

FOOD SECURITY, NUTRITION, AND AGRICULTURE
IN THE COMMUNITY OF ESTERO DE PLÁTANO

A report prepared for the Yanapuma Foundation

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Introduction

This analysis of the food situation in Estero de Plátano was made during the period of September through December of 2009. I came to Estero with the goals of collecting information about the community food system, what problems existed, how food production practices were related to diet and nutrition, and what might be the most appropriate methods of improving food and nutrition in the community.

The information I have presented here is the result of research which consisted of 1) a survey on food and agriculture given to most of the women heads of households in Estero, and 2) interviews with 10 women heads of households about the importance of agricultural production systems and nutritional and health needs. It is also the result of both formal and informal interviews with the nurse of Estero de Plátano, the nutritionist of the Ministerio de Salud Pública in Esmeraldas, information collected by the Ministerio de Salud, and observations during meetings and conversations with women in the region.

1. Agricultural Production

Agriculture, animal husbandry, and fishing serve as:

- food for the family
- income
- economic security

The survey showed that a small majority of families in Estero have a farm (57%), fish (56%), or keep animals (54% have chickens and 48% have pigs).

A. Fishing

Fishing is important for many families, particularly for those that don't have farms to serve as sources of food and income. In addition to feeding the family, fish and other seafood are sold both in Estero and other communities such as nearby Galera and Tonchigüe.

It is important to note that while fishing is important it remains a cheap product, creating a secure but not large income. In addition, many fishermen don't go out to sea as often as in times past due to ocean conditions and fear of pirates.

Octopus, a very important product in the local culture, gets a better price, but the process of catching octopus is time consuming and many people only do so every once in a while for home consumption. The octopus population also appears to be diminishing.

Another marine product which generates income is "muchin," or sea cucumber. This is caught and sold to local buyers who then sell to buyers in Asia. It is easy money, but muchin is also an important food source for octopus and other sea creatures. The collection of muchin is therefore not a sustainable income source and puts other marine food sources at risk.

B. Farm Crops

Both subsistence and commercial crops are grown on the farms. Farms are small: roughly 76% are less than 10 hectares, and 53% are less than 3 hectares. Agricultural production is therefore not large, but serves to supplement family income and assure a source of staple foods.

The most important crop for home use is plantain and banana. These crops are used both for human consumption and for pigs, and are only sold inside the community.

Fruit trees and annual crops are also grown on the farms, and these crops can be either for family use or for sale. For example, avocado, tangerine, mango, and papaya are fruits that can feed the family, and can be sold in the community itself or to buyers from outside. Annual crops such as watermelon and canteloupe can also be sold. Others, such as cassava and beans, are almost exclusively for family use. Maize is also grown, mostly as animal feed, but also for home use and occasionally for sale. Only some 13% of those surveyed indicated that they planted annual crops—this might be because of the fact that the survey was conducted during the summer, when these crops are not planted, and that which annual crops are planted changes every year depending on climactic conditions, time, and the economic situation of the family.

Generally speaking, vegetables are not planted on the farm. Exceptions are squash and sometimes lima beans. For most people, farms are located some distance from homes, and it is not very convenient to harvest vegetables from such a distance. Farms are also located in the forest, where animals and disease would harm susceptible crops like vegetables. In addition, vegetables need water, and during summer there is no water on the farms.

According to those surveyed, cacao is the most important commercial crop. Some 80% of families with farms have cacao planted, and 24% indicated that they would like to plant more. Cacao is an important source of income and offers financial security to the family. Because cacao always fetches a good price and yields throughout the year, if a family needs money (because of an illness or other sudden reason), one can harvest cacao and sell it to meet those needs.

C. Animals

Raising animals, for the most part pigs and chickens, supports family food security. Chickens provide a source of protein and vitamin A in the form of eggs, and also meat when there are few resources. Both animals provide economic security, since these animals can be income sources when there is a need for money. This is particularly true in the case of the pigs.

Pigs are not used more as an investment than as a food source. One purchases a small pig and raises it until it is old enough to give birth or to sell at a good price. Having a pig is a way of assuring oneself of having an income source should an emergency situation arise. Raising pigs is a traditional savings and insurance system. This is why so many families have animals and why many (some 48%) would like to have more, or have them if they don't have them already.

