

Intra and Inter Community Redistribution and Food Security in Four Tseltal Communities in the Highlands of Chiapas, Mexico

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Abstract: In Latin America, food insecurity remains prevalent in regions where extreme poverty and political instability are common. In Mexico, “Los Altos” (highlands) in Chiapas is one of the regions with the highest level of malnutrition. Following the theory of humanitarian action, the federal, state and municipal governments have implemented a total of nine food aid programs in the area. The effectiveness and effects of food aid programs have been questioned in other countries. This study compares the nutritional status of four communities, per the results of the National Health and Nutrition Survey (ENSANUT) 2012, with two scales of social capital designed by the researchers (inter and intra community redistribution) to understand the effects that participation in food redistribution programs (monetary and in foodstuffs) has on the level of food security of the communities. The results indicate that communities with a higher level of participation in intra-community redistribution are more food secure.

Keywords: food security, redistribution, reciprocity, food aid programs, Tseltal people of Chiapas.

INTRODUCTION

Worldwide one in eight people is food insecure, in the Mexican state of Chiapas the proportion is eight in every ten (FAO, 2013; Trujillo-Oliveira, Noriero-Escalante, Martínez-Rodríguez, García-Chong, 2015). Public policies on food security (FS) are insufficient to reduce child malnutrition and food insecurity in the area, for example, per an analysis of ENSANUT data only thirteen out of every one hundred households benefited by the Mexican’s government OPORTUNIDADES (now PROSPERA) is food secure, the rest have some level of food insecurity. Forty three percent of households in the state have mild food insecurity, so they had to decrease the quality of their diet, another 25% are classified as moderately food insecure decreasing the amount of food eaten by one or all of the family members. And finally, in 15% of households, some or all the members went hungry, that is, they did not eat for a full day in the three months prior to the survey (Trujillo-Oliveira, et al, 2015). Contrary to what the political discourse says, hunger is a reality in Chiapas.

Traditionally, communities have developed different strategies to address food insecurity, including reciprocity and redistribution (Broughton, Janssen, Hertzman, Innis, & Frankish, 2006; Frankenberger & McCaston, 1998). In much of Latin America, cooperation and reciprocity are essential for personal and community survival (Cohen, 2010). However, in the Highlands, these strategies have been altered by public policy, migration, religious conversions and political conflict, diminishing the importance of the institutions of the traditional political-religious system within which many of the reciprocal and redistributive exchange take place (Gossen, 2013, Pérez-Enríquez, 1994, Urbalejo, 2003 and Veltmeyer, 2000).

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Community members have been active agents in these institutional changes. When under stress, a society's ability to adapt and cope with changes lies in its ability to act collectively, while adaptation decisions are made at different levels - individual, society, government - often vulnerable groups are excluded from the decision-making process (Adger, 1999). However, this exclusion does not imply that the vulnerable do not generate new institutional arrangements on their own (Adler de Lomnitz, 1975, Lewis, 1961, Ostrom, 2002). On the contrary, when actors have autonomy to design rules of governance, their institutions often achieve better economic results and are more equitable than when others design them (Ostrom & Basurto, 2011).

This manuscript explores the effects that social capital, specifically participation in redistributive institutions, has on the food security level of four Tseltal communities. The research focuses on the analysis of qualitative variables of redistribution at the inter-community level to explain the institutional change from a continuum where tradition is represented by participation in the traditional political-religious system and modernity is represented as the participation in food aid programs. The purpose of this manuscript is to:

1. Design a scale around the concept of redistribution at the inter-community level.
2. Design a scale around the concept of redistribution at the intra-community level.
3. Identify the impact that participation in redistribution systems has on food security.

FOOD SECURITY AND SOCIAL CAPITAL IN THE HIGHLANDS

Food security

According to the Food and Agriculture Organization of the United Nations (FAO), food security exists when: "all persons have at all times physical and economic access to sufficient safe and nutritious food to meet their needs and preferences, in order to achieve an active and healthy life" (World Food Summit, 1996; 1). This concept is considered as a model with several dimensions that are stratified, so the biological utilization depends on food consumption, which rests on food access and relies on availability.

Food security depends on multiple variables that are interdependent and complex. Food availability is the sum of imports and domestic production (FAO, 2008). In Mexico, the trend is an increase in dependence on imports, as domestic production is declining. Authors like Martínez Rodríguez (2013) point out that the current trend is unsustainable since, per its projection for 2025, half of the corn, a basic element of the Mexican diet, must be imported. However, it is important to note that as the Nobel Prize in economics Amartya Sen poses, the current food crisis is one of distribution and not of availability, since at the global level the necessary quantity of food is produced to provide all human beings. In the Highlands, subsistence agriculture is still common practice, but climate change, specifically hurricanes, is an imminent threat to low levels of production (Frank, Eakin & López-Carr, 2011).

