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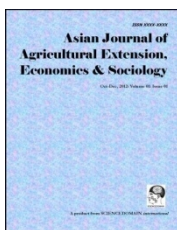
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## **Food Security in the United Arab Emirates; the Role of the State in Overseas Farm Crops Production**

**Saif S. Al Qaydi<sup>1\*</sup>**

<sup>1</sup>*Department of Geography and Urban Planning, P.O.Box 15551, UAE University, Al Ain,  
United Arab Emirates.*

### **Author's contribution**

*This whole work was carried out by author SSAQ.*

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### **ABSTRACT**

With its increasing population and continuing rapid infrastructural development in order to deal with international events such as Expo 2020, The United Arab Emirates (UAE) has created a pull-in environment for a large international labor force eager to work and settle down in the country. Food security has become an important issue as a result of the population growth and the labour force increase. The aim of this paper is to review and analyze a number of approaches, which could point the way to fostering policy options for achieving long term and sustainable food security for the UAE.

Within the Gulf Cooperation Council (GCC), the UAE produces an extremely limited amount of its necessary foodstuffs, and as the UAE population increased from 557,000 in 1975 to over 8.5million at the end of 2012, and during that time the annual expenditure on food imports exceeded AED 41.7billion (Arab Emirate Dirham, 1 USD=3.67 Dirham). In fact the country depends almost entirely on imports, especially cereals. Rice, for example, is a vital staple primarily imported from India, Pakistan, Thailand and Vietnam.

This paper focuses on the UAE alternatives to deal with food security by growing food in some friendly countries. Alternatives of 1) increasing food production locally; 2) direct importation; and 3) leasing farmland for food production in other friendly countries are examined to answer the main question raised in this paper.

\*Corresponding author: E-mail: [alqaydi@uaeu.ac.ae](mailto:alqaydi@uaeu.ac.ae);

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## 1. INTRODUCTION

Producing sufficient quantity and quality of food is a critical focus for any government, and currently in the UAE this is achieved through direct food imports in global markets. However the UAE government is among those that work toward producing their own food, employing the latest technology and modern techniques in greenhouses and controlled environments. Nevertheless, harsh agricultural conditions have restricted local production mainly to vegetables (most notably cucumber, tomatoes and green peppers), and even this is insufficient to supply the local markets with the necessary quantities of food productions. A crucial question is whether these technologies can be adapted to grow strategic cereals, like wheat and rice, the staple foods of most of the UAE population.

Should this be unsuccessful, a second scenario is for the UAE to actively lease land in foreign countries and invest in agricultural production specifically to satisfy its own food needs.

A review of other food security studies in specific areas [1,2,3] show that many tend to focus on the historical and human factors affecting the food security in the certain countries like Egypt and parts of North Africa. Work of [4,5,6,7], demonstrated the need for clear strategies to help in producing food in the Arab World through using the historical background as a baseline to predict potential future problems in food production, supply and demand. Although few studies refer directly to UAE both [8,9] present examples and examine economic cooperation in relation to domestic production and trade in food commodities.

Most researchers point out that the land lease approach has advantages over the more common broader, market-based importation. Food importing countries have greater control over their food supply, and exporting countries benefit from agricultural investment in the land and water resources, and even general infrastructure, as well as provision of jobs. Several Middle Eastern countries, including Qatar and Libya have already implemented projects. Others, in particular UAE and Saudi Arabia are in the road to utilize their international relationship with other nations to lease fertile farmland from friendly countries to grow rice and wheat.

However such programs are not without significant challenges. Geopolitical, political and diplomatic complexities abound and they cannot be successful without a high degree of political stability in participating countries. These can be exacerbated by natural hazards, like flooding, drought, earthquakes, climate change, and so on.

With special reference to cereals, the aim of this work is to shed a light on the main cereal suppliers to the UAE markets and examines the possibility of leasing land in friendly countries to grow food and import it to the UAE markets. The efficacy of exchanging food for oil is also considered.

Due to the nature of this study, most data used have been retrieved from both original governmental statistical abstracts and the latest available secondary sources. Some qualitative information has been collected from UAE local food markets, with a specific example of farmers' experience in tomato growing, to calculate generalized cost-benefit feasibility for UAE domestic agriculture.