There are also many problems in the raising of animals. Reasons cited by those surveyed for not having as many animals as they would like are: disease (especially with chickens—when “peste” comes through the community nearly all might die), theft, the need to acquire food for the animals, and the cost of medicine for diseases.

Pigs are also a cause of many problems in the community. Pigs are a major reason why many families do not have gardens, as the pigs enter the gardens and damage everything. This is the reason why it is necessary to put fences around all gardens. For the most part people do not put their pigs in fences: it is easier to feed the pigs if they can freely search for their own food rather than be inside a pen. Consequently the pigs walk in the river and contaminate it. Water tests indicate a large presence of fecal bacteria in the river, presumably caused at least in part by the pigs.

D. Home Gardens

Only some 13% of those surveyed had home gardens near the house to grow vegetables. Nonetheless, some 67% indicated that they would like to have a home garden.

Women interviewed stated that their gardens helped them substantially to improve the food they give to their family, save money, and have foods available that they would otherwise not have. It therefore appears that home gardens could substantially improve food security.

Since one generally cannot grow vegetables on the farm, and many don't have a farm, home gardens near the house offer the only way to produce fresh vegetables and fruits. Since Estero de Plátano has a piped water system going to nearly every house, there is an opportunity to cultivate home gardens throughout the whole year which doesn't exist in neighboring communities.

There are a variety of reasons why more people don't have gardens. Most survey respondents named sheer laziness as the reason why people did not make their gardens. This makes sense in some ways because, due to the fact that one needs to enclose the gardens to protect against pigs and chickens, starting a garden is a lot of work. The reasons given by those surveyed for not having a garden were: lack of land, damage from animals, lack of money for materials, lack of labor to start, and lack of water.

Figure 1. Agricultural Production (survey results)	
Families with farms	57%
Size of farm less than 3 ha	53%
Size of farm between 3 and 10 ha	23%
Size of farm greater than 10 ha	17%
Farm next to house	23%
Distance to farm less than half an hour	53%
Distance to farm more than half an hour	21%
Cacao production	81%
Households with home garden	13%
Raise chickens	54%
Raise pigs	48%
Member of family fishes or catches other marine products	56%

Figure 2. Agricultural Interests (survey results)	
Want more cacao	24%
Want more fruit trees (including plantain and banana)	21%
Want more annual crops	13%
Reasons for low production: lack of labor	18%
Reasons for low production: materials	7%
Reasons for low production: money	10%
Reasons for low production: damage from animals	5%
Want home garden	67%
Reasons for not having a garden: labor	11%
Reasons for not having a garden: materials	6%
Reasons for not having a garden: money	15%
Reasons for not having a garden: water	9%
Reasons for not having a garden: damage from animals	16%
Reasons for not having a garden: land	27%
Want animals/more animals	48%
Reasons for not having more animals: lack of food	9%
Reasons for not having more animals: money	16%
Reasons for not having more animals: disease	11%
Reasons for not having more animals: theft	7%
Reasons for not having more animals: lack of space	10%

2. Food

A. Food Sources

Food in Estero de Plátano comes from both local agriculture and outside purchases. The figure below shows which foods are produced within the community itself and which come from outside.

Local Production	Outside products for sale in the community	Outside products sometimes available	Products only available in other areas
<ul style="list-style-type: none"> • plantain/banana 	<ul style="list-style-type: none"> • rice 	<ul style="list-style-type: none"> • staple vegetables (onion, tomato, pepper) 	<ul style="list-style-type: none"> • other fruits
<ul style="list-style-type: none"> • local vegetables • local fruits • home-raised chicken 	<ul style="list-style-type: none"> • oil • sugar • processed foods (condiments, canned fish, sodas, candies, etc.) 	<ul style="list-style-type: none"> • milk • cheese • commercially-raised chickens 	<ul style="list-style-type: none"> • other vegetables • other dairy • beef
<ul style="list-style-type: none"> • fish, seafood • pork • home-raised eggs • chocolate 	<ul style="list-style-type: none"> • commercially-raised eggs 		

Although many products are produced in the community itself, this production is limited, and most of these items are purchased outside the community as well.