Physical and economic access to food means that when there is adequate availability, an individual could acquire enough quality food stuff to meet their needs. In contrast to availability whose unit of analysis is the nation, access is analyzed from the domestic unit, which is why it is closely related to the sociological concept of poverty. Purchasing capacity is related to economic access, while physical access refers to the distance and time that must be traveled to purchase food stuffs. Three components of economic access, deterioration of purchasing power, price increase and reduction of services provided by the state stand out (Trujillo-Oliveira, et al, 2015). In Mexico, the deterioration of purchasing power is reflected in the increase in the price of the basic basket that only from December 31, 2016 to January 31, 2017 was 3.3% (IMAGEN, 2017) and the increase in the number of poor (CONEVAL, 2012). In the area, the lack of physical access is reflected in the inability to purchase some goods, the need to move to regional centers to make purchases and the high price of products in communities.

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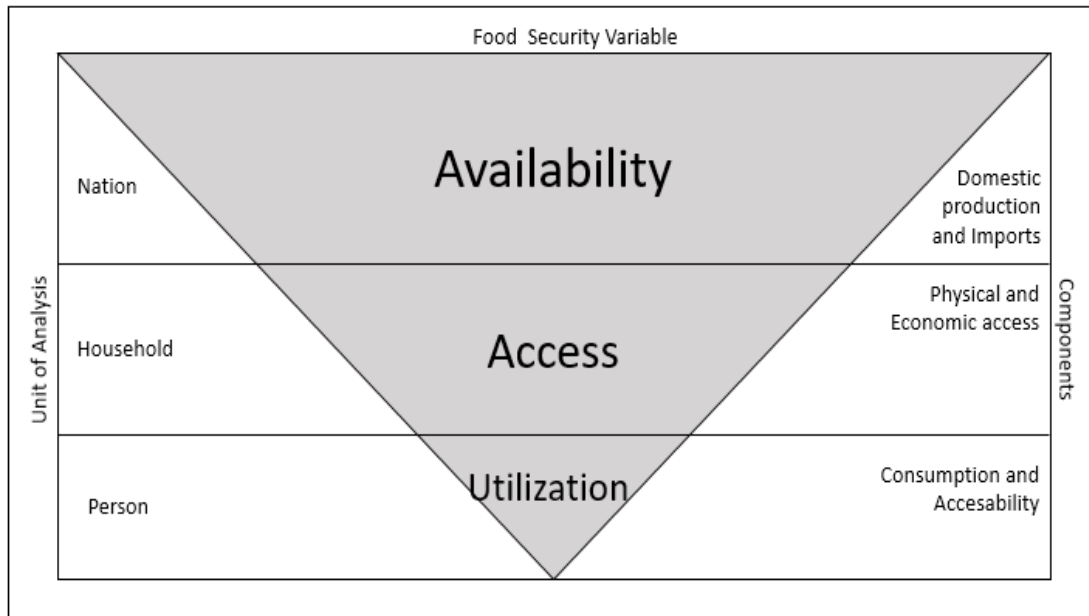


Fig1. Food Security model. Source: Self elaboration

The dimension of utilization can be broken down into consumption and acceptability. Consumption refers to the act of consuming food, its unit of analysis is individual. Acceptability depends on the cultural preferences of the group or community. At the global level, the industrialization of the food chain is causing changes in local diets. In Chiapas, the results of ENSANUT 2012 describe a transition diet in which there are still elements of the traditional diet such as corn tortillas and beans, but in which other elements such as pozol (nixtamalized corn drink) is being replaced by carbonated soft drinks. Cultural preference has a major impact on rural communities, since there are cultural practices that relate to food consumption, such as uneven distribution of food to the interior of the home, in which food is served first to the father and last to the daughters and mother. There is also a lack of awareness of the ways in which some of the food products provided through public programs are prepared. The last element is the bio utilization of nutrients, however, in Chiapas the problem of food security is structural since it is linked to social and economic processes; it is not biological.

Social capital

The idea that participation in groups can have positive consequences for the individual and the community is a basic sociological notion (Portes, 1998). Social capital pays attention to how non-monetary resources can be important sources of power and influence (Portes, 1998) and have an impact on solving problems that might otherwise be considered as market problems. Growing evidence shows that social cohesion is critical for societies to thrive economically and for development to be sustainable.

Pierre Bourdieu defines social capital as belonging to a group. He asserts that it is the “aggregate of real or potential resources that are linked to the possession of a lasting network of more or less institutionalized relationships of mutual knowledge and recognition” (1986, p. 51). For Bourdieu, these relations exist only in material or symbolic exchanges. Exchanges are crucial to maintaining social capital as the exchanged goods are transformed from objects to signs of mutual recognition from group members. According to Bourdieu

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(1986), exchanges occur within institutions and while he refers mainly to kinship institutions, he recognizes that institutions are not limited to the family. Exchanges take place following norms that, at the same time, help to monitor the fulfillment of the same ones.

