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Technological Advancements and Water Stress Reduction in Saudi Arabia: A Quantitative Analysis

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Abstract

This study examines the impact of digital economy indicators specifically, high-tech exports, ICT goods imports, and internet usage on natural resources, particularly water stress levels, in Saudi Arabia. It evaluates the relationship between digital adoption and water stress, exploring whether increased digital engagement promotes more efficient water use and conservation. Additionally, the study investigates how digital and technological advancements may indirectly contribute to water sustainability by improving public awareness, operational efficiency, and infrastructure development. The findings aim to inform strategies for sustainable water resource management in the context of Saudi Arabia's digital transformation.

Introduction

The digital economy has become a transformative force in the 21st century, reshaping various sectors and driving economic growth globally. This new digital landscape relies on advanced technologies and online connectivity to enhance productivity, improve efficiency, and create job opportunities. Sustainability has also become a central goal within the digital economy, as digital technologies contribute to reducing environmental impact by promoting resource efficiency and offering environmentally friendly solutions. As the global economy rapidly shifts towards digital, many countries, including those in the Arab region, are transitioning from traditional economies to digital ones. This transition is especially urgent in Saudi Arabia, where reducing oil dependency and boosting productivity and competitiveness are key national priorities. Emphasizing sectors that benefit from technological innovation helps enhance economic resilience and creates new job opportunities, particularly for the growing youth population in the labor market.

In the water sector, technologies such as smart meters and blockchain have shown promise in improving water management. Smart meters, powered by Internet of Things (IoT) technology, enable real-time monitoring of water flow, pressure, and temperature, allowing for more efficient use and remote tracking. Blockchain technology enhances transparency and efficiency in water distribution systems by providing real-time information for stakeholders to track infrastructure conditions and billing operations. Together, these technologies enable better water management and more effective conservation strategies.

Saudi Arabia holds a prominent economic position, being the largest economy in the Middle East and one of the top 20 economies globally. As part of Vision 2030, the country aims to strengthen its economy and achieve a top 15 global ranking by creating a favorable investment environment and diversifying its economic base. A major focus of this vision is to increase non-oil exports and reduce reliance on oil. The

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rapid digital transformation in Saudi Arabia plays a crucial role in promoting non-oil sectors and achieving the goals of Vision 2030, particularly by expanding the digital economy's contribution to domestic output.

However, one of the main challenges Saudi Arabia faces is water scarcity. The government has made significant efforts to provide and conserve water resources, with technology playing a key role in these efforts. This paper aims to explore the relationship between selected digital economy factors and water stress levels in Saudi Arabia. The factors were chosen based on data availability and potential for actionable insights. If a solid relationship is identified, it could prompt a broader discussion on balancing the impact of the digital economy with the sustainability of scarce resources.

The research will use the E-Views program to analyze data and examine the findings of similar studies to ensure reliable results. As the digital economy continues to grow, it raises important questions about how it can contribute to the sustainable use of natural resources. Technologies such as the Internet, big data, cloud computing, and artificial intelligence have transformed industries, supply chains, and consumer behavior, creating new opportunities for growth. The growth of the digital economy also calls for careful consideration of its environmental impact, particularly in terms of resource consumption and waste. The relationship between the digital economy and sustainability is complex. While digital technologies promote the efficient use of resources, it is essential to balance innovation with environmental and social considerations to ensure that the needs of future generations are met. By investing in sustainable technologies and ensuring widespread access to digital tools, we can harness the potential of the digital economy to drive sustainable development.

Literature Review

The interaction between digitalization, technological innovation, and green economic development has garnered increasing attention in the context of sustainable water resource management. In a study by Wei Yang, Qiuxia Chen, Qiuqi Guo, and Xiaoting Huang (2022), the authors focused on the green total factor efficiency (GTFE) of industrial water resources in China. They utilized the Super-Slack Based Measure (SBM) model of non-expected output alongside the Stochastic Impacts by Regression on Population, Affluence, and Technology (STIRPAT) model and Generalized Method of Moments (GMM) for dynamic panel data analysis. Their findings revealed that technological innovation did not significantly impact the GTFE of industrial water resources in China. They emphasized the importance of other variables, such as environmental regulation and education level, in influencing water resource efficiency (Yang et al., 2022).

