



Trends of Energy Consumption in Muslim Countries: Capturing the Effects of Tourism and Government Effectiveness

Adiba Amjad¹, Farzana Munir², Ismat Nasim³, Furrukh Bashir⁴

¹ Research Scholar, Department of Economics, The Government Sadiq College Women University, Bahawalpur, Pakistan. Email: adibaamjad95@gmail.com

² Assistant Professor, School of Economics, Bahauddin Zakariya University, Multan, Pakistan. Email: farzanamunir@bzu.edu.pk

³ Lecturer, Department of Economics, The Government Sadiq College Women University, Bahawalpur, Pakistan. Email: ismat.nasim@gscwu.edu.pk

⁴ Assistant Professor, School of Economics, Bahauddin Zakariya University, Multan, Pakistan. Email: furrukh@bzu.edu.pk

ARTICLE INFO

Article History:

Received: July 24, 2023
Revised: September 18, 2023
Accepted: September 19, 2023
Available Online: September 20, 2023

Keywords:

Tourism
Energy Consumption
National Governance
Government Effectiveness

JEL Classification Codes:

G34, H11, L83, P18, P28, Z32

Funding:

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

The focus of this study is to check how energy consumption is affected by tourism, FDI, and urban population in the Muslim nations keeping in view the role of government effectiveness during 2001-2022. The empirical analyses are based on slope homogeneity tests, cross-sectional dependency tests, unit root test and Panel ARDL tests. The empirical evidence suggests that carbon emissions, tourism, foreign direct investment, and urban population increase all have a positive impact on energy consumption. On the other hand, the efficiency of governance appears to have the opposite effect on energy use. Reducing carbon emissions while concurrently increasing energy efficiency, shifting to renewable energy sources, and minimizing the negative effects of energy usage on the environment and society is a worldwide necessity.



© 2023 The Authors, Published by iRASD. This is an Open Access Article under the [Creative Common Attribution Non-Commercial 4.0](https://creativecommons.org/licenses/by-nc/4.0/)

Corresponding Author's Email: farzanamunir@bzu.edu.pk

Citation: Amjad, A., Munir, F., Nasim, I., & Bashir, F. (2023). Trends of Energy Consumption in Muslim Countries: Capturing the Effects of Tourism and Government Effectiveness. *IRASD Journal of Economics*, 5(3), 765–775. <https://doi.org/10.52131/joe.2023.0503.0159>

1. Introduction

According to numerous studies, the main origins of increasing environmental pollution are rapid global financial development along with energy use, and tourism development (Agbanike et al., 2019). Environmental quality is affected mainly by increased energy consumption in all areas of life especially transportation, restaurants and hotels, recreation centers, Azam, Khan, and Ali (2023) information technology, and other areas, the rapid development of the tourism and financial sectors Gamsakhurdia and Fetelava (2023); Katircioglu, Katircioğlu, and Altinay (2018); Khanna and Sharma (2023) may intensify environmental degradation and consequently promote economic growth (Ayad, Sari-Hassoun,

Usman, & Ahmad, 2023). But how much of an impact they have may depend on how well-run the institutions are governing (Zhang, Chen, Lyulyov, & Pimonenko, 2022).

Additionally, the research by Azam et al. (2020) and Tinta (2022) showed that there is a valuable association between the quality of the institutions and the amount of energy that is derived from fossil fuels, further suggesting that an increase in the quality of the institutions would result in higher CE and lower quality environmental performance. It gave belief to the primary conclusion reached by Mavragani, Nikolaou, and Tsagarakis (2016) and Xu and Hussain (2023), which stated that lower levels of corruption and government effectiveness are associated with higher levels of environmental performance. This conclusion was also supported by Ozcan, Ulucak, and Dogan (2019) and Kerner, Kalthaus, and Wendler (2023). Institutions should be improved to promote the advantages of tourism in Muslim nations and to lessen the damaging effects of development and tourism. This is a component of the financialization of an environmental quality system that is sustainable. Institutions may theoretically increase energy efficiency, which would improve the environment.

Tourism may potentially apply a multifaceted influence on energy consumption in Islamic countries. The correlation between energy consumption and tourism is intricate due to several factors, and the precise ramifications of this correlation can differ significantly across countries, tourism sector composition, and level of development (Gokmenoglu & Eren, 2020; Khanal, Rahman, Khanam, & Velayutham, 2021). Infrastructure, such as hotels, airports, and transportation networks, are frequently built as a direct result of tourism's economic impact. It is possible for the demand for energy to considerably increase both during the building and operation of these facilities. This could, in some circumstances, result in the growth of industries that rely heavily on sources of energy (Noreen, Nasim, Bashir, & Salahuddin, 2023). Tourism is an industry that faces seasonal fluctuations and by the time there are more tourist arrivals, it causes energy usage to increase and result in higher consumption at certain times (Nasim, Boukhris, Kayani, Bashir, & Haider, 2023). Government Effectiveness (GF) is one of the important factors that is an effective participant in the evaluation process and determining the efficiency of public institutes and governance (Yahya & Rafiq, 2020).

