

WORSENING WATER CRISIS IN BURKINA FASO



Image from Noëlie Sawadogo. 2019. *Burkina Faso* ©

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We are a team of undergraduate students studying at Concordia College, North Dakota State University, and the University of North Dakota, working to better understand the water crisis in Burkina Faso. Two teammates are international students, one from Burkina Faso who has personally witnessed the water crisis. Our research was compiled through (1) in-depth interviews with those who have first-hand experience with the issue, (2) articles by nongovernmental organizations and nonprofits directly working to tackle this issue, (3) and a variety of world databases analyzing the water crisis and financial situation in Burkina Faso.

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Introduction

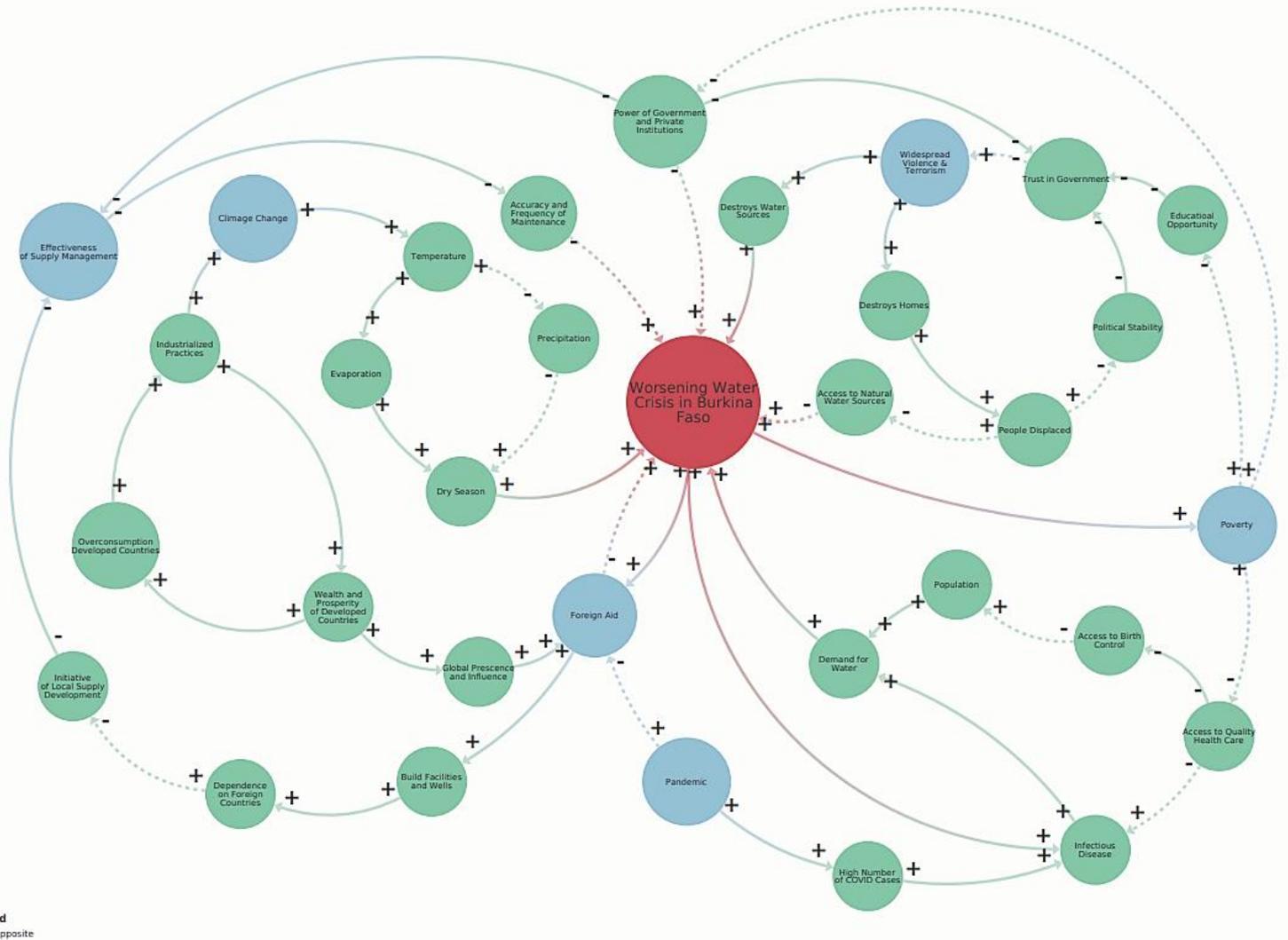
Burkina Faso is a small landlocked country in the center of West Africa with a population of about 20,903,278 people. It ranks as one of the poorest nations in the world with 40.1% of the population living below the poverty line (*The World Bank in Burkina Faso*, 2021). Due to poverty, limited natural resources, and a highly variable climate, Burkina Faso struggles to provide its growing population with basic water supplies.

With the recent humanitarian crisis and the pandemic, the water demand has doubled or even tripled in some regions. **In Burkina Faso, nearly 10 million people, approximately half the country, do not have clean water at home** (Bruess, 2020). This has increased women's vulnerability, childhood death, and disease. This has also led to greater difficulties in the agricultural or farming sector as well as poverty. Many are providing aid to lessen the water crisis: the government, humanitarian organizations, and local communities. However, the need for humanitarian assistance is increasing exponentially in rural areas each year.

While the root causes of the water crisis are poverty and scarcity of water resources, there are many other factors further exacerbating the issue such as widespread violence, climate change, the Covid pandemic, and mismanagement of water resources. This project analyzes these factors, investigates potential solutions implemented to solve similar problems, maps the stakeholders, and identifies potential leverage points.

