# TARVESTING DSPARED

Climate Change, Food and Water Security, and Migrants of the UAE

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## **EXECUTIVE SUMMARY**

As COP28 commences, skepticism persists regarding the potential conflict of interest with UAE assuming the presidency of the climate summit as an oil-producing state. Simultaneously, the UAE, through local narratives and PR messaging, continues to underscore its regional leadership in steering the climate agenda.

Amid these contrasting narratives, a notable gap exists—comprehensive research on the impacts of climate change in the UAE, government interventions, and the resulting consequences. The challenge lies in generating high-quality, unbiased research within the constraints of the country's restrictions.

This report aims to cut through the noise by producing relevant, in-depth findings and analysis to fill gaps in information about the UAE and extreme climate conditions.

In particular, the report explores the extensive impacts of extreme climate conditions and the far-reaching consequences of policies aimed at mitigating food and water security issues in the UAE.

The report is divided into two main sections, each addressing food and water security individually.

This is particularly relevant as the UAE has extensively promoted the idea that the food at COP28 will present "1.5°C-aligned menus".

The food security section delves into the country's security challenges, examining state-led policies, including extensive land acquisition abroad.

Beyond previous coverage, the report uncovers overlooked aspects, such as the use of acquired land for exports. Additionally, it investigates consumption patterns, shedding light on the country's significant food waste issue one of the highest globally. Finally, it scrutinizes food access for a large demographic of low-income migrants working long hours.

The water section addresses the country's severe water scarcity issues and dissects two major solutions currently in progress.

A team of journalists and researchers based in the Gulf created this report, drawing insights from Gulf-focused researchers and numerous on-theground interviews. The key findings include:

- The official <u>COP28 website</u> proclaims that "Our focus is to deliver sustainable, affordable, delicious, and nutritious food. COP28 UAE will deliver a catering menu which is largely plant based, emphasizing local and regional produce and promoting environmentally-friendly food consumption." Another official page announces that the COP28 Presidency is "striving to show the world how climate-friendly food can be tasty, healthy and affordable." However insights uncovered in this report found that outside the venue, the reality for many workers in the UAE is in stark contrast to "environmentally-friendly food consumption".
- Land acquisition in agricultural countries is a crucial strategy for the UAE's food supply resilience. However, it transcends mere domestic needs, evolving into economic ventures that involve exporting approximately 60% of the produced food. This practice not only exacerbates local shortages but also underscores a global economic dimension, shaping international trade relationships and economic interests for the UAE.
- The UAE emphasizes building resilience in food production by fostering the ag-tech industry. However, the contribution of ag-tech to the overall food supply is limited in capacity. This limitation implies that, for the foreseeable future, the UAE may continue to heavily rely on food imports to meet its domestic consumption needs, highlighting a potential gap between technological aspirations and current practicalities in achieving food self-sufficiency.
- Consumption patterns in the UAE exhibit two contrasting trends. On one hand, there is excess, apparent in the abundance of food and <u>one of the largest food waste issues globally</u>, being addressed at the policy level. The report identifies gaps in research on the long-term health impacts of these disparities. Notably, findings reveal instances where low-income migrants experience hunger due to challenges in accessing cooked meals. This food insecurity among vulnerable communities may have far-reaching consequences, affecting not only their immediate well-being but also posing potential long-term health risks. Further research is essential to fully understand the implications of these disparities on the health and overall livelihoods of these populations.
- The UAE faces one of the highest water scarcity levels globally, with per capita water consumption <u>50% higher than the global average</u>.
- Efforts to increase water production involve technology such as

desalination and cloud seeding. However, both have incompletely understood impacts. Desalination, while essential for meeting 42 percent of the UAE's drinking water needs, is energy-intensive and environmentally impactful. The country's desalination plants are estimated to account for around one-fifth of global brine production. Cloud seeding, while inconclusive in scientific understanding, raises concerns about potential infrastructure damage and flooding due to heavy rainfall.

### **INTRODUCTION**

The Gulf Cooperation Council (GCC) serves as a platform for political and economic integration among Saudi Arabia, the United Arab Emirates (UAE), Oman, Qatar, Bahrain, and Kuwait. Despite their differences, these nations share numerous commonalities, including linguistic and religious ties, similar governing regimes, and a heavy reliance on fossil fuel resources, contributing to rapid growth and development.

They all also have relatively small native populations and a large influx of abundant, low-cost migrant labor that have enabled their urban centers to keep pace with rapid advancements.

Geographically, they are all situated on the Arabian Peninsula, contending with arid desert landscapes that cover a significant portion of their territories. Arable land is scarce, <u>constituting less than 4.5%</u> of their combined land area, posing challenges in ensuring a stable food supply. Consequently, the Gulf states heavily depend on food imports to meet the dietary needs of their growing populations.

This research specifically focuses on the UAE, exploring its unique food and water consumption patterns, strategies for ensuring food and water security, and the broader implications of climate change on these crucial aspects of national sustainability. The timing of this research is particularly relevant as the UAE prepares to host COP28.

It aims to transcend the narrative solely scrutinizing the country's role in fossil fuel production or the divergent local public relations efforts portraying itself as a climate action leader. Instead, this research delves into the intricacies of the UAE's food and water security, as climate change exacerbates challenges in accessing both. The goal is to reveal findings and analyses that add to the limited body of research directly derived from localized, in-depth investigations within the country.

#### **Summarized Methodology**

This research employs a dual methodology, blending primary and secondary research approaches. The research team is composed of individuals with extensive lived and professional experiences within the UAE and the broader Gulf region, contributing a unique dimension to the investigation.

The core primary research method employed was in-depth interviews. The data collection process involved 11 interviews with residents, primarily migrant workers, and insights from seven researchers and industry experts. Maintaining anonymity was a paramount consideration throughout the research process, with all interviewees' identities protected to uphold the security and confidentiality of those contributing to the study, given the associated risks.

In addition to interviews, this research integrated observations and analyzed various secondary sources, including press releases, reports, and other pertinent documentation.

The team behind this report comprises five journalists with both Wlived and professional experiences in the UAE and/or the broader Gulf community. Earlier this year, the Centre for Investigative Journalism supported the team's capacity building for more effective climate reporting in the UAE. The team is dedicated to on-the-ground knowledge production in the country and the wider region. They have undertaken several projects, including this report, in preparation for COP

The analysis involved collaborative efforts, encompassing brainstorming sessions and discussions among the researchers. While acknowledging that individual biases and perspectives may influence the research outcome and findings, the primary intent of this study was to approach research from localized voices, a dimension frequently absent from the prevailing discourse.

