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Effective policies to mitigate food waste in Qatar

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This paper highlighted food waste as one of the biggest threats to food security that put pressure on the natural resources and limit the ecological capacity of land of Qatar to continue providing renewable resources. Climate change, desertification of farmland, water shortages, soil degradation and arable land per capita decline are the main characteristics of the state of Qatar. This arid and semi-arid environment resulted in difficulties to produce food locally. Qatar used to import 90% of its food from neighboring countries before the blockade in 2017. Qatar is passing an important era of total shift from food security to self-sufficiency. In a very short time, Qatar managed to register almost full sufficiency in perishable foods and produced abundant amount of food. This shed light in the importance of sustainable production and consumption to avoid environmental disasters such as food waste that directly affect the sustainability of arable land and ground water. A panel of academics, administrators, civil society and charities came together to discuss the issue of sustainability regarding food waste, in order to formulate policies and strategies to mitigate food waste and produce compost to be used in agriculture and hence achieve food self-sufficiency. These policies will help managers and policy makers to make correct decisions to preserve the environment.

Key words: Food waste, sustainable development, policies, food security.

INTRODUCTION

Recently, food waste research is gaining more attention globally because of its direct relation to the Sustainable Development Goals such as environment and resources sustainability, food security, resource management and the higher economic and environmental costs related to food waste and loss. The growing concern of the sustainable practice of converting waste to valuable resources such as energy, that registers an ever-increasing demand for food production, is also one of the factors that increased the food waste research (Thyberg and Tonjes, 2016). Moreover, in September 2015, the United Nations General Assembly adopted seventeen

goals for sustainable development as part of Plan 2030. Specifically, the 12th goal aims at “*ensuring sustainable production and consumption patterns*” The third sub goal (Goal 12.3) is to decrease the per capita share of global retail and consumer food waste and to reduce food loss, including post-harvest loss, along the production and supply chains by 2030 (United Nation 2015). According to the Food and Agricultural Organization (FAO), when all the population in a country are able to access safe, nutritious and sufficient food at all time with affordable prices, the country is considered as a food secure country. Unfortunately, the ability of attaining food

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security is threatened by the issue of food wastage (FAO, 2015a). As observed by Aktas et al. (2017), food wastage poses a great threat to the social, environmental, and economic pillars of the Sustainable Development Goals (SDGs). For instance, there is the issue of monetary value lost across the entire production and supply chain and inability to improve on the problem of malnutrition by not feeding those who cannot afford the food. Measuring food loss and waste along food chains can give decision-makers a better understanding of where and why food is wasted. These data are also the basis for prioritizing the mitigation and monitoring strategies to make progress in waste management (Flanagan et al., 2018).

Qatar has rich non-renewable (gas and oil) and renewable resources, which have been subjected to misuse and environmental pressures. A major reason is the recent population explosion resulting from the FIFA World Cup Qatar 2022 preparations, which have involved every aspect of the society. The ensuing expansion in construction, manufacturing, agriculture, and mining has put greater pressure on the country's natural wealth. The carbon dioxide levels, the air pollution, and the incidence of pollution-related diseases have increased (Richer, 2014).

The State of Qatar has responded to the sustainable development goals by formulating Qatar National Vision 2030, which calls for sectoral coordination to achieve responsible consumption and increase recycling. In order to avoid the issue of previous National Development Strategy 2016–2019 that had poor sectorial coordination implementation, the second National Development Strategy 2018–2022 has established a clear and comprehensive mechanism to enhance coordination. The second strategy included a review of the performance of the institutions in response to the first strategy. One of the advantages of National Development Strategy 2018–2022 has been its promotion of innovative policies and support for institutional reflection on the food security program (Planning and Statistics Authority Report, 2018).

Environment and food security are the most prominent sustainable development goals because they overlap and comprise all the pillars of sustainability, which are economic, social, and environmental. One of the greatest threats to food security and environmental sustainability is food waste. It has a direct effect on several interrelated aspects of human life. For example, economically, food waste leads to increased demand for food, and thus, higher prices. This leads to social cost, when prices are high; fewer individuals can purchase good quality food. It also has adverse health effects such as malnutrition-related diseases. From environmental aspect, food waste can affect the environment negatively and produce environmental pollution, that is, the decomposition of organic waste in landfills leads to higher levels of methane, which is more harmful than carbon dioxide because it accumulates in the atmosphere for a longer time. Seven percent of the greenhouse gas emissions

are from food waste (Buzby and Hyman, 2012). The management of Landfills requires a lot of financial and human resources. Globally, the carbon footprint resulting from food waste greenhouse gas release is estimated at 3.3 billion tons of CO₂ and 750 dollars economic loss (FAO, 2015b).