Similarly, Jin, Zhang, Liu, and Zhang (2018) conducted a study using the same methodology to analyze the relationship between technological innovation, environmental regulation, and the GTFE of industrial water resources. Their results corroborated the earlier findings, indicating that while technological innovation played a role in improving water resource efficiency, its direct impact was minimal. The study highlighted the intricate interplay of multiple factors, including industrial development and the degree of openness, in shaping the GTFE (Jin et al., 2018).

Turning to the role of technological innovation in the broader context of the green digital economy, Liu, Yang, Zhang, and Yang (2024) explored how innovation could drive sustainable economic growth while reducing environmental impacts. Their work examined optimization techniques for multi-layer perceptron (MLP) networks and how they relate to green economic development. By comparing various machine learning models, the authors demonstrated that technological innovation, when appropriately optimized, could significantly contribute to sustainable economic strategies, although challenges persist in integrating these innovations into traditional economic structures (Liu et al., 2024).

Aivazidou et al. (2021) shifted the focus towards the integration of digital technologies in urban water management. They argued that sustainable water management practices, particularly in urban areas, are becoming increasingly critical due to rapid urbanization and climate change. The study found that technologies such as the Internet of Things (IoT), big data analytics, and machine learning could enhance water efficiency by improving monitoring, control, and forecasting of water usage. Their research aligned

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with the Sustainable Development Goals (SDGs) by promoting fair water access and responsible resource use through smart technologies (Aivazidou et al., 2021).

In a similar vein, Adedeji, Ponnle, Abu-Mahfouz, and Kurien (2022) explored the potential of Water 4.0 technologies in managing urban water delivery systems. With the increasing complexity of urban water systems due to factors like climate change and population growth, the authors argued that intelligent systems—powered by digital technologies—are crucial for ensuring sustainable water supply and consumption. While past ICT solutions had limitations, the ongoing advancements in technology are expected to provide more robust support for managing the challenges faced by modern water utilities (Adedeji et al., 2022).

The potential of digitalization in advancing sustainable practices, particularly in the water sector, has become a focal point of recent studies. Hernández-Chover et al. (2022) explore how digitalization can foster a circular economy in the urban water sector. They emphasize the transformative impact of increased data generation through digital technologies, such as smart sensors, which improve the efficiency of water cycle management. The study highlights the importance of digitization in urban water management, particularly in wastewater treatment, which not only enhances the operational efficiency of water systems but also contributes to the recovery of valuable resources like sludge and nutrients. These resources can be redirected to sectors such as agriculture, further contributing to a circular economy. By facilitating better integration of market players and optimizing supply-demand dynamics, digitalization aids in promoting sustainable resource management. The authors focus on four key stages in the urban water cycle—collection, treatment, distribution, and wastewater management—providing concrete examples to illustrate the pivotal role of digital technologies in fostering sustainability across economic, social, and environmental dimensions (Hernández-Chover et al., 2022).

Building on the theme of digitalization's role in sustainability, Balogun et al. (2019) explore the broader implications of the digital revolution for urban climate change adaptation. Their study examines how digital technologies contribute not only to the mitigation of climate change but also to enhancing cities' resilience against climatic hazards. Through case studies from various cities, the research demonstrates how digital tools—such as early warning systems, climate monitoring, and resource management technologies—can improve water security, power infrastructure, and overall urban resilience. The findings suggest that digitalization offers significant promise for improving climate adaptation efforts, although challenges remain in fully harnessing its potential. This underscores the need for comprehensive evaluations and strategies to maximize the benefits of digitalization in combating climate-related challenges (Balogun et al., 2019).