Resources:

- *Tradition of agriculture, fishing, and animals husbandry*
- *Secure sources of staple foods:* for example, rice, plantain and banana, eggs, and chicken are always available in the community

Weak points:

- *Low availability of many foods:* For example: vegetables, many fruits, dairy products, and other foods that are not produced in the community. These foods are only sometimes available in the community, or in some cases can only be purchased elsewhere.

- *Diminishing natural resources.* According to older people in the community, the amount of fish, octopus, other seafood, and wild animals for hunting has decreased substantially in the last generation. If the loss of these natural resources continues like this, the community will lose a huge part of its ability to sustain itself.

The lack of food availability increases food insecurity and weakens the ability of families to eat well.

B. Food Security

Survey results indicate that food insecurity is a problem in Estero de Plátano: in the survey, more homes demonstrated some level of food insecurity than those who demonstrated food security (only 20% demonstrated complete food security). Food insecurity was measured through a series of questions having to do with difficulty in obtaining food in the last three months. Responses of “no” to all questions indicated a state of food security. Responses of “yes” indicated a state of food insecurity, and the number of “yes” responses determined whether this food insecurity was mild, moderate, or severe. The questions to which people most commonly responded “yes” were: 1. if she had worried at some point that the household would run out of food due to a lack of money, 2. if at some point they had been left without money to acquire healthy, varied, and nutritious food, and 3. if at some point an adult in the house had eaten only a few types of food and of low nutritional value due to a lack of money. Some 65% of those surveyed answered “yes” to these questions. When answering what they did when there wasn’t enough money for food, the majority said that they borrowed from the stores or borrowed money (49%), or collected food from the farm, animals, or fishing. Another 35% said they did nothing and made do with what they have.

Food insecurity can be attributed to:

- a lack of economic resources
- a lack of availability of many foods, which can be attributed to:
 - a lack of home production of foods
 - isolation of the community

Women surveyed indicated that there is a lack of certain foods in the community. Foods most commonly named as lacking were vegetables and fruits. This lack was more commonly attributed to a lack of availability rather than the cost of these foods.

This lack of these foods was reflected in the diet diversity demonstrated in the survey. Diet diversity is an important indicator of the ability of a community to eat well, and its measure is an accepted way to evaluate nutritional adequacy of the diet of a population.

Every woman was asked what she ate the day before. Less than half of the women indicated that they had eaten fruits or vegetables, other than vegetables used to flavor foods or fruits for juice. Only some 33% had eaten dairy products.

C. Nutrition Risks and Problems

The diet diversity survey shows that the community is running a great risk of Vitamin A deficiency. Eggs are the only source of Vitamin A that many people consumed (some 50%). Other sources (orange-fleshed fruits and vegetables, organ meats) appear to be consumed very infrequently.

In addition, Vitamin A supplements are not given to lactating mothers in the Subcentro de Salud. Vitamin A supplements are given free to children, however, according to the authorities at the Centro de Salud in Atacames, these are only given during medical examinations, and therefore do not reach all children.

Vitamin A deficiency is a health problem because it can cause or worsen anemia, and it weakens the immune system, increasing the frequency and severity of diseases such as diarrhea.

Consumption of Vitamin A-rich foods during pregnancy and lactation is especially important because 1. Vitamin A requirements increase during pregnancy and vitamin A supplements cannot be given during pregnancy due to their potentially teratogenic effects, and 2. unlike most nutrients, the vitamin A content of breast milk depends on the vitamin A status of the mother.

The diet diversity survey showed that people in Estero do frequently consume iron-rich foods; however, iron-deficiency anemia is a big problem in the community. It therefore appears that this deficiency is the result of a low *quantity* of consumption of these foods, particularly among pregnant and lactating mothers. Iron supplements are also given free at the Subcentro, but like vitamin A, they are only given during medical visits.

Because iron deficiency exists, there is also likely to be a deficiency of other nutrients, such as zinc and high quality protein among small children. Low consumption of dairy products also indicates a risk of calcium deficiency.

There are also many cases of overweight and obesity in the community. One can conclude that this prevalence is the result of the high availability and consumption of sugar, fats, and sweets in combination with lack of exercise. There is a lack of knowledge in the community about how to combat problems of overweight and obesity.

