

The Forests, the Coffee, and the People of Guatemala

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The Altiplano and its People

IN ADDITION TO THE IMPRESSIVE BIOLOGICAL DIVERSITY AND the beauty of its landscapes, the Altiplano is home to more than 4 million people distributed throughout approximately 7,000 villages, 90% of which have less than 1,000 inhabitants. The Altiplano is also the region with the greatest cultural diversity in the country and its inhabitants have a rich collection of knowledge and ancestral indigenous practices for managing their ecosystems and biodiversity, soil and water conservation and organic and agroforestry crops.

For the inhabitants of the region, one of the most common economic activities is agriculture and agricultural producers vary from region and crop variety. René Gaspar is an exemplary farmer in the Altiplano; a coffee producer in the La Igualdad community in the municipality of San Pablo, San Marcos. René is 46 years old and has been growing coffee since he was a child and he currently manages his plot of 1.3 hectares along with his wife and 3 of their 11 children.

René is a longstanding member and has been president of the Agricultural Cooperative La Igualdad, a successful community association that produces coffee in San Marcos and consists of 53 male and 8 female producers. Located on the foothills of the Tajumulco volcano, this climate is ideal for growing coffee: high altitude and a tropical temperate climate.



The story of this cooperative is rooted in a time of peace for Guatemala, in the mid-90s emerging from the signing of the Peace Accords and after the civil war that affected this country deeply. As Guatemalan refugees and those displaced by the war began to return and reintegrate into Guatemalan society, a group including Rene came together in La Igualdad to help create this coffee cooperative. As such, the residents of La Igualdad fought to be included in a Governmental program which provided financial assistance for technical programs and land grants in an attempt to allow the displaced to rebuild their lives. Through this program, Rene and other members of the Cooperative were able to receive their properties and, at the same time, convert them into productive working landscapes that could raise the necessary funds to pay off the loan. In the end, the innocent victims of a conflict from which they did not take part in ended up becoming stewards of their development,

The Western Highlands of Guatemala

LOCATED IN THE WESTERN REGION OF GUATEMALA NEAR THE TOURIST city of Quetzaltenango, the Western Highlands (Altiplano) of Guatemala is a region with enormous biological and cultural diversity that covers approximately 18% of the country's territory.

The Altiplano integrates the five departments of San Marcos, Quetzaltenango, Totonicapán, Huehuetenango and Quiché and is formed by a volcanic chain, the Cuchumatanes Mountain Range. Thanks to its varied topography with steep slopes ranging from 30 to 80% and peaks up to 4,200 meters above sea level, the region is characterized by a great diversity of microclimates. There are also a diverse set of ecosystems such as páramos, coniferous forests, cloud forests, lakes, canyons and wetlands and many key and threatened species such as the peccary, the jaguar, the puma and the quetzal, as well as a large number of endemic species.



A new context, new challenges

IN ADDITION TO THE SOCIAL CHALLENGES THAT GUATEMALA faced during the civil war in the 1990s and beyond, today the country now faces a new challenge. Like the other countries in Central America, Guatemala is extremely vulnerable to climate change and is considered amongst the most vulnerable countries in the world. In the coming decades, the Central America region is expected to experience increases in temperature above the global average and confront severe changes in precipitation patterns that will increase the probability of both extreme rainfall events and droughts. If one asks the local populations in Guatemala about the changing climate, most all will recount the changes that have arrived to their doorsteps - increased irregularity in rainfall, incidence of pests and diseases, an increase in temperature and more intense heat waves. The effects of these climatic changes are already generating negative consequences for Guatemalan citizens, such as the loss of their staple crops, a reduction in water availability and forest products and an increase in social conflicts mainly due to water availability.

However, for residents of the Altiplano, one of the most severe events in the region that showed Guatemala's vulnerability was the coffee rust crisis of 2012. Known in Spanish as "la roya", this rust is a fungus that causes the leaves of the plant to fall and overall weakens the trees, thus generating great losses for the producers. Amongst other climatic factors, in 2012 the increasingly high temperatures and humidity that prevailed was like lighting a match over dry grass, and led to a wide expansion of this coffee rust.

The rust, which can even lead to the death of the plant, first appeared in Central America in 1976, but in 2012, the Central American region, including Guatemala, experienced the worst outbreak in its history. The impact also affected René significantly, and this disease caused him to lose 75% of his coffee production, slightly more than the La Igualdad Coffee Cooperative which lost 50% of their coffee crop.

