

# REPORT OF THE ETHNOGRAPHIC FIELD SCHOOL IN BELIZE (SUMMER 2021)



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) in Orange Walk District, Belize, during summer 2021. Ethnographic interviews were conducted within the communities of San Estevan, San Lazaro, and San Pablo 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 within which interviews took place. This field season's research focused on the following topics: job opportunities, children's educational support, child labor, alcohol/drug use, climate change, farmers association investment, garbage disposal, COVID's<sup>1</sup> effect on the community, farmers association meeting attendance and association concerns, and networks of information sharing. This report presents the preliminary findings of the 2021 field season and recommends topics of research for the next field season.

## **Background**

While the educational aim of the ethnographic field school is to train students in basic ethnographic methods, the applied purpose of the field school is to collect and analyze data that can then be used by SIRDI, BSCFA, PSCPA, and community members in the development of programs for betterment of the sugarcane farming communities in northern Belize. As written on the field school's web site (CfAA 2022):

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,

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<sup>1</sup> The shortened term COVID will be used throughout this report for Coronavirus disease (COVID-19).

- 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.

Since the literature review was written for last season's report (Hume et al. 2021), there has been additional scholarly research published related to this field school's research. Several articles have been published on traditional medicine of Belizean Mayas (Arnason et al. 2022; Schmidt 2022; Waldram and Hatala 2022) as well as non-Maya Belizeans (Mphuthi and Husaini 2022). Research on the political economy of community management of natural resources (Smith 2021) as well as development in Belize in general (Ferrell and Wainwright 2022) have also been published. Issues related to food consumption (Cleary et al. 2022), insecurity (Stevenson et al. 2022), and revitalization (Griffith and Griffith 2021) are also recent additions to the scholarly literature on Belize's culture. Two articles have been published related to farming, one on sustainable milpa farming (Drexler 2021) and another on crop protection and hunting with dogs (Pacheco-Cobos and Winterhalder 2021). In northern Belize, research has been published on the migration of sugar cane labor (García Ortega 2021) and the effects of COVID on adolescent learning (Mathias Vairez 2022). There continues to be an important scholarship published about the people and natural resources of Belize.

## **Methods**

As in previous field seasons, upon arrival in the villages of San Estevan, San Lazaro, and San Pablo, 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 gain local approval for our presence in the community. Each village council gave their permission and was supportive of our efforts. We presented printed copies of last year's report (Hume et al. 2021) to the councils of San Estevan, San Lazaro, San Pablo, and Yo Creek. In addition, we printed business cards with shortened URL links to previous reports to give to individual community members.

Participants of the field school (Rebecca Eder, Chantal Kifunga, Diego Salinas, and Joshua Stephenson) conducted house-to-house interviews in 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 as cultural liaison and research assistant during field research. Mr. Novelo explained our general purpose and introduce students to community members. Students would then present the informed consent statement in both English (Appendix I) and Spanish (Appendix II). Upon an informant's consent to be interviewed, the students would have the informant sign a copy of the informed consent statement (on file) and offer an unsigned copy for the informant's records.

Interviews were conducted on the informant's property (e.g., porch, house, et cetera) with a pair of students, one serving as the primary interviewer and the other as 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 were from five minutes to an hour in length, depending upon the informant's time constraints and willingness to be interviewed by the students. Ideally the interview would flow naturally from topic to topic and 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 job opportunities in the community, job opportunities for women, children's educational support, child labor, alcohol/drug use, climate change, farmers association investment, garbage disposal, COVID's effect on the community, did COVID aid help, and COVID aid priorities (see Appendix III: Ethnographic Interview Schedule [Procedure], Part I). Self-identified sugar cane farmers were additionally asked about meeting attendance, association concerns, the Santander Sugar Group, and networks of information sharing (see Appendix IV: Ethnographic Interview Schedule [Procedure], Part II). Students digitally recorded interviews and took field notes during and directly after each interview.

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

## **Community Development**

### Demographics

A total of 155 informants were interviewed: 55 (35.5%) in San Estevan, 46 (29.7%) in San Lazaro, and 54 (34.8%) in San Pablo. The median age of the informants was 45 years with a minimum age of 18 and maximum age of 78 years old. Ninety (58%) of the informants were female and 65 (42%) were male. Of the 155 total informants, 33 (21.3%) self-identified as sugar cane farmers. Due to the COVID pandemic, fewer informants were interviewed this field season than prior field seasons.

### Job Opportunities in the Community

In prior years, the community was concerned about job opportunities, specifically within the communities in which they live. In addition, the farmers associations are concerned about what job opportunities exist outside of sugar cane farming, as sugar cane farming alone cannot support the needs of the community. The most common response to what opportunities should be created within the community included agriculture (e.g., more cane as well as other crops, such as citrus, cannabis, beans, vegetables, cattle, wheat, and corn) [43<sup>2</sup>]. The next most

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<sup>2</sup> The numbers within brackets "[ ]" indicate the number of informants that made the statement. The statements are listed by most common to least common throughout this report.

common source of community jobs was in industry/factories (e.g., clothing, shoes, makeup, recycling, and tourist goods) [13]. Informants also suggested jobs in construction (e.g., solar and housing) [7]. Finally, a couple of informants mentioned that vocational schools should be built for adults and more opportunities should be created for younger people to have jobs within their communities.

The informants stated that it was difficult to suggest jobs when they do not foresee new companies, industries, or opportunities of work coming to their villages. They did see new opportunities within Orange Walk Town and Corozal, but transportation and family obligations made working outside of the village difficult. In the next field season, when we visit different communities, we will again ask about job opportunities within the community. The responses may differ in the future due to changes in the COVID pandemic's effects within smaller communities.

### Job Opportunities for Women

There are more job opportunities for men than women within Belize in general, but even more so within small communities. The farmers associations asked us to explore ideas that the community members had about possible sources of work and income for women within village communities. The most common responses included: sewing (e.g., dressmaking and embroidery) [37], baking/decorating cakes [21], growing and selling food (e.g., fruits and vegetables from gardens) [19], housekeeping [15], working in an office (e.g., administration and secretaries) [11], and working at shops/cashiers [10]. One informant mentioned that a community farm cooperative (growing and selling fruits and vegetables) and community market cooperative (selling food and clothing) could be created locally with little or no outside assistance.

