International Journal of Development and Sustainability
ISSN: 2186-8662 – www.isdsnet.com/ijds
Volume 7 Number 3 (2018): Pages 892-903
ISDS Article ID: IJDS18012202

Building climate resilience in urban areas of hydrocarbon based economies

Elnazir Ramadan *, Talal Al-Awadhi, Noura Al Nasiri, Yassine Charabi

Department of Geography ,Sultan Qaboos University, Oman

Abstract

The Gulf Cooperation Council (GCC) States are becoming extremely urbanized. The region consists of more than 15 major cities with more than 15million inhabitants and clearly these cities are the vital cultural, economic and innovative centers. Urbanization of the region is characterized by one of the world high urban population growth rates. Urban primacy is another feature of these countries as most countries are dominated by huge capital cities. The urban growth rates within the region are basically attributed to both high fertility rates as well as to the influx of migration into the region. It is quite evident that climate change stresses create pressures on these rapidly growing urban centers. The key objective of this article is to study and examine the urban policy question in response to climate change challenges in these countries. The overall approach and method is focused on a policy review and a policy analysis framework to see how climate change mitigation and adaptation measures could to be incorporated and coordinated within the whole policy frameworks. Results have revealed the inadequacy inclusion and integration required.

Keywords: Urban Policy; Climate Change; Adaptation; Arabian Gulf States

Cite this article as: Ramadan, E., Al-Awadhi, T., Al Nasiri, N. and Charabi, Y. (2018), "Building climate resilience in urban areas of hydrocarbon based economies", *International Journal of Development and Sustainability*, Vol. 7 No. 3, pp. 892-903.

* Corresponding author. *E-mail address:* alnazir@squ.edu.om

1. Introduction

Cites of the Arabian Gulf states are formed and influenced by local environmental conditions as well as by the socioeconomic structures that led to their emergence and development. Urbanization of the region is characterized by large scale expansion of urban infrastructures. Urban primacy is a distinctive feature of urbanization in the region. The states capitals have grown is size to form big prime cites that accommodate all activities. The urban population in these states are growing with high rates which considered among the highest in the world, with escalating trends which reflects the growing economic conditions and consumption patterns. The increasing amounts of the population are basically attributed to the substantial external migration towards the region. As well as the extremely high natural increase rate of the inhabitant population. (Ramadan, 2015) In fact, climate change consequences need an efficient urban policy that respond to its urgency. Urban policy can be defined as the entire set of government procedures at different administrative levels regional level of GCC, national, and local level - that is directed to cities. These polices and strategies is supposed to empowers local population capacities to cope with the emerging events of climate change and adopt the necessary measures and actions that enable and maintain their resilience. The variety layers of procedures that are imbedded within the various hierarchical policy frame from national to regional to local are expected to act efficiently in establishing an urban policy that support sustainability. It is quite evident that modifications and dynamism that happen on economy, demography and governance are affecting the urban agglomeration of the Gulf States. The urban entities are becoming increasingly competitive and multifaceted and have the ability to respond quickly to opportunities and threats that influence them.

Cities, municipalities and local governing bodies are expected to develop policy measures to meet the challenges, but at the same time higher layers of government at national and provisional levels adopt policies that influence these cities in different way. These national policies need to be in consistency with local measures and should help facilitate better responses to climate change threats. The national government policies are expected to provide an enabling environment in which cities frame their own policy guidelines, strategies and also design the plans that fits their situation.

This article starts from the premise that urban policies play a crucial role on improving life in cities. It is also increasingly recognized that climate change challenges are not just an environmental issue. Climate change influences places on economic, social and environmental dimensions and the whole development efforts. The community is becoming increasing aware about the phenomenon (Buloshi and Ramadan, 2015) Lack of Policy or policy inadequacy is a serious risk that hinder sustainable growth and development. It will also push communities to implement unsuitable coping practices to deal with emergencies. As a result of that empowering Local capacities is so crucial to meet the challenges and to deal with the expanding urbanization. Cities and urban settlements are part of whole national system and structure. They are subject to central government procedures regarding budgetary policies, development priorities, decentralization policies. To meet the urban challenges of today, and the challenges to come, appropriate management frameworks must be available, through which cities can apply innovative approaches suitable for their local circumstances. Considerable studies on urban studies has emphasized the role of national and local institutions and polices in

mediating, contesting, and shaping the particular products of economic changes in particular cities (Knox and Taylor, 1995).

