

El Agua Es Oro: A Human Centered Solution for the City of Cochabamba, Bolivia

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ABSTRACT

The purpose of El Agua Es Oro (The Water is Gold) is to satisfy social needs, specifically for women living in peri-urban areas, with a more advanced efficiency. El Agua Es Oro creates an added value for people's well-being by maximizing socio-environmental context and not just focusing on for-profit economics. Nevertheless, it is noteworthy to generate economic resources to sustain the impact that the organization seeks to achieve. El Agua Es Oro is a social enterprise based on the application of social innovation with the methodology and tools of a people-centered design, focusing on teenage girls and women. The foundations of the project and the pre-conceived idea were born from the informal field work that was carried out with a small community in Cochabamba, Bolivia, based on the women's needs to access greater hygiene and sanitation. The core of the social project showed the difficulties faced in the area, from socio-environmental problems, going through the lack of access to water, to the lack of public initiatives from the State and non-profit organizations for the community. To ensure the sustainability of the planned intervention, this project plan has been carried out as informal fieldwork and research for more than a year. The project is divided into segments that identify the analysis of the macro environment, implement the strategic marketing, determine the resources needed, design the operations, and finally analyze the assessment of viability.

1 INTRODUCTION

Clean water is a human right that must be available as a basic condition for human development. This is recognized all around the world. There have been global movements to find solutions to the lack of water access in communities, such as the construction of wells and dams as well as home distribution networks and sewage systems. There is very little innovation through these system implementations that fosters

social welfare. In the case of Cochabamba, Bolivia, the problem stands in its execution. Despite the decision made by the Government to privatize the 'Servicio Municipal De Agua Potable y Alcantarillado' (SEMAPA – Municipal Service of Potable Water and Sewage), the city experienced one of the most iconic water wars in the century. The privatization resulted in a precedent for water ownership with the expulsion of a foreign private water company, and a decade later promoting water as a human right until establishment by the United Nations (UN) in 2010.

The main setbacks for the city's water supply have been a combination of root problems ranging from drastic weather changes impacting the water availability at a country level, to a lack of investment and proper infrastructure to secure water for a rapidly growing city. Despite the people's efforts, there are areas in Cochabamba that struggle to get access to clean water, especially in peri-urban areas on the city's outskirts. There are also cases where people buy water from water-tank trucks at a higher cost due in part to an environmental problem that is being reinforced by climate change, even though Cochabamba is known to have been a dry city for over 50 years. In addition to this, the political and economic climate has never contributed to improving any conditions that would greatly benefit society.

'El Agua Es Oro – Lavanderias Moviles' (EAEO – Water is Gold Mobile Laundries) was founded as a project that permits adequate development for the most vulnerable population in the city, improving the conditions of cloth washing and avoiding the current environmental impact generated by hand washing in the river or streams around the city. Women typically get their water from cisterns. Unfortunately, there are a number of issues for them when using this system. First, there is a lack of coordination between the cisterns and the distant communities. This leads to an unreliable option to access water as some days the cistern car might not pass through their neighborhoods. This leads to the second point, which is the time lost waiting for the water to arrive week after week. Lastly, there is zero regulation on the quality of the water that these women get, leading to other health problems. The same is the case with the prices, as these tend to fluctuate constantly, especially during periods of drought. The challenge is to make a sustainable organization over time and expand the awareness related to water consumption.

2 PROBLEM TO BE RESOLVED

2.1 Environmental Cause

2.1.1. Climate Change

The lack of access to water in the southern suburban area of Cochabamba is attributed in part to a fundamental and deeper cause, which is the environmental factor. Bolivia has been classified by the United Nations as a country highly vulnerable to climate change, as confirmed by research carried out in 2013 by the UNDP and stated by organizations such as the Oxford Committee for Famine Relief (OXFAM). In 2016, the former President Evo Morales declared the nation in an emergency due to drought and water deficit in different regions of the country caused by adverse weather events (Montero, 2016). This drought was the worst in 25 years in the history of Bolivia (Amurrio Montes, 2016). The impact in the area of the valleys, where Cochabamba is located, reports that the precipitations are lower every year and the temperature is increasing. This report goes hand in hand with the statement by Dirk Hoffmann, a scientist specialized on climate change in Bolivia, who confirmed that the rainy season will

start later and will last less. Another expert in natural resources from the Bolivian Documentation and Information Center (CEBID), also attributed the severe crisis to climatic factors (Miranda, 2016). However, both Hoffmann and Campanini attribute the 2016 crisis to other causes and factors that shed light on the complexity of the problem.