The ability to work outside of the home is more difficult for women than men within the village communities due to family obligations (e.g., children and aged parent care). In addition, fewer women than men are taught career-oriented skills as children and young adults. However, most of the women that we spoke with wanted jobs outside of the home using skills they already had (e.g., sewing and baking). As with the opportunities for work within the community, women found it difficult to imagine careers for them being created within the local community. In the coming field season, we will continue to ask about what job opportunities there are or could be created for women within their communities.

### Child Labor

Child labor remains a difficult issue in Belize. During the prior field season, informants were asked about the reasons that children worked, what would keep children from working, and what could be done to possibly reduce child labor (Hume et al. 2021). Boys have historically worked alongside their fathers in the sugar cane fields. Some children must work to help support their families. Now with pressure from Fair-Trade and other aid agencies, child labor is illegal or discouraged, depending upon the type of work and age of the child. In previous years we have collected information on the community's thoughts on child labor.

For example, why it occurs, how it can be prevented, and both the positive and negative aspects of child labor. This year, we continued the conversation as more Fair-Trade and government rules take effect and the COVID pandemic complicates the situation.

Informants told us that child labor is now forbidden both by Fair-Trade regulations and the government [84]. Informants reported that they have seen a decrease in the number of children working in cane farming related work [57]. Some informants said that children should stay in school and only work part-time on the weekends in non-cane related jobs [33]. However, there were several informants that suggested that there were benefits for children working, especially those that are not in school. First, there is a concern that if children are not kept occupied by either school or work, they will start using drugs or commit crimes [12]. Second, by working, especially alongside their parents, children can learn skills, trades, and a work ethic to prepare them for supporting their own family in the future [9]. Finally, there are families who are struggling financially and must rely upon their children to assist the family by working [8]. Informants reported that since COVID has forced students to stay home and learn remotely as well as there being a general lack of work in the community, children have not had enough to do.

While the farmers associations and communities report that child labor has decreased, there are still children that are engaged in cutting sugar cane—although their participation may follow the guidelines of the Fair-Trade agreement. It is important that we continue to collect data to enable the associations to work with communities to find alternatives to child labor. In the coming field season, we will consult with the associations to determine what line of research would best aid them in forming policies and programs to this end.

### Children's Educational Support

In prior field seasons we collected information on the exact amounts and categories of educational aid that was available within the community. This year, our conversations were broader, collecting an overview of how educational aid may be changing due to COVID and changes in the national government's political party leadership. Informants reported that government aid is available for tuition and books that is need dependent [24], schools receive financial aid from farmers associations [9], high performing students may receive scholarships (e.g., British/Taiwan Embassies, SIRD, Banks/Credit Unions, Social Security Board, and farmer's associations) [6], non-government schools receive financial aid from their associated church [4], Ministry of Education loaned students computers during COVID, they have now been returned [3], government gave small grants (about \$300<sup>3</sup>) pre-COVID [2], scholarships from churches to specific families based upon financial need [2] and that an American woman provides scholarships for some children [1]. Most informants stated that they have either never received aid or that education aid ended during COVID due to home schooling. Some informants

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<sup>3</sup> All dollar amounts within this report are in Belize Dollars (BZD), which is set at a fixed rate of 1 BZD to two United States Dollars.

also told us that only those with close personal ties to the political party in power are the only ones who receive aid from the government.

It is not only educational support where community members report that their political party membership in relation to the village or federal government's party determine the aid that they receive. This past field season's collection of education data was made more difficult by disruptions to schools due to the COVID pandemic, as the usual aid was disrupted. We will continue to collect information on educational aid in the next field season to, in part, find what effects the pandemic has had on the long-term education within the communities.

### Alcohol/Drug Use

Informants in past field seasons have mentioned alcohol and drug use was a significant problem within their community. Specifically, they worried about public safety issues, such as robbery, accidents, and fights. This field season informants reported that: alcohol and drug use is about the same as it has always been, alcoholism has always been a problem in Belize [95], alcohol and drug use has increased among minors specifically [14], alcohol use has increased with lack of employment and being stuck at home during COVID [13], crack/cocaine use is becoming more common [6], alcohol and drug use has decreased due to COVID, because of lack of money or people staying home and not being drunk in public [4], and other informants were worried about legalization of marijuana and influence of drug dealers in their community [2].

When we asked informants about alcohol and drug use, we asked about what was happening in the community rather than personally or within their own family. This was done to protect the informants, but also tended to result in informants describing how other people misbehaved. In the next field season, we will also include within our discussions opportunities that might support people who abuse alcohol or drugs.

### Climate Change

For several field seasons, we have been asking about people's perceptions about climate change to track how community perceptions change over time. This field season informants said they had recently experienced: hotter temperatures/the sun is hotter [59], weather that is less predictable/more variable (e.g., it is dry during the rainy season, rains during the dry season) [32], no changes to the climate/weather, it is normal [27], more rain resulting in flooding [24], less rain resulting in drought [20], and increased frequency of hurricanes/intense storms [4]. With the change in climate, people are experiencing different effects, such as: too little rain prevents sugar cane growth/poor crop [8], too much rain floods sugar cane fields/hinders harvesting [8], cane cutters are affected by heat more, work earlier, take a longer mid-day break [5], too much rain floods villages and houses [5], people are using fans and air conditioning more [5], there is more frequent respiratory illness (e.g., asthma and influenza) [4], streams and rivers have less water [3], people are drinking more water due to heat [2], and ponds have become

dry [2]. Less commonly, informants said that fruit trees are dying due to heat [1], people are starting to irrigate fields [1], too much rain affects road quality [1], and vegetable gardens negatively affected by heat [1].

Over the past few field seasons there is an increasing number of informants that report both dryer/hotter weather as well as more variable weather. In the next field season, we will continue to ask informants about their perceptions of climate change in their community.

### Farmers Association Investment

A stipulation of the Fair-Trade agreements with the farmers associations, the Belize Sugar Cane Farmers Association and the Progressive Sugar Cane Producers Association, is that a portion of Fair-Trade monies be spent on general community development, not specifically sugar cane farmers and their families. Both farmers associations that we are collaborating with have asked us to ask the community about the impact of the programs that they have done in the community. Informants reported to us that the farmers associations: either have done nothing or that the informant was unaware of any activities by the farmers associations to develop or benefit the general community [102], invest in education by giving schools funds or through student grants [6], give grants for coffins and funerals [3], give food support to the elderly [3], supply chairs and tents for community events [2], and gave cooking pots to women [2]. While we did not ask about what investment the farmers associations made to farmers and their families, informants told us that the farmers associations support farmers and their families through: giving fertilizer, herbicide, and pesticide to the farmers [28], giving a one-time COVID support payment (e.g., \$100, \$2-300, or \$500) [8], giving food assistance to members [3], and organizing training for farmers [2].

