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Market Analysis: A study of the Gulf Cooperation Council Members as target for FinContainer product.

Case Company: Daira

Susan Hesham Yosri

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Authors
Susan Hesham Yosri

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The countries that make up the Gulf Cooperation Council hosts over 50 million residents. These countries, including Kuwait, Bahrain, Oman, Qatar, Saudi Arabia, and the United Arab Emirates, are also located in an area that has limited access to fresh surface water reservoirs, which means, that they have been relying increasingly on treated water that has been cleansed through the process of water desalination to meet their growing clean water needs. In this thesis, a qualitative research approach that relies on qualitative data derived from surveys and previously published credible reports has been employed to generate insights on the most effective market entry strategies that, Daira, a Finnish circular economy company, can use to introduce its advanced water desalination technology into the Gulf. This technology, which can easily fit and be transported using a regular shipping container, promises a future where the region can leverage its proximity to large water bodies to generate vast volumes of clean water that can sufficiently satisfy the region's freshwater needs. The study has shown that there is a huge water scarcity problem among the Gulf countries, a factor that amplifies the potential demand for Daira's product, but there are also established water desalination companies that have been offering their services in the region for decades. Based on the findings of the study, the optimal market entry strategy would require the company to adopt a market pull positioning for its FinContainer. Market pull can be described as the need for a new solution to a problem in the market, and FinContainer can play this role by being marketed as a product that individual consumers and small communities can use to implement their small-scale water desalination projects.

Key words
Water, Desalination, Sustainable Development, Gulf Cooperation Council, Circular Economy

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1 Introduction

Water is a critical element of life. It is also largely abundant on the planet, with more than two thirds of the earth's surface being covered by water, which makes it the largest natural resource on the planet. However, it is important to note that clean water or freshwater, which is often used for drinking and many other sanitation purposes, is not very accessible, especially since it makes only about 2.5% of the global water supply, as well as only 1% of the currently accessible global water output (National Geographic, 2019). This is problematic because the world's scarce natural resources are expected to support its massive population, and clean freshwater is a part of these scarce natural resources. With the threat of exponential population growth in the next 50 years and an already massive current world population of 6.8 billion people, the chronic limited accessibility to clean consumable water presents a substantial obstacle for the future of environmental health and development, not to mention the very survival of individuals and different societies around the world. (National Geographic, 2019)

Having sustainable water can be interpreted to indicate that a nation has self-sufficient supply of fresh water, and that this supply sufficiently meets the water needs of various social and economic sectors within the country such as agriculture, municipal citizen consumption, and industrial applications. In his Water & Sustainable Development research report, Ramio Aurin 2015, proposes that water is a limited resource whose need is constant. He argued further that water's availability depends not primarily on its geographical location, but on how we manage it as a society. He suggests that to be able to attain water sustainability is not a matter of moral category, but an activity dependent on the technologies available today. (Aurin 2015)

To achieve more sustainable methods of development towards universal access to fresh water, technology will play a vital role in accelerating the effectiveness and efficiency of innovative systems of today and of the past. This is one of the key reasons why the research problem that underlies this study needs to be extensively investigated. Technology provides us with new knowledge, techniques, and processes that can be used to pursue and implement the goal of sustainability and regenerative purposes. Additionally, in the research report on Water & Sustainable Goals explored above, Josefina Maestu 2015, examines some of the opportunities technology introduces to different nations around the world when it comes to addressing their current pressing problems as well as their existential problems such as scarcity of important resources. These include economic development, environmental improvement, poverty alleviation,

competitiveness, resource productiveness and access, and social capital. She proposes that the spread of technology acts as a powerful incentive on how well a country can adapt to change or external events, such as the threat we face as the global society for water scarcity.

A case could be made that we need to learn from the ongoing viral Covid-19 pandemic on a variety of issues. With almost a two years of eLearning classes and no or minimal face-to-face social interactions, the pandemic has shown just how vital it is to be superior with technology in order to gain advantage in economic development. The United Nations articulated that adapting to such a fast-changing world where technology has been proven to contribute to creating sustainable lifestyles and economic growth is important as one of the Sustainable Development Goals, especially since it will make sure that no one is left behind (World Water Assessment Programme, 2009). It could be argued that we need to ensure that the global market is integrated with broadly shared values and practices that reflect global social needs, and that all the world's people enjoy and share the benefits of globalization (Annan 2001). One of the ways that this can be achieved by leveraging the available wealth of technology to increase access to clean drinkable water to different societies around the world.

1.1 Research problem and Research questions

This Research Project was commissioned by Daira Ltd, a Finnish company that provides circular economy solutions for regenerative purposes to different profitable organizations, government institutions, and NGOs around the world. It serves as a platform for accelerating circular economy particularly in the MENA, Middle East and North Africa regions, which will be the central focus of this study. Daira's four main focus sectors include Water, Waste to Value, Agriculture, and Capacity Building.

This thesis is also done as a part of completing my Bachelor's degree in International Sales and Marketing. In Fall 2020, I successfully completed my internship position with Daira. During this work-placement, I got the chance to be a part of Daira's Sustainable Water Act, which aims to pursue universal access to clean water, sustainable and innovative wastewater treatment, as well as quality sanitation. The thesis will be centered around Daira's Sustainable Water Act, more specifically its portable water treatment product, the FinContainer. The FinContainer water treatment solution can be described as a water treatment plant that has been miniaturized to fit within a container. FinContainer's target market at the moment includes markets from 7 countries, Bahrain, Oman, Kuwait, Saudi Arabia, Qatar, and the United Arab Emirates (UAE), of the Gulf region, all of which

have pressing needs for increased access to clean water and are willing to invest to address these needs. The FinContainer solution is competing in the salty water desalination industry. The process of desalination was born during the early stages of oil exploration. Desalination is the process of removing salt from seawater or brackish water to make it pure. The three main concerns for desalination are producing clean water, reducing salt levels to consumable levels, and supporting life in water. The idea of turning saltwater into freshwater has been around for ages, however, the practice has not been possible until the modern era thanks to the advancement of new technologies.

The two main technologies used for desalination are thermal and membrane systems. Thermal desalination vaporizes the clean water and leaves behind brine. Thermal desalination consists of Multi-Stage Flash (MSF) and Multi-Effect Distillation (MED), and the main difference between these two is the methods used for the evaporation and the heating processes. Desalination is used to facilitate the provision of a clean water supply to meet the needs of large or small communities that live in areas where water scarcity is a problem. In areas where water scarcity is a threat and population growth is rising, desalination is a substantial asset, especially since it makes one of the world's most abundant but inaccessible resources accessible. Daira understands that successful desalination, especially on a scale that is large enough to sustainably address the persistent problem of water scarcity in the Middle East and North Africa, is highly dependent on sophisticated technology and modern innovation in a variety of areas from water treatment to management and distribution.

As a water treatment plant, FinContainer would be installed in a shipping container, where it will act as an efficient and portable water cleansing technique that can be distributed to reach various remote places where it is needed using the existing logistics infrastructure and capacity in the global supply chain. Each unit is tracked by computer software throughout the journey. With estimated times of departures and arrivals, this miniaturized water treatment plant can be extensively and efficiently distributed to different communities that need them, unlike previous water treatment solutions that were not only bulky, but also relied on less sophisticated technology. Shipping containers are also some of
the environmentally friendly ways for transport goods, mainly because they are made of materials that are easy to recycle, and also because they minimize carbon emissions in shipping by bundling shipments together to avoid multiple trips. They have traditionally been used to transport almost anything, which means that transporting this sophisticated water desalination technology that has been created for water treatment in different terrains will not pose any significant logistical problems.

The problem lies on how enthusiastic the targeted markets will be when it comes to accepting this new technology because of factors that include the level of competition, cultural barriers, as well as resistance to change among others. The level of utility provided by a product plays a significant role in determining the extent to which the product is accepted recognized and bought by customers. The importance of a market penetration study will help to determine the available limitations in a new market, as well as to inform key decisions on areas such as the most appropriate marketing strategy and marketing position to adopt for the new environment.

In order to fully address the research problems above, the study will be guided by the following research questions:

1. What is the market potential for the water desalination industry in the GCC countries?
2. What challenges and regulations face the FinContainer as it enters the GCC countries' markets?
3. Which strategies Daira could use to successfully capture these markets with its containers?

