

Green Economy Sustainability in the UAE and Agrarian Leadership

ISTVÁN KUNOS, PH.D.
ASSOCIATE PROFESSOR

UNIVERSITY OF MISKOLC
e-mail: szvkunos@uni-miskolc.hu

SOMAYEH KARIMAN
PHD CANDIDATE

UNIVERSITY OF MISKOLC
e-mail: somy2012kariman@yahoo.com

AIGUL MEIRMANOVA
PHD CANDIDATE
UNIVERSITY OF MISKOLC
e-mail: aygulmeyr@mail.ru

SUMMARY

Recently, green economy sustainability has become one of the major studies for science. In particular, developing countries need more infrastructure and technologies in order to improve their green economy. This article attempts to demonstrate a way of the implementing the green economy sustainability concept in the United Arab Emirates through improvement of the green economy based on new technologies, innovations and agrarian leadership.

Keywords: Green Economy; sustainability; leadership

Journal of Economic Literature (JEL) codes: O13; Q01; Q56; Q58.

DOI: <http://dx.doi.org/10.18096/TMP.2020.02.05>

INTRODUCTION

The most common definition of the green economy is described as being "low carbon, resource-efficient and socially inclusive" and an economy that "results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (Luomi 2015; Willis & Kirby 2015). Furthermore, the green economy has become a main concept in international sustainable development programs. One main objective of the green economy is to reduce risks of environmental and ecological shortages, aiming to eventually lead to sustainable development without destroying the environment (Fogarassy 2017).

The concept of the green economy in the Gulf countries is beginning to take shape, and finally can be "underpinned by a complex web of multifaceted, state-led international interactions" (Luomi, 2015). As countries become richer, a heightened interest in the environment comes from two sources: from citizens and from governments (Markandya & Tamborra 2005). For instance, building and construction sector in the Gulf

Cooperation Council (GCC) region has already experienced rapid development in some factors such as the economic growth, increasing population and modernization of the country. Furthermore, the world's highest per capita values of energy consumption and environmental emissions belong to the GCC. Therefore, the rapid growth and developing of the building sector which has already taken place in the GCC have negative implications on the region's energy and environmental scenarios.

The main subject of this research is to review the concept of the building sector in the GCC region, focusing on one of the most important countries in this area: the United Arab Emirates (UAE). We compare the green economy indicators of the UAE with Hungary and OECD-EU. This research reveals a relationship among the role of the leadership and the green economy in the UAE why the terms of ongoing investment in the building sector, population and the size of the economy in the UAE has been reached to 79% in the GCC region.

LITERATURE REVIEW

The term “green economy” was first mentioned in a pioneering report for the government of the United Kingdom by a group of leading environmental economists in 1989, entitled “Blueprint for a Green Economy” (Pearce & Barbier 2000). According to sustainable development reports, the economy cannot be separated from the environment. The method and techniques with we are managing the economy may directly and indirectly affect the environment, and the environmental quality has a direct effect on the performance of the economy as well (Pitelis 2011). On the other hand, nowadays the issue of global warming is becoming one of the most significant challenges for scientists. Global warming has already provided some threats to human life such as sea-level rise, food insecurity and increased natural catastrophes like flooding, droughts and wildfires in the global ecosystem.

In this situation, the building and construction sector plays an important role in global warming since it accounts for more than 40% of materials consumption and more than one-third of the total greenhouse gas emissions in the world (Klufallah et al. 2016). The contribution of constructions to global warming is not only usage of resources such as energy and raw materials but also producing waste and harmful atmospheric emissions as well. Moreover, the availability of natural resources, unpolluted air, clean water, adequate food and shelter must be balanced between protection and provision of resources for the growing population. For instance, the electricity demand in the UAE has grown from 38,600 GWh in 2000 to 79,500 GWh in 2009 and then to 90,600 GWh in 2010, with an average annual increase rate of about 8.8% during the last decade (Mokri et al. 2013). Between 2006 and 2011, the annual increase in electricity demand (10.8%) closely followed the trend in annual population growth of 11% during the same period (Mokri et al. 2013). In addition, the population of the UAE reached 1 million in 1980, to 8.4 million in 2010 and 9.77 million in 2019.

