

REPORT OF THE ETHNOGRAPHIC FIELD SCHOOL IN BELIZE (SUMMER 2025)



CENTER FOR APPLIED ANTHROPOLOGY, NORTHERN KENTUCKY UNIVERSITY

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Introduction

This report documents the findings of the Ethnographic Field School in Belize, organized by the Center for Applied Anthropology (CfAA) at Northern Kentucky University (NKU) and held in the Orange Walk District during the summer of 2025. Ethnographic interviews were conducted in the communities of San Estevan, San Lazaro, and Yo Creek in cooperation with the Sugar Industry Research and Development Institute (SIRDI), Belize Sugar Cane Farmers Association (BSCFA), Progressive Sugar Cane Producers Association (PSCPA), and the three communities where interviews took place. This field season's research focused on the following topics: jobs, children's opportunities, pregnancy and birth support, alcohol and drug abuse support, farmers' association impacts, climate change impacts, medicinal plants, illnesses, and what the community wanted shared about them. This report presents the preliminary findings of the 2025 field season and recommends future research topics.

Background

While the educational aim of the ethnographic field school is to train students in basic ethnographic methods, its applied purpose is to collect and analyze data for use by SIRDI, BSCFA, PSCPA, and community members to develop programs that improve sugarcane farming communities in northern Belize. As stated on the field school's website (CfAA 2025):

This course immerses students in Belizean culture and trains them in contemporary anthropological field methods. Students will gain valuable research skills (e.g., ethnographic interviewing and qualitative data analysis) to apply anthropology in their future careers (e.g., applied anthropology or other social/behavioral discipline), an appreciation for Belizean cultural diversity, and further their personal growth. While in Belize, students will be primarily engaged in guided applied ethnographic fieldwork. Students will learn about the local culture by doing participant-observation and conducting ethnographic interviews in a community-based research project. Students will learn research ethics, unobtrusive observation, participant observation, field note writing and coding, ethnographic and life history interviewing, ethnolinguistic data collection, community mapping, rapid assessment procedures, qualitative data analysis, and other ethnographic methods in addition to basic ethnographic writing. After successful completion of this course, students will have:

- developed a basic understanding of Belizean culture,
- formulated an understanding of ethical and validity issues in ethnographic research,
- practiced skills in research design and ethnographic methods of data collection,
- applied basic ethnographic research methods in a non-western culture,
- engaged in a community-based research project, and
- analyzed ethnographic data resulting in an ethnographic monograph.

Methods

As in previous field seasons, upon arrival in the villages of San Estevan, San Lazaro, and Yo Creek, Antonio Novelo (Jungle River Tours) introduced the field school members to village council representatives and assisted Douglas Hume in explaining our collaborative research project to

obtain local approval for our presence in the community. Each village council granted permission and supported our efforts. We presented printed copies of last year's report (Hume et al. 2025) to the councils of San Estevan, San Lazaro, and Yo Creek. In addition, we printed business cards with shortened URL links to earlier reports to give to individual community members.

Participants in the field school (Maria Batchenkova, William M. Bergman, Caroline Boehmer, Cheyenne Mondragon, Pam Pepper, Emilio Ramos, and Trey O. Uwate) conducted house-to-house interviews using a census sampling methodology. The Cooperative Center for Study Abroad hired Antonio Novelo (Jungle River Tours) as the field school's land agent. He served as both a cultural liaison and a research assistant during fieldwork. Mr. Novelo explained the general purpose and introduced students to community members. Students then presented the informed consent statement in English (Appendix I) and in Spanish (Appendix II). Upon an informant's consent to be interviewed, students had the informant sign a copy of the consent statement (on file) and offered an unsigned copy for the informant's records.

Interviews were conducted on the informant's property (e.g., the porch or the house) with a pair of students, one serving as the primary interviewer and the other as an observer. The standard method used for this research was the ethnographic interview (Spradley 2016), which is informant-centered (Levy and Hollan 1998) rather than interviewer-centered. Interviews ranged from five minutes to an hour, depending on the informant's time constraints and willingness to be interviewed by the students. Ideally, the interview would flow naturally from topic to topic. It would end when the interviewer or the informant perceived a natural stopping point, or when the informant no longer seemed comfortable or interested in continuing the interview (Levy and Hollan 1998).

All informants were asked about jobs, children's opportunities, pregnancy and birth support, alcohol and drug abuse support, farmers' association impacts, climate change impacts, medicinal plants, illnesses, and what the community wanted shared about them (see Appendix III: Ethnographic Interview Schedule [Procedure]). Students digitally recorded interviews and took field notes during and after each interview.

After returning from the field, data from each interview were aggregated and analyzed. Following analysis, the digital audio recordings were securely erased. Douglas Hume then conducted statistical and network analyses and compiled this field report.

Demographics

A total of 159 informants were interviewed: 46 in San Estevan, 52 in San Lazaro, and 62 in Yo Creek. The median age was 45 years, with a minimum of 18 and a maximum of 86 years. Ninety-one (57.2%) of the informants were female, and 68 (42.8%) were male.

Jobs

The economic landscape of the northern Belizean villages reflects a longstanding dependence on sugar cane production while also showing signs of diversification driven by shifting market conditions and household needs. The interviews reveal a clearly gendered division of labor: men are associated with agricultural production and other forms of exterior manual labor, whereas women's work is concentrated in domestic, care, and service-oriented domains. Although the

cultural figure of the sugar cane farmer remains symbolically central, the data illustrate a community in transition, negotiating new livelihood strategies shaped by gender, education, and proximity to urban centers.

Jobs for Men

Sugar Cane Industry

- Cane Farming: Many men identify as cane farmers or “King farmers,” serving as primary agricultural producers.
- Cane Cutting: Seasonal cane cutting continues to be one of the most frequently reported forms of manual labor.
- Drivers: Men work as truck, freight, and tractor drivers, transporting cane to factories.
- Field Maintenance: Tasks include pesticide application, field fertilization, and general field cleaning.
- Factory Work: Employment at the Belize Sugar Industries (BSI) mill is also cited.

Construction and Trades

- Construction: General construction work, including masonry and house building, is widespread.
- Mechanics: Men engage in mechanical work and welding, repairing vehicles and agricultural machinery.
- Electrical and Plumbing: Skilled trades, such as electricians and plumbers, are available within and beyond the village.
- Landscaping: Yard work, grass cutting and general landscaping, is frequently cited.

Other Agriculture and Livestock

- Livestock: Cattle rearing (“cow key”), as well as raising pigs and poultry, are common occupations.
- Poultry Industry: Employment in facilities such as Caribbean Chicken is repeatedly mentioned.
- Fisheries: Some men work as fishermen.
- Coconut and Vegetable Farming: Additional agricultural income is generated through the cultivation of coconuts, vegetables, and corn.

Service and Security

- Security and Police: Men hold positions as police officers, security guards, and members of the military.
- Laborers: General labor and personal labor services are also part of the male employment landscape.

Jobs for Women

Domestic and Care Work

- Housekeeping: Cleaning homes is the dominant occupation.
- Babysitting: Childcare is a common source of income.
- Laundry Services: Washing clothes is also widely cited.

Retail and Sales

- Shopkeepers and Attendants: Women work in grocery shops and “Chinese shops.”
- Cashiers: Many are employed as cashiers locally or in Orange Walk Town.
- Food Sales: Women commonly sell fruits, vegetables, and prepared foods such as burritos, empanadas, and pastries.
- Tortilla Factories: Work in tortilla factories is specifically noted.

Food Service

- Restaurants: Women work as cooks, servers, and waitresses.
- Bakeries: Employment in bakeries and cake preparation is also common.

Processing Industry

- Chicken Processing: Women are employed in poultry cleaning and processing, particularly at Caribbean Chicken.

Jobs for Both / Sex Not Specified

Professional and Office Work

- Teachers: Teaching represents one of the main professional pathways available to both genders.
- Office Work: Positions include secretarial work, bank teller roles, and administrative support.
- Government: Employment within government departments, such as lands and fisheries, is cited.
- Health: Roles such as nurses and doctors are reported for both men and women.