While the primary focus of the analysis remains on the UAE as an actor, the investigation frequently extends its purview to encompass the broader GCC region. This approach is motivated by the pronounced similarities, interconnected policies, shared circumstances, and prevalent practices that are prevalent among these nations, thereby enriching the depth and breadth of the study's findings.



## FOOD SECURITY INTHEUAE

## 1. National Food Security and Dependency

#### 1.a. The Country's Reliance on Food Imports

The UAE's abundant oil resources and strategic positioning as a key trading and tourism hub have allowed it to experience significant development.

However, food security remains a significant challenge on the policy-level as the population grows and climate change-induced factors introducing additional instability to the food supply.

With less than 0.5% of its land classified as arable, the UAE encounters significant challenges in attaining self-sufficiency in food production. Due to climate change, the limited arable land is also contending with worsening agro-ecological conditions, marked by limited water resources, high temperatures, and poor soils. These factors continue to hinder domestic agricultural production.

Currently, <u>almost 85% of its food</u> is imported from around the globe, spanning India, the US, Brazil, the UK, Europe, and various other regions.



Top 10 Source Countries for UAE Imports

The vulnerability of the UAE's food supply became a visible concern during the global food crisis of 2008. The agricultural sector in the UAE faced challenges due to the 2007-2008 global economic crisis and unexpected climate conditions in food-producing nations, causing domestic food shortages. In response, affected nations implemented export restrictions on food commodities to ensure domestic supplies and stabilize local prices. These restrictions had a ripple effect on the global food supply chain. For the UAE, this translated into a sudden increase in food prices, which could be mitigated to some extent given its substantial oil wealth. However, it also posed a looming threat of essential food supplies becoming inaccessible, irrespective of price.

While a serious food shortage never materialized in the UAE, there were speculations about its possibility. Reflecting on the global recession, an Indian resident of Dubai, who has worked there in sales for over two decades, stated, "I don't think there was ever a shortage of food in grocery markets, but there was a general anxiety and worry amongst everyone. Many people lost jobs and left the country [foreign residents], and I don't think anyone saw it coming. My wife lost her job, but I was lucky to retain mine, so we could ride through it. There was a general worry in the economy, but I don't remember ever struggling to find food in shops."

Wealthy Gulf governments, including the UAE, never came close to facing food shortages, but they did experience a significant concern, particularly because the price of oil— their primary income source—briefly <u>tumbled by</u> <u>three-quarters</u> in 2008. This crisis unveiled a critical weakness in the UAE's (and other Gulf countries') food security strategy—the nation's dependence on external supply channels, susceptible to disruptions beyond its control.

The consequences of an unpredictable food supply chain have significant implications for the regime. Ensuring a specific consumption capacity and maintaining a comfortable lifestyle for citizens, often supported by substantial subsidies, has historically been crucial for Gulf regimes. Consequently, food security is not just essential for social stability; it becomes a vested interest vital for the survival of these regimes.

With a growing population and increased instability in supply chains due to unexpected global political and economic conditions, exacerbated by climate change, these concerns are heightened. Climate change, marked by warmer weather and reduced rainfall, not only impacts typically more vulnerable agricultural-producing countries but also diminishes the capacity of the already limited agricultural space. In response to these challenges, the country has established objectives to bolster food security. The upcoming subsection will delve into the UAE's ambitious plans, reflecting the nation's determination to address this critical issue.

This approach has shown effectiveness to some extent. Following the COVID-19 lockdown in the spring of 2020, when global panic buying led to reported shortages, the UAE government reassured its citizens through texts and media messages, emphasizing the security of the country's food supply and the well-stocked status of grocery stores.

This, in no doubt, stems from the UAE's efforts, especially since the 2008 economic crisis, to actively secure its food supply chains. The next section will explore these endeavors in more detail.

#### 1. b. Context and Importance of Achieving Food Security

According to the F<u>ood and Agriculture Organization of the United Nations</u>, a country is considered to have achieved food security when it meets the following criteria:

- Ensuring sufficient amounts of quality food are consistently available through imports or domestic production
- Providing adequate access to and resources for nutritious food

In 2018, the UAE launched <u>The National Strategy for Food Security</u> with the aim of positioning the country as the world's best in the Global Food Security Index by 2051 and among the top 10 countries by 2021. While the 2021 target has not been met yet, there has been improvement - the Global Food Security Index (GFSI) ranked the UAE 31st in 2018, and by 2022, it had risen to 23rd.

The commitment to this initiative is reflected in its institutional priority, with the establishment of a <u>Ministry of Food Security</u> under the purview of the Minister of Climate Change and Environment.

The agenda comprises 38 short and long-term key initiatives, guided by five strategic goals that emphasize:

- Facilitating the global food trade
- Diversifying food import sources
- Identifying alternative supply schemes, covering three to five sources for each major food category.

Regarding local food supply, there are efforts and targets in place to develop a comprehensive national system for enhancing local production. One approach to boost local production involves investing in and supporting the application of modern technologies, such as hydroponics, to expand local production capacity. Another focus is on improving the efficiency of existing farming, beekeeping, fisheries, and other local sectors. To support these efforts, various funds and foundations have been established to facilitate research, innovative practices, and direct financial assistance. This initiative also includes efforts to attract investments and promote innovation in the agricultural sector, highlighted by the announcement of 100% ownership for foreign investments in agriculture.

The remaining components of the food-secure supply chain revolve around what is termed "developing international partnerships to diversify food sources." This aspect is crucial for securing the actual supply chains and is arguably the more critical focus, given the limited local production capacity. In many respects, this represents the primary area of emphasis, which will be explored in detail in the subsequent section. Additionally, the food security strategy aims to enhance nutrition and reduce waste, topics that will be addressed in later sections.

## 2. Impact of Land-Grabbing and Exploitation

#### 2. a. Consequences of Land-Grabbing in Vulnerable Nations

In 2016, Sudan's capital witnessed hundreds of demonstrators accusing the government of seizing their land without compensation. Police responded with batons and tear gas, in what was one in a series of ongoing protests against austerity measures and rising fuel prices. Local and international reports stated tat the protesters' claims that the government was expropriating land and leasing it to foreign investors.

