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Original article

## Public perceptions: The role of Individuals, societies, and states in managing the environmental challenges – cross-sectional study

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## ABSTRACT

**Objectives:** The major challenges of the current century are the rapid changes in the climate, weather conditions and the environment. Governments, individuals, and societies need to work together to tackle the challenges posed to the environment in recent times. The literature highlights the urgent need to act however, little is known about public perception and their responsibilities. This study aimed to explore the public perception of the role of individuals, societies, and states in managing environmental challenges.

**Methods:** In this cross-section study, a well-established English language questionnaire was developed. A total of 1000 questionnaires were distributed, and the response rate was 852 (85.2%). Among 852 participants, 488 (57.28 %) were males and 364 (42.72%) were females. The survey encompassed students 681 (80%), teachers 85 (10%); government officials 34 (4%), shop owners, merchants 25 (3%), doctors and engineers 17 (2%) and housewives 10 (1%). The questionnaires were analyzed, frequencies and percentages were calculated, and a p-value less than 0.05 was considered significant.

**Results:** The results revealed that 621 (72.8%) of the individuals suggested that states adopt sustainable environmental policies; 639 (75%) of the respondents were in favor that individuals personally playing a role in tackling climate change; 699 (82%) agreed that there should be a bottom-up approach while dealing with the environmental problems. Moreover, 605 (71%) believed that the young generation is more inclined than the previous generation for global climate action, 542 (63.61 %) were in favor that civil society galvanized to enshrine environmental protection in the state constitution, and 554 (65%) suggested that national and international efforts cannot make a difference until and unless individuals don't play a role in reducing the environmental pollution. The majority of the respondents were in favor of adopting the constructive approach to managing environmental challenges.

**Conclusions:** These days the environmental issues have become a grave concern. This role cannot be performed only by the states, but the role of societies and individuals is also of utmost importance. A large number of people suggested a bottom-up approach required to deal while managing environmental challenges. The importance of individual, societal and collective efforts are essential in managing environmental challenges.

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## 1. Introduction

The major environmental challenges of the current century tend to change the course of life on the planet. Global warming and toxicity of waste, water, land, and air pollution are alarming concerns and endangering the future. The water and carbon cycles and many other high dynamic ranges for the planet, such as the sun's position and activity, have altered atmospheric circulation. Moreover, climate change is now deep-rooted in human activities on the earth. The rapid changes in industrialization

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and crop production have resulted in rapid urbanization, and human population growth has quadrupled in the last century (Opoku & Aluko, 2021). The need to adapt and prepare for these effects is growing in importance. The human surroundings keep on changing, and this fact cannot be denied. The environment evolves, and simultaneously we need to become more conscious of the issues that exist within it. People need to be aware of the types of environmental difficulties the world faces due to tremendous floods, natural disasters, warming and cooling seasons, and various forms of weather patterns. The world is trying to tackle the loss of natural ecosystems caused by climate change and environmental challenges (John et al., 2021). Ecological challenges change the lifestyle, and because of globalization, the entire world is affected by these challenges.

Environmental challenges pose unconventional threats to nations and can also harm the entire world. Climatic change is a complex procedure that enjoins weather events and has great ecological effects on humankind and other species. Climatic change spreads on a regional and international level (Habibullah et al., 2022). Climate variability has always existed throughout history and was affected by external occurrences such as active volcanoes and solar output. The realization of considering it as a threat has now been taken very seriously, especially after this event of COVID-19 pandemic. The pandemic has changed the entire world order and the negative and positive side of globalization has been seen during the COVID-19 pandemic, in a way that, the spread of the virus was the negative side of globalization while the states standing together to fight against the virus and the vaccine diplomacy can be the positive aspect of globalization. Similarly, while dealing with environmental problems, there is the key role of globalization (Bickley et al., 2021). Expansion of population, water scarcity, pollution, food shortage, the decline in biodiversity, deforestation, rapid urbanization with slum development drought disasters, all-cause environmental harm, causing serious threats to livelihood, global food crises, and climate-induced migration (Ashraf et al., 2021; Amaya et al., 2021).