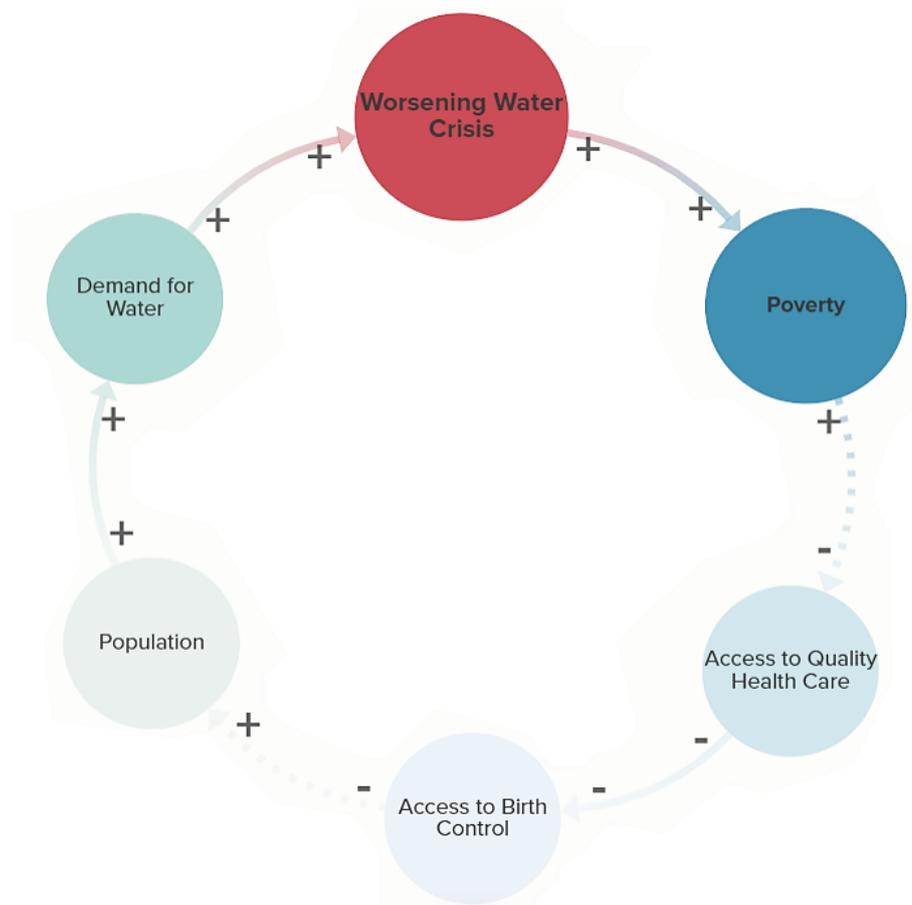
Challenge Landscape

Causal Map



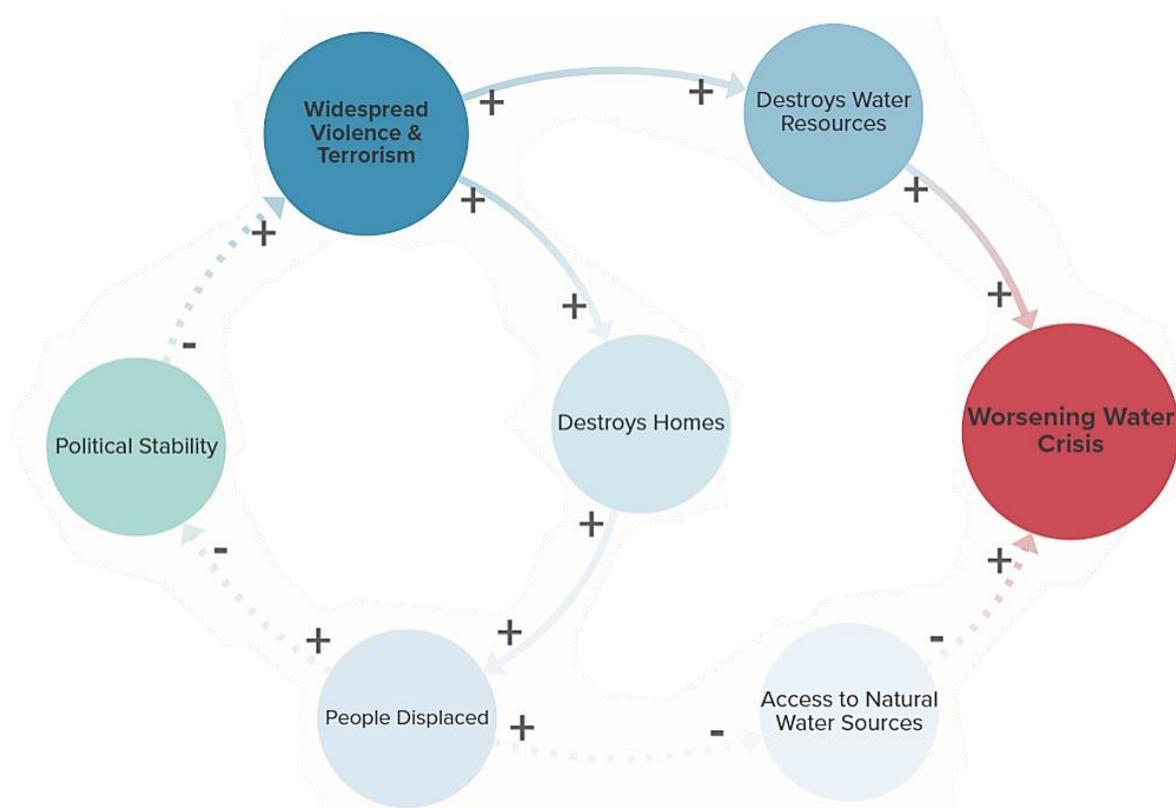
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Poverty