By finding answers to the above questions we hope:

 To assess the interests, attitudes, knowledge, and opinions of all stakeholders regarding the current state of the water desalination industry in the region and their future expectations.

 To identify key areas that can be leveraged for optimal FinContainer market entry.

1.2 Limitations

The study's limitations include the inability to determine the true extent of the diverse determinants that are critical to supporting the water desalination industry in the Gulf, as well as how they will truly affect the chances for successful market penetration for FinContainer due to the expansive scope of the research problem. The study's low survey sampling ratio might also slightly affect the generalizability of the results negatively. The ongoing coronavirus viral pandemic also limited the ability to conduct face-to-face interviews, which means that the study will have to rely on virtual data. Face-to-face interviews are better when it comes to capturing some intangible aspects of the respondents' responses. However, the core principles of research ethics will be observed during this research project including minimizing the risk of harm, obtaining informed

consent, protecting confidentiality and anonymity of participants, and avoiding the use of deceptive practices.

2 Research Approach and Methods

This research project is structured based on the assumption that researching the water desalination market in the Gulf necessitates the use of an appropriate scientific methodology that is compatible with an established interpretive paradigm. This means that the study will be implemented based on well-established theory, with more emphasis being poured on qualitative research methodology than quantitative methods, although both methodologies will be employed for the purpose of this study, albeit to varying degrees.

2.1 Qualitative Approach

The use of qualitative methods for the study is anchored on the belief that some of the research problems that underlie this thesis are better studied through an in-depth analysis of a small number of cases as opposed to unnecessarily inflated study groups. The research problems that apply to these criteria include the need to understand key stakeholders' opinions on the most effective and sustainable water ways to increase access to clean water in the gulf, as well as investigating the market growth potential for the water desalination industry in the region. The use of qualitative research methods to address these problems provide a better framework to gather an intimate understanding of the reality of various variables in play through a combination of new and previously tested theoretical models.

This method proves to be necessary in this case because it informs of functional and spatial analysis for things like potential intervention areas for sustainable development projects, as well as in the social analysis of the nature and level of clean water needs for which the region needs to accommodate in its implementation of sustainable water management framework that will be supported by contemporary sophisticated water desalination technologies such as the FinContainer. It will also help in gathering insights on the most appropriate approach that can be used to optimize market entry for FinContainer in the Gulf's water desalination industry. To help the region balance environmental, economic, and social impact of the new technology as they aim to create and maintain a circular economy.

2.2 Data Collection Process

The data collection process of this thesis is conducted from both qualitative and quantitative methods, both which will serve as primary data. Primary data will be gathered through accredited models, as well as, survey respondents. Secondary data is sourced from public records and published material, used to initiate the study and help in guiding the analysis of the larger market and individual aspects of the industry. The survey method is used to gather stakeholder perspectives and interest in the referred product.

Using qualitative and quantitative methods help in gathering insights and accommodating behaviors, attitudes, and desires of various stakeholders and social groups that are relevant to the region's water desalination industry. The circular economy concept is heavily related to balancing interests between consumers, governments, businesses, and other stakeholders in the region, and therefore testing, evaluating, and measuring the nature and popularity of various interests requires the use of qualitative methods for data collection and analysis. Some additional quantitative data is used to address the parts of the research problem that need distinctive quantification, especially when it comes to areas such as the size of the population and the volume of clean water needed at any given time, as well as the current freshwater deficit. This data might provide insights of the region's capacity to absorb Daira's product, now and in the near future.

3 Sustainability & Circular Economy

The idea of these two concepts, sustainability and circular economy, rose from the two concerns of the aspirations of mankind and the limitations imposed by nature. (Kuhlman & Farrington, 2010) In other words for humans to coexist with the Earth's biosphere. Since development achievements over the years have made our lives easier and better, at what cost does this come? The overuse of natural resources and fight over them has led us to what we know as climate change. Sustainability aims at reassuring our future generations to come and circular economy aims at teaching ways to manage resources to be able to regenerate them without loss.

3.1 The Concepts of Sustainability and Circular Economy

In 1983 the UN commissioned the former Norwegian prime minister Gro Harlem Brundtland to run the World Commission on Environment and Development. After 4 years the commission released its closing report, "Our Common Future", which is famous for defining sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". In 1992, during the Earth Summit, the first agenda regarding the "master plan" was adopted – the sustainable development goals. The year 2015 was the year when UN decided on 17 specific goals that were to be identified regarding the sustainable development act. The ultimate initiative for the sustainable movement was to generate change. Scholars agreed that there should not have to be a trade-off between environmental sustainability and economic development.

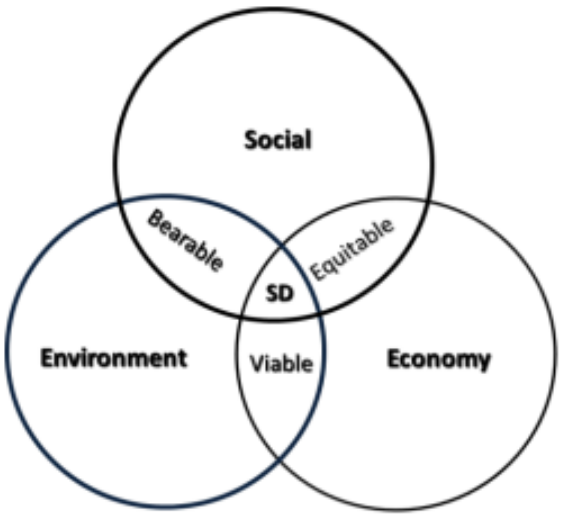

Figure 1. Three Pillars of Sustainable Development. (Adams, 2006)

Today, we can identify sustainable development into 3 pillars:

- Environmental sustainability – focuses on the wellbeing of the Earth's environmental systems, to keep natural resources align with innovation.

- Economic sustainability – refers to long-term growth without impacting the other 2 pillars, environmental and social.

- Social sustainability – social sustainability can be seen in various aspects, it promotes the idea of creating safe places for individuals and communities. Research on social sustainability mostly involves the study of understanding what humans need to live well in their daily, as well as work lives.

A circular economy is a model created to encourage the sustainable act. During the industrial revolution, new methods made industries become more efficient and productive. It has now been approximately 200 years since the revolution and experts are alarmed by the repercussions. For years we have used the take, make, throw linear model which has had an enormous impact on the environment. The climate suggests it is now time for change once again.

Precisely how an economy depends on the productivity of communities and social interactivity; for a society to reach its fullest potential, it depends on the relational growth of the industries that help boost the economy, last but not least, we all depend on the environment for a strong ecosystem and a habitat to call home. Figure 1 above presents the 3 pillars of sustainable development intersecting; this is to signify their tendency to depend on one another.

A circular economy can be described as an approach to economic development that is anchored on systematic techniques that are engineered to benefit society, businesses, and the environment. This deviates from the conventional economic development approach that is anchored on the take-make-waste philosophy, which is basically a linear model that involves increasing productivity and consumerism, which results in more waste generation and utter disregard of resource regeneration. (EllenMcArthur, 2017)

Much like sustainability, circular economy also encompasses 3 main principles within the doctrine. These are to design out waste, keep products and material in use; regenerate natural systems. (EllenMacArthur Foundaion, 2015) Designing out of waste can mean that all products which have a longer life span must be reused for a new purpose. Such as car tires into flip flops. This is just one example, however, the main idea is to create a repurpose for the product. All products with a shorter life span must be used as much as

possible until safely returned back to the nature. Lastly, all natural resources must only be used if possible to be regenerated. A circular economy is made to favor the economic success of business operations, society, and the environment, never one without the other.

3.2 Clean Water and Sustainable Development

In 2015, when the United Nations established their first concrete goals for the sustainable act, number 6 was clean water and sanitation. Water is considered as the core to life and therefore; that is what makes it the core to sustainable development. Water signifies health, nourishment, and a significant component to socio-economic development. Today we understand that water is an infinite natural resource, however; we tend to consider clean water that is fit for human consumption as a finite resource (Al-Zubari et al. 2017). Experts from the Ellen McArthur Foundation suggest that we must think of “water as a product” (Tahir et al. 2018). Despite all the time that was lost consuming clean water for granted, there is still hope for moving past the conventional water management style that was characterized by laxity and wastefulness, which can no longer be supported by the current clean water scarcity levels. Nations will learn to adapt to the contemporary standards of managing the increasingly scarce natural resources more prudently if they want to be able to guarantee the future of it.