Many of these crises have serious outcomes, especially for vulnerable individuals residing in risky areas, and can jeopardize human and environmental protection. Furthermore, an unsustainable environment creates a risk to human health, as well risk to ecosystems. The high usage of energy, transportation, and industrial wastes results in a high amount of pollution (Apergis et al., 2021). This causes the destruction of plants which reduces carbon dioxide absorption. As a result, greenhouse gas emissions have risen at an exponential rate and the whole natural cycle including the water cycle have disturbed. These issues must be seriously considered because these are unconventional threats that can cause great difficulties for survival in near future (Karimi et al., 2021).

These days environmental issues have indeed become a grave concern. However, the literature on this aspect mostly comes from advanced nations. In the Global South, it is not at a high priority aspect among policymakers and practitioners. Civil society and individuals are the least concerned, action on climate change mitigation and adaptation at the grassroots level is overlooked. It is not easy to implement the bottom-up approach especially, in developing countries. The bottom-up approach can also be complex and time-consuming. So, the challenges that the states can face to change the traditional top-down approach have not been amply highlighted. However, Saudi Arabia and Pakistan took the steps of green initiatives, to keep the states green and clean to control the environmental pollution and climate changes.

This role cannot be performed only by the states in isolation, but the role of societies and individuals is also of utmost impor-

ance. Therefore, this study aimed to explore the public perception of the role of individuals, societies, and states in managing environmental challenges.

## 2. Subjects and Methods

### 2.1. Study design and Settings:

This questionnaire-based cross-sectional survey was steered under the supervision of the National Defense University, Islamabad, Pakistan and the College of Medicine, King Saud University, Riyadh, Saudi Arabia during the period January 2022 to August 2022.

### 2.2. Study survey procedure and instrument:

In this study, a well-established, English language questionnaire was developed. The study participants were invited to join the questionnaire survey using social media platforms including WhatsApp and emails and direct invitations to the academic and research institutes. The study objectives, consent, and voluntary participation were presented at the beginning of the questionnaire. The study variables were socio-demographic characteristics, age, gender, occupation, level of education, and socioeconomic status. The survey consists of a set of questions in which the respondents were asked to state whether they agree with the statement, remain neutral or they disagree in the form of “yes, no and neutral.” The questions in this survey were distributed to the public aged more than 16 years, who are residing in different regions of Saudi Arabia, Gulf regions, and Pakistan. The survey was conducted with the focus on the young generation encompassing students of various levels, and then to have a broader outlook people from all walks of life were included. Power formula was used to calculate the sample size.

In this study, one thousand questionnaires were distributed, and the response rate was 852 (85.2 %). Among 852 participants, 488 (57.28 %) were males and 364 (42.72 %) were females. The first part of the questionnaires covered the need for individual responsibilities and the importance of personal roles regarding climate change. The second part covered the societal role in curtailing climate change. The third part covered the role of a state and what steps can be taken to help reduce climate change. Finally, the questionnaire inquired if the respondents agreed that a bottom-up approach is more effective as compared to a top-down one. All principles and their different versions were covered in the questionnaire, and some principles have statements connected to them. However, the statements were not directly connected to one particular principle, and some statement covers different principles depending on if respondents support the statement or not.

### 2.3. Ethical statement:

The study was conducted according to the guidelines of the ethical board of the Federal Government Education Institutions, Rawalpindi, (FGEI-11/A2-X/2022).

### 2.4. Statistical analysis

The results were analyzed using the SPSS software, version 26.0. The demographical variables were reported using frequency and percentage. The comparisons between the variables were analyzed using independent sample *t*-tests, and chi-squared tests and a *p*-value of less than 0.05 was considered significant.

**Table 1**  
The demographic profiles of the respondents (n = 852).

Variables	Frequency (n)	Percentage (%)
<b>A: Gender</b>		
Male	488	57.28
Female	364	42.72
<b>B: Professional level</b>		
Students	681	80.0
Teachers	85	10.0
Government officials	34	4.0
Shop owners, merchants	25	3.0
Doctors and engineers	17	2.0
Others	10	1.17
<b>C: Level of Education</b>		
Higher Secondary	136	16.0
Bachelor's degree holders- BA, BSc	324	38.0
Master's degree holders- MA, MSc	119	14.0
Postgraduate degree holders- M. Phil	77	9.0
Postgraduate degree holders-PhDs	25	3.0
Others- Diploma, certificate courses	171	20.0