From a religious perspective, food waste can create a sense of guilt from extravagance and often-unintentional waste, especially during the month of Ramadan when food waste is not accepted and is becoming significant ethical dilemmas. According to the Food and Agriculture Organization of the United Nations (FAO), the number of undernourished people is increasing daily and estimated to be approximately 925 million in 2015 (FAO, 2015a).

Municipal waste management and food waste are complex issues that need interdisciplinary approaches to manage and if handled carefully, it will save considerable amount of money, feed the hungered and reduce pressure on natural resources. It can also be very beneficial and has multiple economic and ecological benefits such as, creating new employment and business opportunities. In addition, compost of food waste can be used in agriculture to improve food security. Environmental gain from waste management includes, the bio-energy produced from waste and reduction of greenhouse gas emissions. Less gas emissions helps improve health and reduce health costs related to pollution (Elagroudy et al., 2016).

There is an urgent need of effective waste reduction strategies to avert environmental disasters. Therefore, the goal of this study is to highlight the importance of the appropriate management of food waste and to provide effective policies and strategies that help the government and non-government agencies to manage food waste successfully.

The State of Qatar: Strategies for the blockade and food security

Climate change, desertification of farmland, water shortages, soil degradation and arable land per capita declined are the main characteristics of the state of Qatar, arid and semi-arid environments. This results in difficulties to produce food locally (Qatar National Food Security Program, 2012). In previous years, before 2017, that is, the date of blockade, Qatar used to import 90% of its food from neighboring countries. Nevertheless, half of the Landfill components is from food waste. Given these circumstances of lower food production, wasting food, regardless of the amount, is unjustified.

The State of Qatar has established a widely recognized food security strategy. Especially since the blockade, the country allocated significant amount of financial resources to implement the strategy, which has become a major catalyst for achieving almost 100% self-sufficiency in a short time. Seventy million Qatari riyals

Table 1. Increases in agricultural land / hectares and production/ tons since the blockade.

Agricultural sources	Increase in agricultural land from 2017 2018	Increase in production from 2017 to 2018
Cold frame greenhouses	14 ha	1,686 tons
Grow houses	20 ha	4,000 tons
Exposed land	-	3,000 tons
Qatari farms that have been rehabilitated	105 subsidized farms for Qataris	59% increase in Qatari consumer products versus only 36% increase in imported products
Major strategic projects adopted by the Ministry of Municipality and Environment	1 Million square meters per project	Vegetable production

Source: Qatar News Agency (2018), Qatar's Achievements in Food Security.

Table 2. Non-vegetable agricultural products.

Agricultural product	Increase in production from 2017 to 2018
Dairy and its derivatives	346 tons
Fish	10% increase in fish farming, 2,000 tons per year of floating cages are produced annually with a capacity of 1,000 tons per year of shrimp farming project
Poultry	An increase of 29 tons per day, the GDP rose to 98%
Table eggs	An 8-ton increase, which led to a 50% drop in the price of imports, reflecting the adjustment of local market prices
Livestock: economic animals	Increase in farm animals by 1.6 million

Source: Qatar News Agency (2018), Qatar's Achievements in Food Security.

were allocated for each of the succeeding five years projects in support of agriculture. Agricultural production (vegetables, dates, red meat, poultry, eggs, fish, and green fodder) doubled to 400% in just one year, which is 2017 to 2018. The implementation of this strategy included the establishment of research centers to enhance agricultural production. Three centers were established to develop research on fish and animal production. This includes: (1) The settlement of Ras Matbukh, the home of the aquaculture system, which is dedicated to fish farming by floating cages and shrimps farming project (Ministry of Municipality and Environment, 2018); (2) Al Sheehaniya Health Center, which was established for animal production, dedicated to the protection of wildlife biodiversity, especially the houbara bustard, which is at a risk of extinction; (3) The Mazroa'a Center, an agricultural extension center, providing outreach services to farmers. Given that agricultural production is new to the State of Qatar, there is an urgent need to help farmers to adopt efficient techniques to increase production while maintaining the soil. It is also worth noting that the Ministry of Municipality and Environment introduced large-scale strategic vegetable production at one million square meters per project. The amount of land allocated indicates that these are indeed very large projects. The most prominent projects in Qatar's

agricultural expansion are listed in Tables 1 and 2 (Qatar News Agency, 2018).

