Changemaker Innovation Challenge : Report

Title: **Water Crisis in Madagascar**

Topic: **Improving Clean Water and Sanitation Facilities**

Special Topic Ezra Stream (Yes/No): No

Final Team Composition

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Problem Landscape

The issue we are looking to address is the lack of clean water and sanitation facilities in Madagascar, specifically in the rural areas. Madagascar is the fourth largest island in the world with a population of over 25 million people and is located close to the east coast of Africa in the Indian Ocean. This island generally has a warm and subtropical climate and is dry and humid in most parts of the year. Water resources however have been unevenly distributed around the country which makes its water resources less accessible for Malagasy people. 88 percent of people in Madagascar lack access to clean water and sanitation leading to the deaths of over 2,100 children each year from diarrhoea (Waller, 2017). A report by WaterAid reveals the extent of the problem globally, with half of all cases of under-nutrition estimated to be associated with repeated diarrhea, intestinal worms and other infections as a direct result of poor sanitation and dirty water (Ghouri, 2016). Meanwhile, less than 15% of approx. 16 million people living in rural areas have access to clean water and sanitation. 70% of the rural population use surface and well water without properly filtering or desalinating (See Exhibit 3). Thereby, the water they use are highly contaminated with bacteria and viruses that causes many diseases.

The two main reasons for water scarcity in Madagascar its political and economic instability. On one hand, Madagascar's government was not set up until recently, therefore for a long time, they did not have proper initiatives which regulates the allocation of their water resources efficiently. On the other hand, majority of the people in Madagascar are suffering from poverty and it is identified as one of the poorest countries in the world with poor infrastructure facilities and lack of proper education. We are looking to understand the lack of clean water and sanitation facilities through which we plan improve their quality of life while attracting more tourists and boosting the economic growth of this beautiful island.

Solutions Landscape

Many non-profit organizations around the world have made attempts to support Madagascar with its prevailing water crisis. Here are some examples.

- WaterAid is an NGO that has worked extensively in Madagascar and with local officials to bring clean water to citizens (WaterAid UK)
- USAID has administered significant foreign aid in trying to improve Madagascar's water crisis by educating communities on sanitation, improving local governance of water resources & more (USAID, 2015)
- World Health Organization is collaborating with the government to develop the National WASH Program in Madagascar (World Health Organization, 2014)
- UNICEF helped to build water pipelines in Southern Madagascar, in areas which have had poorer access to water
- Government Initiatives; recently pledged a €12 million investment in drinking water supply initiatives in the country. Reports show that most initiatives are led by NGO's and not the government. (Feukeng 2019)

These organizations have taken several measures to address this issue such as donating mineral water bottles, educating communities on how to use safe water and maintain proper waste disposal and sanitation measures, rehabilitating existing or installing new protected water points and promoting the construction and use of family latrines etc. All of those measures have been successful but only to a certain degree. Lack of funding seems to be a huge barrier that slows down the process of these initiatives. As lack of clean water and sanitation facilities is a problem faced by the majority of the Malagasy population, it is practically impossible to initiate high-cost approaches throughout the country which requires a huge amount of funding.

Gaps

The government of Madagascar, due to the prevailing situation in the country, had failed to contribute the required level to resolve this problem. For an economically struggling country like Madagascar, monetary support should be provided from outside parties in order to face this crisis head-on. Even though, non-profit organizations are trying to help provide clean water such to Malagasy people, the results are mostly temporary or does not meet the expectations entirely. For example, organisations like WaterAid UK and UNICEF have fundraised to build tap lines in some areas of Madagascar, however, these could not be installed in rural areas of the country with poor infrastructure facilities. Most of these initiatives are solely focused on the water crisis and thereby does not help to improve sanitation facilities and proper disposal of human waste. The problem of insufficient funds to promote and implement these programs is the main reason why this issue still persists in this country in a very significant level.