While acknowledgment of urban reactions to climate change at the international policy level has been relatively recent, a growing number of researchers has studied the connections between urban centers and climate change. Since the mid-1990s, research has concentrated on municipal strategies, policies and measures, and the challenges that municipal authorities face in terms of policy implementation and effectiveness (Vanesa et al., 2013) It has been difficult to identify a key approach to urban policy since the 1990s (Cochrane, 2007; Turok, 2009). Instead, there has been a range of diverse models in a variety of settings and environments. These models reveal different aims and objectives, and different indigenous cultures and traditions. There is no agreement about the goal of urban policy or about the most appropriate tools and techniques. This has occurred together with a reaction against the broad wishes of urban planning in the mid-twentieth century. Planner wanted to develop a rational-comprehensive approach to decision-making based on management science and operations research. With this approach, a universal scientific method could be created for analyzing different scenarios for the interactions between land-use, transport and housing within cities, and then choosing the optimum solution based on specified goals. Urban planners are far more cautious about their ability to control course of action and anticipate consequences, and are more concerned with the social impacts of their decisions as well as how most of the needed adaptations in the next few decades can be integrated into existing government functions (Satterthwaite, 2011).

Two main classes of reactions are defined by the United Nations Framework Convention on Climate Change (UNFCCC) in response to the issue climate change, specifically, mitigation and adaptation. Mitigation discusses the anthropogenic intervention to cut or prevent the emission of greenhouse gases while adaptation indicates the capacity to adjust negative impacts of climate change and take suitable actions to prevent or minimize the damage they can cause. It obvious that both responses are significant and can assist in reducing the hazards expected on environment. Usually mitigation will have worldwide long-term benefits, while the earnings of adaptation are immediate and are sensed at local to regional scale.

There has been considerable debate within the scientific community about the scale of adaptation to climate change. Adger et al. (2004) argue that adaptation operates at different spatial and societal scales and that success need to be evaluated against different criteria at these different levels. Adaptation practices are of different nature and scales. Adaptations measures could be of an expected form and thus planned or unexpected and hence unplanned and occurs as spontaneous adjustments by ecological-socio-economic systems. (Smit et al., 2000: 225). Former methodologies of adaptation took a top-down form, emerging from global climate model settings and move to sectoral impacts studies and then to assessments of adaptation options (Van Aalst et al., 2008: 165).

Figure 1. Map of the GCC states

2. Urban dynamics in the Gulf States

The Gulf Cooperation Countries (GCC) (Figure (1) are among the world's most urbanized areas worldwide with large scale physical developments and immense urban sprawl. Governments in the region need to find solutions to these challenges. Excluding Qatar, the entire states of the region have adopted spatial development strategies to manage growth. Given the dominance of their primary cities, most of these countries are now making an effort to shift growth to secondary cities to reduce primacy and introduced balanced hierarchy of urban system. Examples of these efforts can be observed in the attempts of the government of Oman to launch a National Spatial Strategy in 2010, which is 30-year development plan intended to promote spatially stable and sustainable growth in line with its 2020 vision. The focus of the strategy is to foster linkage between both urban and rural areas through comprehensive urban planning that accommodate all aspects.

Traditionally, the cites of GCC states were small diving, fishing and trading centers. The exploration of oil has flourished prosperity and promoted substantial socio-economic developments. The GCC states in the present time are between the highest GDP and per capita income in the world. (Figure 2) The recent fluctuation of oil prices have led these countries to adopt economic diversification polices to decrease dependence on oil and gas investments. (Figure 3) The wealth of these countries and their high economic revenues have made them more integrated and incorporated into the world economy The GCC states are also working on spatial development strategies that reduce primacy and growing of the current capital cites to the benefit of new secondary towns that can accommodate the increasing economic expansions.

