

# The outlook of future food security in the United Arab Emirates.

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## Introduction to Food Security

The International Food Policy Research Institute defines food security as the condition in which all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Recently, we have experienced numerous changes to the environment around us, including the rapid increase in the population size. It is expected that by the year 2050, the world's population will reach 9.7 billion. Therefore, the demand in food will increase rapidly. The question at hand is: will there be enough food and water in the future?

According to Maslow's hierarchy of needs, a five-tier model consisting of basic human needs, the first need a human has to fulfill to be able to grow are his physiological needs. Physiological needs include air, food, shelter, drink, and sleep. Science tells us that a certain level of protein and energy is needed for our dietary intake to be sufficient; yet not everyone has access to the minimal required levels. With climate change, many lands are being destroyed and are soon expected to turn into deserts, threatening the conditions of our available physical space to grow crops. Thus, not having enough arable lands will impact our agricultural sector production negatively.

In the United Arab Emirates, revenue is mainly derived from its oil exports. The past decade has introduced a more diversified portfolio of revenue, such as tourism and real estate. With an increase in the number of immigrants, the total population in the UAE as of March 2018 is over 9.5 million. With regards to the government of the UAE being constantly alert, it recently appointed H.E Mariam AlMheiri as a Minister of State for Future Food Security. This action has helped raise awareness about the challenges the UAE might face in the future regarding food security, and laid grounds to being proactive.

Amongst the UAE's numerous Sustainable Development Goals, its first SDG is no poverty, followed by zero hunger. For instance, promoting sustainable agriculture and initiatives to fight hunger locally and globally fall under zero hunger. Thankfully, people on this land never experienced an insecure food day, unlike others around the world. However, it is important to be aware of the challenges facing this country.

In this paper, we will see a list of challenges and proposed solutions regarding the outlook of future food security in the United Arab Emirates.

## Challenges facing the United Arab Emirates

The United Arab Emirates lies on the eastern part of the Arab World, mainly being a desert stretch of land surrounded by the Persian Gulf. Its climate is very high and humid in the coastal area, where most of the population live. The temperature tends to cool down around 20 degrees Celsius during the winter time which is around November, when rainfall is expected. Due to climate change, the UAE has experienced minimalized rainfall over the past 3 years. Amongst the characteristics described above, we can deduce that water scarcity and little arable land are two of the challenges UAE is facing, with regards to food security. Other challenges include: finite resources, population growth, changing tastes in diets, as well as the way food is produced, stored, processed, distributed, and accessed.

Due to the high standards of living and global trade in food markets, consumers have a variety of options to choose from when it comes to grocery shopping. With a higher disposable income at hand, higher purchasing power is created. Recent studies such as one conducted by the World Economic Forum states that “As people become more affluent they start eating food that is richer in processed foods, meat and dairy;” thus consumer tastes began to change. Having said that, if demand continues to increase in the future with a limited supply, a shortage in food markets will lead to negative consequences.

Another fact threatening food security is the loss of agricultural land worldwide to urbanization. However, the UAE is currently tapping into future solutions for such scenarios, such as high-tech agriculture and research and development.

The growing population of the UAE is an issue to be taken into consideration, since the expats outnumber the locals, and tourism is growing. The more the people, the more use of electricity required and food consumed, both being highly water-intensive. It is becoming hard to keep track of how food is being distributed amongst the citizens. The number of food outlets is expanding too, thus attracting more customers, leading to higher demand for food. Food consumption is positively related to water consumption; 70% of the world’s water consumption is due to the production of food. H.E Mariam AlMheiri states that “we have a big issue with water in our country,” thus reinforcing the importance of finding ways to preserve water for future generations and making it available.

## Proposed Solutions

Technology has attributed significantly to the way societies are changing worldwide. It is currently playing a key role in finding solutions to solve matters revolving around food security.

Vertical farming, also known to be the future of farming, is a technique of growing plants indoor, without using soil and using less water. There are three famous ways to grow indoors: hydroponics, aeroponics, and aquaponics. Hydroponics is a water-based technique of growing plants, without soil. Aeroponics involves spraying the crops' roots with water and nutrients. Finally, aquaponics is breeding fish to help cultivate bacteria used for plant nutrients.

Urban farming is growing or producing food in a city or heavily populated town or city. What differentiates it from urban agriculture is the absence of commercial activity. Any individual or group of people can begin running an urban farm. The benefits associated are the increase in food security, creates a sense of belonging, produces healthy food, provides a learning opportunity, and helps in making efficient use of land.

