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# Evaluating the environmental efficiency of the Organization of Islamic Cooperation in achieving climate change goals with an emphasis on Saudi Arabia

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## Abstract

Evaluating environmental efficiency is crucial for comprehending how governments meet the climate change objectives outlined in SDG 13. This analysis assesses the ecological efficiency of OIC (Organization of Islamic Cooperation) nations, with a particular emphasis on Saudi Arabia. The study examines the connection between different environmental input and output variables to assess the efficiency with which OIC nations use resources to pursue climate objectives. This study employs Data Envelopment Analysis (DEA) to investigate essential input variables, including land area, agricultural area, agricultural product export value, consumer price index, total population, access to electricity, labor force, human development index (HDI), and final consumption expenditure. The output variables encompass $CO_2$ emissions, protected areas, forest area, agricultural product import value, crude birth and death rates, population density, total fertility rate, employment in industry, GDP, and water stress levels. The results demonstrate that although certain OIC nations attain environmental efficiency, others face challenges reconciling economic development with their climate obligations. Saudi Arabia has achieved notable progress in broadening its energy portfolio and allocating resources towards renewable technologies. Nonetheless, the significant energy consumption and ongoing economic dependence on fossil fuels pose considerable obstacles. This study offers valuable insights that can assist OIC nations in improving their ecological strategies and contribute significantly to global climate change objectives.

**Keywords:** Climate change, Data envelopment analysis, Environmental efficiency, OIC countries, SDG 13.

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## 1. Introduction

The OIC has 57 members from Asia, the Middle East, and Africa. With its minerals, gas, and oil, these countries account for a significant portion of the world's population and support the global economy. Key environmental issues include resource limitations, ecological degradation, and climate change. These problems have become more pressing given the 2015 UN Sustainable Development Goals (SDGs). One of the 17 Sustainable Development Goals, SDG13, demands a quick response to climate change [1]. International cooperation is essential to lower greenhouse gas (GHG) emissions, adapt to climate change, and include climate action in national policies and programs. OIC nations are already experiencing the consequences of climate change. Extreme events, including heat waves, floods, and droughts, disproportionately affect underprivileged areas among OIC members. Many of these countries lack the money and knowledge to start thorough initiatives for mitigating and adapting [2, 3]. Nevertheless, several OIC countries have made notable strides in environmental governance, renewable energy, and climate policy. Whereas Malaysia has increased palm oil production, Morocco leads in solar energy [4, 5]. Nevertheless, overreliance on fossil fuels, inadequate industrial practices, and limited access to green technology have led many OIC nations to struggle to fulfill SDG 13 [6-10]. Environmental efficiency analysis finds use for data envelopment analysis (DEA). DEA uses a non-parametric method to assess national resource consumption (inputs) and outputs. DEA is a flexible technique for evaluating national environmental sustainability since it can account for the complexity and variety of environmental challenges and does not depend on a functional link between inputs and outputs [11-17]. The DEA can assess OIC countries' energy, water, and financial use to reduce carbon emissions, enhance air quality, or enable renewable energy potential. DEA contrasts these countries with ideal practices to identify which countries are doing well and which need greater environmental assistance. Climate change challenges ecosystems, economics, and humanity in the twenty-first century. Adopted by the UN, SDG 13 calls for immediate action on climate change by reducing greenhouse gas emissions and raising adaptation capacity [6-10]. Achieving these goals depends on increasing environmental efficiency and maximizing economic outputs while lowering environmental damage. A strong, non-parametric approach for evaluating environmental efficiency across many inputs (energy, capital, and labor) and outputs (positive and negative) is data envelopment analysis (DEA). Recent DEA improvements [11-17] have enhanced its capacity to examine trade-offs between environmental sustainability and economic growth. OIC members have to preserve the environment and show notable economic development simultaneously. Many countries depend on fossil fuels; hence, a low-carbon economy is essential. Saudi Arabia, a major regional economy and energy supplier, is crucial to this transformation. Saudi Vision 2030 [18], the ambitious reform project of the Kingdom, aims for environmental improvement and economic diversification. According to Alnaser and Alnaser [19], rapidly expanding solar energy and other renewable technologies in the Gulf Cooperation Council (GCC) countries are lowering carbon emissions and raising environmental efficiency. Although OIC countries have many challenges, DEA is an excellent tool for evaluating environmental efficiency. Data accessibility raises the first question. Many OIC countries lack adequate environmental data for carbon emissions, energy consumption, and renewable energy. Data shortages might compromise DEA operations [11, 17]. Different OIC members—from agricultural states to oil-exporting nations—make uniform efficiency modeling challenging. Many studies utilizing DEA have evaluated OIC nations' environmental performance.