In the last two decades significant progress has been made to expand access to clean water and sanitation to hundreds of millions of people. However, this progress is not fast enough especially when one considers the fact that hundreds of millions of people from around the world still practice unsanitary acts. The coronavirus viral pandemic has demonstrated the importance of universal access to clean water, especially since it is directly related to hygiene and sanitation that is required to contain and prevent spread of diseases. The consensus on how to address water scarcity in various areas is yet to be established. Some of the promoted theories revolve around reclaiming and cleaning wastewater, water desalination projects, tapping rain water, and renewable energies. These methods will be the most viable and sustainable solutions in the long run.

Moreover, at a time when urbanization and population growth are increasing rapidly, we cannot afford to leave remote and rural areas behind while we push for sustainable development policies across the board. Many remote and rural areas are often characterized by limited accessibility, especially with regards to access to the nearest services, which means that implementing sustainable policies in these areas will require incorporating a diverse range of community needs ranging from social, cultural,

environmental, economic, and infrastructural needs (Horlings & Padt, 2011). A part of implementing sustainable development is promoting social and economic equality, and for those in remote areas, this could mean improving accessibility to clean water.

Additionally, renewable energy plays a significant role when it comes to planning and implementing sustainable development in remote and rural areas. In most remote and rural areas, especially in developing countries, access to electricity is very limited. Expanding the energy infrastructure in this area is critical and promoting sustainable social and economic development. Unlike in urban areas that already started to benefit from the dirty and polluting non-renewable energy, rural areas have the opportunity for adopting renewable energy from the very start as they push to increase access to electricity as a part of the ongoing sustainable development project (Horlings & Padt, 2011).

4 Market and Water Treatment in the GCC Countries

This chapter will introduce the GCC countries and their water sector industry a little bit further. It will take a closer look on how the countries got started with water treatment technology and give some data on the available technology used today in the region. Expectantly the coalition of modern tech and sustainable development in arid climates should be somewhat recognized during this chapter. By using accredited theories, such as the PESTEL analysis, the chapter will further examine the market.

4.1 Geographic and Demographic Factors

The Persian Gulf (commonly also knows as the Arabian Gulf) is located in western Asia. Belonging to a desert biome, the region itself is classified to have an arid climate with low precipitation and high temperatures. In which surface water resources are mostly absent and groundwater sources are often renewable. (Muhammad and Mohsen, 2000) Occupying 80% of the area is Saudi Arabia, making it t+0000000+he largest territory in the area. (Abd El Rahman, 1986). Geographically adjacent to the kingdom of Saudi Arabia are the remaining 5 member countries, Oman, United Arab Emirates, Qatar, Bahrain, and Kuwait. The UAE has the largest population of the 5, Oman being the following largest country after Saudi Arabia does not influence its population figures, with a population of 4.9 million it comes close to sharing the same population rates with Kuwait, the fourth largest area by land. Qatar has a population of 2.8 million, Bahrain, the smallest state, hosts a population to 1.6 million (World Bank, 2019). In 1981, all 6 countries of the Gulf Cooperation Council came together in order to establish unity based on their common objectives towards economic development, politics, and shared religious views (Hussein and Khan, 2017).

4.2 Market Situation

In 2019, the World Economic Forum held in Switzerland declared North Africa and the Middle East as the highest-ranking regions to be at threat of a water crisis in the near future, mainly on the account of the limited clean surface water resources available in the region (World Economic Forum 2019). Almost all nations on the Gulf exist at higher-than-normal levels of water scarcity. This means that evaluating the larger water market in the region requires investigating on how these countries and their citizens continue to thrive despite living largely in water-scarce areas. A case could be made that some of the countries also lack key regenerative capacities to make optimal use of the available

renewable resources, which is a key prerequisite for creating the perfect circular economy. Like many other civilizations around the world, the concept of universal access to fresh water has long been taken for granted in the region, especially in the past when communities used to live and practice agriculture around areas with large surface water reserves. However, as communities started to urbanize in areas where access to freshwater surface reserves are not guaranteed, things started to change. Originally perceived as a natural resource and a gift that keeps on giving, various stakeholders did not feel the need to make elaborate plans to make fresh water available to people's homes in different parts of the nation when people could work into a spring or a river and fetch the water they needed for their daily use. This changed when communities started being build in water-scarce areas where land is cheap. Public interest changed from considering water to be a natural resource gift that they did not need to worry about, and shifted into being a vital and scarce natural resource needed to be managed diligently for those that are keen on ensuring the survival of their communities.

Looking at the various points of concern being researched and addressed in the Gulf with regards to the region's freshwater market, one can see how these countries are gradually shifting to increasing clean water management frameworks that is backed by a variety of stakeholders including local governments, federal governments, business enterprises, and more importantly, regular consumers. Similarly, for the freshwater management and distribution solutions that are being developed for the region and other global markets, "efficiency" is the primary objective, which is critical to facilitate optimal performance of the water sector in the region, since the increasingly severe water scarcity has made it that countries cannot afford any more wastage in the system. It has been suggested by different experts that digitalization plays a major part in implementing the high level of
efficiency that is required in better water management of the GCC countries, hence the rise of a new trend in the region, technology.

Modern technology is being considered for deployment to help the region build the necessary water management framework that has enough capacity to fulfill all of clean water trends. This has also contributed to a new trend of recycling used water in an attempt to mitigate the water scarcity problem even further. Treating wastewater and sludge water has become the main point of interest in order to restore a large amount of potentially usable water in the region, which has been a common practice in many Western nations for decades (Hombrecher 2019).

The Gulf has one of the highest consumption levels of water per capita in the world. Freshwater use in all sectors rose from 6 billion gallons in 1980 to around 26 billion gallons in 2010, with the agricultural sector being the greatest consumer (Dutch Economic Network 2018). The agriculture sector in the region consumes vast volumes of the region's desalinated water output, with almost 85% of the Gulf's freshwater being consumed on agricultural activity. This is still not enough, and further attempts to use more clean water to support additional agricultural activity in the region poses a variety of challenges, not just in the agricultural sector, but also in other societal sectors where clean water is needed. These challenges could potentially be solved by modern technology.

4.3 Water Treatment Processes

After the discovery of oil and natural gas in the region, the economic development of the GCC countries increased immensely (Omar Saif 2012). The region is among the world's top fossil fuel exporters today. Even so, universal access to clean water has remained a pipe dream in the region. The Gulf is home to a desert biome, the fifth-largest desert in the world. The region is very hot and dry, and the rainfall is very rare. This, on its own, poses an increasingly severe threat in terms of land degradation and water scarcity. However, many of these countries do actually border ocean coastlines or have large amounts of brackish/ground water. Opening the borders to foreign labor and investors brought a new wave of demand for clean water and new ideas on how to meet this demand. As the populations grew in the region, so did the tourism sector, and a larger demand for water was inevitable (Al-Faris 2002). The Gulf's main source for freshwater was groundwater before this huge spurt in population growth.

Today in Saudi Arabia, only 10% of their drinking water comes from surface water. This suggests that alternative methods for advancing access to drinking water are in use, which is proven by the fact that almost 50% of Saudi Arabia's drinking water comes from desalination (Dutch Economic Network 2018). The Gulf countries accounted for at least two-thirds of the output of approximately 16 million liters of water from nearly 9000 separate desalination plants worldwide as of 1995 (Ayoub 1996). These figures have changed significantly since then, but a significant portion of the world's desalinated water output still comes out from the Gulf region.

Thermal desalination has been a preferred method for desalination in the GCC in previous years. Other desalination methods include Membrane Desalination. Membrane Desalination gets its name from its use of membranes for water treatment. This

technology uses membranes to separate the clean water and bring it to the surface while the byproducts are left below. Reverse osmosis membranes are the leading technology for new desalination installations (Greenlee & Lauren 2009). Desalination satisfies a substantial proportion of the region's freshwater needs, which have been rising as demand outstrips the availability of natural freshwater reserves. Qatar, for instance, relies on desalination plants for 87% of its freshwater requirements, followed by about 50% in Saudi Arabia, 42% in the UAE and Kuwait, 36% in Bahrain, and 27% in Oman (Irena, 2015).