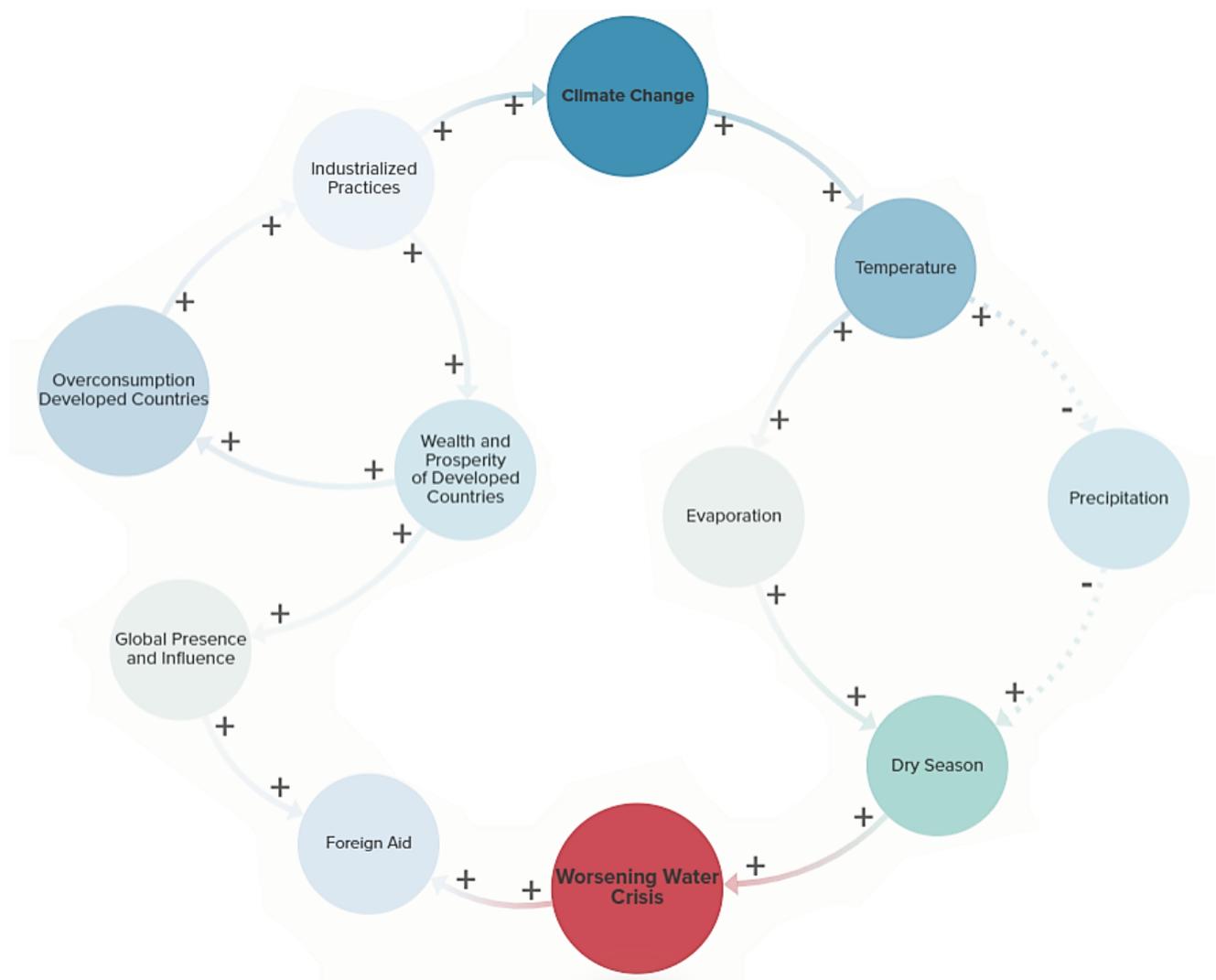
Burkina Faso has neither the resources nor funds to supply clean water to the entire population. Burkina Faso's Human Development Index (HDI) for 2019 ranked it at 182 of 189 countries (*The Next Frontier*, 2020). Because 80% of Burkinabe rely on agriculture for subsistence and revenue; the economy is heavily reliant on water (*Agriculture and Food Security*, 2022). The scarcity of water thus worsens the economy, deepening poverty. Burkina Faso's gross domestic product was only \$17.3 billion in 2020, yet reaching the Sustainable Development Goal (SDG) of access to safely managed water and sanitation services by 2030 will require countries to spend \$150 billion per year (*Millions Around the World*, 2021). Because the majority of the workforce is in the agricultural sector, 3/4 of the population does not work during the dry season as the harvest does not provide enough profit. In addition, the pressure on water resources is increasing yearly, making it even harder for authorities to supply clean water to the population. A growth in population without economic prosperity means a smaller percentage of people whom authorities can afford to provide clean water.

Widespread Violence & Terrorism



The growing insecurity in Burkina Faso has created the fastest-growing displacement crisis in the world. Terrorism has forced more than 1.5 million people to relocate (*Burkina Faso Factsheet*, 2022). Many already struggling host communities have faced additional challenges in obtaining water, especially in the Kaya and Barsalogo regions. In some rural areas, certain armed groups are destroying the already scarce water supply and are making it dangerous to reach water resources. Women are especially vulnerable because they are responsible for fetching water. According to the Internal Displaced People representative in Barsalogo, **Women and girls risk their lives every day when they get up early in the morning to walk 9 to 15 kilometers to reach water supplies, about a 5-hour trip** (Ouedraogo, personal communication, July 3, 2020).

Climate Change

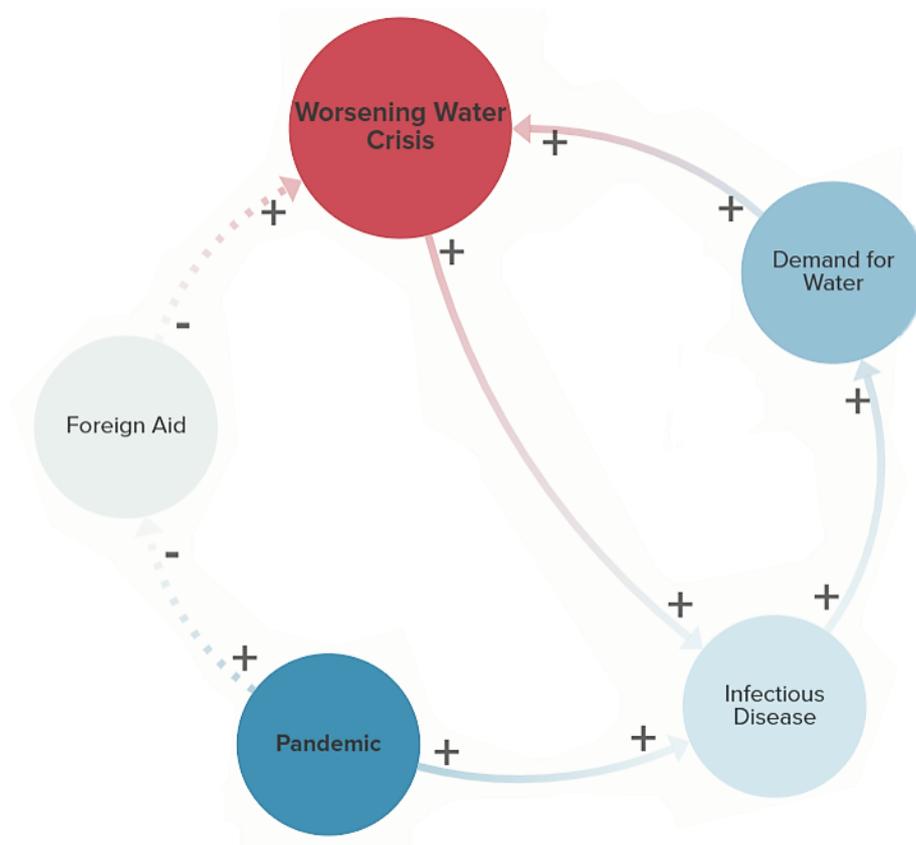


Burkina Faso is a Sub-Saharan hot and dry landlocked country with very few rivers. The territory of Burkina Faso straddles three basins of international watersheds, but a significant portion of this water is shared with Ghana and other neighboring countries (*Burkina Faso: Politique National*, 2015). The country's two water sources are surface waters and groundwater (*Country Profile – Burkina Faso*, 2015). Due to bedrock, it is difficult to build infrastructure such as pumps and dams in certain areas, limiting the areas where groundwater can be extracted. Furthermore, the groundwaters are unevenly distributed because the country's nutrient-poor soils are degraded and have a low water-holding capacity.