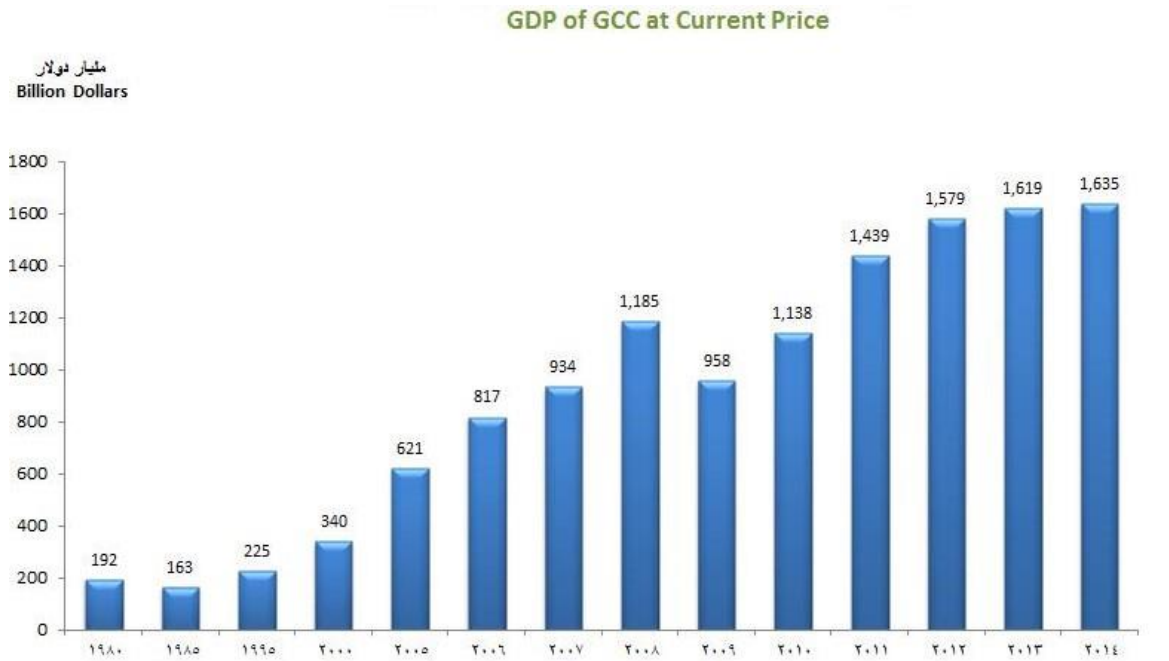

Figure 2. GDP of GCC 2014 (Source: Statistical Center of the Gulf Cooperation Council)

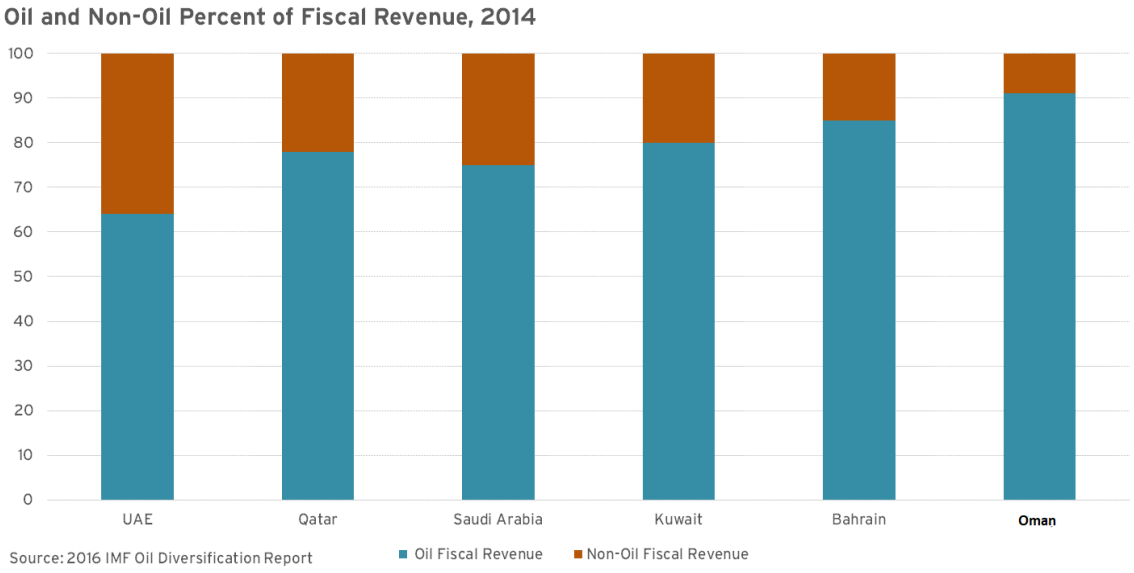

Figure 3. Oil and Non-Oil Fiscal Revenues 2014 (Source: Statistical Center of the Gulf Cooperation Council)

