



VOICES
— on the border —
...Just and equitable development in El Salvador



Large-Scale Sugarcane Production in El Salvador

“We do not believe the talk about the economic benefits for a country that produces sugar for export. The communities in the regions where sugarcane is grown are the poorest, most marginalized populations - malnourished, and contaminated.”

*Miguel Ramirez
Executive Director
Movement of Organic Agriculture in El Salvador*

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Introduction

Residents of rural communities throughout El Salvador are concerned that large-scale sugarcane cultivation threatens their environment, public health, access to water, local economy, and food sovereignty. El Salvador has laws and procedures in place that should regulate sugarcane production, but government officials at the national and local levels have been unable or unwilling to enforce them. Salvadoran sugarcane production has grown in recent years due to the country's embrace of neoliberal economic policies that emphasize, in part, free trade and unregulated markets. Unfortunately, the profits and wealth generated by the industry do not trickle down to the communities where it is grown.

Last year, Voices on the Border staff accompanied residents of the Bajo Lempa of Jiquilisco, Usulután as they stopped investors from planting sugarcane near local mangrove forests, wetlands, and community centers. Despite their success, the ad hoc protests failed to produce any long-term changes. During the process, however, residents, community leaders, and local civil society organizations articulated a need for more information about sugarcane production and how it affects the region.



(A sugarcane worker cutting cane in a field along the Litoral Highway in Usulután)

Voices on the Border staff responded by researching the issue of sugarcane cultivation and producing this report. We did so with several audiences in mind. The first was our partner communities in the Bajo Lempa that suffer the effects of burning fields, contamination of agrochemicals, loss of biodiversity, and other impacts of large-scale sugarcane production. A second audience is the government officials that have the power to regulate the industry, to ensure they know how sugarcane is affecting the regions like the Bajo Lempa. A third audience is members of the international community who are concerned with issues related to El Salvador, climate change, food sovereignty, environmental justice, and other topics.

Voices staff is grateful to Jaime Lochhead for his help with this project, especially the time he spent living in the Bajo Lempa and interviewing local experts and community leaders. We are also grateful to Rebecca Walker Marquez for her excellent translation of this document to Spanish. Vocies staff also recognizes our

“The cultivation of cane is not bad. What’s bad is the practice of management and the interests behind the cane. Cane growers are tenants, while in theory the grower is the owner of his cane fields, but the one in control is the sugar mill. The ones behind all of the growth are the mills. The other problem is that no one regulates [the industry]. There is a Land Use Plan but the government has not done anything to put it into practice.”

*Miguel Ramírez,
Director del Movimiento de Agricultura Orgánica
de El Salvador*

Salvadoran partners who are starting to speak out on the impacts of large-scale agricultural production. Finally, we are also grateful to the Flora Family Foundation and other donors that support Voices Grassroots Resource Center.

This report begins with an overview of large-scale sugarcane production as practiced in El Salvador. It continues with a discussion of the impacts that these practices have on the surrounding communities. The report concludes with a list of findings and recommendations that individuals, civil society organizations, and government officials must adopt in order to protect El Salvador’s fragile environment and natural resources, as well as the health of its people.

Table of Contents

Executive Summary	1
Overview of Sugarcane Production in El Salvador	2
History of Sugarcane	2
Large-scale Production	2
Zafra	3
Plowing and Planting	3
Agrochemicals	4
Burning and Harvesting	6
Zafra Verde	7
Life of a Sugarcane Worker	8
Milling	9
Neoliberalism and the Domestic and International Demand for Sugar	9
Other Sugarcane Products	11
Impacts of Sugarcane Production	12
Sugarcane is Better for the Environment?	12
Destruction of Topsoil	13
Depletion of Water Resources	14
Contamination of Agrochemicals	15
Burning of Sugarcane	18
Biodiversity and Local Ecosystems	19
Food Production	21
Laws and Regulations	22
Findings and Recommendations	24

Cañal en Flor

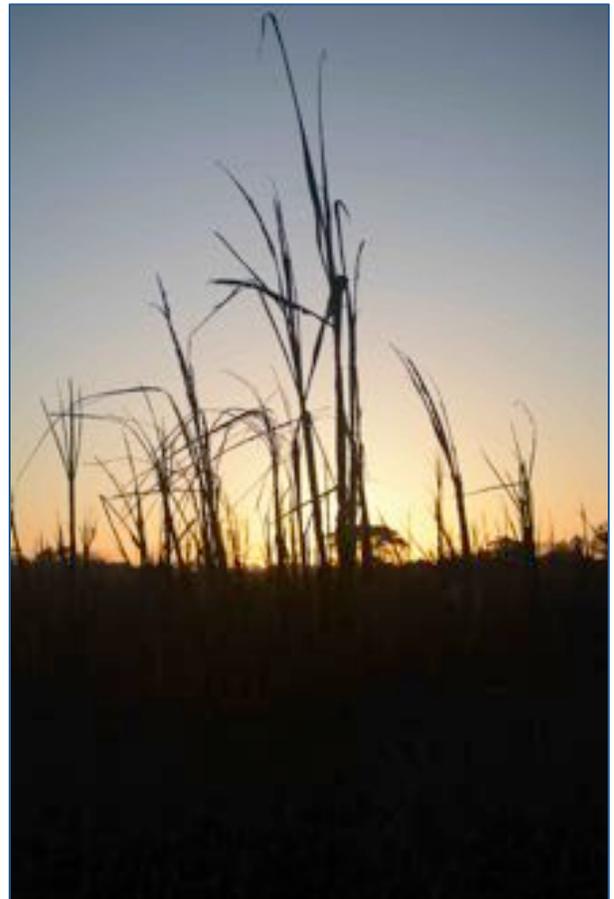
*Eran mares los cañales
que yo contemplaba un día
(mi barca de fantasía
bogaba sobre esos mares).*

*El cañal no se enguirnalda
como los mares, de espumas;
sus flores más bien son plumas
sobre espadas de esmeralda...*

*Los vientos -niños perversos-
bajan desde las montañas,
y se oyen entre las cañas
como deshojando versos...*

*Mientras el hombre es infiel,
tan buenos son los cañales,
porque teniendo puñales,
se dejan robar la miel...*

*Y que triste la molienda
Aunque vuela por la hacienda
De la alegría el tropel,
Porque destrozan entrañas
Los trapiches y las cañas...
¡Viertan lagrimas de miel!*



Executive Summary

Large-scale sugarcane production is bad for the environment and public health of the communities where it is grown. Destructive practices such as intensive tilling, the use of toxic agrochemicals, and burning cane before harvest result in the erosion of topsoil, diminished biodiversity, and contamination of fragile ecosystems and nearby communities. Large-scale sugarcane production also decreases the ability for local communities to achieve important development goals such as food sovereignty.

The Ministry of the Environment acknowledges these harmful impacts and has even tried to get growers to adopt practices such as *zafra verde* (harvesting without burning), but industry leaders refuse to do it because it will cut into their profit margins. There are laws in place to protect Salvadorans and their environment, but government agencies have yet to enforce them.

The sugarcane industry is a manifestation of El Salvador's commitment to neoliberal economic policies that prioritize unregulated capital investment and generation of wealth. Sugarcane growers and mills want to produce the most sugar possible for the lowest costs possible, and therefore externalize their actual costs of production by contaminating the environment, destroying agricultural land, and paying very low wages to field workers. While investors and mills generate large profits, the communities suffer the environmental, public health, and economic consequences. This is a great injustice.

This report concludes with the following findings and recommendations:

Findings

1. El Salvador's sugarcane industry is driven by neoliberal economic policies that prioritize production of exports and deregulation. Sugarcane generates wealth for investors, while communities where it is grown suffer serious environmental and health consequences.
2. Heavy tilling and burning of cane renders once-fertile soil infertile.
3. Agrochemicals used in sugarcane production contaminate the soil, water, and nearby farms and communities, contributing to the renal failure epidemic that plagues coastal regions. In addition, the application of ripeners before harvest destroys crops on nearby farms.
4. The sugarcane industry's unregulated use of groundwater for irrigation is depriving smaller farms and local communities access to the water they need to survive.
5. Burning sugarcane causes respiratory illness, asthma, atopy, and eczema in local populations.
6. Large-scale production of sugarcane (and other crops) diminishes biodiversity and destroys ecosystems.
7. The profitability of sugarcane increases competition for use of land, driving small farmers out of business and diminishing food security.
8. The Salvadoran government does not exercise its legal authority to regulate sugarcane production.