Moreover, Alam [20] compared Saudi Arabia's energy efficiency in 2024 with other Middle Eastern countries using Data Envelopment Analysis (DEA). Factors studied included energy consumption, labor force, GDP, and $CO_2$ emissions. According to the poll, Saudi Arabia, the UAE, Bahrain, Cyprus, Qatar, and Turkey ranked first in energy efficiency. The declining efficiency in Yemen, Lebanon, and Syria highlights the necessity of governmental actions to enhance sustainable practices. Notably, data envelopment analysis (DEA) is used to assess the environmental efficiency of OIC countries in relation to Sustainable Development Goal 13.

The study assesses the resource management practices of these nations, utilizing economic, energy, and environmental data to mitigate climate change concerns. The results seek to provide stakeholders and legislators with benchmarks and recommendations for resilient and sustainable growth.

Furthermore, the effectiveness of Saudi Arabia's health regions is evaluated using Data Envelopment Analysis (DEA) in the research by Abdelfattah and Alanazi [21]. The study identifies areas where resource allocation needs improvement by pinpointing regional differences in performance. The results provide insightful information for policymakers seeking to enhance healthcare effectiveness.

This study aims to assess the environmental efficiency of countries within the Organization of Islamic Cooperation (OIC) and their progress toward Sustainable Development Goal 13 (SDG 13) concerning climate change. This study's specific objective is to give special attention to Saudi Arabia, examining its advancements, obstacles, and the implications of its policies for achieving SDG 13.

The structure of this study's subsequent sections is as follows: Section 2 outlines the methodology employed, including the selection of variables, sources of data, and the specifications of the model. Section 3 delves into efficiency scores, conducts a comparative analysis of Saudi Arabia's performance, and examines the key factors influencing these outcomes. In conclusion, the final section encapsulates the findings, recommends policy measures, and outlines potential avenues for future study.

## 2. Methods and Materials

Data Envelopment Analysis (DEA) examines various inputs and outputs to assess the efficiency of decision-making units (DMUs), which can include businesses, governments, or other organizations. The aim is to evaluate the effectiveness of the Organization of Islamic Cooperation (OIC) member states' efforts to address climate change and achieve the Sustainable Development Goal (SDG) 13 objectives. The objective is to assess the productivity with which OIC nations reduce their carbon footprint and enhance their capacity to mitigate the effects of climate change by tracking the economic, environmental, and social resources they allocate. Goal 13 of the Sustainable Development Agenda is to adapt to the impacts of climate change. DEA provides a thorough method for evaluating the success of these initiatives.

*2.1. Data*

The data used in this research was sourced from the OIC Statistics Database (OICStat) for 2022. This collection includes all statistical indicators regarding the social, economic, and development facets of OIC member nations. Statisticians from the Organization of Islamic Cooperation's (OIC) official statistical organization, SESRIC, compiled and released the statistics [2]. The data description for the test is elucidated in Table 1, which provides further clarity regarding the inputs and outputs.

*2.2. Data Description*

**Table 1.**
Description of data.

| Data types | Description |
|---|---|
| Input variables | Land Area (Thousand km2) |
| | Agricultural Area (Thousand Hectares) |
| | Agricultural Products, Export Value (Million USD) |
| | Consumer Price Index, Annual Average |
| | Population, Total (Millions) |
| | Proportion of Population with Access to Electricity (%) |
| | Labor Force, Total (Millions) |
| | Human Development Index |
| | Final Consumption Expenditure, Current Prices (Billion USD) |
| Output variables | CO2 Emissions, Territorial, Total (Million Tons), |
| | Protected Areas, Terrestrial, % of Total Land Area |
| | Forest Area as a Proportion of Total Land Area (%) |
| | Agricultural Products, Import Value (Million USD) |
| | Crude Birth Rate (Per 1,000 Population) |
| | Crude Death Rate (Per 1,000 Population) |
| | Population Density per km2 (Persons) |
| | Total Fertility Rate (Births per Woman) |
| | Employment in Industry, % of Total Employment |
| | GDP, Current Prices (Billion USD) |
| | Level of Water Stress: Freshwater Withdrawal as a Proportion of Available Freshwater Resources (%) |