An environmental activist from Sudan states, "It was not new; it had been ongoing for some time now." A 2010 report revealed that the UAE alone controlled 2,800 square kilometers of farms in Sudan. "So much of rural Sudan had been suffering from this. Small farmers and pastoralists have been legally evicted and lost everything they had and given to large investors and elites. They are not compensated anything."

While the exact extent of foreign ownership of farming land in Sudan remains unclear, <u>several billion dollars</u> have already been invested by Gulf states in Sudan's agriculture. Significant investments include the Arab Authority for Agricultural Investment and Development, a joint initiative between Arab states, which <u>contributed 64 percent of total investments</u> in Sudan.

In 2021 alone, Sudan <u>received USD 400 million</u> from Saudi Arabia and the UAE to fund agricultural production inputs. In 2020, IHC Food Holding, a subsidiary of the International Holdings Company of the UAE, <u>invested \$225</u> million in partnership with Sudan's DAL Group to develop and cultivate over 100,000 acres of farmland in Sudan. Amtaar Investment, a joint venture between Jenaan of Abu Dhabi and the Sudanese government, operates an irrigation farm at Al Dabbah in the Sahara desert, exporting 230,000 tonnes of dry forage annually to the UAE via Port Sudan.

Experts suggest that GCC governments, particularly Saudi Arabia and the UAE, are also actively seeking a ceasefire in the current civil war in Sudan as the ongoing instability is feared to significantly impact agricultural supply chains.

This issue extends beyond Sudan; land acquisitions across Africa and other parts of the world have been a topic in academic, activist, and policy discourse for some years now. In 2016, <u>Ethiopia faced protests</u> over land

grabbing, leading to the burning of foreign investors' vehicles and buildings. The Ethiopian government's response resulted in the <u>death of 55 protestors</u>, with no subsequent government reforms following the protests.

This issue extends beyond Sudan; land acquisitions across Africa and other parts of the world have been a topic in academic, activist, and policy discourse for some years now. In 2016, Ethiopia faced protests over land grabbing, leading to the burning of foreign investors' vehicles and buildings. The Ethiopian government's response resulted in the death of 55 protestors, with no subsequent government reforms following the protests.

The negative consequences of selling off farms are extensive to rural communities and the wider economy of host countries. Approximately 60% of the food produced on foreign-owned land is usually exported back to the investor's country, seldom benefiting the local community's markets. This practice exacerbates the potential for local food shortages and fails to invigorate the host country's economies, especially considering that many of these nations already grapple with food scarcity, disproportionately affecting their large populations of impoverished citizens.

In many post-colonial states, these lands have been nationalized in recent decades, heightening the vulnerability of small farmers who lack sufficient documentation to prove ownership rights, pushing them into greater precarity. Various foreign businesses also reportedly often pay significantly reduced taxes, if any, often citing the challenges of operating in conflict-impacted contexts. Host governments also tend to undervalue the price of the land sold to investors, and it is not uncommon for leases to extend up to 99 years, essentially depriving local communities of their land without even a chance to receive any indirect rewards. All of these factors contribute to the draining of these usually underdeveloped economies, especially impacting vulnerable rural communities.

This is not a new phenomenon - Gulf states has been buying farms abroad for <u>several decades</u> - though the scale and scope of it escalated in the 2010s, particularly after the fright of the economic crisis of 2008. It was also during this time that criticism from academics, activist groups, and international human rights organizations intensified against Gulf states' attempts to secure their food supply through "land grabbing."

Much like how criticism of human rights practices in Gulf states is often dismissed as racialized or orientalist, local discourse has similarly labeled criticism of their "land-grabbing" practices as unfair. The National, an English-language daily newspaper based in Abu Dhabi and owned by the royal family, characterized the "land grabbing" critique faced by Arab states as "harsh." The article argued that Gulf governments prioritize their citizens in securing food sources and suggested that Western criticism tends to orientalize "Arab sheikhs" by exclusively attributing to them a practice that, according to the article, is also employed by Western states. The column emphasized that Western media employs "pejorative buzzwords", such as 'land grab,' which continue to frame the conversation about food security for the Arab world.

Interestingly, not everything being produced on UAE farms abroad is going back to feed its citizens. A field researcher has pointed out, "You can buy olive oil produced in Morocco on Emirati-owned farms sold in Germany. It is Moroccan labor and resources, but the profits go to the UAE companies owning the farms, of course. And a huge chunk of this is being exported because Morocco stole these farms from the owners and sold it to pocket whatever corruption it could. Europe gets cheap oil, UAE profits off it, the Moroccan State elite pocketed some money in the sale. The farmers who owned the land and still work on it get exploited."

She also hints at the struggle in being able to get data on the extent of exploitation on the farms because farmers and others working there are hesitant to speak about it.

Meanwhile, the UAE's public relations narrative frames these ventures as essential for ensuring domestic food security, emphasizing the agreements as strategic measures to guarantee a stable food supply for its people. The next section will look into the immediate impacts of land acquisition on rural farmers workers, and communities.

#### 2. b. Effects on Farmers and Laborers in these Countries

While some see land grabs as the creation of <u>"extractive zones</u>" detached from their host society and linked to investor states, defenders - like the column in The National - stress potential economic gains for the rural poor.

However, the key issue lies in the limited significance given to the voices and choices of these rural communities, making resistance appear less impactful. Host governments often overlook local demands, resulting in documented cases of displacing indigenous communities, exploiting local farmers, and exacerbating food shortages in already deprived host countries.

The following are specific instances illustrating the impact of UAE's foreign farms on farmers and other rural laborers in the host countries.

#### Case study 1

A UAE-owned farm in Morocco, a massive agricultural company boasts extensive acres of farmland. The company engages local agents to manage the logistical aspects of the farm, officially asserting that all practices adhere to ethical standards. However, the lack of transparency raises concerns about the veracity of these claims.

A farm worker on the ground reveals a different narrative. The employee describes working long hours without regard for personal health, emphasizing a relentless focus on task completion. Comparisons are drawn to previous local smaller farm owners who, despite their exploitative tendencies, offered relatively more rewarding conditions. The current agents, employed by foreign owners, are perceived as more abusive, perhaps fueled by a belief that their foreign affiliation shields them from accountability.