Service Industry

- Call Centers: Business Process Outsourcing (BPO) work is an increasingly prominent employment option requiring travel.
- Business Owners: Small-scale entrepreneurship is present across genders.
- Gas Stations: Employment as gas station attendants is also mentioned.

The labor market in these villages reflects a deeply entrenched gendered division of labor, reinforced by the spatial dynamics between rural settlements and nearby urban centers. Men’s employment remains closely tied to outdoor work in agriculture and construction, while women’s labor continues to be anchored in domestic, caregiving, and service roles. The villages themselves function primarily as residential and extractive spaces, and access to upwardly mobile or professional positions often requires travel to Orange Walk Town. Education is widely regarded as the most viable mechanism for transcending the limitations of both cane-field labor and domestic work, serving as a key pathway to more stable, less physically demanding employment.

Children’s Opportunities

Opportunities for children in these sugar cane–producing communities fall into two broad categories: structured forms of recreational and educational engagement, and informal economic and domestic activities through which children have historically learned household and agricultural responsibilities. The ethnographic data illustrate a tension between emerging institutionalized models of childhood development, characterized by sports programs, library initiatives, church-led activities, and civic groups, and older patterns of agrarian participation that integrated children into labor from an early age. Although structured opportunities have expanded in recent years, many residents nonetheless describe children’s daily lives as marked by periods of

unstructured time, reflecting gaps in recreational infrastructure and shifting norms regarding child labor.

Sports and Physical Recreation

- Football (Soccer): The most widely cited activity, involving informal play, organized tournaments, and occasional “football camps,” prominent among boys and increasingly among girls.
- Basketball: Often paired with football as a major activity, sometimes on village courts equipped with lighting for evening play.
- Volleyball: Regularly mentioned and sometimes organized by churches or community groups.
- Softball: Noted particularly for girls.
- Baseball: Identified as an additional option in several communities.
- Karate: Offered through classes or summer programs organized by the village council.
- Cycling and Bicycling: Riding bicycles as a common unstructured pastime.
- Fishing: Informal recreational activity in local creeks.

Religious and Educational Programs

- Vacation Bible School (VBS) / Bible Camp: Churches run summer programs central to children’s structured activities.
- Church Activities and Youth Groups: Provide routine engagement beyond seasonal events.
- Library Programs: Reading programs, tutoring, and summer camps serve as an educational hub.
- Summer Camps and Classes: Math, art, baking, and other skills organized by the village council or community groups.

Cultural and Civic Engagement

- Drumming (Drum Corps/Band): Participation with regular practice schedules.
- Police Cadets: Weekly discipline training, marching, and civic instruction.
- Music and Dance: Lessons and performances, including Maya and Garifuna traditions.

Labor and Economic Socialization

- Cane Fields and Farming: Older children, especially boys, sometimes accompany parents to fields and assist with tasks.
- Domestic Chores: Cleaning the yard, washing, and household maintenance.
- Community Service: Cleaning public spaces, picking up garbage, painting infrastructure.
- Selling: Food sales such as bread or burritos.
- Construction: Occasional engagement by older youth in construction or masonry.

Unstructured Time

- Staying at Home: Children spend time at home without formal engagement.
- “Nothing” / No Opportunities: Reports indicate limited meaningful opportunities.
- Technology Use: Cell phones, video games, and other digital devices.
- General Play: Informal outdoor play with peers.

The data show communities transitioning from traditional agrarian models of childhood—where participation in fieldwork and domestic labor played a central developmental role—to more modern frameworks that emphasize structured recreation and institutional support. While sports,

library programs, church initiatives, and civic groups offer valuable opportunities, these activities are often seasonal or intermittent, leaving significant gaps in daily engagement. As child labor becomes increasingly restricted by regulatory changes and shifting norms, a structural void has emerged, marked by unstructured time and greater reliance on digital entertainment. This tension underscores an evolving landscape in which communities continue to adapt their expectations for children as agricultural labor becomes less central and institutional recreational infrastructure remains unevenly developed.

Pregnancy and Birthing Support

Pregnancy care in these communities is marked by a clear distinction between routine monitoring, conducted within the village by mobile or visiting health personnel, and childbirth, which is consistently referred to urban medical facilities. The data reveal a “maintenance versus crisis” orientation in which the village provides basic prenatal surveillance, while labor and delivery occur exclusively in Orange Walk Town due to regulatory requirements and the absence of permanent clinical infrastructure. As a result, pregnancy is managed locally, but birth itself is firmly within the jurisdiction of state-run medical institutions.

External and Institutional Birth Services

- Orange Walk Hospital / Northern Regional Hospital: The primary site for labor, delivery, and emergency obstetric care. Government policy prohibits home births to reduce infant mortality, requiring travel to Orange Walk Town.
- Private Clinics: Some expectant mothers seek prenatal or delivery services from private physicians in Orange Walk Town.
- District-Level Services: Many refer more broadly to traveling to “town” or the “district,” underscoring centralization of birth-related services.

Local and Mobile Monitoring Services

- Mobile Clinic / Visiting Nurses: Scheduled monthly visits provide blood pressure monitoring, glucose checks, vaccines, and baby weigh-ins.
- Community or Health Centers: Village centers serve as temporary sites for services.
- Lions Clinic: Some respondents mention the “Lions clinic” for periodic checkups.
- Prenatal Care: Routine assessments occur locally before women transition to hospital-based labor and delivery.

Support Networks and Specialized Programs

- Community Health Workers / Social Workers: Local workers assist with monitoring and scheduling hospital appointments.
- National Health Insurance (NHI): Program through which some services are funded or facilitated.
- Foreign Medical Brigades: Occasional visits by international teams provide supplementary checkups.
- Family Support: Households rely on family members for transportation, emotional support, and general assistance.

Service Gaps

- No Local Delivery Services: Delivery does not occur in the village; women must travel to the hospital for childbirth.

- No Resident Doctor or Full-Time Nurse: Care is limited to intermittent visits rather than continuous availability.

The ethnographic data depict a maternal health system in which the village plays a limited yet important role in monitoring pregnancy, while the state maintains exclusive control over childbirth through centralized medical institutions. Local clinics serve as periodic points of contact for prenatal surveillance, yet they lack the capacity for labor and delivery, leaving expectant mothers to leave the community at the critical moment of birth. This arrangement reinforces dependence on urban health infrastructure and positions childbirth as an event that relocates women from their home communities to the regional center. In this model, villages manage the ongoing processes of pregnancy, but the decisive event of birth occurs outside local control.

Alcohol and Drug Abuse Support

Support for alcohol- and drug-related challenges in these communities is defined largely by its absence. Ethnographic findings show that formal addiction services, whether therapeutic, clinical, or rehabilitative, are not available in the villages themselves. Instead, residents view treatment as located elsewhere, primarily in Orange Walk Town, or, for more serious cases, in Belize City or across the border in Mexico. Within the village, responses to addiction tend to take the form of social control or religious intervention rather than structured medical care. Thus, the community's understanding of support reflects a persistent displacement of responsibility for addiction treatment to external institutions.

The “Nothing” Response (Local Absence)

- No Support: Many describe the village as having “no support,” “no help,” or “nothing” available for individuals struggling with alcohol or drugs.
- Lack of Awareness: Responses such as “I don’t know” illustrate the absence of visible or accessible support structures.

External Institutions (The “Town” Solution)

- Orange Walk Town: Residents frequently reference traveling to Orange Walk for help, often without naming specific institutions.
- Alcoholics Anonymous (AA): The most explicitly named organization, consistently situated outside the village.
- Northern Regional Hospital: Viewed as a generalized site for crises with access to counselors or psychiatrists.
- Rehabilitation Centers: Mentions of “rehab centers” or “rehab houses” in Orange Walk Town, often without specific names.
- National Drug Abuse Control Council (NDACC): Referenced as an office in Orange Walk providing counseling or educational programs.