### 3. Results

Table 1 demonstrates the demographic profiles of the respondents. Among the 852 participants, 488 (57.28 %) were males and 364 (42.72 %) were females. The survey encompassed students 681 (80 %), teachers 85 (10 %); government officials 34 (4 %), shop owners, merchants 25 (3 %), doctors and engineers 17 (2 %) and housewives 10 (1 %). The minimum level of education for the students was higher secondary school. University students of Bachelor, Master, M.Phil., and PhD also participated. The number and percentages of the 681 students both of public and private sector based on level of education were higher secondary 136 (16 %), bachelor 324 (38.0 %), masters 119 (14.0 %), and higher postgraduate M. Phil 77 (9.0 %), and PhDs 25 (3.0 %) (Table 1).

The results revealed that 620 (72.8 %) individuals agreed that states should adopt sustainable environmental and economic policies, while 9.02 % remained neutral and 18.2 % gave a negative response; 639 (75 %) of the respondents were in favor that individuals personally play a role in tackling climate changes; 699 (82 %) agreed that there should be a bottom-up approach while dealing with the environmental problems. All these responses were significant in favor of (p = 0.001) (Table 2).

**Table 2**  
Public perceptions about environmental challenges from the global south on individuals, societies, and the role of states (n = 852).

Questions asked of the participants	Yes	NO	Neutral	p-value
Can individuals steer the states to adopt environmentally & economically sustainable policies?	620 (72.8 %) *	155 (18.2 %)	77 (9.02 %)	0.001*
Can individuals personally play a role in tackling climate change?	639 (75 %) *	155 (18.2 %)	58 (6.8 %)	0.001*
Do you support and practice measures such as cycling, using green energy, and waste recycling in your daily life?	235 (51 %) *	162 (19.0 %)	255 (29.95 %)	0.001*
Has the COVID-19 pandemic acted as a catalyst for global climate actions in communities?	267 (66.5 %) *	204 (24.0 %)	81 (9.5 %)	0.001*
Do you agree that there should be a bottom-up approach while dealing with environmental problems?	699 (82.0 %) *	102 (12.0 %)	51 (6.0 %)	0.001*
Should civil society be galvanized to enshrine environmental protection in the state constitution?	542 (63.61 %) *	103 (12.1 %)	207 (24.29 %)	0.001*
National and international efforts cannot make a difference unless individuals do not play a role in reducing pollution.	555 (65.15 %) *	169 (16.9 %)	255 (29.95 %)	0.001*
Are you satisfied with the pace and progress of climate action at the National and international levels?	506 (59.4 %) *	261 (30.6 %)	85 (10.0 %)	0.001*
Has your local government integrated environmental consideration into policy, planning and development?	336 (39.4 %) *	363 (42.6 %)	153 (18.0 %)	0.001*
Have you or your family ever considered migration due to environmental concerns?	255 (30.0 %)	511 (60.0 %)	85 (10.0 %)	0.001*
Do you as an individual capacity support carbon tax?	383 (45.0 %) *	382 (44.91 %)	86 (10.09 %)	0.001*
Do you agree that the younger generation is more inclined than the previous generation to global climate action?	605 (71.0 %) *	145 (17.0 %)	102 (12.0 %)	0.001*
Do you think that global climate action dissent with state sovereignty?	445 (52.2 %) *	95 (11.2 %)	312 (36.6 %)	0.001*

Note: Response rate is presented in number and percentage with a level of significance.

The results also revealed that 620 (72.8 %) of the individuals suggested that states should adopt sustainable environmental and economic policies; 639 (75 %) of the respondents were in favor that individuals personally playing a role in tackling climate change; 699 (82 %) agreed that there should be a bottom-up approach while dealing with the environmental problems. All these responses were significant (p = 0.001). Moreover, 605 (71 %) believed that the young generation is more inclined than the previous generation for global climate action, 542 (63.61 %) were in favor that civil society galvanized to enshrine environmental protection in the state constitution, and 554 (65 %) suggested that national and international efforts cannot make a difference until and unless individuals don't play a role in reducing the environmental pollution. The majority of the respondents were in favor of adopting the constructive approach in managing the environmental challenges All these responses were significant in favor of (p = 0.001) (Table 2, Fig. 1).

