Conceptualization of community-based entrepreneurship: A case study of Ecofiltro in Guatemala

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Abstract

Workplace innovation and community-based entrepreneurship (CBE) constitute a powerful combination which, if leveraged, could potentially solve society's most pressing problems. This case study illustrates how an entrepreneur, Philip Wilson combined these two elements to pursue the ambitious goal of taking clean water to one million families in Guatemalan rural areas by 2020, through his organization, Ecofiltro. The research was conducted between 2014 and 2015 in three rural Guatemalan communities. Historical data, observations and semi-structured interviews with Ecofiltro representatives, community leaders and customers were used as data collection methods for this exploratory study. The main objective was to gain a deeper understanding of what made the firm successful in achieving its ambitious goal, whereas other enterprises, mainstream non-government organizations (NGOs) and government institutions fail in solving social, health-related and economic problems. Findings reveal an ingenious workplace innovation led by a visionary leader and a way of organizing which extends Ecofiltro's workforce by drawing from the local community; a simple yet powerful water filter which fits with the local culture.

Introduction

The lack of success of many governments and mainstream non-government organizations (NGOs) in solving developing countries' most pressing problems (see, for example, Chowdhury, 2017) has contributed to the rise of a new type of actor:

The community-based entrepreneur. This individual, like other entrepreneurs, is characterized by her ability to find and create business opportunities and sometimes even innovatively destroy current value-creating initiatives (Schumpeter, 1939). However, her goals concentrate on solving social problems sustainably rather than only pursuing profits.

There are certain contexts which favor the emergence of community-based entrepreneurs more than others; namely, developing countries. Guatemala, which we focus on, is a good example of such a context and there are two main reasons for this. The first reason is that community-based entrepreneurs emerge partly in response to government's and NGOs' inefficient and unsustainable dependence on tax collections and donations, respectively. Second, often well-intended foreign donations generate complacency as well as dependency in the recipient country, thereby reducing the desire to overcome unfavorable circumstance through other initiatives. In Guatemala, the above have fostered a vicious cycle of a paternalistic relationship between recipients and donors, characterized by a sense of victimization and entitlement to receive aid without taking responsibility for finding solutions. This has resulted in NGOs' and the government's poor performance leading to poor social and economic development results.

Interestingly, certain rural communities played a significant role in overcoming the economic and social development stagnation caused by a 36 years long civil war, which officially ended in 1996. Rural communities had received aid from multiple entities including religious ones, thereby enabling the emergence of local leaders and communal organizations. That is why, when a growing number of local and foreign entrepreneurs realized that a shift in focus was needed to provide an effective and sustainable answer to the rural population's basic needs such as clean water, education and nourishment, they found a fertile ground for development.

In the following, we present a case study – the story of how Philip Wilson and his organization, Ecofiltro, tackled the lack of clean water in Guatemalan rural communities. Philip Wilson, Ecofiltro's CEO and a Guatemalan Wharton MBA graduate, found the above to be the ideal conditions to construct a successful business model to solve the clean water problem: Community-based entrepreneurship (CBE), which combines communities' self-organization capabilities with business acumen.

In this article, we show that the success Ecofiltro has achieved has not been straightforward; instead, it has been the result of a painstaking trial and error process in working with the local communities.

Context

As Philip Wilson was driving towards the outskirts of Antigua Guatemala glancing with awe at the stunning landscape, he could not help but think about the huge mission he had set for Ecofiltro: "To reach 1 million rural families with clean water by the year 2020" (Ecofiltro, 2015).

He had embarked on a challenging journey to solve one of the most pressing problems that rural Guatemala has always had: Lack of clean water. Furthermore, this was only one of many interrelated challenges that a 16 million population, with an annual per capita income of just $3,915 is facing. Of the total population, 62.4% are poor and 29.6% live in extreme poverty (UNDP, 2015) and the impact of poverty is striking. For example, low income and illiteracy contribute to 49.8% of children younger than five years old suffering from chronic malnourishment and 2.2% dying from protein-energy malnutrition. Additionally, three per 1,000 children die from diarrheal diseases, related to a lack of appropriate sanitary conditions and contaminated water consumption (WHO, 2015). Approximately 97% of water streams in Guatemala are contaminated with fecal bacteria and 50% of the population in rural areas lack access to clean water (Wilson, 2015a).

Even people living in cities, though, may suffer from gastrointestinal diseases, should they consume water directly from taps. Hence, most families usually purchase bottled water, and higher-income minorities rely upon water-filtration technologies such as ozone filters. The city dwellers, on average, spend almost $200 per year per household on bottled water. For people in rural areas this means collecting water from river streams or wells, and then boiling it over open fires. This means that they may spend from $20 to $40 monthly in wood for combustion, depending on the size of the family and the wood prices. Given this context, it is evident why Philip decided to tackle the challenge of sustainably providing poor communities with clean water.