In the context of urban water scarcity exacerbated by climate change and over-urbanization, Ekmekcioğlu et al. (2022) employ a hybrid multi-criteria decision-making approach to evaluate 44 water scarcity mitigation strategies. The study prioritizes strategies based on five constraints: cost-effectiveness, time/effort, feasibility, and both primary and secondary benefits. Using fuzzy set theory and the technique for order of preference by similarity to ideal solution (TOPSIS), the authors identify the most effective strategies for urban water scarcity mitigation, with a focus on organized land use planning and limiting urban growth. This work highlights the importance of integrated water resource management in enhancing urban resilience to water scarcity, thus aligning with broader sustainability goals (Ekmekcioğlu et al., 2022).

Lastly, the impact of water stress on ecological systems, particularly forests, is addressed in the study by Xu et al. (2018). This research examines how water availability influences forest recovery, with a focus on the interaction between canopy height and water stress. Their findings suggest that forest ecosystems are highly vulnerable to droughts, with shorter trees showing better recovery under water scarcity. However, the study also indicates that as water availability improves, recovery rates become more uniform across tree heights. This research emphasizes the need for adaptive forest management policies that take into account climate projections and the potential for increased water stress in the future (Xu et al., 2018).

Schlosser et al. (2014) provides a comprehensive assessment of global water stress, evaluating the capacity of water systems across 282 subregions to meet increasing water demands driven by socioeconomic growth

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and climate change projections up to 2050. Using the Massachusetts Institute of Technology Integrated Global System Model, the study reveals that in many developing countries, population growth and economic activity contribute more significantly to water stress than climate change. By 2050, approximately 1.8 billion people are expected to face moderate water stress, predominantly in developing nations. While regional climate change may either worsen or alleviate water stress, the most severe impacts are anticipated in Africa, with notable effects also expected in Europe, Southeast Asia, and North America. The combined pressures of socioeconomic growth and uncertain climate change projections are expected to further exacerbate water scarcity, potentially subjecting an additional 1.0–1.3 billion people to water over-exploitation. To address these challenges, adaptive measures such as improving water-use efficiency, groundwater management, interbasin water transfers, and consumption adjustments are crucial (Schlosser et al., 2014).

In the realm of human resource management for water utilities, a study by Administração e Gestão de Sistemas de Salubridade (AGS) (n.d.) highlights the importance of managing human capital to ensure the sustainability of urban water systems. Water utilities are responsible for large-scale infrastructure management, and maintaining a stable workforce is vital for organizational knowledge continuity. The study introduces the Personnel Aging Index (PAI), developed to assess human resource frameworks in water utilities, and evaluates the need for knowledge transfer to address the aging workforce. Through a case study involving ten AGS water utilities, the paper explores team maturity levels and provides insights into long-term human resource planning for water utility systems. The integration of human resources with urban water infrastructure planning is identified as essential for sustaining water services (AGS, n.d.).

As digital transformation reshapes business practices globally, the integration of the digital economy with green development is explored in Asif Raihan's (2024) work. The study underscores how disruptive technologies such as artificial intelligence, big data, and cloud computing are redefining consumer behavior and business operations. While digital technologies offer opportunities to enhance efficiency and support sustainable development goals, such as promoting renewable energy and improving resource efficiency, the study also highlights the need for robust regulatory frameworks to address challenges such as electronic waste and social inequality. Raihan (2024) suggests that the digital economy can significantly contribute to sustainable economic growth, provided that innovation is managed with care to prevent adverse social and environmental impacts (Raihan, 2024).

The impact of the digital economy on sustainable development is further explored in the European Union context by Imran et al. (2022). The study investigates the role of the Digital Economy and Society Index (DESI) in promoting sustainable development indicators (SDIs) across 28 EU countries. DESI, which includes connectivity, human capital, internet services, digital technology integration, and public digital services, is found to have a significant influence on SDIs. Specifically, the study highlights that connectivity, human capital, and internet services have a greater impact on sustainable development goals (SDGs) than the integration of digital technologies and public services. These findings suggest that enhancing digital infrastructure, particularly in connectivity and human capital, is critical for achieving sustainable development across European nations (Imran et al., 2022).

