



Smallholder Farmers Face the Challenges of Climate Change In Zagora's Oases

Ismail Ait Bassou & Abdessamad Khadiri



Oct 2024



About the authors:

Ismail Ait Basso: PhD student in Sociology and Anthropology at Mohammed V University, Rabat, and a member of the Oasis Anthropology research team, Ismail is interested in youth and societal transformations, sustainable development, and social protection in North Africa and the Middle East. He is the author of several publications, most recently a co-edited article in the book *Oasis and Societal Transformations: Man, Space, and Society* (Fikr Foundation and Faculty of Arts, Mohammed V University, Rabat, 2023): "The Double Impact of Youth Migration on Oasis Society" ("التأثير المزدوج لهجرة الشباب على المجتمع الواحي").

Abdessamad Khadiri: A PhD student in Sociology and Anthropology at Chouaib Doukkali University, El Jadida. His research interests revolve around sustainability in urban areas, urban heritage, and socio-spatial transformations in oasis regions. He is the author of several articles, most recently a story in climate fiction entitled: "The Oasis War" ("الحرب الواحية"), in the collective book "IMAGINE. Histoires et récits du monde d'après" (lit : IMAGINE : stories and tales from the future world), published by the Heinrich Böll Foundation, Rabat, 2023.

List of Contents

About the authors	4
Acknowledgments	7
Introduction.....	10
1- The Oasis: A Paradise for Smallholder Farmers?.....	13
2- Drought and Adaptation Strategies	19
2.1 Farmers' Adaptation Strategies	19
2.2 Strategies to Adapting Public Policy	23
3- Modern Agricultural Activities	26
4- Youth and Migration	30
5- Women and the Future of the Oasis	33
Conclusion and Recommendations	38
Bibliography	40

List of Illustrations

Table 1:

The predominant subsistence crops in the oases of Zagora Province 14

Table 2:

Distribution of cooperatives by product and field of activity in Zagora Province 20

Table 3:

Amount of Water Needed by Watermelon from Planting to Production 28

Image 1:

The palm trees restoring their natural splendor following the Drâa River release 18

Image 2:

Agricultural Farm Benefiting from Land Equipment Support 23

Image 3:

Irrigation Project Using Solar Energy in the Afra Oasis 33

Image 4:

Plowing of Land (by E. B.) after 5 Years of Abandonment due to Water Scarcit 37

Acknowledgments

When we began our research on the impact of climate change in Morocco's oases, our primary objective was to convene scientifically-driven knowledge through hands-on field research. We aimed to move beyond simplistic perceptions of issues facing oases and contribute to a more comprehensive understanding of these ecosystems, with the intention that our research will facilitate broader discussions about the environmental, economic, and social challenges these geographies face.

Furthermore, we aimed to build upon our own previous research on oases environments. To achieve this, we facilitated a comprehensive field study, conducted a literature review of existing sources, and aggregated firsthand accounts of Moroccan oases.

The primary epistemological challenge we encountered stemmed from defining an appropriate research methodology concerning the nature of the target geography and magnitude of the challenge (i.e. the impact of climate change on smallholder farmers), while dually standardizing an accessible writing style and global definitions. We endeavored to effectively articulate the key elements of the study—oasis geography, climate change, and small-scale farmers—while integrating the indigenous language and perspectives of the local community. Through this approach, we refined the research to optimize its accessibility for a broader audience. Based on this context, we determined to blend ethnographic research with storytelling, sharing vignettes of the daily lives of small farmers in their struggle for adaptation and resistance to climate change.

This exploratory research project, from its inception as an abstract concept, has come to life thanks to the endorsement and trust of the Heinrich Böll Foundation (HBS), in collaboration with Siyada Network (شبكة سيادة). Our dedication to this project spans over two years, originating from our collective determination to amplify climate impacts on oasis regions.

This initiative represents our contribution to honor and advocate for the oases that embraced us—where we grew up, learned the basics of life, and developed resilience to all circumstances. We extend our deepest thanks and gratitude to the Heinrich Böll Foundation for supporting and accompanying us. We recognize the contributions of all the research participants, including the local residents and farmers, for their hospitality and positive interaction with the research process. These individuals shared their suffering, pain, ambitions, and great hopes for the return of the oases to their former glory. We share our gratitude to the President of the Zagora Regional Council, the employees of the National Agency for the Development of Oasis Areas and Argan Trees (ANDOZA), as well as the civil society actors and researchers in the Oasis areas, for their patience and collaboration, who each enriched this research in their own way.

Note: This publication is translated to English from the original Arabic version, parts of the text have been adapted to portray the original research in its translated form appropriately.

Introduction

Our field visit to the oases of Zagora province in September 2023 coincided with water flowing back into the Drâa River, a long-awaited relief for farmers, reviving their deep connection to the fertile land. This revitalization activated the natural and aesthetic magnificence of the oasis, following years of consecutive droughts. The dire search for water has become a hallmark of the oases of Zagora province. The region has experienced the most prolonged drought after the last flood that ravaged southeastern Morocco in 2014. The Drâa River's water level rose to record highs after the Al Mansour Ed-Dahabi dam was filled beyond its capacity. Morocco's oases have experienced intermittent droughts throughout history. The first wave of recorded drought occurred during the protectorate period, casting a persistent shadow well after Morocco's independence. During the past two decades, the oases have been magnified by the effects of climate change, as groundwater levels and arable areas have declined. At the same time, desertification, sand encroachment, fires, and biological diseases plagued the palm trees, especially the date palm disease *Fusarium oxysporum* f. sp. *albedinis*, locally known as "Bayoud" ("البيوض").

In contrast, environmental and development discourse positioning the oases have been aligned with the interests of economic and political elites. Based on their neoliberal vision, these elites prioritize "modern" agricultural policies, most notably the Green Morocco Plan (2008-2020), that inevitably have led to the depletion of water reserves.

The Green Morocco Plan boasted results through an increased number of solidarity farming projects with 985 launched, benefiting about 733,000 farmers, and an increase in palm production to 117,000 tons and a contribution of about 2.8 million new palm seedlings by the end of 2018.^[1]

[1] Ministry of Agriculture, Fisheries, Rural Development, Water and Forestry: Outcome of the Green Morocco Plan 2020-2030. Accessed on 10/30/2023.

<https://www.agriculture.gov.ma/ar/dat-agri/plan-maroc-vert>

However, a survey conducted by the Moroccan Center for Citizenship found that 93.9% of Moroccans perceive large-scale farmers as the primary beneficiaries of this plan. The survey also revealed that 83% of participants believed the plan failed to improve food security. Additionally, 94.2% of respondents noted an increase in agricultural product prices, which they attributed to the government's priority of export-oriented farming to generate foreign currency. Research shows that these policies have caused the purchasing power of citizens to suffer due to the scarcity of agricultural products in the national market.^[2]

Furthermore, local residents have been excluded from participating in environmental resource management, despite their knowledge of indigenous customs and lived experience. This exclusion has contributed to a deteriorated and precarious environmental situation, particularly concerning access to and availability of scarce natural resources such as land and water. Additionally, competition continues to increase between modern and traditional resource management practices, further exacerbating the situation.^[3]

This study was conducted in the context of climate change and high levels of inflation facing the global population. The negative impacts of rapid geopolitical and economic changes on food sovereignty have incurred regulations such as strict control of food diversity. Governments thereby hope to maintain adequate supplies based on the population's needs^[4] and achieve sustainable development for future generations. In this context,

[2] Moroccan Center for Citizenship. Synthesis report on the results of the Moroccan opinion poll on the Green Morocco Plan, May 2023.