Case Study: Ecofiltro

This research was conducted as part of a university-industry collaborative endeavor (Sobrero, 2013) between 16 Entrepreneurial Engineering students from a Guatemalan University and Ecofiltro during the second semester of 2014 and the first semester of 2015. In order to gain access to the firm, we proposed an action research (Reason & Bradbury, 2008) project to Philip Wilson so that we could help him accomplish his firm's mission statement:

[Ecofiltro] *"...has a very clear social objective: To reach 1 million rural Guatemalans with clean water by the year 2020...[it] will always use financially sustainable methods to reach this goal and [we] will always remain open to sharing [our] production process and marketing tactics with any outside group that wants to solve the water challenge..."* (Ecofiltro, 2015).

The project's aim was to help Ecofiltro gain an understanding of the most effective way of introducing the filter to new communities. Due to its accelerated growth, Ecofiltro was entering new rural communities and the resulting social, economic, educational and cultural differences were complicating the filter's effective commercialization. We thus offered help in gaining a deeper understanding of rural communities' perceptions (Bauer & Gaskell, 2000), health concerns, and purchase power in order to refine the filter's commercialization process.

Ecofiltro was chosen due to its distinctive approach to solving a pressing social problem. The approach is based on a form of CBE which actively involves community leaders in organizing people. This form of CBE differs from the one proposed by Torri (2009) in two ways. First, for Torri (2009), CBE is a community-generated enterprise created to solve local problems, whereas Ecofiltro is an external enterprise which expands its operations into local communities, helping them solve local problems by making use of community leaders to drive the engagement of the larger community. This constitutes a very novel way to operate an enterprise and a good example of workplace innovation (McMurray, Islam, Sarros, & Pirola-Merlo, 2013). Second, Torri's (2009) CBE is a collaboration run by the community members, whereas Ecofiltro is run by a CEO using an organizational structure similar to a for-profit enterprise.

However, these are precisely the two factors which make Ecofiltro a unique form of community-based enterprise, and reflect our main motivation to understand the success of this workplace innovation in greater depth (McMurray et al., 2013).

Research Methodology

We employed a single case study design (Yin, 2003) which consisted of historical (secondary) data, semi-structured interviews and participant observation in the communities and at Ecofiltro's headquarters. Considering that it was necessary to gain deep knowledge of the field operations despite the time constraints of Ecofiltro personnel and the students, a combination of qualitative methods was used as suggested by Burgess (1984). The interviews were fully transcribed and interpreted using thematic networks to structure unsorted data as suggested by Attride-Stirling (2001). The historical data were gathered from the firm's website, newspapers and magazine publications.

Semi-structured interviews (DiCicco-Bloom & Crabtree, 2006) were conducted with eight field representatives of Ecofiltro who were in charge of promoting the filter in the communities. The CEO, the filter's inventor, and the operations manager were interviewed, as well as the community leaders. These included interviews with two leaders of two communities in the Guatemalan South Coast, and two interviews with two community leaders in The Highlands. By doing this we aimed to capture the cultural differences between the communities as suggested by De Walt, De Walt and Wayland (1998). Additionally, four interviews were conducted with customers from each of the four communities. Participant observation was conducted during two Ecofiltro presentations at The Highlands' communities and two at the South Coast. Table 1 summarizes the data collection.

Table 1
Summary of the Data Collection

Interviewee	Instrument	Number
CEO of Ecofiltro	Semi-structured interview	1
Operations manager of Ecofiltro	Semi-structured interview	1
Inventor of Ecofiltro	Semi-structured interview	1
Field representatives of Ecofiltro	Semi-structured interview	8
South coast community leaders	Semi-structured interview	2
Highlands community leaders	Semi-structured interview	2
South coast community leaders	Semi-structured interview	8
Highlands community leaders	Semi-structured interview	8
South coast community customers	Participant observation	2
Highlands community customers	Participant observation	2

Meta-findings and theory-development

In the next sections, we present our findings as meta-findings integrating the history of Ecofiltro, semi-structured interviews and observations to refine the understanding of the concept of CBE. We define meta-findings as the results of analyses using various sources of information to arrive at a holistic theoretical overview of the focal concept and its implications (c.f., Marcus, 1995).

Key Insights from the History of Ecofiltro

Ecofiltro´s origins can be traced back to the Central American Institute for Industrial Research and Technology (ICAITI in Spanish), founded in 1956 as a regional technology transfer office to support Central American firms. In 1980, ICAITI was commissioned to develop a solution to provide clean water to poor rural areas in Central America. Fernando Mazariegos, a Guatemalan scientist from ICAITI led the project. His team discovered that people purified water using chlorine or by boiling it which, although effective, generated a flavor that people disliked. This led them to look not only for a technical innovation, but for something that people would adopt.

