

“Measurement of Saudi Society Environmental Awareness in Relation to 2030 Saudi Vision and The Saudi Green Initiative”

Researchers:

Rana O. Khayat^{1*}, Dalal N. Felemban^{1,2}, Tahani K. Altowairqi^{2,3} and Mohammed O. Aljahdali^{2*}

¹Umm Al-Qura University, College of Applied Sciences, Department of Biology, Makkah, Saudi Arabia

²King Abdulaziz University, Faculty of Science, Department of Biological Sciences, Jeddah 23589, Saudi Arabia

³Taif University, Faculty of Sciences, Department of Biology, Taif, Saudi Arabia



Abstract:

The need to instil environmental awareness relative to sustainable development and green initiatives to abate the degradation of natural resources through environmental contamination is very important. In this study, the measurement of environmental awareness of the populace of Saudi Arabia using the Saudi Arabia 2020 vision and green initiative as factors was put into consideration. Data were generated by the use of a questionnaire distributed to 1446 respondents via snowball sampling method among the populace including Saudi and Non Saudi citizens. The data generated were subjected to descriptive statistics, a Chi-square test and Principal Component Analysis. The results from this study indicated significantly high environmental awareness among respondents, especially the male respondents and respondents in the age range of 20-40 years. However, about 95.4% and 93.9% of the respondents believed Saudi Arabia's 2030 vision aims to protect the natural environment and consider the sustainability as survival of vital systems and preservation of life and natural resources respectively. In addition, only 39.7% of the participants are aware of environmental sustainability as a basis for the launch of 4 initiatives on Saudi Arabia's vision 2030. Although, it was revealed in the results that the respondents' awareness of Saudi Arabia's vision 2030 relative to the global environment as a worldwide connection of environments correlates with awareness of the status of environmental pollution. In conclusion, the results contribute to the database on populace awareness and attitudes towards the environment, Saudi Arabia's 2030 vision and green initiative. The need to encourage the implementation of a nationwide environmental awareness program is important, as it will further support the achievement of sustainable environmental goals, Saudi Arabia's vision 2030 and green initiatives.

Keywords: Environmental awareness, Saudi Arabia, Vision 2030, Green initiative.

Introduction:

Indicators of a culture's level of civilization include its attention to and care for the environment (Khan, Haque, & Khan, 2020). Achieving ecological consciousness, which Madsen (1996) argues involves making a personal commitment to work toward sustainability, begins with raising one's level of awareness (Khan et al., 2020). Although, Implementing the sustainability concept requires growing public knowledge of individuals with influence, what the common individual knows, believes, and does to save the environment for future generations and guarantee that economic development is sustainable still significant (Khan et al., 2020). Moreover, awareness of environmental issues is the first step in getting people to work together to solve such issues. For instance, Air and water pollution, solid waste management, dust deposits, noise, etc., all have repercussions on the ecosystem that needs to be acknowledged by individuals and society (Khan et al., 2020). Moreover, it is becoming more commonplace for people to be concerned about environmental issues in the world in which we live (Sarikaya & Saraç, 2018). Educating individuals who are both aware of and able to come up with solutions to environmental problems is vital at this time (Sarikaya & Saraç, 2018).

Recently, numerous environmental problems have arisen because of the current way of life, those problems involve; acid rain, deforestation, global warming, greenhouse gases, water shortages supply and pollution, waste disposal, extinction of species, urbanization, ozone layer depletion, and resource depletion, (Dolenc Orbanic & Kovač, 2021). Ecological types of radiation may pose a concern to the health of the affected population since they can eventually be transferred to humans through food chains (Calvo & Garcia-Lorenzo, 2018). At this time, the major environmental concern is global warming, which has a significant effect on every corner of the globe (Dolenc Orbanic & Kovač, 2021). Thus, all those issues have a vital influence on climate change (Dolenc Orbanic & Kovač, 2021).

However, scientific research over the last 50 years has raised awareness of complex environmental issues and confirmed the need for immediate action (Burke et al., 2017; Valavanidis, 2019; WHO, 2020), including global cooperation, interdisciplinary approach, developed technology and management techniques, effective climate policy, efficient methods for sustainability, raised public awareness, and improved environmental learning (Dolenc Orbanic & Kovač, 2021).

In Saudi Arabia, many of those environmental problems, such as ecosystem deterioration, resource depletion, and widespread pollution, have arisen in as a result of the country's fast industrialization, urbanization, and high consumption culture (Almulhim & Abubakar, 2021). In a population with a strong inclination to consume, this is a significant source of pollution worldwide (Khan et al., 2020). Air pollution, clean water availability, coastal and marine area vulnerability, and solid and hazardous waste management are only some of the challenges the Kingdom must overcome. The Brundtland Commission Report (1987) recommends that governments implement policies to mitigate the negative impacts of human activities and ensure the sustainability of the environment for future generations (Khan et al., 2020). Given that the country is still expanding and that the building rate is greater than ever, Saudi Arabia formulated its development plans with the hope

that doing so will improve and facilitate the implementation of sustainability (Surf & Mostafa, 2017). The concept of sustainability promotes development and alteration that is in harmony with current and future social, ecological, and other restrictions (Khan et al., 2020).