René and the other producers had no choice but to turn to using non-organic pesticides to save their crops, however this unfortunately caused them to lose their organic certification and cut off access to selling their coffee to the Federation of Agricultural Cooperatives of Coffee Producers of Guatemala (FEDECOCAGUA), which has access to international markets, a premium market that purchases coffee at a higher market value.



After the rust ran rampant throughout the coffee plantations in La Igualdad, René and the other producers had to find new options such as selling the coffee through intermediaries. However, since they lost their organic certification and were forced to sell to these less desirable outlets, René and the cooperative members were not compensated as expected for their coffee and economic hits began to sweep through the community and the region.

To make matters worse, the rust was not the only impact that families in the Altiplano were suffering from as a result of climate change. Due to the steep slopes and inadequate management of the landscapes, the Western Highlands region is extremely prone to severe landslides, thus placing many communities especially vulnerable to natural disasters. For example, in 2005, Hurricane Stan hit Guatemala and caused significant damage, rendering the region without power or communication and affecting more than 400,000 people. In La Igualdad, the tropical storms Stan (2005) and Agatha (2010) caused the river levels to increase and provoked large landslides which destroyed the irrigation infrastructure of for key crops in the area such as peas and corn. Unfortunately, since 2010, the producers have still not been able to recover the irrigation system due to the costs required in order to repair this system.

Responding to the challenge

FOR RENÉ'S FAMILY, COFFEE HAS ALWAYS REPRESENTED THEIR main source of income. In 2012, when the economic returns for coffee were seriously affected, many producers began to look for alternatives that would allow them to cover their needs. Amongst several activities that René piloted, he decided to take a position on a larger farm which came with a guaranteed salary. In addition, René was able to diversify on his farm by selling wood, poultry and pigs. These financial resources allowed René the security to stay in San Marcos and plan a long-term strategy that would allow him to better prepare and face future challenges as they come. However, René was considered the exception. Many producers did not have the same opportunity, and therefore decided to migrate to cities in Mexico along the Southern border such as Tapachula, or even as far North to the United States in search of better opportunities.

But for those who stayed in La Igualdad, they became increasingly aware that the likelihood of a new similar event affecting their crops in the coming years would be likely. Therefore, René and the other members of the cooperative requested help from the National Coffee Association -ANACAFE-, who provided all the members of the cooperative a new coffee variety plant that was resistant to rust and that could be implemented throughout 4 hectares of coffee plantations in the community. Conscious of the advantages this new rust-resistant variety could provide, all the members of the cooperative eventually adopted this process and all members have planted this new crop.



More than coffee

Agroforestry Systems

WHILE THE COFFEE RUST REPRESENTS ONE OF THE MOST REAL and tangible threats to coffee production and therefore to the economic security for producers, there are many other challenges that these producers face: changes in rainfall patterns, increase in temperature, degradation of soils and soil instability, amongst others.

Fortunately, René was one of the farmers who looked beyond coffee rust and opted for a long-term vision with his fellow cooperative colleagues. René, along with a few other producers in La Igualdad began planting trees within their farms, which is known as an Agroforestry System (SAF).

With support from The Nature Conservancy (TNC) and ANACAFE, the producers of the La Igualdad cooperative began to implement a scheme in which coffee plantations were integrated into an agroforestry system where trees and soils are considered fundamental elements of the health of the system and natural partners for the coffee producers.

The introduction of these tree species to the crops in order to construct these agroforestry systems provides many advantages. For example, the guama tree (*Inga edulis*) was one tree variety that was weaved into these systems and after three years began to offer various benefits. First, the guama offered shade for the coffee, which contributes to an ideal microclimate within the farm, controls the temperature and protects the farm from the impacts of heavy rains and winds.

In addition to providing shade, the guama is excellent for increasing the amount of organic matter in the soil (fertility) and helps to prevent erosion, since, when the leaves fall to the ground they cover the soil and eventually disintegrate into the soil.

Lastly, the guama is also a source of wood and firewood that can be used directly by producers or sold locally and regionally, therefore providing an alternative economic source for these local coffee producers.

However, the guama is not the only species introduced into these producers plots. They have used various species of trees that have commercial importance as timber or fruit trees, such as the palo blanco (*Tabebuia donnell-smithii*), cedar (*Cedrela odorata*) and tepemiste (*Poeppigia procera*).

The La Igualdad Cooperative is establishing a productive and resilient agroforestry system that will allow them to once again access their organic certification and therefore market their coffee in international markets, which will bring back better prices. Currently, the community is in the process of recertification and of the 80 social, environmental and production criteria that are necessary to be recertified, La Igualdad currently sits at 95%. René hopes that soon they can regain certification, which will be an opportunity for him to continue with his work and continue supporting his family.