There are a number of potential reasons why the solution to the issue could be found in the filtering stage of the process. First, filtering could prevent water from tasting bad. Second, it had the potential to be a culturally acceptable solution, easier to adopt and diffused, given that historically, indigenous people from Central America had been collecting water using clay pots. Although in recent years, plastic had reduced the use of clay containers, probably as an inexpensive, more robust and light material, ceramic pots were still being widely used for cooking. Third, its production could generate new jobs, because ceramic could be used as a base material for a filtering device, generating additional work for ceramists who made a living out of producing decorative clay handicrafts.

The team experimented with and combined pinewood sawdust with clay to create a ceramic filter. Pinewood sawdust had the advantage of not altering water's taste and had the additional advantage of being transformed into carbon when exposed to high temperatures. Carbon has chemical properties which eliminate odors, colors and flavors from water. Clay, given its malleability, could be shaped into different designs and would offer porosity so that the water could be filtered. The third material used became colloidal silver, which eliminates bacteria. With these three materials, Fernando and his team developed what later on would be named the Ecofiltro (Figure 1).

Not long after the first filter was developed in 1980, Fernando presented it at a Latin American Health and Environmental Engineering conference where it received its first award out of more than 30 international honors and recognitions by 2015. The filter has been so successful that, currently, there are more than 59 factories producing it across 37 countries in America, Asia and Africa. ICAITI folded in 1998 and, despite having been able to submit patent applications, Fernando decided to never claim the Intellectual property (IP) as his contribution to humanity. His views have not changed to date, despite the filter's great success. Fernando has humbly shared how pleased he was when a group of Harvard graduates who founded a factory in Uganda told him to 'feel good' about the 2.5 million more people who were going to be added to the long list of those who had already benefited from his invention.

It took almost 30 years for Ecofiltro to transition from a great invention in the early 1980s to become a successful innovation by 2009 (Figure 2). The transition started