Countries	Population (million)	Online desalination capacity (106 m³/d) (2014)	Break down of online capacity by technology (2014)				Additional Contracted* (106 m³/d)
			MSF (%)	MED (%)	RO (%)	Other (%)	
Saudi Arabia	29.9	11.4	37.6	10.4	49.6	2.4	10.5
UAE	9.6	8.9	68.2	12.2	19.4	0.2	2.5
Kuwait	3.6	2.6	72.7	0.1	27.1	0	2.3
Qatar	2.3	1.8	69.4	19.9	9.8	0.8	1.5
Oman	4.2	1.1	36.3	7.6	55.9	0.2	1.7
Bahrain	1.4	0.6	16.9	46.2	36.9	-	-
Total	**51**	**26.4**					**18.6**

Figure. 4 GCC desalination capacities and breakdown per technology (IRENA 2015)

Early research on desalination was conducted during World War II to satisfy freshwater needs in remote locations that were heavily affected by the war (Islam et al., 2018).

An off-grid building should be able to generate enough supply energy and clean water to support its residents. This is more serious for isolated locations in which it is difficult to reach general on-grid utilities.

The quantity and quality of water treated in off-the-grid areas depends upon the location and available technology. If the remote location is nearby an ocean, the seawater can be purified and repurposed for human's consumption. However, in other remote areas with dry land, groundwater can be distilled and used for numerous purposes. The technology for the desalination process uses up a lot of energy, mostly for the pumps. In this case, the hot climate of the Arabian Gulf could be leveraged since the energy could be

harvested from solar or other renewable energy sources in remote areas. Today's off-the-grid living could allow for communities to remain completely self-sufficient.

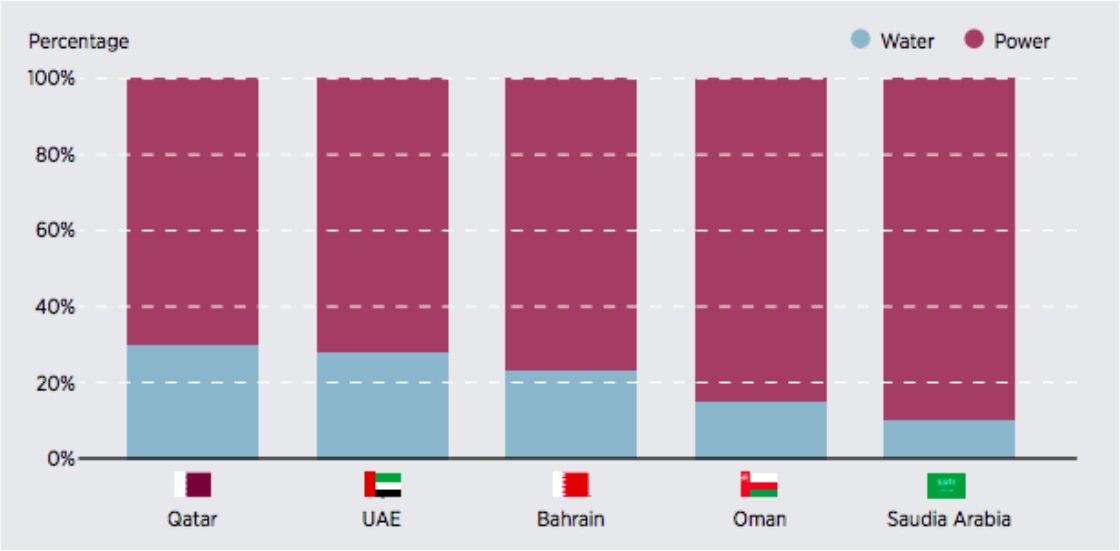

Figure. 5 Fuel consumed in the power and water sectors for desalination (% of fuel) (Lahn, Stevens and Preston, 2013)

In the chart above we can see that much of the desalination processes include more renewable energy than conventional fossils fuel. The nonrenewable fuel consumption is fairly low compared to the renewable energy consumptions, which is indicative of the region's willingness to embrace a circular economy. Ultimately, the fuel demand for desalination could be almost eliminated by using solar desalting plants. They are at an early stage of development in the region, but small-scale solar desalination plants for remote area have already started to show cost effectiveness, which is highly necessary given the high costs of delivery (Tolumo 2016).

4.4 PESTEL Analysis

The PESTEL analysis is one of the many and most reliable tools that can be used by those that want to discover external forces that affect an organization and its plays in the current and future markets. Moreover, to identify the external factors that continue to define the marketing environment of the target market. The letters in PESTEL stand for Political, Economic, Social, Technological, Environmental, and Legal operations, which are the key parameters that define the external marketing environment (Bruijl, 2018). The PESTEL analysis tends to act as a significant prior tool for those seeking to develop new

and effective market entry strategies since it summarizes the basic factors that individual businesses have limited power to influence. This chapter will firstly present a written overall analysis of the GCC market, and then it will further on go to present two tables in which each member state country is used to examine for more details on their affairs on the water sector.

Virtually every government in the GCC has adopted several policies to support various major treatment projects. This creates a positive environment for water treatment companies that are looking to enter these new markets with more sophisticated water treatment and desalination technologies. The political elite in the region has also made ambitious promises on increasing access to clean water. Named as some of the fastest developing countries in the world, the GCC countries are in their growth period, they offer investment opportunities for all sectors in most of the countries, as well as, funds. The growing purchasing power of these nations makes them ripe for the adoption of sophisticated water desalination technologies such as FinContainer. The societies of the GCC countries are based on a mix of values, most of which are considered conservative by many. However, the region has managed to integrate today's technologies into their societies, as well as allowing new perspectives to shape various aspects of their societies. The official language of these countries is Arabic, but English is also considered to be the language for business. The region's most popular religion is Islam and setting up a business requires some level of conformity to the practices of Islamic laws. The Golf Co-operation countries are known to be the ideal location to market new technologies, especially due to the region's insatiable need to modernize. Additionally, due to the variety of environmental issues that the region faces, these countries could benefit more from relying on modern technologies to sustain a good quality of life that has become the norm for the developing region. However, desalination technology in the region is not very advanced, which means that there is huge room for more sophisticated and efficient technologies.

The emerging reality of climate change threatens lands and homes all over the globe at present. However, looking more closely at the global map of vulnerability to climate change, the Gulf region has been ranked among the highest in its threats from climate change (World Economic Forum, 2007). This implies that there is a growing demand for efficient technologies to mitigate the current and expected impact of climate change in the region, especially on its water management infrastructure. These threats include rising sea levels that will have an immense effect on the marine life and coastlines of the countries. The second biggest impact of climate change threats will affect the rising temperatures of the region, resulting in increasing water demands. Water scarcity is

predicted to grow as a major problem in the area. The nations in the Gulf Cooperation Council also face a number of local environmental challenges individually, challenges such as loss of biodiversity, rise in air pollution, marine pollution, accelerated desertification, and water scarcities. As of now, the GCC countries still depend heavily on petroleum and gas as their main source of revenue. Their economies are highly dependent on these industries. Withstanding the fact that these activities could lead to more severe environmental issues in the future, new technologies need to be incorporated into mitigating and reversing the current and future environmental issues. The idea of catching up on renewable sources in the region could help to mitigate the future threats. (Raouf, 2008)

Over the last 25 years, the Gulf Cooperation States have experienced a dramatic change in their legal systems. After the World War II and the discovery of oil, the transformation of the legal systems led to nationalistic and independent movements concerning the development of economic growth of the states. Today most of the laws are based on a combined rule of the Islamic principles with the civil law system (Al-Suwaidi 1993). Laws and regulations made changes to increase substitution over custom procedures to decrease general risk and unpredictability. Additionally, the growth of more conventional legal protections makes it a little harder for foreign companies to succeed in the region without forging strategic local partnerships. However, contemporary changes in recent years have proven to be more beneficial to foreign investors especially when they partner with locals. A new trend has emerged where the political elite is adopting more policies to support the private sector to be more involved in the economic activities (such as infrastructure) of the countries

PESTEL ANALYSIS OF GCC COUNTRIES:

	UAE	Saudi Arabia	Qatar
P	• The UAE is a constitutional federation that consists of 7 emirates. • Privatization of the water sector was issued in the early 2000's for foreign companies to have joint ventures with national companies.	○ Most of the water and power producers are owned by independent corporations, aligned with royal decree.	○ An Emirate government, ○ Divided into 8 municipalities. ○ Kahramaa, an independent corporation, aligned with the government policies is the sole distributor for public water & electricity sectors in Qatar.