The public's trust in government institutions is highly damaged by corruption, which also skews decision-making processes (Sekrafi & Sghaier, 2018; Voumik et al., 2023). An efficient government is accountable to the public it serves by ensuring that decisions are made transparently, being attentive to the requirements of the public, and having mechanisms in place to hold public officials accountable for their actions (Akorli & Adom, 2023). Due to an increase in energy consumption in areas such as transportation, restaurants, hotels, recreation centers, information technology, and other areas and consequently economic growth, The financial and tourism sectors' fast development could have negative effects. Additionally, the region has promoted the usage of renewable energy over time (Handayani et al., 2022; Sultana, Rahman, Khanam, & Kabir, 2022).

To evaluate how tourism affects energy consumption in a selected Muslim-majority nation and to examine the relationship between governance practices is the objective of the study. In addition, the research makes use of balance panel data econometric approaches, which make it possible to generate estimates that are reliable and consistent. Moving forward, the research is carried out in the following manner: the section that follows offers a review of the previous research and the section that comes after that covers the model specification and the data that was utilised. In the fourth segment, an in-depth examination of the results is offered, while in the fifth section, the conclusions of the study are presented in the form of policy suggestions, which are derived from the findings of the study.

2. Literature Review

The impact of tourism, governance, and carbon emission on energy consumption is well-recognized, with previous studies demonstrating its significant contribution to increased energy usage and emissions of greenhouse gases. The impact of carbon emission on energy consumption is somehow not there in theories but empirically their link is strong. Saidi and Hammami (2015) used a decomposition method to investigate the elements that influenced the variations in the total amount of CO₂ emissions that were caused by energy-related activities. Using the LMDI technique, Sheinbaum-Pardo, Mora-Pérez, and Robles-Morales (2012) discovered significant shifts in the structural effect that resulted in decreased emissions for ten different subsectors of the manufacturing industries.

The significance of effective governance practices in influencing energy consumption has been mentioned in the literature (Akram, Sultana, Sultana, Majeed, & Saeed, 2021; Haseeb, Hassan, Azam, & Suryanto, 2018). The linkage between governance-related factors and energy consumption patterns as well as CO₂ emissions have been examined by Friedman and Gürce (2020); Nguyen (2022). These investigations have underscored the criticality of robust governance frameworks in the pursuit of sustainable development objectives (Guan & Qamruzzaman, 2022). FDI-related factors that influence energy consumption patterns and CO₂ emissions in a subset of Muslim countries are examined by Muhammad, Khan, Razzaq, and Karim (2021) and Faqeer, Khan, Naveed, and Rehmat (2021).

Akram et al. (2021); Islam, Mindia, Farzana, and Qamruzzaman (2023); Yudina, Vandina, Bogoviz, and Lobova (2017) indicated that economic development and the environment were interconnected. The effectiveness of governments, encompassing governance quality, democratization, adherence to environmental regulations, corruption control, efficient tax systems, and political stability, influences the propensity of economic agents to comply with such regulations and carry out activities in a manner that mitigates environmental damage (Azam et al., 2020).

According to the findings of some researchers like Ewing, Sari, and Soytaş (2007); Sari, Ewing, and Soytaş (2008); Ziramba (2009), a rise in energy consumption can increase industrial activities, and side by side it may also result in greater concentrations of polluting gases in the environment. CO₂ emissions and energy use have a positive correlation, and in the long term, there is bidirectional causation between the two. Researchers Al-Mulali, Ozturk, and Lean (2015) discovered that urbanization, energy consumption, and CO₂ emissions are all linked in a way that has a bidirectional causation relationship. Some empirical studies Nepal (2008) suggested that international tourism, as measured by the number of arrivals, results in an increase in the amount of energy that is consumed. Both Kelly and Williams (2007) have centered their research on the investigation of the influence that tourist indicators have on energy usage. Contrary to this, Tang and Tang and Abosedra (2014) postulated that economic growth might be affected not only by tourist indicators but also by energy consumption. According to Iwaro and Mwashia (2010) and Matsumura and Yamagishi (2017) energy conservation regulations have a detrimental influence on economic growth in industrialized nations, but usage of renewable energy contributes to reductions in emissions.

