

Land Usage and Its Affect on Farming Families in Costa Rica.  
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Costa Rica is a country where around a fifth of the working population is involved with some form of farming or ranching. The family size is the average composition of a father who stands as the head of the household, a mother who acts as the stay at home mom, and children to help around the home. The standard education of a Costa Rican is that of the ability to read and write, however the law states that all children are to complete at the very least elementary school. After that they have the opportunity to enter a secondary school before moving to a university level. Their dietary needs are met either by foods bought at local markets, or food the family itself has grown in the case of a subsistence farm. This diet can consist of such foods as corn, eggs, rice, coffee, beans, or squash. Families also grow and eat fruits like bananas, mangoes, pineapples, and oranges. The groceries families buy at local locations are usually places like the Central American Common Market which is a market that stimulates trade among members. Most families also make weekly trips to local markets, usually a market where the family itself sells food, knowing that the food is inexpensive, and they have developed relationships amongst fellow sellers allowing the family to bargain prices down. The income of these families can be anywhere from the normal household that makes enough to live in the run of the mill painted wooden houses connected to one another in various rows, or the select few acquire enough to have a more spacious home. The yearly salary for the usual family is around one-hundred seventy seven U.S. dollars. Costa Ricans face numerous barriers when it comes to their farms, some are local complications that also affect income such as how poor families live in the wooden homes in assorted rows and don't have enough space lengthwise to grow substantial crops, or that at the market where the family sells their crop the relationship between families can cause money to be lost in the bargaining of prices. Large scale problems can range from the fact that Costa Rica suffers many natural disasters yearly for instance hurricanes, earthquakes, recurrent flooding in the wet seasons, and drought in the dry seasons, and how the country has four volcanoes, two of which are active. Other dilemmas in the way are environmental issues for example air pollution, soil erosion in some areas, and deforestation. All of these natural disasters affect where crops can be grown in how the families can't risk growing so close to these areas in fear of the destruction that would be done to their crops. There is also the question of land usage and how both arable and permanent crops share a total of around ten percent of the land available in Costa Rica. All of these predicaments make up the reasons behind why it is difficult to keep your head above water as a farmer in Costa Rica.

The conventional home for a Costa Rican farming family is a wooden box in a sense connected to others wooden structures in assorted rows. This form of home may be large enough for the average family of a mother, father and children, but does present issues when it comes to farming efficiency. The factor that can cause the family difficulties with food production is space and there not being enough of it when a family has to share a tiny front yard with their neighbor and in the backyard is another row of houses, or if the family is part of the Central Highland they face the issue of how to stop their crops from sliding down the mountain after being planted. The status of this aspect is of growing concern considering currently in Costa Rica only around five percent of land is used for arable, or land suited for plowing or tillage, crops. Another concern of amount of space per low income family is the land and how over time if it is not kept up it will break down due to how much pesticides each of the families in these rows have to use to keep their crop going. These pesticides will over time pollute the land by way of after a good rain or watering of the crops the pesticides will through the run off process drain the chemicals into nearby sources of water. The other way pesticides will affect the land of these families is that the pesticides can often kill more than what's intended on top of killing small organisms present in the soil, this causes life in the soil to decrease which leads to decreasing soil quality. Crops can depend on the bacterial and fungal nutrients and when these are killed by the pesticide the roots of the crop will deteriorate over time. The