Information given by the provincial Ministerio de Salud tells us that the region already has problems of:

- malnutrition among pregnant mothers
- malnutrition among children 1 through 5 years of age
- iron-deficiency anemia among pregnant and lactating mothers, infants under 1 year of age, and children between 1 and 5 years of age

Direct causes of nutrition problems (anemia and underweight in small children):

- inadequate consumption (low quantity) of nutritious foods among vulnerable groups (pregnant and lactating mothers, small children)

Indirect causes of nutrition problems

- low availability of nutritious foods

- lack of economic resources to acquire sufficient quantities of nutritious foods
- lack of resources to cultivate nutritious foods
- lack of knowledge about nutrition and a healthy diet
- cultural habits which result in poorer nutrition such as:
 - low consumption of animal-source foods among women
 - early weaning and initiation of complementary foods
 - low quality of complementary foods for young children

Women and people in general have never received any kind of nutritional education. Observation and conversations with mothers in the community indicated that although they have heard names of certain nutrients, they don't know why they are important nor which foods contain which nutrients. There are many false ideas about what foods contain protein, vitamins, and iron, and they do not know what the accepted recommendations are on weaning and breastfeeding.

Nutritional education exists in the Subcentro only during medical visits. Observation during a nutrition workshop for nurses and conversations with the nurse in Estero indicated that knowledge about nutrition among health care workers in the region is also inadequate.

The nurse in Estero and the data from the Ministerio de Salud, in addition to conversations with women, indicate that many women begin to give complementary foods to infants before six months: an act which puts the baby at risk of malnutrition and diseases such as diarrhea. In addition, it is customary for women in the region to wean their babies at one year or less of age, which also puts the baby at risk of malnutrition.

Women themselves are also often malnourished and therefore make it more likely that their children will become malnourished. In addition to food insecurity and low diet quality, it is customary among women to eat very low quantities of animal-source foods, and to give most of these foods instead to the men of the house. Thus although a majority of the surveyed women indicated that they ate animal-source foods, it is likely that the quantity of this consumption was very small. Data from the Ministerio de Salud shows that there is a large prevalence of anemia among pregnant and lactating women, in addition to cases of underweight.

There are also high rates of teen pregnancy (21% of the pregnancies in the region) and a high birth rate. Both of these increase the probability of malnutrition of the mother, and therefore malnutrition of children.

Data from the Ministerio de Salud reflects the common phenomena of an increase in the prevalence of malnutrition among children between 1 and 5 years. This is generally attributed to low quality of foods eaten by children other than breast milk. In this region early weaning exacerbates this problem. Low availability of foods and lack of knowledge about nutrition contribute to the low quality of complementary foods.

Figure 3. Food security and availability (survey results)	
Households showing food security	20%
Households showing mild food insecurity	23%
Households showing moderate food insecurity	17%
Households showing severe food insecurity	24%
Women indicating a lack of vegetables	33%
Women indicating a lack of fruits	22%
Women indicating a lack of meat	12%
Women indicating a lack of fish	10%
Women indicating a lack of dairy products	5%
Women indicating they do not lack any foods	34%
Lack attributed to low availability	53%
Lack attributed to high cost	17%
Coping mechanisms: borrowing from store or borrowing money	49%
Coping mechanisms: gathering foods from farm or animals	30%
Coping mechanisms: selling something to gain money	4%
Coping mechanisms: help from family	11%
Coping mechanisms: make do with what have/no solution	35%

Figure 4: Diet Diversity—Food Groups Consumed (survey results)	
Vitamin A-rich vegetables	9%
other vegetables	24%
Vitamin A-rich fruits	5%
other fruits	38%
dairy products	33%
eggs	51%
organ meats	1%
flesh meats	72%
fish and seafood	73%
rice and cereals	99%
plantain/banana	73%
roots and tubers	33%
beans, nuts, legumes	26%

**Percentages do not include foods eaten in very small amounts, such as vegetables used as flavoring, or fruits used for juice