3. Data and Methodology

This study uses panel data from 11 selected Muslim countries (table 1) from 2001 to 2022 and the data is taken from the WDI - World Development Indicators. Given the difficulty in gathering data for the governance indicator, the study uses the Government Effectiveness that represents all indicators of governance, and data is gathered from WGI - World Governance Indicators, and the missing values are interpolated to make a balanced panel. While measuring the results of the study, various tests have been applied like cross-sectional dependency test; slope homogeneity test Pesaran and Yamagata (2008), first-generation unit

root test (LLC – Levin, Lin & Chu and IPS – Im, Pesaran and Shin W tests), Kao Cointegration test and Panel ARDL.

Table 1
Names of Muslim Countries

Selected OIC Countries			
Bahrain	Maldives	Turkey	Libya
Comoros	Malaysia	Yemen	Egypt
Iran	Pakistan	United Arab Emirates	

Having the said aims of the study, the following model is specified as;

$$EC_{it} = C_1 + \alpha_1 CE_{it} + \alpha_2 TOUR_{it} + \alpha_3 GovEff_{it} + \alpha_4 FDI_{it} + \alpha_5 UPG_{it} + \epsilon_{it} \tag{1}$$

Here in the equation, α 's are the coefficients and ϵ_{it} is the error term and detail about these variables are presented in table 2.

Table 2
Description of Variables

Variables	Description of Variables	Measurements	Data Sources	Expected Relationships
EC	Energy Consumption	kg of oil equivalent per capita	WDI – World Development Indicators	Dependent Variable
CE	Carbon Emission	Kilotons		Positive
TOUR	International tourism (Receipts)	US Dollar		Positive
FDI	Net Inflows of Foreign Direct Investment	Percentage of GDP		Positive/ Negative
UPG	Urban Population	Urban population/ Total Population		Positive
GovEff	Governance Effectiveness	Index	World Governance Indicators	Positive/ Negative

4. Results and Discussion

For the purpose of analysis, the results of the study are being started with Panel data cross-sectional dependence analysis that is important to determine whether there is a significant level of interdependence or correlation among the cross-sectional units at a certain point in time. Various statistical tests can help you assess cross-sectional dependence. In table 3, tests of Pesaran, Friedman and Frees indicate the absence of cross-sectional dependency and lead the study toward the application of first-generation unit root tests.

Table 3
Cross-Sectional Dependency Results

	Value	Prob	CSD
Pesaran	0.112	0.911	No
Friedman	16.539	0.0852	No
Frees	1.905	0.05	No

In panel data analysis, panel heterogeneity refers to the presence of individual-specific differences or unobserved heterogeneity that can affect the dependent variable. Testing for panel heterogeneity is important because it helps determine whether there are systematic variations across individual units in a panel dataset (Pesaran & Yamagata, 2008). Table 4 signifies that the chosen cross-sections of the panel are heterogeneous and not identical.

Table 4
Slope Homogeneity Test

Ho: slopes are homogeneous.

	Delta	p-value	Conclusion
	-0.914	0.361	Reject Ho
Adjusted	-1.18	0.238	Reject Ho

Table 5 indicates that GovEff and FDI are stationary at level and the remaining series i.e. EC, CE, TOUR and UPG are stationary at first difference so we may be able to apply Panel ARDL test for estimating the coefficients.

Table 5
Unit Root Test

Unit Roots Test of First-Generation

Variables	Level	Levin Lin and Chu			Im Persaran and Shin			
		Prob.	1st diff.	Prob.	Level	Prob.	1st diff.	Prob.
EC	-1.2554	0.1047	-8.1983	0.000	-1.1685	0.9661	-5.911	0.000
CE	-0.2173	0.414	-6.1117	0.000	-1.0824	0.9438	-4.371	0.000
TOUR	-0.5593	0.288	-4.5428	0.000	-1.8379	0.1256	-5.846	0.000
GovEff	-1.3847	0.0831	---	---	-1.1094	0.9338	-4.316	0.000
FDI	-2.5776	0.005	---	---	-2.3807	0.003	---	---
UPG	-1.066	0.1432	-6.5329	0.000	-1.4164	0.6066	-2.747	0.000

Panel cointegration test (Kao Cointegration test) is used to evaluate the possibility of a long-run equilibrium relationship among variables in panel data, where data is collected on multiple cross-sectional units over time. Several panel cointegration tests are available to determine if cointegration exists. These tests are based on the assumption that cointegration does not exist; hence, a low p-value (usually one that is lower than the significance threshold that you have chosen; for example, 0.05) shows that there exists a cointegration among the variables chosen in the model as stated in table 6.