*2.3. Proposed Model*

According to the findings of this research, the DEA model is used to evaluate the effectiveness of every decision-making unit (DMU). Utilizing the DEA identified as DMUi, where ‘i’ varies from 1 to 57, the evaluation of DMUs was considered. After solving the following suggested model, values were obtained for the input variables, $x_{ji}$ (j = 1, 2, ...,9) and output variables $y_{ki}$(k = 1, 2, ...,11). These values were used to determine the output of the model. This work offers a standard formulation based on the model developed by Charnes et al. [12]. The efficiency of the decision-making unit r ($\theta_r$) may be calculated by solving the suggested DEA model (1)-(5), which is expressed as follows:

$$max\ \theta_r = \sum_{k=1}^{11} \omega_k y_{kr} \tag{1}$$

st,

$$\sum_{j=1}^{9} \vartheta_j x_{jr} = 1 \tag{2}$$

$$\sum_{k=1}^{11} \omega_k y_{ki} - \sum_{j=1}^{9} \vartheta_j x_{ji} \leq 0 \tag{3}$$

$$\forall\ i, i = 1,2, \dots\dots, 57 \tag{4}$$

$$\vartheta_k, \omega_j \geq 0 \qquad \forall\ j, k \tag{5}$$

Where;
$x_{ji}$ = quantity of input j consumed by DMUi
$y_{ki}$ = quantity of output ‘k’ formed by DMUi
$\vartheta_j$ = weight for input j
$\omega_k$ = weight for output k

From the above model, if $\theta_r$ equals 1, then $DMU_{\mathrm{r}}$ is efficient compared to other units; otherwise, the converse is true. This study uses DEA Software (https://onlineoutput.com/dea-software/) to calculate the efficiency scores of OIC nations using 'Basic Radial Models' output-oriented with Constant Returns to Scale (CRS).

*2.4. DEA Framework for Evaluating Environmental Efficiency in OIC Countries*

The following is the framework for evaluating environmental efficiency in OIC Countries using DEA.

I. Designated DMUs—OIC nations selected as decision-making units (DMUs).

II. Identified Inputs and Outputs—Inputs included resources for climate action, while outputs represented environmental accomplishments.

III. Selected DEA Model—An output-oriented DEA model optimizes climatic outcomes based on specified inputs. This method determines the most efficient routes for attaining climate-related objectives.

IV. Collected Data—The data is obtained from the official OIC website. The dataset records longitudinal trends to evaluate temporal changes in environmental efficiency.

V. Computed Efficiency ratings—DEA allocates efficiency ratings to each DMU, where a score of 1 signifies ideal performance and values below 1 indicate inefficiencies. The findings provide a comparative Framework for evaluating environmental productivity across OIC nations.

VI. Benchmarking and Enhanced Policies—We evaluate inefficient nations against the most efficient Decision-Making Units (DMUs), identifying exemplary approaches to policy enhancement. Our recommendations emphasize optimizing resource usage, improving climate measures, and accelerating progress toward the goals of SDG 13.

## 3. Results and Discussion

Figures 1 and 2 illustrate the efficiency scores of different countries, displaying values ranging from 0 to 1. A score of 1.000 signifies complete efficiency, while lower scores indicate varying levels of inefficiency. We show the effectiveness of OIC nations in meeting climate change objectives (SDG 13), with a specific focus on Saudi Arabia.