Distant and International Options

- Belize City / Belmopan: Cities cited as sites for formal or long-term addiction treatment facilities.
- Mexico (Merida / Chetumal): Descriptions of sending individuals across the border for rehabilitation.

Informal and Punitive “Support”

- Police / Jail: Principal response framing addiction as a legal rather than health issue.

- Church Support: Spiritual counseling, conversations, and prayer.
- Sports as Prevention: Football and tournaments intended to deter substance use among youth.
- Family Support: Conversations, supervision, and informal care by family members.

The reliance on services outside village boundaries underscores a structural gap: while residents recognize addiction as a community problem, the lack of local services limits intervention to family- or church-based support and, at times, the criminal justice system.

Farmer's Association Impacts

The Farmers Association occupies a central yet contested position in village life, serving as an intermediary among the sugar cane industry, local households, and community institutions. While respondents consistently recognize the Association as a key provider of agricultural inputs and occasional social support, they also describe it as an organization marked by exclusivity and uneven distribution of benefits. The data portray the Association as simultaneously indispensable and polarizing; an institution whose material contributions are significant yet whose internal governance and membership practices generate persistent tensions within the broader community.

Agricultural Inputs and Production Support

- Fertilizer Distribution: Frequently mentioned service, often provided as grants or credit.
- Pesticides, Herbicides, and Agrochemicals: Supplies include insecticides and herbicides, with some concern for impacts on bees.
- Fuel and Diesel: Diesel coupons or fuel support for machinery operations.
- Tools and Equipment: Items such as boots, gloves, machetes, and water containers.
- Field Maintenance Assistance: Plowing, harvesting assistance, and field cleaning.
- Technical Training and Advice: Sessions and guidance on best practices for cane cultivation.
- Diversification Projects: Initiatives supporting livestock rearing and apiculture.

Financial Safety Nets

- Loans and Credit: Financial credit or small loans, occasionally for housing needs.
- Scholarships and Educational Grants: Support for farmers' children.
- Emergency and Medical Aid: Assistance with funeral expenses, healthcare costs, and income support for injured farmers.
- Bonuses: Periodic bonuses tied to membership or tenure.

Community Infrastructure and Welfare

- School Support: Fences, supplies, and construction assistance.
- Church Support: Material support to local churches.
- Road Maintenance: Repair and maintenance of cane roads and village access roads.
- Christmas Pantries and Gifts: Holiday food baskets and gift distributions.
- Public Maintenance: Community clean-up and public space maintenance.
- Cemetery Maintenance: Assistance with cemetery fencing or upkeep.

Employment and Social Programs

- Job Creation: Seasonal employment during harvest and summer jobs for students.

- **Women's Programs:** Training for women, such as baking classes and capacity-building workshops.

Negative Perceptions and Exclusion

- **Exclusion of Non-Farmers:** Benefits perceived to accrue primarily to cane farmers, marginalizing non-farmers.
- **No Impact / Lack of Visibility:** Assertions that the Association has “no impact” or limited visibility.
- **Inequity and Favoritism:** Reports of favoritism, limited transparency, or benefits concentrated among wealthier farmers.
- **Fair Trade Issues:** Concerns about mismanagement or discontinuation of Fair Trade funds.

The Farmers Association emerges from the data as a powerful yet divisive institution. Its material contributions (i.e., fertilizer, loans, training, scholarships, and infrastructure support) are central to sustaining the agricultural economy and filling service gaps in village life. At the same time, its benefits are widely perceived to circulate within a closed network of members and affiliates, reinforcing an “in-group versus out-group” dynamic that excludes large segments of the population. This dual role positions the Association as both a crucial economic actor and a source of social friction. While it provides essential agricultural and community support, its contested internal practices and limited inclusivity raise ongoing questions about equity, representation, and community cohesion.

Climate Change Impacts

For residents of these sugar cane-producing communities, climate change is not an abstract phenomenon but a set of immediate, disruptive environmental shifts that affect daily life, agricultural productivity, and personal well-being. Informants describe the climate as increasingly unpredictable and physically taxing, disrupting long-standing agricultural calendars and reshaping local understandings of seasonal cycles. Rather than a distant or theoretical concern, climate change is perceived as a direct challenge to the viability of cane farming and to the health and comfort of those working in the fields.

Thermal Intensification and Extreme Heat

- **Extreme Heat:** The heat is described as exceptionally intense, beyond prior decades.
- **Stronger Sun:** Sun exposure is said to feel harsher and more aggressive.
- **Longer Hot Seasons:** Reports of extended and earlier hot seasons.
- **Physical Fatigue:** Increased reliance on fans or air conditioning with associated costs.

Hydrological Chaos (Unpredictability)

- **Unpredictable Rain:** Rainfall during traditionally dry months or absence during rainy season.
- **Flooding:** Heavy downpours and flash floods causing standing water in fields and road damage.
- **Drought:** Extended dry periods harming crops and reducing water availability.
- **Soil Erosion and Cracking:** Erosion, deep cracking, and riverbank wear.

Agricultural Distress

- **Cane Quality and Yield:** Cane turning yellow, growing poorly, and failing to meet expected yields.

- Pests and Diseases: Increased pest pressures (e.g., froghoppers) and diseases (fungus, fusarium).
- Loss of Other Crops: Fruit trees and vegetables struggle under heat and irregular rainfall.
- Interrupted Labor: Extreme weather halts fieldwork and construction.

Somatic and Health Impacts

- Frequent Illness: Shifts from rain to sun linked to recurring colds, especially in children.
- Allergies and Respiratory Issues: Dust and smoke exacerbate allergies and asthma.
- Heat Stress: Risks of heat stroke and dehydration.

Environmental Degradation

- Fires: Higher temperatures and dryness contribute to more frequent fires.
- Dust: Persistent dryness creates heavy dust affecting homes and respiratory health.

Denial or Normalization

- No Change Reported: A minority describe the weather as “normal.”

Collectively, residents describe the climate as increasingly unreliable for agricultural planning, with practical consequences for yields, pest management, and labor conditions. Adaptations, such as adjusted work hours and greater reliance on cooling technologies, reflect ongoing efforts to sustain cane-based livelihoods amid changing environmental conditions.

Medicinal Uses of Aloe Vera

Within these communities, Aloe vera holds a prominent place in local ethnomedical practice, serving as both a restorative topical agent and a versatile internal cleanser. Residents view the plant primarily as a cooling, regenerative substance that repairs skin damage, reduces inflammation, and supports bodily purification. Its uses span dermal care, cosmetic enhancement, internal digestive treatment, and systemic health maintenance, underscoring its status as a cornerstone of the local household pharmacopoeia.

Dermal and Cosmetic Care

- Hair Health: Applied to promote hair growth, prevent hair loss, treat dandruff, and strengthen hair.
- Burns and Sunburns: Primary remedy for cooling and soothing skin after thermal damage.
- Skin Care (Face/Acne/Pimples): Used to reduce acne, clear dark spots, and smooth the skin.
- Scars and Stretch Marks: Employed to diminish scars and stretch marks over time.
- Rashes and Itchiness: Soothes rashes, itching, and minor skin irritations.
- Cuts, Wounds, and Bruises: Functions as an antiseptic and healing agent for minor injuries.

Digestive and Internal Health

- Stomach Pain: Gel eaten raw, blended, or swallowed in pieces to relieve pain.
- Gastritis and Ulcers: Associated with soothing gastric inflammation and treating ulcers.
- Detoxification: Consumed to “clean” the intestines and remove impurities.
- Gas and Acid Reflux: Used to reduce gas and alleviate reflux.

Systemic and Organ Health

- Kidney Health: Blended preparations, often with pineapple or lime, consumed to “clean” kidneys, alleviate pain, or dissolve stones.
- Inflammation and Swelling: Anti-inflammatory qualities for internal and external swelling.
- Diabetes and Blood Sugar: Some consume Aloe to help regulate blood sugar.
- Cancer and Tumors: A subset identifies Aloe as beneficial for preventing or treating cancer.
- Back Pain and Infection: Also used for back pain and general infections.