Table 6
Kao Test for Cointegration

Test	Value	Probability	Conclusion
Unadjusted modified Dickey-Fuller t	3.5118	0.0002	Reject Ho (No Cointegration Exist)
Unadjusted Dickey-Fuller t	-4.2025	0.0000	Reject Ho (No Cointegration Exist)

The study uses ARDL to analyze the short and long-term estimators and their results are reported in table 7 & 8. The performance of this approach delivers better results when compared to other estimation approaches and the estimates are more reliable. Additionally, ARDL methods aid in the resolution of serial correlation, endogeneity, and heteroscedasticity (Asongu, El Montasser, & Toumi, 2016; Khan, Yu, Sharif, & Golpîra, 2020).

In the model of the study, energy consumption is taken as a dependent variable that is explained by a set of independent variables that are CO2 emission (CE) Tourism (Tour), Governance Effectiveness (GovEff), FDI, and Urban Population (UPG). The positive reaction of tourism to energy use suggests that tourism revenues are not directly related to energy consumption, but that the transport industry, which is involved in tourist travel, makes a positive contribution to energy consumption (Gokmenoglu & Eren, 2020; Pata & Balsalobre-Lorente, 2022). The findings corroborate a study that claimed that the energy demand in the tourism industry restrains the growth of the industry. The benefits of tourism contradict each other.

It is essential to make it clear that carbon emissions do not have a beneficial effect on the amount of energy that is used which is also evident from the estimated value of CE

(Acheampong, 2018; Farhani, Chaibi, & Rault, 2014). Carbon emissions from the burning of fossil fuels constitute a substantial contribution to environmental concerns, most notably climate change, and are linked to adverse effects on both the health of the planet and of humans (Wang, Wei, Zhang, & Qi, 2023). There have been instances in which greater carbon emissions have been linked to both increased economic development and increased energy use very minimal.

Considering governance component, it has a favorable negative impact on energy consumption (Huang, Ahmad, & Ali, 2022; Muhammad et al., 2021). This may be the reason that the need for direct energy cannot be ignored while adopting economic and environmental policies; as a result, the government's response to the energy industry has been good and industries are becoming energy efficient. The government can further make sure that the institutions do not consume energy up to a certain level.

As the number of people living on this planet increases, there is a proportional rise in the amount of energy that is required to fulfill the requirements of newly formed communities (Batiwala & Reddy, 1994; Khan, Hou, & Le, 2021). This need extends to a wide range of industries, including residential, commercial, and industrial, as well as the transportation industry. An increase in the urban population is frequently followed by a general rise in the level of living, as exemplified by an expansion of the availability of domestic appliances, technological devices, and automobiles. These shifts in lifestyle contribute to a higher level of energy consumption on a per-person basis which is also supported by the findings of the study. When economies expand, their need for energy for their businesses, transportation, and families often increases as well (Rehman & Rehman, 2022; Wang et al., 2023). Even though this might result in higher levels of CE, the fact that living standards also rise. The need for clean energy solutions may be driven by tourism, which can result in the creation of renewable energy projects that are beneficial to both visitors and the areas in which they are located (Wu, 2023).

Table 7
ARDL Long Run Results

Variables	Coefficients	Standard Errors	t- value	Probability
CE	0.003	0.00001	16.093	0.000
TOUR	150.200	31.270	4.803	0.000
FDI	31.938	7.416	-4.307	0.000
UPG	478.281	111.907	4.271	0.000
GOVEFF	-233.189	87.366	2.669	0.000

Table 8
Short Run Equation

Variables	Coefficients	Standard Errors	t- value	Probability
COINTEQ01	-0.0530	0.0448	-0.5128	0.0693
D(EC(-1))	-0.3626	0.1320	-2.7477	0.0073
D(CE)	0.0371	0.0239	1.5561	0.1232
D(CE(-1))	0.0074	0.0227	0.3266	0.7447
D(LNTOUR)	-92.4233	74.6933	-1.2374	0.2192
D(LNTOUR(-1))	-98.7713	78.0550	-1.2654	0.2090
D(FDI)	-5.9302	8.4653	-0.7005	0.4854
D(FDI(-1))	2.9405	8.3502	0.3521	0.7256
D(GOVEFF)	-136.6280	251.4173	-0.5434	0.5882
D(GOVEFF(-1))	-158.5205	125.8292	-1.2598	0.2110
D(UPG)	80.7631	47.9780	1.6833	0.0958
D(UPG(-1))	3.5328	38.6585	0.0914	0.9274
CONSTANT	-313.3529	202.3566	-1.5485	0.1250

The value of cointegration shows the convergence towards the long run and the variables of the model will converge to the equilibrium and the speed of adjustment is 5% a

year approximately. The speed of adjustment is very slow with significant value so it will take 20 years to reach its steady state point.