Considering recent legislative shifts, the nation is making more efforts to create a sustainable community that values protecting the planet's natural wonders (Khan et al., 2020). Holding the view that increasing urbanization, industrialization, and high levels of consumer spending are major contributors to environmental degradation (AlQahtany & Abubakar, 2020). After the new Saudi Vision 2030 was adopted and made public, local engineering groups and the government began working together to codify the concept of sustainability to safeguard future generations (Surf & Mostafa, 2017).

The Saudi Vision 2030 aims to protect the natural environment in the Kingdom of Saudi Arabia and encourage sustainable development practices by preserving natural and environmental resources, which helps in providing a healthy, safe, and high-quality environment for us and for future generations (Surf & Mostafa, 2017). And how much are they affected and affected by it? With Saudi Vision 2030, the Saudi government hopes to diversify the economy away from its reliance on oil exports and public expenditure. An all-encompassing plan for privatization and economic transformation (Surf & Mostafa, 2017). Additionally, it plans to get 50% of its annual energy needs from green sources. In addition, the Saudi Green Initiative 2021 aims to drastically reduce carbon dioxide emissions via a combination of tree planting and the use of renewable energy (Almulhim & Abubakar, 2021; Alshammari, 2021).

In light of rising public and private sector worries about the state of the planet, the Kingdom of Saudi Arabia has taken great effort to include an extra ecologically feasible action plan in all of its commercial operations (Albahlal, Alqahtani, & Al-Muqri, 2017; Khan et al., 2020). Even though the kingdom of Saudi Arabia is going under huge transformation economically, politically, and socially, this change is governed by the 2030 Saudi Vision and its initiatives, especially the Saudi Green initiative. To have a successful mission requires much attention and effort from the public and local residents. Therefore, this study poses a crucial inquiry: how widespread is public awareness of the 2030 vision with regard to the environment and sustainable development in Saudi Arabia through a public survey.

Materials and Methods

a) Study setting

The current study focuses on assessing the individual environmental awareness and the knowledge level of the individual towards KSA vision 2030. To achieve the outlined objectives of the study, a qualitative research approach was used to answer the research questions. Thus, qualitative data were collected by engaging the participants in the survey.

b) Data Collection and Analysis

The survey was built to achieve the study objectives. Data were collected using a survey of 30 closed-ended questions. The first 7 questions were about the participants' information. Then the rest of the questions were to assess the extent of the participant's knowledge about KSA vision 2030, measure the extent of the participant's awareness and knowledge about environmental pollution, and how to deal with that pollution, estimate if the participants' have the desire to live in sustainability environment in the future. The survey was performed using Google forms. It was distributed through the social media application, with concern to reaching most societal groups. The survey was published in April 2022, and the participation reached 1466 by May 2022.

c) Statistical analysis

The collected data were analyzed using R Statistics for windows (v.3.0.4). Descriptive analyses were used for sociodemographic and categorical data. The Chi-square test was used to determine the significant difference between the awareness of respondents on opinions of the environment in relation to Saudi vision 2030, and the green initiative and respondents' demographic characteristics such as age, gender, educational level, and income.

Results

The results of the survey were among 42.8% male, and 57.2 male% and the majority of the participants (61.9%) were between 20-40 years old. Regarding the educational level, 65.1% of the participants were at the university level, while 19.8% and 15% were above university and secondary and below, respectively. The survey included 95.5% Saudi and 4.5% non-Saudi participants; most of the participants (72.2) were at a good economic level, and in they belonged to the Government sector (44.7%). The western region residents formed the most participants by a percentage of 59.3% (table 1).

Table 1 Sociodemographic Characteristics of the studied participants (n = 1446)

Sociodemographic characteristics	n	%
Gender		
Male	627	42.8
Female	839	57.2
Age (Year)		
20-40	907	61.9
41-60	450	30.7
More than 60 years old	51	3.5
Less than 20 years	58	4.0
Educational Level		
Above University	291	19.8
Secondary and Below	220	15.0
University	955	65.1
Nationality		
Non-Saudi	66	4.5
Saudi	1400	95.5
Economic Level		
Good	1058	72.2
Higher than good	290	19.8
Less than good	118	8.0
Job		
Government Sector	655	44.7
Private Sector	217	14.8
Student	178	12.1
No Job	416	28.4
Place of Residence		
Central Region	221	15.1
Eastern Region	67	4.6
Northern Region	125	8.5
Southern Region	184	12.6
Western Region	869	59.3

In terms of the survey results, most of the participants (95.4%) believe that the Kingdom of Saudi Arabia's 2030 vision aims to protect the natural environment, while 93.9% of the participant consider the Sustainability as survival of the vital system and preservation of life and natural resources. A similar percentage supposed that Vision 2030 encourages the use of sustainable environmental technologies. Although, 96.1 % of the participants thought that the term (global

environment) is correct, and 90.9% thought the environment is in danger. While the majority of the participants (96.5%) supposed the environment is important (table 2).

