



**KENNESAW STATE  
UNIVERSITY**

COLES COLLEGE OF BUSINESS  
*Bagwell Center for the Study of Markets  
and Economic Opportunity*

# Undergraduate Research Fellowship Working Paper Series

## Title:

*"J ki j 'Cvrcu'Hqwpf cvkqp<"  
Kõ rtqxkpi 'Y cvgt 'Cee guu'kø"  
O qt qeeq"vj tqwi j 'Køvgt pcvkqpcn'  
Eqqr gt cvkqp"*

## Author(s):

Erwfk'Kkpc'I ctcxku'O qpvc i ww  
Undergraduate Research Fellow  
4245/4246

## **Introduction**

Two billion people in the world live without access to clean and safe drinking water (Kashiwase and Fujs 2023). Water access is essential for ensuring public health, environmental development, peace, and security. Morocco has experienced hardship due to water scarcity resulting from alterations to the environment, an increase in the population, and overuse of this resource. According to the World Resources Institute (WRI), Morocco ranked 22<sup>nd</sup> among countries most at risk of water shortage by currently having 606 m<sup>3</sup> of water per capita, which represents a decline compared with the 2,560 m<sup>3</sup> of water per capita in the 1960s (U.S. Department of Commerce 2022). As a response to the current situation, the implementation of international cooperation to regulate water scarcity has become a need for the country. International cooperation has shown to be beneficial not only by growing the economy but also by ensuring access to basic needs. Although many programs have been implemented domestically to invest in the water sector and prevent possible cases of shortages, actions still need to be taken to mitigate the negative effects of the lack of water.

Many researchers have studied different possible causes of water scarcity in the world. Analyzing and understanding the links between water, sustainability, and economic development has been a common denominator within the field (Falkenmark 1990; Li and Wu 2024). Other projects have provided information regarding international cooperation and the outcomes achieved as a result of its application. The creation of global partnerships has helped generate improvements in the sustainable development and maintenance of organizations, such as nonprofits, that aim to improve conditions and guarantee access to natural resources and basic needs within international borders. Correspondingly, regional, national, and global efforts put together have become a great strategy to improve domestic issues, such as guaranteeing

sustainability (Nicolai 2022). Both approaches mentioned above look in two different directions to explain a variety of consequences caused by water scarcity as a global issue.

Despite an increased interest in environmental and sustainability subjects, it is surprising that only a small amount of research has been conducted regarding water in Morocco. A variety of studies explain water shortages as an international problem, but there has been little to no research on a narrower point of view. That point of view is how the lack of access to water has affected each country domestically along a number of different margins. Most research has been done by looking at water scarcity as a global issue, but the conditions and causes of lack of water vary from one region of the world to another. On a narrower point, I will be looking specifically at the relationship between international cooperation through the High Atlas Foundation (HAF), a nonprofit organization, and the improvement of water issues in Morocco. The HAF promotes community-designed initiatives for sustainable agriculture, women's and youth empowerment, clean water, education, health, and capacity-building by using foreign investment.

Studying water issues in Morocco and the implementation of international cooperation as a strategy to solve them is important for many reasons. First, understanding the relationship between water scarcity and global partnership is needed not only for the development of Morocco but for the international community as a whole. Second, the lack of water is a global crisis that must be understood and resolved. Long-term drought can increase diseases, negatively impact plants and land, and destroy ecosystems. Third, appreciating and analyzing the role of nonprofit organizations, such as the HAF, can help to build stronger partnerships between various areas of society to ensure long-term solutions that benefit countries around the world.

## **Literature Review**

The review provided will explain how the HAF, a nonprofit, affects positively two different areas for the improvement of water and sustainability in Morocco. The first section reviews the current state of water as a resource from the outside and inside of Morocco. The second section evaluates the important role that international cooperation plays in achieving sustainability and improving the functioning of nonprofits.

### **Water as a Scarce Resource in Morocco**

Water is a resource of extreme need. Despite being a finite resource, most worldwide activities are still dependent upon water, which increases its global relevance. In the past few years, human activity has deteriorated this natural resource and has created irreversible consequences. Climate change, the increase in population, industry, and many other human actions have made sustainable water resource management a global need (Li and Wu 2024). Human health, sanitation services, agriculture, food production, and even socioeconomic development are some of the areas that are linked to the accessibility and quality of water. Water and sustainability are interrelated areas that impact socioeconomic, environmental, and technological domains (Li and Wu 2024).