5. Conclusion

The importance of tourism and government effectiveness cannot be ignored if discussed with the perspective of energy consumption of Muslim countries of the world so this study is conducted to trace out this effect along with many other variables like carbon emission, FDI, urban population. The phenomenon is that energy use of Muslim countries are continuously increasing due to tourism, urbanization, FDI and many other variables so the data of eleven Muslim countries have been collected from 2001 to 2022. The panel data of selected variables is collected by WDI – World Development Indicators and WGI – World Governance Indicators. The analysis of the study is based on the various tests i.e. Cross-sectional dependency test (Frees, Friendman & Pesaran), Slope Homogeneity test Pesaran and Yamagata (2008), First-generation unit root test (Levin, Lin & Chu and Im, Pesaran and Shin W tests), Kao Cointegration test and Panel ARDL tests.

The study concludes that no cross-sectional dependency is found, the chosen cross sections of the panel are heterogeneous. Unit root test suggests to use Panel ARDL for further estimation of results because EC, CE, TOUR and UPG are stationary at 1st difference while GOVEFF and FDI are stationary at level. There are evident findings that tourism is responsible for an increase in energy consumption. The inflows of foreign direct investment are also having a large and beneficial effect on the use of energy. The results of the study enable researchers to gain a deeper understanding of how variables interact over time within datasets that have both cross-sectional and time-series dimensions.

However, there are some circumstances in which the connection between carbon emissions and energy use may be construed in a manner that is not usual. Indirect economic drivers have shown a correlation between greater carbon emissions and increased energy use in certain circumstances. When economies expand, their need for energy to power their businesses, transportation, and families often increases as well. Although this might result in higher levels of carbon emissions, the fact that living standards have risen and the economy has advanced is still a positive sign. However, there are costs to both the environment and society associated with this connection, thus it cannot be considered intrinsically favorable.

Reducing carbon emissions while concurrently increasing energy efficiency, shifting to renewable energy sources, and minimizing the negative effects of energy usage on the environment and society is a worldwide necessity. It is essential to keep in mind that the beneficial influence that tourism has on the use of energy is not a given and is contingent on ethical and environmentally conscious tourist practices. Unregulated and unsustainable tourism may have some negative effects on the environment and the energy sector, including an increase in energy consumption, the degradation of natural habitats, and the release of carbon dioxide. The development of large-scale infrastructure projects, such as those involving transportation, real estate, or tourism, may lead to a rise in the amount of energy used during both the building phase and the operation phase of the project.

Authors' Contribution

Adiba Amjad: Initiated the core idea of performed data analysis and drafting

Farzana Munir: Reviewed and revised overall quality and writeup of the manuscript

Ismat Nasim: Provided guidelines for empirical analysis

Furrukh Bashir: Provided guidance for data analysis, reviewed, supervised overall study

Conflict of Interests/Disclosures

The authors declared no potential conflicts of interest w.r.t the research, authorship and/or publication of this article.