The UAE has decided to face the issue of the global warming and provide a specific goal for 2021. The vision for National Agenda 2021 focuses on improving the quality of air, preserving water resources, increasing the contribution of clean energy and implementing green growth plans (National Agenda 2019). The UAE government seeks and implements collaborative and innovative instruments to meet immediate basic needs while ensuring that the long-term needs of the country are also met. Likewise, the National Agenda highlights the importance of the infrastructure and aims for the UAE to be among the best in the world in the quality of

airports, ports, road infrastructure, and electricity. A leading telecommunications infrastructure would allow the UAE to become a forerunner in the provision of smart services. For providing and improving this purpose, the UAE has set standards and the state is clearly monitoring its national key performance indicators. Some of the sources such as the data and information are related to the measurement are taken from the Ministry of Climate Change and Environment in coordination with the National Center for Meteorology & Seismology, the Ministry of Climate Change and Environment in coordination with the Federal Competitiveness and Statistics Authority, the Ministry of Energy, the World Economic Forum - Global IT Report, the World Bank, the United Nations, and the Sheikh Zayed Housing Program. The Government of the UAE, both at the federal and Emirate level, is the key driver of sustainability in the UAE. The UAE has aligned itself strategically with the green economy goals, as demonstrated by a speech by Dubai’s Ruler and the UAE’s Vice President and Prime Minister, Sheikh Mohammed bin Rashid Al Maktoum in January 2012:

‘Our goal [...] is to build [an] economy that maintains the environment, as well as an environment that supports the growth of the UAE economy. In line with the vision 2021, the UAE seeks to diversify an economy that is based on knowledge and innovation and through which we can provide employment opportunities for our citizens, maintain our natural and environmental resources, and strengthen our competitive position in global markets, especially in the areas of renewable energy, and green economy-related products and technologies.’- (Luomi 2015, p. 15).

International Cooperations of the UAE for Green Economy Sustainability

The UAE cooperates with different institutes and initiatives in order to reach its green growth goals. Here are the most relevant ones, according to Luomi (2015):

Specialized International Institutions IRENA (International Renewable Energy Agency): UAE has already decided to participate in the international relations of the green economy. IRENA is an international agency which is promoted the adoption and sustainable use of renewable energy.

UNEP, World Bank, and UNIDO: The UAE signed technical assistance and cooperation agreements with the international agencies with expertise in green economy-relevant tools and strategies. In March 2014, UNEP and the UAE’s Minister of Environment and Water signed an agreement under which UNEP is to assist the UAE in implementing its Green Growth Strategy and the broader Vision 2021 agenda.

Global Green Growth Institute: The UAE and Qatar are founding members of the Seoul-based Global Green Growth Institute (GGGI), which aims to support green growth in developing countries as well.

Clean Energy Ministerial: The UAE is an active member of the US-led Clean Energy Ministerial (CEM) initiative, which was launched in 2010.

International Partnership on Mitigation and MRV: The UAE is represented by the Ministry of Finance. In addition, the UAE is the only GCC state that participates, along with three non-oil exporting Arab states (Lebanon, Morocco, and Tunisia) in the International Partnership on Mitigation and MRV (measurement, reporting, and verification), an initiative established at the 2010 Petersberg Climate Dialogue by South Africa, South Korea, and Germany.

Renewables Club: The UAE is also a founding member of an intergovernmental 'Renewables Club', proposed by Germany's Environment Minister in 2013 and by a committee of ministers from 10 countries that represent over 40 per cent of global renewable energy investments.

PAGE: The UAE has also been an active participant in the UNEP-led, multi-agency Partnership for Action on Green Economy (PAGE) initiative, established in 2013. PAGE supports green economy transitions in 30 countries through capacity-building, research and information services aimed at shifting investment patterns and policies. The first PAGE conference was held in Dubai in March 2014.