"The large companies buying these farms don't actually know anything about farming here. They have to hire local people to manage us. So, whatever little money we Moroccans get to keep in this agreement, these managers keep most of it. We get nothing."

The worker also highlights a rise in the cost of living due to the inability to sell most of their produce locally, leading to a sense of deprivation despite sustained production efforts.

"Before, local farm owners might exploit us, but there was some reward. Now, the workload is heavier, and these foreign agents seem to think they can be abusive just because they're hired by 'foreigners.' We're producing, but it feels like we're being deprived."

#### Case study 2

A community in Uganda was recently forced to relocate, leaving behind lands where they had lived and engaged in small-scale farming for generations. It was a close-knit community, with several hundred individuals compelled to depart. The narrator expresses the deep roots of their connection to the land, spanning across parents, grandparents, and great-grandparents. The absence of formal land ownership papers had never been an issue until the country decided to sell the farm.

Following the sale, the farm underwent partial cultivation and transformation into tourism spots, altering the landscape of a oncebeautiful place teeming with nature. For the displaced community, it represented not just a picturesque setting but their home and a source of sustenance. Now, ownership belongs to foreigners, and they are denied access to a place that held profound significance for generations.

Given their expertise in agriculture, some family members found employment on another medium-sized farm owned by a Saudi Arabian company. However, the rest faced limited options, either migrating to the city or seeking labor opportunities abroad, including in Gulf states often in precarious conditions - due to the dearth of alternatives in their homeland. To preserve anonymity, the precise timeline and location of their community cannot be disclosed.



## 3. Dubai's Consumption and Environmental Impact

#### 3. a. "Innovating" the solutions to food security

The previous section explored the uncertainties surrounding the UAE's food security, stemming from its significant reliance on food imports. To address this vulnerability, the country has implemented policy interventions, such as overseas land acquisition, which has varied impacts on indigenous communities, farmers, and the broader rural populace.

While a significant aspect of the UAE's food security strategy involves international land acquisition, local discussions place substantial emphasis on the importance of domestic production. This narrative is rooted in the country's efforts in fostering innovation, providing substantial funding, and creating a favorable business environment for the growth of local agriculture, particularly in the tech-based sector. Hydroponics and vertical farms, in particular, have gained significant attention, purportedly playing crucial roles in the UAE's initiatives to enhance local food production.

The country is channeling significant investments into the development and implementation of vertical farming initiatives. It is home to the world's largest vertical farm, ECO 1, sprawling across 330,000 square feet. The \$40 million facility provides greens for passengers of Emirates and other airlines and hospitality groups at the airport. Emirates Flights Catering prepares an average of 200,000 meals a day. Another major player, Pure Harvest Smart Farms, has garnered \$180 million in funding from global investors, hires over 300 employees, and produces over 17 million pieces of fruit and vegetables annually in climate-controlled greenhouses.

Currently, only 20 percent of the fruits and vegetables consumed in the UAE are locally grown. The government is actively promoting the local agtech industry with the aim of increasing this percentage by at least 10%, although a specific timeline has not been outlined. According to Data Bridge, the vertical farming market in the Middle East and Africa is projected to reach almost \$5 billion by 2029, highlighting the significant potential for growth in this sector. Numerous government initiatives are underway to establish the UAE as a regional hub for ag-tech.

<u>Abu Dhabi leads AgTech innovation</u> with over AED500m in incentives to attract global pioneers as part of the AED2bn Ghadan 21 Innovation Programme. This initiative, launched in 2020, supports innovation in highgrowth sectors like AgTech, offering incentives for local and international companies to thrive in Abu Dhabi. The emirate is constructing worldclass infrastructure, including the planned 200-hectare AgTech Park in Al Ain by the Abu Dhabi Developmental Holding Company. This park, the UAE's inaugural fresh produce AgTech industrial hub, aims to produce 39 kilotonnes of produce annually, with the intentions to solidify the UAE's position as the regional farming leader.

Local media frequently highlights these details as key strides in the country's food security plans, underscoring that substantial investments leveraging advanced technologies will boost efficiency, optimize resources, and enhance the nation's self-sufficiency in food production.

However, despite the limited academic exploration, some researchers that have been looking closely at food security in the region have doubts on the tangible impact and feasibility of these ambitious endeavors.

An academic researcher, focusing on the country's food security, says: "These vertical farms can only do so much. They cannot grow everything - at best, right now most farms can grow leafy greens, tomatoes, strawberries, and a few other produce. They also consume a lot of electricity, as far as I can tell, they are not necessarily all run on solar." The researcher has previously lived in the UAE and wishes to remain anonymous.

"It is great that Emirates is producing some of the produce it uses in its meals in its own farm now. Of course, that is great. Why should you import greens or tomatoes from halfway across the world when you can use technology to grow it locally. But it cannot grow everything - or even a large number of food staples - that it needs to prepare a meal in its farm. There are many advantages to vertical farms but to act like technology will be the ultimate solution to food supply is not being serious." These advantages encompass a controlled environment that shields them from harsh weather conditions, the capacity for year-round production, and notably lower water usage—an essential advantage for a country grappling with water scarcity.

"They cannot cultivate staple crops such as grains. Also, I have been to grocery stores in the UAE. The majority of vertical farm 'home grown' produce are salad packs catering to a high-end market, with emphasis on the cleanliness in production - a little along the same lines as the 'organic label'. This is a legitimate market to tap into but it is only a fraction of what makes up a grocery stores and, most importantly, there is very little potential for significant growth."

She highlights that traditional farming faces inherent limitations as well.

Climate change and the region's naturally occurring constraints impose significant restrictions on the potential expansion of traditional farming practices, as per current expectations for the future food supply.

"It's commendable that they are striving for greater efficiency in local farming, researching suitable seeds for this climate, and supporting innovative ideas. However, it will never suffice to fully stock our grocery stores. We will always be dependent on sourcing produce and meat globally, and unfortunately, this reliance cannot be managed in a manner that benefits the planet and the people, especially those whose resources are exploited for these secure food supplies."

The researcher emphasizes that the sustainable and ethical approach to address food supply involves reverting to indigenous dietary lifestyles.