E	• Rapid economic growth reached through natural resources, economic diversification, and inflow of foreign direct investments. • Ideal destination for technology improvement.	○ World's most powerful petrol-states. ○ Looking to diversify for more modern economic success. ○ Looking to diversify through private sectors.	○ Fast growing economy ○ Plans to diversify ○ GDP: 175.8 billion (the world bank, 2019) Mostly due to petroleum and natural gas reserves and exports.
S	• Most of the residents of the UAE live luxurious lifestyles, resulting in higher needs of water consumption & lack of preservation. • Domestic water needs are rising.	○ Growth of urban population. ○ Focus on youth. ○ Contrast seen within social classes.	○ Ministry of labor & social affairs is known to provide public healthcare and education for everyone. ○ Islamic customs and traditions are well adapted into society.
T	• Large investments have been made over the years for infrastructure improvement. • Growing interest for smart cities & smart government.	○ Growth in technological advancements. ○ Successful infrastructure. ○ A rising entrepreneurial hub.	○ IT sectors are growing rapidly. ○ Technology to support sustainable economic development.
E	• Exposed to decreasing levels of groundwater. • Faces threat of little to no rainfall expected in the future due to climate change.	○ Rapid urbanization ○ Intense usage of fossil fuel leads the country to threat of climate change (such as desertification).	○ Air, water, and pollution are the main environmental problems of the area. ○ The Environmental Protection Committee, established in 1984, prioritize in increasing water supply through desalination.
L	• Water management is embedded in the federal structure of the UAE; however, each emirate presents its own laws & regulations to control water resources.	• MEWA is responsible for water & sanitation policies. • Electricity & Co-generating Regulatory Authority (ECRA) is responsible for privately owned desalination plants.	• Foreign investment laws • Minister of the relevant sector must give approval. • Projects that contribute to Qatar's development goals are encouraged.

Figure. 2 PESTEL Analysis: UAE, Saudi Arabia, Qatar

	Kuwait	Oman	Bahrain
P	• Constitutional emirate with a semi-democratic political system. Tensions between parliament and monarchy have occurred the past. • The Ministry of Electricity & Water is responsible for providing public water services.	▪ Public-Private partnership is encouraged in the water sector. ▪ Oman shares aquifers with Iraq & Saudi Arabia. (with no official agreement)	• Constitutional monarchy with a national assembly. • The ministries are well aware and involved with the water sector. • Most big desalination projects are government involved, smaller ones remain private sectorized.
E	• Small, wealthy and open for growth. • Water scarcity could oppose a negative impact on many industries, as well, as the economy of Kuwait.	• Economic diversification goals for 2025, especially increasing industrial water demands.	• Plans to expand high tech industries + increasing diversification urgency. • Goals for 2030 to encourage a private sector driven economy.
S	• Originally nomads and Bedouin customs • Among the highest water consumption per capita today.	• Traditionally a tribal society. • Willing to integrate a business mindset in order to find solutions for economic development.	• Many foreign workers and expatriates are exceeding the amount of the locals. Creating a rapid rise in the population and diversification.
T	• Desalination plants are one of the main sources for freshwater resources.	• Increased amount of farmers are starting to use small RO plants for water use instead of the previous groundwater sources.	• Improved highly over the years. • Impressive road networks that connect to various small villages.
E	• Desert climate, very hot and dry, scarce rainfall.	• Most of the population is	• Small island country. Due to the small-scale of the country the

	• Exposed to threats of water scarcity. • Signed for the Kyoto Protocol in 2015.	inhabited by the coast. • Oman also hosts a lot of inland area where agriculture thrives.	government has allowed land degradation on sea. • Lack of freshwater resources & and threat of desertification.
L	• Municipality water only from desalination plants to control groundwater assets. • Laws on marine life and sustainable development are included in water policies.	▪ Most desalination units in Oman owned by individual organizations attain contracts for certain periods of time.	▪ Local partner needed in order to start a business. ▪ Established municipal water tariffs. ▪ Missing legislations on water consumption and reuse.

Figure. 3 PESTEL Analysis: Kuwait, Oman, Bahrain.

5 Competitor Analysis: Daira

In this chapter we will be discussing the case company, Daira's latest project in creating regenerative solutions for the water sector. The project's product "The FinContainer" will be introduced. In the chapter we will also take a look at the competitors of the case company and hope to find out their value in the market. Lastly a SWOT analysis will be conducted which will be based of the competition analyses and the previous PESTEL analyses in order to spot the threats and opportunities for the coming of the products' commerce.

5.1 Daira's FinContainer

The FinContainer is a mobile "plug and play" containerized water system. Inside the container technology is available in full range of applications such as, floatation, softening, filtration, reverse osmosis, seawater, ultraviolet, disinfection, and more. For example the floatation, filtration, and membrane based technology are able to remove all type of contaminants from water (solids, colour, bacteria, viruses, etc.) in order to provide pure, clean water for drinking purposes or other water needed processes.

The container's inside technology is made based on the customers need, of how much water and for what capacity is required on site. The container offers purification from virtually any water source, whether it be a well, lake, river, the open sea, tap water, surface water, or waste water. It is suitable for any type of environment as its temperatures sustain -40 – +45 degree C. The many benefits of this over a built-in plant room is the plug-and-play unit, quick installation, and lower capital costs. Moreover, a lower energy consumption and minimal chemical consumption. It aims to achieve the fastest possible installation on site available in 24 hours from arrival site.

5.2 Competition Analysis

The competitive analysis grid used in Table. 1 is a tool for organizing and presenting information on a company's competitors, their products and market strategies (Barringer, 2015). In this case Daira's competition. It helps to see in which position the firm's competitors are and what they offer on the market. As well as, illustrate primary sources of competitive advantages for Daira; which will be shown in Table. 2 in the SWOT analysis. The first table will show global companies from foreign locations obtaining similar products

and exporting to the GCC market. The second table will show local companies from the GCC countries selling similar containerized water systems locally in these countries.

Table. 1 Global Competitors

		Fluence Corp.	OSMOFLO	LennTech
		Global Competitors		
Company Profile	**(Company Highlights)**	Founded in 2017, USA. Meets the needs of mid-market water needs by offering water treatment technologies. Mergers & Acquisitions	Founded in Australia, 1991. Global water treatment company. Provides recycling, reusing water treatment systems. Subsidiary of ALMARWater Solutions.	Founded in the Netherlands, 1993. Water treatment design & manufacturing company.
Competitive Advantage		Offer technology to all aspects of the water market chain.	Industry Network	Broad range of water treatment systems & experience in the industry.
Operating countries (GCC)	**(Market Information)**	UAE	UAE, Oman	UAE, Qatar, Saudi Arabia
Industries		Municipalities, housing developments, construction sites, remote facilities, resorts, hotels, power plants, agriculture irrigation, and mining camps/operations.	Oil & Gas, Power, Mining, Municipal, Food/Beverage.	Agriculture/Horticulture, Food/Beverage, Chemical, Industrial, Mining, Oil & Gas, Power, Tourism, Transportation, Education, Engineering.
Marketing Strategy		Modern, desire to work with 21st century vision. The industry's smallest carbon footprint.	Experiences + Videos	Transparent + Professional

Products	**(Product Information)**	NIROBOX & NIROFLEX. (40-foot container supplies 10,00 people) Containerized ultrafiltration, multimedia filtration and RO.	Containerized solutions; reverse osmosis. Custom plants tailored for clients.	Containerized solutions; reverse osmosis + solar powered reverse osmosis plants. Ready – to – use & custom plants.
Pricing		Competitive costs Revenue 2020: 23.5M (fluencecorp.com)	XXX	Contract pricing depends on duration and size of projects. Ex. Project duration Feb 2015-May 2015, Qatar, 100 m3/per day, 150,000-450,000 EUR. Ex. April 2012 to Nov. 2012, containerized brackish water RO, 30.000 – 70.000 EUR.
Distribution Channels		Direct/Internet Direct/Sales Team Sales Agent	Direct/Internet Regional Sales Managers	Direct/Sales Team Online: Organic search 77.71%, direct 17.16%, paid search 5.13% EX: Export Enviromental