Other Uses

- Vaginal Infection and Hygiene: Frozen pieces used as a suppository or wash.
- Cough: Occasionally mentioned as a remedy.
- Lung Cleaning: Some consume the gel to support lung health.

Aloe vera stands out as a highly adaptable plant in the community’s healing practices, valued for its ability to cool, cleanse, and regenerate. Its dual role, repairing external injuries while purifying internal systems, reflects a coherent ethnomedical logic in which inflammation, whether manifested as a burn, an ulcer, or systemic “heat,” is addressed through the plant’s perceived cooling and restorative properties.

Medicinal Uses of Avocado Leaves

Within the community’s ethnomedical framework, avocado leaves primarily serve as agents of metabolic regulation and pain management. Residents distinguish sharply between the fruit viewed as food and the leaves, which are understood as medicinal. Most uses center on regulating “high” internal states, such as elevated blood pressure, blood sugar, or cholesterol, while external applications focus on reducing localized pain or inflammation. Boiling the leaves into a tea is the most common preparation method.

Cardiovascular and Metabolic Health

- High Blood Pressure (“Pressure”): Tea widely consumed to lower or regulate blood pressure, sometimes with guava leaves or cinnamon.
- Cholesterol: Used to reduce cholesterol and assist lipid regulation.
- Diabetes (“Sugar” / “Sweet Blood”): Tea drunk to manage diabetes or reduce high blood sugar.
- Triglycerides: Cited as helping reduce triglycerides.
- Blood and Circulation: Tea framed as improving blood quality and circulation.

Pain and Inflammation Management

- Arthritis and Joint Pain: Leaves applied externally or consumed as tea for chronic pain.
- General Body Pain: Used for pain relief, sometimes prepared with alcohol or applied as a compress.
- Headache: Leaves applied to the head or consumed as tea for headache.
- Inflammation and Swelling: Boiled or heated leaves for internal and external inflammation.
- Menstrual Cramps and Uterine Pain: Tea used to alleviate menstrual discomfort.
- Wrapping and Compress: Heated leaves applied or soaked in alcohol and wrapped around painful sites.

Respiratory Health

- Cough: Tea used for coughs, often noted alongside other remedies.
- Colds and Flu: Leaves boiled to treat colds and lengthy bouts of flu.
- Asthma: Leaves boiled, sometimes with soursop, to treat asthma symptoms.

Digestive Health

- Stomach Pain: Tea consumed to alleviate general stomach discomfort.
- Diarrhea: Boiled leaves, often with guava leaves, used to stop diarrhea.

Infection and Systemic Illness

- Infection: Used for internal infections, with some comparing effects to an antibiotic.
- Fever: Boiled as tea to reduce fever, sometimes with cinnamon.
- Measles: Leaves used in baths or as boiled remedies for measles.
- Cancer: Leaves cited as part of treatment, occasionally with soursop.

Psychological State

- Stress and Relaxation: Tea described as calming or helpful “when feeling uncomfortable.”

The community’s use of avocado leaves reflects an ethnomedical logic in which the body is understood as governed by internal pressures and circulating fluids. The plant’s role as a regulator of these “high” states (i.e., blood sugar, blood pressure, and cholesterol) positions it as a key remedy for chronic lifestyle-related conditions. Heating the leaves and applying them directly to the body underscores their perceived capacity to alleviate localized pain and swelling.

Medicinal Uses of Chaya (Maya Tree Spinach)

Chaya holds a distinctive place in the local ethnomedical system as a form of medicinal nutrition; a plant whose consumption is believed to strengthen the blood, support circulatory health, and improve overall bodily function. Unlike other remedies used primarily for acute illness, Chaya is regarded as a staple food with inherent therapeutic value. Its widespread use in meals underscores a cultural understanding of health maintenance rooted in nourishment rather than episodic treatment.

Hematological and Circulatory Health

- Blood Building: Chaya described as “good for the blood,” capable of increasing blood volume and improving quality.
- Anemia (“Low Blood,” “Weak Blood”): Regarded as the primary remedy for anemia.
- Blood Pressure Regulation: Associated with regulating blood pressure (lowering hypertension or raising low blood pressure).
- Iron and Hemoglobin: Identified as a source of iron and a booster of hemoglobin.
- Circulation: Used to enhance blood circulation.

Dietary and Culinary Preparation

- Fried with Eggs: Common preparation involves frying leaves (often with onions) and mixing with eggs.
- Boiled Water / Tea: Leaves boiled and water consumed as tea.
- Soups: Added to soups with potatoes or other vegetables.
- Tamales and “Tamalitos”: Leaves used as wrappers or fillings.

- Juice / Blended: Prepared as green juice with pineapple, green apple, or celery.

Digestive and Organ Health

- Digestion and Constipation: Aids digestion, treats constipation, and “cleans the intestines.”
- Liver and Kidneys: Identified as beneficial for the liver (reducing swelling) and supporting kidneys.
- Detoxification: Used to “clean the blood” and detoxify the body.

Other Health Benefits

- Lactation: Consumed to promote milk production.
- Pain Relief: Used for general body pain.
- Diabetes / Blood Sugar: Cited for benefits in managing “sugar.”

Botany and Safety

- Rash / Itch / Sting: Varietal differences noted; some types cause itching when handled raw.

Chaya is central to the community’s integration of dietary practices and preventive health care. Its reputation as a “blood-builder” and circulatory regulator makes it a foundational part of daily well-being rather than a remedy reserved for illness. By incorporating Chaya into routine meals, most notably when fried with eggs, residents turn everyday eating into a form of health maintenance.

Medicinal Uses of Cinnamon

Cinnamon is recognized as both a culinary staple and a common household remedy. Residents use it for digestive discomfort, menstrual pain, respiratory symptoms, and certain metabolic concerns.

Culinary and Dietary Uses

- Food and Cooking: Added broadly for flavor.
- Maja Blanco / Rice Pudding: Central to traditional sweet preparations.
- Breads and Pastries: Used in baking, including breads, rolls, and donuts.
- Oats and Porridge: Added to breakfast porridges.
- Tea and Drinks: Consumed as a tea or added to coffee, juices, and other beverages.

Digestive Health

- Stomach Pain: Boiled as tea to relieve discomfort.
- Gas and Bloating: Used to expel gas and ease indigestion.
- Vomiting: Consumed to address nausea.
- Diarrhea: Boiled, sometimes with guava leaves or rice water, to help stop diarrhea.
- Detoxification: Used to “clean the system.”

Metabolic and Circulatory Health

- Diabetes and Blood Sugar: Cited for helping regulate blood sugar.
- Blood Pressure: Used to manage high blood pressure.
- Weight Loss: Consumed as part of weight-loss practices.
- Liver Health: Boiled cinnamon used to address fatty liver or liver pain.

Respiratory Health

- Cough: Prepared with lemongrass, ginger, honey, or garlic.
- Flu and Colds: Used for flu symptoms and colds.
- COVID-19: Included in mixtures used during COVID-19 outbreaks.

Reproductive Health

- Menstrual Cramps: Consumed to relieve period pain.
- Labor and Birth: Used to ease labor pains or support childbirth.

Other Uses

- Fever: Tea, sometimes with fever grass, used to lower fever.
- Infection: Described as an antibiotic or remedy for general infections.
- Chest Pain: Used for chest discomfort.
- Not Used: Some community members do not use cinnamon medicinally.

Cinnamon serves practical roles in both cooking and household care. Its use in teas and mixtures for stomach pain, menstrual cramps, and respiratory symptoms illustrates its perceived utility as a mild, accessible remedy that complements stronger preparations when needed.

Medicinal Use of Fever Grass/Lemongrass

Fever grass (lemongrass) is a foundational element of the community's medicinal repertoire, serving as a primary remedy for regulating body temperature, supporting respiratory health, and maintaining overall systemic balance. Widely consumed as a boiled tea, it is regarded as a reliable treatment for fever, mucus congestion, and stomach discomfort. Its applications have expanded to include responses to recent illnesses such as COVID-19.