Recommendations

1. The Government must begin enforcing environmental laws.
2. The Legislative Assembly should pass the General Water Law, along with the ban on toxic agrochemicals and the Constitutional amendment on food security.
3. The Legislative Assembly and Central Government must enact policies to protect small farmers and local markets.
4. Municipalities must enact ordinances to regulate agricultural practices and help rural communities create environmental units to monitor development issues.
5. Launch a campaign in rural communities about the impacts of large-scale agriculture, and assist in developing food security plans based on local production for local consumption.
6. Create a movement of communities affected by large-scale sugarcane to advocate for the rights of the people and proper regulation of the industry.

Overview of Sugarcane Production in El Salvador

History of Sugarcane Production in El Salvador

Sugarcane originated in New Guinea 8,000 years ago and spread throughout Asia.¹ By 1492, Europeans had developed a sweet tooth and Christopher Columbus carried cane with him to the Americas. Early colonialists established sugarcane plantations on land seized from indigenous groups and used enslaved natives and Africans for labor.² At some point during colonization, sugarcane made its way to Mexico and on to El Salvador.³

For centuries, Salvadoran farmers have grown small batches of sugarcane for local consumption. In the 1960s, however, the amount of land dedicated to sugarcane grew 43%, resulting in a 114% increase in sugar products. The industry grew to comprise 3.1% of the Salvadoran GDP.⁴ Between 2001 and 2011, sugarcane production grew another 30%, while the price of sugar rose from \$0.08 to \$0.25 per pound.⁵ During the 2013/14 zafra (growing season),⁶ growers produced more than 7 million tons of cane on 108.5 manzanas of land (188 acres), and produced 15.6 million quintals of sugar and 54 million gallons of molasses.⁷

Large-scale Production

While Salvadoran farmers continue to grow small batches of cane amongst their other crops, it is the large-scale production that has grown in recent years. The distinction between small, artisanal farmers and large-scale growers is important. Artisanal production is largely sustainable and has been part of the culture for generations. Small, artisanal producers do not use toxic agro-chemicals or burn their crops, and the cane they grow is for local consumption. Large-scale production is a more recent phenomenon that has significant environmental, social, and economic impacts. This report focuses almost exclusively on large-scale production.



(Worker processing cane juice into panela in a small trapiche (artisanal mill) in San Vicente)

The 2007 agricultural census registered 2,615 sugarcane producers, 103 of which were businesses or corporations that grew 40% of all cane that year. Sixty-six other cooperatives grew another 28% of the cane, while the remaining 2,446 growers were small family farms that accounted for 32% of the total cane harvested.⁸ According to the Salvadoran Sugarcane Growers Association, there are now 7,000

¹ (Chewing Cane n.d.)

² (Johnson n.d.)

³ (Ortega 2008)

⁴ (Organization of American States 1974)

⁵ (Keilhuaser 2011)

⁶ Zafra refers to the harvest of sugarcane as well as the growing seasons

⁷ (Ministry of Agriculture 2014)

⁸ (REDD/CCAD - GIZ 2014)

growers that account for 90% of all sugarcane grown in El Salvador – a much larger number than reported in the 2007 census. Sixty percent of these growers are agricultural cooperatives, while the 40% are small and medium sized growers.⁹ Three thousand shareholders own and operate the country's six mills, which process the cane into sugar and molasses and control much of the industry.

The Zafra

The zafra, or sugarcane-growing season, begins on November 1 and ends on October 31 of the next year. The zafra is divided into two periods, beginning with the dry season zafra (November to April). During this period farmers grow and harvest sugarcane, and process it in the mills. From May to October, the period when there is no harvest, farmers plant new fields and maintain those that are already planted. During this period, mills often close for cleaning and maintenance.¹⁰



(A freshly plowed field, ready for sugarcane)

Plowing and Planting

Planting sugarcane begins by workers clearing the land of rocks and stumps, and breaking the ground with a heavy plow. Workers plow a second time to till the soil down 80 cm (31 inches). They plow a third time with a heavy plow and then a fourth with a polisher, a light machine that levels the ground. The final step is to go over the field with an amplifier, which creates rows.¹¹ Such intense tilling softens the earth and maximizes the soil contact with the cane plant, as well as manages weeds and assists with the absorption of chemical fertilizers.

Once the land is prepared, growers plant setts 0.9 to 1.5 meters (2.95 to 4.9 feet) apart. The setts are 40 cm (15 inch) pieces of cane cut from a previous crop, each with a couple of nodes and eyes where the roots and shoots sprout. One sette produces about 12 shoots, or cane plants. Growers soak the setts in water and fungicide before planting¹² to protect against red rot, which can be deadly to the freshly planted cane.¹³ Farmers also apply herbicides to prevent weeds, as well as a first round of nitrogen, potassium, and phosphorus to ensure the crop has nutrients during the early stages of growth.

One planting of cane generally produces five or six crops, though growers in the Bajo Lempa say they can harvest as many as nine crops per planting.¹⁴ The first planting is called the *plant cane* and subsequent crops are called the *stubble* or *ratoon crops*. Once the stubble becomes uneconomical, growers destroy the plant with chemicals or mechanically by plowing it under. They then till again and plant a new plant cane. Farmers strive to harvest 120-130 tons of cane per manzana, and produce

⁹ (Asociacion de Azucarera de El Salvador 2010)

¹⁰ (Asociacion de Azucarera de El Salvador 2010)

¹¹ (Hernandez 2015)

¹² (Hernandez 2015)

¹³ (Netafim n.d.)

¹⁴ (Hernandez 2015)

between 220-240 pounds of sugar per ton of cane. When a crop only produces 90 tons of cane per manzana and 150 pounds of sugar per ton, the cane is no longer profitable and farmers replace it.¹⁵

Agrochemicals

According William Hernandez, a Salvadoran agronomist who specializes in Sugarcane production, “in the management of cane, it’s all chemicals - control of weeds, pests, and even the planting is mechanized with chemicals.”¹⁶ Industrialized agriculture such as the large-scale cultivation of sugarcane, diminishes biodiversity and the life cycles that keep soil healthy and productive, and prevent outbreaks of pests and diseases. As soil quality decreases, farmers have to apply even more chemical fertilizers and nutrients. They also have to apply herbicides, fungicides, and insecticides to control weeds and other pests that thrive in the absence of other natural controls.

“In the management of sugarcane, its all chemicals – the control of weeds, pests, and even planting is mechanized with chemicals”

*William Hernandez
Agronomist*

Fertilizers

Because sugarcane produces large quantities of stalks and leaves, it requires more nitrogen, phosphorus, potassium, and micronutrients than other crops.¹⁷ Sugarcane needs the most nitrogen during the tillering phase, which occurs 30-45 days after planting. The tillering phase “is a physiological process of repeated underground branching from compact nodal joints of the primary shoot.” Growers apply nitrogen at the beginning of the tillering phase, along with potassium and phosphorus. When the cane is six months along, growers apply more potassium to increase sugar recovery.¹⁸

Growers generally use a blended NPK (nitrogen, phosphorus, and potassium) product, which saves time and labor.¹⁹ Field workers apply the NPK mix using a spreader pulled by a tractor. This application accelerates the growth and volume of the cane and results in deep green leaves but not much sugar. William Hernandez says the concentration of sugar comes later. At the earlier stages the main goal is to make sure the cane is healthy.²⁰

Fungicides and Pesticides²¹

Large-scale sugarcane growers have to worry about a wide variety of pests, one of which is the mosca pinta (Grass Spittlebug). To kill mosca pinta, growers spray Actara 25-WG, the active ingredient of which is Tiametoxam.²² They also use Jade²³ produced by Bayer-CropScience, the active ingredient of

¹⁵ (Hernandez 2015)

¹⁶ (Hernandez 2015)

¹⁷ (Netafim n.d.)

¹⁸ (Netafim n.d.)

¹⁹ (Fertica n.d.)

²⁰ (Hernandez 2015)

²¹ This report does not attempt to provide a comprehensive list of agrochemicals used in El Salvador or the dangers related to specific agrochemicals.

²² (Syngenta n.d.)