Sources/Websites: https://www.fluencecorp.com/, https://www.osmoflo.com/ https://www.lenntech.com/

Table. 2 Local Competitors

		Competitor 1 (AL Kafaah Water)	Competitor 2 (Wateronics)
		Local Competitors (GCC)	
Company Profile	**Company Highlights**	(UAE) 2007	UAE Dubai, 2011
Competitive Advantage		Network + Local Particular knowledge on government guidelines and water dilemmas in the Gulf.	Certified, member of the Dubai chamber of commerce
Industries	**Market Information**	Marine, oil & gas, hospitality, industrial, agriculture, power & energy	Off shore, armed services camps, construction sites, resorts, & mining.
Operating Countries		Egypt, Kuwait, Oman, UAE, Saudi Arabia, Kuwait, Qatar	UAE
Marketing Strategy			Customer satisfaction
Products	**Product Information**	Containerized RO: output 25,00 (100m3/day) 530,00 (2000 m3/day) Via reverse Osmosis After Sales Training	RO Containerized plant (filtration, softening, demineralization)
Pricing		XX	
Distribution Channels		Sales & Contracts Director Sales Coordinator Sales Engineer	Direct/Website

Sources/Websites http://www.alkafaahwater.com/ , https://www.wateronics.ae/

5.3 SWOT Analysis

The main direct threat in most cases in industries lies with the similar product retail. However, success lies within the product's value proposition and uniqueness. Table. 3 purpose is to identify the areas in which Daira, the case company, possess strengths over

its competitors; as well as, which areas it will face difficulties in. A SWOT analysis presents strengths, weaknesses, opportunities, and threats of businesses.

Table. 3 SWOT diagram

Strengths:	**Weaknesses:**
○ Lower energy consumption ○ Minimal chemical consumption ○ Water treated from all sources such as tap water & waste water. ○ Reliability of Finnish technology	○ New to market ○ Small scale projects ○ Offering matching products
Opportunities:	**Threats:**
○ Market Need ○ Renewable energy ○ Market strategy ○ Contacts in neighboring country (Egypt)	○ Existing competitors (global & local)

6 Key Results and Discussion

In order to collect data, a survey method was conducted. The aim of the survey was specifically to gather data from the target market in hand, the GCC region. Where do their water services come from and who provides them? Respondents consisted of important businesspersons in high ranking positions located in the region. Responds were gathered only via. personal messaging on LinkedIn, as well as, personal networks. To assure respondent validity the search had to be limited. In the discussion section will give an overall review of results from the survey as well as the theoretical search.

6.1 Respondent distribution per country and target sectors

The survey was sent to 30 potential customers of Daira which 18 of responded. The respondent distribution is as follows in Figure 6. gathered from all member states of the target market. The audience was dissected into career alternatives that included 6 sectors. The sectors were chosen based on the competitor analysis, as well as, potential industries of the FinContainer. This is shown in figure. 7. Lastly 3 locations were set in order to find out the sites of these businesspersons. In Figure. 8 we see that most were located next to an open sea. This did not come as a surprise since most of the Gulf countries still rely heavily on built-in plant room installations.

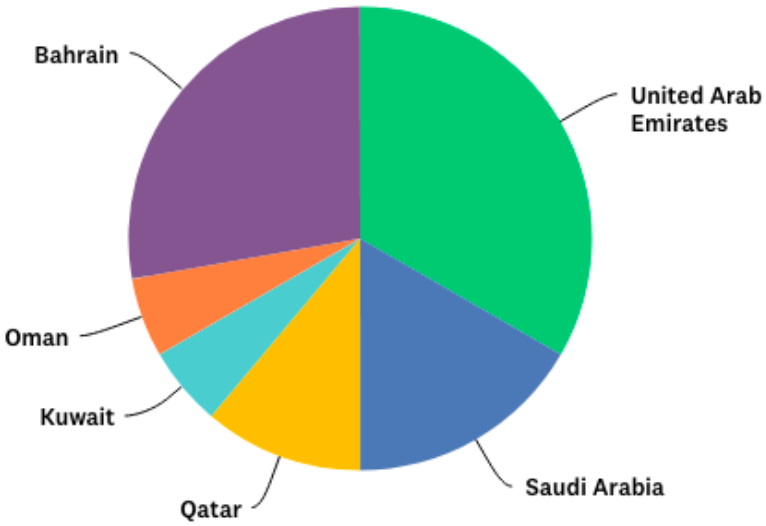

Figure. 6

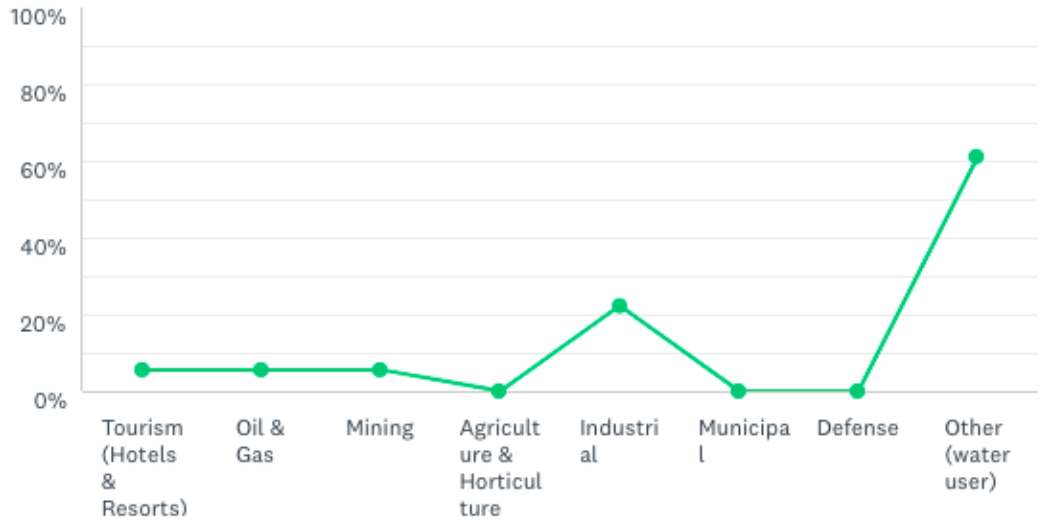

Figure. 7

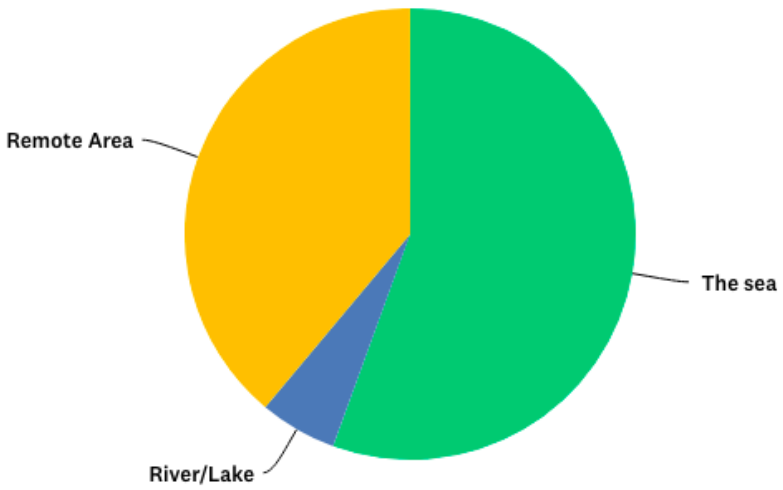

Figure. 8

Respondents from remote areas included countries from the UAE, Bahrain, Qatar and the kingdom of Saudi Arabia. The only member that responded to being located next to a river/lake was from Bahrain from the mining industry.