Table 2 Importance of environment, sustainability and KSA 2030 vision

	n	%
The Kingdom of Saudi Arabia's 2030 vision aims to protect the natural environment		
No	68	4.6
Yes	1398	95.4
Sustainability as survival of vital system and preservation of life and natural resources		
No	89	6.1
Yes	1377	93.9
Encouragement of Vision 2030 in the use of sustainable environmental technologies		
No	100	6.8
Yes	1366	93.2
Do you think that the term (global environment) is correct?		
No	57	3.9
Yes	1409	96.1
Do you think the environment is in danger		
No	134	9.1
Yes	1332	90.9
Environment (Importance)		
No	51	3.5
Yes	1415	96.5

Regards to Sustainable environmental trends and vision 2030, the results of the study show that most of the participants (77.6%) agree that the sustainable environmental trends involving all the aspects mentioned in the survey which are Maintaining water balance and restoring biodiversity; Preventing soil erosion and addressing desertification through afforestation; and Sustainable agriculture (table 3, figure 1). Furthermore, 39.7% of the participants completely knew that environmental sustainability is a basis for the launch of 4 initiatives on Vision 2030, and 75.6% wish completely to live in an environment with sustainable development in the future (table 3).

Table 3 Sustainable environmental trends and vision 2030

	n	%
Sustainable Environmental Trends		
All of the above	1137	77.6
Maintaining water balance and restoring biodiversity.	184	12.6
Preventing soil erosion and addressing desertification through afforestation.	47	3.2
Sustainable agriculture.	98	6.7
Environmental sustainability as a basis for the launch of 4 initiative on Vision 2030		
I don't know	183	12.5
I know somewhat	296	20.2
I know	405	27.6
I know completely	582	39.7
Do you want the future to live in an environment with sustainable development		
No	10	0.7
Yes	284	19.4
I wish completely	1108	75.6
Yes to some extent	64	4.4

In terms of the cause and sources of environmental pollution, the opinions of the participants about the knowledge of environmental pollution were obvious. As most of the participants knew completely about environmental pollution with a percentage of 37.6 and 52.7%, respectively. Also, their opinion about the disappearance of animals/plants as an indication of environmental pollution was in agreement to a close extent. When they were asked about the 3 most important types of pollution, the results were graded from water pollution to Air pollution, to Noise pollution to Land pollution.

Regarding respondents' place of residence, 57.2% of them have a problem of environmental pollution, and 17.3% don't have problems, while 25.5% are ignorant about the environmental problems in their place of residence. On the other hand, most of the participants thought that environmental pollution may not affect their life completely (59.4%). Although, 39.4% of the participants thought that environmental pollution may affect their life (to a different extent).

The results of the survey also revealed that 53.8% of the participants do not report any environmental issue to any environmental authority. Whilst 82.9% have the practice to preserve the environment. Therefore, most of them thought there should be an awareness of environmental-related laws (Table 4).

Table 4 Causes and Sources of Environmental Pollution

Environmental Pollution	n	%
I don't know	21	1.4
I know somewhat	121	8.3
I know	551	37.6
I know completely	773	52.7
The disappearance of animals/plants as an indication of environmental pollution		
Agree	494	33.7

I agree to some extent	265	18.1
I do not agree	97	6.6
Totally agree	610	41.6

3 most important types of pollution

Noise Pollution	38	2.6
Air Pollution	244	16.6
Land Pollution	30	2.0
Water Pollution	1150	78.4

Do you have problems of environmental pollution in your place of residence?

I don't know	374	25.5
No	254	17.3
Yes	838	57.2

Do you think environmental pollution may affect your life?

I don't think so	18	1.2
I don't think so completely	871	59.4
I think somewhat	135	9.2
I think so	442	30.2

Have you ever reported any environmental issue to any environmental authority?

No	789	53.8
Yes	677	46.2

Any practice to preserve the environment

No	251	17.1
Yes	1215	82.9

There should be an awareness of environmental related laws

I don't think so	30	2.0
I think so completely	954	65.1
I think somewhat	102	7.0
I think so	380	25.9

Regarding the environmental awareness among respondents, the statistical analysis of the data obtained that, environmental awareness is significantly higher among male participants (n= 616, 98.2%, p=0.009). Regarding age, the participants with the age range of 20-40 years are significantly higher in environmental awareness (n=894, 89.6%, p<0.001). On the other hand, the significant higher environmental awareness among participants was at the above university participants category (n=288, 99%, p<0.001).

It is important to note that the non-Saudi participants were significantly higher in environmental awareness (n=63, 95.5%, p<0.001) compared to Saudi participants. The economic level has a significant effect, as the participants with good levels are significantly higher in environmental awareness (n=1043, 98.6%, p<0.001). However, the participants in the government sector jobs have the same results (n=648, 98.9%, p<0.001). However, environmental awareness does not differ significantly between participants from different regions.