²³ (Diccionario de Especialidades Agroquimicas n.d.)

which is imidacloprid.²⁴ The sugarcane borer is another common pest in Salvadoran sugarcane fields. It is the stalk-boring larvae of a cane-eating moth. Adult moths lay eggs on the leaves, and when they hatch the larvae crawl down and bore into the stalks to eat cane. The larvae cause a lot of damage and can only be killed before they begin boring. While chemicals have not been overly successful, growers in Mexico apply Furadan 5G, Brigidir 3G, and Counter when they plant.²⁵ As mentioned already, sugarcane growers in El Salvador also have to contend with red rot, which can kill young plants. To combat red rot, growers apply Benomyl and Carbendazium.²⁶

Herbicides

Weed infestations can reduce sugarcane yields by 12-72%, making weed control an important part of production. Weeds are more prevalent in sugarcane fields because cane is planted farther apart than other crops, giving weeds plenty of space to develop. Sugarcane also takes more time to sprout than other crops, giving weeds time to set roots and consume nutrients in the soil before having to compete with cane. Sugarcane needs relatively large quantities of nitrogen and phosphorus early on, and if weeds consume the nutrients that growers have applied, the cane will not grow properly.

Growers work to control weeds before they emerge from the ground. Pre-emergent control includes tilling, as well as spraying chemicals like Diuron +2, 4D Sodium salt 80 WSP, Paraquat, and Glyphosate.²⁷ The concentration of these chemicals depends on the soil type. Soil in the Bajo Lempa is sandy loam, which means more weeds and the need for more chemicals.²⁸ Bayer CropScience sells a pre-emergent herbicide called Merlin Total. The company claims it is better for the environment and workers because it lingers in the soil for 120 days, meaning fewer applications. They also claim Merlin Total increases production by 15-20%.²⁹ The active ingredients in Merlin Total are isoxaflutole and indaziflam. Atrazine is another common pre-emergent herbicide used on sugarcane. Syngenta, the Swiss company that produces Atrazine, claims that it is “safe for people, good for the environment and the economy.”³⁰

Ripeners

Before harvesting sugarcane, growers spray it with a ripener, which is little more than an herbicide that damages the plant causing it to focus on producing sugar instead of flowering. Ripeners decrease the amount of cane produced, but result in a higher concentration of sugar. The most common ripener is glyphosate, the main ingredient in Monsanto’s line of Roundup products, which includes Roundup WeatherMax and PowerMax, and Syngenta’s glyphosate-based ripener called Touchdown Total.³¹

“The most dangerous practice is the burning before harvest, and the second [most dangerous] is the use of ripeners that effect the environment, which they apply with cropdusters.”

*Miguel Ramírez
Movement of Organic Farmers in El Salvador*

²⁴ (Hernandez 2015)

²⁵ (Campos Hernandez, et al. 2006)

²⁶ (Victoria, Guzman and Angel 1995)

²⁷ (Netafim n.d.)

²⁸ (Hernandez 2015)

²⁹ (Diario1.com 2015)

³⁰ (Syngenta 2014)

³¹ (Gravois 2015)

Growers apply ripeners with crop-dusters. According to the LSU Ag Center, “a 28-to-49 day treatment-to-harvest interval is recommended following glyphosate application.” If growers harvest earlier than 28 days after application, the ripeners do not have enough time to concentrate sugars in the cane. Harvesting beyond 49 days may cause harms that reduce yields in the current crop as well as the next year’s crop.³²

Burning and Harvesting

Before harvesting sugarcane most growers burn it to remove the thick, green foliage. The burn is fast and intense. Flames sprint through the cane, consuming several manzanas in minutes. Temperatures during the burn exceed 1000 degrees F, and produce large quantities of dense, black smoke and soot that can travel for miles, especially along the coast where the winds are strong.



(A 6-manzana cane field burning just before harvest)

Growers remove foliage in part because the cane is easier to cut and transport without the leaves. The main reason for burning, however, is because the mills require it. William Hernandez says that mills will not accept cane that has not been burned because it is too expensive to remove the foliage at their facility.³³ Burning is purely a question of maximizing profits.

Burning sugarcane is arguably against the law, a point made by Margarita Garcia at the Ministry of the Environment.³⁴ Article 262-A of the Penal Code says, “those that burn stubble or crops of any kind will be sanctioned with a fine of between 10 and 200 days of fine; each day of fine is equivalent to the daily minimum wage.”³⁵ There is an exception, however, for crops that are “strictly cultural.” According to environmental attorney Luis Gonzáles, the Ministry of Agricultural considers burning sugarcane to be cultural and is therefore permitted. Mr. Gonzáles also reports that the Environmental Officer at the Ombudsman’s office for Human Rights says burning sugarcane is not cultural and should be prohibited. Unfortunately, the Ministry of the Environment has yet to take a clear position, which means that for the time being growers can keep burning.

The day after growers burn a sugarcane field, a team of workers cuts it all down and stacks it in rows. They are followed by a front-end loader that packs the burned, cut cane onto tractor-trailers that deliver it to one of El Salvador’s six mills.

³² (Gravois 2015)

³³ (Hernandez 2015)

³⁴ (Garcia 2015)

³⁵ (Legislative Assembly of El Salvador 1997)

Zafra Verde (Green Harvest)

In 2011, recognizing the damage that burning sugarcane can cause, the Ministry of the Environment, Ministry of Agriculture, and the Salvadoran Council of Sugarcane, and others agree to adopt healthier growing practices, including harvesting cane without burning. According to the Ministry of Environment, the impetus was the growing concern for the environment as voiced by the Salvadoran people, especially communities from the Bajo Lempa region of Jiquilisco.³⁶ Government representatives proposed that growers harvest 20,000 manzanas (34,720 acres) of cane using the zafra verde, or no burning practices. Growers, however, committed to only 2,500 manzanas (4,340 acres) to zafra verde.

“There is not much interest on the part of the cane growers to employ zafra verde (green harvest) because it means higher production costs.”

*Miguel Ramírez
Movement of Organic Farming in El Salvador*

Director Garcia said, “In the 2011/2012 harvest, we agreed on 2,500 manzanas (4,340 acres) of zafra verde, and they achieved 2,540 manzanas (4,409 acres). It’s a very small amount, almost insignificant. For the following zafra 2012/2013, the goal was 7,500 manzanas (13,020 acres) and they achieved 6,800 (11,804.8 acres). The factors that prevented them from achieving more was that the cost of production almost doubled, due to the time that it takes the cutters. For the 2013/2014 harvest, we set a goal of 12,000 manzanas (20,832 acres).”³⁷ Director Garcia stressed that the Ministry did not have the authority to impose zafra verde on the industry, and that any actions were purely voluntary.



(Sugarcane workers from Santa Ana cutting cane in the Bajo Lempa of Jiquilisco, Usulután)

Agricultural economist Amy Angel agrees with the idea of Zafra Verde but said the slow transition is due to the sugarcane cutters who prefer to burn because it is easier to harvest. Miguel Ramírez from the Movement of Organic Farming in El Salvador has a different view. He says that growers are unwilling to convert to zafra verde because it means higher costs of production, and the mill owners “do not want to absorb the [higher production] costs even though they are the ones making the profit.”³⁸

According to Margarita Garcia, “MARN is rethinking its strategy towards the sector. Until now, it has been a dialogue to achieve volunteer agreements, but this has yielded few results.”³⁹ It is unclear which way the ministry will go, but it might be a good time for communities to make their opinions known.

³⁶ (Ministry of the Environment and Natural Resources n.d.)

³⁷ (Garcia 2015)

³⁸ (Ramirez 2015)

³⁹ (Garcia 2015)

Life of a Sugarcane Worker

It used to be that sugarcane field workers were from the communities where cane was grown. For example, residents of Amando Lopez in the Bajo Lempa recall waking up at 3 am to get to the main road where a truck would pick them up and take them to nearby fields. While the majority of workers were over the age of 18, adolescents as young as 13 would sneak on to the truck alongside their fathers, uncles and brothers. The days were long and hot, with no shade and little rest.⁴⁰

The days of local laborers working in local sugarcane fields are ending. Mills now hire cane-cutting crews that travel around El Salvador. Professional crews are more efficient and cost-effective than local workers. In 2016, Voices staff spoke with a crew cutting cane in the Bajo Lempa of Usulután. The workers were from Sonsonate and spent the season traveling along the coast cutting cane. They had been on the road for a couple months and would not return home until the season ends in April. In 2014, Voices staff spoke with another cane cutting crew in Usulután that was from Santa Ana. They too were traveling the country cutting cane for one of the mills.

Salvadoran sugarcane workers have received attention from the international community over the years. In the late 1990s and 2000s, Salvadoran growers were under scrutiny for allowing minors as young as 13 to work in their fields and subjecting them to dangerous work conditions.⁴¹ More recently Salvadoran sugarcane workers have been in the spotlight due to the chronic renal failure epidemic that has plagued Central American communities for at least 17 years. Public health officials remain unsure of the cause of renal failure and for years many have blamed it on the exposure to agrochemicals. The latest theory, however, is that they work too hard for too many hours, in extreme heat with insufficient access to shade and water. Some public health officials say the epidemic is a combination of exposure to agrochemicals and the working conditions. To date, no one knows for sure why tens of thousands of otherwise healthy people along the coast of El Salvador are dying of renal failure.