6.2 Existence of desalination services

Now that we have the right target in the right target market, it was important to gather data on their water utilities. This is why Figure. 9 answers the question whether these businesspersons and their companies are using desalination plants and if so, in Figure. 10

which source are their water services provided from. To add on more about clean water & sanitation Figure. 11 gathered data on available tap water services.

Here in Figure. 9 we see that majority of respondents' companies are using desalination plants for water services.

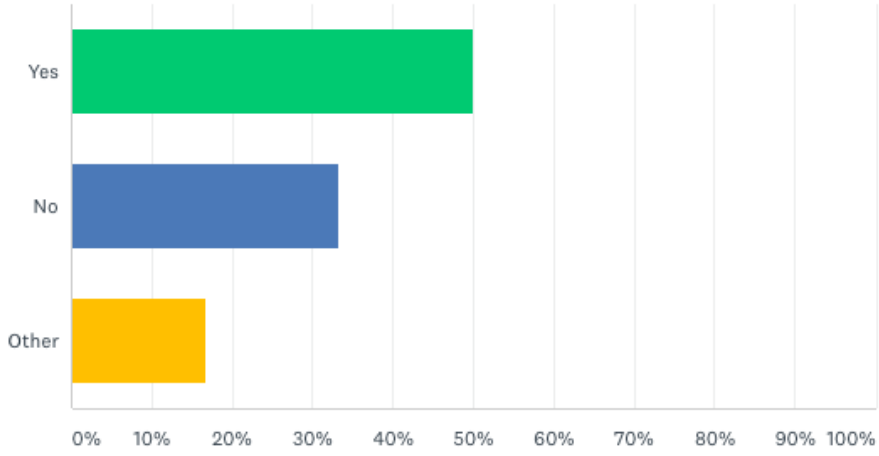

Figure. 9

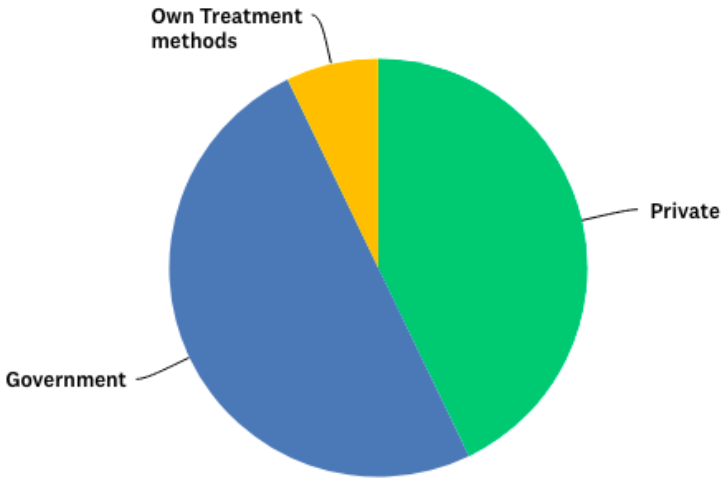

Figure. 10

Question No. 5 answers the question whether their water services are provided by the government, private sector, or own treatment methods. As is shown half of respondents replied to water resources being provided by the governments of these states. The other half employ private companies, and/or use their own treatment methods.

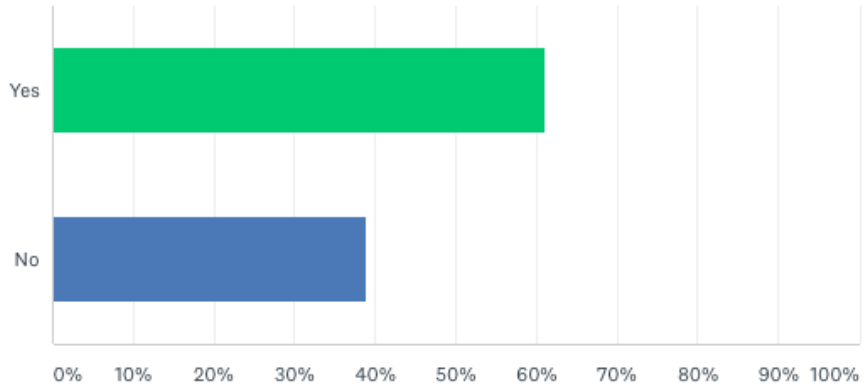

Figure. 11

Figure. 11 shows whether or not tap water is safe to drink from at the location. Over half replied that it is safe and drinkable.

6.3 Readiness for Investment

Here it was asked if the respondents' organizations are ready to invest in a desalination plant that provides clean tap water, majority of respondents replied with a positive aim towards being ready to invest in such a plant.

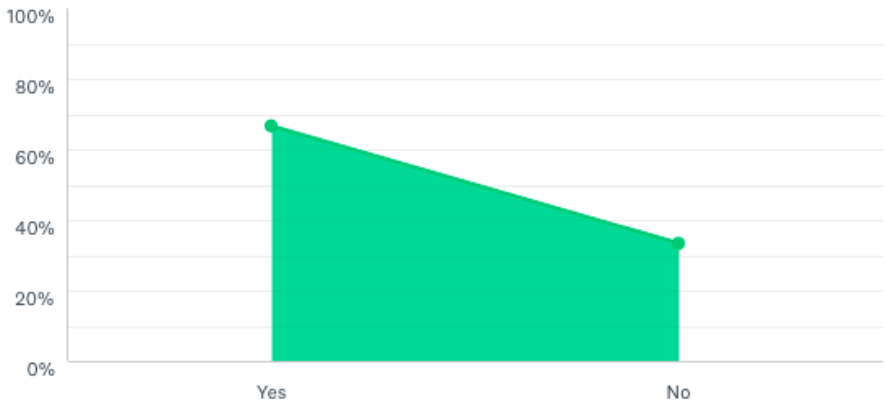

Figure. 12

More than half would be willing to invest in a desalination plant.

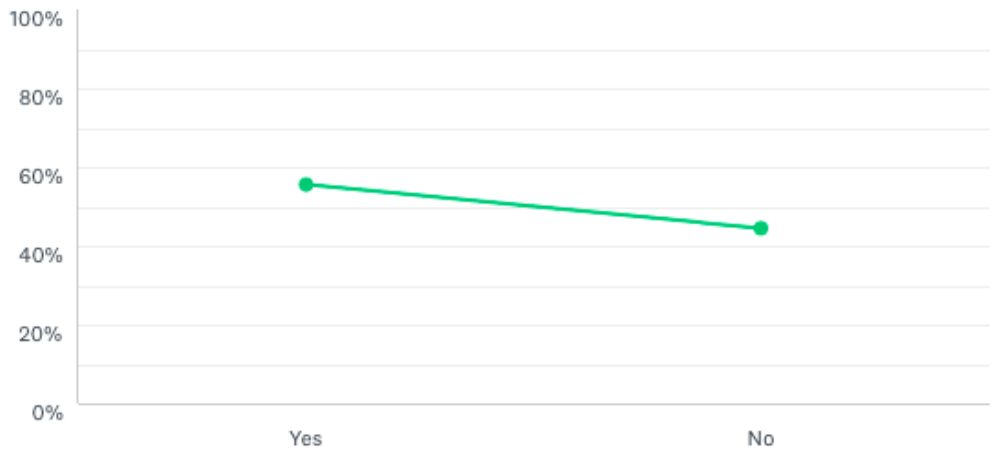

Figure. 13

In figure No. 13 we find out that answers were a very close tie between wanting the desalination plant to be mobile and/or immobile. Nevertheless a larger number did respond to wanting a mobile plant.