Table 5 Factors associated with environmental awareness in Saudi Arabia among respondents (N = 1466)

Variable	n	Aware n (%)	Not Aware n (%)	P value
Gender				
Male	627	616 (98.2)	11 (1.8)	0.009
Female	839	829 (98.8)	10 (1.2)	
Age (Year)				
20-40	907	894 (98.6)	13 (1.4)	<0.001
41-60	450	444 (98.7)	6 (1.3)	
More than 60 years old	51	51 (100.0)	0 (0.0)	
Less than 20 years	58	56 (96.6)	2 (3.4)	
Educational Level				
Above University	291	288 (99.0)	3 (1.0)	<0.001
Secondary and Below	220	214 (97.3)	6 (2.7)	
University	955	943 (98.7)	12 (1.3)	
Nationality				
Non-Saudi	66	63 (95.5)	3 (4.5)	<0.001
Saudi	1400	1382 (98.7)	18 (1.3)	
Economic Level				
Good	1058	1043 (98.6)	15 (1.4)	<0.001
Higher than good	290	286 (98.6)	4 (1.4)	
Less than good	118	116 (98.3)	2 (1.7)	
Job				
Government Sector	655	648 (98.9)	7 (1.1)	0.003
Private Sector	217	216 (99.5)	1 (0.5)	
Student	178	172 (96.6)	6 (3.4)	
No Job	416	409 (98.3)	7 (1.7)	
Place of Residence				
Central Region	221	220 (99.5)	1 (0.5)	0.002
Eastern Region	67	65 (97.0)	2 (3.0)	
Northern Region	125	123 (98.4)	2 (1.6)	
Southern Region	184	181 (98.4)	3 (1.6)	
Western Region	869	856 (98.5)	13 (1.5)	

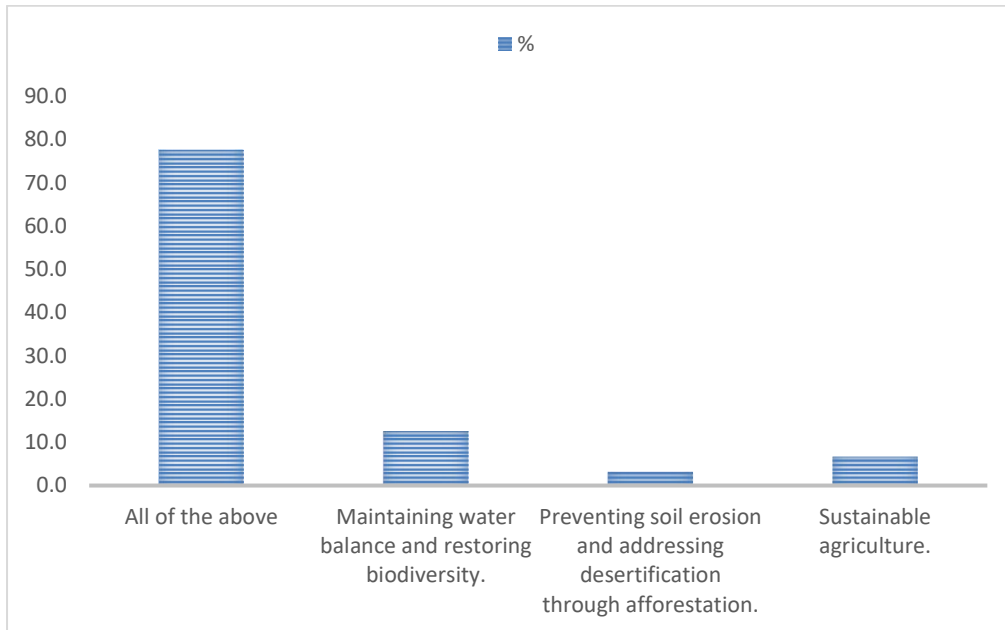


Figure 1 Sustainable Environmental Trends

The principal component analysis (PCA) at a 95% confidence interval, with components 1 and 2 accounting for 95.1 % of the total variation revealed a relationship between pollution sources, causes (EP) and KSA vision 2030 (EV) (Fig. 2).

Relative to information from 1446 respondents, information on KSA vision 2030 such as knowledge on the aim of vision 2030 to protect the natural environment (AV), sustainability as survival of vital systems and preservation of life and natural resources (SD), and encouragement in the use of sustainable environmental technologies have strong relationships with respondents' awareness on environmental pollution (EV), global warming phenomenon (GW), and classification and types of pollution (TP) (Fig. 2).

In addition, respondents' awareness of KSA vision 2030 relative to the global environment as a worldwide connection of environments (GV), opinions on the status of the environment either endangered or not (DE), and the importance of the environment (IE) correlates with awareness on the status of environmental pollution (PP), awareness on laws of environmental pollution (AL), the disappearance of biodiversity as an indication of environmental pollution (IP) and positive practices by individuals to prevent environment (Fig. 2).