Systemic and Thermal Regulation

- Fever: Used to "sweat out" fever, often prepared with milk or cinnamon.
- Cholesterol and Triglycerides: Attributed with reducing "fat in the blood."
- Diabetes / Blood Sugar: Used to help manage high blood sugar.
- Immune System Support: Consumed to strengthen general immunity.

Respiratory Health

- Cough: Frequently cited treatment, often with honey, lime, or garlic.
- Colds and Flu: Utilized for colds, "catarrh," and flu symptoms.
- COVID-19: Mixed with lemon, garlic, or ginger during COVID-19 illness to relieve symptoms.
- Sore Throat: Tea used to soothe throat inflammation.
- Lung Health and Congestion: Consumed to clear mucus and support lung function.

Digestive and General Health

- Stomach Issues and Pain: Consumed for stomach pain, indigestion, and infections.
- Vomiting: Used to calm the stomach and reduce nausea.
- Gas and Bloating: Relieves gas and bloating.
- Headache: Tea consumed to reduce headaches.
- Swelling: Used for throat swelling.
- General Health and Cleansing: Drunk routinely for overall health and to "clean the system."

Its widespread use for fevers, respiratory symptoms, and digestive discomfort reflects a consistent household practice: lemongrass tea is prepared when residents seek a familiar, readily available remedy for common ailments, and it has also been incorporated into local responses to recent illnesses.

Medicinal Uses of Garlic

Garlic is widely used as a household remedy for both prevention and treatment. Residents prepare it by roasting, crushing, or boiling, and in some cases consume it raw. It is used to address respiratory ailments, digestive disturbances, cardiovascular health, external infections, and general immune support.

Respiratory Health

- Cough: Boiled with onion, oregano, or honey, or eaten raw mixed with honey.
- Flu, Colds, and Catarrh: Used widely in teas for flu symptoms and persistent colds.
- Sore Throat: Honey-garlic mixtures for throat pain.
- Asthma: Boiled or eaten to manage symptoms.
- COVID-19: Mentioned for use during COVID-19 infections.
- Bronchitis: Cited for treating bronchitis.

Digestive Health

- Stomach Pain: Boiled or raw to relieve discomfort.
- Gas and Bloating: Reduces gas and treats indigestion.
- Worms and Parasites: Chopped or boiled to address intestinal worms.
- General Digestion: Used as a digestive stimulant.

Cardiovascular and Systemic Health

- High Blood Pressure: Swallowing a clove whole or eating raw to lower blood pressure.
- Cholesterol: Used to manage high cholesterol.
- Diabetes / Blood Sugar: Used to regulate blood sugar.
- Immune System: Viewed as an immune enhancer.
- “Cure-All” and Cancer: Some describe garlic as protective against cancer.

Dermal and Exterior Applications

- Ear Pain and Infections: Roasted or heated clove placed in the ear or applied as oil drops.
- Skin Infections and Cuts: Crushed garlic applied to prevent infection.
- Inflammation and Swelling: Used topically to reduce swelling.
- Splinters and Punctures: Burnt or crushed garlic to draw out splinters.
- Bites and Stings: Applied to insect or dog bites.
- Itching: Topical application to relieve itching.
- Teething: Roasted garlic squeezed onto infant gums.
- Toothache: Applied for dental pain.

Dietary Use

- Cooking: Used regularly as a culinary ingredient.

Other Uses

- Veterinary Use: Fed to sick animals such as chickens, ducks, and geese.

- **Weight Loss:** Consumed to support weight-loss efforts.

Garlic is widely regarded as a potent, multi-purpose remedy used by residents for respiratory relief, gastrointestinal issues, blood pressure management, and basic antiseptic needs. Preparation methods are believed to activate its properties, and its broad applicability supports its standing in household care.

Medicinal Uses of Guava

Guava leaves, most commonly prepared as a boiled tea, are a core component of the community's ethnomedical repertoire. They are understood as agents of physiological regulation, particularly for digestive stability and chronic metabolic conditions. Their perceived ability to "tighten" bodily processes makes guava leaves a primary remedy for disorders involving excess fluidity or imbalance.

Metabolic and Chronic Disease Management

- **Diabetes ("Sugar," "Sweet Blood"):** Tea consumed to lower blood sugar and manage diabetes.
- **High Blood Pressure / Hypertension:** Tea used to regulate high blood pressure, sometimes with avocado leaves or cinnamon.
- **Cholesterol and Triglycerides:** Associated with reducing cholesterol and "fat in the blood."

Digestive Health

- **Diarrhea:** First-line treatment, often prepared with rice water or cinnamon.
- **Stomach Pain and Stomach Flu:** Relieves pain, vomiting, and general digestive discomfort.
- **Dysentery and Vomiting:** Specifically mentioned for acute episodes.

Infection and Dermal Care

- **Internal Infections:** Tea consumed for throat infections and general internal cleaning.
- **Skin Rashes and Wounds:** Boiled leaves used topically to wash irritations, rashes, and wounds (including diabetic sores).
- **Kidney Issues:** Tea used for kidney stones, infections, or general pain.

Respiratory Health

- **Cough:** Tea consumed for coughs, often in mixtures with garlic or oregano.
- **Sore Throat:** Used for throat pain and infections.

Other Medicinal Uses

- **Cancer:** Tea described as beneficial for cancer, including prostate cancer, often combined with soursop.
- **Pain and Swelling:** Tea or washes used for body pain, swelling, or arthritis.
- **Blood Levels / Anemia:** Employed to "increase blood levels" or address anemia.
- **Menstrual Cramps:** Consumed for menstrual pain.
- **Liver Health:** Used for "fatty liver" or general liver support.

Practical / Non-Medicinal Uses

- **Tenderizing Meat:** Leaves ground or added to meat to soften.
- **Hair Care:** Leaf water used to prevent hair loss or support scalp health.

Guava leaves serve as a primary regulatory agent, valued for their perceived ability to stabilize and restrain bodily processes. Their role in stopping acute digestive fluid loss while reducing chronic metabolic “highs” positions guava as a dependable household remedy integral to both everyday maintenance and chronic condition management.

Medicinal Uses of Honey

Honey holds a central place in the community’s ethnomedical system, serving as both a medicinal substance and a delivery medium for other remedies. Although it is also a food, its medicinal role is dominant. Residents value honey for its soothing, antimicrobial, and restorative properties, using it extensively for respiratory care, wound healing, and digestive support. Honey also serves as a “binder” that makes stronger remedies (e.g., lime, garlic, and onion) more palatable and effective.

Respiratory Health

- Cough: Most common use in mixtures, typically with lime, garlic, onion, or warm water.
- Sore Throat: Used to soothe pain and dryness, often with lime.
- Flu, Colds, and Catarrh: Employed as an immune-supportive agent.
- Asthma: Mixed with onion, garlic, or lime to alleviate symptoms.
- Lung Health: Consumed to “clean” the lungs.
- COVID-19: Used in mixtures during COVID-19.
- Congestion: Used to relieve chest and throat congestion.

Dermal and Tissue Repair

- Cuts and Wounds: Applied to prevent infection and promote healing.
- Eye Care: Used as eye drops for pain, infection, or pink eye.
- Infant Mouth Care: Clean infants’ tongues or soothe sores.
- Burns: Applied for tissue repair after burns.
- Scars and Skin Rejuvenation: Applied to reduce scars and rejuvenate skin.
- Blisters: Used for blisters on the tongue or face.
- Infection: Recognized as a natural antibiotic.

Systemic and Internal Health

- Diabetes and Blood Sugar: Used to treat diabetes or applied to diabetic wounds resistant to healing.
- Blood Pressure: Combined with garlic or lime to regulate pressure.
- Immune System: Taken routinely to strengthen immunity.
- Fever: Mixtures including honey and lemongrass used to reduce fever.
- Sleep: Consumed for insomnia.
- Antibiotic Function: Recognized as antimicrobial for internal use.

Digestive Health

- Stomach and Belly Pain: Consumed for discomfort.
- Hiccups: Specifically mentioned as a remedy.
- Gas: Mixed with oregano to relieve gas.