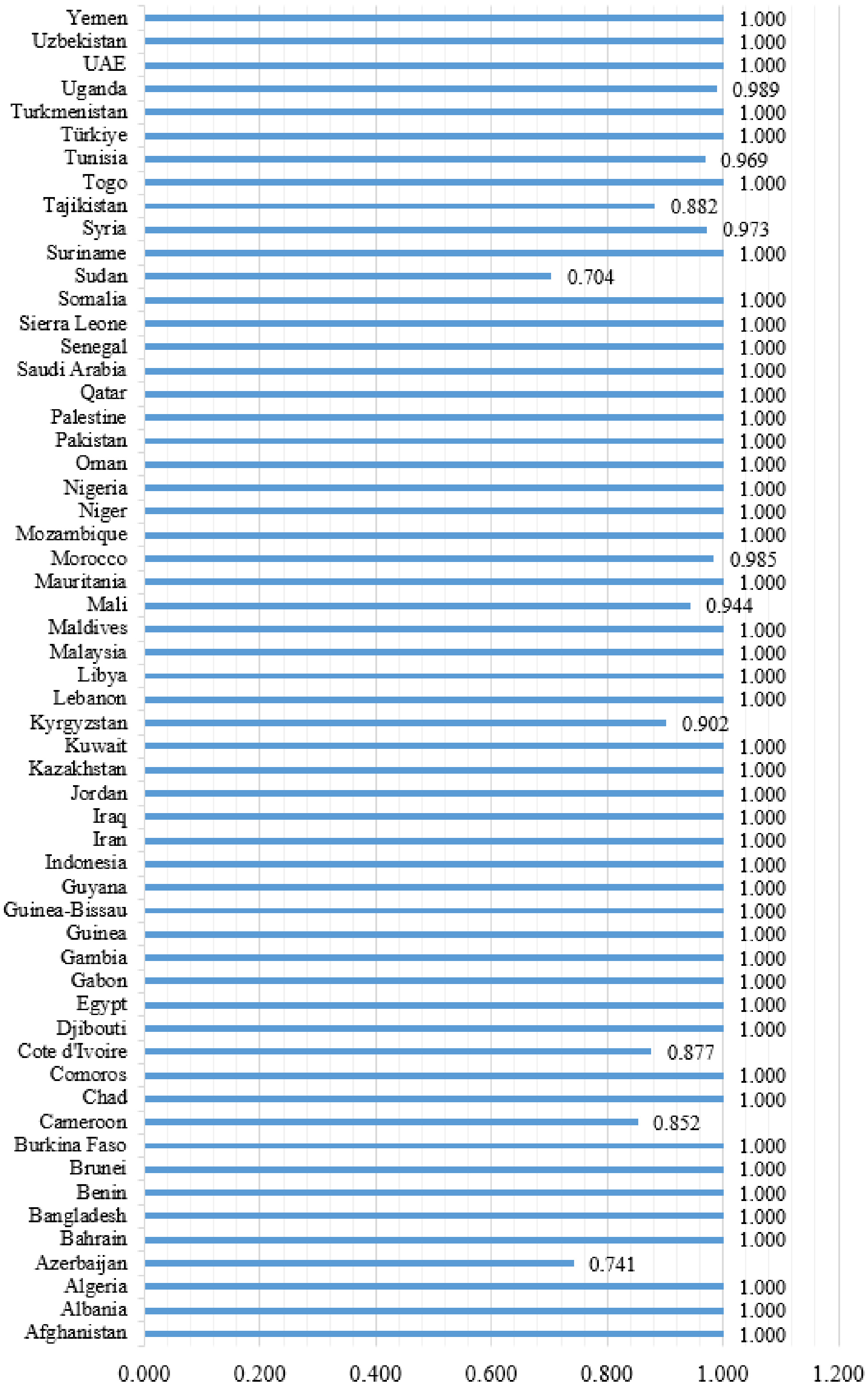


**Figure 1.**
Efficiency of OIC.

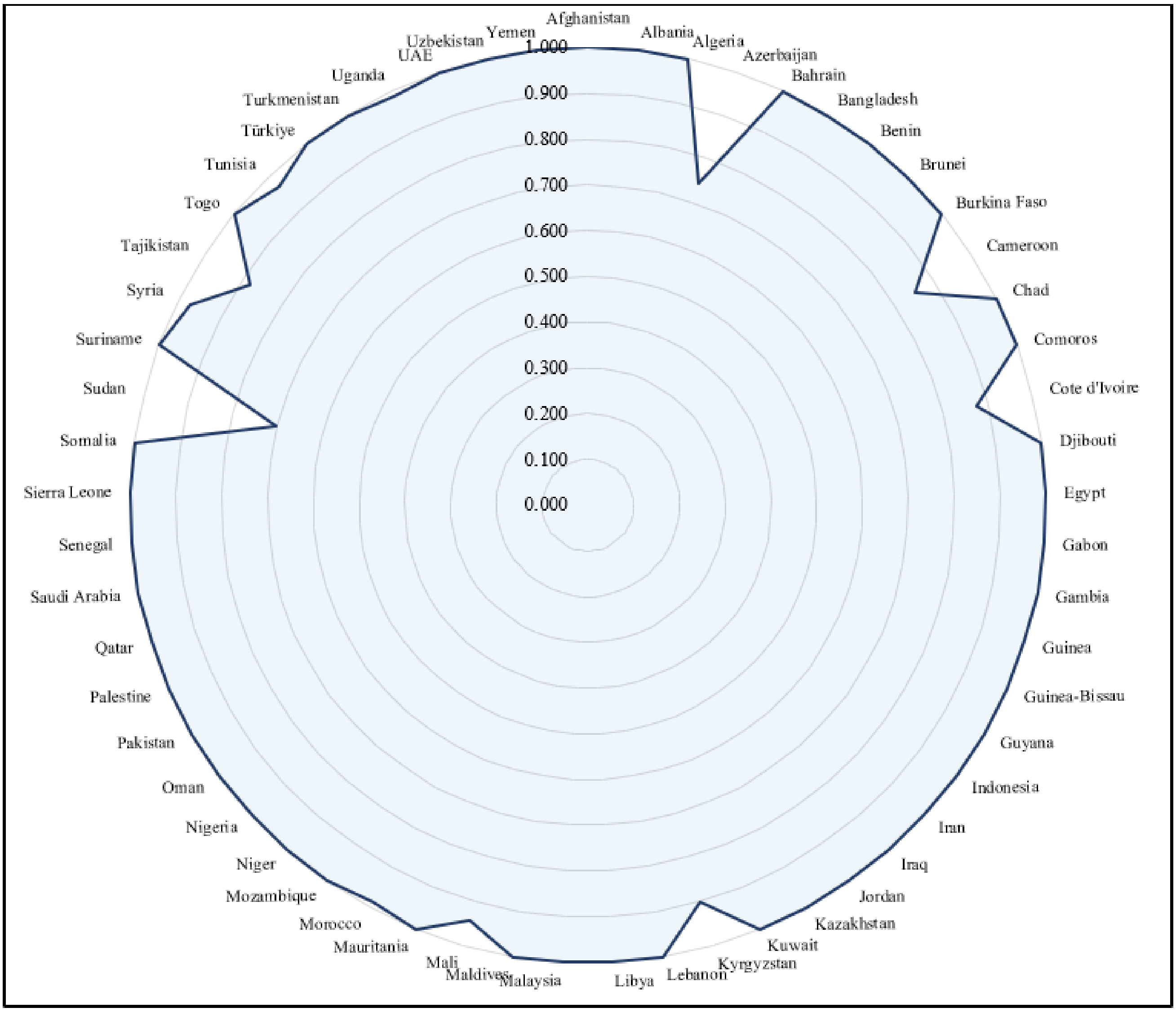


**Figure 2.**
Efficiency of OIC presenting via radar chart.

This efficiency score may be based on Data Envelopment Analysis (DEA), which compares countries or organizations using several input-output metrics. Country scores of 1 indicate that they meet their climate goals more effectively than others, while scores below 1 indicate a need for improvement.

Afghanistan, Albania, Bahrain, Bangladesh, Benin, Brunei, and others score 1 for eco-efficiency, as these countries are fulfilling their climate change and sustainability objectives. In contrast, inefficient countries, including Azerbaijan (0.741), Cameroon (0.852), Côte d'Ivoire (0.877), Sudan (0.703), and Tajikistan (0.882), exhibit environmental disparities. To address this, these countries may optimize resource use and policy to meet their climate goals while pursuing Sustainable Development Goal 13.

Countries with efficiency scores below one can improve through various strategic measures. A primary strategy involves minimizing input waste by identifying and eliminating unnecessary expenditures, including excessive labor costs, inefficient capital allocation, and energy wastage. Streamlining resource utilization enables countries to improve cost-effectiveness and approach full efficiency. Furthermore, enhancing output with existing inputs is crucial and achievable through the implementation of best practices observed in highly efficient nations. Such practices may involve improving operational management, enhancing workforce productivity, or optimizing supply chain processes.