### 4. Discussion

The rapid change in the environment is a serious global crisis the world is facing these days. The research has significance in drawing the attention of the individual towards climate change. It will contribute to managing the existing environmental issues through an idea of the bottom-up approach. The approach is ideal; this present research may provide a possible sense of responsibility and awareness among societies. The present study findings demonstrate that the role cannot be performed only by the states in isolation, but the role of societies and individuals is also of utmost importance. The importance of individual, societal and collective efforts are essential in managing environmental challenges.

Since it has been known that the top-down approach forces behavior changes through policy while the bottom-up approach is the opposite. So, the bottom-up approach is required to influence policy through behavior. An action of an individual can have a profound impact when adopted at a larger level. The impact is limited but has exciting potential if it is adopted by a massive number of individuals. To implement a bottom-up approach, communicating the behavioral change goals with the strategies is required. Changes at all levels are required for a sustainable environment.

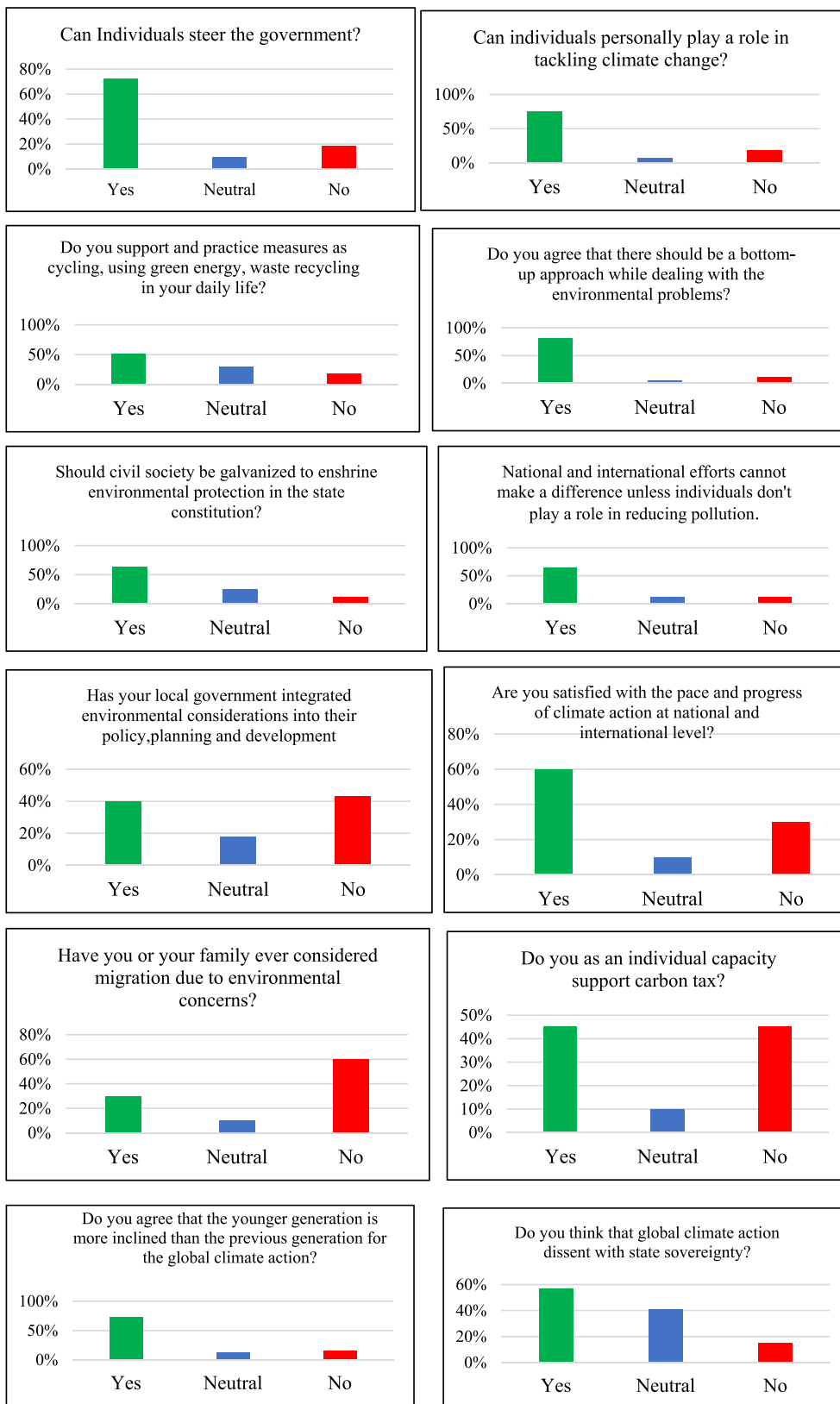


Fig. 1. Public perceptions about environmental challenges from the global south.