farmers themselves can also be affected by the issue of space in that if their soil quality is going down, but at the same time the farmer can't stop using pesticides, then when their crops fail they will be left without work. Women especially could be in trouble because even though the unemployment rate in Costa Rica as of 2008 is only around six percent the man of the house would be the one to find a job leaving the women at home to tend to the children. The situation in terms of space per family could be increasing because the amount of space each family is given in their wooden homes isn't improving, and the unemployment rate from 2007 to 2008 grew. Also due to the issue stated above of pesticides isn't improving because the more pesticide the crop is given once the more it will take over time will only decrease soil quality causing the space problem to worsen once again. However there are ways to solve the concern of space on mountain ranges without the families needing more space or a different location. As for the topic of space and not being given enough, the cost effective and simple way to fix this is through the agronomic technology of trellises. A trellis is a sort of vertical wooden structure that can be made as tall as needed used for growing vines or plants. Trellises will help because they are cheaply made using a hammer, wood, and nails and can be made very tall vertically or wide if needed, a trellis can grow such crops as beans, melons, squash, or maybe even corn. The trellis would great help knowing how inexpensive they are, and can be made as large or small as desired, and they will allow the farmer to grow upward and outward. The solution to the subject of crops sliding down the mountain in the Central Highlands is that of terrace farming. It is a technique that involves shaping the hillside into terraces, or a series of steps supported by sod, and can solve problems by keeping the crops flat and exposed to sun or clouds depending on the needs, and the dry and wet seasons in Costa Rica will keep the crops in good condition. Finally the resolution to the pesticides eroding the soil is to use less of the pesticide, follow the toxicity levels and use a pesticide with a lower level of toxins, or try organic farming because organic crops are grown using for the most part no pesticides. The problem of space in Costa Rica is of enlarging concern, however there are ways to solve the problem as a whole as well as all the lesser problems involved.

On a larger scale Costa Rica has undergone and will undergo dangerous and deadly natural disaster such as hurricanes and earthquakes. This problem can affect these families with only moment's notice anytime, anywhere, and some come with catastrophic aftermath. This factor can have an effect on land usage in how there are locations in Costa Rica that are more common for earthquakes and hurricanes to take place and families won't put up a crop in these areas. It's difficult to say how big of a threat a natural disaster is until it has already occurred, however based on the previous earthquakes and hurricanes of Costa Rican families could be in big trouble if something decided to strike. Nevertheless if it happened it would cause the production of crops to slow due to winds, flooding, or fallen debris, and families could lose everything including their crops and have to start fresh if the magnitude was large enough. The current standing of this issue is unknown, and as for severity unfortunately for these families there is no way of telling the path a natural disaster will take. In the past the Costa Rican earthquakes have been sizeable ones such as the earthquake that occurred on August 20<sup>th</sup>, 1999 fifty-five miles south of San Jose with a magnitude of 6.9, the damage from this quake was destructive. The quake of 2004 was smaller at a magnitude of 6.4 and happened on November 20<sup>th</sup>, 2004, it was located 25 miles southwest of San Jose and there weren't many casualties but families still had loses. The most recent earthquake in Costa Rica took place on January 8<sup>th</sup>, 2009, had a magnitude of 6.1, and arose 20 miles northwest of San Jose, it killed dozens of people. In Costa Rica there are two plates to which most these quakes to occur, the Atlantic and the Cocos, or Pacific, plates. The last seismic quake came about on the 22<sup>nd</sup> of April in 1991 and measured a 7.4 on the Richter Scale. The catastrophe left twenty-seven dead, 400 injured and 13,000 homeless. There isn't much of a trend involved given that these tremors are almost undetectable or in the case of a farmer by the time the family realizes an earthquake is coming, it could be too late. Hurricanes are another form of natural disaster occurring in Costa Rica annually. For example hurricane Mitch took place in October of 1998 and was said to have been a category five on the Richter scale. It was rumored to have killed thousands, and left an extensive cleanup process. Another hurricane in Costa Rica in the year

2005 was hurricane Stan which affected 459 communities and over a thousand evacuated, the U.S. also aided in the disaster relief for hurricane Stan. There were other hurricanes in the year 2005 that weren't directly in Costa Rica but were in surrounding countries that still affected the country hurricanes Emily, Wilma, and Beta. There may be no way out of a natural disaster in which case a poor farming family has no choice except to ride out the storm given that it's usually too late to secure anything by the time the quake hits so the best thing the family could do would be to gather their money and children and wait it out. There are more earthquakes and hurricanes that occurred have in countries bordering Costa Rica that have been smaller, but still left damage.