The overwhelming response from informants was that they did not witness any community investment by the farmers associations that was not directed at farming or farming families. In the next field season, we will consult with the farmers associations to learn about what programs they have done in the community so that we can ask about concrete examples, which may affect informant's responses in what they have noticed within their community.

### Garbage Disposal

Garbage disposal, especially the burning of trash in yards and the dumping of trash alongside of the road or within sugar cane fields has been a topic of concern for community members in past field seasons. Many informants reported that they dispose of their garbage at a dump site [56]. Informants told us that there is a truck that comes around, either supported by the village council or a community member that for a small fee (varies \$2, \$5, or \$10) to take garbage away, but it is too expensive for some, and the service is irregular [31]. Some of the same informants that disposed of their garbage at the dump also burn trash in their yards, especially paper products [35]. Informants also reported that they or someone that they knew dumps their garbage illegally outside of the community,

due to the distance of the dumping site or the difficulty of access (e.g., bad road) [27]. There were complaints that people dump garbage on other people's property or on the side of the road [13] as well as burying garbage on their own property [4]. There is a significant difference between communities. San Estevan informants report that it is clean, people pick up after themselves, and everyone takes trash to the dump, or pays someone to do it for them. San Lazaro informants told us that they are farther from a dump site and people complain about the distance. In San Pablo, people say that they are far from a dump, and they complain of people throwing trash on their property or the side of the road.

Since garbage disposal has been a repeated concern of informants, we will continue to ask about this issue with different communities in the next field season. It may be that different communities each have their own specific garbage disposal issues.

### COVID's Impact on the Community

This past field season was the first time we had been back to Belize since the start of the COVID pandemic. We shared our community partners' concern about the impact that COVID had on sugar cane farming communities. We asked about the impact of COVID in the community along three topics: (1) what was the effect of COVID on the community, (2) did the aid you received help, and (3) what should the priorities be for future aid?

When informants were asked what were the effects of the COVID pandemic on their community, they responded most commonly that: there was higher unemployment, people were laid off and/or could not find employment [52]; the medical treatment for COVID was expensive, which resulted in people treating themselves at home rather than going to the hospital or purchasing medicines [19]; people died in the community [16]; prices have risen in Belize for food, fuel, and supplies [13]; people stayed home more and did not go out [12]; people were not able to visit family and friends in other communities [11]. Additionally, informants responded that: children were not in school, are not learning social skills, and did not learn well due to not having access to computers or the Internet [7]; the COVID Pandemic did not affect them much [7]; people are not spending as much money as before; they are either saving more or do not have enough [7]; people cannot buy cheap goods from Mexico; the Free Zone was closed [7]; people cannot move freely/go out whenever they want due to curfews [7]; people must wear masks [6]; tourism was greatly reduced, which impacting the availability to work [4]; people are finding creative ways to earn money, such as growing garden crops [3]; people could not sell their goods [3]; people went to the store less frequently [3]; the curfew did not affect them [2]; parties are not allowed [2]; people are more frightened [2]; people cannot attend church; church attendance limited [2]; people have begun stealing because they do not have any money [2]; people washed their hands more [2]; people's businesses closed because people were not buying things [2]; the community experienced an economic downturn [2]; there were food shortages [2]; and vaccines are now required for some jobs [2]. The impacts of COVID were varied and specific to each informant based upon their own family, work, and community membership.

In the next field season, we will continue to ask about COVID's impact on their community, as we assume the effects will be long-term and we will be visiting different communities.

### Did COVID Aid Help?

Everyone we asked said that the government aid helped, but that it was not enough, if not for them, then the poor. While we did not directly ask, informants told us about the amounts that they received, which were based upon income, assets, employment status, and family size: \$300 every two weeks [4], \$150 every month [3], \$150 every month [3], \$300 every two months [3], \$100 every two months [2], \$150 every two weeks [2], \$300 every month [2], \$100 every month [1], \$400 every month [1], and \$75 every two weeks [1]. Others mentioned that there was aid for other reasons, including unemployment: \$1,800 unemployment for tourism industry employees from government, and \$1,000 for general unemployment relief. Several informants mentioned that their church or other community organization organized and gave food or money to those in need [11]. A few informants mentioned that the BSCFA gave masks and hand sanitizer to them [4]. Finally, many informants reported that they received groceries multiple times from the government [35]; one informant told us this included "2 condensed milk cans, two sticks of butter, one can of baking soda, two pounds of flour, two hot chocolate mixes, five pounds of sugar, 10 pounds of beans, 8 pounds of rice, one bar of soap for dishes, 2 pounds of carrots, 2 pounds of onions, 1 pound of potatoes, to a total of \$76.75." While the groceries did help, informants stated that they were not enough to offset their poverty due to the pandemic.

Respondents reported that it was difficult to apply for aid, as it was online and not everyone has access to the Internet or knew how to apply. Informants told us that they did not receive aid due to their income or employment status. There were a few informants that suggested that people submitted false information to gain more aid [3]. Several informants reported that some aid was dependent upon whether you were of the same political party as the government [5]. They told us that before the elections and change of government in summer 2021 from the United Democratic Party (red) to the People's United Party (blue), everyone received aid, regardless of political affiliation. They added, after this summer, if you were red, you did not receive the same aid as those who were blue. As with education aid, COVID aid was perceived to be determined by the relationship between the informants' and the governments' political affiliation.

### COVID Aid Priorities

Community members recommended that future aid include the following: food aid needs to continue [24], financial aid needs to continue [24], medical aid is needed (e.g., funding local clinics and medicine) [11], and educational aid (e.g., computers and Internet [3], adult career training [3], children's educational supplies [2], and train more teachers [1]) [10] as well as farm aid (e.g., fertilizer, land, goats, and cows) [4], ensure everyone is vaccinated [4], create more jobs [3], distribute

masks and hand sanitizer [3] and continue unemployment assistance [3]. Prioritize aid to those that need it (e.g., the elderly [18], single mothers [10], poor [7], and families [6]) [64], not by people's political affiliation [7]. There was a strong opinion by several of our informants that any aid must go to those that need it, not just to those with certain political affiliations or abilities to apply for the aid.