Social capital is a resource of individuals and families inherent in its network of relationships and capable of transforming itself into other forms of capital (that is, economic, cultural, etc.) understood in Marxist terms as the accumulation of human labor. The volume of social capital that an agent possesses depends on the size of the group and the agent's ability to sort resources through their membership in networks and other social structures (Bourdieu, 1986). As noted by Alejandro Portes (1998), Bourdieu's definition of social capital focuses on the benefits that the participants in the groups can acquire by stressing that these benefits are an incentive to build the social networks in which social capital resides. Thus, social networks are not given, they must be built and maintained. Bourdieu focuses his analysis on exchanges, so that for him reciprocity and redistribution are mechanisms through which social capital is given (Portes, 1998).

According to Karl Polanyi's (1944) exchange theory, there are three types of exchange: market, redistribution and reciprocity. The market principle refers to the purchase and sale of goods. Reciprocity is the exchange of goods based on symmetrical relationships between social entities (Polanyi, 1944). Redistribution is the relocation of resources through a central entity (Polanyi, 1944). For this paper, it is distinguished between two types of redistribution, one that occurs through government programs and those that occur outside of these. In terms of the dimensions of food security, the three types of exchange fall on the access dimension, that is, they impact the capacity of a social unit to acquire food. Redistribution and reciprocity are mechanisms that alter the original distribution of food resources, and are key to solving the food crisis, understood as a problem of redistribution.

Traditionally, indigenous groups in Mexico have developed reciprocal and redistributive relationships to address food shortages (Adler de Lomnitz, 1975) through food exchange (Quijano, 2006; Vázquez, 2007) that act as a "safety net" in times of scarcity (Chance & Taylor, 1985; Leon de Santiago & Carvajal, 2005; Monaghan, 1990; Stern, 1983; Utrilla & Prieto, 2009; Van den Berghe, 1978; Wolf, 1986). Recent changes in community structures as well as other external factors have diminished the use and importance of these traditional arrangements. Recently, the functions of traditional institutions (redistribution and reciprocity) have been taken over by modern institutions (e.g. *comites*, basketball, among others). Cohen (2010) states that these new institutions invent new relationships and practices in response to global forces. In many cases, these new institutions still have their basis in reciprocity and redistribution (Cohen, 2010; Feinberg, 2003; Springwood, 2006). Reciprocity and redistribution occur through institutions that are part of life in society. Institutions evolve over time to respond to disturbances through adaptation (Janssen, 2006; Ostrom, 2009).

Usually, in southern Mexico the institutions through which redistribution and reciprocity of food stuff occurs within and in between communities are part of a religious system (López, 1996). In Los Altos, this complex system is based on a syncretic form of Catholicism and a traditional system of community and municipal governance called *cargos* (Cámara Barbachano, 1952 and López Meza, 1996).

Brief history of Los Altos, Chiapas and its Tseltal inhabitants

The Chiapanecan highlands constitute a portion of the Central American Highlands that run from the Tehuantepec Isthmus in Mexico to the lowlands of Nicaragua (Encyclopedia Britannica, 2013). The highlands of Chiapas comprise a limestone mass with extrusive volcanic rocks at the highest peaks, extending for over 11 000 km², 160 km along a northwest-southeast axis, and 70 km at its widest (Mullerried, 1957 cited by

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Ochoa-Gaona & González-Espinosa, 2000). The height of the relief varies from 300 meters to 2,898 m above the sea level (CEIEG, 2013) with a land area of 3,711.90 km². The higher elevations are covered by extensive pine forests, while oak and liquidambar stands are found at lower elevations (Encyclopedia Britannica, 2013). The variation in altitude produces two distinct micro climates: *tierra caliente* (hot soil) in the lower altitudes and *tierra fria* (cold soil) in the higher altitudes.

The seasons comprise a hot dry season (March through May) and a rainy summer (May through September). The winter (October through February) has alternating dry and damp spells. The seasonal pattern of rain is ideal for the cultivation of maize and beans, which are the staple food for most indigenous peoples. However, at high elevations in *tierra fria*, production only reaches subsistence levels. On the flanks of the highlands, in *tierra caliente*, between an altitude of 1,220 and 1,670 m coffee can be produced. Coffee constitutes a major crop and unlike beans and maize it is sold for cash (Menegoni, 1990). Other cash crops are also produced for local consumption and commerce within the region such as cabbage in Chamula or Mandarin oranges in Tenejapa, but their importance is negligible compared with coffee. Cattle and sheep are other commercial enterprises undertaken in some of the municipalities (Brown, 1993; Menegoni, 1990). Economic activity in the Highlands is still limited by a high degree of marginalization and ethnic segregation. Chiapas is inhabited predominantly by rural-indigenous people, 51.5% of its population lives in localities of less than 2,500 inhabitants, 31.5% of the total population is indigenous (CNDI, 2010) and 74.7% of the population live in poverty (CONEVAL, 2012). Being indigenous living in a rural area increases the possibility of being poor and food insecure (Trujillo-Olvera, et al, 2015).