[3] Fawzia Borj. Ecology of the Poor: Dynamics of Adaptation and Livelihood Practices: An Anthropological Approach (مقاربة أنثروبولوجية) مقارنة أئروبولوجية وممارسات العيش: ديناميات التكيف وممارسات العيش: مقاربة أنثروبولوجية), Omran Journal, Issue 7/27, Winter 2019, p. 87.

[4] "The Issue of Food Sovereignty: the constraints of indebtedness and free trade", interview with economist Dr. Najib Aksabi, coordinated and reviewed by Ali Aznak, edited by Ali Amouzay, Siyada Network, November 2023.

رهان السيادة الغذائية: إكراهات المديونية والتبادل الحر بالمغرب", حوار مع الباحث الاقتصادي "د نجيب أفصبي، تنسيق ومراجعة علي أزنك، تحرير علي أموزاي، شبكة سيادة، نونبر 2023

Morocco is undergoing a severe water crisis caused by the decline in rainfall, which has led to a reduction in agricultural activities, widening social disparities, and increasing the difficulty of accessing potable water, among other challenges.

According to a national government survey, only 55.8% of Moroccan households confirmed that their incomes covered their expenses. A total of 42.2% of surveyed households have depleted their savings or resorted to borrowing, according to national research on household conditions during the third quarter of 2023. Moreover, the rate of households that managed to save part of their income does not exceed 2.0%^[5], which is attributed to the rise in the prices of basic commodities, and the Central Bank's (Bank Al-Maghreb) decision to raise interest rates to 3% to curb inflation.

Researchers have continuously investigated the impact of climate change on smallholder farmers in the oasis regions of Zagora province. Specifically, a study led by HBS researchers in 2017 examined the annual decline of groundwater levels, estimated at 15-20 cubic meters. Their research identified a corresponding reduction in date production by 34%, alongside the trend of population density surpassing 700 inhabitants per square kilometer of arable land in recent years.^[6] To address these issues in our research, we employed qualitative methods including on-site field observations, digital monitoring techniques, as well as individual and group interviews. We conducted 20 interviews with smallholder farmers, youth, and women to reveal their livelihood experiences and alternative strategies to subsist on farming activities after the continued drought. Additionally, we conducted interviews with civic and political actors as well as researchers in the field, to understand the ethnographic changes amongst the local population. We aimed to identify patterns and the emergence of adaptive solutions to resist the new challenges posed by the contemporary context, preserving the "oasis spirit,"^[7] and the sustainability of the local ecosystem in these areas.

[5] High Commission for Planning (HCP): Information note on the results of the Household Situational Survey, third quarter of 2023.

[6] Houzir Meriem. Oasis Women and Climate Change in Morocco (Femmes oasiennes et changement climatique au Maroc), Heinrich-Böll-Stiftung Rabat, 2017. P 6.

[7] Hassan Ahjeej & Jamal Fezza : Fegig: the Wounded Oasis (فكيك الواحة المكلمة)). Dar Abi Ruqraq for Printing and Publishing, 2020.

1- The Oasis: a paradise for smallholder farmers?

Throughout history, oases have symbolized a paradise for smallholder farmers, particularly through their prevailing agricultural model of subsistence farming. The Er-Rouha ("الرّوحا") region, once a stronghold of high-production subsistence farming, made Zagora province self-sufficient and competitive against agricultural products from outside the region. Today, however, most smallholder farmers are struggling to make ends meet following this wave of ecological challenges. [8]

In this context, a survey respondent (I.T., 63 years old) stated:

"I was not quite aware of vegetable farming before, especially because of the water scarcity. Farming requires certainty and patience to harvest a good product. For example, if I planted coriander in this acre, I would profit much more, as opposed to planting wheat. Some farmers have invested well by growing onions and jute mallow. One acre covered with manure [as a natural fertilizer] with a thickness of 20 centimeters can provide two years of good yields without needing chemical fertilizers and pesticides. What we actually need here is the Mejhoul (المجهول) palm tree. A small palm costs 600 dirhams to plant and about 5 years to get a good crop, then the yield can reach 1 million centimes (10.000 MAD) per palm in the agricultural season. In addition to that, the farmer also has time to plow the land and use it for other crops."

[8] According to historical data, agricultural products in the oases of the Drâa Valley in the Middle Ages were subject to natural influences, including drought, high temperatures, as well as issues related to land and water ownership. This explains to some extent the state of food sovereignty in the oasis today. For more, see Ahmed Bouzidi's : The Social History of Drâa (early 17th and early 20th centuries), a study of political, social and economic life through local documents, MedPro Publications, 1994.

Table (1): The predominant subsistence crops in the oases of Zagora Province

Subsistence agriculture	Palm trees	Vegetables	Fruits	Beans	Livestock	Grains
Types of agricultural products	<ul style="list-style-type: none"> - Bousthammi (بوستحامي) - Al Jihl (الجهل) - Faqous (الفقوس) - Najda (نجدة) - Mejhoul (المجهول) 	<ul style="list-style-type: none"> -Tomatoes -Eggplant -Pepper -Onion -Carrot -Coriander -Jute Mallow 	<ul style="list-style-type: none"> -Pomegranates -Apple -Apricot -Watermelon (all kinds) -Fig 	<ul style="list-style-type: none"> -Lentils -Beans -Peas 	<ul style="list-style-type: none"> -Chicken -Rabbits -Beekeeping -Cows -Goats -Sheep -Camel 	<ul style="list-style-type: none"> - Barley - Wheat

Source: Field Research, September 2023.

From the early 1990s to the present day, the oases of the Zagora province have undergone significant changes in their social, economic, urban, and environmental fabric. This period has seen the emergence of economic activities beyond traditional subsistence agriculture. The development of tourism has played a major role in the country's growth since the mid-1960s, with the implementation of the 1965 Tourism Development Plan. However, by the beginning of the 21st century, tourism development was concentrated in rural areas, especially oasis areas, due to the richness of their natural and cultural heritage.^[9] At the same time, the Morocco Green Plan spurred the emergence of large-scale agricultural exploitations and the expansion of concrete-based construction in the oasis regions. This advent generally coincided with the settlement of many government employees after the administrative division of the region and the emergence of certain economic activities such as services.

[9] Abdellatif Al-Khalifi, Natural and cultural heritage and its role in the development of the tourism economy - a case study: Oases of Drâa and Tafilalet, Arab Council for the Social Sciences, Working Paper Series, Working Paper No. 14, July 2020, pp. 3-4.

Contrastingly, the region also witnessed waves of outward migration of many young people, who formerly provided labor for subsistence farming, to major metropolitan areas in Morocco.

This collective demographic shift affected subsistence farming activities that previously dominated the oasis, prompting many smallholder farmers in Zagora's oases to change their livelihoods and adapt to the new economic activities. As a result, many farmers abandoned their fields that no longer yielded income, as before, and neglected the palm trees that used to guarantee them a permanent livelihood. [10]

Moreover, the widespread adoption of unsustainable practices among smallholder farmers in the Zagora province oasis is of particular concern. Many farmers have participated in excavating wells near the Drâa Valley and clearing trees along its banks, leading to soil erosion in the valley. These practices have exacerbated the drought crisis and contributed to the depletion of the aquifer. As a result, sedimentation has accumulated in the river and obstructed the flow of water in the Drâa Valley.