Carmen Nadia Ciocoiu (2011) examines the intersection of the digital and green economies, both of which have emerged as critical policy areas in recent years. The paper discusses the environmental impacts of digital technologies, particularly in the realm of ICT, and contrasts this with the green economy, which promotes sustainability and environmental protection. Ciocoiu argues that integrating the digital economy with the green economy can create new opportunities for sustainable development, especially in the context of the recent global economic and environmental crises. The study emphasizes that leveraging digital technologies within the framework of green economic principles can support economic recovery and long-term sustainability by fostering a knowledge-driven green economy (Ciocoiu, 2011).

The role of China's digital economy in promoting sustainable development is explored by Ma et al. (2023), who investigate the relationship between digital economy growth, industrial agglomeration, and sustainable development across 30 Chinese provinces. Using panel data from 2015 to 2021, the study reveals that the digital economy positively impacts sustainable development by driving industrial concentration.

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Furthermore, an inverted U-shaped relationship is identified between the digital economy and industrial agglomeration, indicating that the effects of the digital economy on industrial concentration initially increase and then decline as the economy matures. The study suggests that targeted policies, such as strengthening digital infrastructure and promoting specialized industrial clusters, can foster greater sustainability, especially in regions with less mature economies (Ma et al., 2023).

In the context of environmental sustainability and digital economies, Salamatov et al. (n.d.) highlight the dual nature of digitalization, which brings both advancements and challenges. While digitalization can support sustainable economic and social development, it also introduces risks, such as economic crimes and environmental degradation. The study advocates for a balanced approach to digital transformation, combining ecological considerations with economic goals through environmental management. This model promotes sustainable resource use, waste reduction, and social equity, offering a framework for countries to achieve balanced progress as they transition to digital economies (Salamatov et al., n.d.).

These studies collectively illustrate the intertwined relationship between the digital economy, sustainable development, and environmental sustainability. From the global challenges of water stress to the local impacts of digital transformation in industries, the research emphasizes the importance of strategic, integrated approaches to policy, technology, and resource management to achieve sustainable outcomes in both urban and global contexts.

Data and Methodology

The study uses the multiple linear regression (least square) model by E-views program in aim to achieve the research objectives with time scope of 2007- 2021 by using data collected in world bank data as reliable source to use in this research. The study used the level of water stress as a dependent variable (Y) followed by the independent variables which are the high technology exports (current US$) (X2), ICT goods imports (%total goods import) (X3), and individuals using the internet (%of population) (X4).

$Y = f\ (X2, X3, X4)$

Level of water stress = $\beta 1 + \beta 2\ (X2) + \beta 3\ (X3) + \beta 4\ (X4) + \varepsilon$

The variables can be explained in the following order:

Where Y= Level of water stress

B1 → Constant

B2 → The coefficient of high technology exports (current US$)

B3 → The coefficient of ICT goods imports (%total goods import)

B4 → The coefficient of individuals using the internet (%of population)

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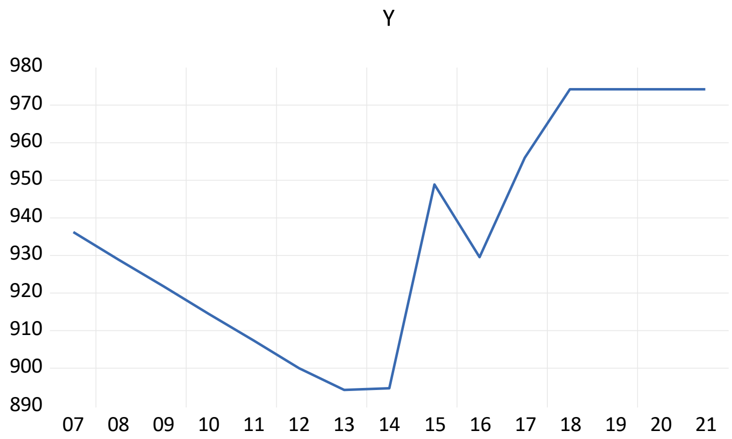
Results and Discussion