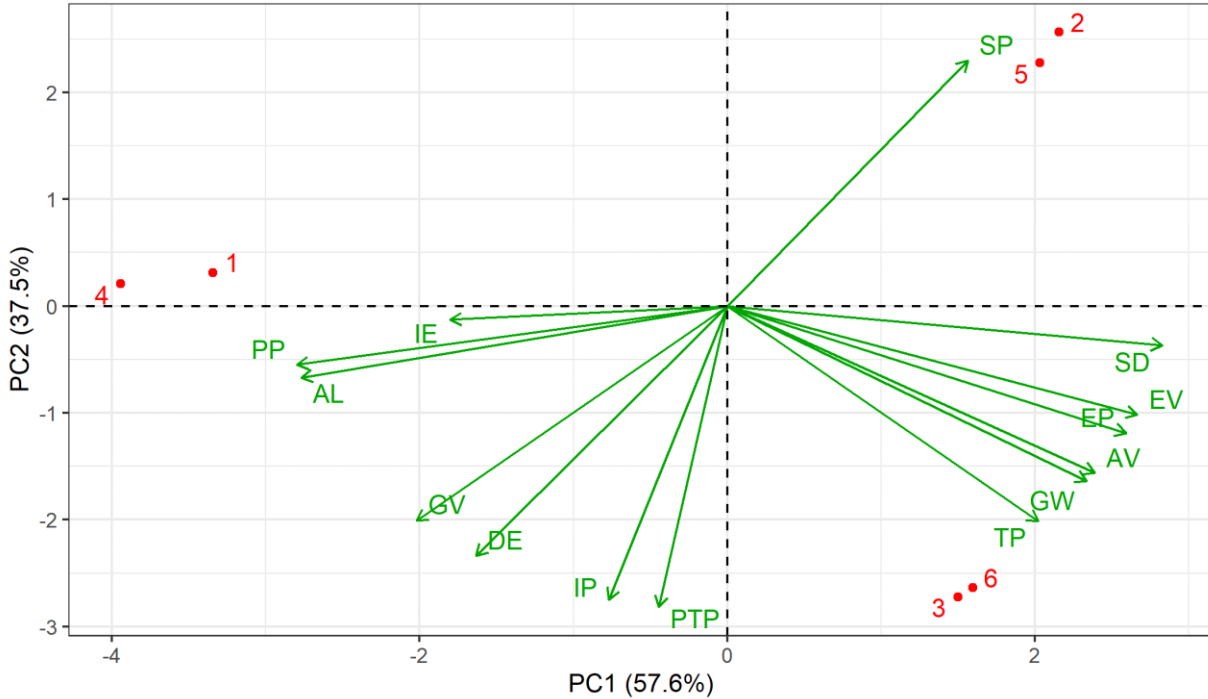


Figure 2 Correlation base PCA for knowledge on pollution sources, causes and KSA vision 2030

Key

- EP Knowledge on environmental pollution
- SP Knowledge on harmful pollution sources
- GW Knowledge on global warming phenomenon
- IP Disappearance of biodiversity as an indication of environmental pollution
- TP Knowledge of classification and types of pollution
- PP Knowledge on the status of environmental pollution
- PTP Knowledge on positive practices by individuals to prevent environment
- AL Awareness on Laws of environmental pollution
- AV Knowledge on Kingdom of Saudi Arabia's 2030 vision aims to protect the natural environment
- SD Knowledge on Sustainability as survival of vital system and preservation of life and natural resources
- EV Knowledge on Encouragement of Vision 2030 in the use of sustainable environmental technologies
- GV Knowledge on global environment as worldwide connection of environments
- DE Opinions on status of environment either endangered or not
- IE Opinions on the importance of environment

For the relationship between the importance of environment, sustainability and KSA 2030 vision, PCA at a 95% confidence interval, with a total variation of 92.4% for components 1 and 2 revealed the relationships between the two factors.

The indices for respondents' awareness of sustainable environments such as knowledge on the lunch of initiative on vision 2030 and its basis for sustainability (LS) and opinion on the future to live in an environment with sustainable development (OS) correlate with respondents' awareness of vision 2030 aim to protect the natural environment (AV), and encouragement in the use of sustainable environmental technologies (EV), sustainability as survival of vital system and preservation of life and natural resources (SD), global environment as a worldwide connection of environments (GV), opinions on the status of environment either endangered or not (DE), and the importance of environment (IE) (Fig. 3).

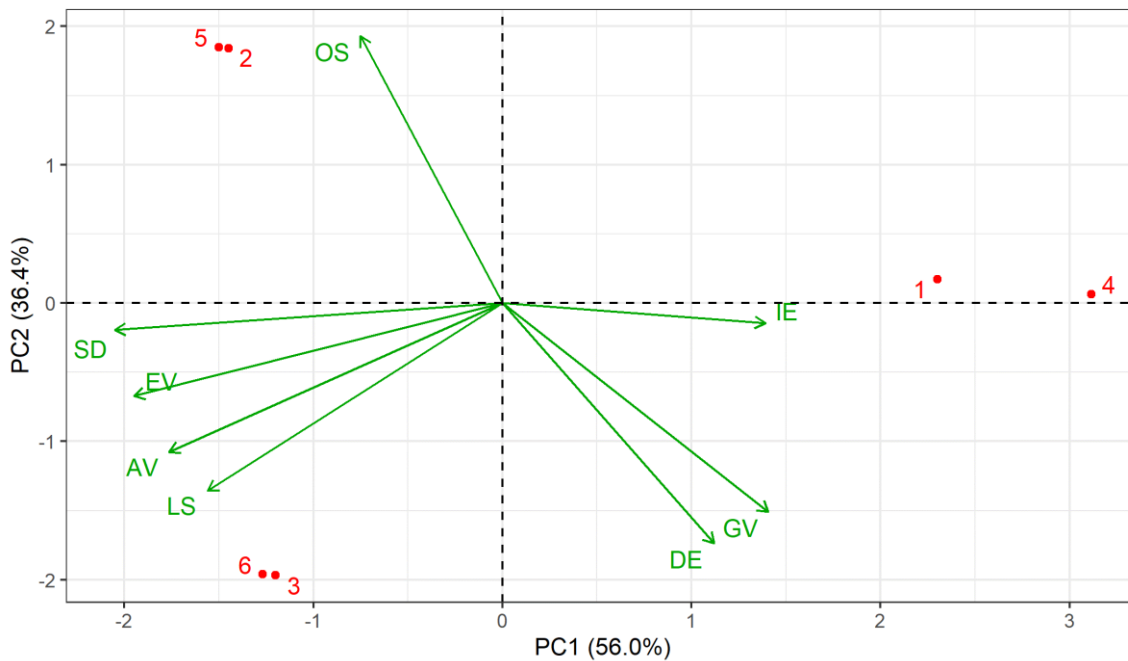


Figure 3 Correlation base PCA for Importance of environment, sustainability and KSA 2030 vision