References

- Acheampong, A. O. (2018). Economic growth, CO₂ emissions and energy consumption: what causes what and where? *Energy Economics*, 74(8), 677-692. doi:<https://doi.org/10.1016/j.eneco.2018.07.022>
- Agbanike, T. F., Nwani, C., Uwazie, U. I., Anochiwa, L. I., Onoja, T.-G. C., & Ogbonnaya, I. O. (2019). Oil price, energy consumption and carbon dioxide (CO₂) emissions: insight into sustainability challenges in Venezuela. *Latin American Economic Review*, 28(1), 1-26. doi:<https://doi.org/10.1186/s40503-019-0070-8>
- Akorli, C. D., & Adom, P. K. (2023). The role of corruption control and regulatory quality in energy efficiency transition tendencies in Africa. *Iscience*, 26(3). doi:<https://doi.org/10.1016/j.isci>
- Akram, S., Sultana, N., Sultana, T., Majeed, M., & Saeed, R. (2021). Country governance, tourism and environment quality: An emerging economy perspective. *Management Science Letters*, 11(6), 1737-1746. doi:<https://doi.org/10.5267/j.msl.2021.2.009>
- Al-Mulali, U., Ozturk, I., & Lean, H. H. (2015). The influence of economic growth, urbanization, trade openness, financial development, and renewable energy on pollution in Europe. *Natural Hazards*, 79(6), 621-644. doi:<https://doi.org/10.1007/s11069-015-1865-9>
- Asongu, S., El Montasser, G., & Toumi, H. (2016). Testing the relationships between energy consumption, CO₂ emissions, and economic growth in 24 African countries: a panel ARDL approach. *Environmental Science and Pollution Research*, 23(12), 6563-6573. doi:<https://doi.org/10.1007/s11356-015-5883-7>
- Ayad, H., Sari-Hassoun, S. E., Usman, M., & Ahmad, P. (2023). The impact of economic uncertainty, economic growth and energy consumption on environmental degradation in MENA countries: Fresh insights from multiple thresholds NARDL approach. *Environmental Science and Pollution Research*, 30(1), 1806-1824. doi:<https://doi.org/10.1007/s11356-022-22256-w>
- Azam, M., Jahromy, S. S., Raza, W., Raza, N., Lee, S. S., Kim, K.-H., & Winter, F. (2020). Status, characterization, and potential utilization of municipal solid waste as renewable energy source: Lahore case study in Pakistan. *Environment international*, 134(1), 105291. doi:<https://doi.org/10.1016/j.envint.2019.105291>
- Azam, W., Khan, I., & Ali, S. A. (2023). Alternative energy and natural resources in determining environmental sustainability: a look at the role of government final consumption expenditures in France. *Environmental Science and Pollution Research*, 30(1), 1949-1965. doi:<https://doi.org/10.1007/s11356-022-22334-z>
- Batliwala, S., & Reddy, A. K. (1994). Energy consumption and population. *Population: the complex reality*.
- Ewing, B. T., Sari, R., & Soytas, U. (2007). Disaggregate energy consumption and industrial output in the United States. *Energy Policy*, 35(2), 1274-1281. doi:<https://doi.org/10.1016/j.enpol.2006.03.012>
- Faqeer, M., Khan, A., Naveed, R., & Rehmat, K. (2021). Influence of tourism, governance, and foreign direct investment on energy consumption and CO₂ emissions: a panel analysis of Muslim countries. *Environmental Science and Pollution Research International*, 28(1), 416-431. doi:<https://doi.org/10.1007/s11356-020-10502-y>
- Farhani, S., Chaibi, A., & Rault, C. (2014). CO₂ emissions, output, energy consumption, and trade in Tunisia. *Economic Modelling*, 38(2), 426-434. doi:<https://doi.org/10.1016/j.econmod.2014.01.025>
- Friedman, B. A., & Gürce, M. Y. (2020). *Relationships among national tourist destination arrivals, effective governance, environmental performance, and human development*. Paper presented at the Strategic Innovative Marketing and Tourism: 8th ICSIMAT, Northern Aegean, Greece, 2019.
- Gamsakhurdia, T., & Fetelava, S. (2023). FINANCING OF THE SUSTAINABLE TOURISM INDUSTRY IN GEORGIA. *Deutsche Internationale Zeitschrift für Zeitgenössische Wissenschaft*, 5(2).