There are twelve indigenous groups in Chiapas of which Tzeltals are the most populous representing 12% of the state's population. Tzeltals and Tsotsils are the most important ethnic groups in the Highlands. Tenejapa and Oxchuc are the most populated of the Tzeltal municipalities. Slash-and-burn agriculture is the main economic activity of rural communities in both municipalities. On *tierra fria*, the sowing is done before the rains of May, the harvest is in Autumn. Throughout the year, other crops are planned to complement the diet, such as peas and different types of pumpkins. Most houses also have at least one free-range chicken that feeds on bits of food and scavengers around the property. Livestock is not a common possession among indigenous people (Menegoni, 1990).

In the 1930s, the first wave of Protestant missionaries who converted some sectors of the population, taught them to speak Spanish and forbade them to participate in some local institutions that were part of the religious system. Beginning in the 1940s, the National Indigenist Institute (INI) oversaw the "integration" of the indigenous to the modern world through a public policy called *Indigenismo*. Acculturation took place through the training of *promotores* - indigenous instructors - who taught Spanish, hygiene and cultural norms in the communities. Basic infrastructure such as roads and schools were also built as part of this public policy. Secular schools were essential to acculturation and to start the new reconfiguration of the communities. The schools became the center of the community from where the promoters instructed. The responsibility to implement the recommendations fell on the whole community, which encouraged the participation of parents, first as visitors in schools, then as part of the school *comite*, which in many communities is nowadays the most important institution (Corbeil, 2013).

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The communities

The study took place in the four Tseltal communities in the Highlands region where ENSANUT2012 was applied.

Balun Canal, Tenejapa

It is located 22 km east of San Cristóbal de Las Casas. It is located at 2245 MASL (INEGI, 2010). It has a temperate sub humid climate with temperatures ranging from 14 to 16 C with a rainy season from May to September (Gómez, Castro, Junghans, Ruíz Montoya and Villalobos, 2000). Locals classify this set of geographic variables as cold land *tierra fria*.

The village of Balun Canal has a total population of 420 inhabitants, of whom 87% speak an indigenous language, while it has the highest prevalence of Tseltal speakers in this study, it is also the community with the lowest rate of monolingualism (42.31%) (INEGI, 2010). Despite the high prevalence of bilingualism and the presence of a kindergarten, elementary school, middle school and frequent taxi trips connecting the village with Tenejapa where the secondary school is, the average person has attended school for 3.79 years (the lowest mean of the communities studied) (INEGI, 2010). This means that, on average, an adult in this community has not finished the fourth grade, thus the relevance of the elementary school commencement party. Only 16% of the community identifies as Catholics (INEGI, 2010).

Cañada Grande, Tenejapa

It is located about 3 km north of the municipal head of Tenejapa at an altitude of 2126 MASL (INEGI, 2010). The community is connected by a paved road from Tenejapa. There is no regular public transportation that connects the population, but you can walk from Cañada to Tenejapa in about 25 minutes.

According to the 2010 census there are 544 inhabitants in Cañada Grande. All inhabitants were identified as indigenous, 82% of the population speak Tseltal and 53% of the population aged 5 and over are monolingual. The average person attends school for five years, one of the highest averages in the Municipality (INEGI, 2010). Half of the community practices Catholicism. Apart from agriculture, there is internal migration.

Pajaltón, Tenejapa

It has a very high degree of marginalization (SEDESOL, 2014). It is located at the top of a hill, at an altitude of 2299 masl (INEGI, 2010), near the border with the municipality of Chamula. Pajaltón and Cañada Grande are connected by a precarious, windy, practically impassable dirt road. It has 715 inhabitants, 85% of the population speaks an indigenous language and 54% of the population aged 5 years and over are monolingual in Tseltal (INEGI, 2010). The average person has attended school for 4.23 years. 43% of the population self-identifies as Catholics.

Mesbilja, Oxchuc

It is located at the bottom of a valley, at an altitude of 1511 masl, through which a small river flows. The city is connected to the paved San Cristóbal-Palenque road by a dirt road. The population is 1793 inhabitants (INEGI, 2010). All members of the community identify themselves as indigenous, 86% of the population speak an indigenous language and 24% of the population of 5 years and older are monolingual (INEGI, 2010). The average schooling is 5.9 years, less than 10% of the population is Catholic. The community is considered a "*tierra caliente*" and subsistence and market agriculture (coffee) are practiced.