Another survey respondent (M.A., 80 years old) argues "The wells experienced a resurgence following the release of the Drâa River, unlike the past two years, which were marked by a decline in the water table level. The transition from expensive gasoline to gas cylinders has stirred discord among farmers and adversely affected water pumps, necessitating simultaneous inspection and monitoring during irrigation. Nevertheless, the primary focus of the farmers remains on watering the palm trees, despite the associated financial strain."

[10] Although many families migrated and abandoned their properties, this does not mean they completely gave up on their land, as their return is inevitable. Land in these areas has a symbolic and heritage load and is an essential determinant of group, community, and social status. See: Mohamed Mahdi, *Diary Of A Stay In The Middle Drâa Valley* (Journal d'un séjour dans la Vallée du moyen Drâa, Meknes), Avril 2020, p 10.

Accessed on 02/11.2023.

https://www.academia.edu/76853347/JOURNAL_DUN_SÉJOUR_DANS_LA_VALLÉE_DU_MOYEN_Drâa_Mohamed_Mahdi

In contrast, vegetable cultivation in the oasis has declined, compelling most oasis inhabitants to purchase products from the weekly market, where prices have noticeably risen during the current farming season. Farmers can no longer maintain the requirements of their agricultural activities. Some plant wheat, only to find themselves unable to afford the high costs of irrigation after a month and a half, and end up harvesting the crop prematurely for livestock feed.

The origin of this shift dates back to the 1970s. When Al Mansour Ed-Dahabi dam was built in 1972, it visibly affected the subsistence farming of smallholder farmers, as it was no longer possible to cultivate large and varied areas of agricultural products that could be marketed locally. Local communities became dependent upon the dam's release, causing uncertain and unsafe conditions for smallholder farmers to carry out their usual subsistence farming activities. Starting from the late 1970s and early 1980s, many adjacent lands to the Drâa Valley were subdivided into several villages. The discourse of the farmers in the Drâa region carries a heavy sentiment with the comparison between a "bright and prosperous past" with abundant water and agricultural resources before the construction of the dam, and a "challenging present state of affairs" following the construction of the dam and the onset drought and water scarcity.^[11]

Beginning in 2014, the dam's releases decreased to only once or twice per year, consequentially aligning with the emergence of discussions about climate change and global warming. At that time, smallholder farmers in the Zagora province oasis did not yet fully associate the consequences of droughts and limited rainfall with their circumstances, given their reliance on the releases from the Al Mansour Ed-Dahabi dam.

During this same period, specifically after 2012, many programs were launched to support and incentivize farmers. Most notably, the Green Morocco program (2008-2020) prompted many farmers to adopt modern agricultural practices, receiving support and encouragement from the government.

[11] Ibid., p 8.

This has led to the adoption of modern farming practices, employing technologies such as drip irrigation, and well drilling, alongside further advancements in their implementation.

These developments contributed to the transformation of farming activities into profitable businesses driven by economic pursuits rather than solely as a means of livelihood. These changes elevated a new rural class of landowners, established through the Green Morocco Plan and the Generation Green 2020-2030, as a population focused on profit and capital accumulation.^[12]

In reality, many smallholder farmers have struggled to benefit from agricultural support programs. National programs primarily focus on supporting landowners with at least two or three hectares of land. However, traditional land use in the oases is often characterized by its dispersed nature and small scale, making it difficult for many farmers to qualify for this support.

“Wheat didn't provide a good harvest this year because of the unsuitable seeds, but I'm looking forward to growing carrots here, as we used to sell them abundantly in the market, after having reclaimed this land that I have been cultivating since 2003. The corn here provides a good yield, so I planted it, despite the high cost of the fertilizers that adversely affect the soil. The Mejhoul date palm, if I try it here, will yield a lot, it just requires some financial support to plant it and take care of it to get good results, as seen in the Errachidia province. We also gave up raising cows and investing in them because they require foodstuff and money or we have to wait until the conditions are favorable to apply for government support.”

(Y. M., 47 years old)

Moreover, "since the last flood of the Drâa Valley in 2014, the water table has been very affected, causing suffering for farmers due to the depletion of numerous wells.

[12] Nouredine Zahi, *The Middle Class in View of Moroccan Society's Long-Term Transformations: On Social, Cultural and Political Transformations in Morocco*, Friedrich Ebert Foundation, ed: Amina Boughalbi and Abderrahmane Allal, 2022, pp. 47-48.

Consequently, farmers have been compelled to excavate deeper wells within the oasis. This alteration has exacerbated challenges related to water accessibility and irrigation, culminating in a pronounced scarcity of potable water in some areas", explains Mustapha El Sheikh, a researcher in the anthropology of oases.

Many smallholder farmers have ultimately lost hope in their land, abandoning significant portions due to the land's diminished productivity. The death of numerous palm trees resulting from fires and the spread of "Bayoud" disease has further complicated the matter. Farmers inevitably consider it challenging to place trust in programs supporting agricultural activities, such as the palm planting program, which typically requires an average of five years to bear fruit. The defining factor in the farmer's relationship with the land has become the successful experiments that generate immediate income returns, such as the experience of growing watermelon, which has recently become an identity to the Zagora region, more than its renowned dates.

Image (1): The palm trees restoring their natural splendor following the Drâa River release



Source: Field Research, September 2023.

Thus, for smallholder farmers, short-term profit prevails as their primary motivation, rather than projections for sustained agricultural activity – marking the overall sentiment in most of the oases of the southeast. Some smallholder farmers have been inclined to maximize the economic efficiencies of their fields over selling them, as they no longer possess the same material value as before. For instance, a farmer will likely invest heavily in a single field close to the well that poses high returns, while neglecting his other fields that yield lower financial returns.

The impact of public policies and the expansion of modern farming practices on the agricultural sector persist as the prevailing impetus of marginalization amongst smallholder farmers. Oasis inhabitants construe their negative state of affairs by linking the scarcity of rainfall, water resources, and drought with the declining adherence to Islamic teachings, which advocates for communal values of solidarity, cooperation, and invoking God's mandate to give Zakat (alms) to the benefit of poor. Residents tend to associate these religious trends as the cause preventing "blessings" and "goodness" from gracing the oasis.

2. Drought and Adaptation Strategies

2.1 Farmers' Adaptation Strategies

Oasis residents expected that the solidarity and social economy, specifically agricultural cooperatives specializing in date production, would present a cost-effective market strategy for smallholder farmers. However, Mr. Abdessadek A., a civil society actor, says that **"the practitioners of the social and solidarity economy often combine several levels of the value chain. For instance, a single person may be responsible for the production, canning, and extraction of derivatives. As a result, these practitioners are often overwhelmed, and individualism prevails."**

Cooperatives have advanced towards privatization, mostly as family-run units rather than diverse collectives. Typically, these structures are controlled by a single individual who oversees all activities, including harvesting, canning, and market dates. Despite efforts by economic interest groups to unite farmers, individual economic interests most often prevail.

Currently, there are numerous agricultural cooperatives in the Zagora Province, particularly in the date sector, as illustrated in Table 2. After 2009-2010, the frequency of cooperatives significantly increased, prompting many farmers to rush to establish or join a unit to reap the promised rewards of support opportunities promised by economic interest groups.

These opportunities included guaranteed market dates, the endowment of new palm nurseries and harvesting aids, prestigious health safety documentation from the National Office of Health Safety (ONSSA), and cold storage facilities granted by the Federation at a nominal cost of 20 centimes per kilogram of dates per month.