Figure 5. Nutritional Data from the Ministerio de Salud de Esmeraldas--Unidad de Salud Atacames Including: Atacames, Galera, Estero de Plátano, Sua, Tonchigüe, Tonsupa, Unión de Atacames	
Adolescent pregnancies	21%
First pregnancies with underweight mother	26%
Subsequent pregnancies with underweight mother	24%
First pregnancy with anemic mother	43%
Subsequent pregnancy with anemic mother	23%
Lactating mothers with anemia	23%
Infants 0-24 months consuming breastmilk	66%
Complementary foods before 6 months	46%
Complementary foods during 6 th month	27%
Complementary foods after 6 months	26%
First children under 1 year malnourished	4%
Subsequent children under 1 year malnourished	8%
First children under 1 year with anemia	50%
Subsequent children under 1 year with anemia	52%
First children 1-5 malnourished	13%
Subsequent children 1-5 malnourished	15%
First children 1-5 with anemia	41%
Subsequent children 1-5 with anemia	62%

3. Recomendaciones

Problems of food security and nutrition are the results of the larger problems of:

- lack of jobs and/or other income sources
- obstacles to home food production
- lack of basic education and health knowledge among women

Whatever program that attempts to solve nutrition problems, in order to be sustainable and effective in the long run, must address these fundamental problems.

The following types of programs could help improve food and nutrition:

1. *Agricultural improvement*

Agriculture presents an opportunity to improve incomes, food security, and diet.

The improvement of production and sale of commercial agricultural products, such as cacao and fruit trees, would provide a stable source of income for families with farms.

The improvement of home food production, that is, the capacity of a family to produce its own food, would improve food security and, if combined with nutrition education, diet. The responses of those surveyed and interviewed indicated that home gardens could substantially help improve food security and diet. Improving the production of subsistence crops on the farm would help similarly.

Help with animal husbandry—in the form of eliminating difficulties in raising animals—would also improve food security and nutrition, as well as generate income. Improving the raising of animals is particularly important to combat the problem of anemia, since animal-source foods are the best sources of iron.

Agriculture assistance could take the form of:

- distribution of materials or loans to buy materials for agriculture, gardens, and animals such as:
 - fencing materials, seeds, plants, hoses and other tools, vaccines and medicines
- links with agencies for the production and sale of cacao and other agricultural products
- establishment of community nursery, seed storage, and animal breeding programs

2. Education for women

In order to successfully improve diet and nutrition, it is necessary to complement the improvement of food availability (in the form of improving home food production) with education. Nutrition education could be accomplished through:

- classes given by volunteers
- visits by volunteers to houses to individually give nutrition information—this may be the most effective strategy given that many women are not willing to leave their houses for a class or meeting
- collaboration with educational programs at the Subcentro and with Fundación FUNDAE

There is also a lack of basic education among women. Although most have had some schooling, the majority, at least among those over 30, have only studied for a few years. Thus many women don't read very well. Literacy classes, in groups or individually, are a huge need and would substantially help women be better able to learn and care well for their families.

3. Microcredit and Business Training

What is most lacking in the community in general are economic resources. Many people have ideas about how they might earn money, but they lack the resources to get started and skills to plan a business or other income generation strategy. There also exists no custom of savings money in the community—when a family has earned some money, the norm is to spend it immediately rather than save it or invest it in something for the future.