The working conditions in sugarcane fields are unquestionably harsh. Sugarcane is harvested during the hottest time of year when temperatures along the coast exceed 105 degrees. The humidity and strong tropical sun are repressive and there is little relief in the wide-open fields. Workers rarely have access to fresh water and even if they bring their own it is never enough and the water in their plastic bottles quickly becomes too hot to drink. In addition to having high rates of renal failure, sugarcane field workers often suffer machete accidents, and are exposed to high levels of smoke, and soot. And whether it is the cause of renal failure or not, sugarcane field workers are exposed to high levels of agrochemicals. Most growers do not supply protective gear, but even when they do many workers opt out due to the extreme heat.⁴²

“The workers in the Mill earn good [money]. The salary of a technician is around \$800 a month with out taking into account their bonus at the end of the season. But the cane workers earn by the day and theirs is the smallest income in the process of generating and exporting sugar.

*Esaú Artiga
Economist
University of El Salvador*

⁴⁰ (Amando Lopez Community Board 2015)

⁴¹ (Human Rights Watch 2004)

⁴² (Urbino Rodriguez, et al. 2012)

“Producing sugarcane is not bad in and of itself. The bad comes from the management and interest behind sugarcane. In theory the grower is the owner of his land, but the ones in control are the mills; the ones behind the growth are the mills.”

Miguel Ramirez

Movement of Organic Farmers in El Salvador

Though they endure such difficult conditions, a 2016 documentary produced by the University of Central America reports that the minimum wage for sugarcane field workers is just \$3.64 a day, \$0.30 less than the minimum for other agricultural workers. If a worker cuts cane for 30 days in a month, he earns \$109.20, far below what a Salvadoran family needs to survive. Julio Castro, the Executive Director of CONSAA argues that workers make more than that -\$4 or \$5 a day. He also said “the

mills would like to pay more, but there is a reality that sugar and coffee are commodities that respond to a global demand, and that affects what they can pay, but the industry pays very good wages.”⁴³ To put that salary into perspective, economist Esua Artiga reports that mill technicians earn \$800 a month.⁴⁴

Milling

When cane reaches the mills (there are six in El Salvador), workers extract juice by running the cane through a series of presses and grinders. The pulp is sold off to use for making paper or producing energy, while the juice goes through a clarification process to remove impurities. The clarified juice is drained into evaporators where it is boiled down to cane juice. The mill then evaporates the cane juice to produce sugar crystals and molasses. The mill evaporates the molasses again to remove the remaining sugar, leaving back-strap molasses.^{45 46}

Neoliberalism and the Domestic and International Demand for Sugar

Large-scale sugarcane production is a manifestation of El Salvador’s commitment to neoliberal economic policies. According to CorpWatch, neoliberalism promotes free markets, deregulation, privatization, and elimination of the concept of the “public good.”⁴⁷ Since the end of the civil war (1980-1992), the Salvadoran government has embraced neoliberalism by privatizing public assets, making the U.S. dollar the official currency, signing free trade agreements, and adopting a public-private partnership law and other policies.⁴⁸ Most recently, El Salvador joined Guatemala and Honduras in developing Plan of the Alliance for Prosperity in the Northern Triangle, which posits that the way to stem the flow minors fleeing to the United States⁴⁹ is by attracting more investment and creating jobs in tourism, light manufacturing, textiles, and agro-industry.⁵⁰ For El Salvador, agro-industry means more sugarcane.

(Truck waiting to be loaded with sugarcane)



⁴³ (Audiovisuales UCA 2016)

⁴⁴ (Artiga 2015)

⁴⁵ (Ovando 2014)

⁴⁶ (Ingenio La Cabana 2010)

⁴⁷ (Martinez and Garcia n.d.)

⁴⁸ (J. E. Martinez 2016)

⁴⁹ Elizabeth Kennedy, who has conducted years of research on the issue has found that minors are fleeing due to violence. Economist Julia Evelyn Martinez and some political scientist are concluding that violence in the Northern Triangle is a product of neoliberal economic policies and globalization. It is ironic that these governments plan to address a problem likely caused by neoliberalism with opening the economy even more.

⁵⁰ (El Salvador, Guatemala, and Honduras 2014)

These neoliberal policies have benefited large-scale sugarcane growers in a few ways. One is the unregulated use of capital. Instead of protecting small farmers with price guarantees or other incentives to keep them farming, the government allows for the free use of capital, primarily land. Instead of competing with subsidized corporate farms in the U.S. for shares of Salvadoran markets, many small farmers lease their land to sugarcane growers and live off remittances from family that has migrated. Another benefit of neoliberalism is that growers operate free of environmental and labor regulations. Yet another benefit is that free trade agreements guarantee that sugarcane growers can sell to the United States and Europe with lower import tariffs. Contrary to principals of free markets and trade, the Salvadoran government also protects the domestic sugar market from cheaper imports from Nicaragua, Honduras, and Guatemala.

Domestic Markets

In El Salvador, sugarcane distributors sell raw, white, and refined sugars to final consumers in supermarkets and other stores, while mills sell directly to companies like Coca-Cola. In 2013, the Salvadoran population (6.5 million people) consumed 6.1 million quintals of sugar, an average of 95 pounds per person.⁵¹ As mentioned, El Salvador protects its domestic markets with a 40% tariff, enough to prevent cheap sugar from Honduras or Nicaragua from undercutting Salvadoran producers. The government justifies the tariff because sugarcane “is an important driver of rural income and employment,” and Central American countries have yet to agree on a harmonized import tariff.⁵²

The domestic price of sugar in El Salvador has increased in recent years due in part to the growing demand from international markets. According to representatives of FUTESCAM (the Foundation for Peasant Land and Hope), domestic prices are high because international prices have fallen, and distributors and mills try to make up the difference by raising local prices. With tariffs in place, they can raise prices without worrying about competition with growers in neighboring countries.⁵³ If the principals of free trade and markets were applied evenly, Salvadoran growers would have to compete against cheaper imports and there might be more incentive for landowners to continue farming

Exports and Preferential Markets

According to the U.S. Department of Agriculture (USDA), El Salvador was expected to export 430,000 metric tons of sugar in 2014/2015 and 450,000 in 2015/2016.⁵⁴ The largest importers of Salvadoran sugar are China, South Korea, Taiwan, the United States, Canada, Indonesia, and the European Union.⁵⁵

The United States has two quotas for buying Salvadoran sugarcane – one under the World Trade Organization (WTO) and another under the Central American Free Trade Agreement (CAFTA). The quotas allow Salvadoran distributors to sell a guaranteed amount of sugar products in U.S. markets at a relatively low tariff. The WTO Tariff-Rate-Quota allocation for El Salvador for FY2015 was 27,379 metric tons raw value.⁵⁶ The CAFTA quota allows another 32,340 metric tons of sugar products to enter the

⁵¹ By comparison, the average person in the United States consumes between 150-170 pounds of sugar in a year. (G. Hernandez 2013)

⁵² (Herrera 2015)

⁵³ (FUTESCAM 2015)

⁵⁴ (Herrera 2015)

⁵⁵ (Pastron 2015)

⁵⁶ (Office of the United States Trade Representative 2014)

United States at a low tariff. El Salvador has maxed out its CAFTA sugar quota every year except for 2010 and 2012.⁵⁷ El Salvador is also part of a Trade Association Agreement between Central American and European countries that allows growers to export 25,088 metric tons of sugar to Europe.⁵⁸ El Salvador is planning to export 430,000 metric tons of sugar products during the 2014/2015 zafra and 450,000 metric tons in 2015/2016.⁵⁹

The USDA also permits U.S. refiners to import low-duty sugar products from El Salvador to refine and re-export on the world market, allowing them to stay competitive.⁶⁰ In 2014/2015, US refiners bought 85,690 metric tons for re-export, a number that is expected to grow to 94,000 metric tons in 2015/2016.⁶¹ In January 2015, El Salvador celebrated a large sale of sugar to China – 50,000 tons, which represented 10% of the country's exportable sugar.⁶² China is the largest sugar market in the world, consuming 12 million tons a year. The sale to China put \$20 million into the pockets of Salvadoran producers. At the time of the sale, the Vice Minister of the Economy said it would contribute to the 50,000 direct jobs and 200,000 indirect jobs that the sector adds to the national economy.⁶³

The price of sugar in international markets has fallen over the past five years, from a high of \$0.2947 per pound in July 2011 to \$0.1067 in August 2015.⁶⁴ One analyst said that low oil prices means that demand for Ethanol is down, causing prices to fall as well.⁶⁵

Other Sugarcane Products

In addition to selling sugar, the mills sell the molasses, the liquid left after the sugar crystals have been removed. Molasses is used for producing ethanol and other alcohol products, cattle feed, and fertilizers. In 2013/2014, the mills produced 51,473,360 gallons of molasses. The mills sold just 13.6% of their molasses domestically at a price of \$0.68 per gallon, and exported the other 86.40% at a price of \$0.50 per gallon. The net income from molasses in 2013/2014 was just short of \$27 million.