Surface waters such as rivers and artificial storage evaporate during the hot and dry season, and evaporation can reach up to 2,260 mm/year (*Project Appraisal Document*, 2009). In addition, precipitation is minimal. Declines in rainfall resulting from climate change lead to temperature spikes, immediately restricting water and food supplies (Guira, personal communication, March 10, 2022). Burkina Faso's dry season can last from October to May or longer, and the average temperature is 28.8 °C (84 °F).

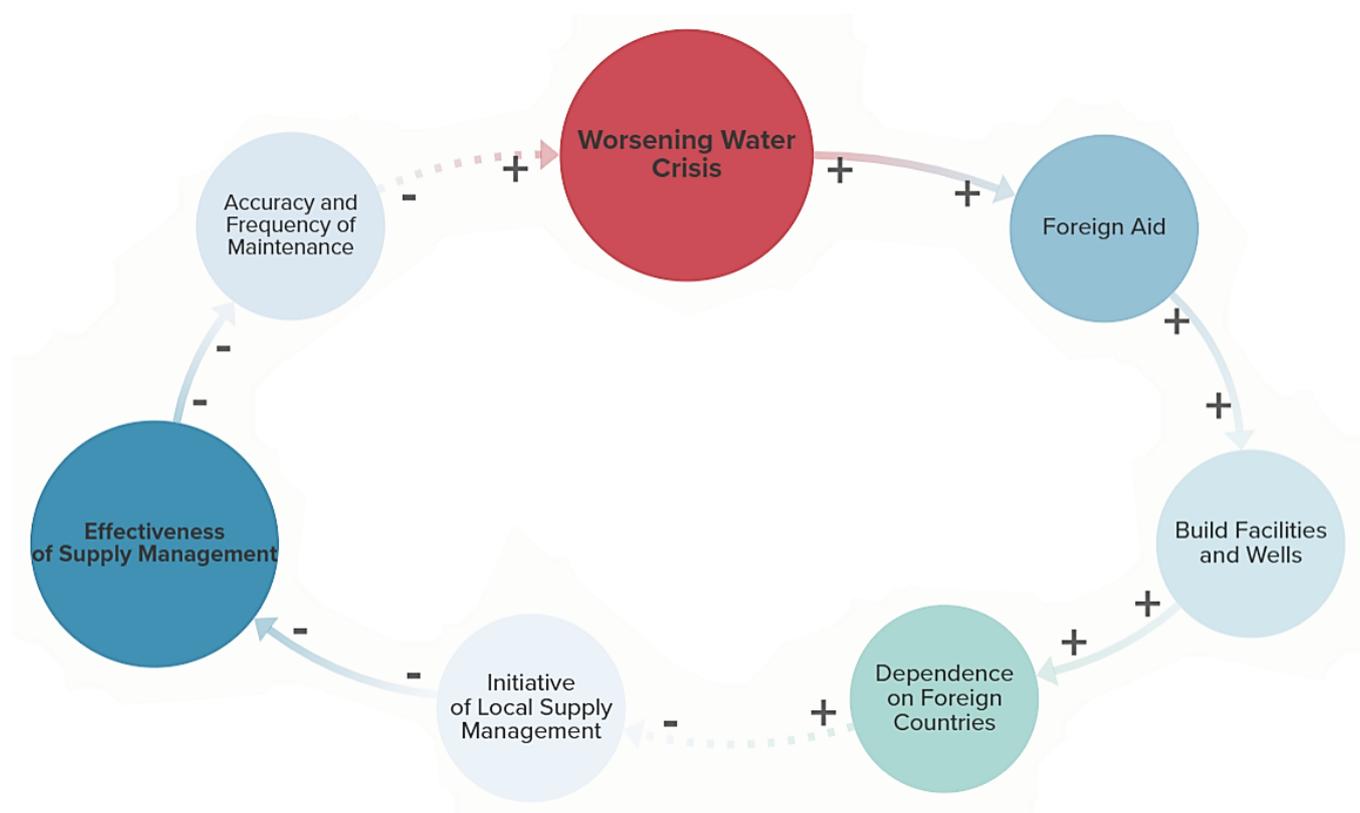
Burkina ranks 159 out of 181 countries vulnerable to climate change and other global challenges (*Burkina Faso: Global Adaptation Index*, 2019). The ranking indicates that Burkina Faso has extremely low levels of readiness to adapt to climate change. The UN predicts that in 2050 the median temperature will increase by 1.4 to 1.6 Celsius and that the already precarious rainfall will decrease by 10%. Extremities of future dry and wet periods are likely to occur as global warming increases (*Burkina Faso: Global Adaptation Index*, 2019).

Covid-19 Pandemic



The pandemic increased the necessity for handwashing, leading to greater water demand that put added stress on water resources, further worsening the water crisis. Covid-19 arrived in Burkina Faso during its dry season in 2020, increasing water consumption in the area. Additionally, humanitarian aid decreased due to the economic downturn. Many people could not afford food, let alone amenities such as soap, increasing the risk of infectious diseases.

Mismanagement of Water Resources



Due to mismanagement, the sustainability of existing water systems is an issue. Of 50,000 water projects in rural areas, 17,000 are not functioning (*Project Appraisal Document*, 2009). ONEA (The National Office of Water and Sanitation) is the only company that supplies water to the country. Although it is a governmental company, its gestion is private. According to Taoufik, a hydrogeologist at ONEA, the water primarily comes from dams but also rivers that is then treated and distributed to the population through a pipe system (Taoufik, personal communication, March 10, 2022).