METHODS

This is a mixed method correlational research since it aimed to evaluate the relationship between two or more variables. The team conducted a rapid assessment multisided ethnography of four communities from January to April 2014. Each of the communities was treated as a separate study area, so the techniques described below are at the community level.

An initial purposive convenience sample of 20 individuals was recruited for the free list protocol in each community. The sample size was large enough producing valid and reliable data about a specific cultural domain (Bernard, 2011) creating a comprehensive list of all the meso-level institutional arrangements in each community and their micro-region. To ensure a diversity of age and gender in the sample, the target recruits were 5 women >35 years old, 5 women <35 years old, 5 men >35 years old, and 5 men <35 years old. The 35 years of age cut off was chosen after asking participants in the pilot study about who they considered “old” or “experts” on specific institutions, and validating their selections with the research team members that have local knowledge of the area. In addition, men occupying top positions in local community institutions, such as churches or *comites*, are usually more than 35 years old. Additional criteria for participant eligibility were that subjects had to be older than 18 years of age, and were community members. In each community, team members first sought out people for the initial sample and subsequently searched for additional subjects until they reached saturation. In this study saturation was understood as the point in data collection in which no new information emerged (Saumere & Given, 2008).

Participants were asked to respond to three free list questions: 1) Tell me all the ways in which anyone can acquire food in this community without buying it; 2) Tell me all the reasons why someone can give you food; and 3) Tell me if ever in your life you have exchanged food with someone from another community, and if so, list the communities.

Participants were probed using redundant questioning and no specific cueing to elicit more information. Sample size varied widely from one community to another since saturation was achieved at a different pace. However, this is not problematic since only a small sample (10-15) informants are needed to produce valid and reliable data on a specific cultural domain (Bernard, 2011). Data analysis took sample differences into account by adjusting frequency and saliency calculations to represent the total number of respondents in each free list rather than in the whole protocol. Frequency and saliency were calculated using the following formulas:

$$\text{Freq} = F/N$$

$$S = (F/N)[(L - mP)/(L - 1)]$$

in which relative Frequency (Freq) results from dividing the frequency of mention of an item in a specific community (F) by the number of respondents in each list in a specific community (N). Saliency (S) is calculated by multiplying frequency with the result of the second factor $(L - mP)/(L - 1)$. The second factor results from the mean length of a list (L) minus the mean position (mP) in which the term is named in that list, divided by the mean length of the individual lists (L) minus 1 (Sutrop, 2000).

The bulk of the data obtained in the field came from *participant observation* and *interview transcripts*. Since this study used a rapid assessment approach, team members were instructed (and monitored) so that notes referred to transcriptions by informant code and that notes and transcriptions did not repeat information. Accuracy of notes and transcriptions was double checked by myself and one other team member by asking about X researcher’s week, contrasting it with their interview log, community interviewee list, and the notes. This step ensured that important or relevant findings and information were contained in one document. Participant

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observations were used to generate adequate rapport, develop experiential knowledge, and to contextualize data from the interviews (Spradley, 1980). This method was used with field informants, as well as with the host families and at public events (i.e. *asambleas*, *comite* reunions). Participant observation mainly took place in the house of the interviewees or in public spaces like the school or church. Comments and social interaction that alluded to food reciprocity and redistribution were recorded in the field notes. Participant observation mainly took place in the house of the interviewees or in public spaces like the school or the church. Comments and social interactions that alluded to reciprocity and food were recorded in the field notes. Team members were trained in how to write field notes.

Once the inter-community institutions and key informants were identified, the team began collecting data through semi-structured interviews. The most knowledgeable informant on an institution (per free listings) was used as a seed for snowball sampling. If the saturation had not been reached through the initial seed, another seed started with the second most informed informant. The final number of interviews in each community depended on the number of seeds, the speed of saturation and the number of institutions that were present in each community. The interviews focused on the functioning of institutions.

Interview analysis was performed using MAXQDA 10, through open coding, to emphasize the diversity of the documented strategies. The information was used to elaborate two scales on exchange tactics. The internal consistency of each scale was tested using the Cronbach Alpha test.

Table 1. Data collection by instrument and community

Instrument	Balun Canal	Cañada Grande	Pajaltón	Mesbilja
No of participants	42	42	59	51
Free lists	38	27	44	26
Exchange interview	4	8	7	7
Comite interview	10	5	7	9
Basketball interview	6	4	6	2
Religious exchange interview	4	6	4	10
End of class (clausura) interview	8	5	4	2

Source: Self-elaboration

Food security. Data from the National Health and Nutrition Survey (ENSANUT) 2012 were used to calculate community's food security level. This study uses: 1) ELCSA (Latin American and Caribbean Food Security Scale); 2) food dependency redistribution; 3) Z score (Weight / Height) of infants, children and adolescents and BMI for adults; And 4) Z score (Height / Age) of infants, children and adolescents. These are reliable food security measures that have been validated in other countries. Through the combination of food experience scales and anthropometric measures, the study has a strong understanding of the food safety status of each community. Sampling consisted of 1712 households in Chiapas and was performed using AGEBS (Geographic Areas and Basic Statistics). The sample has a 95% validity.