Once the mills have extracted sugar and molasses from the cane, there is one more product left to sell - the crushed stalks called *bagacillo*, or bagasse. The mills sell it to power companies who burn it to produce energy. According to FUTESCAM, the mills make \$50 million a year selling bagasse.⁶⁶ The Clean Energy Council of Australia reports that every 10 tons of sugarcane crushed produced about 3 tons of bagasse.⁶⁷

⁵⁷ (U.S. Customs and Border Protection n.d.)

⁵⁸ (Herrera 2015)

⁵⁹ (Herrera 2015)

⁶⁰ (US Department of Agriculture n.d.)

⁶¹ (Herrera 2015)

⁶² (Pastron 2015)

⁶³ (Rivas 2015)

⁶⁴ (Index Mundi 2016)

⁶⁵ (Srivastava 2014)

⁶⁶ (FUTESCAM 2015)

⁶⁷ (Clean Energy Council 2014)

Impacts of Sugarcane Production



(The Bajo Lempa says NO to the Mono-cultivation of Cane, in the Defense of Life and Territory!)

Large-scale sugarcane production has profoundly negative impacts on the environment, public health, and sustainability of the communities where it is grown. The Ministry of the Environment 2013 National Strategy for Biodiversity recognized as much when it reported, “the agricultural practices used to cultivate sugarcane in El Salvador are based in technology that causes significant harm to the health [of the population], soil, and environment. Of the practices used, the worst negative impacts are burning and the use of agrochemicals.”⁶⁸

Miguel Ramirez from the Organic Agricultural Movement of El Salvador points out that “producing sugarcane is not bad in and of itself. The bad comes from the management and interest behind sugarcane. In theory the grower is the owner of his land, but the ones in control are the mills; the ones behind the growth are the mills.”⁶⁹

Sugarcane is Better for the Environment?

Before detailing the affects of large-scale sugarcane production, it is necessary to refute an assertion made by the Association of Salvadoran Sugarcane Producers that sugarcane production is good for the environment. Their claim is that “the high production of biomass of sugarcane, the production of environmentally friendly bi-products, the requirement of carbon dioxide (CO₂), and the release of oxygen into the environment contribute to improving the ecosystem. To plant one hectare of sugarcane is the equivalent of planting two hectares of native forest.”⁷⁰

Like other plants, sugarcane absorbs carbon during photosynthesis and stores it in its vegetation and eventually underground. However, any carbon absorbed is released again when growers burn their fields and plow their land, and mills process the cane into sugar and molasses. Deforestation is one of the largest contributing factors to increased atmospheric carbon. Cutting down native forests releases carbon that has been sequestered for millennia, and planting sugarcane cannot undo that damage. One study on the topic found that “soil organic carbon can accumulate by processes that essentially reverse some of the effects responsible for soil organic losses when land was converted to perennial vegetation.”⁷¹ That means the only way to



⁶⁸ (Ministry of the Environment and Natural Resources 2013)

⁶⁹ (Ramirez 2015)

⁷⁰ (Association of Sugarcane Producers of El Salvador 2016)

⁷¹ (Post and Kwon 2000)

recapture and store carbon is by planting perennial vegetation. Sugarcane is not a perennial coverage – it is a crop that is grown and harvested, and then removed when it is no longer profitable. It is simply untrue and disingenuous to assert that planting sugarcane is in any way more beneficial than native forests.



Destruction of Topsoil

The Food and Agriculture Organization of the United Nations says soil health is “the continued capacity of soil to function as a vital living system, within ecosystem and land-use boundaries, to sustain biological productivity, promote the quality of air and water environments, and maintain plant, animal, and human health.”⁷²

Unfortunately, many aspects of large-scale sugarcane production are bad for soil health – tilling and burning fields at harvest being among the worst. The intensive tilling practices used in sugarcane production are very harmful to topsoil. The Integrated Crop Management website reports that frequent tilling results in poor soil quality. “Since tillage fractures the soil, it disrupts soil structure, accelerating surface runoff and soil erosion. Tillage also reduces crop residue, which helps cushion the force of pounding raindrops. Without crop residue, soil particles become more easily dislodged, being moved or splashed away... Splashed particles clog soil pores, effectively sealing off the soil’s surface, resulting in poor water infiltration.” In addition, “frequent tillage also results in a complete breakdown of soil structure... bringing microbial activity to a halt.”⁷³

The World Wildlife Fund adds, “when natural vegetation is cleared and when farmland is ploughed, the exposed topsoil is often blown away by wind or washed away by rain.”⁷⁴ This is a big deal “because it takes up to 300 years for 1 inch of agricultural topsoil to form, soil that is lost is essentially irreplaceable.” “Erosion affects productivity because it removes the surface soils, containing most of the organic matter, plant nutrients, and fine soil particles, which help to retain water and nutrients in the root zone where they are available to plants. The subsoil that remains tends to be less fertile, less absorbent, and less able to retain pesticides, fertilizers, and other plant nutrients.”⁷⁵

Burning sugarcane at harvest further degrades the health of topsoil. The extremely high temperatures bake soil like clay in a kiln. Margarita Garcia, an official from the Ministry of the Environment, told Voices on the Border, “We as a society tend to see the impacts [of sugarcane] from the ground up, but what happens to the soil underneath when we burn? It affects the whole ecosystem. There are elements that give life to the soil’s microorganisms and affect the fertility of the soil.”⁷⁶

⁷² (Food and Agriculture Organization of the United Nations, 2008)

⁷³ (Al-Kaisi, Hanna, & Tidman, 2004)

⁷⁴ (World Wildlife Fund n.d.)

⁷⁵ (Trautmann, Porter, & Wagenet, 2012)

⁷⁶ (Garcia, 2015)

“There are other problems like irrigation – in the coastal regions they irrigate sugarcane. As a country that does not have the quantity and quality of water available, we are entering a period of water stress. When they irrigate large extensions of sugarcane, this limits the amount of water available for other uses.”

Margarita Garcia
Ministry of the Environment

A 2012 study compared sugarcane fields in Brazil, burned and non-burned, and found, “soil chemical fertility under the sugarcane without burning was better than under sugarcane with burn.” The differences were significant. “The TOC (Total Organic Carbon) values for native forest and for the harvesting without burn were higher than those under the sugarcane with burn (148% and 54%, respectively). This superiority was also confirmed for TN (Total Nitrogen), L-C (Labile Carbon) and R-C (Recalcitrant Carbon). An even more significant difference was found under natural forest and sugarcane without burn for MB-C (microbial biomass carbon), which was 222% higher under

native forest and 102% higher under sugarcane without burn than the value under sugarcane with burn, confirming that MB-C could be a reliable indicator of soil quality for monitoring soils under different sugarcane harvesting systems.”⁷⁷ This means that soil is healthiest under native forests and sugarcane fields that have not been burned, and significantly lower under fields that have been burned.

While sugarcane growers in other countries are moving towards no-till production, this is not even part of the conversation in El Salvador. But without question, the heavy tilling practices and burning of crops before harvest destroy the soil where sugarcane is grown.

Depletion of Water Supplies

Large-scale sugarcane production also diminishes El Salvador’s already limited water supplies. Jason Clay of the WWF estimates that it takes “1,500-3,000 liters (396-792 gallons) of water to produce 1 kg (2.2 lbs) of sugar.” In processing cane, mills use another 10 cubic meters (2,641 gallons) of water to wash each metric ton (1.1 tons) of sugar.⁷⁸

Salvadoran sugarcane growers produce cane in the hottest, driest time of year (November to April) and rely heavily on irrigation. Small farmers in the Bajo Lempa report that water tables have fallen dramatically in recent years and they blame it on the increased production of sugarcane, and the government’s failure to regulate water consumption.