Figure 1. Fernando and Ecofiltro

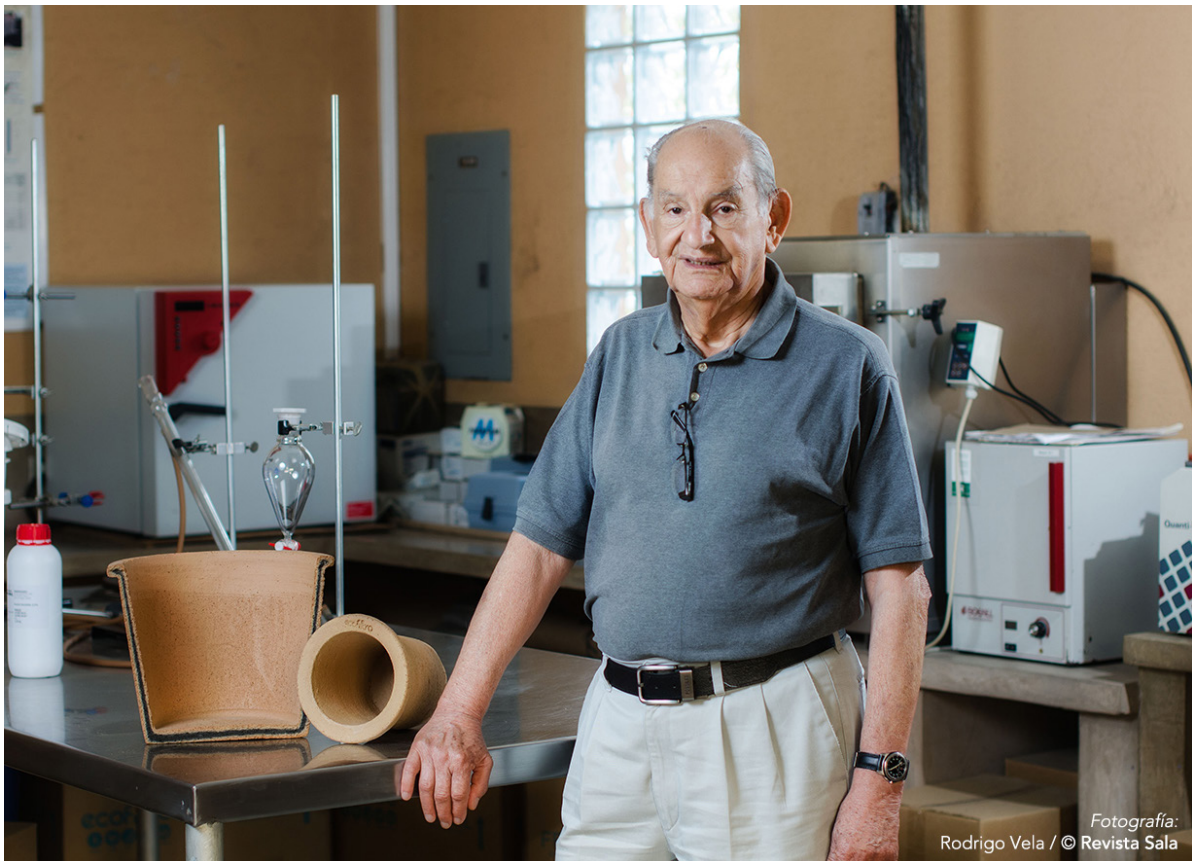
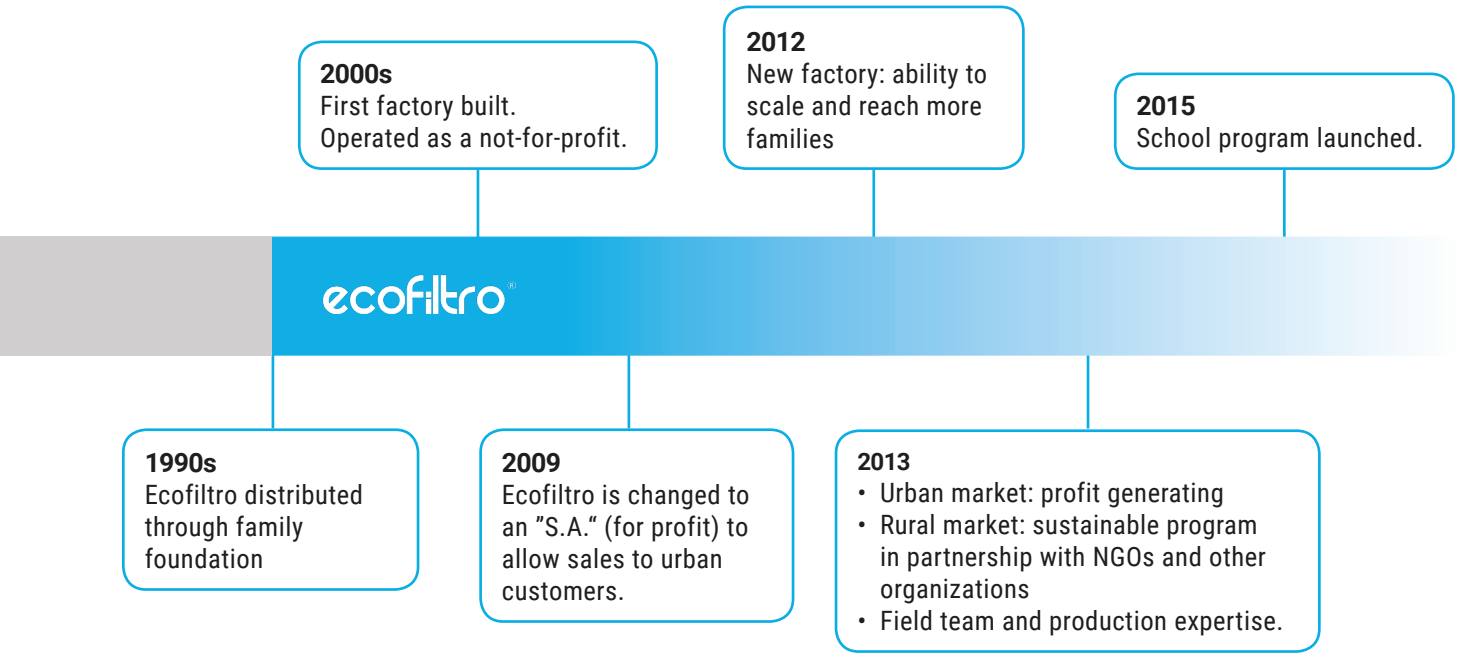


Figure 2. Ecofiltro's Timeline



when, in the early 1990s,Fernando met Philip's sister, Mrs Dominique Wilson, a nutrionist and social worker who was leading a family-owned foundation called Familia Guatemalteca de las Américas (Americas' Guatemalan Family). She met Fernando by chance while waiting for a meeting at a government office. They started talking and the filter came up during the conversation. She saw its potential and suggested that the foundation and Fernando run an "acceptability" research project to test the likelihood of the filter's diffusion. That is how Fernando – along with other five scientists from Harvard University, Universidad Rafael Landívar from Guatemala, the World Health Organization, the Panamerican Health Organization, the Instituto de Nutrición de Centroamérica y Panamá (Central America and Panama Nutrition Institute (INCAP)) – undertook a two-year study during the early 1990s.

These results showed that those families who had received education about health alongside using the filter had managed to reduce gastrointestinal diseases by 55%. This was encouraging and resulted in Fernando and the NGO setting up an artisanal workshop in the 1990s to produce the filter. In the early 2000s the NGO acquired more land and set up the first factory. This was about the same time that Philip had made up his mind about what his career should concentrate on – helping others.

That is when Philip became more involved and the process of transforming the NGO into a community-based enterprise started. Considering that the aim was for Ecofiltro to become self-sustainable, Philip realized that the filter could also be sold to urban users, not only be brought into rural communities. However, this required Ecofiltro to become a for-profit organization, which they did in 2009. Paradoxiclly, selling to urban families enabled them to reach more rural families; they achieved this by subsidizing the filters for the rural families through the income generated by selling the filters more expensively to urban users. In 2012 they set up a new factory to meet the increasingly high demand.

