CARC Research in Social Sciences 2(1) (2023) 08-11

02-CARC-74-18

Content list available at:
https://journals.carc.com.pk/index.php/CRISS/issue/view/3

CARC Research in Social Sciences

Journal homepage: journals.carc.com.pk

Impact of Tourism Development, Energy Consumption, Urbanization on Sustainable Development: Empirical Evidence from Qatar

Othman Mohammed*, Cao Erbao, Abdullah Aloqab,

Al Radhi Akram, Wahib Elayah

Hunan University Changsha – China

ARTICLE INFO

Article history:
Received: March 10, 2023
Revised: March 19, 2023
Accepted: March 28, 2023
Published: March 31, 2023

Keywords:
Sustainable development
Energy consumption
Urbanization

ABSTRACT

Qatar is one of richest country in terms of per capita (PC) in the top ten world richest countries. The highest level of growth rate in per capita is attributed to the growth rate in population and energy production. However, There is consensus that growth rate negative affect environment especially growth of population and energy consumption. Furthermore due to Qatar national plan to diversify the economy and reduces reliance on the oil, depletion of oil reservoir in the country and market volatility in the price of petroleum products, there is need to conducted the empirical research to checked the effect of tourism development, energy consumption and urbanization on sustainable development in Qatar. After gathering time series data from the period of 1995 to 2019 and conducting preliminary tests, the study found there is negative and significant effects of energy consumption, urbanization on sustainable development and positive and significant effect of tourism development on the sustainable development. Therefore, it is recommended to plan that project which are environmentally sustainable. Secondly, energy and sustainable nexus shows that energy consumption is detrimental to sustainable development; therefore, fossil fuel energy consumption project should be replaces with energy efficient and environmental friendly projects. Lastly the rate urbanization should be properly managed which could reduce the negative environmental degradation.

1. INTRODUCTION

Qatar is enriched with oil and natural gas and ranked at the third largest oil and gas endowed country. The country is the world largest exporter in terms of liquefied natural gas (LNG) and export most of the petroleum products. The country largest source of revenue comes from oil natural gas and petroleum products (U.S. Energy Information Administration, 2022). According to Qatar National bank estimates, the country is earning 49% of total government revenue from production and export of petroleum products (Qatar National Bank, 2015, p, 12). Additionally, the report of US energy information administration reveals that in 2014, Qatar had earned 38 billion dollars from the export of crude oil. This shows that the growth and development of Qatar economy is heavily reliant on the petroleum and petroleum related products. However, due to depletion of oil resources, volatility of oil price in oil markets leads to the policy makers to shift the gear from oil economy to non-oil

***Corresponding author:** Othman Mohammed, Hunan University Changsha – China

E-mail: **malathwri15@hotmail.com**

How to cite:

Mohammed, O., Cao Erbao, C. E., Abdullah Aloqab, A. A., Al Radhi Akram, A. R. A., & Wahib Elayah, W. E. (2023). Impact of Tourism Development, Energy Consumption, Urbanization on Sustainable Development: Empirical Evidence from the Qatar. *CARC Research in Social Sciences, 2*(1), 08–11.

DOI: **https://doi.org/10.58329/criss.v2i1.18**

based economy. Therefore for the purpose of diversification of economy and lessen the dependence on petroleum driven growth, tourism development, which is the fastest growing sector in the world with the lesson effects on sustainable development could be a vibrant sector of the economy. Therefore Qatar National Vision Agenda of 2030 includes tourism development on the top of the list (Qatar General Secretariat for Development Planning, 2012). Investment in tourism sectors and the launch of Qatar National Tourism Strategy shows that the Qatar is determined in the development of tourism sector. The country has competitive to host the certain events in order to attract the tourists and tourism related business i.e, "organized festivals meetings, exhibitions, incentives, heritage, desert, sea, safari" are some of the country's tourism resources.

Qatar is one of top ten world richest country in terms of per capita (PC). According to the World Bank estimates the PC of Qatar is $104,668 dollars (WDI, 2022). In 2018 the country attain 13.8% growth rate in Gross Domestic Product (GDP) as compare to 2017 growth rate. The highest level of growth rate in GDP is attributed to the growth in population and energy sector. There is great consensus on the relationship between economic growth, energy consumption and environmental degradation (López et al., 2014; Ansuategi & Escapa, (2002). The growth in energy and population especially urbanization has substantially damage the environmental quality in Qatar. The cost would further triggered the world economy if the environmental loses due to human activities are not reduced (Mrabet & Alsamara, 2017). According to the study conducted by Stern, (2004) the world economy is suffering from the environmental degradation equal to 5% of global GDP, which could be reduced to 1% if the Greenhouse gases (CHG) is reduced.