UN Secretary-General's Initiatives: In addition, the UAE participates via its Ministry of Foreign Affairs Directorate for Energy and Climate Change (DECC), in two sustainable development initiatives launched by former UN Secretary-General Ban Ki-moon: The Sustainable Development Solutions Network (SDSN), and the Sustainable Energy for All initiative (SE4ALL) in 2015.

Dubai Green Economy Partnership: At least one green economy international cooperative initiative has been established by a GCC state. Launched in 2012, Dubai Green Economy Partnership has a multi-stakeholder with a cross-sector partnership in order to promote green growth in the Middle East and supports the growth of green trade, investment, uptake of green technologies, products, and services globally.

ADFD-L'Agence Francaise de Developpement Partnership: In January 2015, during the World Future Energy Summit in Abu Dhabi, the UAE and France announced a funding partnership for promoting renewable energy deployment in developing countries.

Strategic Tracks for Green Growth in the UAE

The UAE has applied some strategies for providing better green economy and meeting green growth goals. The UAE Green Growth Strategy is divided into six main paths covering various aspects of economic, social and political life (National Agenda 2019).

Green Energy: Effectiveness programs and policies for promoting the production and use of renewable energy which is related to technologies as well.

Green Investment: Development of policies for encouraging investments in the green economy and facilitating the production, import, export and re-export of green products and technologies.

Green Cities: Policies and program for urban planning, which includes the special design for improving the environmental efficiency usage of houses and buildings.

Tackling Climate Change Impact: Policies to reduce carbon emissions from industrial and commercial enterprises and also to encourage the industrial sector to use organic agriculture for their activities.

Green Life: Providing special policies and programs for rational usage of water, electricity, natural resources, and for waste recycling projects.

Green Technology: Determining the carbon capture, storage techniques and waste-to-energy technologies that contribute to the economical disposal of waste to meet certain energy needs.

The roadmap of this vision can be divided into three parts: short-term (until 2017), medium-term (until 2021) and long-term (until 2030 and from 2030 onwards). The UAE has already solved the most important challenges to be completed by the end of 2021, such as the introduction of a functional data system and key policies. By 2030, major structural changes in the UAE economy will be achieved, and prospects for 2050 will be expanded to stay on track in pursuit of achieving the green growth strategy vision. Table 1 shows some sectoral indicators in the United Arab Emirates' economy and the growth rate values of the UAE for 2030, when the estimated population in the UAE will be 12.33 million. For comparison, the UAE's total GHG emissions were 128,300 Gg of CO₂ equivalent in 2000, a 64% increase in total GHG emissions since 1994 (Jayaraman et al. 2015).

Table 1
Projected Values for the Identified Goals for the Year 2030

Goal by the Year 2030	Value	Growth Rate
GDP growth (G1)	2,725 billion USD	7%
Electricity Consumption (G2)	286,980 GWh	8%
GHG Emissions (G3)	284,739 Gg	2%
Number of Employees (G4)	9452000	3.75%

Source: Jayaraman et al. 2015

In addition, the Gross Domestic Product (GDP) in the United Arab Emirates was 414.18 billion US dollars in 2018. The GDP value of the United Arab Emirates represents 0.67 per cent of the world economy. GDP in the United Arab Emirates averaged is 137.54 USD

billion from 1973 until 2018, reaching its peak of 414.18 USD billion in 2018 compared with 2.85 USD billion in 1973. Therefore, Figure 1 presents the GDP of the UAE in billion US dollars.