The blockade is an economic shock that forces a country to develop a short-term strategy to cope with the new situation. However, there is a need to consider the long-term negative environmental effects that accompany the short-term strategies especially since those environmental negative impacts are irreversible. The long-term negative environmental effects include the expansion of the areas allocated to agriculture. This places stress on the natural reserves and threatens the country's biodiversity. Qatar, which has the world's largest environmental footprint, will face many challenges, including land degradation, air pollution and increased waste from the agricultural and industrial expansion. This can result in a higher incidence of diseases related to low air quality, especially if the factories are dependent on fossil fuel energy. Caution is required for the policy of increasing food production. Sustainable production and environmental and natural resource management is very vital to be addressed at this stage. Because of the blockade, agricultural expansion has also led to water waste in a country that relies on water treatment, thereby increasing the burden on the financial resources.

The State of Qatar has addressed these challenges

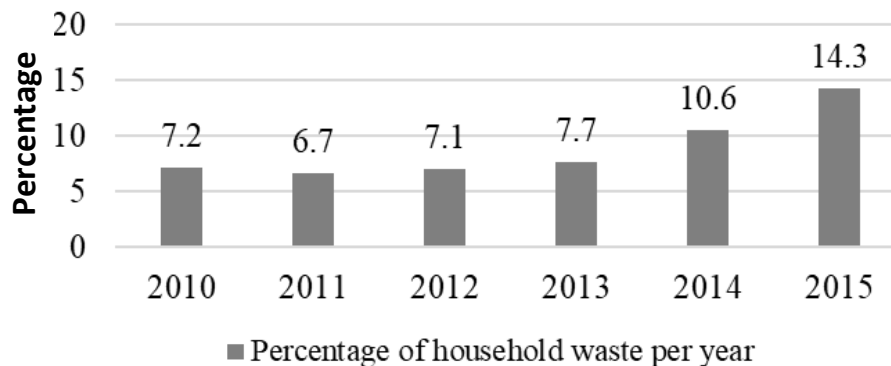


Figure 1. Percentage of household waste per year compared to total waste. Source: Planning and Statistics Authority (2017). Qatar's Voluntary National Review, 2017.

through the development of sustainable environmental management policies. For example, the government has shown an interest in sustainable food production techniques to reduce water consumption and environmental waste. There are also policies to encourage multidisciplinary studies, such as assessments of the sustainable productivity of the renewable natural resources to ensure long-term sustainable development (General Secretariat for Development Planning, 2008).

Greater attention should be paid to the problem of food waste because of the expansion of the agricultural sector, e.g., vegetable and fruit production. The acceleration in food production leads to an increase in supply and, thus, a reduction in prices, this in turn results in increased food waste. FAO noted that the estimated average food wastage by inhabitants in Qatar is around 250 kg per day (Adema, 2016). Approximately 20 million kilograms of food in Qatar are either destroyed or discarded before reaching the end-consumer (Adema, 2016). The increase in food waste in Qatar has been associated with the population growth. Figure 1 illustrates the increase in food waste from 2010 to 2015.

The social impact of food waste on Qatar society

One of the social impacts associated with the intensified food wastage in Qatar is the increase in food prices which, eventually exacerbating the issue of food security resulting in the problem of malnutrition. This is primarily because when the food prices go up, some of the population will be unable to afford quality foods implying that they will not be in a position to meet their dietary needs.

In their research study, Baiga et al. (2018) underscored the fact that the Gulf Cooperation Countries (GCC) takes the lead of the global top food wasters. An example case scenario is the case of Ramadan when considerable amount of food is wasted. In the Qatari context, the issue

of food wastage was cited as a major problem in the country (Adema, 2016). In 2012, the total food consumption and wastage estimation stood at 1.4 million metric tons (Adema, 2016). However, it is also imperative to acknowledge the fact that Qatar is one of the GCC countries that have experienced a rapid and monumental economic growth over the recent decades after the oil discovery. It follows that the per capita income has increased and hence money is not a deterrent factor when it comes to the quality and quantity of food that the population demand (Adema, 2016).