## **2. INTERNATIONAL PROCUREMENT: ALLIANCES AND LAND**

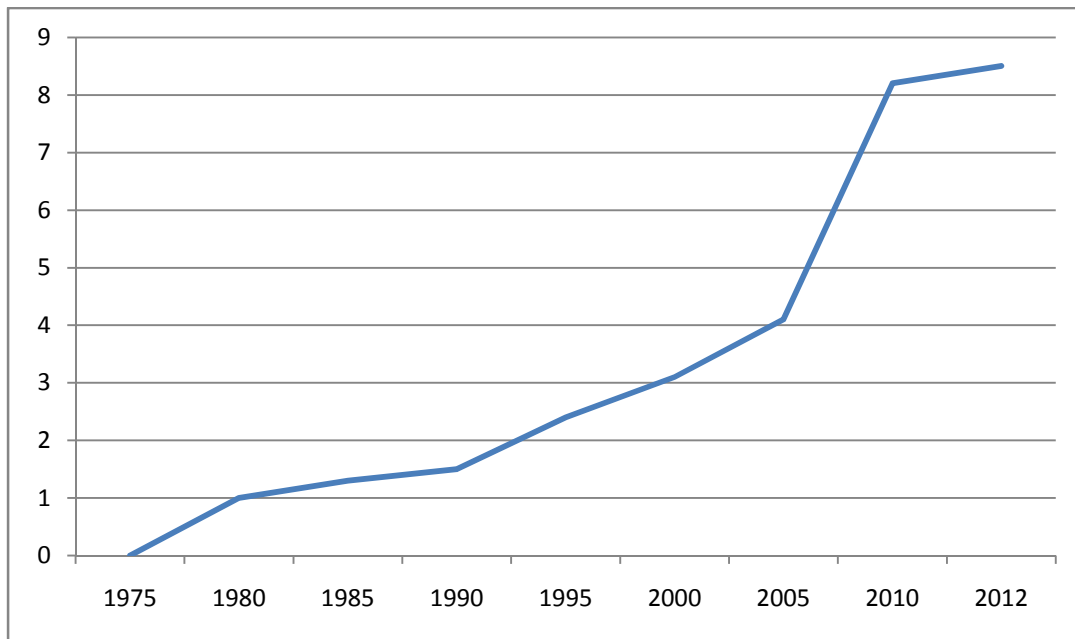
With global agriculture declining and food sources diminishing due to climate change, every importing country will have to institute strategic policies in relation to consumption and source supply. Future UAE food security policies will have to consider how to enhance domestic production, and establish clear guidelines on which vital agricultural products will produce more nutritional value in relation to capital, energy, and scarce land and water resources consumed. It follows that UAE international relations will then have to focus on securing alliances with food producing and exporting countries, as well as with countries in which UAE government and private investors have purchased current and potential agricultural lands.

### **2.1 Low-income People Feel the Impact of International Finance**

As mentioned, this study considers policies and approaches for ensuring quantity, quality, continuity and accessibility of food supplies, adequate to enable the entire UAE population to live a healthy life. Food security became a major issue raised by GCC countries as globalization began to shift toward political agendas being inserted into international trade & commerce in foodstuffs. The importance of how international costs impact even the lowest economic classes can be explained with the following discussion. Annual food import expenditures by all GCC countries reached AED 44.04billion (US\$12billion) by 2010, with the UAE ranking second highest. However, by 2011, worldwide impacts of climate anomalies and natural disasters on agricultural production caused UAE food prices to increase 4.8% over the previous year. Thus, many UAE private sector food importers supplying local markets raised prices of staple commodities, notably rice and grain, to unaffordable levels especially for the low wages foreign labor force. Between March and April of 2010, the price of vegetables rose by 0.9%, meat and poultry by 1.2% and dairy products by 0.1% [10]. Such increases can produce a social shock to those low-income labor forces. Even in countries with a high GDP, such as the UAE, many local inhabitants, especially guest workers, are unable to afford such increases when their incomes must include savings to repatriate for families in Less Developed Countries (LDC) of origin.

### **2.2 Oil Export and Food Demand**

The Gulf regional economies have developed in direct proportion to available natural resources focusing on extraction, processing, and exporting of petroleum and derivative products. This has resulted in the UAE focus on petroleum income related investment in developing petroleum and petro-chemical related infrastructure. However, revenues in excess of those expended in petroleum related sectors, have advanced development across many economic sectors such as construction, real estate and transportation. Diversification in investment has produced greater employment resulting in migration of both expertise and labor to the UAE, which in turn boosts population and food demand. Because of recent economic development and commitment to globalization, the UAE has experienced exponential population growth. These pull factors have encouraged many people to elect to live and work in the UAE. As a result, the total UAE population has doubled three times since 1975 to more than 8.5million people in 2012 (Fig. 1), thus a corresponding increase in demand for additional food supplies. Consequently, the amount spent on food imports increased from AED 28,460billion in 2006 to more than AED 41billion in 2010.