RESULTS

Data on exchanges were collected using free lists, semi-structured interviews and participant observation. Guided by theory, redistributive exchanges reported in each community were classified as inter-community redistribution or intra-community redistribution. Two scales were constructed, one for each of these theoretical

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distinctions, each scale measures the frequency of mention of a specific type of exchange in the community. We used Cronbach's Alpha tests to check the internal consistency of the scales, both of which have a value of .75 suggesting that both scales have very good internal consistency and reliability. Table 2 shows the scores for each community on each of the scales.

Table 2. *Intra and Inter community redistribution scales*

	Intra-community redistribution	Inter-community Redistribution
Mesbilja	High	Low
Pajaltón	Low	High
Cañada Grande	High	Medium
Balun Canal	Medium	High

Source: *Self-Elaboration*

Intra-community redistribution

Catholic and Protestant religious groups continue to be at the center of redistribution within the community. The most common type of redistribution mentioned in the free lists (Frequency SUM = 2.42) and interviews (n = 19) was one in which a church acted as the hierarchical center of distribution. Intra-Community redistribution through the church occurs either through mutual help or religious celebrations, the third type of inter-communal redistribution is secular and other festivities.

Mutual help or *ayuda mutua*, refers to the help given by a church to the needy. It is a common practice in all the studied communities. The semi-structured interviews reported that Mutual Aid is more frequent in Mesbilja (n = 5) than in Cañada Grande (n = 3), Balun Canal (n = 1) and Pajaltón (n = 0). The frequency of mutual aid does not correlate with the number of churches in the community (Mesbilja n = 7, Pajaltón n = 3, Cañada Grande n = 3 and Balun Canal n = 5) Religious N = 82,59, Pajaltón n = 47,41, Cañada Grande n = 20,77 and Balun Canal n = 64,52) (INEGI, 2010). *Ayuda mutua* has the following pattern with slight variations in every community: when a church member needs help either another church member or themselves will report their situation to the head of the church in the community. Then someone from the church will pay that person a visit to assess their situation. That person will get an idea of what the most pressing necessities are for the person enduring the hardship (i.e. medicine, food, money). He or she will talk to the head of the church (if he is not the person occupying this position), and they will decide what they can request from the rest of the church members. At the next meeting they request a *cooperación* (cooperation) or *ayuda* (help) and collect it in the next meeting. After the resources have been collected, an entourage will pay a visit and deliver them. *Ayuda mutua* constitutes a clear example of redistribution because households give resources to the church and then the church delivers them, avoiding the creation of reciprocal ties, but enforcing a sense of community by diffusing the burden of the affected household (Mtika, 2000).

The other mechanism through which religious institutions redistribute food in the community are religious festivities (Cancian, 1994). In this context, redistribution means a movement of goods from those who sponsor a fiesta to other members of the community, through the serving of sumptuous meals to fiesta guests (Monaghan, 1990). But religious conversion has altered the way religious festivities work. Instead of finding a wide participation in the traditional Catholic based religious systems like the *Pas a'teletik* in Tenejapa or

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the *Calpul* in Oxchuc, the team found either religious festivities in which only members of a specific church participate (i.e. Holy week, Christmas, Easter) or some “traditional festivities that still remain as a community event” (i.e. water celebrations and corn production rituals). The later kind seem to persist because their function is to ensure harmony in the region (i.e. maintaining peace, supplying water, having a good harvest) and they have a clear pre-Hispanic origin. The third type of redistributions consists of secular parties in which there is also flow of goods such as *clausura* parties or birthdays.

Inter-community redistribution

While intra-community redistribution is strongly marked by religious institutions, inter-community redistribution is dictated mainly by secular institutions. The free-listing data shows that there are two distinct types of inter-community redistribution that occur at the community level: government-based and non-governmental. Non-governmental refers to institutions that dictate the life of communities, including churches and civil institutions that are called *comites*. Semi-structured interviews were used to collect information on the frequency and details of non-governmental inter-community redistribution. Data from the National Health and Nutrition Survey (ENSANUT) were used to inform the section on government sponsored inter-community redistribution.