#### 4.1. Individual role and bottom-up approach

The role of an individual is important and influences public policies. Individuals can also help in the implementation of sus-

tainable policies. States cannot implement policies without the acceptance of their population. If individuals are aware of the sustainable policies, they can make a stark difference (Jakučionytė-Skodiėnė & Liobikienė, 2021). This can be done through the social

media campaigns and community service work an individual does in his capacity. Individuals can also help the states in promoting environmental and economic policies. Sustainable development, which is the promotion of economic growth while conserving environmental quality for future generations, has emerged as the main idea in environmental policy (Ruggerio, 2021). Individual activities are affecting the environment because if we look through the lens of neoliberalism, individuals are more of the consumers than the citizens of the states. The activities can be the emission of chlorofluorocarbons from the household items that an individual owns, such as carbon emission from cars, not dumping the waste properly (Luo et al., 2021). Environment conservation and sustainable development economic policies were once the duty of the appointed officials but lately, policies and management of the environment are seen as a broader term that requires the communities, individuals, and corporate sector directly involved. The role of the government has changed regarding environmental policy (Thaler & Seebauer, 2019). The change recognizes the contributions of various levels of government like global, regional, and local as well as the roles of the private sector, nongovernmental organizations, and civil society. These levels of governance have emerged which compliments the need for new institutions to overcome the more complex problems of society. Moral values and globalization in terms of the economy have also played a role in this transition of governance (Lau et al., 2021a). Many factors are superior to a government because of the free market's commercial activities. These perceptions consequently stem from privatization, which has diminished the sole influence and ability of governments to directly control their economies (Sholahuddin Al-Fatih et al., 2021).

#### 4.2. Individual level changes

Drop by drop makes a mighty ocean. The efforts of individuals can help the states reduce pollution. It is not possible without collective effort and the actions must be taken from the grassroots level. Personal actions and systemic changes must take place simultaneously (Drouet et al., 2021). This is the binary option for us to save the world. Individuals can indeed take certain actions to reduce climate change, but it is not practical to completely depend on an individual. Individual actions are important but are limited. In this battle against climate change, the powerful personal actions individuals can perform are reducing their carbon footprint and keeping a check on food miles, reducing food waste, and eating the leftovers (Jakučionytė-Skodienė & Liobikienė, 2021). An individual can plant a garden and promote local products. The culturally specific example of individual action in reducing this great global environmental issue is of using pollution-free products, but this thought is flawed. Individual actions can be used as short-term reduction strategies (Jakučionytė-Skodienė & Liobikienė, 2021). The definition of personal actions is needed to be broadened beyond what we buy or consume. Transformation of the lifecycle of an individual is required only of those who are financially and physically capable (Lau et al., 2021b).

#### 4.3. Societal level changes

Measures such as cycling, using green energy, and waste recycling in your daily life indeed create a good difference and influence in society as well as on the mental health of an individual. Humans have a major influence in modifying and conserving the environment. The sustainability of the environment can be determined by the interaction between the environment and mankind (Ruggerio, 2021). To fulfil their daily needs, humans interact with their surroundings. If sustainable steps are not taken by individuals, states, and international communities, future generations will

not be able to meet their needs. Sustainable environmental steps that must be taken depend on the stakeholders (government, local communities, civil society organizations, and the market sector are also included) (Ayre and Callway, 2005). Most developing countries have failed to do their role in managing natural resources because of the lack of a bottom-up approach and the monitoring systems. Civil society support the government and market sectors in processes for environmental management. Civil societies perform environmental research, provide advice for sustainable strategies, and can motivate participatory management of the environment through the involvement of local communities. The financial facility can also be provided by civil society (Lau et al., 2021). They can also create awareness among local communities and influence the public to better natural resource management strategies. Their key role can be to function as watchdogs, monitor, evaluate and ensure effectiveness. Hence, civil society needs to be galvanized to enshrine environmental protection in the state constitution (Lau et al., 2021b).