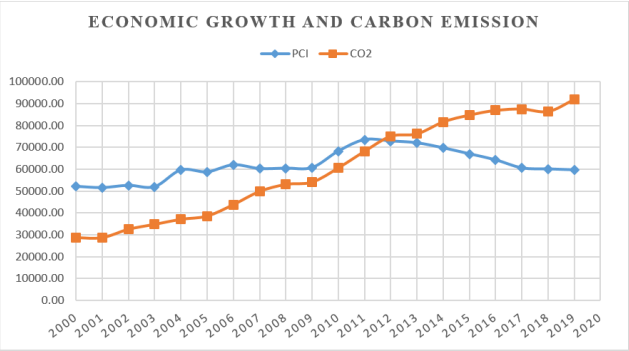

Figure 1. Growth and Environmental Degradation

The relationship of growth and environmental degradation which is measured by emission of greenhouse gases in atmosphere is measured by the amount of CO2 in the air, which is represented in figure 1. Here CO2 is measured in Kiloton (Kt) and the overall economic performance of the country is measured by per capita income (PCI) at 2015 constant prices. It can be seen from the figure that CO2 increases with the betterment in the overall economic performance of the country, which is evident from the figure. The graph shows that carbon emission starts rising from 28660 Kt to 75080 Kt from the period 2000 to 2012 as economy starts growing i.e., PCI moves from $ 52157 to $72870. After the year 2012 the economic performance of the country goes downward, this because of the political ties with the neighbors and world political crises. However the environmental degradation still worsen as the CO2 emission further increase. This is because of the other important factors such as population growth and especially the growth of urbanization. So the basic objective of conducting this research is because of the two reason. One is the depleting oil reservoir and price volatility in the oil market and to reduce the reliance on oil based economy to non-oil based economy. Another reason is due the environmental degradation arises from the two main factor energy consumption especial fossil fuel energy and population growth. Lastly the researcher did not find any empirical evidence measuring the impact of tourism development, energy consumption and urbanization on sustainable development. Therefore there is need to investigate the relationship between tourism development, energy consumption, urbanization and sustainable development in Qatar.

2. METHODOLOGY

The study includes four variable analysis, sustainable development, tourism development, energy consumption and urbanization to find the effect of tourism development, energy consumption and urbanization on sustainable development in Qatar. the study takes sustainable development index (SDI) to gauge the sustainable development, tourism expenditure (TE) as proxy for tourism development, urbanization as percentage of total people living in urban areas and energy consumption in quadrillion British thermal unit (Quad Btu) as proxy for measuring energy consumption. The study takes annual time series data from the periods of 1995 to 2019. The data has been taken from various sources such as sustainable development data has been taken from (Hickel, 2020) dataset, urbanization data from (WDI, 2022) tourism expenditure data from (UNWTO, 2022) and energy consumption data from (UNWTO, 2022).

It is one of the assumption of the ordinary least square (OLS) that the model should be free from econometric problems such as, normality, heteroscedisticity, autocorrelation and specification bias and unit root problems. For this various tests are employed to check the econometric problems in order to avoid the spurious results. The unit root problem in the model is checked by Augment ducky fuller test (ADF), Normality is checked by Jarque Berra(JB), Heteroscedasticity is check by Breusch Pagen Godfrey test (BPG) autocorrelation is checked by Breseusch Godfrey serial correlation LM test (BG) and specification bias is tested with Ramsey reset test ((Dickey & Fuller, 1979; Breusch-Pagan, 1979; Ramsey, 1969). The study applied Auto regressive distributed lag model (ARDL) to measure the long run association between the variables after testing for unit roots problems, as the data shows that all variable are not stationary at level and have mixed order of integration. The long run co-integration among the variables was checked by bonds test, which shows variables of the study are co-integrated in the long run (Pesaran et al., 2001).