The Community-based Entrepreneur's Journey

Philip Wilson describes himself as a businessman interested in solving social problems through enterprise models (Wilson, 2015a). We see his approach as CBE, where an entrepreneur takes on big challenges – especially those which have not been solved for decades – and wants to leave a legacy for his community or for the entire nation.

In contrast, a "general" entrepreneur is focused on creating profits for the firm's shareholders. We call this CBE (see, also, Britton, Jackson, Morrow, Scaff, Scott and White, 2014) because communities are at the heart of such entrepreneurial processes and moral causes serve as the main aspect of innovation, rather than simply making profits. More importantly, this approach not only addresses social problems but also solves micro-level problems that are often ignored by typical commercial institutions and NGOs.

CBE is driven by strong moral consciousness which is shared by both the community and entrepreneurs. We cannot separate this moral consciousness of the one party (i.e., the community) from that of the other (i.e., the entrepreneur). When both parties realize that they share similar moral values, their drive for profit and sustainability takes on a different meaning. They see each other as partners – and this partnership is not about profit that benefits a community or an entrepreneur in the short-term. Instead, they engage in collaborative innovative activities through which they make unique, long-term contributions to a society. They are ready to make sacrifices (Chowdhury, Banerjee, & Nagarkoti, 2017) to develop a sustainable product or service. They may even abandon the development of a product or service if they do not find it feasible or if they think that it may harm society in the long run.

In this respect, one of Philip's moral concerns was about how many children's health problems, such as impaired physical development and cognitive abilities, were caused by their lack of access to clean water. Therefore, he thought that, if Guatemala wants to solve its other most pressing economic and social problems, water and malnourishment must be prioritized. During the interviews he recalled how, earlier in his life, despite being a successful entrepreneur in California, the USA and Guatemala, he still felt that something was lacking in his life. Therefore, when he found out that his sister was struggling to promote the Ecofiltro, he took this opportunity to use his business skills for a higher purpose. For Philip, the greatest rewards come from being able to save children who would otherwise die from gastrointestinal diseases as well as enabling the poor to prosper by being healthy. These days, the mission of taking clean water to one million families by 2020 makes him wake up every morning and feel fulfilled, happy and useful (Wilson, 2015).

But how did Philip get to this point? When the Ecofiltro factory still operated as a not-for-profit organization, his sister, Dominique, saw with frustration how small the donations were compared to the huge task at hand. Moreover, they were negatively affected by the cash flow and, therefore, sustainability was at risk. She asked Philip for advice on how to change this. This led Philip to reflect and wonder "Why not set up an organization which has the brain of a business and the heart of a foundation?" (Wilson, 2015a: 3). She was a philanthropist and refused to transform it into "a business"; despite her reluctance, though, she embarked on Philip's idea of transforming the foundation into a CBE. He was confident this was the right decision. In his opinion, real entrepreneurs use resources ethically and efficiently and everything they do must be sustainable otherwise they go bankrupt.

With the metaphor of "an organization which has the brain of a business and the heart of a foundation" (Wilson, 2015a) in mind, Philip organized a CBE where everybody has weekly, monthly and annual goals and clear long-term objectives. It means that everybody in the organization knows that their market consists of those people who have no access to clean water, and that the goal is solving 100% of the problem. "Not 5%, not 6% but 100%!" says Philip, "and that – he stresses – is a businessman mentality". What makes Ecofiltro a CBE is the fact that the sales and collections processes are supported by community leaders who (Wilson, 2015a):

- Organize the community for health talks where the problems with contaminated water are explained and the filter is presented as a solution.
- Share a small percentage of the sales through the periodic collection duties they perform.

Key Successes: Business Model Innovation and Mindset Shift

CBE requires finding new ways of making projects sustainable (see Britton et al., 2014) and, in order to achieve that, a paradigm shift is necessary. In this case, the key was extending the sales force by integrating community leaders and having field representatives who understood the local culture. However, this would not have been so effective in solving the water problem if Philip and his team had not changed the way they saw the people in these communities. They shifted from feeling pity for them, to seeing them as customers with special needs, thereby also restoring

their dignity. This mindset shift led Ecofiltro to provide the special conditions these communities needed to be able to afford, and benefit from, the filter.

Business Model Innovation

Giving away products for free, as government and NGOs tend to do, is not sustainable. Philip realized that they had to go beyond feeling good about helping people, to really solving the root-level problem. This could only be done by identifying the market and by re-conceptualizing poor families as functioning buyers as opposed to charity cases; buyers who are able to purchase products and gain value from using them. For example, when they gave the filter away for free, sometimes they would find the filters being used as flower pots or rubbish bins, suggesting that they had not properly communicated the filter's value to people. In addition, they used to look at the poor person with pity, rather than as a functioning and honorable buyer – a customer. These insights about low adoption and 'pity-based' philanthropy led them to shift their perspective: They evolved to utilizing the Ecofiltro as the main solution to the problem (as opposed to the earlier use of chlorine pills), while shifting to selling it instead of giving it away free. Accordingly, Philip decided to keep the price of filters as low as possible so that his customers could easily afford them. The low pricing could not only improve the lives of the poor health-wise, but also acknowledge that the poor could function as capable and dignified human beings in societies (Sen, 1999; 2010).