In the next 5-10 years, the UAE government can develop an extended arm to its educational sector, and create a teaching method combining both techniques of vertical and urban farming. Students at school can replace their typical science experiment of planting a seed in soil, with ways to efficiently produce crops in classrooms through hydroponics. This can be done by a collaboration between the Minister of State for Future Food Security and the Ministry of Education. Moreover, policies can be introduced on a federal level to encourage university and school students into using their learning environment by contributing to the agricultural sector. Vacant lands on such grounds can be put into efficient use, instead of just containing grass.

If schools and university campuses dedicate an area to urban and vertical farming, we will slowly expand the idea to neighborhoods and households. Thus, the citizens of the UAE will begin producing their food rather importing it. This will not only raise people's confidence, but also have a positive impact on its economy. Being highly dependent on importing food weakens our net exports in our GDP formula. Producing our own food and later on marketing it can introduce numerous advantages and opportunities to the country, such as competing in global markets and having a self-sufficient economy.

Also, nutrition students can work on finding substitutes for certain essential nutrients whose sources may face supply shortages in the near future. As for engineers, they can work

on prototypes of kitchen accessories. For instance, using kitchenware charged by recyclable batteries to cook food independent of water, by either finding ways to eliminate water or reduce it. The future kitchens of people in the UAE are to be smart, and youth are innovative and capable to create such ideas and introduce it to the markets.

Another way of addressing challenges facing food security is by exploring synergies between the public and private sector, resulting to an added value for both parties. For instance, Heatworks launched a multi-functional dishwasher that will be able to cook a lobster as well. The product is called Tetra, connected by internet, and uses minimal amounts of water. Also, Platuni launched a smart garden which is an automated smart gardening device to be used in homes, without soil. If such technologies were to be adopted by households in the UAE by the next 2-3 years, the long term beneficiaries would contribute to saving water and reducing soil erosion.

Once the UAE has a variety of local developed products, both food and technology-wise, it can set up its own local store that accommodates all of the above. A start-up idea can be introduced to angel investors and entrepreneurs who will help sponsoring the stores financially at first, until it breaks-even and later profits will contribute to the government's revenue. Before setting up a physical space, the Minister of State for Food Security can establish a private partnership with a food retail outlet, that will provide a shelf to contain these products. This will help assess cash flows and profitability of such a project.

Food waste management is an essential factor for the government to tap on, and thus by establishing regulations and policies that serve such purpose is crucial. By managing food waste, sustainability will be achieved. Also, introducing policies that regulate water, climate and erosion across the country will help ensure future food security.

However, the government can only do such efforts and investments and accomplish their goal, with the help of their people. Educating children, youth, and adults about the changes that are happening is crucial. Awareness campaigns, digital interaction, and media engagement are effective methods to deliver messages regarding food security. Consumers in the UAE should have an idea about the growing scarcity of some resources. This will help them be more aware with their purchasing decisions, and not take advantage of the food supply in the present, in order to help the future. Being health conscious is another important factor; high intakes of meat and dairy has negative consequences on the long run.

During Ramadan, a late study in 2015 shows that food consumption increases around 10%, meaning people purchase more food in a period where they have fewer hours to eat. The first concern would be the health of a fasting individual, and now the second concern is

food security. If excess food is purchased and not consumed, where does it go? To waste. Our society must be motivated to become a zero food waste society. This can be done by equipping citizens with recycling and composting tools to be used almost everywhere. The recently developed Zera food recycler is a product to consider, it turns food scraps into fertilizer within 24 hours.

Now, let us imagine a house kitchen in 2050. Where you grow your own plants using a smart device, convert your food waste into fertilizer, and eating different foods than the ones used today for certain nutrients or vitamins. Also, let us imagine your child or younger sibling coming home from school, with a bag of fresh basil leaves which they planted in class or on their campus garden. Being proactive in educating ourselves about the threat facing food security 30 years ago, has made us safer when the world population hit almost 10 billion. Completely relying on the food markets has now decreased, technology and urban farming has helped contribute to where we are today (2050).

Now back to our present time, 2018, where H.E Mariam AlMheiri already shared news with us of being able to grow salmon in the desert; giving us an optimistic outlook on our future food security. All of the citizens in the UAE must take part in participating to create a safer food environment for the generations ahead. As a first step, youth engagement is important as they are the changing agent. If policies and regulations are set out to empower them to participate in food-related projects, they will be enablers.

Mentioned above are brief descriptions regarding the challenges and solutions facing the future food security in the UAE. However, having a positive mindset and the intent to participate in overcoming the challenges of the future, today, has always been an Emirati trait.

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