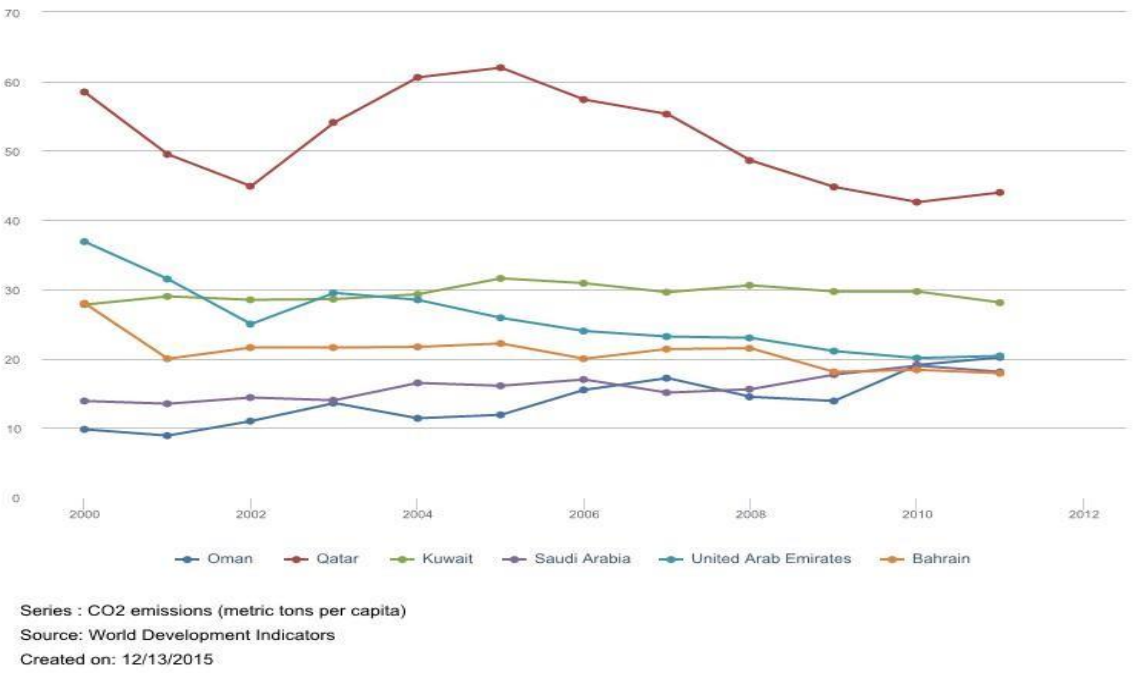

Figure 4. CO2 Emission (metric tons per capita) 200-2012

With the current development and growth of the GCC states, high emissions are expected and projected in the region. The projection Scenarios detected by some regional and international agencies were only presented for the whole MENA region both of which measure energy related CO2 emissions (In 2010, the Gulf countries represented 52.5% of the region's emissions (Figure 4).

Water resources are one of the areas of stresses in the region. With The hot and desert climate and increasing consumption patterns, the GCC states mostly among the water-scarce areas worldwide Most of these states are between the countries that face severe shortage of water in comparison to their consumption. The limitations water of supply resulted from limited ground water reserves that are filled by the low rate of rains that usually took place in the fall. Water statistics in the region indicated that the population of these countries have doubled several folds, while water resources increase by far lower rates to meet the growing population.

To take care of high demand for water, the GCC nations over used their water resources and expanded intensively in desalination services. Governments are applying strict water administration measures that call for more rational water usage. Water management authorities in these countries are minimizing their dependency of desalinization services and searching for more innovative techniques for increasing water asset through adoption of water harvesting techniques.