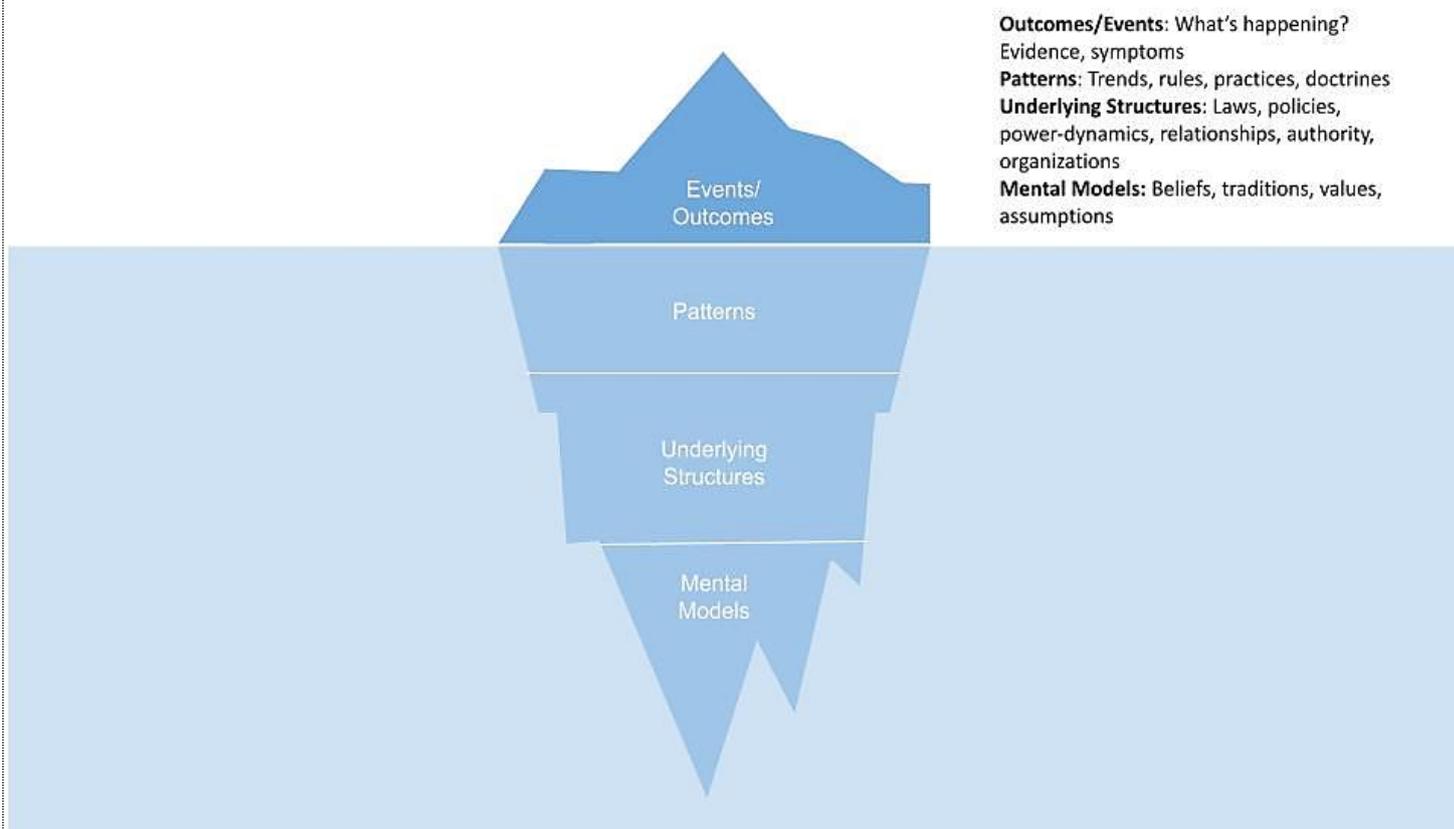
ONEA receives much of its funding from international donors and is one of the most successful and efficient water companies in Sub-Saharan Africa (*Access to Water*, 2019). In 2019, 92.44% of the urban population had access to drinking water (*Products and Services*, 2020). The cost of a pipe connection for a household is 35,000 CFAF (US \$59.00 or 45 GBP), and an average household must pay 4,400 CFAF (US \$8 or 6 GBP) for 45 liters of water.

ONEA predominantly services urban areas because it is unprofitable to build the water pipe systems in poor small villages with low population density (Taoufik, personal communication, March 10, 2022).

In Urban centers, which make up 1/4 of the total population, the recovery of tariffs allows ONEA to deliver services and ensure the maintenance of the facilities. The excess financial balance of the big cities helps to cover the deficit of the smaller cities, where consumption is lower. However, in rural areas, where 3/4 of the total population resides, the tariff is barely enough to cover small networks' operation and maintenance costs. Low consumption due to poverty slims the profitability for operators, ruling it inefficient and nonviable (*Burkina Faso: Water Sanitation*, 2019). To compensate, the government subsidizes ONEA to provide independent water supplies to rural areas. However, the government frequently does not have enough funding to subsidize the construction of such independent water storage facilities, leaving villagers to rely on dirty water from seasonal rivers for consumption or upon support from international donors and local and international nongovernmental organizations (NGOs).

External partners play a major role in the water provision in Burkina Faso. According to the Ministry of Agriculture, Water Resources, Sanitation, and Food Security, financing the water sector averaged 86.30 billion CFAF per year, and external partners contribute 68% on average per year. The financing methods recorded include grants, donations, and loans (*Burkina Faso: Politique Nationale*, 2015).

Iceberg Model



Events	Millions of people in Burkina Faso are without reliable access to water, leading to poverty and illness, negatively affecting their livelihoods.		
Patterns	Communities are being displaced due to terrorism , limiting their access to natural water sources.	Women are walking 10 km and queuing in 6-hour lines to get water.	Climate change is increasing the dry season due to greater evaporation and declining precipitation.
Underlying Structures	Political instability leads to weakened governmental bodies , minimizing their ability to manage the water supply effectively. Foreign entities offer short-term solutions without sustainability .	ONEA provides independent water supplies to the nation but is unable to support rural areas due to a lack of funding .	The wealth of developed nations, resulting from industrialized practices , leaves underdeveloped nations most vulnerable to the effects of climate change.
Mental Models	People in the government with power to induce change are dependent on aid from other countries.	Communities in Burkina Faso view it as socially unacceptable for men to participate in water collection.	Developed countries overconsume due to emphasis on “growth” and the mindset that “more is better.”