Margarita Garcia at the Ministry of the Environment told Voices on the Border, “In the coastal zone they irrigate sugarcane. As a country we do not have water in quantity and quality, and are entering a situation of water stress. They irrigate large expanses of sugarcane and this limits



⁷⁷ (Souza, et al. 2012)

⁷⁸ (Clay, 2012)

the amount of water available for other uses.”⁷⁹ Guillermina Rivas, a member of the municipal council of Tecoluca said much the same. “Another problem [with cane] is the use of water. The sugarcane growers irrigate their fields, installing large pumps, and extract large quantities of water, leaving no water for us to use on our small parcels.”⁸⁰ A participant in a focus group in Nueva Esperanza added that sugarcane “consumes very large quantities of water, so it takes large investments to grow it. The people with economic resources are digging wells and take water all the way to the bottom of the aquifers so they have enough to water their sugarcane, and that leaves the water sources for human consumption all dried up, and that is dangerous.”⁸¹

Small farmers in the Bajo Lempa grow traditional crops such as corn, beans, sorghum, vegetables, and others during the rainy season, May to November. In a normal year, the rains are enough to produce healthy crops that feed local families and generate some income. Climate change has had an adverse affect on the rain cycles, which in recent years has resulted in drought. The overuse of water by sugarcane growers has meant that there is not enough water in the region’s aquifers to help these small farmers get through these droughts.

Contamination of Agrochemicals

Contamination of agrochemicals is perhaps the biggest concerns for those who live near sugarcane fields. Toxic pesticides and fertilizers contaminate nearby water and soil resources, as well as farms, field workers, and local communities.

Sugarcane growers apply fertilizers, fungicides, herbicides, and pesticides using crop-dusters, backpack sprayers, and

spreaders pulled by tractors. Geologist Brenda Hicks reports that it is nearly impossible “for pesticides to only affect its targeted crop.”⁸² The same is true for fertilizers, herbicides, and other chemical inputs – they all drift into nearby fields and communities, leach into the soil, and travel through surface and underground water resources. By some estimates, “when pesticides are applied to protect a crop from pests and diseases, only around 15% of the preparation hits the target and the rest will be distributed into the soil, water, and air; and finally reach nearby water bodies through run-off.”⁸³

According to agronomist William Hernandez, when farmers apply agrochemicals via crop-duster, they have to use a greater concentration because the drift is much worse. In order to apply the correct quantity of chemicals on the intended targets, growers have to apply more and at greater concentrations.⁸⁴ If only 15 % of the chemicals are hitting their target, this is bad news for the forests, rivers, farms, schools, soccer fields, and other places where the other 85% settles.

“The ripeners affect is most of all – I don’t know what kind of chemical it is. More than anything when they apply it with the airplanes or helicopters it doesn’t fall directly on the crop – some of it does, but the wind carries most of it to neighboring houses, gardens where they grow fruit. The affects of the ripeners are felt the most on vegetables like chiles, tomatoes, which are more delicate.”

*Focus Group Participant
Comunidad Amando Lopez*

⁷⁹ (Garcia, 2015)

⁸⁰ (Rivas, 2015)

⁸¹ (Nueva Esperanza Focus Group 2015)

⁸² (Hicks, 2012)

⁸³ (Hegde, Mandya , Gokarnakar, Babu, & Shivaramaiah)

⁸⁴ (Hernandez, 2015)

“If regulation of agrochemicals is a priority, they could do it – the government has sufficient funds and if it were a priority, they would be able to regulation them.”

*Amy Angel
Economist, FUSADES*

Wind is a big problem for spreading agrochemicals beyond their intended target. Whether it’s a crop duster, backpack sprayer, or a spreader pulled by a tractor, if the wind is blowing, the chemicals will drift. The concern is so great that environmental laws and regulations around the world prohibit application of agrochemicals when the wind blows above a set level. With regards to the drift of ripeners, the Louisiana State University Ag Center website

says, “glyphosate can cause serious damage when drifted onto non-target sites, such as newly planted cane, other crops or residential landscapes. Drift-control agents may be added to reduce drift. However, ripeners should only be applied when wind speeds are between 3 and 10 mph and should not be applied when there is a surface temperature inversion.”⁸⁵

Guillermina Rivas, a member of the municipal council of Tecoluca told Voices on the Border that one reason the municipality wanted to regulate sugarcane production was due to the impacts of drifting agrochemicals. “There are many reasons we drafted the ordinance [that regulates sugarcane and agrochemicals]. Nine years ago we started to work on a popular movement to organize farming (MOPOA). Through this movement we have undergone many processes with the goal that the people will improve their way of life. One of these was to produce cashew nuts and certify them as organic. We also produced vegetables. Little by little people lost their motivation and are leasing their land to cultivate sugarcane. Many times our cashew crops border with sugarcane fields, and when they spray ripeners our cashews are affected. The flower falls off and we lose our crops and organic certification.”⁸⁶

In addition to drifting, agrochemicals soak into the soil where organisms consume and pass them up the food chain. Agrochemicals also migrate through soil via rain and irrigation water, which transports them to groundwater, streams, rivers, and on to the ocean. Once agrochemicals enter these water resources they adversely affect fish and other aquatic life, as well as any flora or fauna that consumes the water, including humans.



Runoff of agrochemicals is especially dangerous in regions like the Bajo Lempa that are home to important ecosystems such as mangrove forests and wetlands, gallery forests, and agricultural land. In discussing mangrove ecology, the Encyclopedia of Earth reports, “runoff from agricultural fields represents the main source of organic chemical contamination in mangrove ecosystems. Little is known about the effects of pesticides in mangroves and associated fauna, although chronic effects are likely.

⁸⁵ (Gravois 2015)

⁸⁶ (Rivas, 2015)

As with heavy metals, many of these compounds are absorbed onto sediment particles and degrade very slowly under anoxic conditions.”⁸⁷ *The Marvelous Mangrove Australia* has entire chapter dedicated to the human impacts on mangroves. It reports that groundwater carries agrochemicals into mangrove forests. Contaminated groundwater flows through mud due to tidal differences of the water table and can be flushed through animal burrows through tidal change.⁸⁸ Similarly, a 2012 report on sugarcane production in the Bajo Lempa concluded that spraying agrochemicals resulted in a loss of tomatoes, chilies, and other vegetables. The contaminated products [that survive] go on to the city where they are consumed.⁸⁹



(In 2014, growers wanted to plant sugarcane on a 680-acre field at the head of this estuary in the Bajo Lempa. Communities feared that chemical runoff and drift would pollute the waters and destroy the dense mangrove forests.)

The heavy use of agrochemicals on sugarcane has a profound impact on the health of the communities where it is grown. Many believe that the extremely high rates of renal failure in the Bajo Lempa are a result of the agrochemicals that contaminate the region. Guillermina Rivas told Voices, “there are a large number of people suffering with renal failure. Many say that it has nothing to do with agrochemicals, but the amount that they apply is exaggerated.”⁹⁰

Most residents of the Bajo Lempa settled in the region in 1992 as El Salvador’s civil war came to an end. By 1999, public health officials began noting the high rates of renal failure in the region. Dr. Ramón Antonio Garcia Trabanino told Voices that when they first began documenting patients, they were stumped because their diseases were not linked to diabetes or hypertension.⁹¹ Over the past 17 years, tens of thousands of people along El Salvador’s coast have died from renal failure. Many people attribute the epidemic to the toxic agrochemicals used on the region’s cotton plantations for decades before the war, and on their present use on sugarcane cane. A paper published by the U.S. National Institute of Health in 2013 argues that glyphosate, the active ingredient in Monsanto’s line of Roundup herbicides and ripeners, “may explain the recent surge in kidney failure among agricultural workers in Central America.”⁹²

The newest theory about what is causing the renal failure epidemic is that agricultural workers work long hours in the hot sun with inadequate access to shade and water. There are pilot programs in sugarcane fields to provide workers with better conditions to see if that lowers the rates of renal failure. But many experts believe that the agrochemicals are at least part of the problem - there are

⁸⁷ (National Oceanic and Atmospheric Administration-Earth System, 2014)

⁸⁸ (Mangrove Action Project 2014)

⁸⁹ (Urbino Rodriguez, et al. 2012)

⁹⁰ (Rivas, 2015)

⁹¹ (Trabanino, 2015)

⁹² (Samsel and Seneff 2013)



(One of many families in the Bajo Lempa affected by the renal failure epidemic)

many renal failure patients that have never worked in sugarcane fields or even in agriculture. Some public health officials believe that it might be a combination of heat and failure to drink water and exposure to agrochemicals. The lack of water allows agrochemicals to accumulate in the body and damage the kidneys.