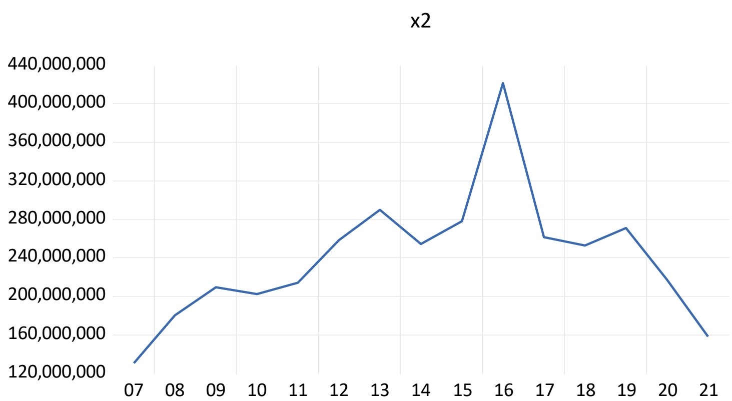
Y (Level of water stress)



Source: Author's own calculations

In Graph 1, the Y variable represents the level of pressure on water resources. A high level of water stress indicates increased pressure on available water resources, reflecting the gap between water demand and supply. This suggests greater challenges in achieving water sustainability amidst growing population and demands.

X2 (High technology exports)



Source: Author's own calculations

In Graph 2, X2 measures the value of high-technology exports in current U.S. dollars. Expanding high-tech exports reflect economic diversification away from traditional resources like oil, potentially enabling the use of revenues to improve sustainable infrastructure, including in the water sector.

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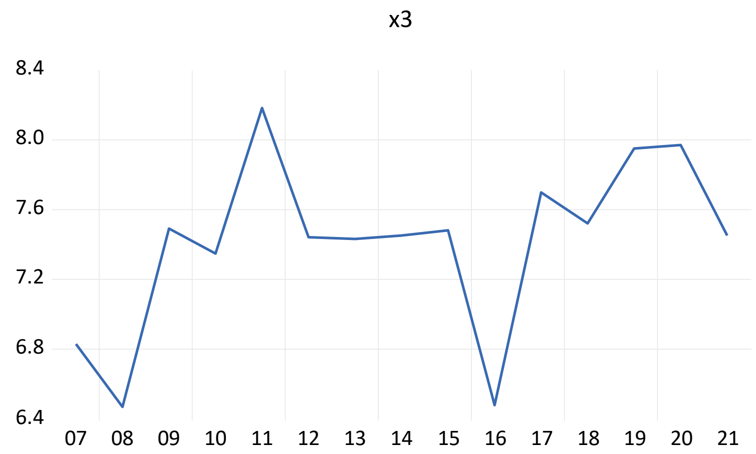
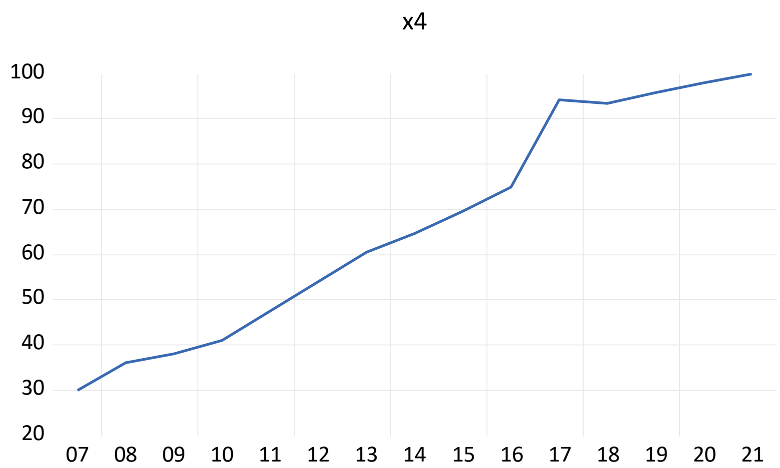
X3 (ICT goods imports)