Similarly, from a global perspective, various issues confronted by humanity are connected to water as a resource, including but not limited to desertification, eutrophication, and pollution (Falkenmark 1990). Furthermore, there is a great need to create sustainable alternatives that reduce the scarcity of and protect this precious resource.

A study presented by Falkenmark (1990) analyzes the main causes that have affected the nature of water, including excess use, the increase of environmental disturbances, and many others. This study shows that because of the inefficiency in strengthening global partnerships, environmental consequences will be inevitably negative in the future. However, there is still hope of preventing this damage from being maximized by improving man's behavior in the living environment.

In the case of Morocco, many strategies have been put into action to improve the current conditions of the environment. Water quality in Morocco has constituted an issue for its population since the introduction of toxic elements in agricultural, industrial, and urban activities (Soumaila, Mohamed, and Mustapha 2019). As a result, the implementation of treated wastewater as a water management strategy has become a need (Makan, Gouraizim, and Fadili 2022). Wastewater treatment systems (WWTS) help to balance the increasing water demand and contrast the consequences caused by natural disasters and climate change. A study conducted by Makan, Gouraizim, and Fadili (2022) analyzes and compares the sustainability of five WWTS. Two surveys were conducted by implementing cardinal (CAR) and Preference Ranking Organization for Enrichment Evaluation (PROMETHEE) methods. The CAR method ensures results with high precision and robustness; the PROMETHEE method examines and compares the responses based on the multiple criteria presented in the surveys. Later in the research, it is demonstrated that implementing treated water systems would help manage the increasing demand for water and recover from the current scarcity.

### **International Cooperation as a Global Partnership Strategy**

International cooperation has been a tool used to ensure global development and achieve objectives worldwide. Tremendous economic development has taken place over many decades, but this economic development has potentially come at a cost to the environment with its effect on climate change. Environmental developments including heat waves, droughts, and sea level increases have been experienced in many different regions. Because of these problems, the need to create global partnerships to improve sustainability has become a priority within the international community. Correspondingly, countries around the globe have considered joint action to be a priority in order to limit greenhouse gas emissions (Zhang and Hennlock 2018).

Ensuring access to sustainable water is a current topic highly debated within international policy discussion circles. Many societies around the world are still living without access to this important resource, which has sharply increased the intensity of diseases and diminished quality of life (Maria 2023). Water is a basic necessity that can be properly maintained by implementing sustainable systems and removing social barriers, which can be achieved by strengthening international cooperation. In the case of Morocco, playing a regional and global role has represented an important step toward sustainability (Nicolai 2022). Similarly, foreign direct investment (FDI) has influenced various sectors of growth in Africa. However, competition and fragmentation across the continent create institutional problems, given that Africa has been the least attractive region for FDI since 1970 (Feulefack Kemmanang and Dongmo Zamke 2022).

## **Theory**

Multilateral research and innovation initiatives have shown to be the most effective way to tackle challenges facing climate, health, food, energy, and water matters. International cooperation in the global sector is defined as a collaborative relationship between states working

toward shared objectives in a mutually agreed-upon field. Cooperation or assistance can be developed between governments, businesses, or individuals to achieve objectives and specific strategies. To ensure sustainable growth, it is essential to maintain work and information exchange between countries. In this regard, the application of international assistance has guaranteed the maintenance of peace, prevention of environmental emergencies, promotion of development, assessment of solutions to climate change, improvement of global trade, and preservation of cultural richness. For these reasons, international cooperation should be used as a response mechanism for transnational sustainability issues.

In Morocco, global cooperation has been fundamental for the development of the country itself, especially by improving accessibility to natural resources such as water. Along with international support, the role of local nonprofit and nongovernmental organizations represents an essential part of the creation of programs to improve water quality and access. In the HAF, a co-design theory has been implemented to respond to social and environmental issues.

Understanding the needs of the community and not imposing solutions but instead building them together has been a primary component of HAF's methodology. More than thirteen villages have been positively impacted in Morocco as a result of international funding through partnerships with the HAF. Building water canals, providing equipment to local communities, and improving life conditions are only some of the positive outcomes that have been accomplished.

Water is an essential resource that impacts all areas of local development. By building water infrastructure, the HAF has improved water access along with increasing primary and secondary education attendance rates, curbing the spread of diseases, and improving household duties. The implementation of water programs by the HAF has raised the need to create and build trust among communities in Morocco. Understanding people's necessities and designing

solutions that encompass specific characteristics and communities' conditions allow programs to have a long-term impact and be sustainable. One of the strategies applied by the HAF is based on generating local work. They integrate locals into the building process of infrastructure programs, which increases job opportunities and creates a relationship between the nonprofit and the community.