Based on the existing literature, the recklessness in food consumption is a common trend in Qatar. When it comes to traditions and customs that revolve around the food industry, Qataris are known for their generosity. The tradition of hospitality is largely acknowledged and practiced in the Qatari context. The tradition has continued to take a center stage in the country. Edelstein (2011) who notes that the culture of generosity is largely felt across Qatari supports the sentiments. This is just like in the traditional times when the host of a party such as weddings or any other form of communal dining was expected to demonstrate unflinching generosity and hospitality. As a way of extending and celebrating the particular family or traditional feast, visitors engage in informal and warmth filled conversations. This act of hospitality and generosity is extended beyond the home settings and into the restaurants and other eateries. For instance, and according to Sillitoe and Misnad (2014), it is highly welcoming to dine with the Qataris. The above-cited authors noted that a Qatari will always insist that the particular visitor eat or take the meal or drink respectively to the last piece or drop. This demonstrates their undying generosity. Nevertheless, some of the Qataris will always insist to settle the pending meal or drink bills in a restaurant. Qataris are also encouraged to share a meal or drink with anyone who sits closer to them. Similar to other nations and cultures, family life does have an influence on the food consumption pattern in Qatar. As

observed by Al-Thani et al. (2017), personal preferences coupled with the individual family resources will play a pivotal role concerning the choosing foods and consumption patterns. The Qatari society is highly multi-diverse owing to the surging number of expatriate community. The more the available resources, the more choices that a family has with regard to food and consumption pattern.

It is partially on this basis that the problem of food waste has been rampant in the Qatari context. There is a clear relationship between a family's economic status and its social position. Education levels and family incomes influence food behaviors and consumption patterns. With oil recovery, there has been intensified economic growth translating into increased per capita income. In the midst of such dynamics, people are able to purchase more than they can consume. For instance, those from the well-to-do families have a choice of buying fast foods at the expense of cooking their own food staffs. However, it is also important to mention that the issue of healthy eating comes into consideration when choosing the consumption pattern. For instance, the diet is often rich in meat protein and carbohydrates rather than fruits and vegetables. As such, and regardless of the economic status, some of the Qataris continue to embrace traditional foods as opposed to junk foods (Al-Thani et al., 2017).

In addition, the phenomenon of the dumping of leftover food is widespread in the Arab countries, especially during the month of Ramadan. It should be noted that observances, e.g., Ramadan, affect the dietary habits and traditions of Qatari families. Despite the large number of Ramadan-related food projects that aim to help the needy, the phenomenon of food waste remains a feature of Ramadan (Al-Thani et al., 2017).

A study showed some interesting results by reviewing a sum of empirical studies conducted in Europe. It revealed that the feel of guilt that household have from wasting food, is only generated by financial loss and has no relation with environmental protection or social implication. They also mentioned that elder people have higher tendency towards reducing food waste however, household with more children tends to waste more food (Schanes et al., 2018).

From a health perspective, food waste has complex effects on health such as increase mortality, chronic health conditions, health deterioration, behavioral problems, and poor mental health. Food waste directly harms the environment. Human health and well-being are affected by air and water pollution, and poor air and water quality contributes to chronic health conditions, such as asthma, bronchitis, and other lung diseases. It also negatively affects well-being. The symptoms include headaches, aches, pain, and chronic fatigue. These symptoms can be related to inflammatory responses to air and water pollution and they could contribute to autoimmune diseases, such as type 1 diabetes, lupus,

and multiple sclerosis (Bos-Brouwers et al., 2014). Therefore, better Understanding of the extent of food wastage is very important for changing attitudes and behaviors towards food waste and formulates sustainable policies accordingly.

MATERIALS AND METHODS

Although food waste is not an easy problem and has significant social, economic and environmental negative impacts, government and policy makers still cannot magnify this extent. FAO in 2012 estimated the food loss and waste in United States reached approximately 936 billion dollars, which is larger than the Netherland GDP at that time (FAO 2018). El-Agroudy et al. (2016) mentioned that half of the world's population lack proper access to waste management services. The main waste-disposal method is open dumping in most developing countries, with unlimited negative consequences.

Food waste is one of the most significant challenges facing the Arab world. For example, in Kingdom of Saudi Arabia, the estimated annual food waste generated was around 7.7 million tons with an average of 0.71 kg per capita per day (Mu'azu et al., 2019 cited in their publication). Moreover, Abiad and Meho (2018) found that food waste in the Arab world was 210 kg per capita. The Food and Environment Protection Project implemented by Georgetown University has found that 90% of the waste in Qatar is food waste (Aktas et al., 2017). In 2016, the Ministry of Municipality and Environment indicated that 31% of the waste was organic. Abdelaal (2017) said that, "*there is a great discrepancy between the figures published in the news on the Internet and official blog articles and data regarding the quantities of waste generated annually in Qatar*". The annual environmental statistics report, published by the Planning and Statistics Authority in Qatar in 2015, indicated that 613,226 tons of solid household waste was treated at the local solid waste management center, and another 482,640 tons of domestic solid waste was treated in Mesaieed outside the local solid waste management center (Abdelaal, 2017). However, rapid population growth remains the biggest challenge to exaggerate the food waste reduction. Because of the contradictory data, the present study created a mechanism for academics and administrators to study food waste collaboratively. Consequently, a closed panel discussion gathered policy makers and academics to discuss food wastage and suggest policies and strategies accordingly.

