change.

The previous discussion has allowed us to see that these different dynamics in upper watersheds and mountains are posing different climate scenarios, including situations of high vulnerability extending to the valleys, plains, and coastlines downriver. The vulnerability caused by these activities could affect both family farms and basic grain production in upper and middle watershed areas, in addition to cities, economic sectors such as large and medium-sized agroindustrial production units on coastal plains, and the various sun and sand resorts along the region’s shores. The fact that Central America’s countries lack adequate mechanisms for the management of watersheds shared by countries further complicates this situation. Harm can include the loss of infrastructure, homes, and crops, but also includes soil, rock, and debris being washed downstream, which speeds up siltation of rivers, dams and drainage systems, irrigation

systems, natural mangrove channels, and finally, coastal seaports

While the coasts, plains, and valleys are experiencing greater vulnerability due to these dynamics, at the same time they are also simultaneously immersed in their own processes of change. Coastal communities, which are often threatened by rising sea levels, are also exposed to multiple and more complex hazards caused by the dynamics already discussed. These include the development of tourism megaprojects and shrimp production that may involve the destruction of mangroves, the concentration of land, and reduced access to water, cropland, and the sea for fishing. Processes of this kind are advancing across large swaths of Costa Rica, Nicaragua, Honduras, and El Salvador.

Meanwhile, the most dramatic expansion of monocrops, such as oil palm, but especially sugarcane, is occurring along coastal plains and in some valleys. This is leading to the dispossession of basic grain production, heavy new demands for water, concentration of power in these areas, and the degradation of land and water resources. Nicaragua is where the greatest threat from the expansion of these crops is being seen, primarily from sugarcane, most likely from a dynamic expansion in areas where there is now basic grain production and subsistence agriculture (see map in Annex I). In addition, there are several metal mining proposals and projects located primarily in Choluteca, Honduras, as well as in Estelí, Chinandega, Matagalpa, Managua, Boaco, Chontales, and Masaya, Nicaragua. This set of dynamics augurs poorly for food security, especially for communities living on the coasts and plains that depend on basic grain production and fishing as key aspects of their livelihoods. It also points to a future of degradation and disputes over land and water resources, among small producers, agroindustry, tourism, and in some cases, the mining sector.

This brief reflection gives us a clearer view of the vulnerabilities that are becoming more acute in the CADC, stemming from a number of sectoral policies across the region that have not sufficiently integrated new dimensions of vulnerability caused by climate change and the different underlying territorial relations. The implications from the continuation of these policies will be crucial to projects and policies, not only those related to climate change, food security, and risk reduction, but also to rural production development, territorial development, infrastructure, energy, and even economic growth.

Territorial Governance for Adaptation

The social, economic, and environmental threads that link the fields and lands of the Dry Corridor and structure the nature of climate vulnerability, require responses that go beyond individual plots of land, and that propose approaches that can address the relationships that are key to adaptation at different scales, from family units to landscapes and territories. To transform practices at these scales requires instruments, mechanisms, and platforms for dialogue, negotiation, and territorial management. This will require efforts and institutions that facilitate individual responses, but also collective action, involving the variety of stakeholders that influence the vulnerability and resilience of territories, such as small farmers and ranchers, medium-sized and large landholders, municipal and national governments, and regional bodies, as well as the different private sectors that want to invest in these territories.

Therefore, greater interinstitutional coordination is needed that links and supports territorial actions with local, national, and regional policy frameworks that are appropriate and demonstrate long-term commitment to building climate-change resilient territories that are condu-