Since the COVID pandemic is ongoing, although not at as high levels as just before the prior field season, we will continue to collect data on the community impacts of COVID, the impact of aid, and opinions on future aid as many of the impacts of the COVID pandemic will be long lasting.

### Traditional Medicine

In previous field seasons, several informants spoke about traditional medicines that community members used for kidney disease and other ailments. After a discussion with Hugo Carillo (U Chan Muul Yaax K'aax [Maya Community Museum in San Lazaro]) about the preservation of local traditional medicine knowledge preservation during a prior field school, we began asking informants about the traditional medicine remedies that they use. In our discussion with informants, we collected ingredients used in traditional medicine, but our collection of each use of the components resulted data that is difficult to analyze due to differences in plant names and applications among informants. In the next field season, we will rephrase questions and focus on acquiring information on the medicinal use of materials not acquired through the pharmacy rather than "traditional" medicines and use other techniques for finding consensus on names and uses.

### **Sugar Cane Farming**

Thirty-three of the 155 informants self-identified as sugar cane farmers and were asked additional questions about their perception of sugar cane farmers' associations as well as information sharing networks. The median age among the farmers interviewed was 51 years old with 73% being male and 27% female. The farmers were members of either the Belize Sugar Cane Producers Association (28, 85%) or the Progressive Sugar Cane Producers Association (4, 10%) with one informant (3%) claiming no membership, as he was retired. There were no members of the Corozal Sugar Cane Producers Association within our informant sample. The informants reported that their roles in sugar cane farmers included: 17 owners (4 are women that said that their husbands managed the farm), 10 cutters, 2 apply herbicide/fertilizer, 3 truck drivers, 3 planters, 1 former farmer, and 1 group leader. As suspected from prior field seasons, identification as a sugar cane farmer is a cover term for different roles and does not only include farm owners.

### Meeting Attendance

In prior field seasons, community members were asked about the roles of sugar cane farming organizations as well as about farmer's association meetings and activities. When we asked the self-reported farmers about their association meeting attendance this field season, 11 (33%) attend nearly every meeting, 3 (10%)

attend some meetings, 11 (33%) rarely attend meetings, and 6 (18%) said that they used to attend more, but COVID has prevented them from being more active. Several farmers (6 [18%]) remarked that they were only a member, not a leader, so they were rarely invited to attend meetings (e.g., for elections only).

It appears that from these responses, the owners and group leaders are more active in meetings than are the laborers. In the coming field season, we will learn more about meetings from the farmers associations and collaborate on additional ways to understand meeting participation.

### Association Concerns

At the request of the BSCFA and PSCPA, we asked farmers about what concerns they had with the farmers' associations. Most informants responded that they did not have any concerns about the farmer's associations 16 (48%). Three (9%) farmers said that farming associations need backing from the government. Two (6%) farmers said that farming subsidies from government should be given to the farmers due to drought. Two (6%) farmers said that there is not enough funding going to individual farmers. Other farmers individually voiced the following concerns: social security benefits for farmers, need suppliers outside of Orange Walk Town, disagreements between farming association, issues at local meetings do not make it to the larger association's leadership, fertilizer can be bought more cheaply from other sources than the associations, association leadership is too interested in helping themselves rather than the farmers they serve, the number of local politicians should have had experience in the sugar industry, splitting the farmers associations has made it easier for the government to control the farmers, the BSCFA pushes farmers to work for BSI/ASR, small farmers should create their own association to represent their interests, promises by one leader are not fulfilled by the next leader of the association, associations encouraged planting more cane, but their quota does not allow them to deliver it all, there are too many farmers as the price of sugar cane declines, the associations should have more of a local presence and action, the low price of sugar cane prevents them from investing or expanding, there is no way to transfer quotas between family members, associations should provide more equipment for husbandry and planning, farmers should diversity their crops with fruit trees and other products for local consumption, and associations must become Fair-Trade certified and train farmers in these practices.

In the next field season, as we interview informants from other communities, we will continue to ask farmers about their concerns with the farmers associations.

### Santander Sugar Group

During this past field season, the option of delivering sugar cane to the Santander Sugar Group as an alternative to ASR/BSI became a widely discussed topic. We asked farmers about their opinion on delivering sugar cane to Santander. Most farmers did not have a problem with selling sugar cane to Santander rather than ASR/BSI, but the main issue that they cited as a barrier was that the cost to

transport cane to Santander would result in little, if any profit. The costs of production and transportation are too high. In addition, other farmers mentioned that the expected surplus did not materialize, so sending cane to Santander is not an option; Santander does not yet have a mechanism for paying farmers like ASR/BSI does; large farmers will benefit from a partnership with Santander more than small farmers; mills in Mexico pay better than Santander, so they should be considered as an alternative to ASR/BSI; the government is supporting ASR/BSI over Santander, which makes negotiation between Santander and farmers difficult; instead of considering Santander, another mill should be built closer to the sugar cane farmers; and ASR/BSI has a monopoly on milling sugar cane, which makes it impossible for farmers to consider other options.

As the relationships between ASR/BSI and Santander develop, we will continue to ask farmers about their opinions about their relationships with the sugar cane mills.

### **Network Analysis**

In prior field seasons, sugar cane farming knowledge concerning sugar cane varieties, fertilizers, pesticides, and herbicides was collected as well as how knowledge is shared among farmers. In other words, we sought to discover what social networks (e.g., kinship, friendship, and farming collaboratives) contribute to the intracultural variation of farming knowledge among farmers.

This field season involved the collection network data on how agricultural knowledge is shared between farmers, associations, agencies, and businesses from the perspective of the farmer. Farmers were asked from whom they requested or received information on each subject of information (e.g. fertilizer, herbicide, pesticide, and sugar cane) from each organization (farmers, Belize Sugar Cane Farmers Association [BSCFA], Corozal Sugar Cane Producers Association [CSCPA], Progressive Sugar Cane Farmers Association [PSCPA], Sugar Industry Research and Development Institute [SIRDI], store/supplier, village chairman, American Sugar Refineries/Belize Sugar Industries [ASR/BSI], and sugar board). Data were then analyzed using UCINET (Borgatti, Everett, and Freeman 2002) and Netdraw (Borgatti 2002).

