Saudi Arabian Green Economy Infrastructure: Barriers, Strategies & Opportunity – An Analysis

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Saudi Arabia; green initiatives; environment; desalination; sustainability; economy; economic impact; investment opportunity

Abstract

Saudi Arabia is finally catching up with the rest of the developed world in terms of environmental awareness. In the past, while much of the rest of the world spent its time pondering issues such as global warming, water, air, and soil pollution, over-exploitation of resources, and a myriad of other environmental concerns, the Saudi people and government seemed to be primarily focused on expanding their capital in a globalized economy. However, in 2015, for the first time, this trend began to show legitimate change. This new emphasis on environmental concerns has caused some interest and uproar, specifically in the economic sector. The research, therefore, concentrated on the barriers, strategies, and opportunities that might impede or encourage Saudi Arabia in its quest to develop a greener and more sustainable economic infrastructure. After carefully considering the available literature, data, and reliable statistics, the report concluded that, while change will be difficult and, possibly slow, Saudi Arabia should expect to see greener projects and initiatives transpiring in their homeland over the course of the next several years.

1. Introduction

In the past, little attention and low budget has been dedicated by the Saudi government to address environmental concerns. While much of the rest of the world has spent its time pondering issues such as global warming, water, air, and soil pollution, over-exploitation of resources, and a myriad of other environmental concerns. Many developed economies have managed to turn environmental challenges into profitable businesses rather than problems that constitute a burden and high cost for the economy (Taher & Al-Hajjar, 2014). Through collaborations between public and private sectors, companies in those economies have been able to make environmental issues a core part of their business strategy. The Saudi people and government seemed to be primarily focused on expanding their capital in a globalized economy (Ali & Al-Aali, 2012). However, in 2015, for the first time, this trend began to show legitimate change. The 2015 budget, written by Saudi officials, consisted of an expenditure section specifically allocated for environmental issues, to include water supply, sewage issues, and other environmental concerns particularly relevant to Saudi Arabia (Saudi Arabia Sustainable Energy, 2015). Finally, two decades later than some nations, Saudi Arabia was entering into the ongoing dialogue regarding the need to protect the environment. Probably, Saudi Arabia is looking ahead to create opportunities with dedicated strategies to handle the environmental issues.

This new emphasis on environmental concerns has caused some interest and uproar, specifically in the economic sector. With any change, there is always room for new products, services, and technologies to become in demand and useful. This paper, therefore, will focus on the barriers, strategies, and opportunities that might impede or encourage Saudi Arabia in its quest to develop a greener and more sustainable economic infrastructure.

2. Methodology

This research will consist of carefully analyzing the literature available regarding certain major environmental concerns that Saudi Arabia is currently facing. Peer-reviewed, scholarly journal articles, expert testimony, statistics, and other raw data from government and reliable sources will be scrutinized to help determine the major concerns present. Then, the obstacles that could stand in the way to fixing these aforementioned problems and transitioning Saudi Arabia into a greener, healthier nation will be highlighted. Afterwards, strategies will be explored that could help to facilitate the necessary transitions. Next, opportunities in green infrastructure for public and private companies and investors will be highlighted, and evaluated for feasibility. Based on these findings, a final analysis will be carried out to assess the likelihood of Saudi Arabia making the necessary changes to protect their natural resources.

3. Saudi Arabia's Major Environmental Concerns

The Kingdom depends heavily on oil revenues for government budget; it is the largest exporter of oil, as it owns 25 % of the world's oil reserves, and has an approach of balancing between production and consumption of resources in addition to looking to balance economic growth and environmental challenges (Taher & Al-Hajjar, 2014).

Highly aggregated indices have been developed to quantify social and environmental aspects of sustainable growth. Such indices aim to reflect all the different dimensions of sustainability in a single measurement (ESCWA, 2013). For example, the Environmental Sustainability Index evaluated national environmental performance in terms of 21 indicators covering natural resource endowments, pollution levels, environmental management efforts, contributions to protection of the global commons and the capacity of a society to improve its environmental performance over time. A high score on the Environmental Sustainability Index or the Environmental Performance Index signifies high achievement. Table 2 provides a sample of those rankings, which clearly indicates that Saudi Arabia (49.97) ranked third amongst the Arab world, after United Emirates (50.91) and Egypt (55.18), in the year 2010.