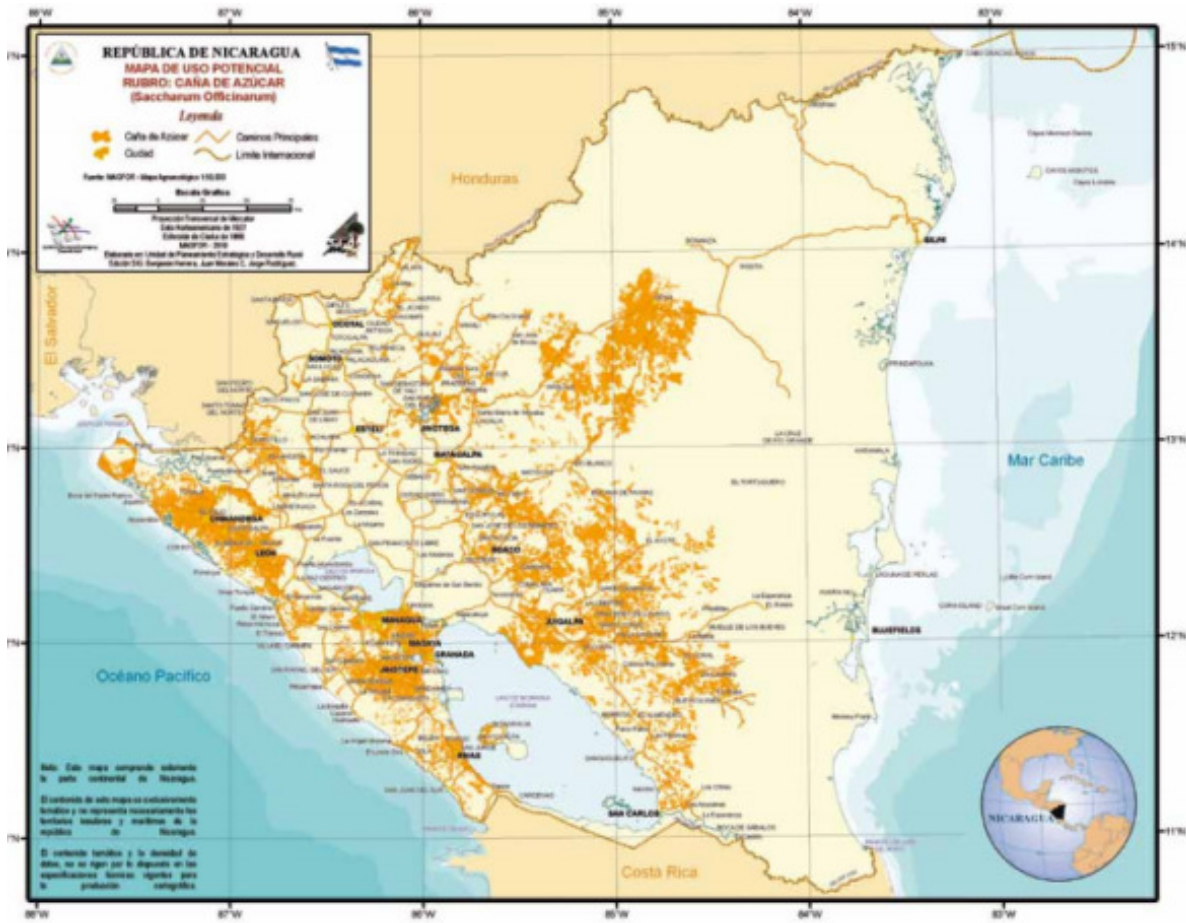
cive to territorial development. This involves greater coordination and consistency not only among sector policies (investment promotion, job creation, etc.) and climate change, but also with food security, risk reduction, and territorial development policies.

Strategies endogenous to the region have emerged that are based on the particular contexts of Central America's territories in order to respond to these challenges. These include the Program for Ecosystem and Landscape Restora-

tion (PREP) in El Salvador and its Adaptation-based Mitigation (AbM) approach. Additionally, new opportunities are being created in the framework of regional bodies, such as the Central American Integration System (SICA) and the Central American Strategy for Rural Area-based Development (ECADERT). These opportunities represent critical elements for developing regional, national, and territorial strategies to halt and reverse the processes and strategies that are posing scenarios of extreme vulnerability in Central America's territories.

ANNEX I

Map Sugarcane Potential in Nicaragua



Source: MAGFOR and INETER, 2010.