Solutions Landscape

Efforts in Burkina Faso

Burkina Faso has implemented various solutions to deal with the water crisis. To respond to the unequal access to water in the country, the 2004 Decentralization Law and the 2001 Water Management Act were passed (*Burkina Faso: Program National, 2016*). In addition, Burkina Faso adopted a plan of action for the Integrated Management of Water Resources (PNGIRE). Targets included institutional strengthening of the country, the creation of water protection policies, the restoration of water resources, and education about the preservation of water resources (*Burkina Faso: Program National, 2016*).

Burkina Faso also set up a National Water Supply Program of Drinking Water and Sanitation (*Burkina Faso: Program National, 2016*). Furthermore, ONEA secured the water needs of the capital through the construction of the Ziga dam.

Moreover, multiple NGOs such as UNICEF; WaterAid, USAID, Oxfam International, and Doctors Without Borders have aided Burkina Faso by providing water, free health care, and education about sanitation in rural areas where the need for water is urgent. Burkina Faso's population, religious congregations, and community leaders have also pushed for education in hand hygiene and proper caring of the resource, which has been met with mixed results.

Filtering Surface Water

Outside of Burkina Faso, nations like Ghana and Kenya also face water crises. Both countries have received donations from LifeStraw, a straw created to filter out pollutants such as bacteria, parasites, and microplastics. While the straw is only a micro-fix, it provides a great breakthrough in the world of filtering. These filtering technologies could allow Burkinabe to drink surface water and other water sources with less fear of contracting diseases or consuming other contaminants (*How Our Products Work*, 2022).

Condensing Water Vapor

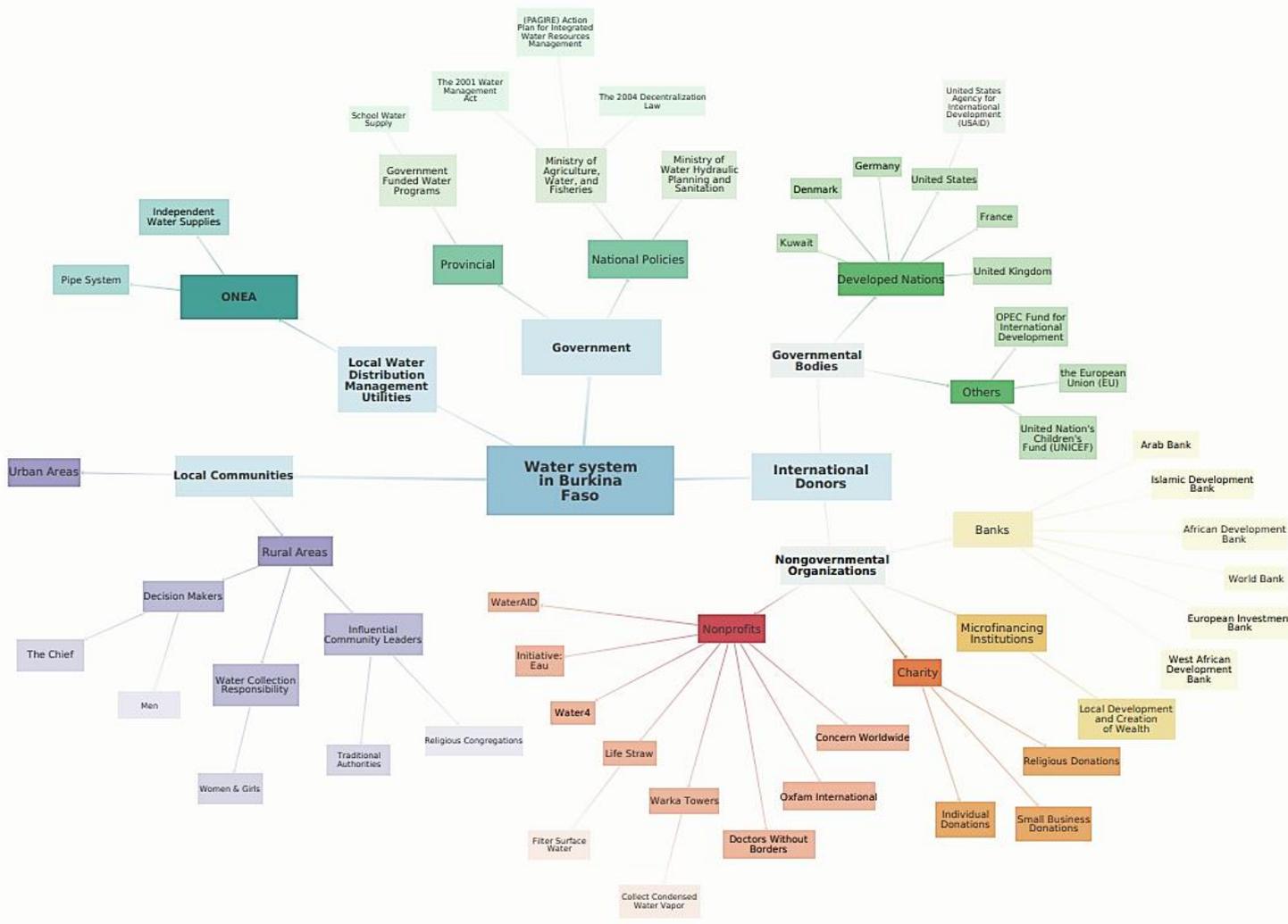


Image from Designboom. 2019. *Warka Towers*

In Ethiopia, the Warka Tower by Arturo Vittori allows water to be harvested from the condensation of the air. The design was inspired by certain insects that can collect water vapor and store it to survive. The tower is made from eco-friendly and biodegradable material with current active projects in Cameroon and Togo (*Warka Water – Every Drop Counts*, 2022). The design captures water vapor from the air that condenses when it meets the mesh (Nguyen, 2014). A tower costs between \$500-\$1,000 (382-764 GBP) and can provide 100L of water a day to a community. The design captures water vapor from the air that condenses when it meets the mesh. With the addition of solar panels, it is also able to provide electricity (*Warka Water Towers*, 2019).