"You're importing chicken from Brazil, and that's not sustainable. Why not promote more traditional diets, like camel meat and grains that can thrive in the desert? Our grandparents didn't consume chicken twice a day every day; it was a rare meal. I'm using chicken as an example, but I mean this in a broader sense. Unfortunately, it's not feasible to have every type of food available from around the world all the time in the middle of the desert in an environmentally friendly way. That's something we need to understand."

Another researcher, who has studied in the UAE and has been focusing on the commercialization of camel milk in the region shares a similar perspective. "I believe that the hyper consumeristic culture and the expectation of having everything available all the time is not sustainable. While there are efforts to promote local and traditional diets, they often struggle to gain widespread popularity. While tourists may be interested in purchasing camel milk chocolate as a souvenir, it remains a niche product, almost exotic in its appeal. This issue is deeply rooted in structural challenges within the 'modern' global identity of Dubai especially."

While local production may improve, both stress for a holistic transformation of the conventional grocery store and everyday meal expectations.

Indeed, the context of COP28 may shed light on this consumer culture to some extent. The promotion of dining options offering a 1.5°C-aligned menu aligns with the goal of carbon neutrality. However, with over 90 food outlets showcasing a diverse range of cuisines, there seems to be a clash between sustainability aspirations and prevailing consumer habits.

#### 3. b. Excess

This section will explore local consumption patterns, particularly in Dubai, and the key industries influencing them. The aim is to understand their collective role in unsustainable food supply and consumption practices.

Despite governmental efforts to secure food and establish a dependable, self-reliant supply chain, the prevailing reality for the majority reveals an apparent abundance of food. Grocery stores, restaurants, and other establishments are rooted in a culture of overconsumption and excess. Dubai, in particular, markets itself as a global city, boasting not only a diverse population representing various nationalities but also a wide array of experiences, especially in terms of the accessibility of diverse food.

This culture of excess seems to have consequences on the food supply: Food waste poses a significant challenge for the country, with the UAE Ministry of Climate Change and Environment highlighting its economic impact, estimating annual food wastage costs at Dh13 billion (\$3.5 billion). According to reports from the Dubai Carbon Centre of Excellence, per capita waste generation is measured at 2.7 kg per day in the UAE, significantly higher than the European average of 1.2 kg per day.

This is especially relevant because food systems account for one-third of global greenhouse gas (GHG) emissions, encompassing everything from production to consumption. The supply of food brought into the UAE, whether through imports or its own offshore production, is carbonintensive, exceeding actual needs due to significant waste generation (which, in itself, contributes to carbon emissions during disposal).

While the UAE acknowledges and acts on the issue by raising awareness and promoting tech-driven solutions like AI to tackle food waste, there remains a lack of transparent understanding regarding the actual impact of business-led initiatives addressing food waste.

A young UAE climate activist says, ""The UAE really encourages throwing money at problems as solutions. They don't realize that is part of the problem - the solution does not always have to be business-led."

For COP28, The United Arab Emirates (UAE) is preparing an 'Emirates Declaration on Resilient Food Systems, Sustainable Agriculture and Climate Action' which we urge all countries to sign. However, experts suggest that pledging to take action alone is not enough and any promises made at COP 28 need to be accompanied by robust follow-up protocol.

## 4. Accessibility and Impact on Vulnerable Populations

#### 4. a. Accessibility of Food for Vulnerable Communities

The previous section delves into the apparent abundance of food supply and access in much of the UAE. However, this situation does not reflect the experiences of all demographics.

A marginalized class of underpaid and exploited immigrant workers exists in the UAE and the broader Gulf states. This marginalized group faces significant challenges, including often being underpaid, experiencing wage theft, and enduring extended working hours—sometimes up to 16 hours at a stretch. Despite the illegality of such practices, they persist as unfortunate realities within this demographic.

This section will analyze the disparities in food access for this group compared to others who appear to experience it in abundance.

Overt poverty may be scarce in many Gulf states as, on a policy level, the states distance themselves from any association with visible homelessness or poverty, choosing to conceal these 'societal/structural failings' from public spaces. However, the labor class, often exploited and vulnerable, does face challenges in accessing an adequate amount of nutritious food. Labour camps, work sites, and tucked-away high-density neighborhoods where low-income expatriate workers reside are areas characterized by inadequate nutrition. This aspect, addressing the challenges faced by the migrant labor class in accessing nutritious food, has not been extensively explored in existing documentation of their exploitation. This section aims to unpack and shed light on this overlooked dimension.

Ali\* a laborer from Pakistan and employed in a factory, sheds light on the challenges he faces in terms of timely payment. He reveals, "I do not get paid on time, and whatever I receive, I have to send back home. That is my priority." Despite engaging in strenuous physical labor, his primary focus is remitting money to support his family, relegating personal expenditures to a secondary position.

Living on a budget of approximately 100 AED (USD 27) per month for himself, he occasionally forgoes meals due to fatigue or the constraints of time. In his own words, "I am better than many. I am grateful in whatever way I can support my family. But myself? I am just staying alive however I can." Ali's diet mainly comprises simple fare like daal and rice, occasionally "[...] I was not paid for such a long time, and I had sent pretty much most of what I had to my family. I remember looking for coins I might find around my things [...] to have enough to buy eggs or something to eat with rice." skipping meals even when provided with food at work. He attributes this to the demands of long working hours and the desire to save money for remittances, stating, "I just want to sleep. I want to save money and focus on sending as much back. What is left from that is what I use to live."

Shivank\*, recounting a period of prolonged unpaid wages, shared, "There has been a time when I was not paid for such a long time, and I had sent pretty much most of what I had to my family. I remember looking for coins I might find around my things, misplaced ones, to have enough to buy eggs or something to eat with rice." In times of financial strain, he relied on the support of friends, emphasizing the mutual assistance among them. He reflected, "My friends helped me. We always help each other, whoever has more or less, depending on work. We will manage. But you also feel bad asking for too much at times."

Diverse dietary preferences influenced by traditional diets contribute to variations in nutritional intake and energy levels. Akiki\*, a respondent from Uganda who is now in Dubai, notes that his accustomed meals have always been predominantly meat-based. He expresses dissatisfaction with the predominantly rice-based meals provided by his employer. "Without meat, I am not full. That is just how we are raised. Here I get a meal of mostly rice and some meat. It is not proper food for me. We African workers have complained about this to our company."