References

- ACH and FAO (2012). *Estudio de caracterización del Corredor Seco Centroamericano (CA-4)*. Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO). Rome, Italy.
- Agroindustria Azucarera de Honduras (2013). *Desarrollo Sostenible*. Accessed 12 January 2014 at: 2014 en http://www.azucar.hn/web/wp-content/uploads/2013/10/suplemento_agroindustria.pdf
- Alonso-Fradejas, Alberto, José Luis Caal Hub and Teresita Chinchilla Miranda (2011). *Plantaciones agroindustriales, dominación y despojo indígena-campesino en la Guatemala del siglo XXI*. Instituto de Estudios Agrarios Rurales (IDEAR) and CONGCOOP. Guatemala.
- Aparicio Mourelo, Á. (2012). *Identificar las prioridades: El reto de la gobernanza en las infraestructuras de transporte*. Accessed 12 December 2013: <http://www.revistaambienta.es/WebAmbienta/marm/Dinamicas/pdfs/versionpdf/Aparicio.pdf>
- Baracaldo Orjuela, D. (24 June 2013). *El canal de Nicaragua provocará tragedia ambiental*. Kien and Ke. Accessed at: <http://www.kienyke.com/historias/el-canal-en-nicaragua-provocara-tragedia-ambiental/>
- CAC (2010). *Estrategia Centroamericana de Desarrollo Territorial 2010 - 2030 (ECADERT)*. Consejo Agropecuario Centroamericano.
- Cañada, Ernest (coord.) (2010). *Turismo y conflictos socio-ambientales en Centroamérica*, Editorial Enlace, Managua.
- Cañada, Ernest (2010a). *Turismo en Centroamérica: Nuevo escenario de conflicto Social*. Alba Sud.
- Central America Data (25 May 2012). *Presentan el potencial mineral de Nicaragua*. Accessed 12 January 2014: http://www.centralamericadata.com/es/article/home/Presentan_el_potencial_minero_de_Nicaragua
- Centro Humboldt (2012). *Situación actual de la minería metálica en Nicaragua*. Accessed 12 January 2014 at http://tragua.com/wp-content/uploads/2012/12/ForoCuencaRSJ_Miner%C3%ADa_Noviembre2012Tania-sosa.pdf
- CEPAL (2008). *Istmo Centroamericano: Crisis Global, Desafíos, Oportunidades y Nuevas Estrategias*.
- CEPAL (2009). *La Crisis de los Precios de Petróleo y Su Impacto en los Países Centroamericanos*. CEPAL.
- Consejo Agropecuario Centroamericano (n.d.). *Propuesta: Política Regional de Desarrollo de la Fruticultura (POR - FRUTAS) 2011 - 2025*.
- Consejo Ecuaménico de Guatemala (2013 July 30). *Guatemala: iglesias advierten costo social del Canal Interoceánico*. E&N. Accessed at: <http://www.estra-tegiaynegocios.net/blog/2013/07/30/guatemala-iglesias-advierten-costo-social-del-canal-interoceanico/>
- Consejo Latinoamericano de Iglesias (26 July 2013). *Consejo Latinoamericano de Iglesias rechaza corredor interoceánico*. Emisoras Unidas. Accessed at: <http://noticias.emisorasunidas.com/noticias/nacionales/consejo-latinoamericano-iglesias-rechaza-corredor-interoceanico>
- Cuéllar, Nelson; Andrew Davis, Fausto Luna and Oscar Díaz (2012). *Inversiones y dinámicas territoriales en Centroamérica: Implicaciones para la gobernanza y la construcción de alternativas*. PRISMA. San Salvador..
- Cuéllar, Nelson, Susan Kandel, Andrew Davis, Oscar Díaz, Fausto Luna and Xenia Ortiz (2011). *Dinámicas territoriales en Centroamérica: Contexto y*

desafíos para comunidades rurales. Fundación PRISMA. San Salvador, El Salvador

Dirección General de Minería (2012). *Anuario Estadístico Minero 2012*. Dirección General de Minería.

ECODES (n.d.). Turismo Rural y Comunitario en Nicaragua. Accessed 12 January 2014 at: <http://www.ecodes.org/documentos/cooperacion/PM-febrero-2008.pdf>

Elías, Silvel (por publicar). *Institucionalidad y Gobernanza en el Corredor Seco Centroamericano*.

Elías, Silvel (Abril – Junio 2010). *From Communal Forests to Protected Areas: The implications of tenure changes in natural resource management in Guatemala*. Conservation and Society. Volume 10, Issue 2.

El Nuevo Diario (4 November 2013). *Oro generará \$430 millones en divisas*. Accessed 12 January 2014 at: <http://www.elnuevodiario.com.ni/nacionales/301000-oro-generara-us430-millones-divisas>

El Nuevo Diario (21 August 2013). *Inversión hotelera impulsa el turismo*. Accessed 12 January 2014 at: <http://www.elnuevodiario.com.ni/economia/294815>

El Nuevo Diario (28 August 2013). *Proyecto de Golfo de Fonseca "Se Inspira" en Hong Kong*. Accessed 31 January 2014 at: <http://www.elnuevodiario.com.ni/politica/295384>.

