

“NARCO-DEFORESTATION”:
MEDIA ANALYSIS AND SPATIAL ACTIVITY OF THE ILLICIT DRUG TRADE
AND ENVIRONMENTAL DEGRADATION IN GUATEMALA

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From ashes, we rise. Viva La Causa por la revolucion.

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Contents

List of Figures	1
Abstract.....	2
I. PROBLEM STATEMENT	3
II. BACKGROUND	5
a. Democratic Spring Challenges Post-Colonial Power Structure .	5
b. Land Reform	5
c. CIA Coup and Role of United Fruit.....	6
d. Genocide and Refuge Crises.....	7
e. Unsuccessful Peace Process.....	7
III. LITERATURE REVIEW.....	11
a. Drug Trafficking Flows in Central America.....	11
b. Environmental Impacts of Drug Trafficking	15
IV. METHODOLOGY.....	18
a. Primary Source Data Collection	19
b. Content Analysis of Media Database.....	20
V. ANALYSIS.....	23
a. Spatial Patterns of Cocaine Trafficking.....	23
i. Figure 1: Map of Air Transport.....	23
ii. Figure 2: Map of Land Transport	26
iii. Figure 3: Map of Guatemalan Transport.....	29

iv.	Figure 4: Map of Maritime Transport.....	31
v.	Figure 5: Map of All Transport.....	33
vi.	Figure 6: Map of Volume of all Transport	35
b.	Environmental Impacts	37
i.	Money Laundered.....	37
ii.	Cattle Ranching	37
iii.	Environmental Degradation.....	38
VI.	CONCLUSION.....	40
VII.	REFERENCES	43

LIST OF FIGURES

Figure 1- Map of Frequency of Cocaine Seizure by Air Transport by Department from 2000-2018.

Figure 2- Map of Frequency of Cocaine Seizure by Land Transport by Department from 2000-2018.

Figure 3- Map of Major Roads and Interstates in Guatemala (Central Intelligence Agency)

Figure 4- Map of Frequency of Cocaine Seizure by Maritime Transport by Department from 2000.

Figure 5- Map of Frequency of Cocaine Seizure by All Transport by Department from 2000-2018.

Figure 6- Map of Total (kg.) Amount of Cocaine Seizures by Department from 2000-2018.

ABSTRACT

The deterioration of the Central American forests by cattle ranchers, oil palm, and extractive industries is well documented. The extent of environmental degradation from the highly active illicit drug trade in Guatemala, however, is less understood. Drawing from a media database analyzing cocaine seizures and transport in Guatemala created by a group of researchers and students, this thesis contributes to this research gap by answering the following question: *How has cocaine trafficking varied across time, space and volume in Guatemala from the years 2000 – 2018? And what are the primary sources and patterns of cocaine trafficking events that have driven environmental degradation in Guatemala?* In analyzing the maps created with a Guatemalan media database in ArcMaps software and content analysis of the media database - this thesis identifies a highly uneven geography of cocaine trafficking and environmental impacts that differ by mode of air, land, and maritime transport.

Narco-deforestation is evident with cocaine related money laundering contributing indirectly to the creation of unsustainable markets. These unsustainable markets coercively privatize the land and perpetuates the structural degradation of sustainable indigenous communities in Guatemala. An unsustainable industry this paper examines is cattle ranching: a market that contributes directly to destructive land use practices.

I. PROBLEM STATEMENT

Citizens, politicians and the media have long decried the violence of the drug trade in Mexico and Central America.¹ Yet, due to the clandestine nature of the drug trade the impacts of this violence are hard to measure and document. Furthermore, while it is critical to understand the spatial and temporal patterns of the drug war's violence, much less is understood about the impacts on Central American environments. This thesis addresses to fill both analytical gaps by using media analysis to document the spatial and temporal patterns of the drug trade in Guatemala from the years 2000 - 2018 and its impacts on the environment and affected livelihoods.

Specifically, this research asks: How has cocaine trafficking varied across space and volume in Guatemala from 2000 - 2018? And, what are the main sources and patterns of cocaine trafficking events that are driving environmental degradation in Guatemala? To answer these questions, I will use a media database that I have helped construct. This thesis will test the following arguments: There will be geographical unevenness, with each transport mode (air, land and maritime), that shows spatial patterns of cocaine trafficking for the years 2000-2018. Cocaine trafficking will be concentrated in departments like the Petén with international borders and marine ports like Izabal in frequency and volume. And, money laundering of cocaine profits and cattle ranching are the primary drivers of environmental degradation in Guatemala and its associated socio-economic structural violence. Drug trafficking negatively impacts poor urban

¹ Heinle, K., Rodríguez-Ferreira R., Shirk D. 2017. "Drug Violence in Mexico." Justice in Mexico.

communities and rural indigenous communities living along international borders in terms of land dispossession.

Identifying the spatial patterns of drug violence in Guatemala will help people better understand the refugee crisis in Central America. Many refugees and asylum seekers coming to the United States come from Central America and the Northern Triangle.² The more variables noted to be contributing to the refugee crisis can help aid the craft of well-informed and effective immigration policies. Knowing the movement and patterns of drug trafficking will aid any future formulation of better environmental and drug policy by seeing links to one another. Today, academia lacks comprehensive research on Guatemala's drug trafficking and its effects that it has on environmental degradation. By learning about clandestine drivers of environmental degradation, like that of drug trafficking, people can know how unregulated systems contribute to environmental and economic destruction.

² Washington Office on Latin America. 2018. Fact Sheet: U.S. Immigration and Central American Asylum Seekers. *Washington Office on Latin America*.

II. BACKGROUND

In order to understand the contemporary drug trade in Guatemala we must look at its history to understand why the country is at the center of cocaine trafficking routes through Central America today.

Democratic Spring Challenges Post-Colonial Power Structure

In 1944 the Guatemalan Democratic Spring initiated. Guatemala created its first form of internationally recognized and independent state government with a type of democratic system in place.³ Juan José Arévalo won the election and was the first president of Guatemala.⁴

Land Reform

In 1951 Jacobo Arbenz Guzman became the president of Guatemala. Arbenz had seemingly more “radical” reform ideas to lessen the poverty gap in Guatemala. Of his more popular ideas was his land reform policy, *Decree 900*.⁵ The Agrarian Reform Act, *Decree 900*, would take back unfarmed land from United Fruit Company and redistribute it back to landless peasants.⁶ At this point in time, the United Fruit Company was a multinational corporation with strong ties to the United States, as the United States was

³ History. (2006). Background Notes on Countries of the World: Guatemala. *US Department of State*. pp. 2.

⁴ Ibid.

⁵ Kinzer, S., S. Schlesinger. 2005. Bitter Fruit: The Story of the American Coup in Guatemala. *Cambridge Mass.: Harvard University*.

⁶ Ibid.

the recipient of most of the produce grown.⁷ Guatemala's rich tropical resources and geographic location intrigued American political interests.⁸ The US owned United Fruit Company was the country's largest landholder when President Arbenz proposed land reform in 1952.

CIA Coup and Role of United Fruit

In 1954 the United States' C.I.A. coordinated a coup d'état against president Arbenz and installed a military dictator that was heavily right wing.⁹ This overthrow created major political instability and violence for many decades to come in Guatemala.¹⁰ In fact, due to the Guatemalan state's instability, violence increased. The Guatemalan government searched for ways to consolidate the new military dictatorship as a form of legitimate government.¹¹ The coup of 1954 brought military policies led to the beginning of a civil war in 1962, that lasted thirty-six years.¹² This civil war was vehemently an attack on Guatemala's indigenous community and therefore should be known as the Guatemalan genocide.¹³

⁷ Kinzer, S., S. Schlesinger. 2005. Bitter Fruit: The Story of the American Coup in Guatemala. *Cambridge Mass.: Harvard University.*

⁸ The Center of Justice and Accountability. 2016. Guatemala: The Silent Holocaust. *The Center for Justice and Accountability.*

⁹ Stich, S. 2018. Social Development Strategies in Peace Processes: Colombia and Guatemala. *Social Development Issues.* pp. 47.