There were, however, several challenges to overcome in order to find a solid strategy that could solve the water problem in Central America through a CBE approach. One of them was scalability; that is, being able to exponentially grow the filter sales and delivery, at the lowest possible cost without having to grow excessively in personnel and infrastructure. The initial idea was born to outsource the filter production to local ceramists which would be good for boosting the local economy by using low-cost, local materials, with qualified labor. Unfortunately, the ceramist profession has become less attractive to younger generations and qualified workers were scarce. That is partly why Ecofiltro decided to build their own factory employing their own ceramists.

A second challenge was finding a way to offer the filter at a low cost to poor rural families. The solution to this challenge came when Philip realized that, similar to 601,000 families in urban areas, he had been paying approximately $200 per year for bottled water. This made him decide to start selling the filter at urban homes. However, his wife did not like the look of the filter since it was installed in a plastic receptacle such as those used to store paint. He proposed putting the filter within a beautiful ceramic receptacle and she said that it looked like a piece of art right in the middle of the kitchen (see Figure 3). Then he realized that he had a product that might appeal to people in urban areas who had to filter water or get it bottled anyway, and who might be able and willing to pay more for it than his poor rural customers could. Hence, market segmentation between urban and rural customers, whereby the rural markets could be subsidized by the urban markets, presented an obvious solution that did not require loans from financial institutions. Hence, cross-market subsidies from profits in the urban areas passed to the rural areas became the second crucial solution to the scalability challenge.

The most important aspect of scalability was to avoid – by all means possible – having to hire a growing number of sales representatives which would have been unsustainable. The key insight in solving the problem came from the realization while visiting the communities that there were key individuals – community leaders – who had the power to influence people due to their standing in the community. Henceforth, they developed an incentive program for the community leaders where they could earn a small portion of the payments from the sales of filters. Through this scheme, each field representative can multiply his/her efforts by collaborating with the community leaders. In summary, the community became directly involved in a solution through small monetary incentives, therefore expanding operational capacity for Ecofiltro without introducing high fixed costs for the organization.

Figure 3. Ecofiltro

Mindset Shift

Business model innovation was coupled with a broad mindset shift towards seeing the poor as customers with special needs instead of charity cases. Nonetheless, the low purchase capacity of poor families in developing countries such as Guatemala would still require some innovative thinking in terms of making the filter affordable. Initially, Ecofiltro had provided poorer customers with the opportunity to pay off the filter in a large number of small installments over a longer period of time. However, after interacting with and getting feedback from the communities, they decided to

shift from longer-term small installments to shorter-term higher installments, a rather counterintuitive move which is explained in more detail below.

Philip realized soon enough that since this was an entirely a new approach, traditional managerial methods based on predictability and control had to be adjusted to 'learning by doing'. This means that Ecofiltro had to involve their customers in solving their own problems and adjusting strategy accordingly. He often uses the analogy of how people frequently used to take 25-30-year-long mortgages. Considering 'how poor' his customers were, the most logical initial decision was to provide as many payments as possible to make it easier for them to have clean water. He was wrong. Philip, who works intensively with his customers in the countryside, started being approached by them asking for fewer installments. "We feel that we are going to be in debt with you forever, can we do something to get rid of this debt quicker?" they exclaimed while referring to the 20-24 installments schemes that were offered to them (Wilson, 2015b).

Philip took this on board. However, he was not sure what the right number of installments would be and wanted to investigate this issue further. In this regard, several groups of students from Stanford University's Extreme Affordability Program and the local students conducted research in the communities on the preferred number and amount of payments. Based on the results, Philip decided to set up a flexible five-installment payment system or an upfront one of roughly $33.

Making this adjustment did not pose a big challenge to him since Ecofiltro is used to make mistakes. In a sense, part of their philosophy is that in order to learn "you have to fail a lot and quickly" (Wilson, 2015b:6). He was surprised, however, by the fact that the preferences of the poor in rural areas contradicted the economic logic of long-term payment schemes[1], which are pervasive in developed countries. This insight had important consequences for other players in the field, given that most NGOs who used to give away free filters now also charge a small amount for them. This implies that

[1] This is a significant finding because microfinance proponents such as Mair et al. (2011) and Yunus and Jolis (1998) argue that microcredits improve the living standard of the poor. However, Chowdhury and Willmott (2018) contradict this argument. The Ecofiltro case indicates that Chowdhury and Willmott (2018) hold a more accurate view: The poor do not desire long-term debt because such debt can lock them into a debt-trap, disempower them and, eventually, decrease their overall living standard (see also Karim, 2011).