Closed panel discussion

As was previously mentioned, Qatar achieved self-sufficiency in perishable food within a short period. The abundance of locally produced food has led to lower prices and increased purchasing power. This could result in a great amount of food wastage that could create an environmental disaster. In order to get rid of all possible long-term negative impacts to the environment, Qatar has tried to avoid short-term strategies resulting from the blockade by adapting different strategies. For instance, the country has emphasized recycling and food waste management to be one of the important objectives and issue of priority to the state of Qatar. Raising awareness about the environment and society is becoming a necessity and the food waste is not individuals based problem. Therefore, involving all the stakeholders through the entire supply chain will help improve policy implication. Thus, a closed panel discussion was held on March 31, 2019, to discuss the reduction of food wastage transferred to the landfill and to develop policies and strategies to reduce food wastage in Qatar. To formulate policies and recommendations, the collaboration of academics from several disciplines with the administrators who work in similar fields is

required. Therefore, the panel brought together academics from Qatar University from different fields such as health, environment, religion, economic, and social science, as well as administrators from the Ministry of Municipality and Environment, and representatives from the private sectors and charities.

Goals of the closed panel discussion

1. Coordination, cooperation and participation between different institutions in the relevant disciplines through conducting research and projects. This would prevent duplication, develop a unified accurate database, and avoid the issues of inconsistent data.
2. Efficient management of financial resources related to the projects and research that are of high priorities to governmental institutions.
3. Discussion of the issues from multiple perspectives to provide a comprehensive understanding of the problem. This facilitates interaction and resolution. It also saves time and effort, especially because the data from the government agencies are often not readily accessible.

RESULTS AND DISCUSSION

There are several ways to minimize and dispose food wastage. The rules and regulations governing the safety of food waste treatment are important. Food redistribution practice by charities to favor underprivileged people is a famous practice worldwide. Reynolds estimated that, if the quantities of food wasted were rescued by charities, a number of 921 people could be supported in Australia (Reynolds et al., 2015).

Charitable organizations in Qatar have played a prominent role in the humanitarian activities to preserve food and to reduce waste. Some charities have thought to raise awareness and to promote a culture of food preservation by delivering excess food to beneficiaries in accordance with the best international quality and safety standards. "Hifz alNiema" and "Wahab" are non-profit organizations that collect the food leftovers from hotels, supermarkets, and restaurants to deliver it to ones in need. These projects seek to address the extravagance in the society. They reduce the waste of surplus food and redistribute meals after ensuring their validity. The food is stored in safe, healthy conditions for distribution to poor families and low-income workers (Sheikh Eid Charity Foundation, 2008). Other initiative includes Amwaj, a pilot project in Mesaieed that converts organic waste into compost and other materials. Reducing the phenomenon of wasted food is a social responsibility issue that should be addressed in homes, schools, universities, and other institutions. These initiatives require sustained government support and encouragement. Additional food redistribution, recycling, and waste reduction community initiatives are needed (Vittuari et al., 2016).

Ongoing initiatives by the Ministry of Municipality and Environment

In the State of Qatar, there are some institutional efforts

to preserve the environment and to support food security. This is manifested in the food waste reduction initiatives and the projects and smart technologies that have been designed to create a clean environment and societal awareness. The following are examples of the ongoing initiatives by the Ministry of Municipality and the Environment:

1. Public awareness campaigns, e.g., those that coincide with the camping season.
2. Penalties, including fines, for improper waste disposal, e.g., dumping garbage in public places. Information about the waste penalties has made available in local radio, newspapers, and in other media.
3. "Oun", a smartphone application launched by the Ministry of Municipality and Environment to help the public in some services such as sewage collection, manage, and rodent control.
4. The use of methane-fueled machines in the landfill to reduce considerable amount of methane and hence reduce emissions.
5. The use of methane-fueled vehicles to transport the waste to the landfill.
6. Redesigning and engineering the construction of landfills to enhance its capacity.
7. Planting 100 trees from seven types of trees, including the acacia, to absorb soil salinity and research is currently underway to study "Marmar" trees to develop a natural plant of oxygen production.
8. Some private factories have been converting food waste into animal feeds and fish food.
9. The largest Plant in the Middle East that recycles waste and converts it into compost follows the Ministry of Municipality and Environment. The State of Qatar decided to achieve 100% self-sufficiency in compost production, which used to be imported from India and Pakistan.