Source: Author's own calculations

In Graph 3, X3 variable represents the percentage of Information and Communication Technology (ICT) goods in total imports. This percentage indicates the extent of the country's integration of modern technology, which could contribute to more efficient water resource management through applications like AI and water consumption monitoring systems.

X4 (Individuals using the internet)



Source: Author's own calculations

The above Graph 4 measures the proportion of the population that uses the internet. An increase in this variable reflects the country's progress in digital technology and communications, opening greater opportunities to spread awareness about water conservation and implement innovative solutions for efficient water use, such as environmental awareness apps and promoting sustainability.

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The regression analysis

Dependent Variable: Y
Method: Least Squares
Date: 11/05/24 Time: 22:23
Sample: 2007 2021
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1026.828	84.63952	12.13178	0.0000
X2	-2.07E-07	7.92E-08	-2.615859	0.0240
X3	-16.21750	11.37045	-1.426285	0.1815
X4	1.178712	0.233964	5.038008	0.0004

R-squared	0.712603	Mean dependent var	935.2486
Adjusted R-squared	0.634221	S.D. dependent var	30.11869
S.E. of regression	18.21567	Akaike info criterion	8.865620
Sum squared resid	3649.919	Schwarz criterion	9.054434
Log likelihood	-62.49215	Hannan-Quinn criter.	8.863609
F-statistic	9.091507	Durbin-Watson stat	1.392244
Prob(F-statistic)	0.002580		

Source: Author's own calculations

The estimated regression equation

Level of water stress = 1026.82-2.07 X2-16.21X3+1.178X4+ ε

With the regression analysis above in table 1, it can be used to interpret some quite important points regarding this research. The value of R-squared is 0.71 which means that the variables that been used in this study are affecting the level of water stress by 71% and the value of adjusted R-square without inflating is 63%.

The overall significance of the estimated model is 0.002580 which is less than 0.05. And in this case H0 will be rejected and the model is statistically significant. In addition to that, the coefficient of B1 was 1026.82, the standard error was 84.63, and the t-Statistic was12.13. For B2 results the coefficient of B2 was-2.07, the standard error was 7.92, and the t-Statistic was -2.61. for B3 the coefficient was -16.21, the standard error was 11.73, and the t-Statistic was -1.42. And lastly the coefficient of B4 was 1.178, the standard error was 0,23, and the t-Statistic was 5.03.

- B1: The intercept (Y) will be equal to 1026.82. when X2, X3 and X4 are equal to zero.
- The probability of B1 = 0.0000 which means that the value is less than 0.05 so, reject H0 and the model is statistically significant.
- B2: If X2 (high technology exports) increases by 1 unit, Y (Level of water stress) will decrease by -2.07, holding the other values constant.
- The probability of B2 = 0.0240 which means that the value is less than 0.05 so, reject H0 and the model is statistically significant.
- B3: If X3 (ICT goods imports) increases by 1 unit, Y (Level of water stress) decreases by -16.21, holding other values constant.

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- The probability of B3 = 0.1815 which means that the value is more than 0.05. H0 is not rejected, and the model is statistically insignificant.
- B4: If X4 (individuals using the internet) increases by 1 unit, Y (Level of water stress) will increase by 1.178, holding other values constant.
- The probability of B4 = 0.000 which means that the value is less than 0.05 so, reject H0 and the model is statistically significant.