Culinary and Practical Uses

- Breakfast Foods: Eaten with pancakes, bread, or waffles.
- Sweetener: Healthier substitute for sugar in beverages and foods.

- Tea and Coffee: Added to drinks.
- Cooking: General ingredient in food preparation.

Honey serves as both a standalone remedy and an essential delivery medium for stronger therapies. Its soothing, antimicrobial, and restorative properties allow it to treat a spectrum of ailments, from respiratory discomfort to wound care, while its sweetness makes otherwise harsh medicinal mixtures palatable to children and adults alike.

Medicinal Uses of Lime

Lime is widely used for both household hygiene and home remedies. Residents rely on it for respiratory mixtures, digestive discomfort, topical cleaning of minor wounds, and routine food preparation.

Respiratory Health

- Cough: Combined with honey, garlic, or warm water.
- Sore Throat: Lime and salt or lime-honey mixtures to soothe irritation.
- Flu, Colds, and Catarrh: Consumed during episodes as part of mixtures.
- Asthma: Used in treatments for symptoms.
- Lung Health: Consumed or inhaled as part of remedies to cleanse the lungs.

Cardiovascular Regulation

- High Blood Pressure: Lime water, lime wedges, or lime with coconut water to lower pressure.
- Cholesterol and Triglycerides: Believed to reduce cholesterol and fat in the blood.
- Circulation: Used to improve circulation when limbs “fall asleep.”

Digestive Health

- Stomach Pain: Mixed with baking soda, oil, or Alka-Seltzer.
- Diarrhea: Sometimes combined with Coca-Cola to stop diarrhea.
- Bloating: Used to relieve bloating and indigestion.
- Detoxification: Warm lime water taken in the morning to “clean the system.”
- Digestion: Used after heavy meals, especially pork.

Dermal and Topical Applications

- Headache: Rubbed on head, forehead, or neck.
- Hair Care: Applied to scalp for growth or dandruff.
- Cuts and Wounds: Used for cleaning minor wounds.
- Swelling and Inflammation: Applied to swollen feet, tonsils, or joints.
- Itching and Bug Bites: Rubbed on stings, rashes, and allergies.
- Fever: Applied to forehead or consumed as tea.

Culinary and Hygiene Practices

- Cleaning Meat: Washing meat, especially chicken, with lime to remove “freshness.”
- Cooking: Common ingredient in soups and ceviche.
- Beverages: Used to make lemonade or added to drinks.

Other Uses

- Weight Loss: Lime water consumed to support weight reduction.

- **Poisoning and Allergic Reactions:** Used to treat intoxication in humans or animals.
- **Energy:** Lime with salt consumed in the morning for energy.
- **Kidney Stones:** Mixed with olive oil to address stones.
- **Veterinary Use:** Used to treat sick dogs or remove fleas.

Lime plays a practical role in daily routines: cleaning meat, flavoring food, and serving as a home remedy for coughs, stomach upset, and minor topical care. Its broad availability and familiarity support frequent use.

Medicinal Uses of Oregano

Oregano is used for both internal and external care. Residents prepare it as a tea for coughs and sore throats, and heat the leaves for topical application to treat swelling and localized pain.

Respiratory Health

- **Cough:** Heated/roasted leaf juice mixed with honey and lime; boiled tea also common.
- **Sore Throat:** Juice or tea used to soothe irritation.
- **Asthma:** Leaf prepared (mashed or boiled) to support breathing.
- **Flu and Colds:** Tea consumed for flu-like symptoms and colds.
- **Congestion and Lung Health:** Described as helping improve lung function.

Pain and Inflammation

- **Swelling:** Heated leaves applied as warm compresses.
- **Ear Pain / Ear Infection:** Warm oil/juice placed directly in the ear.
- **Menstrual Cramps:** Boiled tea consumed to relieve discomfort.
- **Inflammation:** Heated leaves used for general inflammatory conditions.
- **Stomach Pain:** Tea or mashed leaves used for abdominal discomfort.
- **Toothache and Molar Pain:** Juice or mashed leaf applied externally.
- **General Pain:** Remedy for various forms of bodily pain.

Dermal and Topical Treatments

- **Vaccine Wounds:** Heated leaves applied to infant vaccination sites.
- **Bruises:** Mashed leaves applied to bruises.
- **Wounds and Cuts:** Used to promote healing of minor wounds.
- **Bug and Insect Bites:** Applied to reduce swelling or pain.
- **Rashes:** Rubbed on skin irritations.
- **Burns:** Mashed leaf placed on burns.

Systemic and Internal Health

- **Fever:** Tea consumed or applied topically to reduce fever.
- **Diabetes / Blood Sugar:** Tea used to help manage high blood sugar.
- **Kidney Problems:** Tea prepared for kidney health.
- **Prostate Health:** Tea consumed to address prostate issues.
- **Triglycerides:** Mentioned for lowering triglycerides.

Other Uses

- **Cooking / Spice:** Used in daily cooking.
- **Vomiting:** Boiled with rice to stop vomiting.

- Bloating / Gas: Given to infants and children to relieve bloating or gas.

Oregano's role in household care is practical and preparation-specific: tea is used to address respiratory and digestive symptoms, and warmed leaves are applied to the skin to reduce swelling and pain. These uses make oregano an accessible option for common complaints.

Medicinal Uses of Soursop

Soursop (Guanábana) holds a prominent place in the community's ethnomedical system. Unlike plants used primarily for everyday ailments, soursop (particularly its leaves) is regarded as a major therapeutic resource for chronic or severe conditions. Its use reflects a belief in the plant's regulatory and restorative properties for illnesses associated with elevated blood sugar, high blood pressure, and cancer. While the fruit is consumed as food or juice, the plant's medicinal value lies predominantly in the leaves, typically prepared as a boiled tea.

Diabetes and Blood Sugar Control

- Diabetes / "Sugar" / "Sweet Blood": Leaves boiled to lower or stabilize blood sugar.
- Preventative Use: Tea consumed regularly to maintain balanced blood sugar.

Cancer Treatment and Prevention

- General Cancer Treatment: Leaves prepared as tea and consumed routinely.
- Specific Cancers: Mentions include prostate cancer.

Cardiovascular Health

- High Blood Pressure: Tea prepared to lower blood pressure.
- Cholesterol: Associated with reducing cholesterol and "fat in the blood."
- Triglycerides: Used to lower triglycerides.

Digestive and Internal Organ Health

- Stomach Issues: Leaves boiled to treat stomach pain and swelling.
- Diarrhea: Tea used to manage diarrhea.
- Kidney Health: Tea consumed for kidney pain or stones.
- Liver Health: Used to treat fatty liver and support function.

Systemic and Pain Relief

- Fever: Tea made from the leaves, sometimes with guava or avocado leaves, used to lower fever.
- Pain Relief: Cited for general body pain, joint pain, and arthritis.
- Immune System Support: Tea or juice consumed to strengthen the immune system.

Other Uses

- Women's Health: Tea used for menstrual cramps and uterine pain.
- Respiratory Issues: Consumed to relieve coughs or asthma symptoms.
- Nerves and Relaxation: Used for stress or general discomfort.
- Food and Drink: Fruit enjoyed as juice or snack outside medicinal contexts.

Soursop is used to treat both common and chronic conditions and is regarded as a plant of considerable therapeutic power. Its reputation as an agent capable of regulating blood sugar, blood pressure, and cancer reflects the community's reliance on plant-based remedies to address health challenges where biomedical resources may be limited or difficult to access.

Community Description of Themselves

Community members describe both strengths and challenges when speaking to outsiders about their villages. They emphasize social cohesion, safety, cultural heritage, and a strong work ethic, while also noting persistent constraints, particularly in healthcare access and household-level economic hardship.

Social Cohesion and Character

Peaceful and Calm

- Villages frequently characterized as safe and quiet.
- Emphasis on the absence of conflict (“no fighting,” “no trouble”).

