

# Fog Collection Projects in Tojquia and La Ventosa, Guatemala

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## ABSTRACT

La Ventosa is a small, isolated, rural village in the western highlands of Guatemala, 10 km from Todos Santos Cuchumatán and in the Department of Huehuetenango. In the winter, precipitation is less than 20 mm a month, as a result of which the 60 people have a serious water shortage. In May 2005, FogQuest built four large fog collectors (LFCs) in the village, with fog water going to two new 2000 L plastic water tanks. In the context of this small project, the challenges of working with an indigenous community in the highlands, including social and women's issues, will be discussed. About one hour by truck from La Ventosa is the village of Tojquia. There are about 50 families living there. Water has come from rainwater in the summer and carrying water from a spring in the winter. The altitude is 3300 m and it is one of the few places in Guatemala to have a Zona de Niebla (Fog Zone) signs on the small highway. FogQuest has carried out a village needs assessment, has determined that fog is present in the dry period and subsequently installed four large fog collectors, and two 3200 L tanks, in October 2006, to provide about 800 liters of water per day to two families. The project will grow in stages to benefit the entire community of 300 people. This paper will emphasize the social sensitivity needed for a successful water project.

## 1. INTRODUCTION

Guatemala is in Central America at about 14° S latitude and, therefore, in the Tropics. The country has coastlines on both the Pacific Ocean and the Caribbean Sea. Inland the topography is rugged with extensive mountain ranges. Cities and villages are found both in valleys and on mountain ridges and slopes. The focus in this paper is on the Western Highlands, a region that borders Mexico and is a one-day drive from the capital of Guatemala City. The terrain where the villages are located ranges from 1500 to 3500 m elevation. This is sufficiently high that the winters are cold, especially at night, and windy, foggy, and quite dry. The summers are hot and rainy with the possibility of severe weather and intense thunderstorms. The goal of the FogQuest projects in the Western Highlands is to provide a supply of clean water to small rural villages. The first two of these are La Ventosa and Tojquia. Tojquia is in the Cuchumatán Mountains at an

elevation of 3300 m and is 15 km from La Ventosa, which is at a somewhat lower altitude.

## 2. VILLAGE SOCIAL ISSUES

There are inherent difficulties in development work and there are also intrinsic challenges concerning social and women's issues while working in the culturally distinct Guatemalan rural highlands. First it is critical to acknowledge the prevailing Mayan culture and its importance to the people of the Cuchumatán. Well over half of Guatemalans identify themselves as Mayan and in the highlands it is an even greater source of pride as they live closer to their ancestral traditions (Carrescia, 1982). It is a region that has maintained its customs in relative isolation from the rest of the world. There is also a debilitating level of poverty in the highlands where access to resources is scant.

It was only in the mid 1960s that the first road was built into the highlands. However, at the height of the 36-year long civil war in the early 1980's, many towns, including La Ventosa and Tojquia suffered terribly and roads were temporarily closed. Many hundreds were killed at the hands of both the government military and guerrilla forces. Those that survived did so as a result of fleeing to even more remote areas, or in the case of Todos Santos, forging together to stave off the enemy and becoming known as one of a few stronghold towns in the civil war. Perhaps coincidentally, it is only one of a few towns in all of Guatemala where not only the women but the men continue to wear the traditional attire: red and white pinstriped pants, embroidered shirts and blue felted hats. Thus anyone not dressed in traditional uniform is known to be an outsider in a place where lingering distrust remains. The peace accords were signed in 1996, yet in 1999 as a result of a misunderstanding and an unease of photography among all Mayans, a Japanese tourist was mobbed and killed (Handy, 2004). Photography is thus a sensitive topic as is overstepping any perceived notions of appropriateness.

The people of the Cuchumatanes are first and foremost subsistence farmers, though with the building of the road, a switch to a cash economy ensued. Many now take advantage of seasonal labour opportunities on the coastal plantations or even in the United States. These are tightly knit conservative communities, with active town councils in which families are represented by the male head of the household. However, these frequent extended absences, usually by the eldest males, have important consequences, in parenting and passing on the traditions, politically with less household representation, and in daily activities as the women are left to complete all chores as well as the small scale farming tasks of the household.

The language spoken in this region of the highlands is almost exclusively Mam, with few women in the rural settings able to speak any level of conversational Spanish. Formal schooling ends at age 12, many girls not attending at all, and illiteracy rates remain high, especially among women. Some men, particularly those that migrate for seasonal labour have better developed Spanish. However, this language barrier is the most difficult to overcome as there are few interpreters available. It is also not appropriate for an outsider male to

interact with females, especially when the father or husband is away.