The network diagrams (Appendices V through XVI) were constructed with the node sizes determined by eigenvector centrality. The eigenvector centrality measure accounts for both the number of connections a node has to other nodes as well as the number of connections those nodes have with other nodes. A higher eigenvector centrality score indicates that a node has more connections with other highly connected nodes. Eigenvector centrality finds those nodes that are important because they are more connected to other important (highly connected) nodes. In the case of this analysis, the larger the information source's node (BSCFA, PSCPA, SIRDI, ASR-BSI, etc.), the more connections it has with farmers who are connected with other information sources. The larger the farmer's node, the more connections the farmer has with information sources who are connected with other farmers. In sum, the larger the node, the more information the node is connected to as

compared with all other nodes within the network. The layout is based on node repulsion and equal edge length bias adjusted for readability.

The following are explanations of the network diagrams (Appendices V through XVI) listing the sources of information which farmers use to access information about sugar cane farming. The explanations are presented in order of frequency reported.

*Appendices V through VII – Fertilizer Sources* – Farmers received information about fertilizer mostly from the BSCFA, followed by other farmers, the stores/suppliers, the sugar board, SIRDI, ASR/BSI, and other sources.

*Appendix V: Network Diagram – Fertilizer Sources by Association Membership* – Although most informants claim membership to the BSCFA, there does not appear to be a strong effect of association membership to which source of information farmers gain their fertilizer knowledge.

*Appendix VI: Network Diagram – Fertilizer Sources by Sex (Female and Male)* – The majority of informants were male and their does not appear to be a significant pattern of preference on where females and males differ in their fertilizer information sources.

*Appendix VII – Network Diagram – Fertilizer Sources by Role in Sugar Cane Farming* – While not a defining relationship, it does appear that the laborers do not have as strong of a connection with ASR/BSI, stores/suppliers, and the Sugar Board as the owners.

*Appendices VIII through X – Herbicide Sources* – Farmers received information about herbicides mostly from the BSCFA, followed by other farmers, SIRDI, stores/suppliers, the sugar board, ASR/BSI, and other sources.

*Appendix VIII: Network Diagram – Herbicide Sources by Association Membership* – The non-BSCFA members appear to rely upon ASR/BSI, stores/suppliers, and the Sugar Board more than BSCFA members.

*Appendix IX: Network Diagram – Herbicide Sources by Sex (Female and Male)* – The women who have more sources of information rely upon ASR/BSI, stores/suppliers, and the Sugar Board much more than men. It appears that most women are not connected with the village chairman or other sources.

*Appendix X – Network Diagram – Herbicide Sources by Role in Sugar Cane Farming* – It appears that owners share connections with other farmers, SIRDI, and the BSCFA, but then fall into two groups: one with connections to ASR/BSI, stores/suppliers, and the Sugar Board and another with connections to the village chairman and other sources.

*Appendices XI through XIII – Pesticide Sources* – Farmers received information about herbicides mostly from the BSCFA, followed by closely by SIRDI, the Sugar

Board, other farmers, and stores/supplies. ASR/BSI, village chairmen and other sources are not as prominent.

*Appendix XI: Network Diagram – Pesticide Sources by Association Membership* – There is a noticeable tendency for PSCPA member to gain information from PSCPA, while BSCFA members do not.

*Appendix XII: Network Diagram – Pesticide Sources by Sex (Female and Male)* – There does not appear to be any significant differences between how females and males gain information about pesticides.

*Appendix XIII – Network Diagram – Pesticide Sources by Role in Sugar Cane Farming* – There does not appear to be any significant difference between how farmers with different roles gain information about pesticides.

*Appendices XIV through XVI – Aggregated Sources* – Farmers received most of their information about farming (fertilizers, pesticides, and herbicides) from other farmers and the BSCFA about equally. SIRDI, stores/suppliers, and the Sugar Board are nearly equal in being second of importance in the source of information. Lastly, ASR/BSI is followed by other sources, the village chairman, PSCPA, and CSCPA, and information providers.

*Appendix XIV: Network Diagram – Aggregated Sources by Association Membership* – There is a noticeable tendency for PSCPA members to gain information from PSCPA, while BSCFA members do not. There were far more BSCFA members than PSCPA members in the sample, so this finding is not definitive.

*Appendix XV: Network Diagram – Pesticide Sources by Sex (Female and Male)* – There does not appear to be any significant differences between how females and males gain information in this aggregated data set.

*Appendix XVI – Network Diagram – Pesticide Sources by Role in Sugar Cane Farming* – There does not appear to be any significant differences between how farmers with different roles gain information in this aggregated data set.

The findings from these network analyses are as follows:

1. farmers within our sample acquire the most information about sugar cane farming for each subject (e.g., fertilizers, herbicides, and pesticides) from the Belize Sugar Cane Farmers Association and other farmers;
2. both the Sugar Industry Research and Development Institute, stores/suppliers, and the Sugar Board share the second most common source of information for farmers in our sample;
3. there is a difference in how female owners and male owners gain information about herbicides—females are not as connected with the village chairman or other sources;
4. there is a difference between how owners and laborers gain information about fertilizer—owners are more connected with ASR/BSI, stores/suppliers, and the Sugar Board; and
5. the complexity of this problem requires further data collection and analysis.

Due to the number of field researchers (four) this past field season, we were not able to interview as many farmers as in prior field seasons. Since we have discovered that a farmer's role and their sex have potential effects in how they gain farming knowledge, we will continue collecting this data in the next field season.

## **Conclusion**

This report documents the findings from the summer 2021 season of the Ethnographic Field School in Belize. This field season successfully met the goals of collecting ethnographic data on topics suggested by community members and prior research. Opportunities for jobs within the villages are difficult for community members to find, let alone imagine creating during the COVID pandemic. Jobs within the community are even more difficult for women to find. Child labor continues to be an issue along with the availability of support for their education. Alcohol and drug abuse remain a problem within communities, without clear solutions. The effects of climate change are being felt locally as the weather become more variable. Garbage disposal is still a concern, although there is variability between communities as to the severity. The impacts of the COVID pandemic are unequally affecting the poor and the effects will be long-term. Finally, the use of traditional medicines varies widely within the communities, as the knowledge is not clearly shared.