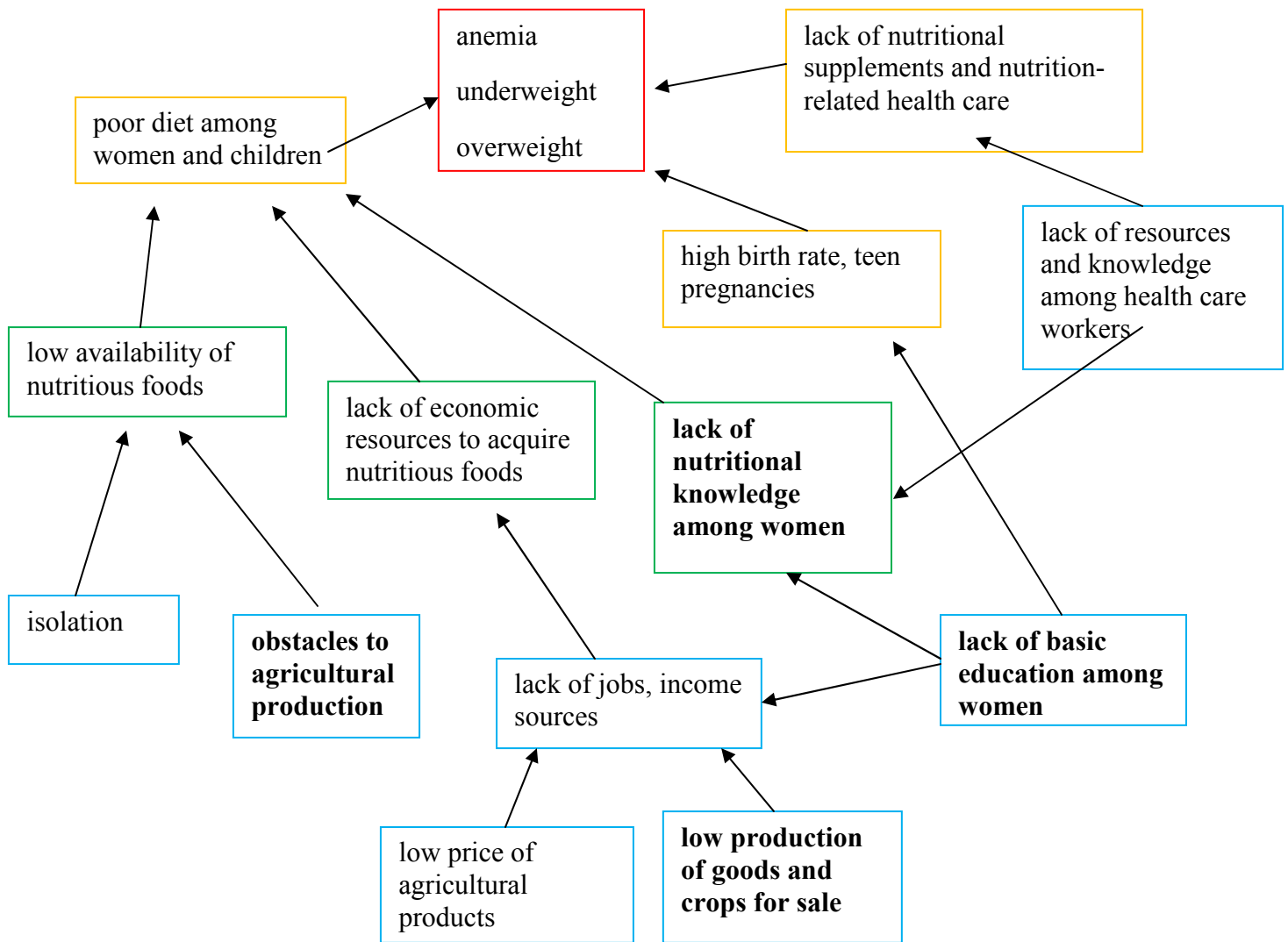
There is a need for:

- training in financial management
- microcredit to start small businesses
- training and help with the development of business plans and business management

Figure 6: Regional Institutions Offering Possible Colaboration and Aid

Type of Institution	Name of Institution	Location	Activities
Health Services	Ministerio de Salud	Esmeraldas	Provincial public health administrative center
	Centro de Salud	Atacames	Public health administrative center in the Unidad de Atacames
	Subcentro de Salud	Estero	Vaccines, medication, medical examinations and advice
	Seguro Campesino	Quingue	Medicine, examinations and advice in Quingue, and free outside hospital care for members paying \$2.50 monthly
Loans and Finances	Banco Comunitario	Estero	Small loans, savings for members
Water	Junta del Agua	Estero	Maintenance of community piped water system
	Agua Muisne	Muisne	Interest in putting a community water purification system in Estero
Sanitation	Municipio del Cantón Muisne	Muisne	Regional governing authority. Provides garbage collection and resources for other projects.
Human and community development	FUNDAE	nationwide	Worker who makes visits to each household doing activities for development of children under 5, meetings with mothers.
	Escuela Viña del Mar	Estero	primary school in Estero
	Grupo de Mujeres	Estero	organized women's group (in development)
	Junta Pro Mejora de Estero de Plátano	Estero	Elected representatives of the community of Estero. In charge of making decisions for the community.

Figure 7. Food Problem Diagram for Estero de Plátano



Problems in bold are those that could be changed or influenced by actions or programs of an organization, such as Yanapuma.

Figure 8: Food Solutions Diagram for Estero de Plátano