Table 2: Distribution of cooperatives by product and field of activity in Zagora Province

Product/Field of Activity	Number of Cooperatives
Beekeeping	28
Afforestation	13
Dates	268
Almond	2
Fruits & Vegetables	6
Gardeners	2
Olives	1
Henna Production	25

Source: Regional Directorate of Agriculture, Drâa-Tafilalet Region, 2022.

Economic interest groups – supported by international cooperation^[13] and the Ministry of Agriculture, Fisheries, Rural Development, and Water and Forests – offered farmers favorable prices for their date harvests, often above local market or urban self-marketing pricing standards. These groups have contributed to increased date yields each year, as farmers replace non-productive palm trees with new trees provided by cooperatives. However, despite these efforts, the largest oasis in the country still lacks self-sufficiency in date production, while the national government allows foreign dates of high quality and lower prices to enter the local market. This state of affairs highlights the lack of unified vision among many farmers, despite many receiving consistent government support in equipping their lands.

The participation of smallholder farmers in economic interest groups remains out of reach for many, with membership fees reaching up to ten thousand (10.000 MAD) dirhams. The aim of these measures is to assess and evaluate a farmer's willingness and commitment to cooperative work through monetary investment. Consequently, many farmers from the same village are compelled to establish an agricultural cooperative with affordable membership fees, before joining the economic interest groups. This strategy allows them to secure a position that enables them to benefit from agricultural support opportunities. However, many smallholder farmers retain limited stability over their date farms and continue to market their

[13] Several international institutions and organizations have contributed to the realization of development programs, such as the Climate changes adaptation project in oasis zones (PACCZO), funded by the adaptation fund, in addition to the Oasis Agroecosystems Revitalization Project (OASIL), which is a GEF grantee, implemented in partnership with the Food and Agriculture Organization (FAO) along with regional and local actors. Moreover, the PAGIE project (which supports economic interest groups in the development of the date palm chain in oasis areas) is jointly funded by the Kingdom of Morocco and the Kingdom of Belgium, and is implemented by the National Agency for the Development of Oasis and Arcane Areas (ANDZOA), the Belgian Development Agency - Enabel -, the Regional Offices of Agricultural Investment Ouarzazate and Tafilalt, the Agricultural Advisory Office, and the Agricultural Development Agency.

dates in major cities using traditional methods, which remain their primary source of income.^[14]

Recently, several alternative cooperative models have emerged and succeeded in unifying ancestral communal lands.^[15] One example is the agricultural cooperative in the village of Tansikht (تانسيخت), which stands as the first regional instance of its nature. The project mobilized one million hectares of communal land in cumulative agricultural investment. As part of the project, 199 land-owning farmers from the village of Tansikht in the Tamazouzte (تمزموط) rural commune benefited from a designated portion of the communal land, from which they were afforded approximately 54 hectares, with 36 hectares designated for palm cultivation and the remaining 18 hectares for henna cultivation. The collective farm is equipped with three wells, each no deeper than nine meters, and a large water reservoir. Additionally, solar energy is used to pump irrigation water through drip irrigation technology, enabling farmers to improve their income.

Self-initiated farming projects have also emerged, some of which received support from the Ministry of Agriculture, Fisheries, Rural Development, Water and Forests, particularly through land preparation, irrigation, or access to farming equipment and nurseries. For instance, one research participant (M., B., 48 years old) acquired new palm nurseries – of the "Mejhouli, Faqous, Najda, and Ljihal" varieties in 2011, and planted them in a new plot he had purchased, repaired, and maintained for over a period of three years emerging as arable land next to the Drâa Valley. Additionally, he grows alfalfa and corn, which are essential crops for livestock.

[14] The farmer used to submit the date crop to the federation of cooperatives, and could lose if the dates were not sold, but now, as in the case of the economic interest group in Tamzmout, which is supported by Belgian cooperation, the farmer receives his compensation in advance. Sometimes he even does not have any dates left to sell during Ramadan, as he has to put at least 3 tons in the refrigerator in order to sell them during the Holy Month.

[15] Dynastic lands or collective lands are those lands that are owned by dynastic groups in the form of tribes, villages, or clans, that may be linked by family, ethnic, social, and religious ties, wherein the rights of individuals are not distinct from the rights of the group, as these lands benefit the members and children of these groups alike.

Some farmers have chosen to relocate from agricultural fields within their villages and instead acquire farmland closer to the Drâa Valley, where groundwater is accessible to sustain a variety of agricultural activities, including cultivating palm trees, alfalfa, corn, pomegranates, grapes, and raising livestock and cattle. This migration mirrors the trend towards local subsistence farming and market-oriented agriculture. An illustrative case of efforts to counter this trend of migration was portrayed through the account of a 66-year-old farmer (A.Q.) who received support from the Ministry of Agriculture to install drip irrigation and solar energy systems on his land. Additionally, he installed a reservoir to store irrigation water, as illustrated in the image below. Through this support, the farmer was able to revitalize his land and remain in his ancestral home.

Image (2): A farm benefiting from land preparation subsidies



Source: Field Research, September 2023.

2.2 Strategies for Adapting Public Policies

The oases of Zagora province are distinguished by their proximity to Morocco's longest valley – the Drâa Valley originates from the Atlas Mountains or Upper Drâa – flowing down to the lower and flat expanses of the desert oases of Tan-Tan. This geological gradient of the valley has made the Zagora region prone to several floods, due to its central location

within the valley. In 1972, the Al-Mansour Ed-Dahabi dam was built in response to periods of drought experienced in the post-independence era of the 1960s, marking the Moroccan government's initial response to this phenomenon through the establishment of dam policies.

Most research participants agreed that the construction of the Al-Mansour Ed-Dahabi dam has had adverse effects on the livelihoods of farmers in the Drâa Valley oases. Researcher Mustafa El Sheikh asserts that half a century after its construction, the dam has not led to agricultural economic development in the oases. On the contrary, it has caused drought, palm tree mortality, loss of extensive agricultural lands, difficulties in accessing water, and an overall exacerbation of the crisis. "The dam raises significant concerns as its obstruction of flow and sediment deposition in the Drâa Valley has led to the death of palm trees, particularly in Tagounite (تاكونيت) and M'hamid El Ghizlane (محاميد الغزلان), creating mass graves of palms due to their direct dependence on the aquifer,' he explains. "

The crisis posed by the Al-Mansour Ed-Dahabi dam is exacerbated by the geological composition of the Zagora region, which lacks reliable and sustainable aquifers or water basins, especially as the Faija (الفايجة) Basin has become increasingly difficult to replenish after depletion. Consequently, inadequate supply from the Al-Mansour Ed-Dahabi dam has gradually reduced agricultural production to levels insufficient to ensure food security for local populations.^[16]

Simultaneously, public policies have not responded effectively with long-term solutions to manage scarcity and abundance in remote areas. The consideration of 'environmental sensitivity' has been neglected in striving for a balance between natural resources, human intervention in these regions, and their potential impact on future generations.

[16] Casciarri, Barbara. Drought and 'Natural' Stress in the Southern Daraa Valley: Varying Perceptions among Nomads and Farmers, in Casimir, M.J. (ed.), Culture and the Changing Environment. Uncertainty, Cognition and Risk Management in Cross Cultural Perspective, Oxford, Berghahn, 2008. p. 147-174.

This delicate balance is hard to establish and can easily become unstable. The environment significantly worsened after 2018, with a notable increase in wildfires throughout the region. This problem was further antagonized through the neglect of oases and palm groves by local communities, leading to their gradual decline. Moreover, rising temperatures have worsened the ecosystem. As a result, the regional council launched wildfire suppression programs in the oases, working with local labor and the General Directorate of Territorial Communities (DGCT). This effort included the "Awrach" program, aimed at clearing palm tree nests, which successfully prevented any fires, on record, in the region in 2023 and increased human presence in the oases.