2.1.2. Contaminated Water Bodies

The southern zone in Cochabamba does not have natural water sources for its use. In a diagnosis on the level of contamination of aquifers in the southern zone of District 9, the sources of contamination are identified: the on-site sanitation systems, the sewage treatment lagoons of Alba Rancho, the agricultural activity in the zone, and the K'ara K'ara Dump (Ghielim, Luján, Mondaca, 2008). The chemical analysis of the water quality of 17 wells in the area showed that the primary problem of water contamination is the high level of salinity (presumed to be natural) and the presence of ammoniacal nitrogen (presumed to be anthropogenic) (Ghielim, Lujan, Mondaca, 2008). Therefore, these factors also affect San Joaquín, which is delimited by the Tamborada River and the neighbors of District 9. The study also confirmed that the levels exceed up to 30 times the Bolivian Drinking Water Regulations due to high ammoniacal nitrogen concentrations (Ghielim, Lujan, Mondaca, 2008).

2.2 Socio-economic Condition

Not having access to water due to poor economic resources and belonging to a migrant population from rural areas to urban areas undoubtedly raises the question of social justice. Unfortunately, access to water and sanitation becomes an indicator of inequality in which the most vulnerable communities are adversely affected in their own human development. Therefore, the poverty level of households in peri-urban areas cannot be ignored and is one of the reasons in which the inhabitants are marginalized and left without basic services. The effects are reflected in health and productivity, whether educational or occupational.

2.2.1. Effect on Health

Health is directly affected by cooking or washing vegetables in unsafe water /or drinking unsafe water. However, it was identified through fieldwork that the residents were aware of this, and in the vast majority of cases, they boiled the water to kill bacteria, or those with a slightly higher purchasing power bought bottles of drinking water, paying approximately \$1.87 for 20 liters. Similarly, the effect on health is impacted by the low level of sanitation and hygiene that the population has. In this case, the contact with viruses or bacteria increases, exposing people to diseases (Bembibre, 2011). In addition, negative exposure risk for women and girls' health is greater, as they must have access to clean sanitation facilities and material resources, such as clean underwear and sanitation pads, so that they can manage menstruation with dignity and safety.

2.2.2. Effect on Productivity

Due to socioeconomic status, the lack of access to water affects labor and educational productivity. Gender is a factor

related to access to water; women and girls around the world spend 200 million hours each day carrying water (González C, 2018). Despite not having quantified data for Bolivia and the population of San Joaquín, women and girls are in charge of supplying water to their families. The time they dedicate to this task takes away girls from schoolwork or extracurricular activities and from women who could be trained to do a compensated job.

3 ABOUT 'EL AGUA ES ORO'

3.1 Project Description

El Agua Es Oro is a social enterprise that offers a user-centric service, mobile laundries, seeking to address the lack of access to water and sanitation. The goal is to create resilience in women and improve their living conditions, providing development opportunities for people living in the peri-urban area of Cochabamba. The valued proposition for the vulnerable women users, in San Joaquín, a peri-urban community in Cochabamba, is to reduce the time spent and physical burden women bear doing laundry. Meanwhile, women can spend the time saved on training and workshops for human development.