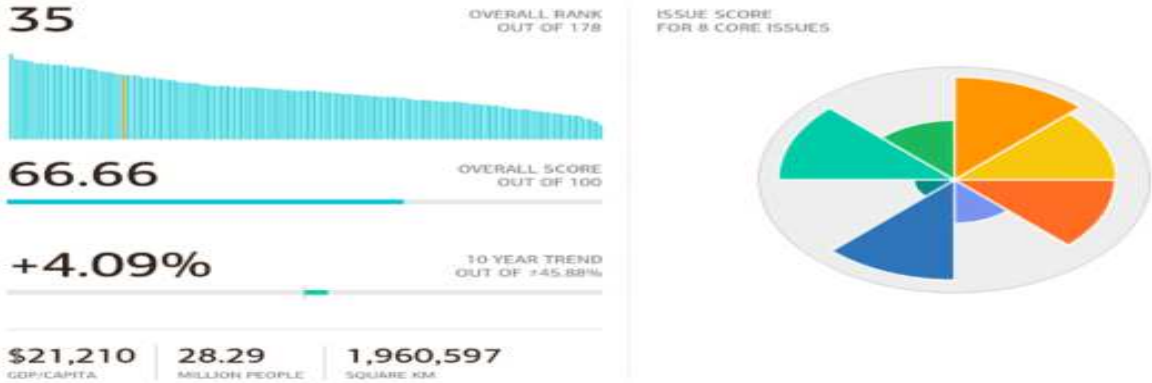
Table 1: Ranking of Selected Arab Countries on Environmental Indices.

	Environmental sustainability index	Environmental performance index	
Country	2005	2006	2010
Algeria	46.0	66.2	48.56
Egypt	44.0	57.9	55.18
Iraq	33.6	-	25.32
Jordan	47.8	66.0	42.16
Kuwait	36.6	Na	35.54
Lebanon	40.5	76.7	47.35
Libya	42.3	-	37.68
Mauritania	42.6	32.0	-
Morocco	44.8	64.1	45.76
Oman	47.9	67.9	44.00
Saudi Arabia	37.8	68.3	49.97
Sudan	35.9	44.0	46.00
Syrian Arab Republic	43.8	55.3	42.75
Tunisia	51.8	60.0	46.66
United Arab Emirates	44.6	73.2	50.91
Yemen	37.3	45.2	35.49

Source: http://epi.yale.edu

By the year 2014, the statistics of Environmental Performance Index, (figure 1), showed improvement in the country rankings, reflected Saudi Arabia as the second highest (35), behind United Emirates (25), amongst the Arab Nations.

Figure 1: The overview of the Saudi Arabia performance in 2014.



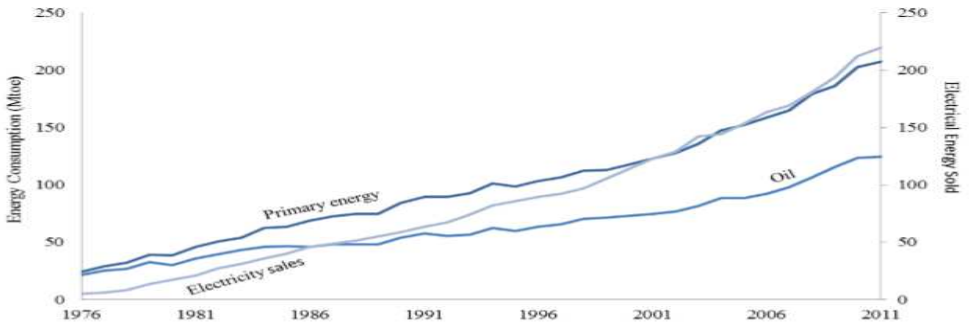
Source: http://epi.yale.edu

3.1. Water and Sewage Issues

It is a well-known fact that the Arabian Gulf's hyper-arid climate creates major problems for potable water which, in turn, results in many, related problems such as the disposal of waste via a sewage system (Kajenthira, Siddiqi, & Anadon, 2012). Most Gulf and Middle Eastern nations, to include Saudi Arabia, lack sufficient water sources for its people and agricultural needs (Barau & Al Hosani, 2015). Importantly, Saudi Arabia is the third-largest per capital water user in the entire world (Kajenthira, Siddiqi, & Anadon, 2012). Therefore, Saudi Arabia, as well as its neighbors, have major problems obtaining the high quantities of water necessary to serve the basic needs of its people and industries. More often than not, the country tends to rely, heavily, on seawater desalination and the abstraction of underground water. Unfortunately, both of these options are not eco-friendly and are not renewable (Barau & Al Hosani, 2015).

The water desalination process is a very extensive and environmentally damaging process that turns salt water into potable water. Desalination is an energy-intense procedure that raises domestic as well as global environmental concerns (Sadrzadeh & Mohammadi, 2008). Over the course of the past several decades, the Saudi government has expressed a desire to rethink its water options. Moreover, the current water desalination process requires so much energy that Saudi Arabia has to use all its natural gas reserves to support it (Figure 2). This has resulted in the government and its industries having to develop more expensive and environmentally damaging high-sulfur energy sources, thereby augmenting the problem even more (Kajenthira, Siddiqi, & Anadon, 2012).