Several workers have also pointed out the significance of charitable donations and food distribution initiatives by individuals, businesses as well from the government, particularly during Ramadan. While these contributions are acknowledged as valuable support, there remains a level of uncertainty associated with relying solely on such handouts.

Access to the food supply also differs based on housing. Residents in labor accommodations are usually <u>not allowed to have cooking devices</u> in their rooms, but they do have access to a shared kitchen and mess area. However, instances occur where the communal kitchen fails to provide adequate meals or is completely unusable. In such cases, residents often resort to using small hot plates in their already cramped rooms. With six to seven people sharing these rooms, cooking becomes inconvenient, and they risk consequences if caught. This presents numerous challenges that hinder access to cooked meals.

Often at work or in these messes, the food prepared can also vary in quality.

"I worked on a huge project, one of the largest in the UAE ever. At one point, I was working with one company and then another. For both, they would provide lunch because we were on site for 8 hours straight. The first was great and ample. For the second, they had hired a contractor to organize food, and we all got sick eating it whenever we did. It also just looked like not edible food. Most of us stopped and would just bring from home. But I am sure there were some more vulnerable workers who just were not eating and waiting to go back home to eat because they were not able to cook and bring food, and ordering is so expensive," says Amna\* who worked as an assistant to a manager, and so was relatively better paid. However, since the site was so far away from the main city, ordering food would have cost AED 30 or more, and for many, this is almost as much as - if not more - than what they are making in a day.

In conclusion, the combination of demanding work conditions, low and often unpaid wages, and inadequacies in the provision of meals by employers creates a scenario where access to food becomes highly variable. These challenges underscore the need for a more comprehensive examination of the intricate intersection between labor exploitation and food security within these communities.

The upcoming section will delve into the COVID-19 lockdown as a brief case study, shedding light on how these challenges worsened food security, underscoring the potential crisis-like impacts of unforeseen events on vulnerable populations

#### 4. b. Impact of COVID-19 on Food Access

In the initial months of the pandemic, as lockdowns were implemented, the exploitation, vulnerability, and food insecurity experienced by specific demographics became starkly evident.

Kayin\*, a Nigerian migrant worker, faced job loss and found himself without a home, spending nights in a park with a few others until the embassy arranged a flight back to Nigeria. Upon his return, he secured another job, not necessarily superior to the previous one but offering better wages than what he earned in Nigeria. He emphasized the crucial role his salary plays for the family as he sends a larger portion of it back home each month.

"It has never been easy but I have never worried about food and shelter like I did back then. We would get meals from the people in the neighborhood who would help us. But now I am scared. So I don't send all money back home, I send a bit less and I save some for a rainy day. But this means it is a "[...] They had hired a contractor to organize food, and we all got sick eating it whenever we did. It also just looked like not edible food." bit less money for my whole family back home."

Several reports also came out during the pandemic of people stranded in cramped labour accommodations after companies effectively shut down and abandoned them after projects, such as in construction, were shut down suddenly. They had no money to leave or fly back and no longer had any income coming in. Media reports pointed out migrant workers stating that they were "starving" and though there were local food/donation drives, it is uncertain how many of these workers got these donations.

"You feel like cattle sometime. They drive you to work, they drive you back to your bed and they give you just enough to keep going. And suddenly when they can no longer take care of the basics, we are helpless. I basically did not eat for a few days. I just had water and some bread that I ate. It had fungus on it so I cut around it because I had no energy left in me at all and I needed some energy. And then some people came with donation," says a construction worker who experienced being 'abandoned' by the company he had been working for, for over a decade.

Another migrant worker - a food delivery driver - had to ask his family in India send money to him so he has enough to be able to eat for three months during the pandemic when work had stopped.

"I felt horrible asking them for money. They put so much money in sending me here and they barely have anything themselves but if I didn't take that I would - I don't know what would happen to me. I spend many days just having one meal a day and eating little bit just to get by. But it got too hard to survive and I had to ask them for money."

It's not only lowest-income migrant workers who have faced such challenges; many others accustomed to living paycheck to paycheck suddenly grappled with the uncertainty of ensuring a stable food supply. "We have always lived paycheck to paycheck because of all the responsibilities my father has, and living here is expensive. I go to university here, and he pays for it," says Fatima\*, a 19-year-old migrant whose father, the sole breadwinner, lost his job during the pandemic. Her father, a technician who has lived in Dubai for three decades, found himself unemployed when the pandemic hit.

"With the pandemic, he lost his job, and we suddenly had to start making tough decisions on what to spend on. My tuition was a no-brainer, as were rent and all, and my grandmother's medicines. So, this meant groceries were cut down a lot," Fatima\* shared. "We stopped eating meat and getting fresh fruits and vegetables or ordering in. Lots of canned food. The end of

"I basically did not eat for a few days. I just had water and some bread that I ate. It had fungus on it so I cut around it because I had no energy left in me at all and I needed some energy." each month was very hard. We would be eating less than our normal diets, but what to do."

While the most challenging conditions and uncertainties about access to food improved for these vulnerable communities after the peak of the pandemic, it exposed an underlying disparity, revealing layers of systemic challenges.

#### 4. c. Health Impact on Migrant Workers

Some research has examined the health impact of migrant workers in the Gulf, specifically addressing issues related to heat exposure and extended working hours. Documentation indicates a significant number of apparently healthy workers experiencing fatal heart attacks or natural causes, raising concerns about overworking and unreported workplace accidents. According to an anonymous health and safety expert, companies may avoid financial responsibility for natural deaths, potentially leading to underreporting.

While this report does not extensively explore the influence of dietary habits on workers' health, some interviewed workers did express concerns about the impact of their diets, among other factors, on their health and well-being.

Maria\* is a 30-something Filipino who works as a domestic worker and visits various houses for cleaning. She has just enough time to complete her tasks and then hops into the company car to reach the next house. Often, her only meals occur if any of the households she works in offers her some.

"Despite this, I always inquire if I can pack some to share with the other maids and the driver because they do the same when they get food. Typically, I only manage to grab a bag of chips or some fruit, along with milk or juice from the shop, consuming it on my way to and from work. Unfortunately, I lack the time, energy, and space to cook." She resides in a flat consisting of three rooms and one kitchen, shared with seven others.

She says that she has experiences menstrual irregularities and gets pains in her abdomen - but is not sure about why it happens and has not been able to see a doctor yet.