In the midst of this period marked by continuous depletion of groundwater resources, depletion of wells, and its impact on numerous crops (particularly palm trees), elected councils formulated a series of public policies to mitigate and address this longstanding challenge in the oases. In January 2023, the Regional Council of Zagora forged a partnership agreement valued at 260 million Moroccan Dirhams with the Ministry of Infrastructure and Water, the Ministry of Agriculture, and the General Directorate of Local Authorities to establish a series of small water dams or diversion structures across the Drâa Valley over a three-year period.

These structures aim to replenish the aquifer and the wells by harnessing floodwaters that otherwise dissipate in the deserts, storing water for one to two years to alleviate the effects of drought in case of delayed rainfall. Notably, oases have historically experienced the dual challenge of floods and droughts.

Civil society organizations in the region have advocated for the initiation of this project since 2014. The project aims to adapt to the drought conditions in Zagora province, through participatory meetings with farmers and civil society, notably irrigation-focused associations, according to Mr. Al Madani Chikhi, President of the Regional Council. He explains that this participatory approach has made it possible to contribute to the success of such projects: "By putting people at the heart of the management [process] and making them aware of the risks, they become aware of the benefits of the decisions

made on their behalf, and thus, they contribute to their implementation."

The Regional Council has also engaged in the Fayja Aquifer Agreement, which involves drafting a memorandum regarding this water basin in collaboration with associations, residents, and local authorities to manage the exploitation levels of the aquifer. In return, the Ministry of Agriculture supports development projects in the region.

3. Modern Agricultural Activities

Watermelon is one of the most prominent new crops that have invaded the oases of Zagora province. This trend followed enormous profits achieved by large-scale farmers in each agricultural season, and intensive marketing both at the national and international levels. This has prompted smallholder farmers to engage in this new, lucrative trend and benefit from the "watermelon wealth" by collectively investing and exploiting their agricultural lands. Other farmers have rented or leased large farming areas, requiring them to dig new wells to ensure sufficient and adequate irrigation for watermelons, which demand substantial water resources. Notably, these farmers also receive 80% to 100% subsidies for irrigation equipment from the Agricultural Office as part of the Green Morocco Plan. ^[17]

Local challenges have prompted farmers to abandon their lands in some areas of Zagora province, as we have witnessed through our fieldwork in Fezouata (فزواطة) and Ternata (ترناتة) oases among others. The sum of these factors has resulted in "ecological violence" affecting both the environment and the people, threatening the collective identity of the population and the strong bond farmers have with their land. ^[18]

[17] Jamie Fico & Amine Kenti. Living on Luck: The Story Behind Zagora's Watermelons, Heinrich-Böll-Stiftung Rabat. 2022. Pp20.

[18] Al-Khattabi Ahmed. Ecological violence and social conflicts: A sociological study of the multiple impacts of the cultivation of red watermelon in the Drâa Oasis in southeastern Morocco, Journal of Geographical Field and Moroccan Society (مجلة المجال الجغرافي والمجتمع المغربي), Issue 27, May 2019. P315.

The current situation in the oases of the Zagora region has led local authorities to issue a decree in the most recent agricultural season, limiting the area dedicated to watermelon cultivation to one hectare per farmer. This measure was taken due to the significant role this crop plays in exacerbating the water resource crisis in the region, with wells being dug to depths exceeding 150 meters in search of water.

According to the President of the Regional Council, the pursuit of these short-term profits proves difficult to restrain. Farmers who grow watermelons work for three months and earn approximately 120,000 dirhams, which translates to 10,000 dirhams per month over a year. They favor this crop over others, which carry a greater risk of lower yields. Nonetheless, through awareness and educational initiatives, the local population has complied with the decree issued by the authorities in Zagora.

The dual approach of raising awareness about the effects of climate change and promoting agricultural development, as highlighted by the activist Abdessadek A., has failed to effectively resonate with the inhabitants of Zagora's oases and has ultimately contributed to the accelerating impact of climate change. For instance, the adoption of solar-powered water pump technology as a substitute for fuel or gas-powered pumps has paradoxically intensified the depletion of groundwater resources in oasis areas.

Solar pumps operate continuously, enabling each farmer to irrigate their fields, which has led to heightened competition among watermelon growers to deepen their wells. Farmers with deeper wells gain a larger share of water, ultimately resulting in the decay of aquifer sources. The crisis has extended beyond irrigation to include a significant challenge: ensuring access to safe drinking water for the local population. As a result, the government issued a decree exempting water-intensive crops like avocados, new citrus trees, and watermelons from state subsidies. ^[19]

[19] A joint Decision of the Minister of Agriculture, Fisheries, Rural Development, Water and Forestry and the Minister Delegate to the Ministry of Economy and Finance in charge of the Budget No. 1323.22, issued on 17 Shawwal 1443 A.H. (May 18, 2022), determining the modalities for accessing and granting the state subsidy for agricultural water adaptation for agricultural exploitation.

This decision prompted large-scale farmers to seek opportunities in Mauritania to sustain their agricultural activities, leading to substantial financial losses estimated at two billion dirhams, according to the President of the Moroccan Confederation for Agriculture and Rural Development (COMADER).^[20]

Table (3): The amount of water needed by watermelon from planting to production

Steps Needs	Beginning of Growth – Until the beginning of Sowing	From Sowing Until the Harvest Phase
m3/Hectare/Day	30	30
Days per Month	60	60
Water Quantity (m3)	1800	3600
Irrigation Flow Rate	6252 distributors x 4 Liters/Hour = 25 m3/Hour	
Duration per Day	1 Hour 15 Min	2 Hours 25 Min

Source: Zagora Agricultural Investment Center (2014)

The data from Table 3 indicates that cultivating one hectare of watermelon requires approximately 5,400 cubic meters of water during a period ranging from 4 to 6 months, depending on soil type and irrigation system. Watermelon can yield up to 70,000 dirhams per hectare, compared to other crops such as alfalfa yielding at best 18,000 dirhams per hectare.

[20] COMADER's president: "The cost of the decision to ban the cultivation of watermelons in Zagora amounted to 200 billion," Iktisadokom newspaper. Accessed on 10/18/2023
<https://iktisadkom.ma/last-news-maroc/ربط-كومادير-كثافة-قرار-منع-زراعة-البطيخ-بزاكورة-بلغت-200-مليار>

Yet, alfalfa requires more than double the water quantity compared to watermelon, reaching up to 12,000 cubic meters per hectare.* [21]

Hence, the demands of the local population to limit the expansion of watermelon cultivation within the oasis – despite its lucrative returns for large-scale farmers – stem from their lived concerns over its adverse impacts on water resources and the decline of livelihood crops.

In the recent past, inhabitants of the oases were satisfied with cultivating small plots of red watermelon primarily for local markets. However, advancements in seed varieties and irrigation technologies have globalized its production, attracting foreign investors eager to capitalize on the profitability of watermelon. It is expected that the decision to reduce its cultivation will open the door to new investments in palm trees and stimulate the creation of vast farms, such as in the oases of Errachidia, Aoufous (أوفوس), Boudenib (بودنيب), renowned for their high-quality date varieties such as Mejhoul and Fegous. Notably under the Oasis Date Palm Development Plan, [22] the government provides substantial support to large-scale farmers by equipping these agricultural areas with advanced palm irrigation systems, solar energy infrastructure, and water reservoirs.