Key

- AV Knowledge on the Kingdom of Saudi Arabia's 2030 vision aims to protect the natural environment
- SD Knowledge of Sustainability as survival of vital systems and preservation of life and natural resources
- EV Knowledge of Encouragement of Vision 2030 in the use of sustainable environmental technologies
- GV Knowledge of the global environment as a worldwide connection between environments
- DE Opinions on the status of the environment either endangered or not
- IE Opinions on the importance of the environment
- LS Knowledge of the lunch of the initiative on vision 2030 and its basis for sustainability
- OS Opinion on the future to live in an environment with sustainable development

The heat map showed the relationships between vision 2020, sustainability, and environmental awareness in Saudi Arabia. Strong relationships with heat map values of 0.0 to 0.2 were revealed between indices of sustainability and respondents' awareness of vision 2030 aims to protect the natural environment, classification of pollution and harmful pollution sources (Fig. 4). In addition, respondents' awareness of positive practices by individuals to prevent environment correlates with awareness on the disappearance of biodiversity as an indication of environmental pollution. Opinions on the

status of the environment either endangered or not and respondents' knowledge on sustainability as survival of vital systems and preservation of life and natural resources had strong relationships with awareness of laws of environmental pollution and encouragement of vision 2030 in the use of sustainable environmental technologies respectively (Fig. 4).

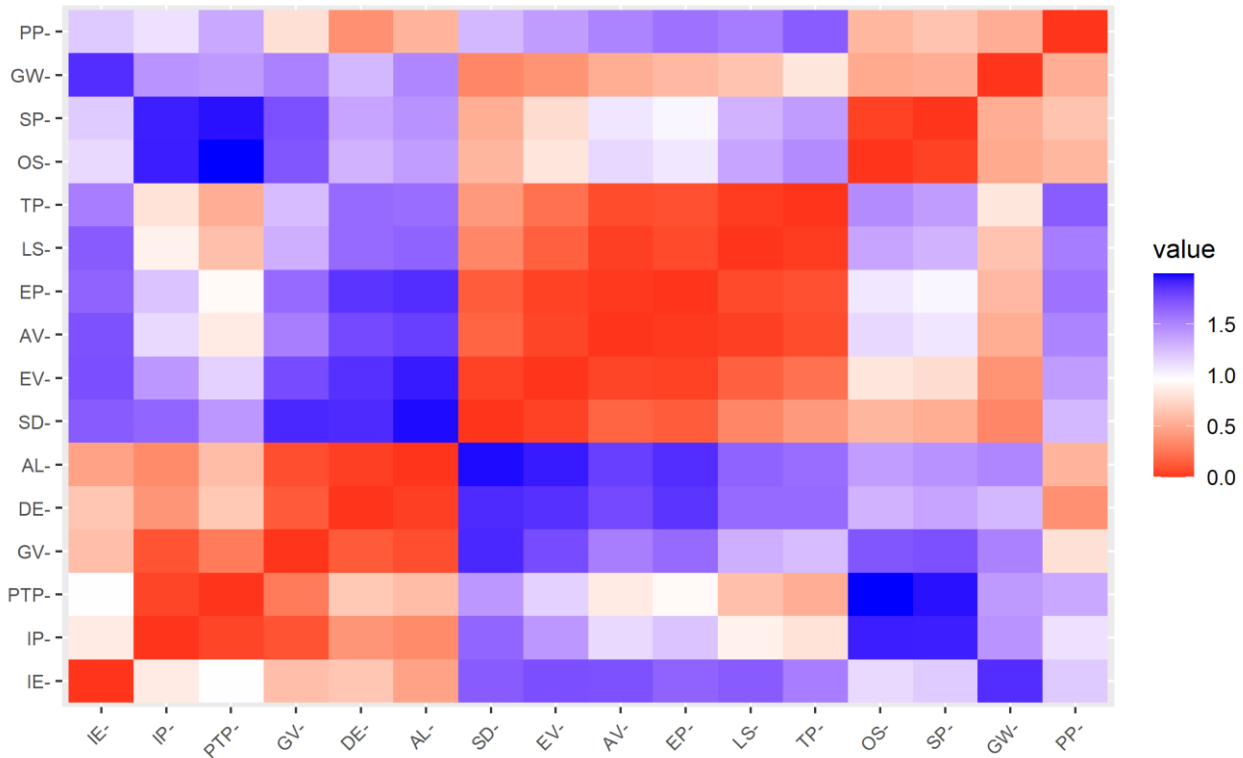


Figure 4 Heat map for KSA 2030 vision, sustainability, and environmental awareness in Saudi Arabia