- Gokmenoglu, K. K., & Eren, B. M. (2020). The role of international tourism on energy consumption: empirical evidence from Turkey. *Current Issues in Tourism*, 23(9), 1059-1065. doi:<https://doi.org/10.1080/13683500.2019.1574723>
- Guan, C., & Qamruzzaman, M. (2022). A symmetric and asymmetric nexus between environmental sustainability and tourism development in BRIC nations: What is the role of good governance and globalization? *Frontiers in Environmental Science*, 10(9), 973420. doi:<https://doi.org/10.3389/fenvs.2022.973420>
- Handayani, B. D., Yanto, H., Pujiati, A., Ridzuan, A. R., Keshminder, J., & Shaari, M. S. (2022). The implication of energy consumption, corruption, and foreign investment for sustainability of income distribution in Indonesia. *Sustainability*, 14(23), 15915. doi:<https://doi.org/10.3390/su142315915>
- Haseeb, M., Hassan, S., Azam, M., & Suryanto, T. (2018). The dynamics of governance, tourism and environmental degradation: the world evidence. *International Journal of Global Environmental Issues*, 17(4), 340-363. doi:<https://doi.org/10.1504/IJGENVI.2018.095155>
- Huang, Y., Ahmad, M., & Ali, S. (2022). The impact of trade, environmental degradation and governance on renewable energy consumption: Evidence from selected ASEAN countries. *Renewable Energy*, 197(9), 1144-1150. doi:<https://doi.org/10.1016/j.renene.2022.07.042>
- Islam, Y., Mindia, P. M., Farzana, N., & Qamruzzaman, M. (2023). Nexus between environmental sustainability, good governance, financial inclusion, and tourism development in Bangladesh: Evidence from symmetric and asymmetric investigation. *Frontiers in Environmental Science*, 10(2), 1056268. doi:<https://doi.org/10.3389/fenvs.2022.1056268>
- Iwaro, J., & Mwashia, A. (2010). A review of building energy regulation and policy for energy conservation in developing countries. *Energy Policy*, 38(12), 7744-7755. doi:<https://doi.org/10.1016/j.enpol.2010.08.027>
- Katircioglu, S., Katircioğlu, S., & Altınay, M. (2018). Interactions between tourism and financial sector development: evidence from Turkey. *The Service Industries Journal*, 38(9-10), 519-542. doi:<https://doi.org/10.1080/02642069.2017.1406479>
- Kelly, J., & Williams, P. W. (2007). Modelling tourism destination energy consumption and greenhouse gas emissions: Whistler, British Columbia, Canada. *Journal of Sustainable Tourism*, 15(1), 67-90. doi:<https://doi.org/10.2167/jost609.0>
- Kerner, P., Kalthaus, M., & Wendler, T. (2023). Economic growth and the use of natural resources: assessing the moderating role of institutions. *Energy Economics*, 126, 106942. doi:<https://doi.org/10.1016/j.eneco.2023.106942>
- Khan, I., Hou, F., & Le, H. P. (2021). The impact of natural resources, energy consumption, and population growth on environmental quality: Fresh evidence from the United States of America. *Science of the Total Environment*, 754(2), 142222. doi:<https://doi.org/10.1016/j.scitotenv.2020.142222>
- Khan, S. A. R., Yu, Z., Sharif, A., & Golpîra, H. (2020). Determinants of economic growth and environmental sustainability in South Asian Association for Regional Cooperation: evidence from panel ARDL. *Environmental Science and Pollution Research*, 27(8), 45675-45687. doi:<https://doi.org/10.1007/s11356-020-10410-1>
- Khanal, A., Rahman, M. M., Khanam, R., & Velayutham, E. (2021). Are tourism and energy consumption linked? Evidence from Australia. *Sustainability*, 13(19), 10800. doi:<https://doi.org/10.3390/su131910800>
- Khanna, R., & Sharma, C. (2023). Does financial development raise tourism demand? A cross-country panel evidence. *Journal of Hospitality & Tourism Research*, 47(6), 1040-1070. doi:<https://doi.org/10.1177/10963480211060789>
- Matsumura, T., & Yamagishi, A. (2017). Long-run welfare effect of energy conservation regulation. *Economics Letters*, 154(5), 64-68. doi:<https://doi.org/10.1016/j.econlet.2017.02.030>

- Mavragani, A., Nikolaou, I. E., & Tsagarakis, K. P. (2016). Open economy, institutional quality, and environmental performance: A macroeconomic approach. *Sustainability*, 8(7), 601. doi:<https://doi.org/10.3390/su8070601>
- Muhammad, F., Khan, A., Razzaq, N., & Karim, R. (2021). Influence of tourism, governance, and foreign direct investment on energy consumption and CO₂ emissions: a panel analysis of Muslim countries. *Environmental Science and Pollution Research*, 28(8), 416-431. doi:<https://doi.org/10.1007/s11356-020-10502-y>
- Nasim, I., Boukhris, M., Kayani, U. N., Bashir, F., & Haider, S. A. (2023). Exploring the Links between Renewable Energy, FDI, Environmental Degradation, and International Trade in Selected Developing Countries.
- Nepal, S. K. (2008). Tourism-induced rural energy consumption in the Annapurna region of Nepal. *Tourism Management*, 29(1), 89-100. doi:<https://doi.org/10.1016/j.tourman.2007.03.024>
- Nguyen, B. (2022). Does local environmental governance improve tourism companies' performance? Evidence from Vietnam. *Journal of Travel Research*, 61(4), 747-761. doi:<https://doi.org/10.1177/00472875211002653>
- Noreen, S., Nasim, I., Bashir, F., & Salahuddin, T. (2023). Tourism, Globalization and Environmental Degradation in Top visited countries. *Review of Education, Administration & Law*, 6(2), 253-260. doi:<https://doi.org/10.47067/real.v6i2.328>
- Ozcan, B., Ulucak, R., & Dogan, E. (2019). Analyzing long lasting effects of environmental policies: evidence from low, middle and high income economies. *Sustainable Cities and Society*, 44, 130-143. doi:<https://doi.org/10.1016/j.scs.2018.09.025>
- Pata, U. K., & Balsalobre-Lorente, D. (2022). Exploring the impact of tourism and energy consumption on the load capacity factor in Turkey: a novel dynamic ARDL approach. *Environmental Science and Pollution Research*, 29(9), 13491-13503. doi:<https://doi.org/10.1007/s11356-021-16675-4>
- Pesaran, M. H., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of econometrics*, 142(1), 50-93. doi:<https://doi.org/10.1016/j.jeconom.2007.05.010>
- Rehman, E., & Rehman, S. (2022). Modeling the nexus between carbon emissions, urbanization, population growth, energy consumption, and economic development in Asia: Evidence from grey relational analysis. *Energy Reports*, 8(11), 5430-5442. doi:<https://doi.org/10.1016/j.egyr.2022.03.179>
- Saidi, K., & Hammami, S. (2015). The impact of CO₂ emissions and economic growth on energy consumption in 58 countries. *Energy Reports*, 1(11), 62-70. doi:<https://doi.org/10.1016/j.egyr.2015.01.003>
- Sari, R., Ewing, B. T., & Soytas, U. (2008). The relationship between disaggregate energy consumption and industrial production in the United States: an ARDL approach. *Energy Economics*, 30(5), 2302-2313. doi:<https://doi.org/10.1016/j.eneco.2007.10.002>
- Sekrafi, H., & Sghaier, A. (2018). Examining the relationship between corruption, economic growth, environmental degradation, and energy consumption: a panel analysis in MENA region. *Journal of the Knowledge Economy*, 9(5), 963-979. doi:<https://doi.org/10.1007/s13132-016-0384-6>
- Sheinbaum-Pardo, C., Mora-Pérez, S., & Robles-Morales, G. (2012). Decomposition of energy consumption and CO₂ emissions in Mexican manufacturing industries: Trends between 1990 and 2008. *Energy for Sustainable Development*, 16(1), 57-67. doi:<https://doi.org/10.1016/j.esd.2011.08.003>
- Sultana, N., Rahman, M. M., Khanam, R., & Kabir, Z. (2022). Environmental quality and its nexus with informal economy, corruption control, energy use, and socioeconomic aspects: the perspective of emerging economies. *Heliyon*, 8(6). doi:<https://doi.org/10.1016/j.heliyon.2022.e09569>
- Tang, C. F., & Abosedra, S. (2014). Small sample evidence on the tourism-led growth hypothesis in Lebanon. *Current Issues in Tourism*, 17(3), 234-246. doi:<https://doi.org/10.1080/13683500.2012.732044>
- Tinta, A. A. (2022). Financial development, ecological transition, and economic growth in Sub-Saharan African countries: the performing role of the quality of institutions and human