Women in these traditional highland societies are honourable and hard working. They not only tend to the more traditional female roles as child rearing, cooking, cleaning, and weaving, but also participate in agriculture: planting and reaping crops, tending to sheep and other livestock, and of course, fetching water. It is not uncommon to see groups of women around a spring filling up numerous containers and balancing them on their heads as they walk long distances wearing the traditional ankle length skirt with inexpensive plastic slippers. Fog collection projects not only appease seasonal water shortages, they also have an exponentially positive effect on women's lives in terms of expendable hours saved and quality of water used to cook and clean with, however it is they who must be convinced of the merits of the project as they are the primary users.



Photograph 1: The women in Tojquia sewed the edges of the mesh for the fog collectors.

Developing and implementing a fog collection project within said context requires a high level of cross-cultural understanding, an appreciation for gender-specific needs and an identification and targeting of problematic areas. Firstly, it is important to foster respectful and trustworthy community relations, getting to know individuals and families in general. In particular one must include women in the planning and development process while also abating any fears of foreigners or hidden agendas. Without this as a crucial first goal, no project can be initiated. Secondly, recognizing the traditional roots of these communities allows for the appropriate introduction of a new technology that will not only seem strange but may be misunderstood as an attack on a traditional way of life. Eliminating misguided notions of the quality or quantity of

fog water is also important, as is effective capacity building to ensure not only the design and construction of a fog collection system are taught and can be diffused, but more importantly, the necessary maintenance for the sustainability of a fog collection system can be effectively implemented.

As the women are the principle users of water, gender-conscious development is a key at every stage and efforts have been, and continue to be made to involve the otherwise non-participatory women into the project through gender-specific meetings and time interacting and gaining their trust. To genuinely extol the benefits of this cleaner source of water, education in terms of storage and point of use needs to be recognized and addressed in the projects. Women truly are the impetus for change, especially in these traditional highland societies and fog collection projects require their full conviction, participation and commitment for overall success.



Photograph 2: Installing the trough on a fog collector, with the help of the entire family.

### 3. FOG COLLECTION INSTALLATIONS

Four large fog collectors (LFCs) were built in the small settlement of La Ventosa in 2005 following FogQuest procedures (Schemenauer et al. 2005). The LFCs have been maintained and are standing up well. The water from the LFCs goes through sedimentation tanks to two large 2000 L storage tanks. The water production is about 800 L per day in total and is used primarily by two extended families to support the goats that they raise for food and income. Some of the water is used for domestic purposes. As the interest and demand builds in La Ventosa for more water, more fog collectors can be added. To this end the cooperation and support of the women are being cultivated.



Photograph 3: A 3200 liter water tank being carried up the hillside in Tojquia.

The primary focus at present is the LFCs built in Tojquia in October 2006. The community suffers from severe water shortages in the dry season when the only sources of water are in valley bottoms at a considerable distance from the homes. LFCs in this mountainous area are expected to produce an average of about 4 to 6 L m<sup>-2</sup> day<sup>-1</sup> during the dry season, based on previous measurements. Data from July 2006 gave a monthly average of 11 L m<sup>-2</sup> day<sup>-1</sup> in the middle of the rainy season. The four LFCs were built under the supervision of FogQuest staff, with labour provided by the landowners and their families plus work teams from the community. The total collection area installed was just under 160 m<sup>2</sup>. The water from each pair of LFCs was delivered to a 3200 L plastic tank for use by one family. It took less than three weeks for the tanks to fill and they remained full through the winter period and were still full at the end of March 2007, even with continuous use by the families. This suggests that a usage rate of about 400 L per extended family per day is an adequate figure. This would be for 6 to 8 people and some animals.



Photograph 4: Men of Tojquia with two large fog collectors and a water tank.

#### **4. DISCUSSION**

The need for a clean source of water for mountain communities in western Guatemala is very evident. One possibility has been shown to be the collection of fog water, which does not depend on rainfall or the existence of groundwater supplies. The goal in 2007 is to expand the supply for Tojquia to include more families and hopefully the village school, thus demonstrating the potential for this technology to sustain entire communities in the region. The local village members as well as those from neighbouring villages have shown a lot of interest in adopting the technology and, as resources permit, the water supply systems will be enlarged. The project work to date has shown that this can only be done after a sound relationship is formed with the community, after women are brought in as active partners in the projects, and when the projects are done in a manner that respects the culture, religion and customs of the people.

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