Our Solution

After all the research we've done, we believe the most ideal solution to this problem is to implement a program that could help us to collect and purify water while also providing a solution to the sanitation facility issue. It is important for a developing country like Madagascar to preserve their environment sustainably, especially being an island that is isolated from the rest of the continent. Hence, we have chosen Warka Water Organization and we plan to build Warka Towers in collaboration with them, mostly targeting the rural parts of Madagascar since they are the ones who are desperately in need of clean water and proper sanitation facilities. Warka Towers are inexpensive compared to other solutions, costing only about $1000 per tower, and lasting up to 10 years (Warka Water, 2019). Warka Tower is a structure that uses natural resources such as bamboo, hemp and bioplastic. It is designed to harvest potable water from the air (rain, fog, dew) and forms droplets of water that fall into a container at the bottom of the

tower (See Exhibit 1). It takes two hours to set up and 40 to 80 litres of clean drinking water every day. Other than providing clean water, it also solves the issue of sanitation. This is from the Warka Sanitation tower that is also a product of this organization which composts toilet waste. Compost, then can used for farming activities by low income families in these areas (See Exhibit 2).

Madagascar is a world-famous country because of its unique wildlife, but less known as a country in which majority of the population live under poverty line, having high child mortality rates and have very low access to clean water sanitation. We believe that our solution is capable of reaching a helping hand to a large number of the affected population in rural areas of Madagascar. Our solution initially focuses on the rural population leaving room for existing NGO's and the government to continue their projects in urban areas. We plan to conduct all the fund raising and promotional campaigns for this project while the Warka Water company implements their water and sanitation towers in targeted our areas. Initially, 30 rural villages have been targeted to build Warka towers and depending on how successful they become, we plan to build more towers in other areas.

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Exhibits

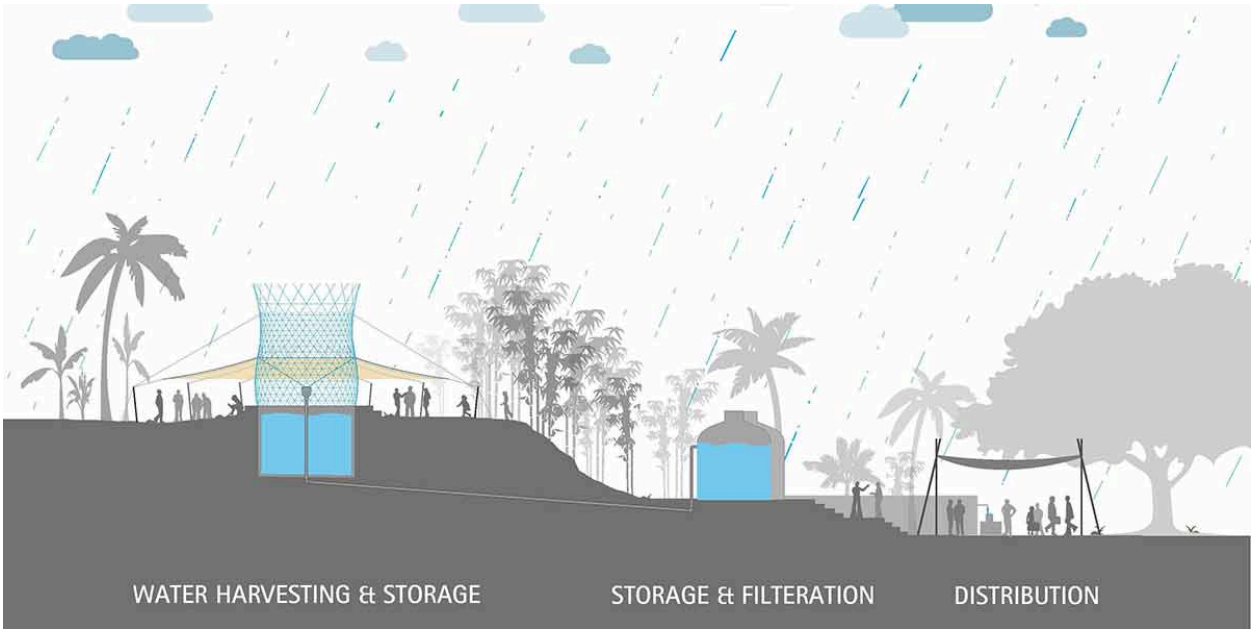

Exhibit 1: How Warka Tower Works (Warka Water, 2019)