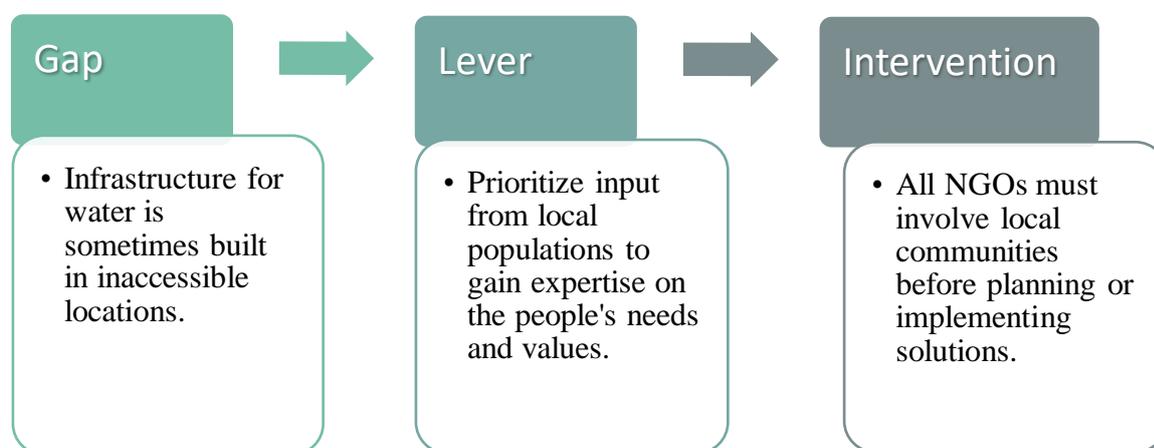
Gaps and Levers of Change

Stakeholder Map



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Ameliorating Management Strategies

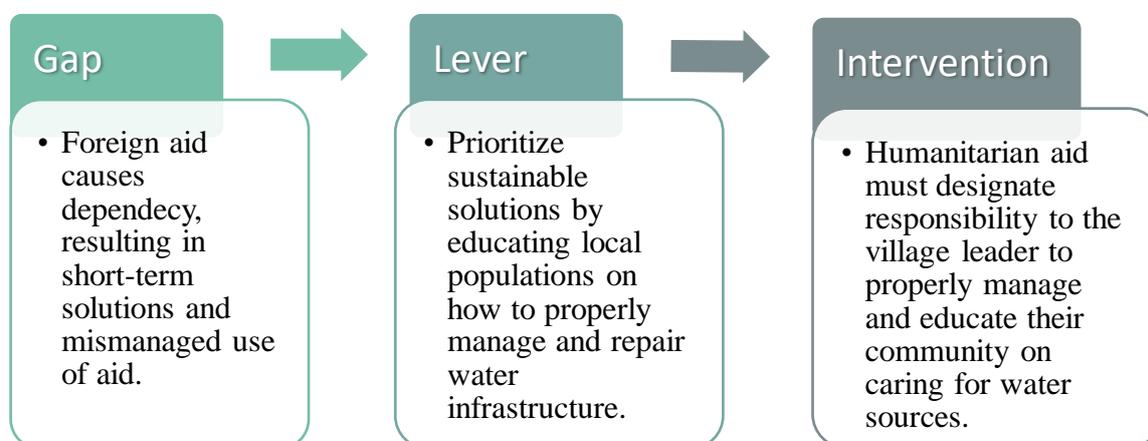


According to the under-Secretary-General for Humanitarian Affairs, more than half of people surveyed in Burkina Faso said that the aid they received did not cover their most important needs (Lowcock, 2021). This is because NGOs do not always have expert knowledge of the landscape or the people. Without involving the voices of those affected by the water crisis, executed decisions do not always serve the people to whom they were intended.

Stakeholder Actions

To improve the effectiveness of implemented solutions, foreign NGOs need to cooperate with community leaders to gain the population's trust and to better understand the problems they face. They can do this by working alongside members like the chief, tradition keepers, the elderly, and religious leaders; and by hiring local experts onto their team.

Educate on Caring for Water Resources

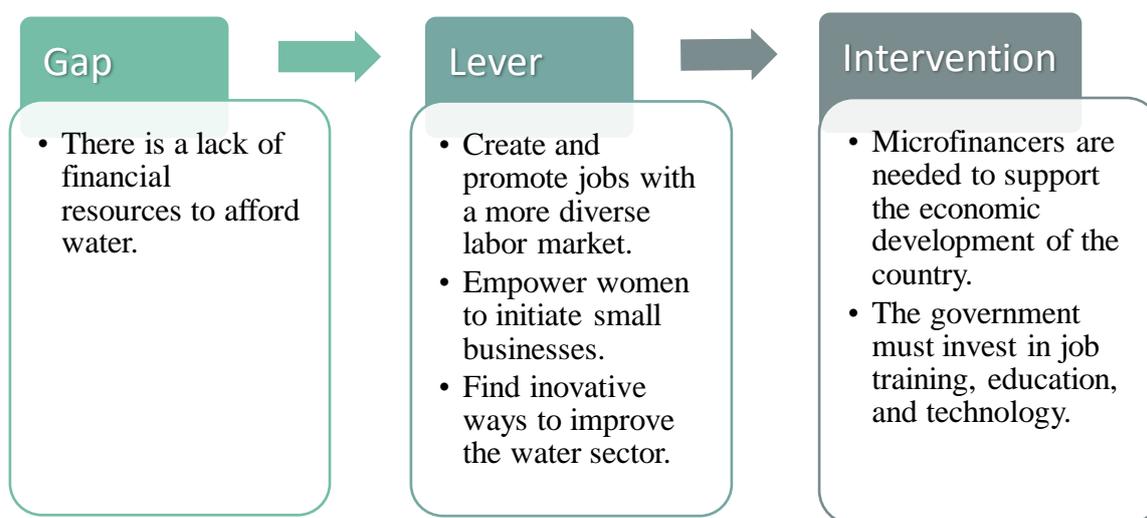


In many villages in Burkina Faso, boreholes and hand pumps are out of service because they are broken, and proper maintenance is not available due to a lack of mechanical knowledge in the community. Therefore, upkeep of the water resources is lacking. Furthermore, the people in Burkina Faso feel a sense of responsibility to take care of that which they work hard for.

Stakeholder Actions

By providing educational tools to a trusted leader in the village, the responsibility of management can be securely placed onto them. In addition, NGOs can encourage the community to participate in the management by asking them to give a very small contribution that will then later be used to repair the infrastructure.

Economic Elevation & Female Empowerment



Breaking the cycle of poverty starts by promoting jobs with less reliance on water and finding innovative ways to improve the agricultural sector, giving the entire population opportunities for financial independence. Furthermore, micro-loans are likely to be successful in helping pull the country out of poverty as there are strong cultural values to repay debt, and there is an enormous felt sense of shame to be indebted to someone. ACEP (Credit Agency for Private Enterprise) is an example of one micro-finance lender that has already given loans to micro-entrepreneurs in Burkina Faso. As one receiver of a microfinance loan, Miriam, states **"We already have to fight for what we have, so you can be sure we will put everything into the companies we have built ourselves."** These microfinance loans foster financial inclusion and are helping the country overcome obstacles resulting from poverty, one small business at a time (Power, 2020).