[21] Yahyaoui Abdelaziz, Abderrahmane Ait Essbaa. Acte du Colloque National " Vulnérabilité des Écosystèmes Oasiens au Changement Climatique : Enjeux et Défis de l'Adaptation", Réseaux de Gouvernance et Développement Durables des Oasis de Drâa, Septembre 2019. P 107.

[22] Ministry of Agriculture, Fisheries, Rural Development, Water and Forests: Presentation of the date palm chain development plan and launching and visiting agricultural development projects within the framework of the implementation of the Green Generation Strategy 2020-2030. Accessed on 10/30/2023.

<https://www.agriculture.gov.ma/ar/actualites/aqlym-alrshydyt-tqdy-mkhtt-tnmyt-slslt-nkhyt-altmr-watlaq-wzyart-mshary-lltnmyt>

4 – Youth and Migration

Zagora's youth inhabitants constitute a significant portion of the greater populace, accounting for 57.4% of the total population, with 30.2% being females and 27% males, according to the 2014 Housing and Population Census. Despite improved access to various levels of education, youth face numerous challenges, most notably the lack of job opportunities in the region, with unemployment rates reaching 16.3% in the province^[23]. This situation prompts many young people to consider migrating to urban centers in search of job opportunities and to support their families, especially given the low productivity in periods of drought. This phenomenon creates the paradoxical "double effect of migration" that, first, deprives the oasis of active labor and, second, deepens the crisis of subsistence farming.^[24] Therefore, land plots and palm trees lack the necessary care, leading to a gradual reduction in cultivated areas and a significant annual loss of palm trees. At the same time, these youth migrants contribute to the flow of economic remittances to their families living in the oasis, ensuring their survival and stability.

The desire of young people to achieve their future aspirations is hampered by a variety of socio-economic challenges, particularly the need to pursue higher education. Due to the absence of a university in the Drâa-Tafilalet region, youth must relocate to cities such as Agadir or Marrakech. Urban relocation entails additional expenses to adjust to the lifestyle in these cities, necessitating family support. These challenges can sometimes serve as a motivation to overcome obstacles and achieve their goals. This determination is evident among the youth from the region who have successfully secured public sector jobs, providing them with a degree of financial stability.

[23] Regional investment Center, Drâa-Tafilalet: Monographie de la province de Zagora, 2022.

[24] Sheikh Mustafa et al: The Double Impact of Youth Migration on Oasis Society (التأثير المزدوج لهجرة الشباب على المجتمع الواحي), collective book: Oasis and Societal Transformations: Man, Space and Society, Fikr Publications, 2023.

Reaching your goals requires individual effort, especially since everyone here grows up in an extended family below the poverty threshold, with limited resources. You have to work during the summer to prepare for school again, to buy books and clothes. But, this shows that you really have a great ambition to make up for what you lack. Thank God we have succeeded and secured jobs in the public sector. These challenges apply to 95% of Tamzmout's population, making it a common and shared reality. If you do not take these steps, you are at risk of falling into drug abuse and unemployment. (F.B., 31)

In recent years, the oases have undergone significant transformations, marked by a growing awareness among families of the importance of education and increased opportunities for girls to access all levels of schooling, including higher education, where they have often excelled beyond their male peers. Securing public sector employment has become an "urgent necessity" to alleviate poverty, reduce vulnerability, and achieve social mobility. These changes have directly influenced the current generation's connection to the land and their investment in the subsistence economy of the oases. This shift is particularly evident, as the oases' productivity has declined due to dwindling water resources. As a result, there is a prevalent belief that engaging in agriculture merely perpetuates the same outcomes experienced by previous generations, following decades of farming that have not significantly improved living standards.

Water is essential for maintaining the oasis's charm and beauty as a heritage from our ancestors. However, in this "forgotten Morocco," life is unsustainable without dates. Although some pursue benefits from projects like "FORSA" and small enterprises, these initiatives are insufficient. Only a few succeed and invest in them, while many others consider migration.

(M. T., 32)

In contrast, the elder generation remains skeptical about entrusting the future of the oasis to the younger generations, given that many young people are increasingly drawn to non-agricultural professions, driven primarily by financial considerations of profit.

This sentiment was evident in field interviews, revealing that parents remain dedicated to their ancestral lands. Despite the challenges of modern oasis life, they continue to cultivate certain areas and irrigate fruit-bearing palms. For them, abandoning these lands would mean relinquishing decades of patience and sustained effort. Despite this divergence in perspectives regarding the oasis's future, the initiative "Chabab Ait Abdallah Al-Ahrar" initiative (مبادرة شباب أيت عبد الله الأحرار) in the Afra (أفرا) oasis has successfully bridged the gap. In 2020, these young individuals spearheaded a solar-powered irrigation project, initiated by gathering financial contributions from villagers who had migrated to major cities and abroad, as well as from local benefactors. The project included five villages: Ait Saket (أيت ساكت), Ait Abdallah (أيت عبد الله), Ait Lahcen (أيت لحسن), Ait Wahi (أيت واحي), and Zaouia (الزاوية), within the local Afra rural commune.

After raising the funds, the association drilled three wells, equipped with solar equipment, arranged in a circular pattern to capture sunlight throughout the day. Local residents were assigned to maintain the system and manage collective irrigation, setting a uniform irrigation fee of 15 dirhams per hour for all users, regardless of land size. The association's system has greatly reduced the high cost associated with gasoline-powered pumps, encouraging farmers to cultivate arable lands that had otherwise remained fallow for decades.

Their work has contributed to the revitalization of the oasis that was once devastated by a fire that annihilated 45 hectares of palm trees in the region in 2021. Hussein Miftah, a member of the project committee, emphasized that **"the initiative also aimed to encourage young people to remain and settle in the oasis and work in the fields, thereby reviving the values of collective solidarity between the villages, which is reflected in everyone's happiness with what has been achieved, hoping that the idea would spread to other areas."**

Picture (3): The Solar-powered irrigation project in Afra Oasis



Source: "Chabab Ait Abdallah Al-Ahrar" initiative (مبادرة شباب أيت عبد الله الأحرار)

Similar youth initiatives highlight the paramount importance that civil society and tribal collectives play as key actors in the development of oasis areas. They contribute significantly to sustainable development and help alleviate the marginalization of southeastern Moroccan communities. Policies and programs targeting oases have shown limited effectiveness or efficiency and a lack of capacity to address climate change. This gap has prompted to the rise of protest movements and civil society leaders, initially through demands related to the drinking water crisis in various oasis areas of Morocco.^[25]

5- Women and the Future of the Oasis

Women of the oases have not been spared the impact of climate change. In a region characterized by cultural traditions, women inhabit multiple roles and acutely experience the disruption posed by climate change in daily life. Women's roles range from agricultural work and livestock rearing alongside their families to managing household chores and childcare responsibilities.

[25] Ismail Ait Basso, Abdessamad Khedairi. Managing Moroccan Oases: Double Discourse and Double Practice, Policy Paper Series, Moroccan Institute for Policy Analysis, 2022.

Accessed on 11/07/2023 <https://mipa.institute/9145>

Women have experienced immense lifestyle changes as a result of globalization and the transition from a subsistence economy to a market economy.