Non-government inter-community redistribution

Non-religious redistribution occurs through activities organized by the *comites* through the *clausura* parties and basketball tournaments. People from communities throughout the region are invited to attend these festivities, however, invitations are also sent in writing to the *comites* of some communities. Formal invitations are extended to high-ranking authorities such as the Mayor and those communities with whom there is a strong relationship or reciprocal relationship (meaning that they mutually invite each other in a formal way). In some occasions the invitation to participate in a basketball tournament is also done through community radio that broadcasts throughout the region in Tsotsil and Tseltal. *Clausura* parties are the most important event in the studied communities. Balun Canal and Pajaltón reported a high frequency in participation in the tournaments and in the free listings the closing party was named by half of the interviewees in Pajaltón.

Some inter-community redistributive exchanges take place through religious institutions. Churches acquire the resources they redistribute at the inter-community level, either collecting them in the community or securing them through the organization of which they are part of. Inter-community *ayuda mutua* was only reported in Mesbilja. Traditional festivals and *cargo* systems are still important in Cañada Grande, where half (51%) of the members of the community are still Catholic (INEGI, 2010). The inhabitants of Cañada Grande participate as assistants and sponsors of regional traditional festivities and hold positions such as *Kaptanetik* and *Martometik*. The feast is a key element of these festivities in which the resources of a family or a rich individual are reassigned to other members of the community (Cancian 1994, Monaghan 1990).

Government Inter-community redistribution

The federal and state governments have a variety of programs aimed to reduce food insecurity. The two most important federal programs are PAL and OPORTUNIDADES (now PROSPERA). Federal programs have a set “enrollment period” in which SEDESOL workers visit communities, contact people, fill out forms, and enroll new beneficiaries. The state of Chiapas has eight programs that are enacted by DIF (Family Integral Development). The DIF programs are coordinated at the municipal level and beneficiaries enroll within each community, which means that the programs are not automatically implemented in each community, but each Municipality has to request to participate in the program and that each community's *comite* has to be aware of the program

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to be able to affiliate beneficiaries from their community. In practice this bureaucratic process is translated in variability in the programs that communities participate in.

Table 3. Frequency of redistributive government programs according to ENSANUT 2012

	Mesbilja	Pajaltón	Cañada Grande	Balun Canal
OPORTUNIDADES	0.75	0.9	0.62	0.85
Grocery bag DIF	0.16	0.5	0.12	0.14
70 y mas	0.08		0.25	
School Breakfast		0.7	0.12	1
Folic Acid		0.1		0.14
Iron		0.2		0.28
PAL		0.1		
DIF soup kitchen		0.3	0.12	
Vitamin A		0.2		
Boarding school for indigenous children		0.1		
Day care		0.1		
LICONSA milk			0.12	

Source: *Self-Elaboration*

There is differentiated access to food security programs provided by the government depending on the capacity of local authorities to enroll in the programs. Data from ENSANUT 2012 shows that there are 12 different government programs in the region, but not all of them are present in all communities. Program presence in communities' ranges from three programs in Mesbilja to 10 programs in Pajaltón. OPORTUNIDADES and Grocery bag from DIF are present in every community while other programs like LICONSA, day care, PAL and Vitamin A supplements are only present in one community.

The second survey used to analyze food security by ENSANUT 2012 is an indicator of the number of food aid and cash transfer programs aimed at alleviating the food insecurity of a household. There is some variability in the amount of programs a home enrolls in the range of zero to eight. Pajaltón is the community with the highest variability (0-8) and that of the highest medians (Md = 2). Balun Canal also has a median of two, but its range is shorter (0-3), with the exception of an outlier that is enrolled in five programs. Cañada Grande and Mesbilja share a median of one program per household.

Food Security

Due to the difficulty of assessing food security and variability in the units of analysis (household and individual) of the data used, this section aims to give a "snapshot" of the food security status of most households in the studied communities. This approach is limited because part of the analysis is done at the household level and to recognize the variability of the food security status within each community we avoid tagging the entire communities as Food Secure. However, the ELCSA medians are the following Mesbilja (Md = 4.5), Cañada Grande (Md = 3), Balun Canal (Md = 5) and Pajaltón (Md = 5).

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Table 4. Distribution of levels of food insecurity among households in each community according to ENSANUT 2012

Food Security level	Mesbilja	Pajaltón	Cañada Grande	Balun Canal
Food Secure	0%	0%	0%	0%
Mild food insecurity	50%	63%	82%	56%
Moderate food insecurity	25%	27%	18%	22%
Severe food insecurity	25%	10%	0%	22%

Source: Self-elaboration

According to the ELCSA scores, it is clear that most households in these communities cannot have a steady supply of food. However, the number and degree of food insecurity in these communities differ (Table 4). First, none of the households in the sample scored as food secure. Most households fall under mild food insecurity. Followed by moderately food insecure households. Severely insecure households are the most uncommon. In Mesbilja and Balun Canal there are the same number of households with moderate and severe food insecurity. In Pajaltón the proportion of households with severe food insecurity is almost three times lower than moderate food insecurity. There are no homes with severe food insecurity in Cañada Grande.