**Fig. 1. UAE Population from 1975-2012 (In million)**

Source: [11]

### 3. UAE FOOD IMPORTS

The UAE's population growth has not been matched by an equal increase in locally produced foodstuffs, and if anything, the ratio of locally produced foods in relation to population has consequently declined to a fraction of its earlier status. The UAE food import bill has thus exponentially increased in relation to previous local food production; thus, the problem becomes how to provide food for the increasing population. The following are some examples of the main UAE imported farm crops that are affected by climate changes and international market prices:

#### 3.1 Rice

What policies, strategies, and plans will be needed to meet increasing UAE food needs? That line of thought can start with an example of the link between natural disaster and price increases for rice. The importance of rice to the UAE cannot be underestimated. The 2010 UAE bill for imported foodstuffs was AED 41billion compared to AED 28,460billion in 2006. Within four years food import costs thus increased by more than AED 13billion, accounting for almost %8.6 of the total UAE import expenditures. As rice forms the staple diet of many UAE residents, and as domestic production and any potential production near zero, rice will remain one major component of food imports. In 2008 rice was ranked 15th on the scale of total UAE imports. In that year, a total of 1.3million metric tons of rice worth AED 5,572,869,708 was imported from the Indian Sub-Continent and other Asian regions. But as global human consumption of rice as a food staple exceeds 50%of the world major cereal production, however much the production, demand will potentially grow in direct correlation to population growth and available supply [12,13]. Thus global pressures will directly affect cost, and while less significant for the UAE than for billions of Asians, when natural disasters

strike vast areas of these East-Asian regions, the resulting supply deficit will affect competition for the volume that the UAE can import, irrespective of the ability to pay increased prices. This is exactly what happened in 2011 when flooding hit Thailand resulting in extreme loss of rice crops that year, and a spike in international commodity markets prices.

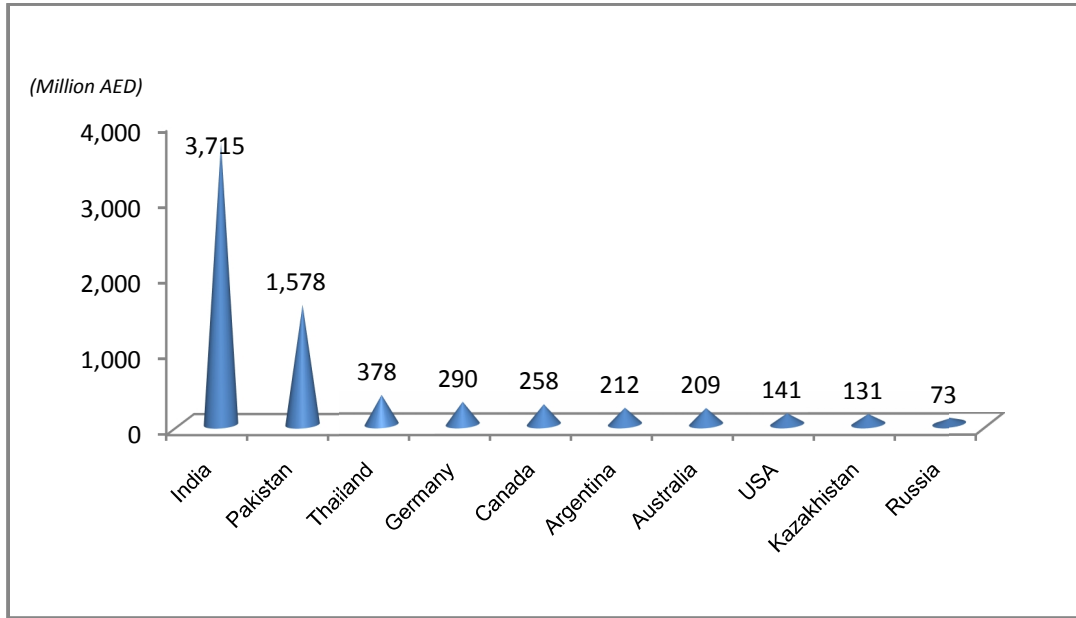
As Thailand and Vietnam control more than half of the global trade in rice, both countries supply UAE market with large quantities of rice. Thus, both UAE and global food security in rice are highly dependent on agricultural stability in Southeast Asia. Immense flooding in 2011 created instability across the Thai agrarian economy with resulting price instability on world rice commodity markets. As of 2010, high quality Thai rice sold for AED 2220 (US\$600) per ton (5% broken grade) and was forecasted to hit AED 2960 (US\$800) per ton by the end of 2011, a figure that is still uncertain. In 2010 Thailand exported almost 80 thousand metric tons of rice (semi or wholly milled) to the UAE market, an export worth over AED 210 million. The same year, the UAE imported only 4 thousand metric tons of rice (semi or wholly milled), from Vietnam, at a cost of AED 6.6million. Also in 2010, UAE rice imports totaled 447 thousand metric tons worth AED 1.3billion. Although producing less overall rice than Thailand and Vietnam, India leads in rice exports to the UAE markets, with 2010 exports of 893 thousands metric tons of rice (semi or wholly milled), worth AED 3.3billion. These figures illustrate how important these producers are to the UAE market, with its large rice consuming population, thus any impacts of natural hazards on rice production in these areas will lead to potential supply reductions and sharp price increases.