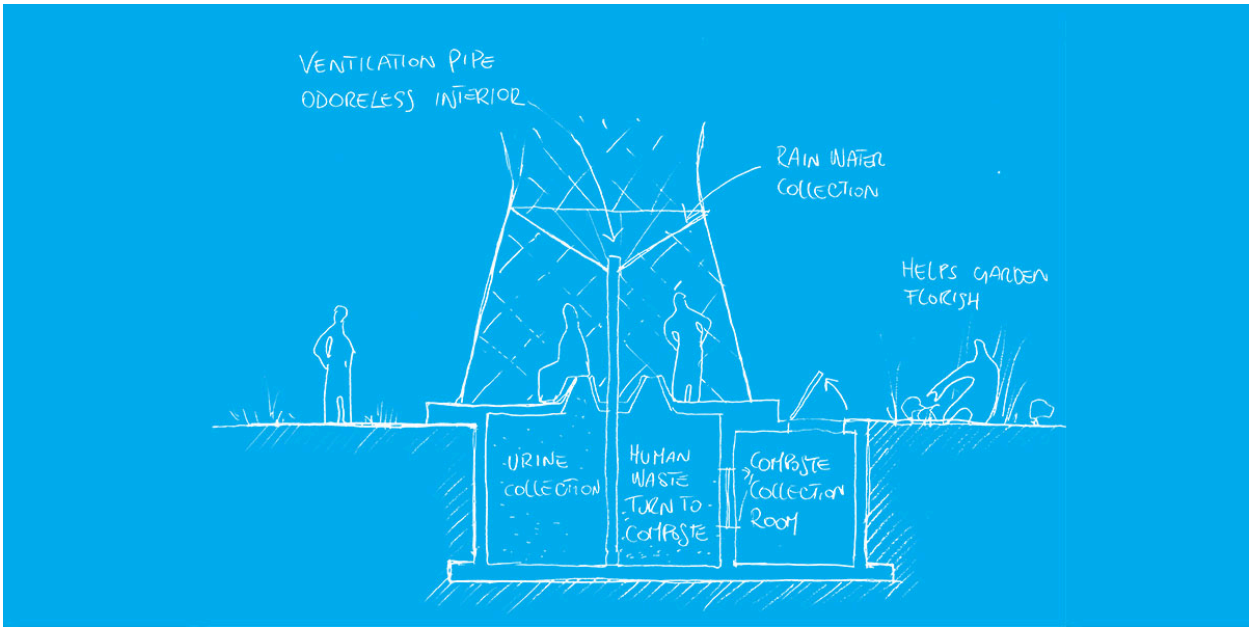

Exhibit 2: Warka Sanitation (Warka Water, 2019)

Table 1. Primary water source used by the household during the dry season

	Rural		Urban	
Water source	Number of households	Per cent	Number of households	Per cent
Public tap	429	26	171	32
Private tap	18	1.0	84	19
Well	405	26	232	40
Surface water	749	44	46	8.0
Other	40	2.4	5	0.7
Total	1641	100	538	100

Notes: Private taps include interior and exterior private taps. Surface water includes rivers, lakes, ponds, and springs. 'Other' category includes rainwater and water vendors. Source information is missing for nine rural and two urban households.

Exhibit 3: Number and percentage of households in Madagascar that use the different types of sources to obtain water (Boone, 2011)