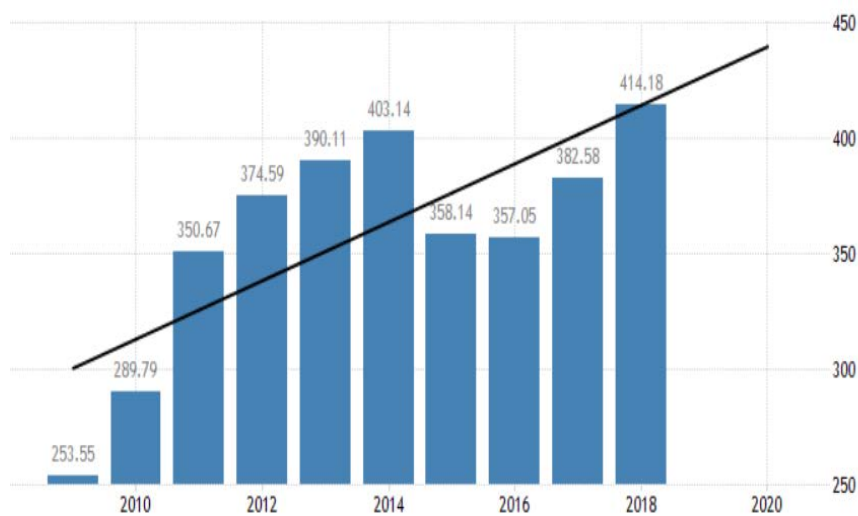


Figure 1. GDP of the UAE, 2009-2018 (in Billion US dollars)

Figure 1 shows that the GDP of the UAE has a positive trend. Abu Dhabi government's strategic development programme and the Mubadala quasi-sovereign wealth fund signed a number of framework agreements with other governments and state-owned entities from South Korea, Jordan, Morocco, France, and Japan.

In 2009, Masdar (also known as Abu Dhabi Future Energy Company) and the Ministry of Knowledge Economy of South Korea signed an MoU (Memorandum of Understanding) on enhanced collaboration in renewable energy and sustainable technologies. In 2013, the Jordanian government and Masdar signed a framework agreement, constituting a public-private partnership, which reportedly allows Jordan to consult on Masdar project viability and delivery-related aspects. In 2013, Masdar also signed a framework agreement with the Moroccan Ministry of Energy, Mines, Water and Environment on cooperation in the area of renewable energy (Luomi 2015).

Similarly, in 2013 the UAE, Masdar and France signed a conjoint declaration outlining areas for collaboration between the UAE, Masdar and French companies and institutions, which includes of the technology co-development, exchange of human capital and experiences, and joint research in renewable energy projects and sustainability technologies. In addition, cooperation between Mubadala and the Japan Bank for International Cooperation (JBIC) began with an MoU signed in 2007, and has since continued with JBIC's participation in one of Masdar's technology funds in 2010, and a bilateral meeting between Japan and the UAE in 2013, where the two countries announced their intention to improve collaboration in the area of clean and renewable energy. Masdar has also signed a framework agreement with the European Investment Bank (EIB), dubbed as the financial arm of the EU, to identify opportunities for joint investment in the development and financing of renewable energy projects in the MENA region. The agreement includes a

human capital development element in the form of an internship programme (Luomi 2015). In addition, Masdar has partnered with a number of leading global companies (for example, Siemens) in the sustainable energy industry. According to the company's website, the company has ongoing projects in 17 countries all over the world. In the next section the case of Masdar city will be presented briefly.

The Case of Masdar City

Masdar City is located in a desert area near Abu Dhabi airport within 17 kilometres in the southern-east part of Abu Dhabi (Manghnani & Bajaj 2014). It has been under construction since 2007. Masdar City is intended to be one of the world's first completely sustainable communities, combining renewable energy sources and efficient resource usage with traditional Arabian design and spectacular architectural elements (Manghnani & Bajaj 2014). In addition, this city is raised on a 23-foot-high concrete base to maximize its exposure to cooling winds and decrease the need for air conditioning (Manghnani & Bajaj 2014). Petrol-powered vehicles will not be allowed on the narrow streets of the city, about 2, 59 square km in area, but a fleet of computer-driven electric cars will navigate a

complex of tunnels under the concrete base (Manghnani & Bajaj 2014). Masdar City worth \$22 billion for its construction for government and independent investors (Manghnani & Bajaj 2014). Simon Joss from the University of Westminster includes Masdar among a collection of global projects, appropriately named "eco-cities", that represents the culmination of several decades of theoretical research into sustainable development (Manghnani & Bajaj 2014). All the buildings in Masdar city are designed in order to the usage of natural light, low-energy lighting usage, and energy-efficient appliances. Through these measures, Masdar City is projected to need only a quarter of the energy supply required by an ordinary city with the same population. Water consumption will be reduced by installing high-efficiency fixtures and appliances and incorporating an advanced network of meters that not only notifies consumers of their usage levels but also determines the location of water supply throughout the city (Madichie 2011). In addition, the city's landscape needs low water requirements and will be irrigated with wastewater; Masdar's total water demand is planned to be less than half the amount that a regular community demands. The infographic in Figure 2 gives a better understanding of the prospective characteristics of Masdar city respectively.