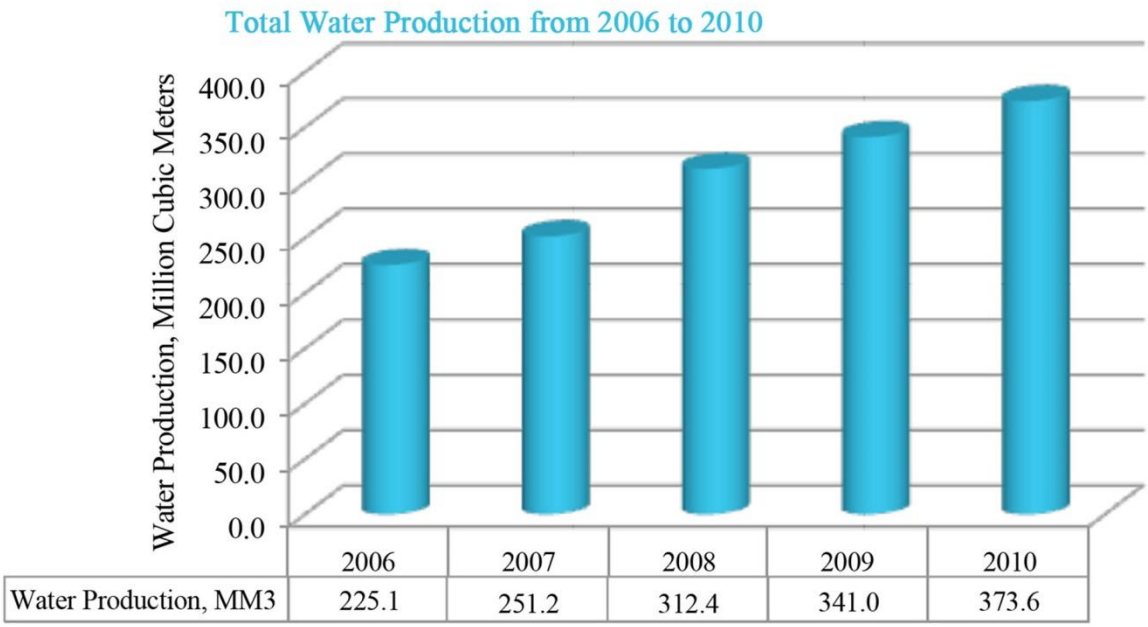

Figure 5. Water Production 2006-2010 (Source: Statistical Center of the Gulf Cooperation Council)