A 2020 study has also examined the link between the duration of residence and type 2 diabetes in male expatriate workers from India, Pakistan, and Bangladesh in the UAE. A rise in type 2 diabetes prevalence is noted after 5 years of residence. The study focused on South Asian migrants who sought better job opportunities in the UAE, with a majority (68%) originating from rural areas and facing precarious socioeconomic conditions. The majority (70%) were married, and of those, 85% lived apart from their families.

In the broader context, the lack of comprehensive health data makes it challenging to fully grasp the implications of the difficult working conditions and the financial constraints preventing access to cooking facilities for a significant segment of the population. This situation raises concerns about the nutritional well-being of individuals who are potentially deprived of access to the necessary meals, posing potential risks to their health. Climate change exacerbating heat conditions, coupled with challenges in securing proper meals, is anticipated to compound the adverse impact on people's health.



## WATER SECURITY IN THE UAE

## 1. Water Scarcity in the UAE

#### 1. a. The UAE's Escalating Water Scarcity

In 2020, <u>a report emphasized</u> the critical need for the Gulf Cooperation Council (GCC) region to boost its water supply by 77% in the next 30 years, given the rising demands of its expanding population. Various factors exacerbate this challenge, including rural-to-urban migration, population growth, inadequate water management, crumbling infrastructure, and governance complexities.

The UAE is specifically categorized as facing "extremely high water stress," according to recent data from the <u>WRI's Aqueduct Water Risk Atlas</u>, highlighting a global trend where 25 countries, housing a quarter of the world's population, regularly experience extremely high water stress, depleting nearly their entire water supply annually

The UAE's water scarcity challenge arises from limited natural water resources, with groundwater reserves, historically <u>supplying half to two-</u> thirds of water consumption, facing severe depletion. Despite these challenges, the UAE sustains one of the world's highest per capita water consumption rates, reaching around 500 liters per day—<u>50% above the</u> global average.

This incongruity between water supply and demand is driven by factors such as population growth, expanding industrial activities, and high agricultural and landscaping needs. Irrigated agriculture, constituting over half of total water usage, stands out as a primary water consumer, despite the limited arable land available and the minimal local production of consumed food. To address this challenge, the UAE is actively exploring alternatives such as hydroponics, as mentioned earlier. Hydroponics is acknowledged for its significantly reduced water requirements compared to traditional agriculture, though its production capacity is somewhat limited and is applicable as a replacement for traditional agriculture in specific crops.

The next section will look at UAE's plans and goals to improve its water security.

#### **1.b. Pursuing Water Security Objectives**

In September 2017, the Ministry of Energy and Infrastructure introduced the UAE Water Security Strategy 2036, a comprehensive initiative aimed at ensuring sustainable access to water in both normal and emergency conditions. Aligned with local regulations, World Health Organization standards, and the UAE's own vision, the strategy outlines the objectives to transform the country's water landscape.

The overarching goals of the strategy include a 21 percent reduction in total water resource demand, elevating the water productivity index to USD 110 per cubic meter, mitigating the water scarcity index by three degrees, enhancing treated water reuse to 95 percent, and increasing national water storage capacity to a two-day supply.

These objectives are underpinned by three main programs:

- the Water Demand Management Programme
- the Water Supply Management Programme, and
- the Emergency Production and Distribution Programme

The strategy aims to halve average consumption per capita while establishing a water supply system storage capacity lasting two days under normal conditions, equivalent to a 16-day capacity in emergencies and enough to sustain water supply for over 45 days in extreme emergencies.

Successful implementation of the Water Security Strategy 2036 is projected to yield savings of AED 74 billion and reduce carbon dioxide emissions associated with the water desalination process by 100 million metric tons.

In a concerted effort to curtail demand, a significant component of the strategy centers on diminishing water consumption in agriculture. For instance, the government has been implementing new irrigation methods, such as the introduction of drip irrigation, which is reported to be reducing water consumption by 46 percent reduction in comparison to traditional techniques. The incorporation of hydroponics is valuable due to its water recycling capabilities, although it comes with drawbacks such as high electricity consumption and limitations on the types of produce it can effectively cultivate, as discussed earlier.

Beyond technological interventions, initiatives are underway to encourage traditional farmers in the UAE to transition from fresh to treated water, contributing to the broader agenda of cultivating water-conscious practices.

In tandem with these measures, there exists a comprehensive strategy focused on raising awareness and fostering a collective commitment to reducing the demand for fresh water across various fronts.

Numerous pathways to enhance water supply are also being explored. At one point, there was speculation about the feasibility of <u>transporting ice</u> from Antarctica to address Dubai's water challenge as an Abu Dhabi firm claimed to make an effort to bring ann iceber to Fujairah's coast; however, this notion was swiftly deemed impractical. Unlike food, which the country can acquire through lands of other nation-states, water - it seems - cannot be done so. Therefore, policy development, the integration of advanced technologies, and innovative approaches are being deployed in identifying the combination of ways that water supple can be enhanced.

Ongoing efforts include the construction of a series of dams, constructing the world's largest aquifer storage and recovery project, as a strategic reserve, and turning to technological avenues - such as desalination, cloud seeding, and reverse osmosis desalination plants - to work on increasing water supply.

A Gulf water security researcher who wishes to stay anonymous said, "The 2017 plan was well-received as the UAE faces a high risk of water scarcity, a challenge acknowledged by the government. While technology and innovation are valuable aids, they come with certain considerations. Ultimately, the imperative is to decrease the demand for water. Reduction measures, such as reconsidering the maintenance of manicured parks and gardens, are essential. This is vital for sustainability, considering the inherent nature of the desert. The path forward necessitates a reduction in demand—there is no alternative."

The following section will explore the approaches to increase supply, examining their advantages, disadvantages, and overall impacts.

## 2. Water Security Solutions Underway in the UAE

#### 2. a. Desalination

Currently, the UAE relies on desalination to fulfill <u>42 percent of its drinking</u> water requirements, and it aims to further enhance this capacity with a planned USD 2 billion investment in new desalination plants. The newly installed desalination units in Umm Al Quwain, Dubai, and Abu Dhabi will collectively desalinate 420 million imperial gallons per day. The water desalination sector is experiencing an annual growth rate of three percent, with the world's largest desalination plant at the Al Taweelah Power and Water complex in Abu Dhabi set to commence operations this year. With a daily capacity of 909,200 cubic meters, it surpasses the world's current largest RO plant by 44 percent.