¹⁰ Stich, S. (2018). Social Development Strategies in Peace Processes: Colombia and Guatemala. *Social Development Issues. Follmer Group.* pp. 50

¹¹ Ibid.

¹² Jonas, S. 1996. Dangerous liaisons: The U.S. in Guatemala. *Foreign Policy*, (103), pp. 144.

¹³ The Center of Justice and Accountability. 2016. Guatemala: The Silent Holocaust. *The Center for Justice and Accountability.*

Genocide and Refuge Crisis

More specifically, the Guatemalan genocide was carried out by military units under the military dictatorship regime.¹⁴ The United States was supporting the military forces by supplying resources and contributing to the genocide under the Guatemalan government by funding them with arms and ammunition.¹⁵ The thirty-six-year civil war greatly increased the number of landless peasants forced to flee their homes (lands of ancestral importance) and seek refuge. Unsurprisingly, this increased the strife in Guatemala.

Unsuccessful Peace Process

The peace process that ended the genocide failed to address the root causes of the war and in the mid-1990s Guatemala retained one of the most unequal land tenure systems in the world alongside high poverty rates and landlessness, especially among the Maya majority.¹⁶

At war's end the United States led War on Drugs rerouted cocaine trafficking on through the region.¹⁷ It is at this point in Guatemalan history that the underground drug trade took off in Central America, making the drug trade an engrained and unregulated systemic structure in Guatemala.¹⁸ During the Guatemalan genocide the Nixon

¹⁴ Bosdriesz, H., & Wirken, S. 2014. An Imperfect Success - The Guatemalan Genocide Trial and the Struggle against Impunity for International Crimes. *International Criminal Law Review*, 14(6), pp. 1067.

¹⁵ Ibid.

¹⁶ Kinzer, S., S. Schlesinger. 2005. *Bitter Fruit: The Story of the American Coup in Guatemala*. Cambridge Mass.: Harvard University.

¹⁷ Ibid.

¹⁸ Shifter, M. 2012. Plan Colombia: A Retrospective. *Americas Quarterly*.

Administration initiated the War on Drugs in 1971, again increasing the political presence of United States in Latin America. A relevant US interdiction plot was “Plan Colombia” that began in the 1990s and ended in 2015.¹⁹

The routes that drugs were channeled before “Plan Colombia” were mostly through Caribbean waters and air, to the primary destination, the United States.²⁰ After “Plan Colombia” drug traffickers saw the route through Central America to Mexico as a more geographically strategic to maneuver through and away from the armed forces.²¹ This meant the drugs were going through Guatemala with different types of transportation. Plan Colombia was vaguely used to end armed conflict and cocaine production in Colombia.²² The United States’ and the cooperative Colombian government’s method were to fumigate crops with glyphosate, a known carcinogen, to eradicate cocaine production.²³ In addition, the United States’ method was to fund the Colombian government and military with funds as well as military training -- completely contradicting the intent for “Plan Colombia”.²⁴ Plan Colombia has ultimately caused more violence (both structural and physical) and increased hazardous and toxic waste in Colombia.²⁵

The rerouting of narcotics (narco) trade is typical as the governments of Latin America and United States tries to enforce combative laws on the narco trade.²⁶ Cartels

¹⁹ Ibid.

²⁰ United Nations Offices of Drugs and Crime (2012). Transnational Organized Crime in Central America and the Caribbean: A Threat Assessment. *United Nations*, pp. 24.

²¹ Felbab-Brown, V. 2009. The Violent Drug Market in Mexico and Lessons from Colombia. *Brookings*.

²² Stich, S. (2018). Social Development Strategies in Peace Processes: Colombia and Guatemala. *Social Development Issues* (Follmer Group), 40(3), 41–57.

²³ Shifter, M. (2012). Plan Colombia: A Retrospective. *Americas Quarterly*.

²⁴ Ibid.

²⁵ Felbab-Brown, V. 2009. The Violent Drug Market in Mexico and Lessons from Colombia. *Brookings*.

²⁶ Ibid.

(narco groups) faction, disperse, and reroute completely when state interdiction happens.²⁷ This is seen in Mexico when the PAN government launched military forces and policies to crack down on the cartels.²⁸ The cartels dispersed into a larger and more dynamic network, increasing the area of narco activity.²⁹

This phenomenon is described in academia as the “balloon effect”, and is normally seen when a state “cracks down” on narco traffickers by the means of state counterinsurgency with armed forces.³⁰ The “balloon effect” presents its action when one drug supplier has halted, another drug supplier pops up to meet the demand of the illicit narco trade.³¹

The combination of Civil War violence, the failure of the Peace Process to bring peace, and the “balloon effect” following the War on Drugs in Colombia combine to create the crisis of drug trafficking, insecurity and violence defining the northern triangle today.³² There are six main narco groups in Guatemala. Specific cartels of significance, in Guatemala, are as follows: Zetas, Sinaloa, Pacífico, Mendozas, Lorenzas, Leones, and Chamales.³³ The Zetas withhold much of the territory of Guatemala as a whole (Northern and Central territories).³⁴ The Chamale and Pacifico cartels are in the Southwestern part of Guatemala.³⁵ Leones is in the Southeastern part of Guatemala, and the Lorenza and

²⁷ United Nations Offices of Drugs and Crime (2012). Transnational Organized Crime in Central America and the Caribbean: A Threat Assessment. *United Nations*, pp. 24.

²⁸ Gonzalez, F. 2009. Mexico’s Drug Wars Get Brutal. *Current History*.

²⁹ United Nations Offices of Drugs and Crime (2012). Transnational Organized Crime in Central America and the Caribbean: A Threat Assessment. *United Nations*, pp. 24.

³⁰ Ibid.

³¹ United Nations Regional Information Center. 2014. The Balloon Effect, New Trafficking Routes Keep Popping Up. *United Nations*.

³² Stich, S. (2018). Social Development Strategies in Peace Processes: Colombia and Guatemala. Social Development Issues (Follmer Group), 40(3), 41–57.

³³ United Nations Offices of Drugs and Crime. 2012. Transnational Organized Crime in Central America and the Caribbean: A Threat Assessment. *United Nations*, pp. 24.

³⁴ Ibid.

³⁵ Ibid.

Mendoza cartels are found in the Northeastern and coastal parts of Guatemala.³⁶

Moreover, Guatemala is a part of the Northern Triangle that also includes El Salvador and Honduras. The Northern Triangle is a specific region of the world where drug crime and deadly violence is concentrated in high amounts.³⁷ It is also a region where many refugees and asylum seekers come from before they reach the United States.³⁸

³⁶ Ibid.

³⁷ Council on Foreign Relations (2018). Central America's Violent Northern Triangle. *Council on Foreign Relations*.

³⁸ Ibid.