Such climatic impacts, whether resulting from global warming, freak weather, or tectonic activities, threaten Southeast Asian rice production and directly affect the UAE labor force's large numbers of Asian laborers for whom rice is the primary cereal their diet. In 2012, UAE hosted approximately 3million people from the Indian Sub-Continent, from laborers and service workers, to business and professional classes, mostly daily rice consumers. Beyond those populations, increasing numbers of Southeast and East Asian workers are joining the UAE workforce, thus increasing overall rice demand.

### **3.2 Other Cereals**

In 2010, the UAE imported over 3.4 million ton of cereals valued at AED 7.5billion, with 97% imported from ten countries. The top three, India, Pakistan, and Thailand, supplied the UAE markets with 78.5% of their total cereal needs (Fig. 2), while the Russian Federation also placed among the top ten. Nevertheless, 2010 was a year of environmental disasters. Pakistan suffered from serious floods that inundated large areas of their northern regions with continuous rainfall leaving more than 20 million people homeless. Needless to say, that crisis will take several years to recover, thus affecting Pakistan's cereal exports to the UAE. Similarly, natural disasters in 2011impacted Russian agriculture with a long-term drought spreading from their southern wheat lands to northern forests, causing devastating fires impacting much of their annual cereal crops. Sweeping across the Russian Federation, more than 10 million hectares of farmland were destroyed, along with 20% of the total harvest, a 7% drop over the previous year's harvest, affecting 20% of the total wheat production earmarked for international export [14]. Such environmental disasters and subsequent crises in the agricultural economies have affected cereal prices worldwide, in particular countries more heavily dependent on cereal imports. Resulting impacts on UAE imports will ride a wave of price increases until these crises have passed, unless other equally serious natural disasters or conflicts significantly reduce the global amount of cereals available for export on the global market, or impede delivery to the UAE. If the international food market price

continues to increase, this may lead to an increase the food price in the UAE markets, and could affect the purchase power of some foreign labor forces with low wages, which may affect their living standard [15]. This situation may force some of them to leave the country for better chances somewhere else or return to their homeland, and this will be a great lost to the UAE.



**Fig. 2. UAE main cereals imports countries, 2009**

Source: [11] Chapter 10 Foreign Trade

#### 4. UAE FOOD SECURITY STRATEGY

At present, the UAE government is following a fourfold food security strategy:

- 1) Subsidies to the importer-wholesaler-retailer supply chain to provide cereals to UAE consumers at lower than international market cost,
- 2) Negotiating other source arrangements with alternative suppliers,
- 3) investing and supporting UAE Nationals investing in agricultural land development and production in “friendly” countries with strong agricultural potential, and
- 4) Exploring diversification and innovation in UAE domestic agriculture.

Negotiations between government and international private sector supply chains are always complex, and often necessarily extremely confidential, but the UAE government purposefully has “leaked” information about food security issues to the media. The intent seems to both stimulate public awareness of the complex issues involved, and yet reassure the public that the government is knowledgeable, concerned and actively pursuing solutions. The Federal National Council (FNC) has called for a food security strategy that reserves more than the government, and proposed a six month reserve supply, as “the UAE imports 85% of its food, making it vulnerable to fluctuations.