- capital. *Environmental Science and Pollution Research*, 29(25), 37617-37632. doi:<https://doi.org/10.1007/s11356-021-18104-y>
- Voumik, L. C., Akter, S., Ridwan, M., Ridzuan, A. R., Pujiati, A., Handayani, B. D., . . . Razak, M. I. M. (2023). Exploring the factors behind renewable energy consumption in Indonesia: Analyzing the impact of corruption and innovation using ARDL model. *International Journal of Energy Economics and Policy*, 13(5), 115-125. doi:<https://doi.org/10.32479/ijeep.14530>
- Wang, Z., Wei, L., Zhang, X., & Qi, G. (2023). Impact of demographic age structure on energy consumption structure: Evidence from population aging in mainland China. *Energy*, 273(6), 127226. doi:<https://doi.org/10.1016/j.energy.2023.127226>
- Wu, H. (2023). Evaluating the role of renewable energy investment resources and green finance on the economic performance: Evidence from OECD economies. *Resources Policy*, 80(1), 103149. doi:<https://doi.org/10.1016/j.resourpol.2022.103149>
- Xu, D., & Hussain, J. (2023). Globalization, institutions, and environmental quality in Middle East and North African countries. *Environmental Science and Pollution Research*, 30(26), 68951-68968. doi:<https://doi.org/10.1007/s11356-023-27348-9>
- Yahya, F., & Rafiq, M. (2020). Brownfield, greenfield, and renewable energy consumption: Moderating role of effective governance. *Energy & environment*, 31(3), 405-423. doi:<https://doi.org/10.1177/0958305X19872936>
- Yudina, T. A., Vandina, O. G., Bogoviz, A. V., & Lobova, S. V. (2017). Effectiveness of the methods of internal financial control as a guarantee of sustainability of tourism companies' development. *Journal of Environmental Management & Tourism*, 8(4 (20)), 861-866. doi:[https://doi.org/10.14505/jemt.v8.4\(20\).15](https://doi.org/10.14505/jemt.v8.4(20).15)
- Zhang, M., Chen, Y., Lyulyov, O., & Pimonenko, T. (2022). Interactions between Economic Growth and Environmental Degradation toward Sustainable Development. *Systems*, 11(1), 13. doi: <https://doi.org/10.3390/systems11010013>
- Ziramba, E. (2009). Disaggregate energy consumption and industrial production in South Africa. *Energy Policy*, 37(6), 2214-2220. doi:<https://doi.org/10.1016/j.enpol.2009.01.048>