3. RESULTS & DISCUSSION

The unit root problems in the data checked by the Augment dickey fuller test and the results are portrayed in table 1. The results of Augmented Dickey fuller test shows that all the variable are not stationary at level, i.e. Sustainable development, tourism development and energy consumption are stationary at first difference while urbanization is stationary at level. In addition the preliminary test of the study shows that that the data is free

from econometric problems such as normality, heteroscedasticity, serial correlation and specification bias.

Table 1

Results of Augment Dickey Fuller Test

Variable	At Level	At First Difference	Decision
Log SDI	-2.24	-2.84***	I(1)
LogEN	-1.06	-3.39**	I(1)
LogURB	-2.65**	----------	I(0)
LogTE	0.75	-3.09**	I(1)

Table 2 shows the results of, normality test, specification bias test, heteroscedasticity test and autocorrelation test. Moreover, the upper part of table 2 shows the results of bounds test. The results of bounds test indicates that there is long run co-integration in the series, because the F statistics value is greater that lower and upper bound at 1%, 5% and 10% level of significance.

Table 2 Bound and Diagnostic Tests

Test Statistic	Value	Sig.	I(0)	I(1)
F-statistic	7.22	1%	3.65	4.66
K	3	5%	2.79	3.67
		10%	2.37	3.2
Diagnostics tests results				
Tests	Coefficient	P. value		
Normality Test	0.93	0.63		
Heteroscedasticity	0.87	0.53		
Serial correlation	1.08	0.38		
Ramsey RESET	1.91	0.83		

The short run and long run results of ARDL model are given in the table 3. The results shows that there is negative association between urbanization and sustainable development. The coefficient of urbanization is -36.81, which is shows that there is negative relationship between urbanization and sustainable development. The coefficient is significant at the 5% level of significance, which shows that if there is 1 unit increase in the urbanization the sustainable development will decrease by 36.81 units, which is similar with the finding of Goel & Vishnoi, (2022), which concluded that the urbanization affect sustainable development. The coefficient of tourism expenditure is .52 is which is positive and significant at 1% level of significance. The coefficient of tourism expenditure indicates that other things remaining the constant, if there is 1 unit increase in the tourism expenditure sustainable development would increase by .52 units. The study of Kaitano, (2020) and Ibănescu et al., (2018) are also shows that tourism development is positively associated with sustainable development, which is consistent with our results. Similarly the coefficient of energy consumption is -1.85 which is negative and significant at 1% level of significance.

The coefficient estimate of energy consumption shows that sustainable development would decrease by 1.85 units. According to Zaharia et al., (2019) energy consumption negatively affect sustainable development. The lower of table three indicates the short run results of ARDL and error correction form. The results indicates that, urbanization and energy have negative impact on sustainable development while the tourism expenditure have positive impact on sustainable development in short run. Furthermore the results indicates that urbanization, energy consumption and tourism expenditure and significant effect while their lag term have insignificant impact on sustainable development. Additionally the table include the error correction and model fitness. The coefficient of error correction is -.46 which is negative and significant, which indicates that the model will recover itself from the shock within two years. The coefficient of R square and adjusted R square also shows that the model is good fit.

Table 3. Long run estimates of ARDL

Long run Results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LogURB	-36.81	17.32	-2.12	0.03
LogTE	.52	.12	4.33	0.00
LogEN	-1.85	.45	-4.11	0.00
C	3.49	1.39	2.52	0.03
Short Run results and Error Correction Form				
DlogSDI(-1)	0.46	0.20	2.31	0.04
DlogTE	9.53	3.45	2.76	0.02
DlogTE(-1)	3.64	3.44	1.06	0.32
DlogURB	-0.33	0.10	-3.33	0.01
DlogURB(-1)	-0.31	0.09	-3.44	0.01
DlogEN	-0.08	0.03	-2.67	0.01
DlogEN(-1)	-0.04	0.03	-1.33	0.28
C	1.31	1.56	0.84	0.42
Coint;	-.46	.12	-3.83	0.00
R2	0.88			
Adjusted R2	0.83			

4. CONCLUSION & RECOMMENDATIONS

The primary objective of this paper is to analyze the effect of tourism development, energy consumption and urbanization on sustainable development in Qatar. The basic motive of this study is due to the fact that Qatar has largest oil reservoir in the gulf region and higher rate of urbanization in the country as compare to the other nations of the world. The literature and empirical review shows that energy consumption and urbanization has is negative effects on sustainable development. Moreover the gulf cooperation council and Qatar especially plan to promote the tourism development in the country. Therefore the study employed urbanization, energy consumption and tourism development on sustainable development in Qatar. For this the study employed annual time series data from the period of 1995 to 2019. The data on sustainable development has been taken from (Hickel, 2020) dataset, urbanization from (WDI, 2022) tourism expenditure data from (UNWTO, 2022) and energy consumption data from (UNWTO, 2022).