III. LITERATURE REVIEW

I. Drug Trafficking Flows in Central America

Kendra McSweeney takes a critical look at the Consolidated Counterdrug Database (CCDB) and makes a valid observation; the database is not serving to address the illicit drug trade but instead shows the weakness of how the United States' government handles the manufactured War on Drugs. The CCDB was created in cooperation with multiple counternarcotic agencies within the United States and is now managed from the White House. Not only has the CCDB been time consuming and costly to the public for decades but, it is ultimately ineffective at showing benefits of the counterinsurgency methods the United States takes at ending the illicit narco trade within Central America.³⁹ The CCDB data shows the more complex dispersion of the drug trafficking routes through time, the stagnant interdiction rates and the outlandish cost of the project on the United States taxpayers.⁴⁰ This thesis contributes to affirming that current methods and perspectives used by the United States government should be entirely re-evaluated to take new critical approaches to countering the illicit drug trade that is demanded from the American population itself.⁴¹ This is due to decades of collecting insignificant data on ineffective counterdrug strategies.⁴² The publicly funded CCDB only falsely justifies the outdated current and harsh rhetoric that enables the violent War on Drugs and ineffectively handles the illicit drug trade.⁴³ The CCDB also lacks critical data of the illicit narco trade in Central America that the more dynamic and comprehensive Guatemalan Media

³⁹ McSweeney, K. (N.D.). Drug War Database that Speaks Against Itself.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid.

Database possesses. It also fails to mention the significance that the illicit narco trade has on the Central American environment.

Olivia Cameron's study solidifies the importance of a more comprehensive study of the illicit drug trade and its established relationship with deforestation. The Guatemalan Media Database sourced from *Prensa Libre* serves to study the illicit drug trade more effectively and efficiently than the Consolidated Counterdrug Database (CCDB).⁴⁴ Methodologically, Cameron shows the significant relationships of each database (CCDB and Guatemalan Media Database) to the dynamics of the illicit narco trade. The Guatemalan Media Database that was created by the encompassing team of this research serves to provide more thorough, less costly, and less time-consuming data of the illicit drug trade.⁴⁵ This thesis contributes to the study of the illicit narco trade economies in Central America by documenting data that the CCDB misses or neglects due to its limitations and politics. It is extremely difficult to obtain reliable data on the illicit drug trade, but the Guatemalan Media Database used for this thesis is a credible data source that permits the study of drug flows and the environmental impacts of the narco trade in Central America.

Julie Bunck and Michael Ross (2013) go over detailed accounts of Guatemala's, evolution of drug trade, drug trafficking organizations, involvement of military personnel, violent interactions of drug networks, and drug trafficking methods and routes.⁴⁶ Guatemala has been dealing with drug trafficking organizations for decades, and

⁴⁴ Cameron, O., (2019). "Narco Deforestation" in Central America Protected Areas: Developing a Spatiotemporal Proxy Database for Drug-Trafficking Activities from Media Reporting. *Oregon State University*.

⁴⁵ Ibid.

⁴⁶ Bunck, J., M. Ross. (2013). Bribes, Bullets, and Intimidation: Drug Trafficking and the Law in Central America. *The Pennsylvania State University Press*, pp. 190-252.

there have been many attempts by international state counternarcotic groups to help combat the drug trade, but nothing has worked.⁴⁷ In fact, over the years that Guatemala became a main transit country, many cartels faced violence with the state and drug trafficking grew extremely more complicated.⁴⁸ These complications were made more complex while Guatemala simultaneously was going through internal state corruption remaining after the Guatemalan Civil War.⁴⁹ Military presence is high in Guatemala even though many military officers often disregard the law and impunity characterizes the judicial system.⁵⁰ Guatemala is the perfect transit country to send drugs through because it would not take much coercion to intimidate and pay a state official to dismiss and contribute to the perpetuation of the drug trade.⁵¹ This thesis contributes to the study of illicit drug activity by visualizing the Guatemalan flow of cocaine through time and space. With this Bunck's and Ross' knowledge of historical geography, scholars can study the development of Guatemala's entanglement with the drug trade. With borders to a producing country (Colombia) and prime borders to Mexico (a gateway country to the United States' demand), Guatemala is an ideal transit country to traffic cocaine north for drug trafficking organizations.

Hall (2013) covers the dynamics and interactions of geography, economies, and organized crime.⁵² The study of legal and licit economies is well documented and those of illegal and illicit economies are understudied. In fact, the illicit drug economy is reportedly estimated as a significant part of the total global economy and it would be

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Hall, T. (2013). 'Geographies of the illicit: globalization and organized crime', *Progress in human geography*, (3), p. 366.

inaccurate to represent the global economy without mentioning the illegal/ illicit economies that exist.⁵³ To get a more thorough look at the entire global economy, researchers are tasked with studying the illicit trade although it does prove to be complicated. This is often by being dangerous, hidden from easy accessibility to info, and the increased difficulty of attaining credible data from complex organized crime trade systems. This is significant to this thesis by establishing that organized crime (cocaine trafficking) is an illicit economy that must be considered in the entirety of the economic geography in Guatemala. It is important to mention the system constraints in which cocaine is trafficked (through time, space, and geography). Not to mention how illicit economies contribute to structural environmental degradation.

McSweeney et. al. (2014) examines how the aggressive state approach to the War on Drugs, via policy, is complicating and increasing the dispersion and complexity of the illicit drug trade in Central America.⁵⁴ McSweeney et. al. explains that state counter-narcotic operations contribute to the disruption and displacement of traffickers into the more forested areas (often protected areas) to counter the narco trafficking while being hidden by foliage cover.⁵⁵ The economic functions of the drug trade are also aiding environmental degradation by creating illicit market economies.⁵⁶ The illicit market economy only maintains that a small number of persons profiting from the narco trafficking. These small number of persons control the stakes and decisions of the narco trade and are often extremely wealthy. This is because the illicit narco trade is an

⁵³ Ibid.

⁵⁴ McSweeney, K., et. al. (2014). Drug Policy as Conservation Policy: Narco-Deforestation. *Science*.

⁵⁵ Ibid.

⁵⁶ Ibid.

unregulated capitalist system that upholds class structure.⁵⁷ This article connects drug related money laundering to the local economy and how it later contributes to the overall destruction of the environment. The environmental degradation happens when laundered money provides funds for investment in exploitative and physically destructive markets like cattle ranching and oil palm.⁵⁸ This research provides explanations of the indirect contributions of the cocaine trafficking market and how the structural and political actions of the state contribute to aiding narco trafficking instead of achieving success on their attempts to end illicit narco trafficking.

Environmental Impacts of Drug Trafficking

McSweeney et. al (2014) first coined the term “narco-deforestation”. Narco-deforestation, as conceptualized by Kendra McSweeney, occurs more often in transit countries, rather than production countries (Colombia, Ecuador, Bolivia). The environmental impacts of drug trafficking are different in cocaine production versus transit regions. As previously mentioned, glyphosate has caused all these problems in Colombia: thyroid cancer, reproductive problems, water quality etc....⁵⁹ This thesis contributes to this literature by analyzing a media database to examine the physical impacts money laundering has on the environment in ways that go beyond deforestation to include land consolidation.

⁵⁷ McSweeney, K., et. al. (2014). Drug Policy as Conservation Policy: Narco-Deforestation. *Science*.

⁵⁸ Ibid.

⁵⁹ Ibid.

Devine et. al (2018) explain the structural connection (linking the direct and indirect contributors) of environmental degradation to drug trafficking.⁶⁰ As documented, money laundering in Central America contributes to narco-cattle ranching.⁶¹ In this case cattle ranching directly destroys the physical forested area of Laguna del Tigre National Park.⁶² Laguna del Tigre National Park is a protected area in Guatemala yet, still faces heightened deforestation.⁶³ This publication also shows that drug related money laundering, relates to the purchase of cattle. These cattle are used to guise money laundering efforts and end up on physical cattle ranches, often in protected areas.⁶⁴ This thesis contributes to this research by showing that the physical destruction of the environment is very much caused by the structural system that guises the drug trade money in manufactured and unsustainable markets of cattle-ranching. These cattle ranches exist to the extent of and money laundering in Guatemala link environmental degradation to drug trafficking structurally.⁶⁵

Sensie et al (2017) relay how drug trafficking systems contribute to Central American forest loss.⁶⁶ The research shows a measurement of the scale of forest loss by a list of correlations of forest loss to those of volume of cocaine seized in those areas.⁶⁷ It is noted that remote sensing has shown significant Guatemalan forest loss.⁶⁸ This study estimates that cocaine trafficking contributes to an estimated 25 to 30 percent of total

⁶⁰ Devine, J., Wrathall, D., Currit, N., Tellman, B., & Langerica, Y. (2018). Narco-Cattle Ranching in Political Forests. *Antipode*. pp. 1–21.