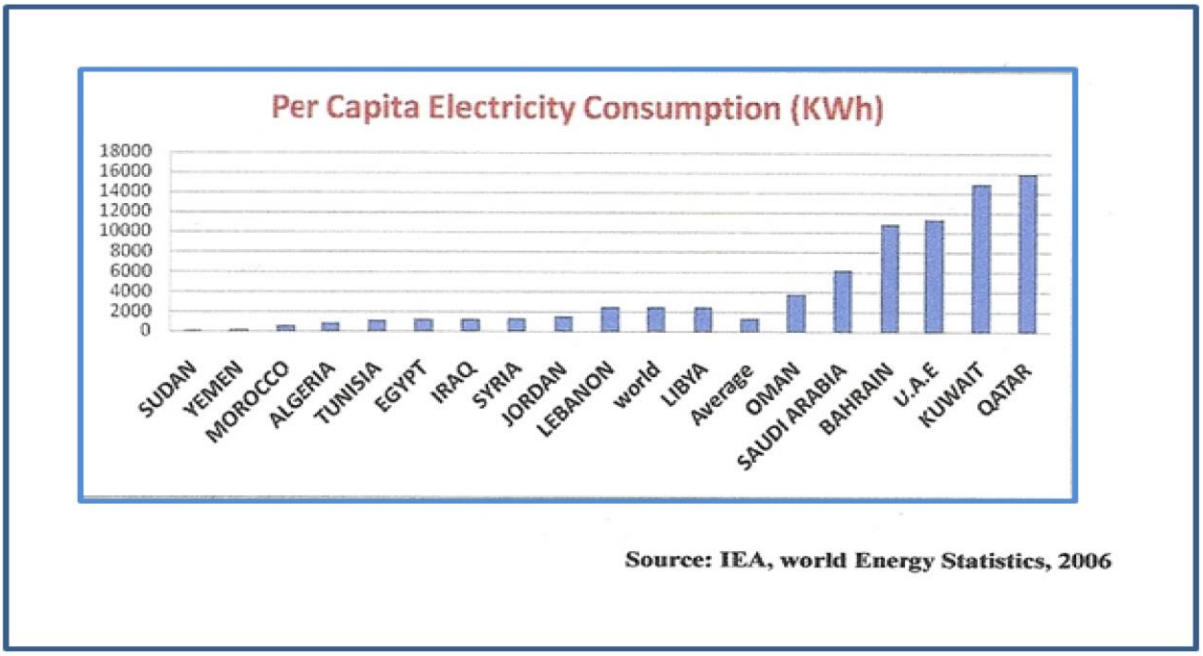

Figure 6. Electricity production 2006

3. Overview of urban policies

The perspectives of policy relate closely to how we understand the city and urbanization process. This process is increasingly seen as a transformative process, closely linked to capitalist development, and emerging

patterns of economic and political interest and investment (Scott, 2008; Harvey, 2006). Cities are human efforts to shape and build an environment and our relationship with the natural world, but cities are also efforts of building social and economic structures and relations (Harvey, 2006; Sandercock, 2003; Simon, 2007). Cities are expressions of socially constructed meanings and values. The boundaries of state administrative units are attempt to define the nature of the city system, and the political authority to manage the system.

Many city administrations work hardly to maintain the core systems and service upon which urban areas depend, including water, energy, and transport. The mapping of national circumstances in the GCCs draws from the most recent communications reports These reports illustrates four broad categories: environment and spatial dimensions, economic resources and structure, social circumstances and environmental quality and biodiversity.

There is an important convention in the global climate arena that countrywide mitigation and adaptation actions entail supporting methods of execution which include funding, technology and capacity-building. These facilities could be supplied by international community. Technology transfer is the area where the Gulf countries needs the support of the international community, in order to introduce and implement an effective mitigation and adaptation measures. Part of the GCC states is following technology transfer on bilateral relationship bases. The IPCC acknowledged that for effective technology transfer, requires government support by creating an environment that facilitate the transfer in terms of institutional and policy frameworks.

The symptoms of climate change witnessed in the recent years include the increase in occurrence and strength of extreme weather conditions, which have been taking place in the past few years, tend to become so obvious and thus attracting the attention of governments and the international community. The results of scientific research clearly indicate that phenomena caused by climate change are a threat to the social and economic development of many countries in the world including the GCC states Climate policy is definitely concerned with systems of administration and governance adopted by these states. Yet, inclusion of climate policy and its incorporation has yet to be institutionalized in policy practice.

Urban polices have crucial roles in climate change mitigation and adaptation in entire countries including the GCC states It can be claimed that municipalities s and local administrations have the essential role in adaptation within their territories, nonetheless it is obvious that they need cooperative institutional frameworks from higher levels of government. The adaptive ability of municipalities in the GCC states obviously has national importance too, given the nature of economic and political structure (Hebbert and Jankovic, 2013).

However, when considering the variety of environmental hazards, these countries encountered, it is found that local governments in the Gulf states have no capacity to reduce the climate change risk that happens within their territory .Despite the fact that local governments in some developed countries many be able to deal with environmental hazards, but risk reduction from climate change in the GCC states depends on major changes in lifestyles and consumption patterns among the population of the region. The quality of urban structure and infrastructure in that cities, would affect the scale of the risk from these climate change extreme events. The role of urban planning and land-use regulations is highly effective as well. Development plans have to become

more climate-aware and develop linkages to existing government policies and initiatives (e.g. Oman Salinity strategy, Oman's 2040, Tourism Strategy, National Spatial Strategy) to enhance the capacity to adapt to climate change.

4. Urban policy and climate change: Incorporation measures

With respect to institutional frameworks of Policy and practice, the governance and administration of climate change issues in the GCC states is considered and dealt with from two ways, international and national directions. The international direction is related to the GCC states work regarding UNFCCC policies and the national direction working on local climate policies. It quite clear that the international structures and links, are more developed, with obviously well-defined roles and actions. Regarding UNFCCC policies GCC states are expressed through national central representative structures which are most usually situated in central governmental institutions. In Bahrain, Kuwait and Oman this contact point is situated in the ministers of environmental domain. In State of Qatar it was relocated in 2012, from the Ministry of Environment into the Ministry of Foreign Affairs. While in UAE there are two principal contact structures; and in Saudi Arabia, it is in the Ministry of Petroleum and Mineral Resources. For investment in the Clean Development Mechanism.