Key

- EP Knowledge on environmental pollution
- SP Knowledge on harmful pollution sources
- GW Knowledge on global warming phenomenon
- IP The disappearance of biodiversity as an indication of environmental pollution
- TP Knowledge of classification and types of pollution
- PP Knowledge on the status of environmental pollution
- PTP Knowledge on positive practices by individuals to prevent environment
- AL Awareness on Laws of environmental pollution
- LS Knowledge on lunch of initiative on vision 2030 and its basic for sustainability
- OS Opinion on future to live in an environment with sustainable development
- AV Knowledge on Kingdom of Saudi Arabia's 2030 vision aims to protect the natural environment
- SD Knowledge on Sustainability as survival of vital system and preservation of life and natural resources
- EV Knowledge on Encouragement of Vision 2030 in the use of sustainable environmental technologies
- GV Knowledge on global environment as worldwide connection of environments
- DE Opinions on status of environment either endangered or not
- IE Opinions on the importance of environment

Discussion

The research study the environmental sustainability awareness in Saudi Arabia. A total of 1446 participants were surveyed. The results of the study indicate that most participants believe that sustainable environmental trends comprise maintaining water balance, restoring biodiversity, preventing soil erosion; addressing desertification; and agriculture aspects. All those aspects are related and interlined, as sustainable agriculture can reduce desertification and soil erosion (Rossi, 2020) (F. M. Ziadat et al., 2021).

Moreover, the survey results analysis shows a strong relationship between pollution sources, causes and KSA vision 2030. This gives an insight into the possible link of the sustainable use of resources and KSA vision 2030. Sustainability has been at the heart of Vision 2030 since its inception. Saudi Arabia is now ushering in a new era as the Kingdom aims to reach Net Zero by 2060. This announcement aligns with broader Vision 2030 ambitions to accelerate the energy transition, achieve sustainability goals, and drive a new wave of investment. Furthermore, the results revealed the participants' awareness level about the KSA vision 2030 and the aim of the vision. A previous study showed that awareness has increased during the past years (2010- 2015) (Surf & Mostafa, 2017). However, extracurricular activities could increase environmental awareness (Khan et al., 2020).

The significant high environmental awareness among respondents with education above the university level can be due to the nature of the collection of data through the questionnaire and the response received from the respondents and the economic level (Almulhim & Abubakar, 2021). Elsewhere, respondents with high education levels such as university and above university were reported to have significantly higher environmental awareness (Guerra & Leite, 2021). In another study involving five towns in southern Jordan, environmental awareness relative to air and noise pollution, the efficiency of water, and solid waste management among others was reported and is in line with our results (A. H. Ziadat, 2010).

For the relationship between the importance of the environment, sustainability and the KSA 2030 vision, the analysis revealed a relationship between those two factors. Moreover, accomplishing environmental sustainability is one of the important components of the national strategic vision (Alshuwaikhat & Mohammed, 2017). However, Saudi Green Initiative is not also left out because it works on increasing Saudi Arabia's reliance on clean energy, offsetting emissions, and protecting the environment, in line with Vision 2030 which also aims to improve the quality of life and protect future generations.

On the other hand, the heat map of relationships between vision 2020, sustainability, and environmental awareness in Saudi Arabia, showed a strong relationship between indices of sustainability and respondents' awareness of vision 2030 aims to protect the natural environment, classification of pollution and harmful pollution sources. Indeed, a previous study showed a lack of sustainability awareness among university students (Alsaati, El-Nakla, & El-Nakla, 2020). However, there was an increase in the awareness of sustainability among faculty members, which is an excellent opportunity to encourage young people to the careers in a sustainable environment, considering the environmental, social, and economic implications (Alkhayyal, Labib, Alsulaiman, & Abdelhadi, 2019). Thus, the results of this study could indicate an increase in public awareness about the sustainability of the environment.

Conclusion

The environmental awareness of Saudi Arabian population who participated as respondents in this study was high, especially the male participants and participants within the age range of 20-40 years. In addition, most of the participants (77.6%) understand sustainable environmental trends to be linked with factors such as maintaining water balance and restoring biodiversity; preventing soil erosion and addressing desertification through afforestation; and sustainable agriculture. However, the indices for respondents' awareness of sustainable environments such as knowledge on the launch of the initiative on vision 2030 and its basis for sustainability and opinion on the future to live in an environment with sustainable development correlate with respondents' awareness of vision 2030 aim to protect the natural environment. In implementing a nationwide environmental awareness programme, researchers must keep track and continue to research environmental awareness. This will further improve the knowledge of the populace on the need to prevent their immediate environment to achieve sustainable environmental goals and supports Saudi Arabia's vision 2030 and green initiative.

Funding: This research was not Funded.

Conflict of Interest: The authors declare there is no conflict of interest.

Contribution: Conceptualization, MOA.; methodology, MOA, DAF and TKA.; formal analysis, MOA; data, DAF and TKA; writing ROK, MOA. DAF and TKA; writing—review and editing, MOA and ROK; visualization, M.O.A and ROK.; project administration, MOA and ROK; All authors have read and agreed to the published version of the manuscript.