⁶¹ Ibid.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Sensie, S. et al. (2017). A Spatio-temporal Analysis of Forest Loss Related to Cocaine Trafficking in Central America. *Environmental Research Letters*. pp. 1-20.

⁶⁷ Ibid.

⁶⁸ Ibid.

Central American forest loss and more within protected areas of forests.⁶⁹ This study also describes the phenomena of visually seen patches of forest loss that bring up the concept of “narco-capitalization”.⁷⁰ Narco-capitalization is when land that was once forested and community owned becomes deforested from a narco related activities such as deforestation by cattle ranching, air plane landing strips, oil palm, etc....⁷¹ This research is important to this thesis by showcasing the significant correlations with drug trafficking patterns and forest loss. Mentioning potential “narco-capitalization” shows the connections of drug trafficking and its environmental impacts.

Mingorría (2018) presents the recent history in which the oil palm industry has seen mass expansion in Guatemala.⁷² This expansion of privatized land by the oil palm industry is contributing to the historical oppression of the indigenous people who previously maintained their historic region in substantiable ways by community commons.⁷³ The oil palm industry has consumed the economic structure of Guatemala substantially fast and is a major contributor to the degradation of indigenous communities and the physical environment.⁷⁴ This research is significant to this thesis by bridging the relation of structural violence to that of the actual Guatemalan environment. Privatized land by the oil palm industry disrupts historically sustainable economies by creating false markets in which narco money is channeled through.⁷⁵

⁶⁹ Sensie, S. et al. (2017). A Spatio-temporal Analysis of Forest Loss Related to Cocaine Trafficking in Central America. *Environmental Research Letters*. pp. 1-20.

⁷⁰ Ibid.

⁷¹ Ibid.

⁷² Mingorría, S. (2018). Violence and Visibility in Oil Palm and Sugarcane Conflicts: the Case of Polochic Valley, Guatemala. *Journal of Peasant Studies*. vol. 45-7. pp. 1314-1340.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Ibid.

IV. METHODOLOGY

Spatial patterns of cocaine trafficking in Guatemala and its connection to environmental degradation of vital forested areas is understudied. As found in the literature review section, the global economy is missing comprehensive examination with understudied illicit economies. Organized crime, like that of cocaine trafficking, are illicit economies. All forms of trade contribute to environmental degradation in one way or another but, illicit cocaine trade is unregulated. The lack of scholarship in studying the environmental impacts of illicit activities can detrimentally effect environments worldwide. Guatemala, an equatorial region, is home to the Maya Biosphere Reserve, a protected forest that is home to a plethora of biodiversity. Guatemala is also a transit country to the cocaine trade. To fill this gap of knowledge, especially of the illicit cocaine trade in Guatemala, this research involves a critical, economic geography framework grounded in primarily quantitative analysis of primary source data. This data is sourced from the main news reporting outlet in Guatemala, descriptive statistics analysis, and media content analysis.

This thesis uses these methods to answer the following questions:

1. How has cocaine trafficking varied across space and volume in Guatemala from 2000 -2018?
2. What are the main sources and patterns of cocaine trafficking events that are driving environmental degradation in Guatemala through the years 2000-2018?

Primary Source Data Collection

To answer these questions, I helped develop a media database. The database was created with various people participating in the research group “Landscapes in Transformation in Central America (LITCA).” The database is primary source data taken from a Central American news source named, “*Prensa Libre*”. *Prensa Libre*’s articles are in Spanish and had to be translated in order to harvest data from the source. The database has about 50 variables and I contributed to about 300 data entry samples. The database includes the nominal location of each data source found (department and municipality), location (longitude/latitude), type of seizure/ state interception, amount of seizures (kg), amount of seizure worth (USD), land/marine/air transport, etc..... I focused on *Prensa Libre* for three years: 2016-2018. LITCA combined the years of 2016- 2018 with the years 2000 - 2015 for a complete database of 791 entries total. It is important to note that all seizures were only recorded in the database if the seizure amount was more than one kilogram in volume. I conducted my portion of this work over the summer of 2018. The database is recorded on a Microsoft Excel spreadsheet.

To answer the first question of spatial patterns of cocaine trafficking, the database was reorganized and recoded by the research team’s graduate student in order to map this phenomenon in GIS ArcMap software. First, I created a shapefile of the data displaying the frequency of type of cocaine seizure transport (air, land, marine), individually, and then combined the years 2000-2018 by department in Guatemala. Within the separate shapefiles, I applied the “Quantity” display (found in the “symbolology” section of the properties for the shapefile I created in ArcMaps), created four “Manual” classes (1-10, 10-20, 20-30, and >30), and then visually represented the data of each map using

different symbols and colors to represent each different type of cocaine seizure. This created three different maps that display cocaine departmental seizures from 2000-2018 for air, land, and marine transport. Next a fourth map was created combining all of the transports (from 2000-2018) together on one map for easy comparison of seizures, by department per type of transport.

Furthermore, to answer the second portion of the first question and to measure the volume of cocaine trafficking, the research team and I looked at seizures reported in the data. The seizures amounts were all converted to one consistent unit of kilograms. Since there are three types of seizures: land, air, and marine, they will be combined to show the total volume of cocaine seized by the departmental level.

The research team (a graduate student, my thesis supervisor, and I) analyzed spatial and patterns of cocaine trafficking by comparing frequency counts of cocaine seizures by transport with their respected Guatemalan departments. After the maps were created patterns and significant phenomena were described in respect to the physical, social, and political geography of Guatemala.

Content Analysis of Media Database

To analyze the environmental impacts of drug trafficking in Guatemala I conducted content analysis and selective coding methods of the Guatemalan media database that the LITCA research team and I contributed to and consolidated. The Guatemalan media database has variables for each entry that are environmentally significant. I use these variables to measure and analyze the scale of environmental degradation as an outcome of the narco trafficking in Guatemala, a transit state.

The variables used to measure environmental degradation are “money laundering” and “cattle ranching”. These categories were chosen based off information found in the literature review and secondary source evidence. These two categories contribute either directly or indirectly to environmental degradation. Direct contribution to environmental degradation includes physically manipulating land use or land cover change, ex. “cattle ranching.” Indirect contribution occurs through money laundering which captures false boom “markets” that are used to hide large amounts of narco money that drive land dispossession for historically marginalized persons. Each noted “money laundering” and “cattle ranching” category in the database has geographical coordinates established with them to further document the location.

The Guatemala media database was queried for each of the follow “money laundering” and “cattle ranching”. The number of queried entries was recorded, and a percentage of total entries was arithmetically calculated by descriptive statistics. This was done for both variables. Next, the amount of money laundered was totaled in USD value. Then the department with the highest frequency of “money laundered” was found. This was only done with the “money laundered” variable because there was a substantial amount of data. The variables for money laundering and cattle ranching are combined to represent the environmental degradation and “narco-deforestation” as it is mentioned.