#### **4.1 Fair Compensation for Friendly Overseas Investments**

In one recent news article on food security, the Oxfam GB director launched their global “Grow Campaign” from Abu Dhabi after holding talks with UAE government officials and private sector entrepreneurs. Quoted in the press [16] as saying that “while countries develop their own food security strategy ... [they should also be] looking at food security in African countries, as well.” Continuing, the director commented that global food security was everybody’s concern and that the Gulf Countries must also look at water security, and increase domestic production where feasible. But the director also warned that GCC and UAE overseas investments must be fair in compensating the developing countries in which they have made investments in agricultural land and development. Among experts attending the Abu Dhabi meeting, some commented favorably on Qatar’s strategy. Other experts suggested that the UAE should focus more on policies that encouraged investment in domestic production, aiming toward a greater self-sufficiency but at the same time, greater self-sufficiency “will automatically contribute to the global problem” as developing countries now benefit from food exports.

#### **4.2 Focus on Continuity and Stability of Alternative Supply**

While the argument of continuity and stability of alternative food supplies e.g. overseas food investments, which is the focus of this present research paper, the main issue it addresses concerns continuity and sustainability of the food supply to the UAE markets. Recent political changes in the Arab World once more demonstrate the volatility of this area as a turbulent region. Thus credible scenarios can be constructed in which UAE simply cannot continue to bring food in due to international conflict. Dependence on local food sources is unrealistic, although potentially mitigated by stocking food reserves, a policy already in motion, along with water reserves. However, because of its harsh environment and the water shortages, any blocking of food imports could be catastrophic. Comparisons cannot be made to Iraq during the international sanction of the 1990s, because Iraq has fertile soil and large water supply, which enabled the farmers to produce more food to supply its main markets. Nevertheless, current tensions between Iran and the powerful states that threaten it, spill over directly in that some of the UAE food imports come from Iran and in the advent of more serious conflicts erupting, that supply chain might be cut. Already increasing international sanctions against Iran influence the large volumes of trade between it and the UAE, potentially squeezing food imports through financial and banking restrictions on doing business with Iran.

But in a globalized world economy, any country has to look outside of its region toward potential food sources as well as trade and investment opportunities.

#### **4.3 The UAE’s Future Food Strategy**

##### **4.3.1 Domestic or imported**

The aim of the UAE Federal government is to provide food at affordable prices to all UAE residents. In order to achieve this, the question arises as to whether the UAE should be independent and grow its own food, on its own soil, using its own farm labor force and sell to its local markets at a reasonable price. Alternatively, should the government conserve such farmland that it has and import food cheaply from international markets? it is very difficult question to answer at this time, but some projections regarding UAE farms, crops and fresh



produce markets might shed sufficient light on the subject to enable a valid conclusive decision to be reached. Given the facts of a shortage of water, small local farm labor force and insufficiently fertile soil, it can be shown that it is not economically viable for the UAE to independently produce the food required by its residents. On the other hand, to depend completely on importing all food from outside the UAE's borders will put the country unduly at the mercy of food suppliers. For example, growing tomatoes in the UAE is not cost-effective because it costs more than 4.25 AED (\$ 1.2) to produce one kilogram of tomatoes locally. Whereas importing the same amount from overseas markets would cost less than 2 AED (\$0.40) (Table. 1). Thus from an economic point of view, in terms of cost benefit alone, it can be concluded that the produce required by the residents of the UAE should be imported from overseas. The added advantage of being able to conserve limited natural resources such as soil, water and labor force further strengthens the motivation to select this option. However, the negative ramifications are that the country's labor force will not gain any farming experience and an indefinite supply on demand cannot be guaranteed. Nevertheless, when one considers other crops such as wheat, maize and rice and the huge volume of water required especially if inefficient farming and traditional water sources are used then the benefits of importing produce seems to outweigh the few advantages to self-production.

**Table 1. Comparing imported and locally grown tomatoes in UAE/Kg in AED**

Items	Local grow	Importing
Water	0.50	00
Preparing soil	0.50	00
Fertilizer	0.50	00
Pesticide	0.50	00
Transporting & package	0.25	1.5
Labor	1.00	0.25
Monitoring	0.50	00
Power	0.50	0.25
Total	4.25	2.00

*\*. Estimated Price (one US Dollar equals 3.67 AED)*

#### **4.3.2 Shifting food sources**

Indeed, several countries e.g. Uganda, even with rich local environment and good agricultural conditions, imports part of its food supply from other countries (mango from Kenya and apples from South Africa) but a significant quantity of fresh and processed fruits and vegetable are coming from local sources [17].