Rural girls are, in their own right, granted greater opportunities to pursue higher education and engage in cooperatives aimed at enhancing local products. These advancements to their position come in alignment with national policies that prioritize the economic, social, and political empowerment of women as a means to achieve gender equality.^[26]

Acknowledging the vital contributions of women to local development, the number of women's cooperatives has dramatically increased from 2,280 in 2015 to over 6,232 by the end of 2020. These cooperatives now encompass 62,821 members and constitute 15% of all cooperatives in Morocco.^[27]

Oasis women are known for their intellect, diligence, negotiation skills, and patience, working tirelessly day and night for the benefit of their families and their lands, contributing to local development^[28] as much as their capabilities allow. In this context, we highlight the story of Hafida and twelve other women from Ksar Ouazagour (قصر وازاكور), who started considering working collectively in a farming cooperative to sell alfalfa and raising livestock in the Tinzouline (تينزولين) oasis since 2016 and until 2020. Each member initially contributed 50 dirhams to rent two large plots of land from a local woman for 150 dirhams per month to plant alfalfa, while assigning a "khamas" [a traditional male worker who gets paid with a share of 1/5 of the harvest] to plow and plant the land.

[26] Ministry of Solidarity, Social Inclusion and Family. Report of the Kingdom of Morocco: "Women's full and effective participation and decision-making in public life, as well as the elimination of violence to achieve gender equality and the empowerment of women and all girls", during the 65th session of the Commission on the Status of Women in 2021. p. 64.

[27] Ministry of Solidarity, Social Development, Equality and Family; Report of the Kingdom of Morocco on "The full and effective participation and decision-making of women in public life, as well as the elimination of violence to achieve gender equality and the empowerment of women and all girls" for the 65th session of UN Women, New York, 2021. p. 64.

[28] Amadou Seyni Saley et al. Words from Oasis Actors (Paroles d'acteurs oasiens), Elwaha N°6 – Genre et Oasis, Réseau Associatif de Développement Durable des Oasis. 2014.

The irrigation responsibilities were alternately shared among all the women, who assigned their sons or another individual to handle the task. Harvesting and bundling the alfalfa were done collectively by the women twice a month, and the bundles were sold within or outside the village, depending on demand, at a price of 8 dirhams per bundle. The project's success prompted them to consider expanding into livestock farming; however, they were unable to find the necessary support to pursue this new venture.

“ We talked to the tribe members about the project and they rejected the idea from the very beginning, and I told my husband: 'We will continue to pursue our goals regardless of their opposition. Anyone who wishes to refuse their wife or daughter's involvement is free to make their own decisions. ” (H. A., 44)

The increasing participation of women in cooperatives may not indicate substantial economic empowerment but rather obscures numerous practices that perpetuate traditional structures hindering women's autonomy. This is particularly evident in family cooperatives where the division of labor remains strongly gendered.^[29]

Opportunities for women to access leadership positions and make decisions remain limited, often overshadowed by male relatives such as fathers, brothers, or husbands. In addition, some local communities still uphold social norms that restrict women from venturing beyond household boundaries. Success for women, in the men's view, is often associated with marrying off their daughters and bearing as many children as possible, as emphasized by Khadija (34 years old). This has led to divergent perspectives of social norms pertaining to the reality of Zagora women: one perspective advocates for assisting women in achieving their future goals through educational investment, while the other believes that preserving traditional lifestyles ensures happiness and stability for women.

[29] Kawthar Beddawi. "Economic Empowerment of Rural Women through Cooperatives: What Paradoxes?", Manboursa Free, 8th issue, Rabat Institute for Social Studies, 2023.

The connection of rural women to the land and agricultural practices has undergone significant changes in their daily lives, largely influenced by climate change and water scarcity. As a result, many have abandoned large portions of their fields that can no longer sustain the cultivation of vegetables, dates, and foodstuff for livestock. This shift has compelled women to surrender activities of raising cattle, poultry, and rabbits, among other livestock, due to the increased financial resources required, unlike in the recent past when these activities provided additional income for households involved.

In response, women resist this situation by raising, at least, a sacrificial lamb for Eid al-Adha during the agricultural season, adhering to local traditions, and avoiding the burdensome purchase from markets or other farmers.

This predicament has exacerbated existing barriers hindering female farmers' access to financing and support programs for smallholders, due to the lack of concerted efforts to bridge the gender gap in accessing productive agricultural resources capable of adapting to climate challenges. Consequently, female farmers are increasing the "death spiral".^[30]

“ Since 2018, I have abandoned our fields that are far from the village, and I am no longer able to visit them even to know their fate after the drought ravaged them. Instead, I only cultivate a small plot near the irrigation well. I feel deep pain whenever my husband informs me that those lands have turned barren and yielded nothing. I pray constantly to God for rain and the revival of our lands. ” (A. B., 46)

[30] Houzir Meriem, op. cit. p16.

Image (4): A Farmer (I. B.) plows his land after 5 years of abandonment due to lack of water



Source: Field Research, September 2023.

The female farmer (A.B.) insisted with her husband to plow the land again and plant alfalfa and corn to provide foodstuff for their livestock. She also asked him to water the palm trees to save them after they had been neglected for a prolonged period. Her husband complied and completed these tasks (as the picture above shows), especially after a new well was erected near their fields through the endowment of a generous benefactor. This initiative inspired young farmers to follow suit in replanting their lands, utilizing the well's capacity to water neighboring fields.

CONCLUSION & RECOMMENDATIONS

Climate change and human intervention in the oasis have caused significant structural transformations in the lifestyle of local inhabitants, with a particular impact on their agricultural practices. Subsistence farming, which once ensured self-sufficiency, is now compromised by declining groundwater levels and ineffective public policy approaches to addressing these changes proactively. To address progress setbacks and plan for the future of the oasis within a sustainable development framework, it is essential to implement more effective and proactive solutions. Despite these challenges, the residents of the oasis, across various social groups, are striving to overcome these obstacles, purporting to restore the nostalgia of the past and revitalize the oasis to its natural beauty and charm – symbolizing their deep connection to the land.

Based on our interviews with the research participants, we derived a set of recommendations aimed at developing the oases of the Zagora province. These recommendations call for a reassessment of the political programs targeting these areas, prioritizing support for smallholder farmers in their struggle to sidestep neoliberal policies.

These recommendations are outlined as follows:

- Foster equity and fairness in the conditions and terms of public support, or subsidies, allocated for agricultural development, thereby addressing the challenges posed by climate change for both smallholder and large-scale farmers. This approach should be specifically tailored to the unique characteristics of oasis regions, incorporating agricultural programs that consider the sensitivities inherent to these environments. Furthermore, proactive measures should be implemented to effectively manage both water scarcity and abundance.
- Strengthen the capacities of smallholder farmers in managing agricultural lands, increasing production, valorizing derivative products, marketing, and achieving self-sufficiency. These outcomes may be accomplished by organizing training courses and providing continuous support to farmers throughout the farming season, in addition to implementing programs targeting behavioral change.

- Intensify projects for the commercialization and marketing of women's products, given their lack of competitiveness in terms of commodity standards or external design. These products should be sold in promotion of their ethical and cultural value, as they contribute to preserving an endangered heritage.
- Provide job opportunities for young people in the oasis to establish roots and contribute to the development of the region, reversing the stereotype of oases being viewed as an area that encourages migration.
- Promote agricultural research to ensure the sustainability of biodiversity and farming, by establishing a dedicated scientific laboratory for oases. This laboratory should include male and female researchers from various disciplines to develop agricultural activities, anticipate the future of farming in these regions, and provide scientific solutions and recommendations to decision-makers.
- Diversify social and solidarity economy activities by embracing new initiatives, while working to create and establish a brand for Zagora's date products to achieve self-sufficiency. This investment aims to raise the monetary value of the farmers' products.
- Adopt innovative construction methods, especially modern earthen building techniques, and implement architectural designs that are resilient to climate change in the oasis environment.