The results of the closed panel discussion

Academics from several disciplines at Qatar University contributed to the design of policies to reduce the amount of food waste transferred to the landfill. The two-hour discussions focus on the following agendas:

1. Promote new food behaviors and attitudes.
2. Increase awareness of food waste and its negative impacts.
3. Enact strong legislation and impose penalties on wastes.
4. Promote the concept and principles of food waste recycling.
5. Encourage community participation, such as school and university students, in reducing food waste.
6. Encourage research in food waste management in the State of Qatar and assist decision-makers and policy makers in estimating food waste.

Policies and recommendations for reducing the amount of food transferred to landfills

The panel's outcomes drafted a proposal of policies and strategies that can be circulated among the relevant authorities. The panel approved the following policies and recommendations:

1. Create a national committee with a mandate to address food waste. Its mission would be to redefine the national consumption culture at the state level through a "National Food Consumption Charter."
2. Publish comprehensive analysis of policies and recommendations about food waste management in a book titled "*Public Policies in Qatar*".
3. Focus on institutional waste rather than just household waste by targeting the sources.
4. Increase awareness and provide training on waste classification and individual recycling with consideration of long-term nature of behavioral and social change.
5. Design a religious–educational communication strategy to connect religion to the environment and community.
6. Reduce food waste in Ramadan's feeding projects such as eco-friendly Ramadan tents.
7. Create incentives and/or penalties to reduce food waste.
8. Include educational and training programs on food waste reduction in the school curricula.

The panel discussion took place when the time of Ramadan was approaching and a significant number of tents spread around the country to provide food to underprivileged individuals for religious reasons. Based on Policy (6), the participants decided to implement a pilot project entitled "Ramadan Eco-friendly Tents" that aimed to reduce the huge amount of food wastage collected from both tents and households in Ramadan. The charities supervised the process of food waste collection. Then, waste treatment center and recycling that belongs to the Ministry of Municipality and Environment recycled the food waste to compost, in order to use it for agriculture production. Though this kind of projects is small in nature, they could make significant contribution to achieving sustainable development and increasing community awareness about the environment and environmental risk management.

Conclusion

The United Nations Sustainable Development Goals (SDGs) 2030 draws attention to the most pressing issues of the past decade mainly: population growth, climate change, soil degradation, water scarcity, and food security. Moreover, feeding the growing population requires more food production while minimizing food waste. The issue of food waste is largely rampant in Qatar

because of many factors such as the dramatic increase in population, the rapid agricultural expansion and Qatar's decision to achieve self-sufficiency provoked by the blockade from its main food importers; this is in addition to the fact that Qatar has limited capacity of the land to absorb waste and to replenish natural resources at the same time. It is very important therefore for Qatar to balance the fast growth and environmental protection by insuring sustainable production and consumption pattern to achieve sustainable development. The political and economic impacts of the blockade by its neighbors, has initially had a soon theoretically shocking impact. With the wise leadership of the State and the will of its people, the State of Qatar was able to reverse this situation in the first year, by resourcing and enhancing the country's agricultural potentials. In order to avoid the trap of short-run strategies, the state has drawn attention to the importance of adopting sustainable technologies, increasing recycling, and converting food waste into compost for distribution to farms, gardens, and households to support food production. Charitable and support organizations have been encouraged to work on the sustainable development projects that have national priority. In this study, the stakeholders who are concerned with food waste came together to come up with proposed effective policies and recommendations to reduce the amount of food wasted in Qatar, that is, household or/and institutional waste that is transferred to the landfill aiming to alleviate the threats to the arable land and the risk of groundwater pollution. Generally, literature shows that religious belief, cultural attitudes, socio-economic status, and working conditions are the main drivers of food waste in Qatar. Therefore, better understanding of attitudes and behaviors towards food waste is very important to formulate sustainable management policies. Finally, the collaboration between sectors are very important; the academic institutions can take care of supervision and consultations and the administrators from different sectors may adapt action plans according to the need and priorities of the countries national strategies.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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