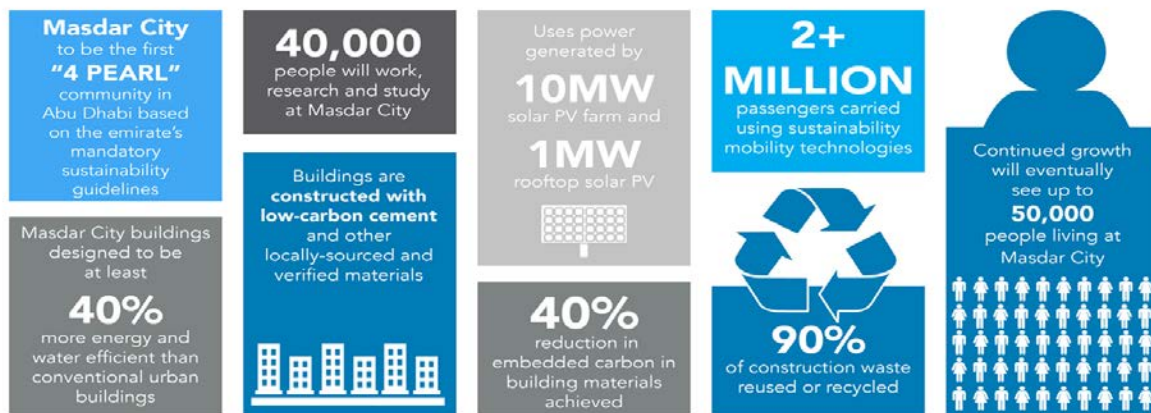


Figure 2. Prospective characteristics of Masdar City (Source: Masdar homepage)

Masdar City's power infrastructure features a range of renewable energy technologies, such as usage of the photovoltaic plants (PV), a concentrating solar thermal power plant (CSP), evacuated thermal tube collectors, and a waste-to-energy plant (Nader 2009).