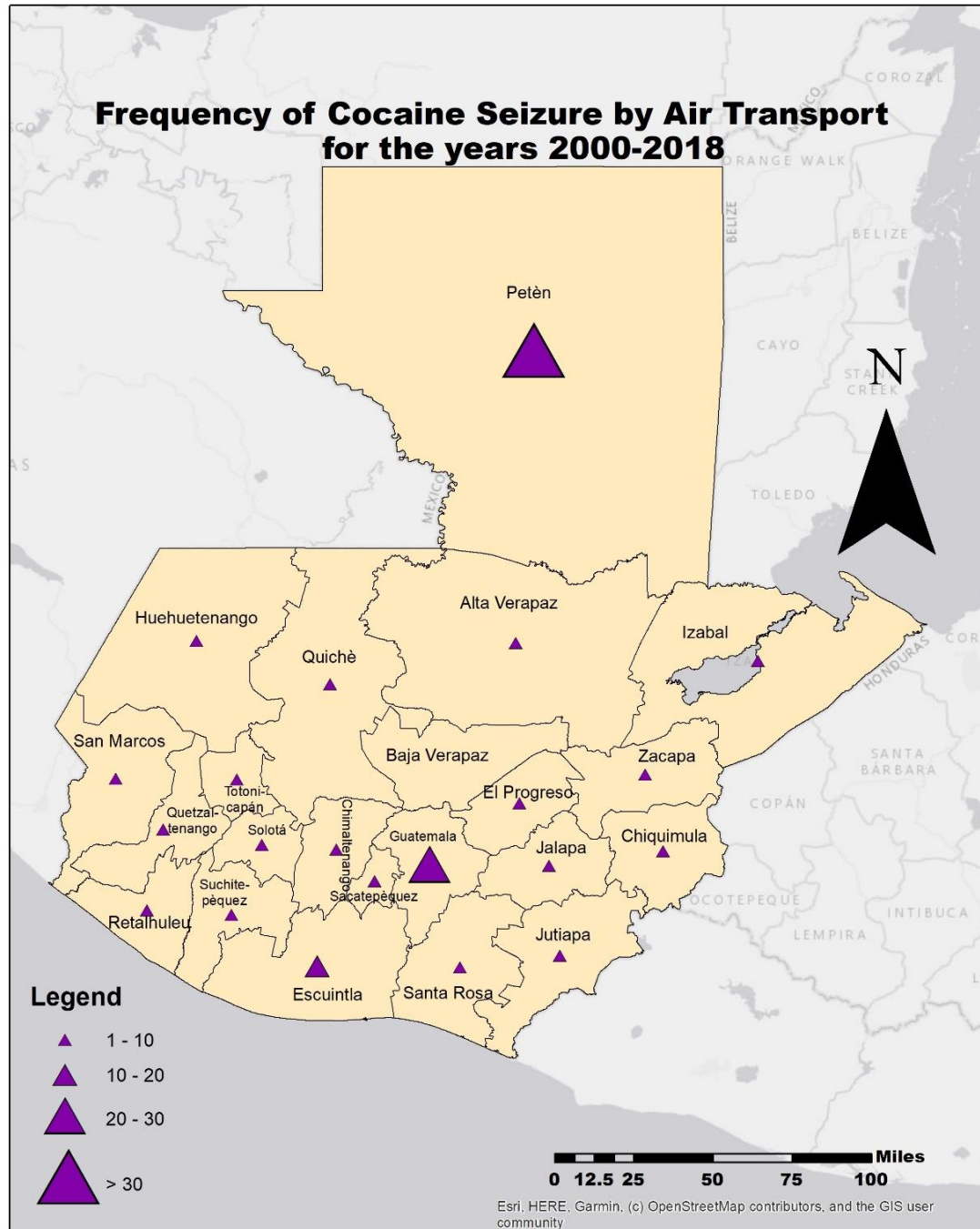
The media content analysis was then examined through descriptive statistics. First within this process, the Guatemala media database was queried for each variable (ex. “money laundering”, “cattle ranching”, “oil palm”, and “protected areas”). The number of queried entries was recorded, and a percentage of total entries was arithmetically calculated. This was done for all variables. Next, the amount of money laundered was

totaled in USD value. Then the department with the highest frequency of “money laundered” was found. This was only done with the “money laundered” variable because there was a substantial amount of data. Finally, the variables for money laundered, protected areas, cattle ranching, and oil palm are combined as “environmental degradation” variable.

V. ANALYSIS

V.1 Spatial Patterns of Drug Trafficking

Figure 1:



Source: author

Figure 1 visualizes the frequency amount of cocaine seized by air transport for the years 2000-2018 by Guatemalan department. All departments in Guatemala have reported cocaine seizure frequency amounts greater than 1. There are three departments with frequency of air transport cocaine seized greater than 10. These mentionable departments are Escuintla, Guatemala, and Petén.

Escuintla department is found in the south western area of Guatemala and is a coastal department borders the Central Pacific Ocean. Escuintla does not politically border another country. Out of the three aforementioned countries with the highest frequency amounts of cocaine seized (by air transport), Escuintla has the lowest amount. Escuintla department has a cocaine seizure frequency of between 10 and 20 through the years 2000 – 2018.

Next, the department of Guatemala home to Guatemala City has the second highest cocaine seizure (by air transport) frequency amount out of the three departments noted for having the highest seizure frequency rates. The Guatemala department is in the south western part of Guatemala and is an inland department. Guatemala department does not politically border another international another country. This department has a

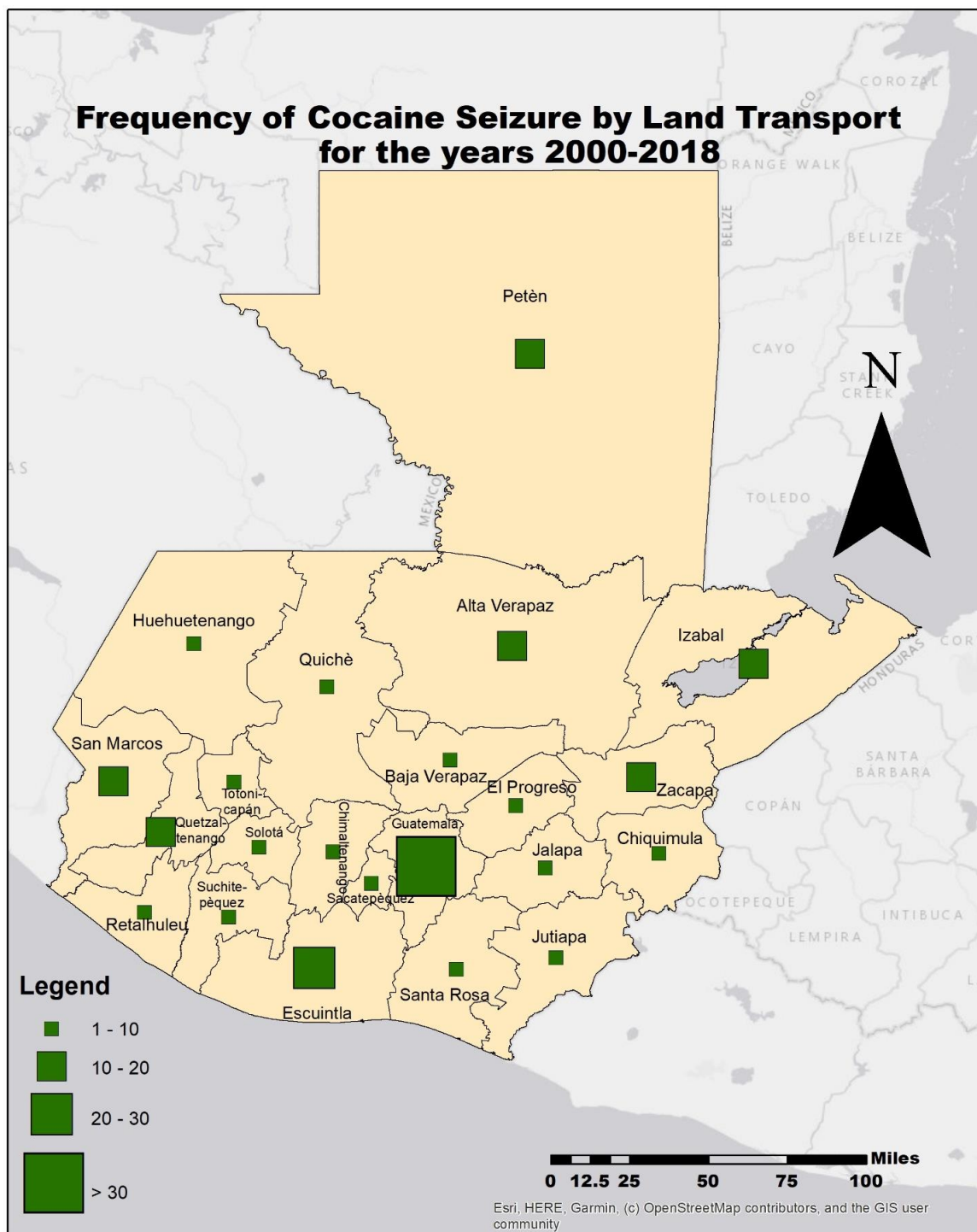
Source: author cocaine seizure frequency of between 20 and 30 for the study period. The Guatemala department is adjacent to that of Escuintla, with both having large frequency amounts of cocaine seized. The area in between these two departments are significant in drug trafficking activity.