Friendly, Kind, and Welcoming

- Residents described as friendly, kind, and welcoming.
- Community members “receive you with love” and rarely refuse help.

Supportive and United

- Culture of helping and supporting one another.
- Descriptors such as “united,” “tightly knit,” and “working together.”
- The expression “caring is sharing” recurs.

Hardworking

- Labor, particularly agricultural labor, is central to community identity.

Cultural and Economic Identity

Sugar Cane Farming and Agriculture

- Roles as cane farmers and the importance of the sugar industry.
- Farming as a long-standing cultural and economic foundation.

Rich Culture and Food

- References to Maya, Mestizo, and Garifuna heritage.
- Value placed on local cuisine and food traditions.

Physical and Infrastructural Attributes

Beautiful and Clean

- Villages described as beautiful, pretty, and clean.

Quiet and Safe

- Safety mentioned often, including for children.

Development and Facilities

- Mentions of internet access, water boards, libraries, schools, gas stations.
- Roads discussed as both assets and areas needing improvement.

Needs and Challenges

Need for Medical Services

- Desire for more doctors and improved access to care.

- Absence of full-time clinical staff as a common grievance.

Drug and Alcohol Issues

- Presence of alcoholism and youth exposure to drugs.

Poverty and Sickness

- References to economic hardship and illness within households.

Taken together, these narratives paint a picture of communities that see themselves as peaceful, supportive, culturally rich, and grounded in agricultural heritage, yet constrained by limited access to healthcare, economic hardship, and emerging social challenges. The contrast between internal cohesion and structural neglect is central to how residents wish to represent their villages to outsiders.

Types and Illnesses and Causes

In the previous two field seasons (Hume et al. 2024; Hume et al. 2025), informants were asked to free list types of illnesses and their causes. In this and the previous field season (Hume et al. 2025), we asked informants to complete a free pile sort of both sets of types of illnesses and causes of illnesses on three-by-five cards. This data was analyzed using non-metric cluster analysis and multidimensional scaling.

Non-metric cluster analysis of free pile-sort data groups items by participants' perceived similarities. The results typically show clusters of items that are frequently sorted together, revealing patterns in how people categorize and relate different types of illness and their causes. This helps us understand the underlying cognitive structures and cultural models that influence these categorizations.

Multidimensional scaling (MDS) of free pile-sort data visualizes perceived similarities among items by placing them in a spatial configuration. Items that are sorted together frequently appear closer to each other in the resulting map, revealing the dimensions along which participants differentiate and categorize types of illness and their causes. This helps clarify the cognitive and cultural structures underlying these categorizations.

Non-metric Cluster Analysis of Illness Types

Figure 1 below shows the results of the non-metric cluster analysis of the pile-sort data on illness types. The circled area at the top is cardiovascular/metabolic illnesses. The next circled area shows arthritis and pain (a symptom rather than an illness). The next circled area on the upper-left side is urologic illnesses. The next circled area on the upper-left side is prostate and cancer, which are closely related to urologic illnesses. The next circled area on the upper-right side is mosquito-borne illnesses and diarrhea (a symptom rather than an illness). The bottom circled area is respiratory illnesses.

The dendrogram from the non-metric cluster analysis groups illness types based on perceived similarities among informants. Here are the key clusters:

- The reddish area in the top, are respiratory illnesses.
- The next orangish area, are mosquito borne illnesses.

- The next greenish area,, are are urologic/gastrointestinal illnesses, which are closely related to cancer.
- The bottom yellowish area, are cardiovascular/metabolic illnesses.

These clusters reveal how informants categorize illnesses, likely reflecting common perceptions and experiences within the community. Chronic conditions are grouped together, suggesting a shared understanding of long-term health issues, while infectious and respiratory diseases form distinct clusters, highlighting their acute and contagious nature.

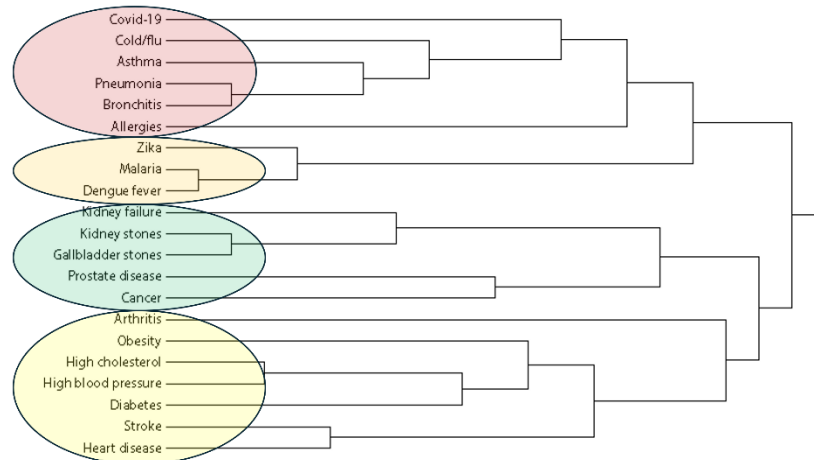


Figure 1 - Non-metric Cluster Analysis of Illness Types

Multidimensional Scaling of Illness Types

Figure 2 below shows the results of the multidimensional scaling of the pile-sort data on illness types. The circled area on the upper left side is urologic illnesses. The circled area in the middle is pain and arthritis. The circled area on the lower left side is cardiovascular/metabolic illnesses. The circled area on the upper right side is mosquito-borne illnesses. Respiratory illnesses occupy the circled area on the lower right side.

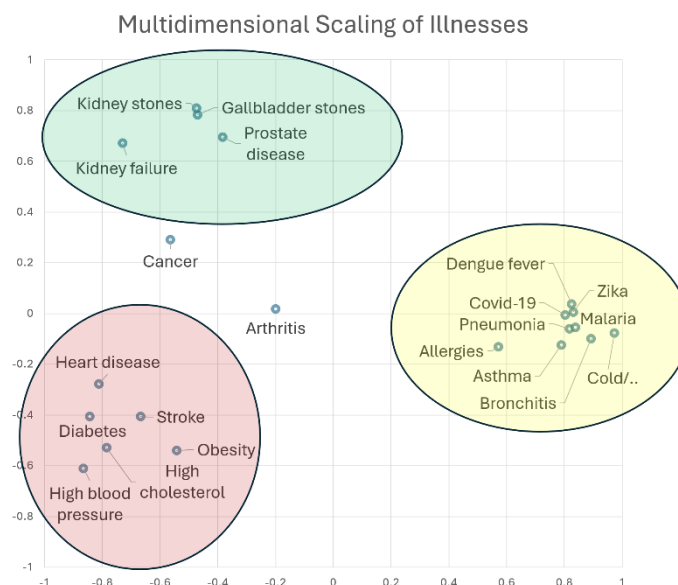


Figure 2 - Multidimensional Scaling of Illness Types

As in the analysis above, the multidimensional scaling plot groups illness types based on perceived similarities among informants in northern Belize. Here are the key clusters:

- The greenish area in the upper-left-side, are urologic/gastrointestinal illnesses.
- The reddish area in the lower-left-side, are cardiovascular/metabolic illnesses.
- The yellowish area in the lower-right-side, are mosquito borne/respiratory illnesses.

These clusters reveal how informants categorize illnesses, reflecting common perceptions and experiences within the community. Chronic conditions are grouped together, suggesting a shared understanding of long-term health issues, while infectious and respiratory diseases form distinct clusters, highlighting their acute and contagious nature.