Correspondingly, global cooperation is essential for the creation of water accessibility programs by providing funds guided towards infrastructure and labor work. Nevertheless, international cooperation should not be solely based on financial support. Instead comprehending regional and national needs must be seen as a priority. Building trust among local communities and organizations allows solutions to be incorporated and generate durable strategies. To achieve cooperation between local and international entities, the role of national organizations comes into play by considering the benefits of connecting domestic and global sectors to achieve a common goal, thus improving life conditions.

In conclusion, international cooperation and assistance have been strategies commonly used in Morocco to respond to current issues presented in the water sector. Similarly, transnational partnerships have ensured a positive impact on the development of social, humanitarian, and economic sectors. International support has generated excellent outcomes by creating an enabling global environment free of structural obstacles as well as addressing water issues and sustainability. Along with these benefits, transnational funding has helped to define a stable regulatory framework compatible with local economic development, to guarantee education and training, and to assure connectivity across borders.

The HAF has stood out from other nonprofits by focusing on numerous areas of development including sustainable agriculture, women empowerment, capacity building, cultural



preservation, and especially clean water. The HAF's projects funded by foreign investment have given direct access to clean water to more than 10,000 people across 26 villages and 12 schools, including over 200 students in Morocco's Rhamna province. In this regard, international cooperation must be continuously used to ensure the peaceful and prosperous management of water necessities within states. Further research into water accessibility is needed to better understand the current scarcity of this resource in Morocco. Such research would contribute to building upon local solutions that guarantee better life conditions by strengthening international cooperation.

## References

- Falkenmark, Malin. 1990. "Global Water Issues Confronting Humanity." *Journal of Peace Research* 27 (2): 177–90. <https://doi.org/10.1177/0022343390027002007>.
- Feulefack Kemmanang, Ludovic, and Jonas Juleo Dongmo Zamke. 2022. "Does the Quality of Institutions Matter for Foreign Investment Concentration in Africa? Understanding the Controversial Role of International Aid." *Review of Development Economics* 26 (1): 354–74.  
<https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=eoh&AN=1986936&site=eds-live&scope=site>.
- Kashiwase, Haruna, and Tony Fujs. 2023. "World Water Day: Two Billion People Still Lack Access to Safely Managed Water." *World Bank* (blog), March 22, 2023.  
<https://blogs.worldbank.org/en/opendata/world-water-day-two-billion-people-still-lack-access-safely-managed-water#:~:text=74%25%20of%20people%20in%20the,to%20safely%20managed%20drinking%20water&text=Although%20we%20see%20progress%2C%20there,safely%20managed%20drinking%20water%20services>.
- Li, Peiyue, and Jianhua Wu. 2024. "Water Resources and Sustainable Development." *Water* (20734441) 16 (1): 134. <https://doi.org/10.3390/w16010134>.
- Makan, Abdelhadi, Mohamed Gouraizim, and Ahmed Fadili. 2022. "Sustainability Assessment of Wastewater Treatment Systems Using Cardinal Weights and PROMETHEE Method:

- Case Study of Morocco.” *Environmental Science and Pollution Research* 29 (13 pp.19803–19815): 19803–15. <https://doi.org/10.1007/s11356-021-17215-w>.
- Maria, Bacalini. 2023. “Ensuring Access to Basic Necessities: The Importance of Sustainable Water, Sanitation, and Hygiene.” *Journal of International Social Research* 16 (99): 1–5. <https://doi.org/10.17719/jisr.2023.96942>.
- Nicolai, Katharina Elisabeth. 2022. “A Green Gambit: The Development of Environmental Foreign Policy in Morocco.” *Journal of North African Studies* 27 (4): 714–40. <https://doi.org/10.1080/13629387.2020.1865931>.
- Soumaila, Kanga Idé, Chikhaoui Mohamed, and Naimi Mustapha. 2019. "Water quality assessment using a new proposed water quality index: a case study from Morocco." *Int J Environ Agric Biotechnol* 4 (4): 957-972.
- U.S. Department of Commerce. 2022 “Morocco – Country Commercial Guide.” *International Trade Administration*, November 29, 2022. <https://www.trade.gov/country-commercial-guides/morocco-water>.
- Zhang, Xiao-Bing, and Magnus Hennlock. 2018. “The Benefits of International Cooperation under Climate Uncertainty: A Dynamic Game Analysis.” *Environment and Development Economics* 23 (4): 452–77. <https://search.ebscohost.com/login.aspx?direct=true&AuthType=shib&db=edsjsr&AN=e dsjsr.26496209&site=eds-live&scope=site>.