The Petén department is found in the northern area of Guatemala and is an inland department. Petén department politically borders two other countries. These countries are Mexico and Belize. The Petén department has the highest reported cocaine seizure (by air transport) frequency amounts out of all Guatemalan departments. This department has a cocaine seizure frequency of being more than 30, through the study period. This analysis suggests that Petén department is the most popular hotspot for landing primary shipments of cocaine by air in the country of Guatemala. The Petén department is also the most forested/protected area department and possesses the Maya Biosphere Reserve.

This map shows that the Petén department has a greater frequency of cocaine seizures by air transport than that of the Guatemala department. This data is surprising because the Guatemala department possesses La Aurora International airport, the largest and most trafficked airport in Guatemala. The data shows however more seizures are taking place in the more remote and less densely populated department of Petén. This means that clandestine airstrips are being created in the Maya Biosphere Reserve. The creation of these clandestine airstrips is driving deforestation in the protected area.⁷⁶

⁷⁶ Devine, J., Wrathall, D., Currit, N., Tellman, B., & Langarica, Y. (2018). Narco-Cattle Ranching in Political Forests. *Antipode*. pp. 1–21.

Figure 2:



Source: author

Figure 2 maps the frequency amount of cocaine seized by land transport for the years 2000-2018 by Guatemalan department. All departments in Guatemala have reported cocaine seizure frequency amounts greater than 1. There are eight departments with frequency of land transport cocaine seized greater than 10. These mentionable departments are Escuintla, Guatemala, San Marcos, Quetzaltenango, Zacapa, Izabal, Baja Verapaz, and Petén.

The departments of San Marcos, Quetzaltenango, Alta Verapaz, Zacapa, Izabal, and Petén all have cocaine seizure frequency (by land transport) amounts greater than 10. Four of these departments have political international borders. San Marcos borders Mexico, Petén borders Mexico and Belize, Izabal borders Honduras and Belize, Zacapa borders Honduras.

Next, the Escuintla department has the second highest cocaine seizure frequency amount by land transport out of the eight departments noted for having the highest compared to the rest of the Guatemalan departments. This department has a cocaine seizure frequency between 20 and 30. The area in between these two departments are significant in drug trafficking activity.

The Guatemala department has the highest reported cocaine seizure frequency (by land transport) seizure amounts out of all Guatemalan departments. This department has a cocaine seizure frequency of being more than 30. The Guatemala department is the largest hotspot for narco trafficking by land. The Guatemala department is adjacent to that of Escuintla, with both having large frequency amounts of cocaine seized.

In total, over half of the departments reported for having frequency (via land transport) amounts greater than 10 have international borders. The pattern of highest frequency of cocaine seizure departments (by land transport) closely resembles to the shape of the Pan American Highway. This is significant to note because most of the cocaine seizures by land transport happen to major highways that travel through international borders. This shows a narrower scope of the specific directions that cocaine has been travelling from 2000-2018 by land transportation.

Figure 3:



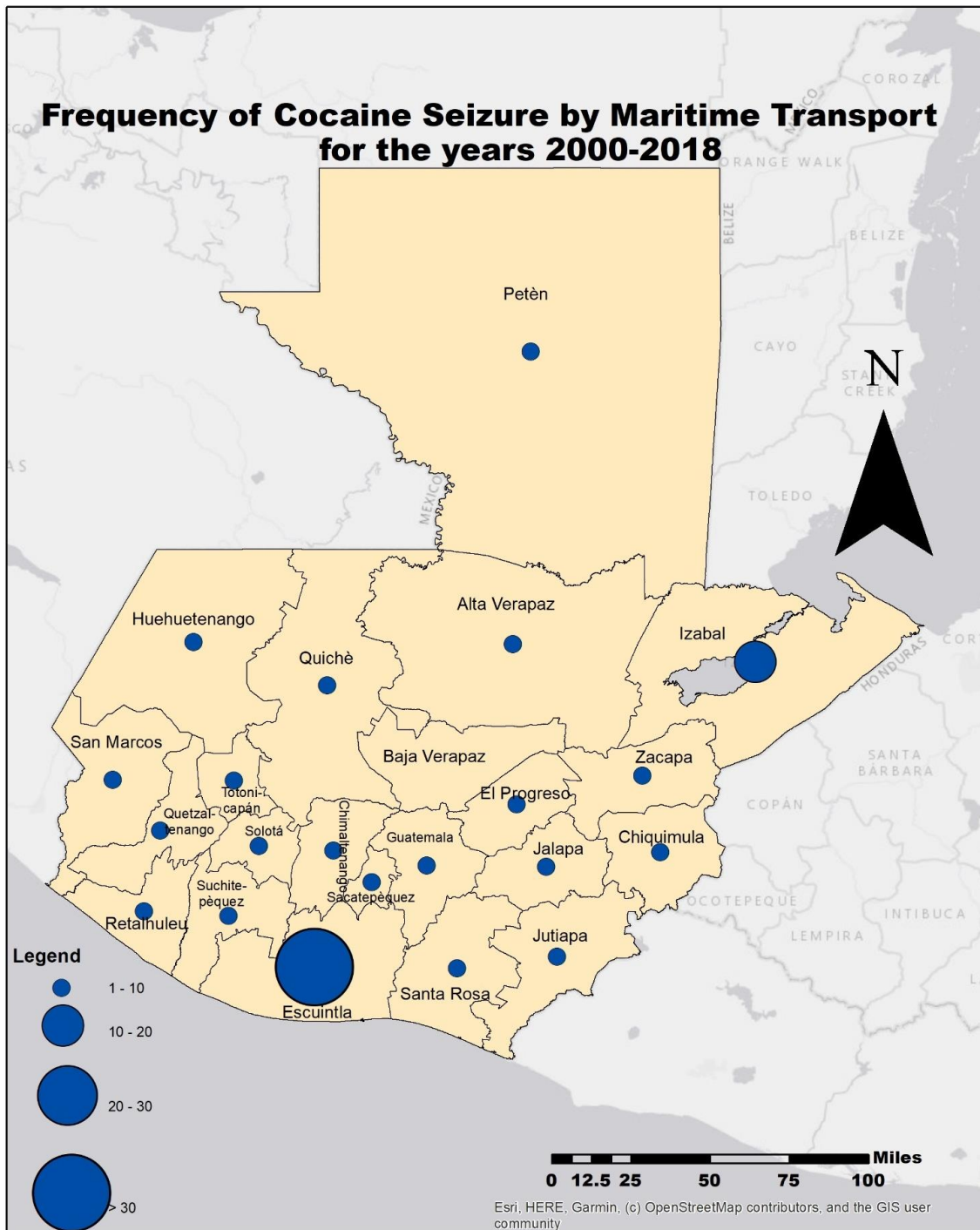
(Adapted map of Guatemala Transport, source: Central Intelligence Agency)