Confidence interval

Coefficient Confidence Intervals
Date: 11/06/24 Time: 08:27
Sample: 2007 2021
Included observations: 15

		90% CI		95% CI		99% CI	
Variable	Coefficient	Low	High	Low	High	Low	High
C	1026.828	874.8250	1178.831	840.5375	1213.118	763.9538	1289.702
X2	-2.07E-07	-3.50E-07	-6.50E-08	-3.82E-07	-3.29E-08	-4.53E-07	3.88E-08
X3	-16.21750	-36.63752	4.202514	-41.24369	8.808686	-51.53191	19.09691
X4	1.178712	0.758540	1.598884	0.663761	1.693663	0.452065	1.905358

Source: Author's own calculations

By using the table 2 above, the results were analyzed by using confidence interval for three levels 90%, 95%, and 99%. All these variables are statistically significant at 90%, 95%, and 99% given that the signs are the same, except for X3 it is not significant at any level.

Heteroskedasticity test: Breusch-Pegan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.126926	Prob. F(3,11)	0.9422
Obs*R-squared	0.501872	Prob. Chi-Square(3)	0.9185
Scaled explained SS	0.212387	Prob. Chi-Square(3)	0.9756

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/06/24 Time: 18:08
Sample: 2007 2021
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-593.0985	1628.400	-0.364222	0.7226
X2	7.61E-07	1.52E-06	0.499573	0.6272
X3	93.95168	218.7588	0.429476	0.6759
X4	-0.642750	4.501287	-0.142792	0.8890

R-squared	0.033458	Mean dependent var	243.3279
Adjusted R-squared	-0.230144	S.D. dependent var	315.9767
S.E. of regression	350.4557	Akaike info criterion	14.77952
Sum squared resid	1351011.	Schwarz criterion	14.96834
Log likelihood	-106.8464	Hannan-Quinn criter.	14.77751
F-statistic	0.126926	Durbin-Watson stat	1.367781
Prob(F-statistic)	0.942159		

Source: Author's own calculations

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By using the data from table 3 above, With Breusch-Pegan-Godfrey the result of this test shows that the probability of F(3,11)is 0.9422 which is more than 0.05.Therefor, accept the null hypothesis H0, Where H0= Homoskedasticity and reject H1= Heteroscedasticity. Which means that the model does not have heteroscedasticity problem.

Breusch- Godfrey serial correlation LM test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.816050	Prob. F(2,9)	0.4724
Obs*R-squared	2.302603	Prob. Chi-Square(2)	0.3162

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/06/24 Time: 18:06
Sample: 2007 2021
Included observations: 15
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-59.87708	99.22418	-0.603452	0.5611
X2	-6.94E-08	1.20E-07	-0.580534	0.5758
X3	10.47728	14.67463	0.713972	0.4933
X4	-0.018653	0.247835	-0.075263	0.9417
RESID(-1)	0.469358	0.384565	1.220490	0.2533
RESID(-2)	-0.582554	0.623868	-0.933778	0.3748

R-squared	0.153507	Mean dependent var	1.93E-13
Adjusted R-squared	-0.316767	S.D. dependent var	16.14647
S.E. of regression	18.52815	Akaike info criterion	8.965634
Sum squared resid	3089.631	Schwarz criterion	9.248854
Log likelihood	-61.24225	Hannan-Quinn criter.	8.962617
F-statistic	0.326420	Durbin-Watson stat	1.930978
Prob(F-statistic)	0.884791		

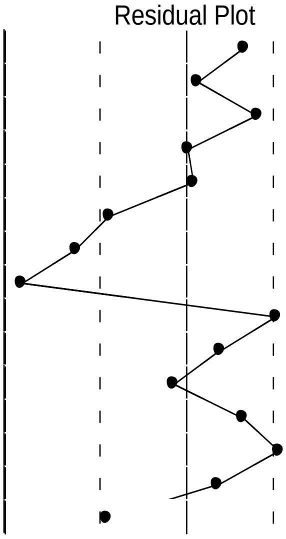
Source: Author's own calculations

Table 4 above detects that there is no serial correlation error because Probability F (2,9) = 0.4724 which is more than 0.05. Therefore, accept H0 the model does not have serial correlation.