Additionally, policy and structural reforms are essential in mitigating inefficiencies. Countries with lower efficiency scores may examine the governance models, regulatory frameworks, and economic policies of high-performing nations to implement targeted reforms. Enhancing institutions, optimizing business environments, and minimizing bureaucratic inefficiencies can substantially improve efficiency. Technology and innovation are crucial in enhancing efficiency, particularly in key sectors such as agriculture, industry, and services. Implementing contemporary technologies, automation, and digital transformation can improve productivity and mitigate operational bottlenecks.

Benchmarking against efficient peers is another effective strategy. Countries such as Sudan (0.704) and Azerbaijan (0.741) may examine the practices of fully efficient nations to identify performance gaps and formulate targeted improvement strategies. Analyzing the experiences of high-performing countries can inform the establishment of realistic efficiency targets and the implementation of evidence-based strategies for enhancement.

Furthermore, this study ranks Saudi Arabia first with an efficiency score of 1. Green initiatives, such as NEOM City, contribute to enhancing the country's environmental performance. Notably, Saudi Arabia produces a significant amount of oil. However, the government occasionally struggles to diversify its energy sources and reduce its emissions.

Data Envelopment Analysis (DEA) calculates entity efficiency by linking energy use, economic activity, carbon emissions, and climate efforts. A score of 1 indicates that the country is on the "efficient frontier," meaning it performs well given its resources and activities.

SDG 13 reveals that, although many OIC states manage climate change, their efficiency varies. Countries with poor efficiency scores may require clean technologies, energy efficiency improvements, and environmental protection laws to enhance environmental outcomes. Despite the progress, certain countries may still need to improve to meet global climate change objectives. Saudi Arabia has performed well but must reduce emissions and diversify its energy mix.

The tables display input and output slacks for various countries, which are crucial in Data Envelopment Analysis (DEA) and related efficiency measurement methods. The rationale for their inclusion is:

- Identifying inefficiencies involves recognizing slacks, which indicate excessive input utilization (Table 2) or unrealized potential output (Table 3). Elevated values signify inefficiencies in resource utilization or output production.
- Performance Improvement as the slack values indicate potential areas for countries to optimize inputs or enhance outputs to achieve greater efficiency.
- Comparative analysis involves analyzing slack values across various countries, enabling policymakers and analysts to distinguish between efficient nations and those requiring operational adjustments.

Table 2 shows input slacks for different nations, with rows representing countries and columns indicating inputs 1–9. Each input's untapped or underutilized resources in the nation are shown in Table 2. Slack values of 0 indicate complete input utilization, whereas higher levels imply unused capacity. Afghanistan, Albania, and Bangladesh use all inputs, indicating complete resource use. However, Azerbaijan and Sudan have considerable input slack, with Azerbaijan having unused resources in Inputs 2, 3, 4, 5, 6, and 7. Mali has slack in Inputs 1, 3, and 5.

Table 3 illustrates how each country's production deviates from the potential or target value across various output categories (Output1 to Output11). The discrepancy between the expected output and actual production is referred to as "output slack" in this table. The absence of slack in numerous nations may indicate a capability, resources, or production deficiency necessary to meet projected levels. Afghanistan, Albania, and Bangladesh exhibit no production across all categories, suggesting a lack of intended output or significant activity within these industries. Azerbaijan, Cameroon, and Tunisia exhibit non-zero values in specific outputs, suggesting they may achieve their output targets. The observed slack in other categories suggests untapped potential or unreported activity. This production slack may indicate inefficiencies or areas where these nations should enhance their sectors to increase output. This table illustrates production slack, which is defined as the disparity between current performance and potential capacity. It highlights areas where nations may require enhancements, including resource allocation, investment, or sector bottlenecks. The Saudi economy exhibits significant concentration in a limited number of sectors. Consequently, this does not necessarily indicate inefficiency. Saudi Arabia should reduce production slack through economic diversification, improved data reporting, and the promotion of non-oil sectors.