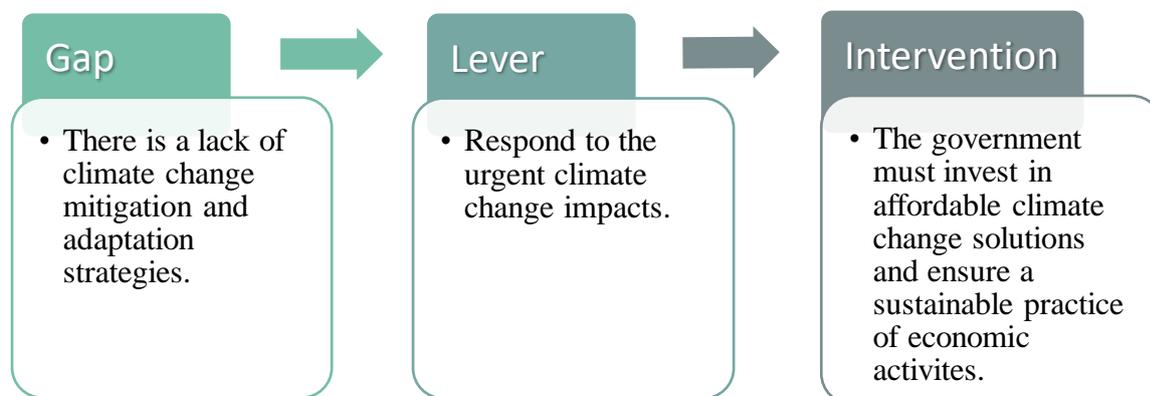


Image from Aga Khan Development Network. 2017. *Premiere Microfinance Agency*

Stakeholder Actions

The government and NGOs must promote revenue-generating activities in rural areas, particularly by supporting small businesses through microfinancing. Furthermore, the government must offer affordable training in fields other than agriculture, reintegrate the refugee population into the economy, invest in the development of innovative technology to improve the agricultural sector such as more efficient irrigation techniques, and educate the nation's youth.

Environmental Sustainability

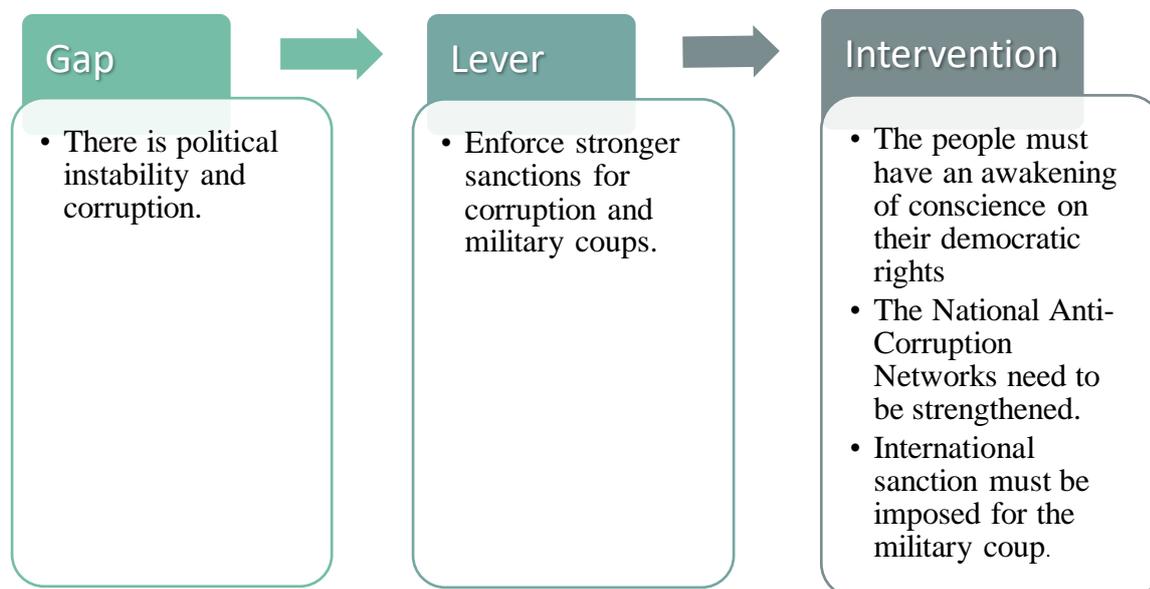


The mining practiced in Burkina Faso has harmful repercussions on the environment, whatever the mode of exploitation. It contributes to soil and water pollution by directly discharging mining effluents into waterways such as used engine oils and chemical products (used batteries abandoned at the bottom of wells containing manganese or lead). In addition, the absence or insufficiency of water is at the origin of certain natural disasters such as drought (*Burkina Faso: Politique Nationale, 2015*).

Stakeholder Actions

The government must invest in renewable energy such as solar energy, afforestation, education, and data collection. The population should plant more trees and protect their environment. The developed countries should decrease their pollution and overconsumption.

Corruption and Democratic Rights



Corruption and Military Coup frequency in Burkina Faso are decreasing the country's ability to respond adequately to the water crises. Corruption generates distortion and drives public investment away from priorities such as water provision. In addition, military Coups deprive the people of their democratic rights and destabilize the country.

Stakeholder Actions

External partners and NGOs must financially assess all grants, donations, loans, and financing so that all investment goes directly to what it was intended to solve or improve. The National Anti-Corruption Networks must increase their monitoring of corruption. In addition, the population in rural areas should participate without pressure or influence in the electoral vote.

Key Insights and Lessons Learned

Mapping the water system of Burkina Faso has revealed that the causes of the water crisis are more profound than were originally thought. It was understood that the lack of water worsens the cycle of poverty, yet by asking important questions and digging into the core of the problem, we began to see how complex and interconnected the world truly is, such as how the overconsumption and pollution of developed countries can dramatically impact the climate in less developed countries. Similarly, we saw how foreign aid could result in a diffusion of responsibility from the shoulders of the government, increasing the dependency of the country on that aid. Solving the water problem in Burkina Faso would present so many opportunities, such as women's emancipation and active participation in the economy, technological advancement of the agricultural sector, millions of lives saved, and improved quality of life for the individuals in Burkina Faso.