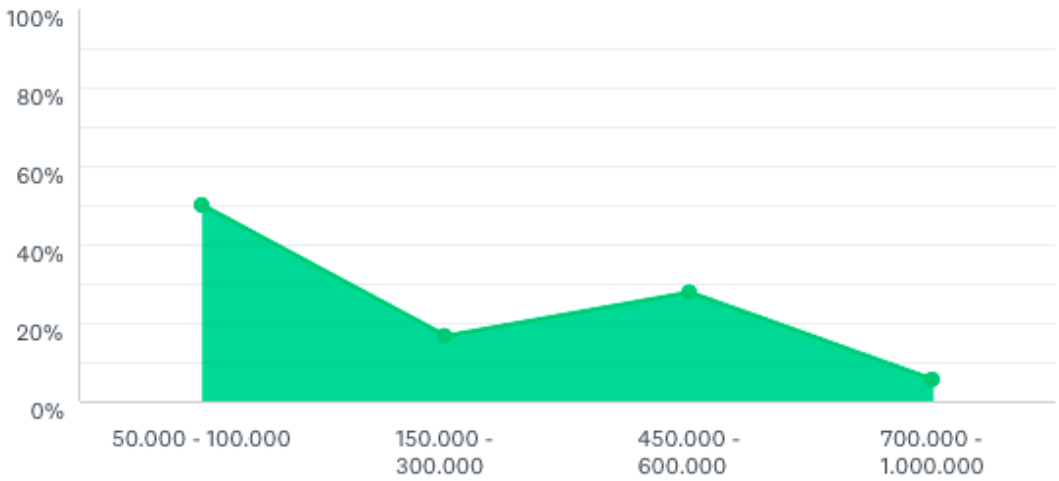

Figure. 14

Here the survey gave a rough estimation of how much would they be willing to invest in a plant in US dollars. Most of the respondents optimized for a lower price, others answered with more rationality.

6.4 Different type of renewable energy

Lastly it was asked whether they use any other type of renewable energies. As we can see by the results, there is much room for potential in this area.

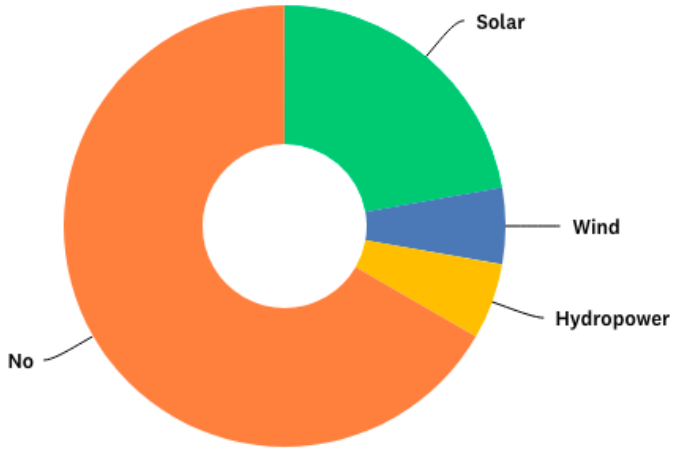

Figure. 15

6.5 Discussion

There is a market for desalination technology in the GCC countries, both public and private sectors included. It is clear that the government already helps toward creating clean water services. However, as results show many would be willing to invest in a plant for their own water usage. The responses from the potential customers assume that most of them are welcome to miniaturized water desalination technologies that can be applied for small-scale use and easily scaled for large water treatment plants on the municipal levels. The responses of the survey also show the immense value that can be exploited by foreign investors who have advanced technologies that can accelerate the level of desalinated water output in the region in order to meet the current and growing clean water needs. Perhaps the biggest result/trend that has transpired during the research is the demand for renewable energies and a clear lack in water conservation and distribution networks of the water sector in these member states.

Results derived from the theoretical framework paint a very unique picture of the region's water desalination market. It is clear that the speedy expansion of the population in the

region and the growing need for additional uses of clean water for various domestic and commercial applications are putting a very profound strain on the region's natural water resources. The findings also indicate that virtually in each of the Gulf countries, they are making several adjustments in the institutional and policy frameworks in order to prioritize increased access to clean water for every citizen.

It is clear that different stakeholders including government officials, for-profit businesses, and end consumers are all appreciative of businesses like Daira that bring revolutionary technologies to help people in the region. However, both Daira and FinContainer are not well-known names in the region, and neither is the concept of a circular economy, which means that the market penetration road that lies ahead will be long and tedious.

7 Conclusions and Recommendations

7.1 Conclusions

Although various water desalination technologies have existed in the Gulf for decades, Daira can still adopt a “market pull” positioning in order to gain an optimal sustainable competitive advantage over its competition. ‘Market Pull’ can be defined as a situation where a market demands a solution for a problem and inventors have to rise up to the occasion to provide this solution. For Daira, such a marketing position would be prudent because , as a new product, FinContainer, offers a fast and systematic solution to the water scarcity problem affecting the region. The fact that the company’s water desalination products can fit inside a shipping container means that they can adopt an entirely new business model of marketing directly to consumers so that they can use this technology to desalinate the water they generate from their boreholes and other water sources. This will give them a notable advantage over the market.

The purpose for the FinContainer, for Daira as an organization, should remain to bond business and environment together in one supply chain. The meaning of circular economy comes from the word itself, meaning that the procedures of a business are circular to create an endless regenerative loop. The most effective market entry approach that the company should adopt should involve emphasizing the value of FinContainer both as a highly innovative technology to address the region’s ongoing water scarcity crisis as well as its utility as an instrument of increasing environmental sustainability in the Gulf. People want clean water first before they consider how accessing this water will be beneficial or detrimental to other environmental and social processes. Daira is in the perfect position to cover both these areas, but in order to do so, the need to adopt a market entry strategy that prioritizes the value of different tiers of customers, including institutional customers such as government agencies and private businesses, as well as individual customers and communities that want to play an active role in mitigating the water crisis in their respective countries.

Many of the countries under the GCC are categorized as developing nations despite having a notable wealth of natural resources in terms of oil. One of the main hindrances for the region’s accelerated economic development is the lack of universal access to clean water, over most of these countries are bordered by large water bodies. Over the decades, the countries have tried to solve their water scarcity problems by adopting increasingly sophisticated water desalination, but the current solutions on the market do

not offer as much dynamism and efficiency as Daira's FinContainer technology which fits an entire water desalination plant in a shipping container.

7.2 Recommendations – entry strategy

Daira's entry strategy could aim at improving better distribution network by tracking the amount of water consumption per container. This could improve the countries' management of water control. New technology that comes with plug-and-play solution, to ensure better climate control than existing solutions, not to mention flexibility, customization, and ability to scale quickly.

A marketing strategy for Daira could aim to assist their B2B customers' end consumers/buyers to make more sustainable choices by using the FinContainer. Daira can implement their small-scale water desalination plants into small communities in new infrastructure projects in the building of sustainable cities/towns. Housing developers like Emaar Properties or Saudi Egypt Developers could act as potential customers for Daira in this case.

7.3 Reflection on learning process

When I first started with Daira, I was working on the Egyptian market. Having lived there in Egypt for over 10 years, I had larger knowledge on the market there. The GCC countries were new territory for me. I learnt much about how similar they are. I enjoyed learning about their economic and future development goals. It is great to see developing countries as such take so highly into consideration the concept of sustainability. What I would have preferred to do differently are the face-to-face interviews. Information or conversation with a direct person from these countries could have helped my research process a lot. During the research I did contact the embassies of these countries to try and interview a special person there. However, I was not able to. I am, nevertheless, happy with the turnout of this report since I was able to gather data on the water and desalination industries in the region and I was able to answer important questions from the survey responds from potential customers of the case company.

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Appendix 1. Survey Questions

This survey is done a part for research purposes on water treatment technologies in the Arabian Gulf. We are aiming to pursue universal access to clean water, sustainable and innovative wastewater treatment, as well as quality sanitation. This survey is centered around mobile desalination plants.

1. Which country of the GCC are you located in?

- United Arab Emirates
- Saudi Arabia
- Qatar
- Kuwait
- Oman
- Bahrain

2. Which sector are you working in?

- Tourism (Hotels & Resorts)
- Industrial
- Oil & Gas
- Municipal
- Mining
- Defense
- Agriculture & Horticulture
- Other (water user)

3. Is your property/company located next to

- The sea
- River/Lake
- Remote Area

4. Which source is your water services provided from?

- Private
- Government
- Own treatment methods

5. If you treat your own water are you using desalination plants?

- Yes

- No

6. Is the tap water at the location safe to drink from?

- Yes
- No

7. Is your company ready to invest in a water treatment plant that provides clean tap water?

- Yes
- No

8. Is it important to you that this water plant is mobile or not?

- Yes
- No

9. How much would you be willing to invest in a plant?

- 50.000-100.000
- 150.000-300.000
- 450.000-600.000
- 700.000-1.000.000

10. Does your company use any type of renewable energies?

- Solar
- Wind
- Hydropower
- Geothermal
- No