**Table 2.**
Input slacks are required for the following countries.

| | **Input1** | **Input2** | **Input3** | **Input4** | **Input5** | **Input6** | **Input7** | **Input8** | **Input9** |
|---|---|---|---|---|---|---|---|---|---|
| Azerbaijan | 0 | 1180.54 | 225.55 | 164.71 | 1.51 | 26.08 | 2.26 | 0 | 0 |
| Cameroon | 288.75 | 0 | 0 | 131.63 | 2.67 | 14.99 | 2.36 | 0 | 0.24 |
| Cote d'Ivoire | 0 | 10066.46 | 5911.69 | 0 | 2.43 | 24.07 | 0 | 0 | 2.83 |
| Kyrgyzstan | 50.24 | 4590 | 44.61 | 0 | 0 | 15.59 | 0.79 | 0 | 0 |
| Mali | 301.87 | 0 | 420.92 | 37.26 | 1.19 | 19.82 | 1.41 | 0 | 0 |
| Morocco | 450.85 | 25183.95 | 0 | 0 | 12.62 | 14.85 | 4.25 | 0.05 | 0 |
| Sudan | 1109.31 | 68209.45 | 1937.11 | 55575.1 | 24.09 | 2.14 | 8.42 | 0 | 0 |
| Syria | 0 | 4052.46 | 0.81 | 0 | 12.75 | 25.24 | 3.21 | 0 | 0 |
| Tajikistan | 0 | 0 | 0 | 1370.15 | 1.76 | 8.52 | 0.36 | 0 | 0 |
| Tunisia | 0 | 6636.52 | 176.64 | 16.48 | 0.8 | 21.67 | 0 | 0 | 0.55 |
| Uganda | 0 | 6032.05 | 0 | 0 | 25.32 | 0 | 9.56 | 0 | 5.97 |

**Table 3.**
Output slacks are required for the following countries.

| | Output1 | Output2 | Output3 | Output4 | Output5 | Output6 | Output7 | Output8 | Output9 | Output10 | Output11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Azerbaijan | 0 | 0.24 | 3.58 | 0 | 13.28 | 0 | 0 | 1.64 | 3.6 | 0 | 119.47 |
| Cameroon | 7.38 | 17.23 | 0 | 0 | 0 | 1.27 | 81.02 | 0.23 | 2.45 | 0 | 2.22 |
| Cote d'Ivoire | 30.45 | 1.07 | 17.61 | 0 | 0 | 0 | 10.82 | 0.33 | 10.57 | 0 | 1.39 |
| Kyrgyzstan | 0 | 8.6 | 29.08 | 0 | 0 | 0.81 | 686.26 | 0.29 | 0 | 4.77 | 0 |
| Mali | 0 | 4.09 | 0 | 674.33 | 0 | 0.43 | 9.77 | 0.07 | 2.04 | 0 | 7.24 |
| Morocco | 46.08 | 6.92 | 3.73 | 0 | 0.48 | 0 | 32.15 | 0 | 0 | 38.91 | 0 |
| Sudan | 0 | 3.05 | 0 | 0 | 0 | 2.43 | 15.78 | 0.42 | 0.18 | 0 | 0 |
| Syria | 0 | 9.8 | 4.54 | 0 | 0.22 | 0 | 529.45 | 0.25 | 0 | 21.48 | 0 |
| Tajikistan | 0 | 0 | 32.72 | 0 | 0 | 3.24 | 275.93 | 0.39 | 0 | 4.28 | 0 |
| Tunisia | 1.11 | 15.09 | 14.28 | 0 | 18.25 | 0 | 185.94 | 2.47 | 0 | 25 | 30.04 |
| Uganda | 17.27 | 9.88 | 15.05 | 903.03 | 0 | 3.69 | 0 | 0.4 | 13.01 | 0 | 3.69 |

## 4. Conclusions

Several of the enumerated nations achieve a score of 1, indicating optimal efficiency. These countries illustrate that varying socio-economic and political conditions can enhance efficiency. Other nations exhibit efficiency scores ranging from 0.7 to 0.99, reflecting governance, infrastructure, economic stability, and social development challenges. Sudan's efficiency score of 0.703 indicates underlying systemic issues contributing to suboptimal performance. While many countries demonstrate efficiency, those with lower scores should examine their inefficiencies. Addressing these challenges could enhance global efficiency. In Saudi Arabia, the efficiency score is 1, indicating optimal performance and efficiency in the examined areas. Vision 2030 aims to diversify the economy, enhance technology, and optimize public sector performance. The substantial infrastructure, governance, and economic development investments may account for the nation's high efficiency ranking. Saudi Arabia's stable political environment, favorable geopolitical conditions, and substantial financial resources contribute to its efficiency. This efficiency necessitates economic diversification, social reforms, and environmental sustainability from the government. In summary, Saudi Arabia's efficiency score positions it as a regional exemplar; however, maintaining and enhancing this status necessitates adaptation to global trends and domestic developments. Countries exhibiting efficiency include Afghanistan, Albania, Algeria, Bahrain, Bangladesh, Benin, Brunei, Burkina Faso, Chad, Comoros, Djibouti, Egypt, Gabon, Gambia, Guinea, Guinea-Bissau, Guyana, Indonesia, Iran, Iraq, Jordan, Kazakhstan, Kuwait, Lebanon, Libya, Malaysia, Maldives, Mauritania, Mozambique, Niger, Nigeria, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Senegal, Sierra Leone, Somalia, Suriname, Türkiye, Turkmenistan, UAE, Uzbekistan, and Yemen.