El País (17 January 2013). *Guatemala anuncia esfuerzos para atraer turismo e inversiones*. Accessed 12 January 2014 at: http://elpais.cr/frontend/noticia_detalle/6/77071,%20en%20Nicaragua,%20donde%20ha%20llegado%20a%20ser%20el%20principal%20rubro%20generador%20de%20divisas%20en%20el%20pa%C3%ADs

El Periódico (16 August 2013). *El Canal de la Discordia*. Accessed 31 January 2014 at:

<http://www.elperiodico.com.gt/es/20130816/pais/232862>

El Periódico (25 August 2011). *Auge de la palma africana crea oportunidad y riesgos*. Accessed 12 January 2014 at: <http://www.elperiodico.com.gt/es/20110825/economia/200003/>.

FAO (n.d.). (Untitled) Accessed 12 January 2014 at: <http://www.rlc.fao.org/fileadmin/content/events/semtierras/acaparamiento.pdf>

Forest Trends (2013). Information Brief #8: *Community Forestry in Honduras: A Path Towards Better Governance*. Forest Trends.

Gobierno de Reconciliación y Unidad Nacional (2012). *Plan Nacional de Desarrollo Humano 2012 – 2016*. Gobierno de Reconciliación y Unidad Nacional.

Grandia, Liza (2006). *Unsettling: Land Dispossession and Enduring Inequity for the Q'eqch'í Maya in the Guatemalan and Belizean Frontier Colonization Process*. PhD Dissertation. University of California-Berkely.

Hall, Carolyn y Héctor Perez Brignoli (2003). *Historical Atlas of Central America*. University of Oklahoma Press, Oklahoma.

Kandel, Susan; Xenia Ortiz y Oscar Díaz (2011). *Megaproyectos, dinámicas migratorias y gestión territorial: El caso de Nueva Concepción*. PRISMA. San Salvador, El Salvador.

Kandel, Susan, Susanna Hecht, Abelardo Morales y Nelson Cuéllar (2013). *Migration, Rural Livelihoods and Natural Resource Management*. PRISMA/UCLA/FLACSO.

Larson, Anne y Jesse Ribot (Octubre 2007). *The Poverty of Forestry Policy: Double Standards on an Uneven Playing Field*. Sustainability Science. Volume 2, Issue 2, pp 189 – 204.

La Prensa (1 March 2013). *En 90 días otorgaran ahora las concesiones mineras*. Accessed 5 January 2013 at: <http://www.laprensa.hn/csp/media-pool/sites/LaPrensa/Honduras/Tegucigalpa/story.csp?cid=331765&sid=275&fid=98#panel1-2>

La Prensa (21 August 2013a). *Crece el boom por el óxido de hierro*. Accessed 12 January at: <http://www.laprensa.hn/honduras/apertura/378905-98/crece-boom-por-el-%C3%B3xido-de-hierro>

La Prensa de Nicaragua (17 May 2010). *“Estamos muy satisfechos con las leyes mineras aquí”* Accessed 12 January 2014 at: <http://www.laprensa.com.ni/2010/05/17/economia/24835--satisfechos-leyes-mineras-aqui?movil>

La Prensa de Nicaragua (2010). *Boaco Levanta inventario turístico*. Accessed 31 January at: <http://m.laprensa.com.ni/departamentos/31227>

La Prensa Libre (21 June 2012). *Retalhuleu será conocido como Guatemática*. Accessed 12 January 2014 at: http://www.prensalibre.com/economia/Retalhuleu-conocido-Guatemagica_0_722927762.html

MAGFOR e INETER (2010). *Nicaragua: Uso Potencial de la Tierra: Compendio de Mapas*. MAGFOR e INETER.

MARN (2011). *Informe Preliminar: Evaluación de daños y pérdidas en El Salvador Ocasionados por la Depresión Tropical 12E*.

MARN (2012). *Análisis de la Producción Azucarera en El Salvador y sus Vínculos con Procesos de Cambio del Uso del Suelo, Deforestación y Degradación de Ecosistemas Forestales*. San Salvador.

MARN (2013). *Estrategia Nacional de Cambio Climático 2013*. San Salvador.

Mesa Nacional para la Gestión del Riesgo (2013). *Más razones para que no se construya el canal*

interoceánico en Nicaragua. Agencia SNN. Accessed at : <http://www.agenciasnn.com/2013/07/mas-razones-para-que-no-se-construya-el.html>

MFEWS, s.f. *Guatemala: Perfiles de Medios de Vida*. Secretaria de Seguridad Alimentaria y Nutricional/USAID/MFEWS/FAO.