The business model consists of a simple formula: a mobile laundry van installed in public areas as a “pop-up” laundry service (Figure 1). The van will be equipped with time-efficient washing machines that will convert hours of waiting for the laundry to wash into time for women to do the workshops. The impact is not only the visible benefit of saving water in washing, but also the proposal to create courses aligned to the capacities of the women and the most vulnerable population. The concept is based on the collaborative economy, where a traditional model of the establishment of shared laundries (where women get together to wash clothes in rivers or streams), is restructured to a dynamic and more flexible model



Figure 1: A mobile (“pop-up”) laundry and water recycling service in Australia example (El Agua Es Oro, 2019)

The collaborative economy model is a global trend that redefines society’s consumption patterns by creating a market for the temporary use of goods or services (Argentine Chamber of Commerce and Services, 2017). Part of the concept is based on individuals owning a large number of products that they use for a short period and that in the remaining time,

they could be used by other people who need them (Argentine Chamber of Commerce and Services, 2017). Similarly, the service offered by El Agua Es Oro uses washing machines for a short period that frees up their schedule, which can be used for other chores or activities.

El Agua Es Oro promotes collaborative consumption by removing this barrier for users, taking advantage of new technologies (Bara, 2017). In this way, the business model makes technology accessible that is otherwise unavailable to low-income families and allows recycling water from washing machines. Under this model, the organization fulfills the need of society to generate an economy that is more environmentally friendly and offers lower prices to goods and services (Bara, 2017).

3.2 Value of the Idea

This idea creates time and increases the productivity of women and teenagers, but it can also be used to invest the extra time in growth development and workshops to improve their working conditions. The housewives dedicate their productive time mostly to household chores and leisure within this time. Similarly, teenage girls must also complete certain school and household chores in order to participate in leisure activities. The household water use for one week equates to approximately 15 hours spent just on handwashing clothes. Of the 60% that goes to personal hygiene usage, 30% goes to washing clothes (Figure 2). As a result, 120 liters of clean water per week is turned into gray water discharge that goes into the subsoil, which contributes to the contamination of water bodies by the filtration of gray water, that is, water with detergent chemicals



Figure 2: Water tank breakage used in water household use (El Agua Es Oro, 2019)

3.3 Mobile Laundry Service

The most vulnerable families in San Joaquín typically buy water from water tank trucks and store it in the 200-liter barrels. San Joaquín is located in the southernmost part of the city and there is no water in this area due to a project that was started 30 years ago, the Misicuni Mega Water Supply, that is still today being developed. Similarly, there is a lack of infrastructure to connect to the network since the area grew in a disorderly and unplanned way throughout the year. To

get their water, the residents pay an average of \$1 (equivalent to Bs. 7 Bolivian pesos), which implies a more expensive cost due to the low volume compared to purchases in larger quantities, such as 900 and 10,000 liters. This means the economically disadvantaged families pay 64% more per liter when buying from a truck. Because of their prominent role in domestic tasks and a conservative idiosyncrasy between gender roles, women have less professional development to occupy jobs.

An example that shows how handwashing clothes has health repercussions for women is the Giradora Project, a concept originated by Alex Cabunoc and Ji A You, students from Designmatters (Cabunoc, 2014). The field study was carried out in the slums of Lima, Peru, where women also face a domestic load of doing laundry; tests and observations were carried out in Cerro Verde, with approximately 30,000 inhabitants. This project highlighted certain ‘hidden’ health impacts of laundry, such as wrist tenosynovitis due to the force required to wring out clothes, chronic lower back pain from squatting over buckets, hand pain, and epidermis damage with cracked skin from immersing hands in cold water for long periods, as well as asthma and respiratory problems related to mold growth on clothes due to long drying times (Cabunoc, 2014) (Figure 3).

The Hidden Problems of Hand-Washing



Figure 3: Giradora Project (Cabunoc, 2013)

3.4 Training Service: Building Resilience and Supporting Human Development

The needs identified by the lack of water for washing clothes that affect women of San Joaquín are the impact on health, the level of sanitation, and time it takes away from productive or leisure activities. To address this, El Agua Es Oro proposes a training service in creating resilience and support for human development. The project seeks to convert waiting time in the laundry service into productivity time by developing a water, sanitation and hygiene (WASH) program with professionals and facilitators in this area. Through this, it responds to women themselves, especially housewives, to get involved in activities that improve their quality of life.

Converting the wait time spent in front of the laundry truck into workshops for women is the basis of the design of the service with programs that reduce the impact on health, and improve the sanitation and education awareness of these women. Wait time is currently a task that is not financially compensated and takes more time than the typical home task of washing clothes. Tools will be provided for the empowerment of the participants that will help them alleviate the adverse effects they face.