Former food exporting countries like Egypt are now gross importers of crops in which they were previously self-sufficient. Further, the rich agricultural Nile delta is increasingly suffering erosion of agricultural productivity through soil salinization due to both intensive irrigation and seawater infiltration as the Mediterranean slowly rises. Thus, a region that has historically produced over half of Egypt's total food supply may be losing half of its productivity in the next several decades.

#### **4.3.3 Linking oil supplies to food supplies**

Another strategy is to sign a long term trade agreement with other nations to grantee the supplies of food commodities to the UAE markets, the same as the long term oil contracts

between the UAE oil companies. The UAE signed a 25 year contract to supply Tokyo Electricity Power Company TEPCO with UAE gas and to grantee the continuing supply of the UAE gas to this company as part of the long term contract. However, if the UAE link its oil and gas supply with food supplying countries and ended in signing a long-term agreement, this might affect the international oil market especially if other GCC countries followed the UAE step. In this case both parties could sign and commitments to protect the interest and to sustain the development in both countries [18].

## **5. LEASING FARMLAND ABROAD**

In recent years, some countries looked for land abroad. Libya was one of the first countries to reach an agreement with Ukraine to farm 250,000acres (100,000hectares) of wheat to feed the Libyan people [19]. Indeed, this is not new practice, as the International Food Policy Research Institute (IFPRI) stated that in 2009 there were around 50 agreements where massive acquisitions of land to grow food for other nations have been signed. Saudi Arabia is approaching more than 11 countries to lease or buy land to grow some food for its people. The Chinese ZTE International lease 6.9million acres (2.8million hectares) of land in the Democratic Republic of the Congo to grow palm trees to produce palm oil. South Korean is doing the same by securing the right to 1.7million acres (690,000hectares) of land in Sudan to grow wheat. Ironically, most of the countries, which are willing to lease their land, are considered to be poor and low income countries e.g. Ethiopia, Sudan and Viet Nam [20].

In 2009 the UAE's Minister of Economics, Mr. Sultan Al Mansoury, announced that the UAE's new food plan would be to invest in many agricultural projects worldwide as an alternative means to supplying the UAE markets with the main food commodities needed. Two countries where these projects would be pursued are Sudan and Cambodia [21]. The UAE is building large storage facilities to accommodate fifteen key food products as part of an early food warning strategy to provide food for the UAE people for three months. The project is completed on 2013, and 20 large cereal storages built in Fujairah on the Gulf of Oman with an estimated storage capacity of one million metric tons.

### **5.1 International Investments**

As an alternative to growing certain cereals within the UAE, the government could increase worldwide UAE food investment by purchasing farming rights in other countries, and by subsidizing UAE corporations and individual investors to do the same. Currently, the UAE government invests in other Arab countries such as Egypt, Sudan and Syria where various crops are grown and then imported for consumption within the UAE. This scheme could also be applied to some Asian countries, such as Cambodia, which is well suited to growing rice, which could then be directly exported to local UAE markets.

But it is too early to say what affect result of the natural hazards in neighboring countries, such as Pakistan and India, would have on the UAE food supply, (especially the cereals) since around 40% of the UAE's population are residents of these two countries. Thus it is unlikely that they will refuse to supply their nationals with their staple food, namely rice. Additionally, these two nations have long enjoyed close relations with the UAE. One such recent example is that within a single day (25.08. 2010) UAE charities successfully collected more than AED 25million (US \$ 6.8million) from public donations to the Pakistani relief effort to aid people displaced by flooding, and over three days collected AED 85million (approx.

US \$ 23million) to support the Pakistani relief efforts [22]. This might give an indication about the close relationship between the two nations.

## 6. CONCLUSION

It is clear that the international environmental and political issues affect worldwide food supply to the UAE markets. Future collaboration between those countries with an ideal environment in producing cereals with less water consumption and utilizing their own labor force and management to enable the UAE to lease farmland under certain condition to grow some farm crops to be later exported to the UAE markets.

Long-term agreements maybe and ideal one to enable the UAE oil and gas to be exported to such countries with a fertile soil and high labor intensive and in return part of this farm crop harvested to be exported to the UAE. These types of agreement could be signed to facilitate an agreement to exchange benefits to stabilize the food and energy supply between both countries. However, the UAE government should continue its efforts to look for other alternatives to answer its future need or food especially with its future obligations e.g. organizing 2020 Expo which expected to draw attention to the region to further development that require more food supply.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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