MFEWS (2005). *Perfiles de Medios de Vida Honduras*. Sistema Mesoamericano de Alerta Temprana para Seguridad Alimentaria.

Ministerio de Energía y Minas, s.f. *Política Energética 2013 – 2027: Energía para el Desarrollo*. Gobierno de Guatemala, Ministerio de Energía y Minas.

Morales Gamboa, Abelardo; Kandel, Susan; Ortíz, Xenia; Díaz, Oscar and Acuña, Guillermo (2011). *Trabajadores migrantes y megaproyectos en América Central*. PNUD/UCA. San Salvador.

OXFAM, s.f. *¿Cuáles el impacto de las concesiones de los recursos naturales (Agua, Bosque, Minería) en territorios indígenas de Honduras?* OXFAM.

Perfecto, Ivette, John Vandermeer and Angus Wright (2009). *Nature’s Matrix: Linking Agriculture, Conservation and Food Sovereignty*. Earthscan Publications.

PNUD (2013). *Evaluación del bienestar humano y ambiente en el corredor seco oriental de Guatemala*. Programa Naciones Unidas para el Desarrollo.

PRAT (Grupo de Trabajo Interinstitucional sobre el Corredor Seco Centroamericano) (2013). *Síntesis Proceso de elaboración y fundamentación inicial de propuesta de territorio afín del Corredor Seco Centroamericano (no publicado)*. San Jose, Costa Rica.

PRISMA (31 de Octubre, 2013). *La agricultura familiar campesina frente al cambio climático y los desafíos territoriales: Diálogo de políticas e investigación en Centroamérica*. San Salvador.

- PRISMA (2013). *Mitigación basada en la adaptación: potencialidades y desafíos para responder al cambio climático en Centroamérica*. San Salvador.
- Programa Estado de la Nación (2011). *Cuarto Informe Estado de la Región en Desarrollo Humano Sostenible*. San José, Programa Estado de la Nación.
- Proyecto Mesoamérica (2013). *Programa Mesoamericano de Biocombustibles*. Accessed 12 January at: http://www.proyectomesoamerica.org/joomla/index.php?option=com_content&view=article&id=174&Itemid=103
- Robinson, William (2004). *Transnational conflicts: Central America, social change and globalization*. Verso. Londres y Nueva York.
- Robinson, William (2007). *Latin America and Global Capitalism: A Critical Globalization Perspective*. Johns Hopkins University, Baltimore.
- SAG (2011). *Cadena de Cultivos Bioenergeticos*.
- Schmidt, Axel, Anton Etzinger, Kai Sonder y Gustavo Sain (2012). *Tortillas on the Roaster: Central American Maize-Bean Systems and the Changing Climate*. CIAT/CRS/CIMMYT.
- Secretaría de Integración Centroamericana (SIECA) y CLACDS/INCAE (1999). *El Corredor Logístico Centroamericano. Un salto cualitativo en la dotación de servicios al comercio exterior de la región*.
- SICA (2013). *Alianza de Energía y Ambiente con Centroamérica*. Accessed on 15 January 2014 at: http://www.sica.int/energia/aea/aea_breve.aspx
- Silva, J. (2013 June 13). Nicaragua da paso decisivo hacia canal interoceánico chino. Inter Press Service. Accessed at: <http://www.ipsnoticias.net/2013/06/nicaragua-da-paso-decisivo-hacia-canal-interoceanico-chino/>
- Solano, Luis (2010). *El mercado del os agrocombustibles: destino de la producción de caña de azúcar y palma africana de Guatemala*. Serviprensa, S.A. Guatemala.
- Tucker, Catherine (Junio de 1999). *Manejo Forestal y Políticas Nacionales en La Campa, Honduras*. Mesoamerica, 37 pp. 111 - 144.
- USDA (2010). *GAIN Report: Honduras Exporter Guide*. USDA Foreign Agricultural Service.



This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries. However, the views expressed and information contained in it are not necessarily those of or endorsed by DFID, which can accept no responsibility for such views or information or for any reliance placed on them. This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, the Climate and Development Knowledge Network's members, the UK Department for International Development ('DFID'), their advisors and the authors and distributors of this publication do not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it.

© 2014. All rights reserved

prisma@prisma.org.sv www.prisma.org.sv
Pasaje Sagrado Corazón, No. 821, Col. Escalón.
Tels.: (503) 2264 5042 y Fax: (503) 2263 0671