The sugar cane farming industry involves complex and changing relationships between multiple stakeholders. The community development projects by the farmers associations is not seen by community members as benefiting anyone who is not involved in sugar cane farming. In addition, those farmers who are not owners or group leaders do not see that they have a voice or leadership role within the farming associations. The roles that community members take within the sugar cane industry and their sex appear to affect the transference of knowledge, which may lead to differential farming successes or failures. Both the relationships and knowledge sharing among and between sugar cane farming industry stakeholders continue to develop and change and the industry evolves.

The collected data helped answer questions from prior research and has resulted in further questions for future field seasons. The findings from this field season were affected by the COVID pandemic that is still impacting people's ability to find work, access food, educate their children, manage their health, and plan for the future. Our aim is to continue to allow data to drive future research as well as involving the communities, associations, and agencies with which we partner to guide research towards answering questions that are important for community development that will benefit all community members.

# 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

TITULO 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](mailto: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), Part I**

### All Informants

1. Job Opportunities in the Community
2. Job Opportunities for Women
3. Children's Educational Support
4. Child Labor
5. Alcohol/Drug Use
6. Climate Change
7. Farmers Association Investment
8. Garbage Disposal
9. COVID's Effect on the Community
10. Did COVID Aid Help?
11. COVID Aid Priorities

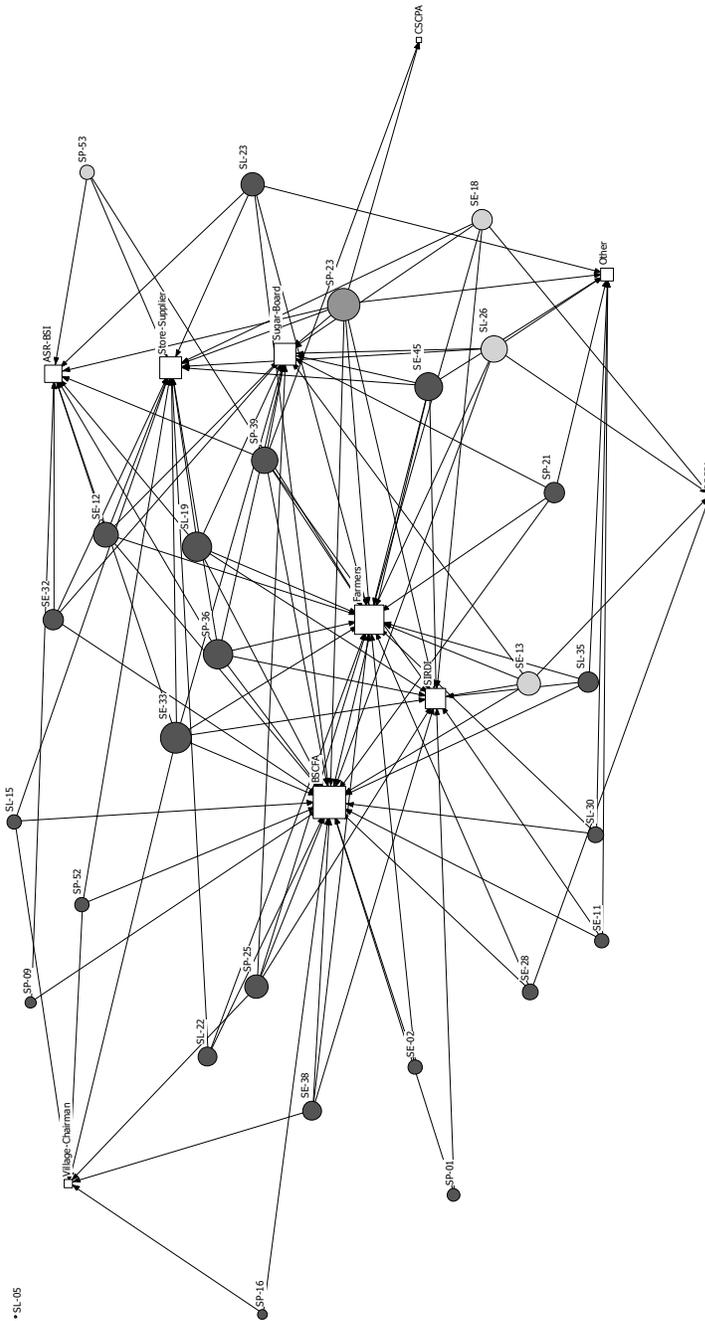
## **Appendix IV: Ethnographic Interview Schedule (Procedure), Part II**

### Farmers Only

1. Meeting Attendance
2. Association Concerns
3. Santander
4. Organizations
  - A. Membership (i.e., BSCFA, CSCPA, PSCPA)
  - B. Role (i.e., owner, group leader, cutter, etc.)
  - C. Involvement
  - D. Association Concern(s)Ego-centric information networks
2. Ego-centric information networks
  - A. Sets
    - i. Fertilizer
    - ii. Herbicide
    - iii. Pesticide
    - iv. Sugar cane
  - B. Entities
    - i. Farmers
    - ii. BSCFA - Belize Sugar Cane Farmers Association
    - iii. CSCPA - Corozal Sugar Cane Producers Association
    - iv. PSCPA - Progressive Sugar Cane Producers Association
    - v. SIRDI - Sugar Industry Research and Development Institute
    - vi. Store/supplier
    - vii. Village Chairman
    - viii. ASR/BSI - American Sugar Refineries/Belize Sugar Industries
    - ix. Sugar Board
    - x. Others?

## Appendix V: Fertilizer Sources by Association Membership

Membership where dark gray is BSCFA, medium gray is none (node SP-23), light gray is PSCPA (nodes SP-53, SL-26, SE-13, and SE-18), and the sources of information are white boxes.