The effects of inter and intra-community redistribution on food security

Nonparametric tests were used to test whether the mean ELCSA scores of the communities differed according to their grouping (Table 2) according to their scores on the two redistribution scales. There was no pre-established point for clusters, as the range on each scale varied considerably. I tried to be consistent and group the results into at least three groups, since the non-parametric tests used compared the medians of the groups according to their nominal "score".

A Kruskal-Wallis test of independent samples revealed a significant difference in ELCSA scores in three different groups (Table 2) on the **intra-community redistribution** scale (Gp1, n = 11 Low, GP2 n = 9 Mean, Gp3 n = 23 High, p = 001). Mesbilja and Cañada Grande, the communities that reported the greatest number of intra-community redistributive exchanges had a combined mean ELCSA score of 4 (Mesbilja Md = 4.5 and Cañada Grande Md = 3) statistically significantly lower than the Balun Canal and Pajaltón (Md = 5). According to this test there is a positive relationship between the household ELCSA median and the amount of redistributive exchange within the community. Communities that reported more and more frequently on inter-community redistribution mechanisms are safer according to ELCSA data.

As for inter-community redistribution, the Kruskal-Wallis independent sample test showed a statistically significant difference in ELCSA scores in three different groups (Table 2) on the inter-community redistribution scale (Gp1, n = 12 Low, GP2 n = 20 Medium, Gp3 n = 11 High, p = 001). Pajaltón and Balun Canal (Md = 5), communities reporting more inter-community redistributive exchanges have higher median ELCSA scores than Mesbilja (Md = 4.5) and Cañada Grande (Md = 3). This means that the inhabitants of Pajaltón and the Balun Canal are more food insecure than their counterparts in Cañada Grande and Mesbilja. Communities that reported more redistribution among communities are more unsafe per ELCSA measurements.

DISCUSSION

Although participation in redistribution outside or within the community is not exclusive, there is a tendency to prioritize the use of one strategy over the other in the studied communities, that is, the communities that participate most in inter-community redistribution, participate less in Intra-Community redistribution. Redistribution through civic institutions (ie, *clausura*, basketball games) follows this pattern to a different level, the resources for an event are requested by a high-ranking authority who in the payment could ask for a favor (that is, the political support of the community). Thus, redistributive religious arrangements use reciprocity among households, while civic redistribution arrangements use the institution to reciprocate with specific actors.

Participation in redistribution takes place through non-governmental and governmental institutions. Religious institutions play an important role in intra-community redistribution among all communities and in inter-community redistribution in Mesbilja. Data collected through semi-structured interviews explain the existence of differentiated religious communities within the communities studied through which redistribution occurs. A negative correlation between the frequency of mention between the presence of religious institutions and secular institutions was found. Leading us to think that when redistributive functions are covered by secular institutions, religious institutions do not play an important role in redistribution, and vice versa.

Statistical analysis also shows a negative correlation between the frequency of participation in the inter-community redistribution and the ELCSA scores. This could be explained by the amount of resources that Pajaltón and Cañada Grande use to engage in inter-community redistribution such as basketball tournaments and *clausuras* and the low return in terms of food for its inhabitants. Their return seems to be in the prestige and status of the community, this is in line with the food security and livelihoods approach that recognizes that food security is not the only goal of one household but one of many (Frankenberger & McCaston , 1998).

Participation in intra-community redistribution is positively correlated with food security. This can be explained by a risk-sharing effect in which sick and needy people can access the resources of their religious group. Mesbilja and Cañada Grande, the two communities that participated most in intra-community redistribution through religious institutions. Mesbilja is the community with lower level of Catholicism, but a strong history of Protestantism, while Cañada Grande is the most Catholic of all study communities. This suggests that there is no relationship between religious affiliation and redistribution within the community but how established the group is. The conversion in Mesbilja began in the 1930s and is not an ongoing process, but there are well-established religious groups that act as small communities within the wider Mesbilja community. In communities where religious institutions are less important, civic institutions have assumed their non-market functions.

Although until recently the communities shared the same institutional landscape through which redistributive exchanges took place, each community has responded to external pressures in a different way, playing an active role in the destiny of their communities. Although there are still similarities in the figures through which exchanges occur, in practice there is a wide diversity in the ways of exchanging. The results indicate that the communities that redistribute to the interior have greater benefits at the Food Security level and this can be an incentive to continue to participate and build new networks (Bordieu, 1975). On the other hand, communities that have focused their efforts on redistributing abroad have achieved high recognition within the region for their great celebrations, which has resulted in an excellent ability to hoard municipal resources, however, the implementation of Food aid programs are not always correct and this can affect the Food Security level of

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the population. Either way, both strategies build and strengthen the social capital of communities through membership in networks and participation in structures. Designers of public food aid policies should explore the possibility of supporting the strengthening of redistributive institutions.

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