Figure 2: Saudi domestic demand for oil, primary energy (oil plus natural gas), and electricity (1976-2011).



Source: Electricity sales: Saudi Arabian Monetary Agency (SAMA, 2012), oil and primary energy consumption: BP Statistical Review (2013)

3.2. Clean Energy

Ironically, despite the fact that Saudi Arabia is amongst the leading petroleum producing nations in world, it still has plans to transition its own energy supply to sustainable and renewable resources. Currently, it use of petroleum-based energy products has caused major problems. Not only does these energy sources pollute the air, they also wreak havoc on the limited water supply and degrade the quality of the soil (Rahman, Rehman & Abdul-Majeed, 2012). Moreover, initial studies have indicated that the process of extracting the oil is just as damaging, if not more so, to the Saudi and global environment than the burning of fossil fuels. This has caused great concerns, to include an increase in health-related issues (Wise, 2015).

3.3. Greener Construction

In recent years, the Saudi government, as well as private investors, have created a mass amount of new infrastructure and building complexes in the Kingdom. For the most part, little to no attention was given to sustainable building practices. Rather, buildings, roadways, and other development was simply done as quickly and cost-effectively as possible (Medallah, 2015). This has begun to cause some environmental problems for the state, making greener options seem more enticing. Increased costs of energy, building materials, higher regulatory standards and greater consumer interest are driving the expansion of the green building market in many countries, although the trend in the Arab region is not yet widespread. New housing and even new cities are being developed in the United Arab Emirates and Saudi Arabia (ESCWA, 2013). The chief sustainability officer of UTC Building & Industrial Systems recently reported "Saudi Arabia has already shown strong interest in strengthening its green building presence", (Al Bawaba, 2014). Undoubtedly, this is due, in part, to the consequences already experienced by Saudis, such as an increase in health-related ailment to include asthma (Medallah, 2015).

In sum, Saudi Arabia has many environmental issues that need to be addressed. These include, but are not limited to, water shortages that lead to sewage issues, a strong reliance on non-renewable, petroleum-based dirty energy, and unsustainable construction. The next section will carefully explore some of the major obstacles that stand in the way of creating greener infrastructure in Saudi Arabia.

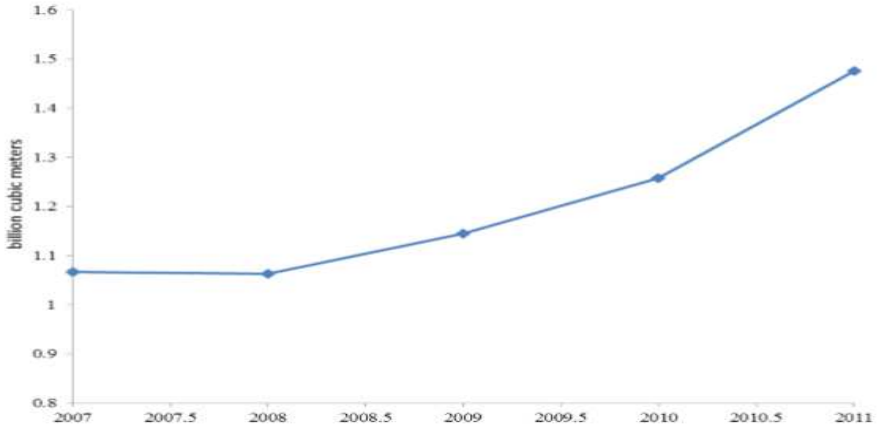
4. Obstacles

Unfortunately, there are always obstacles that prohibit positive change. Cost is a major obstacle that stands in the way of Saudi Arabia developing sustainable, green infrastructure. Dr. Kok, a professor of economics at Maastricht University in the Netherlands, has studied the economic implications of green energy in Saudi Arabia for several years. His findings suggest that higher rent rates are associated with energy-efficient buildings, making Saudis less likely to choose these types of infrastructure for their homes and businesses. Petroleum-based energy options are so plentiful and inexpensive that it makes it incredibly hard for renewable energy sources to compete. Most of the time, they cost significantly more money and, therefore, lack a competitive advantage (Al Bawaba, 2014). Moreover, there is an overarching thought amongst many Saudis that the nation should use its own natural petroleum resources and not invest in other forms of energy. Such thought is hard to break because oil has been such a strong part of the Saudi economy for decades. It is excruciatingly difficult to convince people to invest in renewable energy whenever non-renewable energy resources are so plentiful (Taher & Al-Hajjar, 2014).