Philip's shift in mindset enabled NGOs to shift their mindset as well and see the poor as customers.

Nevertheless, another challenge in the adoption of the filter resulted from more subtle and cultural barriers such as the look of the filter. Initially, Philip had thought that the ceramic filter would be easily accepted given that it solved an acute health issue. However, with amusement, he shares how the first 100 families the organization tried to help were reluctant to drink from a flower pot-like filter, but when they did it the water tasted so good that they embraced this piece of technology. Another subtle and cultural barrier was the manner in which child mortality was seen in the rural areas. The majority of villagers believed that such mortalities are inevitable. For instance, "Out of my eight children only five made it" is a statement that illustrates this. Philip realized that, in order for the filter to be accepted, a mindset shift needed to happen in the rural communities so that child mortality would no longer be seen as something inevitable. Therefore, it was important to raise awareness of the importance of clean water. Accordingly, the student team's research findings suggested that more vivid and graphic representations of contaminated water (rather than traditional presentation) would be more effective so that people understand the severity of the problem. For instance, graphic posters and educational videos depicting bacteria were deployed. Also, some people had a chance to observe bacteria through disposable $0.25 microscopes. Hence, Philip increased the adoption of the filter not only by adjusting the payment system, but also by providing a product that was culturally sensitive and contained simple health information.

Community-Based Entrepreneurship and the Commercialization Process

The first five years of selling the filter (i.e., from 2000 to 2005), as opposed to giving it away for free, revealed something very important. It turned out that a uniform approach across poverty-stricken rural areas was unlikely to work given the wealth disparities even among those who were classified as poor (i.e., living on an income of under $2 per day; see World Bank, 2016). As a result, Ecofiltro segmented the poor rural markets into three levels. Some people were poor but could still pay the whole value of the filter upfront (level 1: poor), others needed a payment plan (level 2: +poor), and others were not able to afford it even with a payment plan (level 3: ++poor). Hence, the latter would still have to be given the filter for free. In contrast, urban customers subsidizing rural families' filters earned $1,000 or more per month.

Sustainability is key and twofold in Ecofiltro's case. First, sustainability means that for its survival Ecofiltro has to be successful. Second, it must provide an effective long-term solution to the water problem for its customers. For example, the filtering unit has to be changed after two years because colloidal silver's performance decays and porosity decreases, thus diminishing the filtering capacity over time. This means that if people do not renew the filtering unit, they cannot have clean water.

Consequently, the segmentation of Ecofiltro's target markets has been the result of a strategy developed to ensure sustainability. Each segment is targeted through different channels. Poor users can buy the filter in hardware stores, +poor need a payment plan based on installments, and ++poor people require donations. The urban markets support all the rural ones by subsidizing their operation and credit system. Profits generated by higher margin products (Figure 4) enable this. This constitutes a new form of workplace innovation from the financial viewpoint: Wealthier urban people subsidizing poorer rural people.

Moreover, urban markets have also opened the opportunity to engage poor families in product and workplace innovation by opening creative spaces for people outside the organization to paint their own filters. In some cases, parents and children have been invited to the factory to customize their products by painting filters together. Through these workplace innovations artists have new sources of income and poor users get personalized stylish products.

Other communities such as graffiti artists (Figure 5) have been involved in similar workplace and product innovation processes which simultaneously increase the product's acceptance and create a social value.

For instance, collaborations between Ecofiltro and graffiti artists opened up opportunities for these artists to generate income; this is particularly valuable in a country such as Guatemala where it is difficult to make a living out of artistic and creative work. There have been successful events where these artists gather and paint filters which were then sold to high-end customers for a premium price. Part of the profits goes to the artists and the rest is used to finance the rural operations. The most interesting aspect is that urban customers are willing to pay a premium for a functional piece of art, which also makes them feel good about themselves knowing that they can support both artists and families in need of clean water.

Ecofiltro remains focused on their main objective despite the attractiveness of other potential markets. For example, some businesses such as hotels have asked Ecofiltro to make smaller versions of the filter for their guest rooms, in order to replace bottled water (Figure 6). Although Ecofiltro fulfilled a few of these special requests, for the time being, they are not planning to cater to this market. The main reason for not doing so is that it would require them to change the production process to be able to produce smaller filters alongside the ones they are already producing, and they feel this would distract them from their main objective. Other markets such as online auctions and sales have also been explored but are still in development given that the rural operations consume most of their resources.

Figure 4. Urban Areas Ecofiltro

Figure 5. Ecofiltros painted by Guatemalan graffiti artists

Figure 6. Ecofiltro for hotel guest rooms

In the rural markets, particularly when it comes to the +poor and ++poor, the successful commercialization of the filter required the involvement of the larger community. These two segments suffer from multiple challenges such as low income, lack of education, and a lack of sanitary infrastructure. In this respect, Ecofiltro field representatives (i.e., full-time employees of the firm) were in charge of identifying community leaders who in turn would gather the whole community for a session on health and the dangers of contaminated water. During such a session, a filter is presented as a solution and people can sign up for an installment payment program. In order to make the payment collection easier community leaders (who are considered entrepreneurs by Ecofiltro) earn a percentage of what they collect. This workplace innovation has increased Ecofiltro's operational effectiveness while keeping their operating infrastructure relatively small. They currently have 10 field representatives and approximately 350 community leaders with whom they work collectively.