Agricultural Economist Amy Angel told Voices on the Border, the “issue of agrochemicals is where we see the weakness of the regulatory system. There is no effective control with consequences that are respected. If the regulation of the use of agrochemicals were a priority, they would do it. The government has sufficient means and if it was a priority they would do it.”⁹³ This was also a conclusion from a 2012 report on sugarcane – “State organizations have the knowledge, studies, and laws, [to regulate the use of agrochemicals] but they do not apply them. The State ought to be more strict in the application of the laws and ordinances.”⁹⁴

Margarita Garcia told Voices on the Border, “with regards to the issue of agrochemicals, we do not have conclusive data, but the precautionary principal says that one should avoid activities before there is the possibility of environmental damage.”⁹⁵ That means growers should stop using agrochemicals as precaution, so they do not run the risk of harming the environment and causing harm to local populations.

Burning Sugarcane

When Voices interviewed communities in the Bajo Lempa about sugarcane production, one of the biggest concerns expressed was the impact that burning fields has on local populations. During the dry season – January to April – it seems as though the whole region is on fire. The smoke and ash from the fires contaminate homes, crops, and water, and cause respiratory illnesses.

The science backs their concerns. One 2006 study published in the journal *Environmental Health Perspectives* reports an “adverse impact of sugarcane burning emissions on the health of the population, reinforcing the need for public efforts to reduce and eventually eliminate this source of air pollution.” The study found that in Brazilian communities where sugarcane is grown, during the burning season the number of children and elderly admitted to the hospital for respiratory illness were much higher than admissions during the non-burning seasons. “The effects during the



⁹³ (Angel, 2015)

⁹⁴ (Urbino Rodriguez, et al. 2012)

⁹⁵ (Garcia, 2015)

burning period were much higher than the effects during non-burning period.”⁹⁶ Another study in Honduras concluded, “outdoor air pollution in an agricultural area where sugarcane is burned for much of the year is associated with a high prevalence of pediatric asthma, atopy, and eczema.”⁹⁷ The particulates from burning sugarcane cause environmental rhinitis, “the medical term for excess mucus, congestion and sneezing... where particles clog or irritate nasal passages.” The smoke affects some people worse than others. The only treatment is to stay indoors and use a sinus rinse and saline nose spray. At times rhinitis can be treated with medications such as Zyrtec, which are designed to help allergies. But environmental rhinitis is not caused by allergies and medications generally offer little relief.⁹⁸

Residents of the Hawaiian island of Maui are having a heated debate over sugarcane production and specifically, the issue of burning. Residents complain that smoke contaminates communities when the island’s only sugarcane farm burns their 36,000 acres of sugarcane. Residents report lung cancer and reactive airway disease, and teachers say their students suffer from asthma and nosebleeds when the fields are burning. Maui residents created a website where people can file complaints, and last year alone they received 1,100 of them. Comments left for an on-line article reporting on the issue seem to represent two sides of the debate. One commenter says she supports the burning of sugarcane and the sugarcane industry. “It is steeped with history and provides hundreds of jobs for our local community.” She also says that she and her friends and family have not experienced asthma directly related to burning.⁹⁹ Another commenter responded that her group has “posted several peer review studies showing that Ag[cultural] smoke DOES cause lung disease on StopCaneBurning.org.”¹⁰⁰ The organization that maintains the site has also filed lawsuits and taken other actions that might be interesting for communities in the Bajo Lempa to learn more about.

Biodiversity and Local Ecosystems

Biodiversity is the “variety of life,”¹⁰¹ and essential because it “boosts ecosystem productivity, where each species, no matter how small, have an important roll to play. A larger number of species means a greater variety of crops. Greater species diversity ensures natural sustainability for all life forms. Healthy ecosystems can better withstand and recover from a variety of disasters.”¹⁰² Simply put – Salvadorans will be healthier and less vulnerable to disasters if they promote biodiversity and ensure that their ecosystems are diverse, resilient, and more capable of sustaining life.

Biodiversity and mono-crop production of sugarcane are mutually exclusive. “In natural ecosystems the internal

“For example, recently we heard that there was 400 hectares of protected land that they cut down. No one knows who did it – the land supposedly belonged to the state, and they said that they don’t know anything about it. [Government officials] are not interested because right now the government wants to generate economic activities, money. They don’t want to generate environmental awareness, and if you file a complaint against them, they threaten you.”

Focus Group Participant
Comunidad Amando Lopez

⁹⁶ (Cancado, et al., 2006)
⁹⁷ (Herrera-Camino, et al., 2014)
⁹⁸ (Albright, 2012)
⁹⁹ (Munchies Staff, 2105)
¹⁰⁰ (Stop Cane Burning on Maui, 2015)
¹⁰¹ (National Wildlife Federation n.d.)
¹⁰² (Shah 2014)

regulation of function is substantially a product of plant bio-diversity through flows of energy, nutrients and information, this form of control is progressively lost under agricultural intensification so that ultimately the only integrated ecosystem function is invested in the below-ground subsystems, regulated predominately by chemical inputs of industrial origin.”¹⁰³ This means that as biodiversity is lost to mono-crop production, land becomes increasingly unable to support life, except through inputs such as fertilizers, herbicides, fungicides, and pesticides. Biodiversity is lost when growers destroy forests and other ecosystems to plant large extensions of crops. The loss of plant life results in the loss of insects and vertebrate species that no longer have a habitat. The plants, insects, and vertebrates that survive in the new agricultural setting proliferate due to the lack of predators, requiring that farmers use pesticides to keep them under control. This in turn leads to further reduction in biodiversity and destruction of the ecosystems.¹⁰⁴

El Salvador has allowed the majority of the country’s forests to be cut down. Today, less than 2% of El Salvador’s primary forests survive, and less than 10% of the country is “vegetated.” Deforestation occurred to make room for crops such as coffee, indigo, cotton, and now sugarcane. Recently, the Ministry of the Environment and the National University of El Salvador studied satellite images and determined that sugarcane coverage grew 30,000 hectares between 2000 and 2010. The greatest concentration of the growth came along the coast in San Miguel, Sonsonate, La Paz, San Vicente, Chalatenango, and Usulután. In 2007 there were 274,321 hectares of forest in El Salvador, not including coffee. That total was 48,280 hectares less than it was in 1998. One of the most important forest ecosystems in El Salvador is mangroves.¹⁰⁵ In the 1950s, El Salvador had more than 100,000 hectares of mangrove forests. Today, there are only 40,000. Due to the destruction of these habitats, 10% of all species living in El Salvador are threatened or endangered.

“We need a campaign to wake people up and say, look, in place of planting cane it’s better if you plant [crops], because the people that [lease their land to plant cane] have a contract for five years. The [growers] burn every year, and when the landowners return afterwards their land is arid and sick, and there are no nutrients. Then they have to wait another 5 years to allow the land to heal.”

*Focus Group
Comunidad Amando Lopez*

In a 2004 report *Environmental Impacts of Sugar Production*, the World Wildlife Fund concluded, “the environmental impacts of sugarcane production have been largely ignored. Sugarcane plantations in many tropical and subtropical countries have led to perhaps the largest loss of biodiversity of any single agricultural project. Although much of this habitat and species loss is historic, sugar production today has a wide range of negative impacts on soil, water, and air in parts of the world that environmental organizations, such as the World Wildlife Fund, have identified as globally important.”¹⁰⁶ In a slide presentation, Jason Clay from the WWF reported, “historical clearing of a wide range of unique habitats for sugarcane cultivation is probably one of the most significant causes of biodiversity loss from agriculture on the planet.”¹⁰⁷

¹⁰³ (Swift and Anderson 1994)

¹⁰⁴ (Steve 2012)

¹⁰⁵ (Ministry of the Environment and Natural Resources 2012)

¹⁰⁶ (Cheesman 2004)

¹⁰⁷ (Clay 2012)

Biodiversity and farming do not have to be mutually exclusive. Farmers have produced food for thousands of years without destroying their host environments. In fact, there are farmers in the Bajo Lempa that produce more than 70 varieties of fruits and vegetables without using agrochemicals or destroying their land. Instead they use traditional methods that maintain balance and biodiversity. They even grow sugarcane. The difference is that they do not use heavy tilling practices or agrochemicals, and they do not burn their fields.