GCC States has to identify an authority at national level to approve projects and share knowledge with their counterparts. In addition, the GCC states have created agencies that concerns with preparations of the national communications to the UNFCCC and for national policy administration purposes.

Regarding their internal national polices on local level, it was observed that two states have set up devoted organizations for Climate issues: Oman's Ministry for Environment and Climate Affairs was established in 2007 and the UAE's Directorate of Energy and Climate Change (DECC), below the Ministry of Foreign Affairs, in 2010. In Oman, the Ministry is the fundamental body in charge of all issues related to climate change strategies and regulations. The UAE's DECC is in charge of speaking to the organization in worldwide connections and agreements, supporting a national climate change system, and liaising with the International Renewable Energy Agency (IRENA), headquartered in Abu Dhabi. The DECC additionally works as the secretariat to the UAE's.

Institutional adoption of policy of adaptation is an essential landmark in adaptation process. The framework for adaptation requires the introduction of an integrated responses that are linked to all levels of institutional hierarchy. This, however, is not going to be an easy task as claimed by (Sharma and Tomar, 2010) Municipal governments and administrations play vital role in services provision in their territories. Thus, inclusion of the adaptive actions into municipal functions is likely to be highly significant and effective.

The administration and governance system in the GCCs is of high centralized nature. The urban planning systems and policies are not excluded. While central ministries for planning establishes urban policies for all level national, regional and local level, the implementation is left for local administration and municipalities to undertake spatial development expansions. This the case in UAE, Saudi Arabia and Oman. National policies, includes legal frameworks and instruments for adaptation and means of incorporation and implementation will also be considered on local level.

While national polices are precise distinctive as far as format, objectives and the stakeholders involved, yet they don't provide directions on how should implantation take place. For instance, they don't include: the defining responsibilities, working structures and provision of ongoing support for implementation. At the municipal level emphasis is given to the revision of building codes, urban development regulations and land-use planning Many other improvements relate to fostering cooperation between institutions, creation of collaboration and coordination of risk reduction and adaptation. In countries like the GCCs will high income, most emphasis is given to improved coordination and cooperation between urban authorities, and the creation of public–private partnerships. Citizens are not thought to contribute to improved risk governance structures. However, in low- and middle-income nations, the comparatively greater involvement of non-governmental organizations (NGOs) (Wamsle, 2013).

In examining the roles and responsibilities of cities municipal demonstrations in the GCC states, it is quite obvious that their primary role is to provide a variety of infrastructure and service that is vital for decent standard of quality of life like water, sanitation, surge water drainage and solid waste management. In addition to other public health services including building regulations. There are many differences in the form of municipalities involvement in urban planning practices, as far as what is to be implemented by the administration itself or what is left to be contracted out or to range the services within their geographical territory are actually the responsibility of higher level of central government.

A range of planned methodologies to integrate climate change responses into the urban planning process can be adopted. Local municipalities in the GCC states can decide to operate in different ways and levels, it may adopt action for the city as a whole or choose specific sectors. By adopting strategies that provide local authorities with an innovative and effective approach to integrate urban development with social, economic and environmental aspects. The policy instruments that municipalities in the GCC States can use to integrate climate change issues into urban planning and management include policy instruments, process instruments, planning instruments and management instruments. Policy instruments deliver guidelines for urban decision-makers. Process instruments offer practical steps that can be taken to reach a planned goal. Planning instruments offer a variety of methods by which urban development plans can be developed and implemented. Management instruments provide tools to direct and administer urban planning decisions.

Barriers to integration of the climate change issues into urban policy remain factual, however, the institutional setting of local administrations which generates obstacles between divisions continue to be the major hindrance of policy integration. Enabling team capacities is normally essential to build an awareness about the need for policy incorporation and the way that can be attained.