Figure 3 displays the important and largest interstates and highways in Guatemala.⁷⁷ This map particularly shows the Pan American Highway and important

⁷⁷ Central Intelligence Agency. (2018). Map of Guatemala Transport.

northward routes. The Pan American Highway starts in the central western part of Guatemala through Escuintla and Guatemala department to the south eastern side of Guatemala. This road route and direction is highlighted in Figure 2 (map of the Frequency of Cocaine Seizure for the years 2000-2018) with the similar dispersion of the to the departments that the Pan American Highway runs through. Next, the northward route in the road map resembles that of Figure 2. The northward road map is found in Figure 2 with the Izabal and Petén department highlighted.

Figure 4:



Source: author

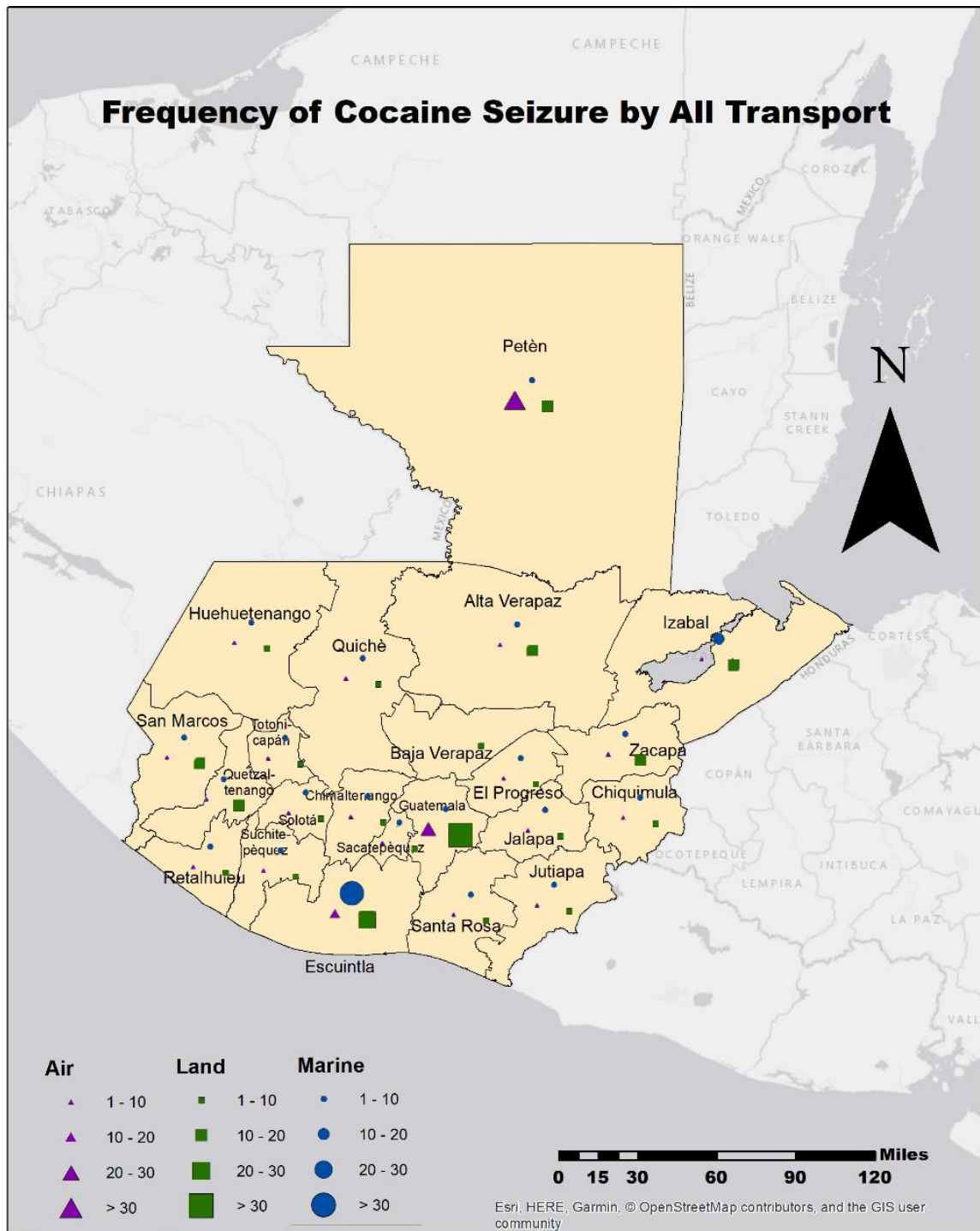
Figure 3 visualizes the frequency amount of cocaine seized by maritime transport for the years 2000-2018 by Guatemalan department. All departments in Guatemala (excluding Baja Verapaz) have reported cocaine seizure frequency, by maritime transport, amounts greater than 1. There are two departments with frequency of maritime transport cocaine seized greater than 20. These mentionable departments are Escuintla and Izabal.

Out of the two countries with the highest frequency amounts of cocaine seized by maritime transport, Escuintla has the lowest amount. Escuintla department has a cocaine seizure frequency of between 20 and 30. Escuintla has the largest trading port in Guatemala.

Next, the Izabal department has the second highest cocaine seizure by maritime transport frequency amount out of the two departments noted for having the highest compared to the rest of the Guatemalan departments. The Izabal department is in the central eastern part of Guatemala and is a coastal department that borders the Caribbean Sea. Izabal department has international border with Honduras. This department has a cocaine seizure frequency by maritime transport greater than 30. The Izabal department has the second largest port in Guatemala.

It is important to note that the departments that possess two of the largest ports in Guatemala have the highest amount of cocaine seizures recorded by maritime transport. These two departments are Escuintla and Izabal. Izabal has the largest port in Guatemala it traffics by maritime transport less than that of Izabal with the second largest port.

Figure 5:



Source: author

Figure 4 visualizes the frequency amount of cocaine seized by all transports, in comparison to each other, for the years 2000-2018 by Guatemalan department. All departments in Guatemala (excluding Baja Verapaz in marine transport) have reported cocaine seizure frequency amounts greater than 1. There are three departments visually striking departments with substantial high frequencies of total transport cocaine seized greater than 10. These mentionable departments are Escuintla, Guatemala, and Petén. Perhaps this is not coincidental, these are the same departments with the three highest frequencies of cocaine seized by air transport.

Figure 6:



Source: author

Figure 5 visualizes the total volume amount of cocaine seized by all transports for the years 2000-2018 by Guatemalan departments. All departments in Guatemala have reported cocaine seizure frequency amounts greater than 0 kilograms. There are six departments with volume of cocaine seized greater than 1,600 kilograms. These mentionable departments are Escuintla, Guatemala, Izabal, Santa Rosa, Quetzaltenango, and Petén.

Petén, Santa Rosa, and Quetzaltenango departments are found with the third highest volume of amounts of cocaine seized by total transport, with a total volume amount between 1,600 and 6,000 kilograms.