Food Production



(Organic Farmer in the Bajo Lempa who produces more than 70 varieties of fruits and vegetables on his small plot of land)

Sugarcane is not a food that can sustain Salvadorans, and land dedicated to sugarcane production is land that is not being used to feed people. According to a 2013 United Nations Commission on Trade and Development report titled *Wake Up Before It's too Late*, "the world needs a paradigm shift in agricultural development: from a 'green revolution to an ecological intensification approach. This implies a rapid and significant shift from conventional, monoculture-based and high-external-input-development industrial production towards mosaics of sustainable, regenerative production systems that also considerably improve the productivity of small-scale farmers."¹⁰⁸

Economist Miguel Altieri said something similar. "Multifunctional agriculture can emerge only if landscapes are dominated by hundreds of small bio-diverse farms, which studies show can produce between two and ten times more per unit area than large farms. Several studies show that small and medium farmers deliver a total output greater than extensive monocultures, and

reduce erosion and conserve more biodiversity. Communities surrounded by small farms exhibit fewer social problems (alcoholism, drug addiction, and family violence) and healthier economies than those surrounded by large mechanized farms."¹⁰⁹

In the Bajo Lempa, sugarcane growers are displacing the kinds of small-scale farmers that the UN report says the world needs more of, and that Mr. Altieri said are more productive and better for the biodiversity and society. The problem is that the Salvadoran government has prioritized the production of tradables, products to sell on international markets, over domestic food production.¹¹⁰ Under the current neoliberal economic model, the Salvadoran government would rather that land in the Bajo Lempa and other fertile regions of El Salvador be used to produce sugar that can be sold to the U.S. and China, than vegetables and dairy for domestic markets. While sugarcane production does generate wealth for investors, it is not distributed equally. The communities where sugarcane is grown and even the workers in the fields do not have a share in those profits and remain unable to feed their families. More importantly, those that live in and around sugarcane fields have to pay the environmental, public health, and social costs of the sugarcane production.

¹⁰⁸ (United Nations Conference on Trade and Development 2013)

¹⁰⁹ (Altieri 2009)

¹¹⁰ (U.S. Department of State 2011)

The emphasis on tradables and production of sugarcane has increased the demand for land in regions like the Bajo Lempa. People who want to get into small-scale farming cannot do so because land is so expensive to rent or buy. Similarly, people with land are finding it easier and more beneficial to rent their land to sugarcane growers than to farm. This means that more land is being used to produce sugarcane than to produce food.

Laws and Regulations

There are several existing laws and regulations that Salvadoran officials should enforce against large-scale sugarcane producers in order to decrease the impacts on communities where it is grown.

For example, Article 262-A of the Penal Code bans all burning of crops and agricultural fields – the exception is an activity that is strictly cultural.¹¹¹ Margarita Garcia says that so far large-scale growers have skirted around the ban by arguing they fall within that strictly cultural exception.¹¹² Large-scale growers rent land, hire workers and machinery, buy agro-chemicals, and sell cane to mills - and they do it to make money. Growing sugarcane in this manner is an economic venture, not cultural. Small farmers that grow patches of cane that they process at their local trapiche might fall into the cultural exemption, but they do not burn their crops. The Ministry of the Environment and State Prosecutors should prosecute large-scale growers that burn and challenge this idea that burning large fields of cane is strictly cultural.

“The act of intentionally burning stubble or crops of any nature, will be sanctioned with a fine of between 10 and 200 days [income]... The exception will be farmers whose agricultural labor is strictly cultural.”

*Article 262 A
Penal Code*

According to Margarita Garcia from the Ministry of the Environment, the government should be applying Article 42 to large-scale sugarcane production.¹¹³ Article 42 says that all people, natural or legal, should avoid actions that deteriorate the environment. It also requires that all people prevent environmental contamination that could harm health, quality of life, and ecosystems. Finally it requires that people avoid activities that contaminate the air, water, soil, and coast.¹¹⁴ Many aspects of sugarcane production run afoul of Article 42 – heavy tilling, burning crops, and use of agrochemicals. Under this provision alone, the Ministry of the Environment should shutdown most large-scale sugarcane operations, or at least requires them to dramatically alter the way they operate.

Margarita Garcia also said that every sugarcane project has to submit an environmental application to determine whether they need to submit an environmental impact analysis and secure an environmental permit. She says that not one grower, however, submits even the environmental application, and the Ministry does not have the authority to make them do so. “Even when a person files a complaint against a grower that does not have a permit, the law does not enable [the Ministry] to stop their work. We suggest they stop and submit an environmental application, but it is just a

¹¹¹ (Legislative Assembly 1997)

¹¹² (Garcia 2015)

¹¹³ (Garcia 2015)

¹¹⁴ (Legislative Assembly 1996)

suggestion. We cannot stop a project; the law does not give us any authority to stop any type of project. All we can do is ask that they stop and go through the process.”¹¹⁵ Other legal scholars that we spoke to seemed to indicate that the Ministry does have the authority to enforce the laws but is choosing to not enforce it.

A majority of sugarcane grown along the coast of El Salvador is in or near protected areas. There are many laws that can be used to regulate cane in these areas. The Law on Protected Natural Areas and the Law on the Conservation of Wildlife can be used to limit the affect of sugarcane.

Municipal ordinances are another mechanism for regulating sugarcane production. Local governments have the authority to enact ordinances to limit burning, use of agrochemicals, and other aspects of production. The Municipal Government of Tecoluca, San Vicente passed such an ordinance last year with the help of the Ministry of Environment and civil society organizations. Guillermina Rivas of the Tecoluca Municipal Council said, “national regulations already exist but they do not enforce them, and for that reason our ordinance is important, so that we can achieve what the laws have already established.”¹¹⁶

In 2010 civil society organizations presented a draft ordinance on sugarcane to the Mayor of Jiquilisco. At the time the authors said, “We are not against the cultivation of sugarcane, which provides an important source of income for the country. However, we oppose the practice of burning and the use of fertilizers and agrochemicals because they affect our crops and harm our natural resources.”¹¹⁷ Nelson Calero, President of the Association of the Communities of the Bajo Lempa says that if the Municipal government has made progress on the ordinance it has been without any input from the local population. He said the ordinance came up in a recent conversation with officials from the Mayor’s office, and it was clear that the focus is on regulating aspects of the industry and not prohibiting new crops. Mr. Calero added that large-scale sugarcane production is the main threat to communities of the Bajo Lempa. It prevents community development and affects the region’s natural resources.¹¹⁸

Whenever one talks about environmental laws in El Salvador, there is a common theme – there are plenty of laws but the State doesn’t enforce them. This came up in several of our conversations about sugarcane. Participants in a focus group in the Bajo Lempa community of Bajo Lempa, for example, said, “Where is the law? Here, there is no problem with law, the problem is with enforcement.”¹¹⁹

¹¹⁵ (Garcia 2015)

¹¹⁶ (Rivas 2015)

¹¹⁷ (Funes 2010)

¹¹⁸ (Calero 2015)

¹¹⁹ (Amando Lopez Community Board 2015)

Findings and Recommendations

Findings

1. El Salvador's sugarcane industry is driven by neoliberal economic policies that prioritize production of exports and deregulation. Sugarcane generates wealth for investors, while communities where it is grown suffer the environmental and health consequences.
2. Heavy tilling and burning crops quickly renders once-fertile soil infertile.
3. Agrochemicals used in sugarcane production contaminate the soil, water, and nearby farms and communities, contributing to the renal failure epidemic that plagues coastal regions. In addition, the application of ripeners before harvest destroys the crops on nearby farms.
4. The sugarcane industry's unregulated use of groundwater denies small farmers and residents access.
5. The burning of sugarcane causes respiratory illness, asthma, atopy, and eczema in local populations.
6. Large-scale production of sugarcane diminishes biodiversity and destroys ecosystems.
7. Prioritization of export crops diminishes the food security of local populations.
8. The Salvadoran government does not exercise its legal authority or enforce its environmental laws to regulate sugarcane production.

Recommendations

1. The Government of El Salvador must begin enforcing its environmental laws.
2. The Legislative Assembly should pass and the President sign into law the General Water Law as proposed by civil society organizations in 2006, along with the 2014 ban on agrochemicals, and the constitutional amendment on food security.
3. The Salvadoran government should enact more policies that benefit small farmers and local markets. These include protecting vegetable and grain markets with import tariffs like they do for sugarcane growers, and helping more rural communities create weekly farmer's markets. The government should also launch a nutrition campaign that focuses on eating locally produced goods.
4. Municipal governments should adopt ordinances that regulate agricultural practices, and help rural communities create environmental units to monitor local development issues.
5. Launch a campaign in rural communities about the impacts of large-scale agriculture, and assist them in developing food security plans that are based on local production for local consumption.
6. Create a movement of communities affected by large-scale sugarcane to advocate for the rights of the people and proper regulation of the industry.

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