The actual, fitted, residuals

obs	Actual	Fitted	Residual
2007	936.128	924.293	11.8354
2008	928.924	926.887	2.03660
2009	921.719	906.707	15.0119
2010	914.514	914.070	0.44386
2011	907.309	905.838	1.47152
2012	900.104	916.340	-16.2354
2013	894.240	917.639	-23.3989
2014	894.708	929.523	-34.8151
2015	948.875	929.941	18.9340
2016	929.583	922.723	6.86074
2017	955.958	958.716	-2.75796
2018	974.167	962.490	11.6770
2019	974.167	954.653	19.5138
2020	974.167	967.868	6.29859
2021	974.167	991.043	-16.8761

Residual Plot



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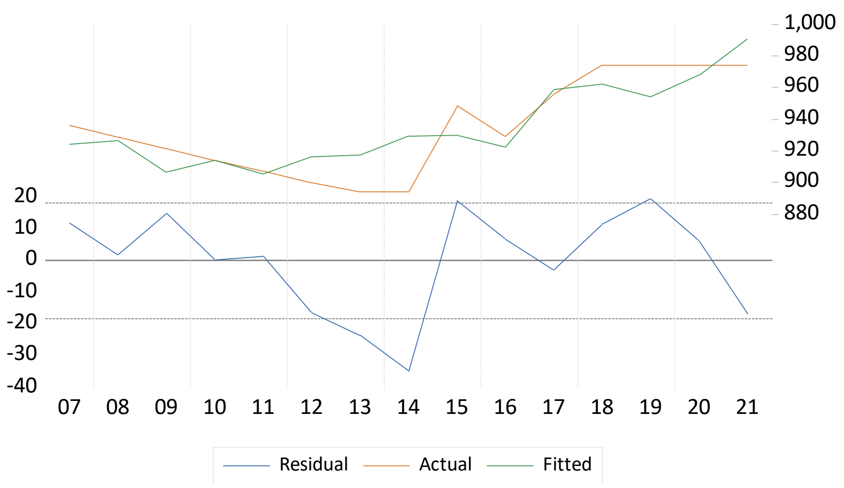
Actual, fitted, residual as a graph



Source: Author's own calculations

Conclusion

Saudi Arabia has implemented a transformative policy approach to address its scarce resources, with water being the most critical, non-renewable, and limited resource due to its predominantly desert landscape. This paper has established a relationship between water stress and key services and products that rely heavily on water consumption. Our findings indicate that high technology exports and the number of individual internet users both have statistically significant effects on water stress, with technology exports contributing to a reduction in stress, while increased internet usage correlates with higher stress levels. On the other hand, ICT goods imports were found to have no significant impact. Based on these findings, we recommend that policymakers focus on enhancing technology exports throughout the digital economy cycle while fostering greater public awareness about the impact of individual internet usage on water sustainability. Furthermore, we suggest expanding the scope of research to explore additional factors influencing water stress, in order to develop a more comprehensive national water conservation program that addresses the most influential drivers of water stress.

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Appendix

Year	Y	x2	x3	x4
2007	936.1285	130907310	6.83	30
2008	928.9236	180686087	6.47	36
2009	921.7188	209615935	7.49	38
2010	914.5139	202105315	7.35	41
2011	907.309	213847737	8.18	47.5
2012	900.1042	258048046	7.44	54
2013	894.2396	289531029	7.43	60.5
2014	894.7083	254585412	7.45	64.7137
2015	948.875	278105529	7.48	69.6162
2016	929.5833	421118918	6.48	74.8793
2017	955.9583	261725660	7.7	94.1756
2018	974.1667	252680855	7.52	93.31
2019	974.1667	270579691	7.95	95.7247
2020	974.1667	217407451	7.97	97.8623
2021	974.1667	158436055	7.45	100