Regarding the ++poor segment, Ecofiltro has concluded that, considering the extreme poverty they live in, there is no other approach to solve this problem than the usual give-away of a product. However, nowadays, most organizations charge at least a minimum in order to increase the adoption because this makes families appreciate the filter and increases the likelihood that they will use it appropriately.

A final challenge to overcome concerned the logistics of delivering the filter to rural areas. Given the lack of infrastructure such as roads, in most parts of the country where contaminated water is a problem, it was crucial to establish an effective delivery system. There are many communities that cannot be reached with heavy lorries; therefore, other means such as motorcycles and pick-ups need to be used locally. This is another reason why integrating the communities to find solutions to problems proved to be important.

Inclusion of Schools

One problem Ecofiltro faced was that, oftentimes, only about 50% of the people invited to the health talks showed up; however, a change made in 2015 increased attendance to nearly 100%. This change consisted of engagement with local schools. Ecofiltro made a strategic move which became an effective workplace innovation: Since 2015 they have been providing free filters to public schools (see Figure 2) under

the condition that a school must organize mandatory health talks requesting parents to attend. In some cases, food and beverage firms sponsor filter deliveries in schools as part of their corporate social responsibility (CSR) initiatives. They see this as an opportunity to help and improve their image in rural communities. Given that the school initiative has started to yield positive results, Ecofiltro has decided to shift its strategy and fully integrate it into its sales process. This means that rather than the community leader herself organizing the meeting, she is in charge of contacting schools to collaborate.

Discussion and the Path Ahead

There are several things which are noticeable about Ecofiltro. First, from a business perspective, they have achieved economic success by becoming profitable, therefore sustainable. However, the growth rate of filter delivery is also important. They have grown from delivering a few hundred filters per month as a nonprofit to delivering 50,125 filters in 2014, a number which grew to approximately 64,100 in 2015.

Second, although it is difficult to objectively measure emotional attachment, the empathy and commitment of Ecofiltro´s employees are crucial for its success. Ecofiltro's field representatives do not hesitate to work at the weekends and during holidays because they are fully committed to the organization's mission. Such commitment occurs because some of the employees know from their experience how severe the negative consequences of drinking contaminated water are. For example, some employees have experienced tragedies of losing several family members due to drinking contaminated water. One of them shared a tragedy she witnessed in her hometown; i.e., her village people found out that more than 20 children had died as a result of having drunk contaminated water. This type of experience encourages one of Ecofiltro's marketing managers to run 113 kilometers from Antigua to Lake Atitlan to raise funds to buy filters for schools (see http://www.quepasa.gt/we-ran-for-water-we-ran-for-the-children/). This clearly reflects how Ecofiltro's employees go beyond what is expected from them in their job descriptions.

Third, Ecofiltro garners more and more support from NGOs, renowned universities such as Stanford, MIT and Harvard, entrepreneurs, and multinational as well as local corporations which support their cause. The next big challenge in the region is an expansion into México with a group of young and enthusiastic entrepreneurs.

Conclusion

Ecofiltro is a great example of how a CBE can bring about workplace innovation that mobilizes poor communities to be aware of their wellbeing in a sustainable manner. While the organization solves local problems, it addresses wider issues too. For example, Ecofiltro's product innovation and business model shows that moral values are important for sustainability. The organization was able to make a profit while serving the local people which shows that helping others is the best way to sustain a business (Grant, 2013).

One of the most powerful lessons from this case study is how a firm can share intellectual property and at the same time maintain a model which involves a wide network of stakeholders working towards a common goal and commitment so that empathy and collaboration with communities are transformed into a societal impact.

The Ecofiltro case shows that when a business empowers local communities it encourages workplace innovations. Employees feel motivated to make small changes that can drive a decent profit margin. In other words, to make CBE work, an organization needs well-thought-out workplace design so that primary members of an organization continuously work hard for the business and communities. In a way, it reinforces the moral compassion that keeps an organization focused on solving social problems sustainably. Without integrating moral values within a business model, a social change is difficult to achieve; however, if more businesses adopt CBE, this can help poorer societies and ultimately reduce social ills.

To conclude, this approach can work in other parts of the developing world such as Bangladesh, where NGOs tend to operate using mainstream mechanisms such as microcredits. CBE can empower the poor by providing them with the necessary business ideas and tools. This type of approach can enable the poor to become self-sufficient. More importantly, it can make them feel valued and dignified members of a society and provide them a real opportunity to live a healthy life.

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