METHODOLOGY

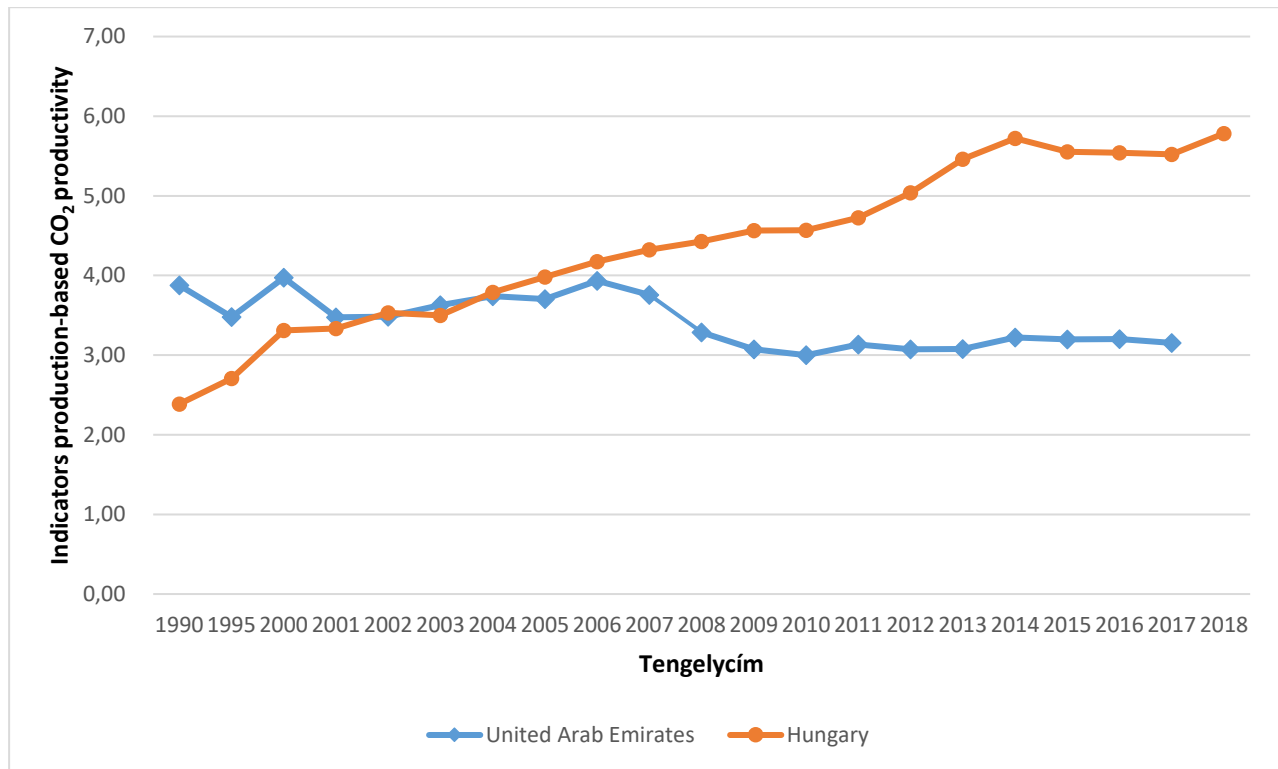
In this research data are collected from both primary and secondary sources. In addition, to achieve research objective qualitative and quantitative research methods

were used. We would like to use the special formula (Szita Tóthné 2014) for our calculation of the green growth indicators based on the OECD report on sustainability (retrieved from <https://stats.oecd.org>) in order to reach concrete results in this study.

UAE Green Growth Indicators

Green Growth indicates that economic growth is shaped by usage of the natural resources in a sustainable manner. In addition, the Green Growth concept consists of environmental and resource productivity; natural asset base; environmental dimension of quality of life; economic opportunity and policy responses; socio-economic context indicators. Among the above-

mentioned Green Growth features, the environmental and resource productivity indicators of the UAE, Hungary and OECD Europe were selected for use in calculations. Figure 3 shows a comparison of production-based CO₂ productivity (GDP per unit of energy-related CO₂ emissions) in the UAE and in Hungary.



Source: Own edition

Figure 3. Changes in production-based CO₂ productivity of the UAE, Hungary (OECD 2019)

As shown in Figure 3, the lowest amount of the UAE in production based CO₂ was 3 (USD/kg) in 2010. Meanwhile, the lowest amount for Hungary was 2.39 in 1990. In 2017 this amount reached 3.15 in the UAE and 5.52 in Hungary. According to the OECD database and line chart, the UAE has a fluctuating trendline from 1990 to 2008, afterwards, it shows a steady trendline in comparison with Hungary which shows a positive trend.

Based on formula below we calculated the environmental and resources productivity of the green growth indicators concerning the UAE, Hungary and OECD Europe (Szita Tóthné 2014). This formula includes two main steps:

1. The first step is the calculation of the various countries' indicator indices with the help of the minimum-maximum statistics model, based on the use of the OECD green growth indicators: $I_i = (X_i - X_{min}) / (X_{max} - X_{min})$, where I_i is the index of the various indicators (1–n);

- X_i : the indicator under review;

- X_{min} : the minimum value of the indicator under review in the OECD countries in the given year;
- X_{max} : the maximum value of the indicator under review in the OECD countries in the given year.

This step also removes dimensions at the same time and produces a ranking order of the OECD countries in terms of the indicator concerned, on a scale of zero to one.