Additionally, there are not a lot of options for obtaining potable water. Options, other than desalination of seawater, are costly and extremely difficult to carry out (Figure 3). Importantly, technology is still in its infancy regarding other, more environmentally friendly

methods of obtaining water in areas such as Saudi Arabia. For the most part, new technologies are still being developed to help meet this need in a cost-effective, greener way (Barau & Al Hosani, 2015). Right now, most experts agree that Saudi Arabia has to spend a large bulk of its resources investing in new methods of obtaining potable water, as well as put stricter limits on water consumption. Unfortunately, the petroleum industry is the number one user of water in the nation, making it extremely difficult to monitor water usage (Barau & Al Hosani, 2015).

Figure 3: Demand for desalinated water in Saudi Arabia.



Source: Ministry of Water and Electricity (2012).

5. Strategies

One strategy being employed to encourage Saudi businesses, government agencies, and individual people to support and develop greener infrastructure is through education. For instance, one environmental group started the Distinguished Sustainability Lecture Series. This program helps to keep the public and investors abreast to sustainability issues in Saudi Arabia as well as throughout the world (Al Bawaba, 2014). It also makes people aware of problems inherent with current operating procedures, such as desalination processes and petroleum / natural gas extraction (Al Bawaba, 2014). Through education initiatives, this program, and others like it, are attempting to win the support of big businesses, the Saudi government, and the people. Studies show that, oftentimes, investors and everyday citizens are not aware of the benefits associated with green infrastructure (Taleb & Sharples, 2011). Not only are there health benefits to environmental sustainability, there are also investment opportunities that, theoretically, could make investors huge sums of money.

Another strategy implemented is to train investors and workers, alike, on sustainable planning and construction. This includes green building training. The Leadership in Energy & Environmental Design (LEED) is sponsored by the Saudi government, forward-thinking, and timely. As of 2015, the Saudi government has given businesses five full years to meet the newly established noise, water, and air pollution standards. These trainings will help facilitate the transition, and make it as smooth and economic as possible (Al Bawaba, 2014).

Since numerous studies have shown, unequivocally, that solid waste management, electricity generation, and the agriculture industry are the sectors in Saudi Arabia that are culpable of producing the highest amounts of greenhouse gasses. The Saudi government is trying to encourage investors to find new, innovative methods of providing the same services in a greener manner. This appeal to technology industries is very effective since the government offers subsidies and grants to innovative investors and inventors (Coad, 2012). This is just one more strategy to try to get people to recognize the issues at hand and develop cost-effective and feasible means to compensate (Coad, 2012).

6. Opportunities

With any major infrastructure or operational change, there are always new opportunities that emerge. This is a prime time in Saudi history for new businesses to enter into the marketplace and provide greener strategies and infrastructure. Smart investors will leap at the opportunity to take part in this changing norm. For instance, as per the Saudi Green Building Forum, 76 green projects are underway that exceed $26 billion U.S. dollars (Al Bawaba, 2014). Included in these projects is the King Abdullah Financial District, which is lauded as the world's largest green building development expanding over 1.6 million square meters. Moreover, the Ministry of Islamic Affairs is currently planning to make a minimum of 90,000 Saudi mosques eco-friendly via the use of various types of renewable energy sources, to include solar, wind, and hydro energy (Al Bawaba, 2014).

Also, the government is currently looking for companies that are able to provide software packages designed to monitor water consumption in existing Saudi households and businesses, and provide a cost-analysis estimate of the amount of savings that would result in various proposed changes. These programs should calculate the prospects for applying different measures to everyday Saudi houses and apartments in order to manage energy and water usage in a more sustainable manner. Then, based on these findings, the Saudi government will be looking for companies and investors to put the best methods into practice (Al Bawaba, 2014).

Yet another opportunity would be for companies to invest in technologies and mechanisms that would permit the oil and natural gas sectors to reuse their water. Already, the government has stated that it is willing to provide significant subsidies to companies able and willing to create the technology necessary to reuse and conserve water. Its overarching goal is to increase "wastewater treatment and reuse in six high-altitude inland cities could save a further $225 million dollars and conserve 2% of Saudi Arabia's annual electricity consumption" (Kajenthira, Siddiqi, & Anadon, 2012, p. 184).

7. Conclusion

In sum, while there are, undoubtedly, obstacles that stand in the way of Saudi Arabia transitioning to a greener and more sustainable nation, no obstacle is so significant that it cannot be overcome with ingenuity and dedication. Moreover, the new push towards greener infrastructure will create many new jobs and investment opportunities for proactive, forward thinking individuals. The coming changings are much needed and well-supported by the Saudi government. Saudi Arabians should expect to see major changes to their nation in the coming years, to include cleaner water, soil, air, as well as more sustainable and renewable energy sources.

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