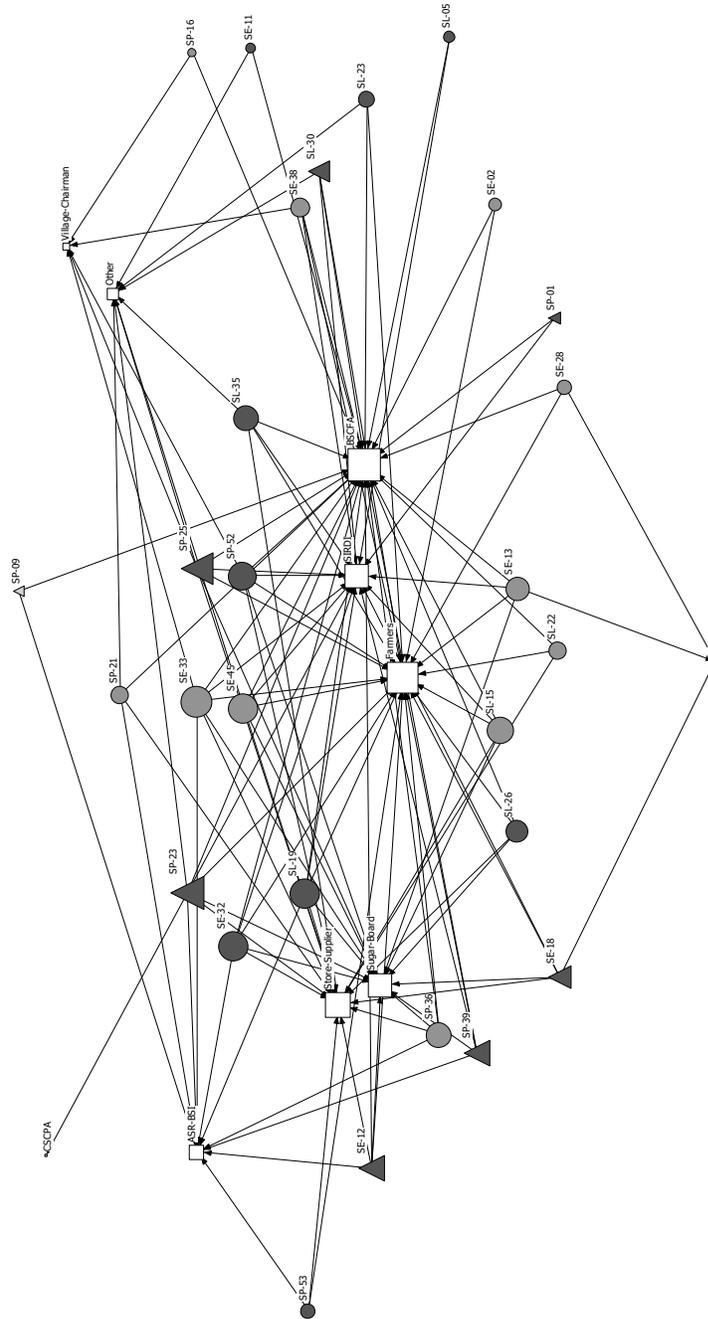






## Appendix VIII: Herbicide Sources by Association Membership

Role where dark gray are owners (circles are those who actively manage their farm and triangles have a family member manage the farm), medium gray are laborers (cutters, fertilizer, herbicide, drivers, and planters), light gray triangle (SP-09) is a former farmer, and the sources of information are white boxes.