3.5 Market Interest

According to the United Nations Development Program (UNDP), upgraded water facilities reduce time household burden and improve women’s health, giving them more time for productive work, educational training, and leisure activities. Human development creates an environment in which people can develop their full potential and lead a productive and creative life according to their needs and interests (UNDP, 2013). The most essential capacities for human development are to enjoy a long and healthy life, to be educated, to have access to the necessary resources to achieve a decent standard of living and to be able to participate in community life. Without these capabilities, the range of available options is severely limited, and many opportunities in life remain inaccessible (UNDP, 2013).

El Agua Es Oro offers a program that intervenes in these variables from an approach with the beneficiary or final user. In addition, by seeking to improve the health of poor households by washing clothes and avoiding the current environmental impact generated by dumping untreated gray water into the subsoil, the goal is for the end-user to benefit from training and recreation that will help to strengthen the sense of community integration. These trainings use a human-centered design to understand how El Agua Es Oro can obtain information from the community. Since it is a peri-urban community, there is a lack of data. Several surveys were done to get more information on their needs, but the participants did not recall or quantify their answers (such as knowing how many liters of water they consumed). So, the organization decided to play games to obtain information in a way that is easier for them to understand. For example, one game focused on having strings with different colors to identify long, medium and short distances, and asked the participants to choose the

color according to their perception of distance travelled to schools, health posts or markets. Another example, was using buckets and rocks, in which one rock represented a bucket of water, and try to quantify in this way the water usage for different activities.

Going forward, and taking these data, El Agua Es Oro plans to partner with other NGOs or social ventures to train women specifically in health and sanitation topics, as well as vocational skills. This way, the enterprise aims to be part of a world vision of the Sustainable Development Goals (SDG) defined by the United Nations in 2015. More specifically, the project will contribute to three goals in order of relevance: SDG 6, guarantees the availability and sustainable management of water and sanitation for all that has been planned to contribute to the progress of other SDGs, mainly in health, education, economic growth and the environment; SDG 5, to achieve gender equality and empower all women and girls; and SDG 11, make cities and human settlements inclusive, safe, resilient and sustainable (United Nations, 2015).

Table 1: Alignment of the El Agua Es Oro Project with the Development Objectives (United Nations Water, 2015)

DEVELOPMENT OBJECTIVE	GOAL AND DESCRIPTION
6 CLEAN WATER AND SANITATION 	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all
	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
	6.b Support and strengthen the participation of local communities in improving water and sanitation management
5 GENDER EQUALITY 	5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate
	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life
11 SUSTAINABLE CITIES AND COMMUNITIES 	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

4 VALUE PROPOSITION

So how do we efficiently improve access to water for the domestic task of washing clothes by hand, carried out by women?

4.1 Client Segment

There are two profiles and characteristics of our user or beneficiary:

Table 2: Profile of the User Segments, Beneficiaries of El Agua Es Oro (El Agua Es Oro, 2019)

PROFILE 1: WOMAN	PROFILE 2: YOUNG TEENAGER
Age: 20 to 50 years	Age: 11 to 19 years old
Occupation: Housewife	Occupation: Student
Secondary Activity: Sale of occasional food or fabrics	Secondary Activity: providing help around the house with cleaning or taking care of siblings and cousins.
Education Level: Primary School or none	Education level: primary or secondary
Income Level: Low	Income Level: n/a
Economic Autonomy: Dependent on her husband's income or resources from family and friends. In some cases, they have passive income from their secondary activity.	Economic Autonomy: dependent on their parents or on money given by relatives (aunts, grandmothers, etc.)

The value proposition is to lessen the challenges faced by the central problem of lack of water in washing clothes by hand. In this way, El Agua Es Oro proposes first, freeing 25% of the water used in washing clothes by hand to be used more efficiently for cooking or personal hygiene. Second, improving well-being and health by eliminating the physical requirement of squatting and bending the back, washing in cold water for long periods of time, and replacing the time dedicated to washing clothes to training and workshops that generate an intangible value.