Source: KAPSARC

Despite being a crucial water source, desalination remains energyintensive, with limited integration of renewable energy in existing plants. Further, desalination plants generate a concentrated byproduct known as brine, which is rich in pollutants and poses a severe threat to marine ecosystems, contributing to hyper-salinity, temperature fluctuations, and oxygen depletion. A <u>UN-backed report in 2019</u> revealed that the world's desalination facilities, producing 95 million tonnes of potable water daily, concurrently discharge almost 1.5 litres of brine for every litre of water. In the UAE, these plants are estimated to contribute approximately <u>one-</u><u>fifth of global brine production</u>, with the entire output released directly into the Gulf. This is a cause for concern given the Gulf's shallowness, leading to rapid salinity increases, and impacting marine life.

A marine researcher based in the UAE suggests that the adaptability of marine life may be underestimated. <u>Ongoing research</u> is being conducted on this aspect: contrary to expectations of evacuations or micro-extinctions, areas with higher salt concentrations near desalination discharge outlets have witnessed a notable flourishing of life-forms. Khalifa University's research highlighted that these outlets host the only organisms for hundreds of meters, challenging prior beliefs about coral vulnerability to brine and desalination by-products. The study suggests that certain coral types are more adaptable to salinity changes than previously thought.

#### 2. b. Cloud-seeding

"In other parts of the world, cloud seeding may not be a familiar topic for the average person, but here in the UAE, it's ingrained in everyone's understanding. It's a common topic in daily conversations, with people speculating about cloud seeding when it rains. Someone might mention they read in the news that cloud seeding was scheduled for the week, or during warm and dry spells, people express a collective hope for cloud seeding. It has seamlessly become a part of everyone's vocabulary," shared a resident of the UAE.

The UAE, characterized by an arid climate receiving less than 100mm of annual rainfall, experiences extreme dryness across the region, except for the coastal areas and the border with Oman, where humidity is comparatively higher. In response to the escalating impact of climate change, resulting in hotter and drier conditions, the UAE is actively exploring strategies to augment its water resources.

While there is uncertainty about the efficacy of cloud seeding in the scientific community, particularly in the West, it remains a significant undertaking in many parts of Asia. The <u>GCC, the broader MENA region, and China</u> are all vigorously pursuing cloud seeding initiatives.

Among the MENA region, the UAE stands out as a pioneer, having engaged in cloud seeding for several decades. It was initiated in the 1990s and has collaborated with various international institutions, private companies, and research organizations across the years. Cloud seeding, a method for enhancing rainfall, entails introducing materials like salt flares into clouds. The United Arab Emirates employs two seeding agents: traditional silver iodide and a newly patented substance developed at Khalifa University. Pilots inject these materials at the cloud base, and the seeding process, involving hygroscopic molecules binding with water vapor particles, aims to increase droplet size until precipitation occurs. Scientists in the UAE have asserted in both local and international media that this process has negligible environmental impact from the seeding materials.

Overall though, there is limited consensus on its utility, effectiveness, and long-term impacts in the broader scientific community. However, steering clear of delving into the scientific intricacies, which are beyond the scope of this research, it is crucial to explore the implications should the UAE succeed in augmenting its rainfall. Recent instances, whether due to natural occurrences or cloud seeding, highlight possible impacts.

Around New Year of 2022, cloud seeding coincided with a storm that <u>yielded</u> 5.6 inches of rain in three days—surpassing the typical annual precipitation in the United Arab Emirates. Heavy rainfall during the summer of 2022 also led to flash floods, necessitating the <u>evacuation of over 3,800 people</u> and causing damage to homes and critical infrastructure. Seven people died in the floods, all of them Asian migrants.

The UAE's National Centre of Meteorology (NCM) told local press that climate change is responsible for the increased frequency of heavy rains, which can cause flooding. It was also not the only country in the Arab Gulf to experience severe flooding at that point - Bahrain, Kuwait, Oman, Qatar and Saudi Arabia also witnessed heavy rainfall the month prior, something the arid region has not seen during the summer in over 30 years. However, it does raise concerns about the country's infrastructure capacity to handle heavy rains - especially in smaller emirates with less developed infrastructure.

"Regrettably, I don't believe there are any resilience plans in place to ready urban cities in the Gulf for flooding. While there may be financial resources to assist with damages, it seems to be the entire strategy at the moment. The absence of resilience measures leaves the most vulnerable populations disproportionately affected."

Overall, while there is inconclusive scientific evidence about the effectiveness of cloud seeding, if it does work and the UAE can increase water supply through enhanced rainfall, it will need to upgrade its infrastructure in vulnerable areas to cope with the additional water.



### **CONCLUDING REMARKS**

In summary, this study provides a broad exploration of the intricacies surrounding food and water security in the challenging climate of the UAE, shedding light on policy impacts aimed at adaptation. Delving into both the production and consumption aspects of the food supply chain, the research exposes vulnerabilities exacerbated by structural issues, particularly affecting those most at risk, amidst a backdrop of worsening climate conditions.

The report scrutinizes mitigation efforts, emphasizing the need for a nuanced understanding of the complete impacts and limitations of technological interventions, calling into question the efficacy of perceived 'solutions.'

Analogous challenges exist in the realms of both water and food, underscoring the Gulf countries' dependence on external sources due to high demands and natural constraints. As COP28 unfolds, this study becomes a timely resource, contributing to the discourse on the UAE's role in climate action and its broader implications for global sustainability. It critically examines the PR surrounding COP28 meals, probing deeper into the narrative of 'sustainability' and climate-friendly claims.

Rooted in a localized perspective often absent from broader discourses, this research aims to catalyze further exploration and discussion in the media and research spaces. By highlighting issues briefly covered in this report, it seeks to inspire a more in-depth understanding of the intricate findings and challenges, fostering informed dialogues on critical climate realities in the Gulf region.

Moving forward, we strongly encourage those generating information about Gulf states to collaborate with local voices. This collaborative approach is essential for gathering insights that go beyond the commonly covered narratives. Only through such collaboration can we break through the usual discourse and cultivate a profound understanding of the realities on the ground. By amplifying local perspectives, we can contribute to a more nuanced and comprehensive portrayal of the complex challenges and dynamics within the Gulf region.

\*Names changed