BIBLIOGRAPHY

- **Ahmed El Bouzidi.** The Social History of Drâa (early 17th and early 20th centuries): a study of political, social and economic life through local documents, MedPro Publications, 1994.
- Hassan Ahjeej & Jamal Fezza : فكيك الواحة (Fegig: the Wounded Oasis (المكلمة)). Dar Abi Ruqraq for Printing and Publishing, 2020.
- Fawzia Borj. Ecology of the Poor: Dynamics of Adaptation and Livelihood Practices: An Anthropological Approach (بيئية الفقراء: (ديناميات التكيف وممارسات العيش: مقارنة أنثروبولوجية), Imran Magazine, Issue 7/27, Winter 2019, p. 87.
- Abdellatif Al-Khalifi, Natural and cultural heritage and its role in the development of the tourism economy - a case study: Oases of Drâa and Tafilalet, Arab Council for the Social Sciences, Working Paper Series, Working Paper No. 14, July 2020, pp. 3-4.
- Nouredine Zahi, The Middle Class in View of Moroccan Society's Long-Term Transformations: On Social, Cultural and Political Transformations in Morocco, Friedrich Ebert Foundation, ed: Amina Boughalbi and Abderrahmane Allal, 2022, pp. 47-48.
- Al-Khattabi Ahmed. **Ecological Violence and Social Conflicts: A sociological study of the multiple impacts of the cultivation of red watermelon in the Drâa Oasis in southeastern Morocco**, Journal of Geographical Field and Moroccan Society (مجلة المجال الجغرافي والمجتمع المغربي), Issue 27, May 2019. P315.
- Sheikh Mustafa et al: **The Double Impact of Youth Migration on Oasis Society**, collective book: Oasis and Societal Transformations: Man, Space and Society, Fikr Publications, 2023.

- Kawthar Beddawi. "Economic Empowerment of Rural Women through Cooperatives: What Paradoxes?", Manboursa Free, 8th issue, Rabat Institute for Social Studies, 2023.
- Ismail Ait Basso, Abdessamad Khedairi. **Managing Moroccan Oases: Double Discourse and Double Practice**, Policy Paper Series, Moroccan Institute for Policy Analysis, 2022. Accessed on 11/07/2023 <https://mipa.institute/9145>
- Moroccan Center for Citizenship. Synthesis report on the results of the Moroccan opinion poll on the Green Morocco Plan, May 2023.
- High Commission for Planning (HCP): Information note on the results of the Household Situational Survey, third quarter of 2023.
- Ministry of Solidarity, Social Inclusion and Family. Report of the Kingdom of Morocco: **"Women's full and effective participation and decision-making in public life, as well as the elimination of violence to achieve gender equality and the empowerment of women and all girls"**, during the 65th session of the Commission on the Status of Women in 2021. p. 64.
- Mustapha Fawzi. **A Review Of The Achievements Of The National Agency For The Development Of Oasis Areas And Arcane Trees In The Zagora Province Within The Framework Of The Implementation Of The Comprehensive Royal Strategy To Preserve The Economic, Cultural And Ecological Heritage Of The Moroccan Oases**, 2023.
- **"The Issue of Food Sovereignty: the constraints of indebtedness and Free Trade"**, interview with economist Dr. Najib Aksabi, coordinated and reviewed by Ali Aznak, edited by Ali Amouzay, Siyada

Network, November 2023.

- COMADER's Chairman:" The cost of the decision to ban the cultivation of watermelons in Zagora amounted to 200 billion," Iktisadokom newspaper. Accessed on 10/18/2023.
- Ministry of Agriculture, Fisheries, Rural Development, Water and Forestry: Outcome of the Green Morocco Plan 2020-2030. Accessed on 10/30/2023. <https://www.agriculture.gov.ma/ar/dat-agri/plan-maroc-vert>
- Amadou Seyni Saley et al. Words from Oasis Actors, Elwaha N°6 – Gender and Oasis, Oasis Sustainable Development Network. 2014.
- -Casciarri, Barbara. Drought and 'Natural' Stress in the Southern Daraa Valley: Varying Perceptions among Nomads and Farmers, in Casimir; M.J. (ed.), Culture and the Changing Environment. Uncertainty, Cognition and Risk Management in Cross-Cultural Perspective, Oxford, Berghahn, 2008. p. 147-174.
- Regional Investments Center, Drâa-Tafilalet: Monographie de la province de Zagora, 2022.
- Houzir Meriem. Oasis Women and Climate Change in Morocco. Heinrich-Böll-Stiftung Rabat, 2017. P 6.
- -Jamie Fico and Amine Kenti. Living on Luck: The Story Behind Zagora's Watermelons, Heinrich-Böll-Stiftung Rabat. 2022.
- Mohamed Mahdi, Diary Of A Stay In The Middle Drâa Valley (Journal d'un séjour dans la Vallée du moyen Drâa, Meknes), Avril 2020, p 10. Accessed on 02/11.2023. https://www.academia.edu/76853347/JOURNAL_DUN_SÉJOUR_DANS_LA_VALLÉE_DU_MOYEN_Drâa_Mohamed_Mahdi
- Yahyaoui Abdelaziz, Abderrahmane Ait Essbaa. Proceedings of the National Colloquium: "Vulnerability of Oasis Ecosystems to Climate Change: Issues and Challenges of Adaptation", Drâa Oasis Governance and Sustainable Development Networks, September 2019.

About the publication

The authors : Ismail Ait Bassou & Abdessamad Khadiri

The granting entity and the editor : Heinrich-Boll Stiftung - Rabat, Morocco

Publication Date: October 2024

Design: Jaouad Er-Rabit

Published by: Heinrich-Böll Stiftung - Rabat, Morocco 2024 ©

You may share, distribute, and communicate this content by all means and forms, under the following conditions:

- The original source of the work must be clearly cited, including a link to it, and it should be indicated if any modifications have been made.
- This content may not be used for commercial purposes, and you are not allowed to sell this work or any part of it.
- If you modify, transform, or create new work based on this content, you are not permitted to distribute or make the modified work available in any form.
- The Heinrich Böll Stiftung - Rabat, Morocco, assumes no responsibility for any use of this document by a third party.

HEINRICH BÖLL STIFTUNG
RABAT
Maroc

Previous publications of Heinrich Böll Stiftung - Rabat, Morocco.

2023

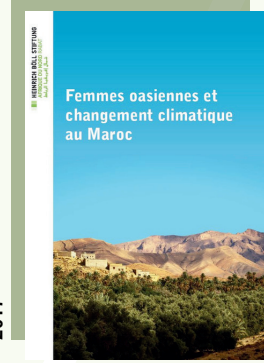


Scan the QR code to download the digital version for free.



Living on Luck The Story Behind Zagora's Watermelons
العيش بالحظ القصة وراء البطيخ الأحمر لزಾಗورة

2017



Scan the QR code to download the digital version for free.



Femmes oasiennes et changement climatique au Maroc

Heinrich Böll Stiftung - Rabat, Morocco.
33, Rue Abou Derr, Agdal, 10000
Rabat - Maroc
05 37 20 20 93/94
ma-info@ma.boell.org
www.ma.boell.org



HEINRICH BÖLL STIFTUNG
RABAT
Maroc