4.2 Service Model

4.2.1 The Laundry Service

The laundry washing service consists of a dynamic model that takes washing machines in an equipped truck to a specific public point in the neighborhood to facilitate and lighten the burden that users have of washing clothes by hand. The objective is that El Agua Es Oro brings water from the city's northern zone, adds the value to access machine technology, and reduces the time and physical effort that users have. This service is led by a coordinator and has the support of volunteers to set up the post and start the machines, then deliver the clean clothing product. To satisfy the price-sensitive customer criteria, the cost of the service is competitive with the real cost that users have of washing their clothes by hand.

4.2.2 The Training and Workshops Service

The training and workshop service will be executed in addition to the washing service. This will be designed by a training facilitator that will support the personal development of users. Programs will also be carried out to create resilience to deal with the difficulties that users have due to lack of access to a regular and constant water service. The topics of the workshops and training will include talks and access to resources to maintain a better level of health such as personal hygiene and menstruation. The workshops will be given with the support of trained and certified volunteers to ensure the skills and techniques are conveyed.

5 LESSONS LEARNED AND FUTURE VISION

Social innovation requires an ecosystem of backing and support to be developed and executed. The actors or stakeholders involved must maintain a high level of interest and influence and, at the same time, ensure that the stages of communication channels between institutions that are not compatible, are shortened. When it comes to social and environmental problems of a global magnitude, it is necessary to have the skills of a social entrepreneur, especially the initiative, to find ways to intervene in the problem. The water crisis is felt by the whole world and the context in which it develops gives the guidelines to generate ideas and solutions.

When an enterprise is established under the collaborative economy model, it is necessary to scale the number of users to spread the fixed costs since the variable marginal cost is close to zero. Although this requires a higher investment, a significantly higher profit margin is generated once the break-even point is reached. A 'minimum viable product' or a mimicry service was created to carry out a pilot test and validate the value proposition in the market. Carrying out surveys and interviews is not enough to validate a solution due to the discrepancy between what users say and how they behave so observation is an important part of the project to get the authentic data.

6 CONCLUSIONS

A different approach to solutions that have focused on a structural point of view is needed to respond to a problem of the magnitude of the global water crisis. The importance of accessing water is the positive impact that this has on health and human development, especially for women. The crisis and the challenge is for all sectors, from the State to private market. Despite being a recurring problem in Cochabamba, with the weight of a social and political burden felt by the population, reassuring solutions must complement the efforts already made.

The entrepreneurial vision of El Agua Es Oro is to revalue water, recognizing the role that this has for the development

and improvement of the quality of life of people who live in marginalized areas and are trapped in segments of urban sprawl. By facilitating access to water through a user-centric service, the aim is to improve people's living conditions and development opportunities, especially for women.

By 2030, El Agua Es Oro would like to impact 1000 women with 1000 loads, recycling almost 28,000 liters of grey water. The vision is to establish as a social business with a laundry service; with mobile and physical spaces. The goal is to have women leaders in the neighborhoods to own the physical spaces, create job opportunities and increase the organization's reach at a national level.

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Natalia pursued a degree in Business and Enterprise Management with a Marketing Concentration and a minor in Environmental Studies at Wake Forest University. Natalia is currently pursuing a master's degree in Environmental Studies at the University of Pennsylvania. She enjoys being busy

and getting involved in as many learning experiences as possible. Because of her passion for sustainability and community development, she gets inspired by ideas to create new ways of finding solutions, or helping others to attain various goals through entrepreneurial stamina and a constant reordering of personal and professional priorities.



Camila was born and raised in Cochabamba Bolivia. She was in first grade when Bolivia encountered its first Water War (2000) and in high school when she first came to know the water issues Champa Rancho faced. She graduated from the University of Texas at Austin with a Bachelor in Economics and

Bridging Disciplines Certificate in Social Entrepreneurship and Nonprofits. She holds a Masters degree in Social Innovation from Universidad de Salamanca and a MSc in Sustainability and Business Strategy from HEC Paris. She is curious about business models that tackle development issues. She is also passionate about volunteering as she believes it is a way of discovering one's talent and interests while contributing to different causes that seek to have a positive impact.