Conclusion

The Ethnographic Field School in Belize, organized by the Center for Applied Anthropology at Northern Kentucky University, conducted ethnographic interviews in the communities of San Estevan, San Lazaro, and Yo Creek during the summer of 2025. The research focused on community development issues, including jobs, children's opportunities, pregnancy and birthing support, alcohol and drug abuse support, farmers' association impacts, climate change impacts, medicinal plants, and illness classification. Across these findings, a consistent structural pattern emerges. These villages function as sites of residence, routine maintenance, and informal support, while the decisive resources of contemporary life are located elsewhere. Childbirth occurs in Orange Walk Town rather than in the village; addiction treatment, where it exists at all, lies outside village boundaries and is locally replaced by family and church; and professional or upwardly mobile employment requires travel to town or to call centers beyond the district. Within this arrangement, residents sustain a substantial body of local knowledge and practice: an elaborated ethnobotanical repertoire in which aloe vera, chaya, guava, lime, soursop, and other plants treat conditions ranging from the everyday to the chronic, and a coherent folk taxonomy of illness in which pile-sort data cluster cardiovascular and metabolic conditions, urologic and gastrointestinal conditions, mosquito-borne illnesses, and respiratory illnesses along recognizable dimensions of chronicity and contagion. Livelihoods likewise show a community in transition. Sugar cane remains the symbolic and economic anchor, and the Farmers Association remains both an essential provider of fertilizer, loans, training, and scholarships and a source of friction over who is included in that provision, even as households diversify into construction, poultry processing, retail, food preparation, and business process outsourcing along a persistently gendered division of labor. Climate variability compounds these pressures, rendering the agricultural calendar unreliable and shifting the conditions of field labor itself.

The findings reported here suggest several lines of inquiry for researchers working in the sugar cane-producing communities of northern Belize. Because the villages consistently serve as sites of residence and routine maintenance while decisive services remain concentrated in Orange Walk Town, further study is warranted on how households navigate that distance; how transportation, cost, and timing shape decisions about childbirth, chronic illness management, and treatment for substance abuse; and what the practical consequences are when travel is not possible. The apparent structural void in children's out-of-school time likewise merits focused attention, as regulatory change and shifting norms displace agricultural and domestic labor without a corresponding expansion of institutional recreation; research on youth aspirations, school persistence, and the intermittent programming currently available would clarify what is emerging in

its place. The growth of business process outsourcing and other town-based employment invites systematic examination of commuting, out-migration, and their effects on household organization and the gendered division of labor. Questions of membership, governance, and perceived exclusion within the farmers' associations also warrant direct investigation, ideally using methods that capture both in-group and out-group perspectives while protecting informants from reprisal. Finally, the ethnobotanical and illness-classification data now available across several field seasons are sufficient to support cultural consensus analysis, which would establish the degree to which this knowledge is shared across age, sex, and community and identify where it may be passing out of circulation. Researchers pursuing any of these topics would benefit from sustained collaboration with village councils and regional agricultural and health organizations, both to ground the questions in local priorities and to ensure that findings return to the communities that make the research possible.

Appendix I: Informed Consent Statement – English



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INFORMED CONSENT TO PARTICIPANT IN A RESEARCH PROJECT

TITLE OF PROJECT: Ethnographic Field School

NAME OF PRINCIPAL INVESTIGATOR: Dr. Douglas Hume, Northern Kentucky University

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS: Douglas Hume, Ph.D., Associate Professor of Anthropology, Northern Kentucky University, humed1@nku.edu or 859-572-5702.

PURPOSE OF RESEARCH: This research project records the way of life of sugar cane farmers in Northern Belize with the intent to share the results on the Internet, journals and conference proceedings as well as in a report to the Belize Sugar Cane Farmer's Association, Institute of Social and Cultural Research, and the Sugar Industry Research and Development Institute.

PROCEDURES/METHODS TO BE USED: The interview includes questions about your household economic behavior and sugar cane farming methods. The interview is estimated to last between five minutes to one-half hour. The audio recording of the interview will be securely stored and destroyed after it is transcribed. Data collected in this study will then be anonymous, as we are not collecting names or other identifying information. You will not be paid for being in this study.

RISKS INHERENT IN THE PROCEDURES: There are no known risks.

BENEFITS: It is hoped that the results of this research will influence how the Belize Sugar Cane Farmer's Association and the Sugar Industry Research and Development Institute develop educational programs about farming, health, and economics for sugar cane farming families in Northern Belize.

CONFIDENTIALITY: The only identifying information that we will keep on record is this signed document, which may be inspected by the Institute of Social and Cultural Research and other human protection bodies. This document will not be connected with you interview data.

LIABILITY: Neither the researchers, their agents, or you (the participant) are liable for any damages or penalties from participating in this research.

PARTICIPATION: Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

Your signature acknowledges that you have read the information stated and willingly sign this consent form. Your signature also acknowledges that you have received, on the date signed, a copy of this document.

Participant name (printed)

Participant signature

Date

Witness to signature (project staff)

Date

Appendix II: Informed Consent Statement – Spanish



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FORMULARIO DE CONSENTIMIENTO INFORMADO PARA PARTICIPAR EN UN PROYECTO DE INVESTIGACIÓN

TÍTULO DEL PROYECTO: Ethnographic Field School

INVESTIGADOR PRINCIPAL: Dr. Douglas Hume, Northern Kentucky University

CONTACTO EN CASO DE PREGUNTAS/PROBLEMAS: Douglas Hume, Ph.D., Profesor Adjunto de Antropología,
Northern Kentucky University, correo electrónico: humed1@nku.edu; teléfono: 859-572-5702.

OBJETIVO DE LA INVESTIGACIÓN: Este proyecto de investigación registra el modo de vida de los cañeros en el norte de Belice con el propósito de difundir los resultados por Internet, en revistas académicas y actas de congresos, así como en un reporte a la Asociación de Cañeros de Belice, el Instituto para la Investigación Social y Cultural, y el Instituto de Desarrollo e Investigación de la Industria Azucarera.

PROCEDIMIENTOS/MÉTODOS DEL ESTUDIO: La entrevista incluye preguntas sobre la economía doméstica y los métodos empleados en el cultivo de la caña de azúcar. La entrevista durará entre cinco minutos y media hora y será grabada. La grabación se almacenará en un lugar seguro y se destruirá luego de su transcripción. La información recopilada en esta investigación es anónima, ya que no registramos nombres ni otros datos personales. No se recibirá ningún tipo de compensación económica por participar en esta investigación.

RIESGOS INHERENTES EN LOS PROCEDIMIENTOS: No hay riesgos conocidos.

BENEFICIOS: Se espera que los resultados de esta investigación tengan un impacto en cómo la Asociación de Cañeros de Belice y el Instituto de Desarrollo e Investigación de la Industria Azucarera desarrollan sus programas educativos sobre agricultura, salud y economía para las familias cañeras en el norte de Belice.

CONFIDENCIALIDAD: En cuanto a información identificatoria, sólo guardamos esta hoja con su firma, la cual puede ser inspeccionada por el Instituto para la Investigación Social y Cultural y otros organismos de protección de derechos humanos y civiles. En ningún momento este documento podrá ser emparejado con la información que Ud. comparta en la entrevista.

RESPONSABILIDAD LEGAL: Ni los investigadores, ni sus agentes ni Ud. (el/a participante) serán responsables por daños o sanciones como resultado de su participación en esta investigación.

PARTICIPACIÓN: La participación en este proyecto es voluntaria. Si decide participar en esta investigación, tiene derecho a anular este formulario y dejar de participar en cualquier momento sin sanciones o pérdida de beneficios a los que tenga derecho.

Su firma confirma que Ud. ha leído la información contenida en el mismo y que firma este formulario de consentimiento por su propia voluntad. Su firma también confirma que Ud. ha recibido una copia de este documento en la fecha indicada.

Nombre del/a participante

Firma del/a participante

Fecha

Testigo (un miembro del equipo de investigación)

Fecha

Appendix III: Ethnographic Interview Schedule (Procedure)

1. Jobs in community for women and men
2. Children's opportunities beyond work
3. Pregnancy and birth services
4. Alcohol/drug support
5. Farmers association impacts – inf
6. Climate change effects – inf
7. Home remedies - inf
 - Oregano
 - Garlic
 - Lemongrass
 - Soursop leaves
 - Guava leaves
 - Honey
 - Fever grass
 - Lime
 - Avocado leaves
 - Chaya
 - Aloe vera
 - Cinnamon
 - others?
8. Types of illness pile sort – inf
9. What do you want others to know?

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