The growing season in Costa Rica occurs all year around, the farmers have mostly drought from December to April, and a wet season from May to November. This can pose issues ranging from flooding during the rainy time of year and bad crops from lack of condensation in the dry period. These seasons can also have an effect on the use of land because Costa Rica has areas that are rainy all year around as well as areas that have a constant drought; this makes these lands almost non-useable in that crops need both seasons. Everyone suffers from these troubles no matter where the family lives given that it is the cause of nature. In September and October of 2007 Costa Rica was hit with a rain lasting weeks affecting the southern parts of the country due to low pressure systems. According to ReliefWeb they experienced extensive flooding that led to road blockages and landslides, this period of rain was said to have began October 8<sup>th</sup> and was on and off until mid-November. During this period there were mudslides but one in particular stood out, around October 14, 2007 there was in a sense an avalanche or mudslide that left fourteen bodies to be found dead and many homes evacuated or destroyed. It happened in the city of Atenas which is west of the capital San Jose. The dehydrated season in Costa Rica has a price to pay; in May of 2008 there was northern zone drought that reportedly left 257 cattle in 54 ranches dead. This drought spilled over northern-central Costa Rica and the losses were said to have been worth over two million dollars. Another year-round worry for the people of Costa Rica is volcanoes, and how according to the CIA World Factbook the country has four volcanoes, two of which are active, around San Jose alone. An example of one of the countries volcanoes is Arenal. Arenal is currently listed as active and is located on Lake Arenal in Costa Rica, it is said to be the youngest volcano in Costa Rica, but one of its most active. It measures over five-thousand feet tall, and the oldest rocks on this volcano are said to only be 2,900 year old. Located east of San Jose, Costa Rica's highest volcano is Irazu. This volcano hasn't erupted since the 1960's however it poses a large threat being so close to the capital. It may be impossible to change the forecast or prevent nature's call; still there are ways for farmers to protect their crops from damage caused by nature. As for the wet period farmers can use the agronomic technology of digging ditches around their crops and in between the rows of crops and their homes. The families could try another technique similar to sand bagging by using heavy bags of some sort and to put these bags around their crops in stacks to keep the water out of the crops. Also the farmers could use inexpensive tarps or items to cover the crops during the rain, the combination of a ditch around the crop and something to cover them should do the trick. The dry season presents problems too, but some ways to prevent crops from suffering in the drought are growing crops such as beans and possibly corn that can survive in the direct sun and drought without much water. As stated above the family could also cover their crops or use cheap wood or scraps to build a cover of sorts over their crop. The farmers of Costa Rica suffer these issues yearly, and usually have no choice but to stick it out and wait for rain, or for the rain to stop.

Costa Rica may be a country where the land doesn't rule in favor of farming; however in today's society there are many forms of agronomic technologies that can assist the farming communities in achieving successful crops. As stated above current problems with the land available for crops are things such as the undersized space these families have to grow their crops, this ties in with the fact that again only about ten percent of Costa Rican land is accessible for farming, money is involved too in how the families don't make enough to support themselves let alone expand in the almost non-existent farm land.

The country also suffers from many natural disasters annually for instance earthquakes, hurricanes, volcanic eruptions, flooding, and how the growing season occurs all the way throughout the year and this alone has its advantages as well as disadvantages being that the wet season is anywhere from the months of May to November and the dry season from December to April. These all pose a threat to families because farmers aren't going to try and start a crop somewhere that is known for a lot of natural disasters during the year or a location like the Central Highlands with mountains or steep slopes unless they have the money to use terrace farming. Other problems arising are that Costa Rica is making the switch to manufacturing plants which in the future could take more land away from farming families, it could open up jobs for women taking them away from the household and the title of stay at home mom, this is good for women, but being that it will take them from the home farming will become less important, and put it in jeopardy. Farming in Costa Rica is a developing business presently, however the farming families will have to keep adapting to the changes the countries government is making toward the agriculture vs. manufacturing businesses and stay up to date with the agronomic technologies of today's farming in order to keep each families crops alive and prosperous.

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