Next, the Izabal and Guatemala departments have the second highest volume of cocaine seizure by total transport amount out of the departments noted for having the highest volume of cocaine seized, compared to the rest. The Izabal and Guatemala departments have a total volume of cocaine seizure between 6,000 and 14,200 kilograms.

The Escuintla department is found with the highest reported volume of cocaine seized (by total transport) amounts out of all Guatemalan departments. This department has a total cocaine seizure volume of about 81,300 kilograms. The Escuintla department is the largest hotspot for narco air trafficking by volume.

Environmental Impacts

Money Laundering

There are 99 data entries in the media database for “money laundering”. The total number of entries in the Guatemalan database is 791. Statistically, “money laundering” entries make up about 12.5 percent of total entries. The consistency of the frequency of “money laundered” is significant as it is a large portion and most recorded variable in the environmental degradation category. The total USD value for money laundered is approximately \$48,712,591. The department with the highest frequency of money laundered is the Guatemala department with 59 entries out of the selected 99. The Guatemala department has about 60 percent of the total money laundered frequency compared to all other departments. The second department with the highest money laundered frequency is Petén department with 8 total entries out of the total 99 entries of money laundered. The Petén department has about 8 percent of the total amount of frequency of “money laundered”. This is significantly lower than the Guatemala department. Money laundering does not directly physically degrade the environment.

Cattle Ranching

There are 5 entries for “cattle ranching” in the Guatemalan Media Database. The total number of entries is 791. “Cattle ranching” entries makeup a total of 0.6 percent of total data entries. The consistency of the “cattle ranching” entries is an extremely low frequency rate. It is important to note that the data collection process was not effective at recording the representative number of cattle ranches and underestimates the number of cattle ranches present in Guatemala. Remote sensing of Guatemala shows substantial

cattle ranches, especially in the Petén department that contribute to deforestation. Cattle ranching directly contributes to environmental degradation.

Environmental Degradation

Both the variables of “money laundering” and “cattle ranching” combine to show the sources of narco-driven environmental degradation. As mentioned, there is a significant amount of money laundering happening in Guatemala, especially in the department of Guatemala. Previous scholars have already established the significant correlation of cocaine trafficking and environmental degradation.⁷⁸ Figures 1-6 shows that there is a distinguishable amount of cocaine trafficking through Guatemala for the years 2000-2018. Scholars have also mentioned how illicit economies, like that of cocaine trafficking, contribute to environmental degradation by going unregulated and under studied.⁷⁹ Next, scholars have found that cocaine transit countries, like that of Guatemala, must be looked at differently in comparison to the cocaine producing countries. Devine et. al (2018) have already stated that the increase in the privatization of land/ land consolidation in Guatemala, particularly that of the Petén department, where the protected area of the Maya Biosphere Reserve exists, is seeing an increase in cattle ranching, as well as, other unsustainable markets created by drug traffickers.

Although laundered money is not a direct cause of environmental degradation, the unsustainable markets drug traffickers create with laundered money are ones that physically environmentally degrade the land. It must be noted that lands that narcos are

⁷⁸ Sensie, S. et al. (2017). A Spatio-temporal Analysis of Forest Loss Related to Cocaine Trafficking in Central America. *Environmental Research Letters*. pp. 1-20.

⁷⁹ McSweeney, K., et. al. (2014). Drug Policy as Conservation Policy: Narco-Deforestation. *Science*.

seizing to cattle ranch, cultivate oil palm and pass drugs are lands that were often previously managed in environmentally sustainable ways by rural and indigenous people. The lands that cocaine traffickers are privatizing are lands that served to be the public commons area that was maintained and used sustainably within the traditional community economies in Guatemala. The rural and indigenous population in Guatemala is largely the Mayan peoples.

VI. CONCLUSION

This thesis identifies the spatial dynamics of drug trafficking in Guatemala and the impact of these activities on the environment from 2000-2018 through a media analysis of the country's primary newspaper publication. This research reveals spatial patterns and geographical unevenness in cocaine trafficking by Guatemalan departments. Analysis of Guatemalan newspaper from 2000 – 2018 revealed several departmental “hot spots” that include the departments of Escuintla, Petén, Izabal, and Guatemala. It is also relevant to note that there are geographical patterns and differences based three main types of transport: air, land, and maritime transportation of cocaine. In addition, it is apparent that money laundering related to cocaine trafficking is contributing to environmental degradation.

First, this research reveals that drug trafficking by air is spatially uneven and predominant in the Petén, Escuintla, and Guatemala in the years 2000-2018. Petén is also the most northern department in Guatemala and is closer to Mexico and the United States, the next and last destination of most of the illicit trade. Petén has the largest narco traffic by air. The Petén department is the most forested and protected area in Guatemala. It is likely that the planes have a first landing in Guatemala and then are transported by land across the border to Mexico. Drug traffickers are building clandestine airstrips in the Petén's Maya Biosphere Reserve and hiding them in cattle pastures. Cattle ranching not only serves as a means of transporting drugs, the media database and secondary literature suggest cattle ranching serves as a means for laundering drug profits as well.⁸⁰ These

⁸⁰ Devine, J., et. al. (2018). Narco-Cattle Ranching in Political Forests. *Antipode*. pp. 1–21.

cattle ranching activities in Guatemala's protected areas in the Petén department are driving environmental degradation.

Second, I find that drug trafficking by land is spatially even and dispersed throughout the greater body of Guatemala. These departments are: Petén, San Marcos, Quetzaltenango, Alta Verapaz, Izabal, Zacapa, Guatemala, and Escuintla in the years 2000-2018. Guatemala department has the largest narco traffic by land. A reason this may be is because Guatemala is the most populous department full of interconnected interstates and highways. Guatemala also houses the capital city where there is a larger amount of state police and counternarcotic presence.

Third, I find that that drug trafficking by marine is spatially uneven and concentrated in only two departments. These departments are: Izabal and Escuintla in the years 2000-2018. Escuintla borders the Pacific Ocean and is more active than the Izabal department that borders the Atlantic Ocean. A reason this may be is that the Pacific Ocean is vaster.

Fourth, the research illustrates that total drug trafficking by all methods of transport (air, land, and maritime separately) is spatially concentrated in three noticeable departments in the years 2000-2018. These departments are: Escuintla, Guatemala, and Petén. A reason this may be is that Petén department is most forested and isolate, Escuintla is coastal on the largest ocean in the world, and Guatemala is the most populous. They are the within the southern and northern parts of Guatemala because most narco trafficking is on its way to the United States from South America.

Fifth, the total volume of cocaine seized by all methods of transport (air, land, and maritime combined) is spatially concentrated in four main departments. These departments are: Petén, Izabal, Guatemala, and Escuintla. Escuintla department has the largest volume of cocaine seized. A reason could be that the marine shipments of cocaine make for large amounts of cocaine from other transient and producer countries further south. The Izabal department has the second highest volume amount of cocaine seized and a reason this may be is that it borders the Atlantic Ocean and where narco shipments likely come from the other transient and producer countries more south.

In answering the second question, the sources of “narco-deforestation” in Guatemala are related to global economic and organized crime structures. Environmental degradation related to cocaine trafficking is structural because narco traffickers create unsustainable markets, like that of cattle ranching, and enable the illicit money laundered to be guised in legal and socially accepted ways. This structural guise of money laundered through cattle ranching contributes to the growing amount of deforestation, as well as other environmentally degrading markets to increase in bad faith.

This research is important because the links between cocaine trafficking and environmental degradation in Guatemala are hardly studied and known. Learning more about the illicit capitalist economies, like that of the drug trade can help reach a broader and more comprehensive understanding of global trade. It also helps the study of how illicit capitalist economies contribute to the global environmental degradation. Future research can help assess and address the scale of the structural oppression that the Mayan people face in relation to the cocaine trade.

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