References:

- Albahlal, A., Alqahtani, S., & Al-Muqri, A. H. (2017). Sustainability awareness in Saudi Arabia. *Green Energy and Technology*, 0(9783319570686), 339–351. https://doi.org/10.1007/978-3-319-57070-9_13
- Alkhayyal, B., Labib, W., Alsulaiman, T., & Abdelhadi, A. (2019). Analyzing Sustainability Awareness among Higher Education Faculty Members: A Case Study in Saudi Arabia. *Sustainability* 2019, Vol. 11, Page 6837, 11(23), 6837. <https://doi.org/10.3390/SU11236837>
- Almulhim, A. I., & Abubakar, I. R. (2021). Understanding public environmental awareness and attitudes toward circular economy transition in Saudi Arabia. *Sustainability (Switzerland)*, 13(18), 1–15. <https://doi.org/10.3390/su131810157>
- AlQahtany, A. M., & Abubakar, I. R. (2020). Public perception and attitudes to disaster risks in a coastal metropolis of Saudi Arabia. *International Journal of Disaster Risk Reduction*, 44, 101422. <https://doi.org/10.1016/j.ijdr.2019.101422>
- Alsaati, T., El-Nakla, S., & El-Nakla, D. (2020). Level of Sustainability Awareness among University Students in the Eastern Province of Saudi Arabia. *Sustainability* 2020, Vol. 12, Page 3159, 12(8), 3159. <https://doi.org/10.3390/SU12083159>
- Alshammari, H. (2021). What Saudi Vision 2030 reform plan has achieved at the five-year mark | Arab News. Retrieved December 16, 2022, from <https://www.arabnews.com/node/1849981/saudi-arabia>
- Alshuwaikhat, H. M., & Mohammed, I. (2017). Sustainability Matters in National Development Visions—Evidence from Saudi Arabia’s Vision for 2030. *Sustainability* 2017, Vol. 9, Page 408, 9(3), 408. <https://doi.org/10.3390/SU9030408>
- Burke, T. A., Cascio, W. E., Costa, D. L., Deener, K., Fontaine, T. D., Fulk, F. A., ... Zartarian, V. G. (2017). Rethinking environmental protection: Meeting the challenges of a changing world. *Environmental Health Perspectives*, 125(3), A43–A49. <https://doi.org/10.1289/EHP1465>
- Calvo, J. P., & Garcia-Lorenzo, M. L. (2018). The contribution of industrial minerals to solving environmental issues. *Bulletin of the Geological Society of Greece*, 53(1), 134. <https://doi.org/10.12681/bgsg.18898>
- Dolenc Orbanic, N., & Kovač, N. (2021). Environmental awareness, attitudes, and behaviour of preservice preschool and primary school teachers. *Journal of Baltic Science Education*, 20(3), 373–388. <https://doi.org/10.33225/jbse/21.20.373>
- Guerra, B. C., & Leite, F. (2021). Circular economy in the construction industry: An overview of United States stakeholders’ awareness, major challenges, and enablers. *Resources, Conservation and Recycling*, 170, 105617. <https://doi.org/10.1016/J.RESCONREC.2021.105617>
- Khan, U., Haque, M. I., & Khan, A. M. (2020). Environmental sustainability awareness in the Kingdom of Saudi Arabia. *Journal of Asian Finance, Economics and Business*, 7(9), 687–695. <https://doi.org/10.13106/JAFEB.2020.VOL7.NO9.687>
- Rossi, R. (2020). Desertification and Agriculture. *European Parliamentary Research Service*, 73(3–4), 179–186.
- Sarıkaya, R., & Saraç, E. (2018). An analysis of pre-service teachers’ attitudes towards environmental issues in terms of various variables. *Universal Journal of Educational Research*, 6(1), 99–109. <https://doi.org/10.13189/ujer.2018.060109>
- Surf, M. S. Al, & Mostafa, L. A. (2017). Will the Saudi’s 2030 Vision Raise the Public Awareness of Sustainable Practices? *Procedia Environmental Sciences*, 37, 514–527. <https://doi.org/10.1016/j.proenv.2017.03.026>
- Valavanidis. (2019). (PDF) Current Environmental Issues and Emerging Global Challenges in the 21st Century for Environmental Protection and Sustainable Development. Retrieved December 16, 2022, from https://www.researchgate.net/publication/337918765_Current_Environmental_Issues_and_Emerging_Global_Challenges_in_the_21st_Century_for_Environmental_Protection_and_Sustainable_Development
- WHO. (2020). WHO global strategy on health, environment and climate change: the transformation needed to improve lives and wellbeing sustainably through healthy environments. Retrieved December 16, 2022, from <https://apps.who.int/iris/handle/10665/331959>

Ziadat, A. H. (2010). Major factors contributing to environmental awareness among people in a third world country/Jordan. *Environment, Development and Sustainability: A Multidisciplinary Approach to the Theory and Practice of Sustainable Development*, 12(1), 135–145. <https://doi.org/10.1007/S10668-009-9185-4>

Ziadat, F. M., Zdruli, P., Christiansen, S., Caon, L., Monem, M. A., & Fetsi, T. (2021). An Overview of Land Degradation and Sustainable Land Management in the Near East and North Africa. *Sustainable Agriculture Research*, 11(1), 11. <https://doi.org/10.5539/SAR.V11N1P11>