2. After that, taking the average of the various indicator indices, we attain to the green index of each country:

$$ZI = \sum_{i=1}^n I_i / n$$

According to our calculations, results show that the green index on the environmental and resources productivity indicators in OECD-EU ($ZI=0.53$) is higher than the UAE ($ZI=0.51$) and Hungary ($ZI=0.22$) in 2017 but the UAE is higher than Hungary.

Table 2
OECD-EU, Hungary and the UAE countries ranking in terms of the Green Index, 2017

Year			2017		
Country			OECD-EU	UAE	HUNGARY
Variable	Min	Max	Ii		
Production-based CO ₂ productivity, GDP per unit of energy-related CO ₂ emissions	3.15	5.88	1.00	0.00	0.87
Production-based CO ₂ intensity, energy-related CO ₂ per capita	4.71	20.71	0.09	1.00	0.00
Production-based CO ₂ emissions, index 2000=100	85.93	246.10	0.03	1.00	0.00
Production-based CO ₂ emissions	64.40	1,152.60	1.00	0.04	0.00
		ZI	0.53	0.51	0.22

Source: own calculations based on OECD Green Growth Indicators (2019)

According to Szita Tothne et al. (2019), accepting a new idea such as the green economy among diverse cultures is not easy when each person has their own values, attitudes and behaviour in the society. On the other hand, the main role of management is planning, controlling and monitoring the environment of the society. Furthermore, the implementation of the new idea does not belong to the management in any society. Because of this, we cannot skip the role of the leadership for changing the mindset of mankind in the global scene. Consequently, in the next section of our research, we explain the role of the leadership in the UAE and which type of leadership could be suitable for providing green economy sustainability in the UAE.

Religion of UAE and its benefits to leadership

Culture, although not entirely ignored in economics, has never been given a rigorous attention (DiMaggio1990; Guiso et al. 2006; Fernandez 2008; Kwanjai & den Hertog 2009). There are several studies which are related to the improvement of the personal and organizational success of leaders in order to guide their followers in a green economy have already published. For example in the Islamic culture, the perception of preserving natural resources is rooted in the Holy Book of Muslims (the Quran). The significant principles of environmental conservation are included in the Holy Quran and it condemns environmental damage and mismanagement of natural resources. According to the Holy Quran: "Eat and drink: but be not excessive. Indeed, God does not like those who commit excess"

(Surah Al-A'raf 7:31; Al-An'am 6:141). In the Holy Quran, it is also stressed that "the wasteful people are brothers of the devils, and ever has Satan been to his Lord ungrateful" (Surah Al-Isra' 17:27). According to these statements, the conservation of all-natural resources from misuse is the obligatory duty of everyone. In fact, the Holy Quran and Islamic law can be a significant factor and play an important role in encouraging sustainable development in Islamic countries (Vaghefi et al. 2016). In addition, there is a critical need and requirement for Islamic countries to be "greener" in management and business due to the equitable law in Islam, whereby the correlation between greenness and the equitable law is very close. Islam & Islam (2011) emphasized the need for leadership in Islamic countries to successfully implement green management. Without appropriate management, great ideas cannot be implemented for the purpose of achieving a green economy. They believe that Muslim countries would be more developed if their people led their lives based on the principles of Islam. For clarification and better understanding about leadership in the next part we present the common leadership skill.

Common Leadership Skills

Asif (2016) believes that any organization needs a direction from its leaders. People want the ability to trust their leaders because trust is the social glue that brings commitment. They also want leaders who are optimistic and have a clear vision of the future. In addition, they want action and results from their leaders. According to

Asif (2016), the basic ingredients of leadership are the following:

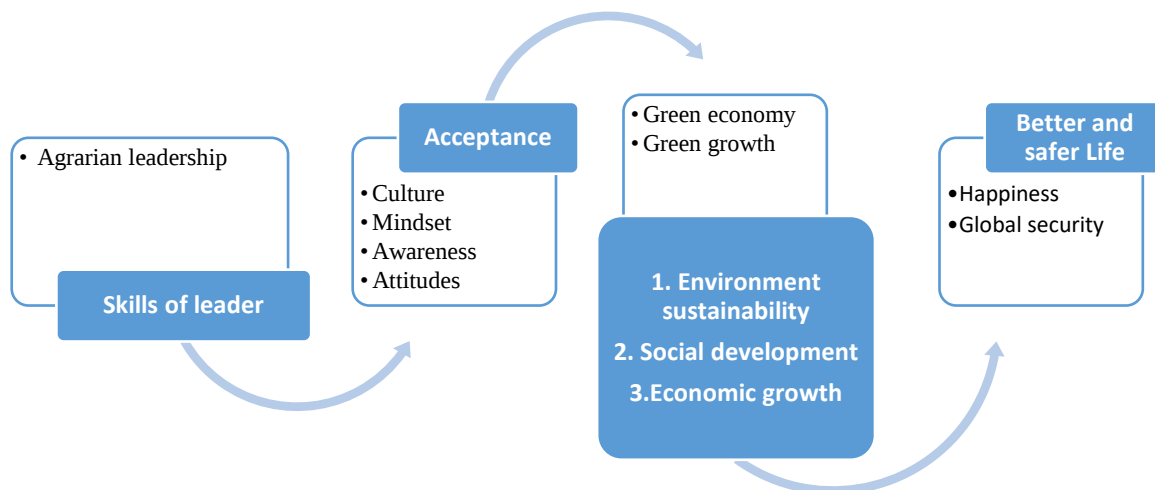
- Guiding vision professionally and personally. The leader has a clear idea of what he/she wants.
- The second ingredient is passion. The leaders love what they are doing and are enthusiastic about it.
- The next ingredient is integrity. The essential parts being: self-knowledge, sincerity, and maturity.

Leadership in the Green Economy

Green & McCann (2011) argue that agrarian leadership represents a new contextual model in dealing with leadership in a green economy. Agrarian leadership is defined as a contextual influence that has an impact on subordinates' attitudes and performance by leaders who are both value and results-driven (Green 2010). In

agrarian leadership managers consider their followers as crucial part of the socio-technical system and the technology does not have any part in driving the value system for society. Before the Industrial Revolution, society evolved on the land and through labour, and it was simpler than nowadays, especially for the leader who was tended to lead the society as an agrarian leader. Therefore, establishing good benchmarking processes of leadership is become important. Green & McCann (2011) argue the merits of benchmarking as a continuous process of identifying, learning, and implementing best practices to optimize opportunities to gain competitive advantage.

In our opinion, based on the ARENA report concerning the green growth indicators, all of the factors have integrity with each other, afterwards, we need the role of the leadership in order to improve our attitudes about green growth indicators (Arena annual report 2019). Figure 4 illustrates the framework of the integration among the indicators.



Source: Own edition

Figure 4. Effectiveness Role of the Leadership to Improve Cultural Awareness Concerning the Benefit of a Green Economy

CONCLUSION

The population in the United Arab Emirates has been already increasing rapidly due to immigration. Therefore, the UAE started implementing programmes in order to create sustainable cities to provide its citizens with a better future with a higher quality of life while preserving its environment. On the other hand, without technological changes and innovations, a full implementation of the green economy is not feasible. In fact, some countries do not have all the technologies, finance and resources which are required for the transition to the green economy. It is important that the UAE's green strategy has the highest level of political support, has been approved by the Cabinet and is

designed by the requirements of the federation-level development vision for 2021. This new economic revolution will be started with a new, positive outlook applying agrarian leadership. There are various types of leadership in any situation (Mitchell 2008). In the green economy, the best type of leadership would be the agrarian leadership due to how it shapes the conservation of the ecosystem and environment. Agrarian leadership has the ability to apply green economy sustainability in the society too. At the same time without implementation the green economy transition is not feasible. The revitalized global partnership will facilitate an intensive global engagement in support of the implementation of all goals and targets while bringing governments, civil,

society, the private sector, the United Nations Organizations and other actors in mobilizing all available resources together (Hong 2017). Finally, the limitations of our research are that to our results are based on findings of other researchers and can be

applied only in the local area, which limits the generalization of the results. Furthermore, we suggest that further research can be applied in other geographical areas.

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