5. Conclusion

The article highlighted the significance and search for inclusion of climate change adaptation into urban policies of the GCCs and aimed at proposing guidelines for strategic actions of climate change adaptation to be embedded into urban development strategies. More specifically, it identified critical environmental problems in the region and a variety of climate change related vulnerabilities and analyzed the current situation of

existing policy frameworks. Despite the fact that the GCC states has just started on policy formulation and implementation in climate change issues, it is obvious from the various documentations and statements that these counties are serious about making difference on this regard. Yet there an apparent gap on the planning polices and strategies that encompass climate change expectations. While this article tried to fill that gap by highlighting the policy framework required yet detailed guidelines are still need at local levels. There is a clear evidence that Gulf States are working closely together to attain the aims and objectives of the UNFCCC. Minimizing reliance on their production of oil and gas come on top on their economic diversification strategies, which represent a corner stone on their way to achieve sustainable economic growth.

Inclusion of climate change mitigation and adaptation measures in urban development policies requires institutionalization of prescribed measures and procedures that need further investigation and inquiry. Findings indicated a need for raising awareness about the phenomenon of climate change itself and the expected impacts and preparation of climate change and its extreme weather events impacts in local administrations as well as involving communities, this awareness and preparations of stakeholders within cities would enables urban adaptation.

References

Adger, W.N., Nigel, W.A. and Tompkins, E.L. (2004), "Successful adaptation to climate change across scales", *Global Environmental Change,* Vol. 15, pp. 77–86.

Buloshi, A. and Ramadan, E. (2015), "Climate Change Awareness and Perception amongst the Inhabitants of Muscat Governorate, Oman", *American Journal of Climate Change,* Vol. 4, pp. 330-336.

Cochrane, A. (2007), *Understanding Urban Policy: A Critical Approach*, Oxford, Blackwell.

Harvey, D. (2006), "From managerialism to entrepreneurialism: the transformation in urban governance in late capitalism", *Geografiska Annaler Series B, Human Geography,* Vol. 71 No. 1, pp. 3–17.

Hebbert, M. and Jankovic, V. (2013), "Cities and climate change: the precedents and why they matter", *Urban Studies,* Vol 50 No 7, pp. 1332–1347.

Knox, P. and Taylor, P. (1995), *World Cities in a World System*, Cambridge University Press, New York.

Luomi, M. (2014), *Mainstreaming Climate Policy in the Gulf Cooperation Council States,* Oxford Institute for Energy Studies.

Ramadan, E. (2015), "Sustainable Urbanization in the Arabian Gulf Region, Problems and Challenges", *Arts Social Sci J,* Vol. 6, pp. 109.

Satterthwaite, D. (2011), "How can urban centers adapt to climate change with ineffective or unrepresentative local governments", *WIREs Climate Change,* Vol 2, pp. 767–776.

Scott, A.J. (2008), "Inside the city: on urbanization, public policy and planning", *Urban Studies,* Vol. 45, pp. 755–772.

Sharma, D. and Tomar, S. (2010), "Mainstreaming climate change adaptation in Indian Cities", *Environment & Urbanization*, International Institute for Environment and Development (IIED), Vol. 22 No. 2, pp. 451-465.

Simon, D. (.2007), "Urbanization and global environmental change: new intergenerational challenges", *International Journal of Green Economics,* Vol. 1, pp. 299-306.

Smit, B., Burton, I., Klein, R. and Wandel, J. (2000), "An Anatomy of Adaptation Climate Change and Variability", *Climatic Change,* Vol. 45 No. 1, pp. 223-251.

Statistical Center of the Gulf Cooperation Council for the Arab States of the Gulf (GCC-Stat), statistical year book (2015).

Turok, I. (2009), "The Distinctive City: Pitfalls in the Pursuit of Differential Advantage", *Environment and Planning,* Vol. 41 No. 1, pp. 13-30.

Van Aalst, M.K., Terry, C. and Ian, B. (2008), "Community Level Adaptation to Climate Change: The Potential Role of Participatory Community Risk Assessment", *Global Environmental Change,* Vol. 18 Vol. 1, PP.165-179.

Vanesa Castán, B. and Harriet, B. (2013), "A survey of urban climate change experiments in 100 cities", *Global Environmental Change,* Vol. 23, pp. 92–102.

Wamsler, C. Brink, E. and Rivera, C. (2013), "Planning for climate change in urban areas: from theory to practice", *Journal of Cleaner Production,* Vol. 50, pp. 60-81.