In order to continue creating a climate-resilient agriculture approach, TNC and its partners are implementing soil conservation strategies. To date, 8 hectares of coffee plantations in La Igualdad have been worked on through the use of live barriers and infiltration ditches which significantly reduces soil erosion, improves the productivity of coffee plantations and avoids the risks for the downstream communities.

The long term: Betting on the forest

IN ADDITION TO THE WORKING AGRICULTURAL LANDS, THE community of La Igualdad has a vast amount of natural resources that are fundamental for the community. In this territory, La Igualdad has a waterfall with a height of 203 meters and surrounding forest lands where Guatemala's national bird resides, the quetzal. In addition, this region is a critical site for water recharge and supplies not only for the community of La Igualdad, but also for the municipal capital of San Pablo, where approximately 10,000 Guatemalans live.

Due to these additional environmental services, and recognizing that well-conserved forests offer ecosystem services that are fundamental for protecting these communities, TNC and its partners are working on a comprehensive and integrated forest conservation strategy centered on forest restoration.

As mentioned previously, the Altiplano is highly vulnerable to landslides and floods. However, this vulnerability can be significantly reduced through the proper management of this territory and its forests. The plant cover fulfills the function of a soil stabilizer. On the contrary, when the lands are deforested



and degraded, the soils are left bare of vegetation which results in landslides that affect the upper parts of the basin and lowland flooding also increases. Therefore, the stability of the land is important for both creating resilient communities but also for creating sustainable crops that can weather these climatic changes.

In addition to reducing the risk of landslides and floods, forest conservation is a crucial element for maintaining the quality and

quantity of water. For example, when the forests are degraded, the water cycle is affected because the water runoff occurs rapidly and oftentimes carries away solid waste, pesticides, and fertilizers which can pollute local water sources.

For TNC, the participation of communities in this processes of forest conservation and restoration is essential. For this reason, René Gaspar and other producers participate in training workshops in which they are taught the importance of forests and

sustainable forestry and provided the tools and financial support to implement these agroforestry systems and contribute to the reforestation of their forests. The communities place their trust in TNC's methods and without willing farmers like René to trust these methods, the positive benefits would never be possible.

The vision: Beyond La Igualdad

RENÉ GASPAR REPRESENTS A STORY OF MANY CHALLENGES, BUT ALSO of struggle and success. René has found in forest conservation an important support for his main source of income: the cultivation of coffee. Like René, around 60 colleagues from the cooperative have implemented this scheme and are already reaping the rewards: a diversification of income sources thanks to timber and fruit species, a productive and climate resilient system thanks to new varieties and the benefits provided by agroforestry systems. In the end, René and his colleagues are noticing a healthier landscape thanks to the environmental services offered by these well-preserved and sustainably managed ecosystems.

With the support of TNC and its partners, there is hope that these best practices will be scaled up and replicated in other regions of the country. René was one of the two or three pioneers who began to implement these practices, and via knowledge transfer and innovation networks, TNC is seeing potential to ensure that these best practices are replicated and escalated to achieve their mission of sustainable climate resilient agriculture management for the entire Altiplano. However, it's necessary to have resources to support these exchanges.

As a follow-up to the achievements initially seen in the Western Highlands, TNC has received funding from the US Department of State to implement the Resilient Central America (ResCA) project in the La Igualdad community. With this generous funding from the US Department of State, ResCA will seek to reduce food insecurity and increase the resilience of Central American communities in the face of climate change. In collaboration with local partners and based on existing efforts, the project will seek to design and support the implementation of appropriate public policies, strengthen the connection to regional and national value chains, promote best practices in land and water management and overall improve the income generation and livelihoods for La Igualdad and other communities in the region.

Conclusion

THE BEST PRACTICES OF CLIMATE-SMART AGRICULTURE SUCH as those that René Gaspar is applying will generate economic resources that take root where it's needed most - within the localities of the small producers. This will prevent these local economies from collapsing and less Guatemalans will be forced to consider inward and outward migration for work.

On the other hand, these well managed plots by René are now eligible for the Government of Guatemala's Incentive Program that is now providing additional incentives to the sustainable agroforestry systems such as René. Finally, the adoption of these best practices for the production of sustainable coffee by small producers is generating an impact on the landscape of the Western Highlands of Guatemala which is irreversible since this is becoming the engine for development of the region. All of these benefits constitute the main lines of the ResCA Project and will continue to be



ⁱ http://www.gt.undp.org/content/dam/guatemala/docs/prodocs/undp_gt_ecoturismo.pdf
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