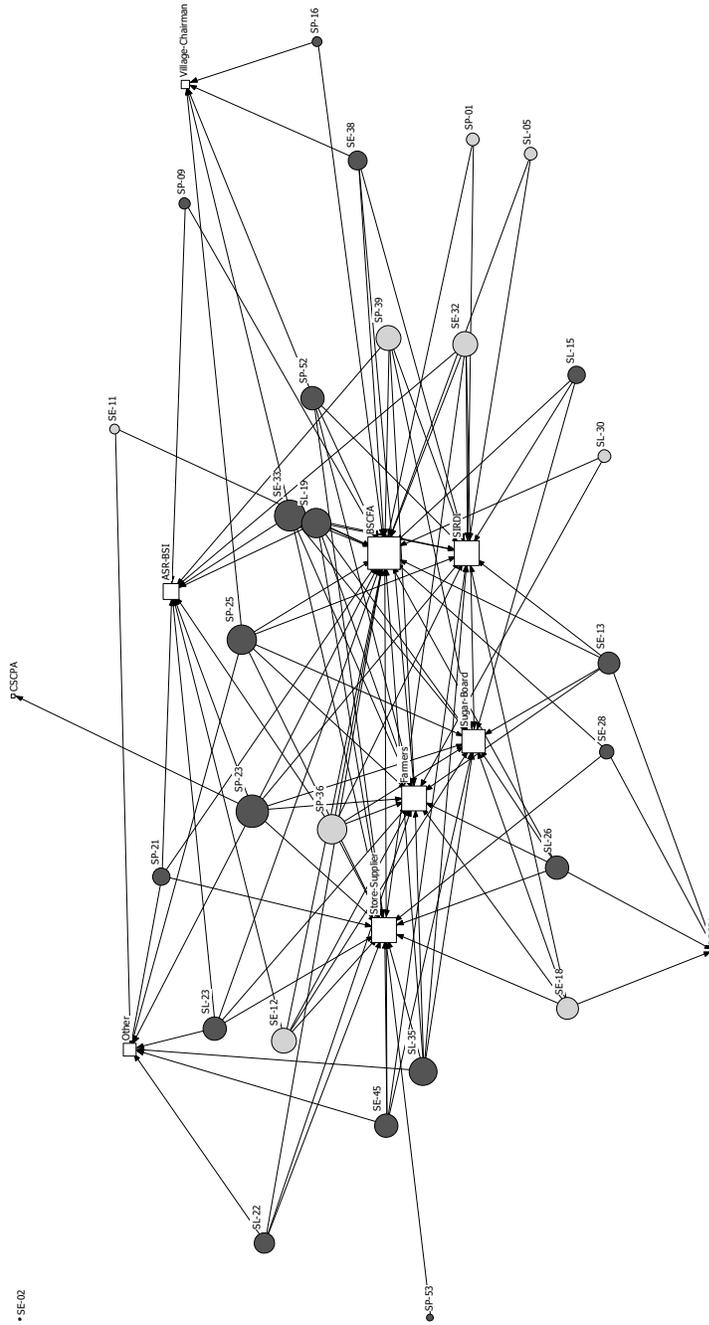






## Appendix XII: Pesticide Sources by Sex (Female and Male)

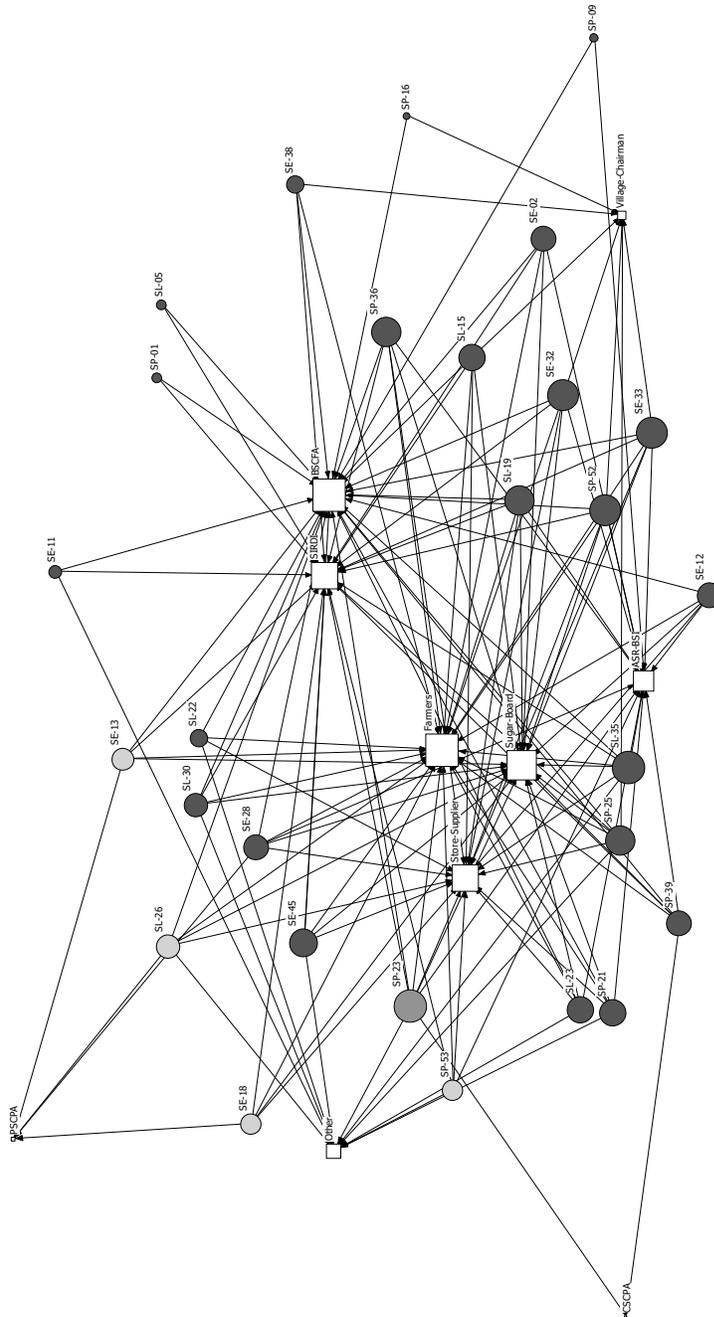
Sex where light gray are females, dark gray are males, and the sources of information are white boxes.





## Appendix XIV: Aggregated Sources by Association Membership

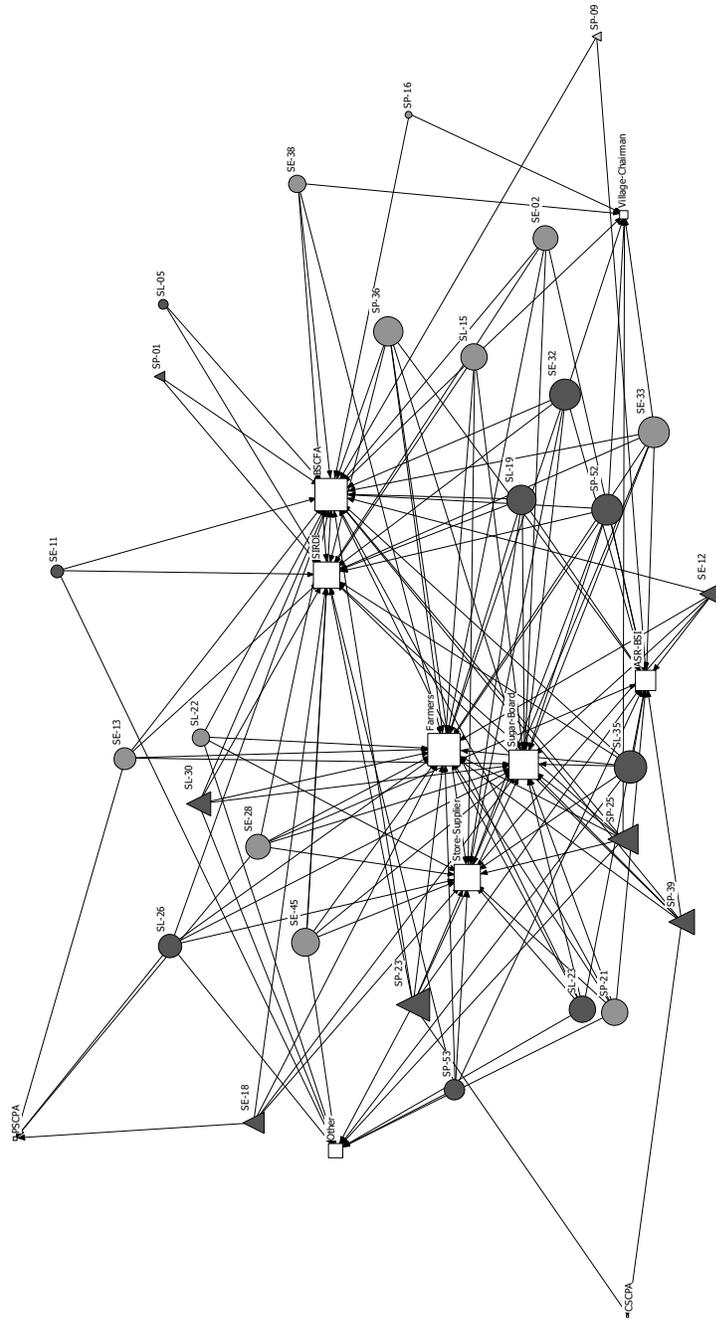
Membership where dark gray is BSCFA, medium gray is none (node SP-23), light gray is PSCPA (nodes SP-53, SL-26, SE-13, and SE-18), and the sources of information are white boxes.





## Appendix XVI: Aggregated Sources by Farming Role

Role where dark gray are owners (circles are those who actively manage their farm and triangles have a family member manage the farm), medium gray are laborers (cutters, fertilizer, herbicide, drivers, and planters), light gray triangle (SP-09) is a former farmer, and the sources of information are white boxes.



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