Before analysing the data for further study some preliminary tests are conducted such as normality, heteroscedisticity, autocorrelation and specification bias and unit root problems. The results of preliminary test shows that the model is free from autocorrelation, heteroscedasticity, and specification bias and normality test. The results of ADF test shows that that variables has mixed order of integration. Therefore the study employed the Autoregressive distributed lag model (ARDL) in order to estimate the short run and long run coefficients of the series. The long run results of ARDL shows that there is positive relationship between tourism development and sustainable development, while urbanization and energy consumption has negative effect on sustainable development in Qatar.

Since Qatar is trying to diversify its economy and achieve higher economic growth to gain the status of developing nations. They set long term economic plan to attain the economic development, since they achieved higher economic growth and per capita, but at the expense of environmental degradation. Therefore it is recommended to plan those project which are environmentally sustainable. Secondly energy and sustainable nexus shows that energy consumption is detrimental to sustainable development therefore, fossil fuel energy consumption project should be replaces with energy efficient and environmental friendly projects. Lastly the rate urbanization should be properly managed which could reduce the negative environmental degradation.

Competing Interests

The authors have declared that no competing interests exist.

References

Ansuategi, A., & Escapa, M. (2002). Economic growth and greenhouse gas emissions. Ecological Economics, 40(1), 23-37.

Breusch, T. & Pagan, A. (1979), 'A simple test of heteroskedasticity and random coefficient variation', Econometrica 47, 1287–1294.

Dickey, D.A., Fuller, W.A. (1979), Distribution of the estimators for autoregressive time series with a unit root. Journal of the American Statistical Association, 74(366a), 427-431.

EIA (2022). Independent Statistics & Analysis US Energy Information Administration. Available online: https://www.eia.gov/ (accessed on 25 May, 2022).

Goel, R. K., & Vishnoi, S. (2022). Urbanization and sustainable development for inclusiveness using ICTs. Telecommunications Policy, 46(6), 102311.

Ibănescu, B. C., Stoleriu, O. M., Munteanu, A., & Iaţu, C. (2018). The impact of tourism on sustainable development of rural areas: Evidence from Romania. Sustainability, 10(10), 3529.

J.B. Ramsey. (1969). Test for Specification Errors in Classical Linear LeastSquares Regression Analysis. Journal of the Royal Statistical Society. Series B (Methodological). Vol. 31, pp. 350-371.

Kaitano, D. U. B. E. (2020). Tourism and sustainable development goals in the African context. International Journal of Economics and Finance Studies, 12(1), 88-102.

López-Menéndez, A. J., Pérez, R., & Moreno, B. (2014). Environmental costs and renewable energy: Re-visiting the Environmental Kuznets Curve. Journal of environmental management, 145, 368-373.

Mrabet, Z., & Alsamara, M. (2017). Testing the Kuznets Curve hypothesis for Qatar: A comparison between carbon dioxide and ecological footprint. Renewable and Sustainable Energy Reviews, 70, 1366-1375.

Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Qatar National Bank, (2015). Qatar Economic Insight, Retrieved from; http://www.gulf-times.com/eco.-bus.%20news/256/details/421989/non-hydrocarbon-%E2%80%98tops-50%25-of-qatar-gdp%E2%80%99.

Qatar Tourism Authority (2014). Qatar National Tourism Sector Strategy 2030. Qatar: Doha.

Stern, D. I. (2004). The rise and fall of the environmental Kuznets curve. World development, 32(8), 1419-1439.

U.S. Energy Information Administration (2022). Qatar: International energy data and analysis. Retrieved from https://www.eia.gov/international/analysis/country/QAT.

UNWTO, (2022). United Nation World Tourism Organization. Retrieved from https://www.unwto.org.

WDI. (2022). World Development Indicators, Washington, DC: The World Bank. Retrieved from https://data.worldbank.org/country/BH.

Zaharia, A., Diaconeasa, M. C., Brad, L., Lădaru, G. R., & Ioanăş, C. (2019). Factors influencing energy consumption in the context of sustainable development. Sustainability, 11(15), 4147.