Countries with moderate efficiency exhibit values ranging from 0.7 to 0.99. This range encompasses the following countries: Azerbaijan (0.7414), Cameroon (0.8522), Cote d'Ivoire (0.8771), Kirghizstan (0.9020), Mali (0.9436), Morocco (0.9852), Syria (0.9726), Tajikistan (0.8825), Tunisia (0.9689), Uganda (0.9890), and Sudan (0.7039). These nations exhibit a level of efficiency that indicates potential for enhancement or optimization.

Preserve and leverage the outstanding achievements of high-efficiency countries (value = 1). These nations can maintain effectiveness, exchange knowledge, and discover innovative approaches for improvement.

Nations with moderate efficiency persist in enhancing aspects that require focus, including implementing best practices from more efficient nations or conducting additional investigations to pinpoint specific challenges. Countries exhibiting low efficiency might require targeted policy adjustments, external financial support, or operational reforms to improve their efficiency.

Saudi Arabia stands out as one of the most efficient nations, boasting an impressive efficiency rating of 1, attributed to its optimal system and process performance. Saudi Arabia's efficiency enables it to channel resources into innovation and sustainability, ensuring the preservation and growth of its prosperity. The country has the potential to enhance its technical infrastructure, prioritize sustainable initiatives, and spearhead regional collaborations to share governance, infrastructure, and commercial best practices. Saudi Arabia's remarkable efficiency bolsters its global influence through contributions to sustainability, technical cooperation, and overall effectiveness. By spearheading digital transformation and sustainability initiatives, particularly in alignment with Vision 2030, Saudi Arabia has the potential to sustain its exceptional performance and continue as a worldwide leader.

### *4.1. Recommendations*

The Organization of Islamic Cooperation (OIC) should promote renewable energy and climate adaptation to assist member nations in shifting to greener economies. Investments in technology and infrastructure will modernize economies and enhance governance, while economic diversification, particularly in resource-dependent countries, will strengthen resilience to global financial instability. The OIC should strengthen governance, transparency, and anti-corruption measures to boost institutional efficiency. Promoting intra-regional trade and supply chain ties will improve economic integration, while the adoption of green technology and climate-resilient infrastructure is essential. Investing in education and human resources will foster a competitive workforce that drives innovation and growth. Humanitarian partnerships should help conflict-affected nations and align aid with sustainable development objectives for long-term stability and growth. OIC member nations can collaborate to enhance efficiency, sustainability, and development by focusing on five critical areas.

As part of Vision 2030, Saudi Arabia should prioritize environmental sustainability and climate change mitigation. By doing so, Saudi Arabia can inspire other countries with its eco-friendly infrastructure, technology, and economic diversification. Implementing renewable energy, reducing carbon emissions, and promoting environmental responsibility will ensure long-term prosperity and balance economic growth with environmental care. Enhancing environmental efficiency will strengthen Saudi Arabia's climate resilience and position it as a regional and global leader in sustainable development.

Future OIC research should address numerous crucial issues. The first stage is creating effective renewable energy transition plans for member states and climate adaptation strategies for each area. Technology and infrastructure investments significantly impact governance and economic competitiveness; therefore, studying them is vital. Increasing economic diversification and reducing natural resource dependence will boost resilience. Improving governance, transparency, and anti-corruption measures is essential to enhance institutional efficiency. Examining the benefits of strengthening intra-OIC trade and supply chain ties, as well as the role of education in fostering a competitive workforce, is equally important. Humanitarian aid must support sustainable development in disaster zones. Saudi Arabia and other OIC governments must examine climate resilience methods and their potential to advance sustainable development and climate action for long-term success.

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