#### 4.4. Future generation

The young generation is more active and motivated in addressing climate change than the previous one. This generation has witnessed more climate issues. Also, globalization has made this world a global village, and the media and technological advancements do not keep any news hidden. There is still a need of inculcating moral values through academics so that they become able of taking action. More awareness should be given so that every individual plays his part. Awareness in rural areas is also needed to be created (Jeong et al., 2021).

#### 4.5. State sovereignty

Environmental challenges can indeed pose a threat to a state's sovereignty. For instance, if the community is facing issues because of climate change and those issues are not being addressed timely, it will pose a threat of conflict within the state. If the climate issues are not addressed, the population will get deprived of basic human needs, and this deprivation will lead to protracted social conflicts (Suh et al., 2021). Climate change can undermine the state's ability to govern by increasing demands on vital resources that support national security such as water, and food (Molotoks et al., 2021). When the states fail to address their environmental issues, their other neighbouring states get affected by the same issues. This may force the neighboring states to get involved to prevent climate change in the home country, this involvement may pose security and sovereignty threats.

There is an interesting case study of countries which supports this version. Australia is the world's largest exporter of coal. Following the climate protocols of the Paris agreement, the coal era is gradually ending. Now, if coal extraction is blocked, it may result in thousands of jobs being cut among Australians (de Valck et al., 2021). Coal royalties for one state alone, Queensland, approached \$4 billion in 2019. Mining policy can still decide elections in Australia and the present conservation government is determined to do the bare minimum on climate change. (Li et al., 2020).

Brazil is home to the Amazon Forest. Now Amazon forests function as the lung of the world and sink carbon dioxide (Jiang et al., 2018). However, they also provide a livelihood to the inhabitants, wherein timbering is a major source, and areas are being cultivated and brought under settlements. Now, both conflict with each other, if Brazil goes for the greater good of the world by following the climate protocols and policies, it affects its local population in an adverse manner (Fulgêncio-Lima et al., 2021). It has been noticed that there are some concerns against climate policies as these become detrimental to national interests and are considered inter-

ference in internal matters of sovereign states (Carrasco-Torrontegui et al., 2022). Conversely, at the international level, there is criticized a lacking action on Amazon forests (Anthony and Stephen, 2019) and converting the carbon sink to carbon sources in Amazon (Meister and Richwein, 2020). It is a universal notion though debatable that climate change, by exacerbating strains on the natural resources of countries, presents a substantial menace to state sovereignty and the peaceful world order (Mirzaei & Zibaei, 2021).

There are multiple factors which causes environmental challenges in Global South. The coal power plants, motor vehicles, unplanned industrilization are the major contributors to CO2 emissions and smog, which lead to global warming and climate change. Moreover, massive tree cutting in the Global South leads to environmental threat (Kouser, et al., 2022; Sayed et al., 2022). Environmental protection is a major factor in the battle of tackling the environmental challenges. More recently, in global south, Saudi Arabia and Pakistan took the steps of green initiatives to keep the environment green and clean, to control the environmental pollution and climate changes.

## 5. Study strengths and limitations:

This study highlights an important topic on environmental challenges in the Global South and the role of individuals, societies and the role of nations. The present study findings are based on the perceptions of a wide range of people and bring out the perspective from Global South. The main limitation of this study is that this is a questionnaire-based cross-sectional study, hence we cannot establish a causal relationship.

## 6. Conclusions

This study contributes to the literature on environmental challenges by providing a more nuanced picture of the perspective of individuals in the global south on the individual, societal, and state responsibility for climate change. The preferred responsibility distribution is a complex weave of different public and private actors, tasks, and principles. In this study, majority of the participants agreed to support the climate, and believed that the new generation is better suited to ensure that the planet is kept safe from future harm. The results reported here also need to be corroborated on larger sample size studies to enable conclusions about environmental concerns prevailing in the general masses. Environmental management policies are important to provide a gateway for sustainable development achievement. Partnerships and interactions are needed for creating dialogues and discussions over environmental management issues among the stakeholders. Every individual should play a significant role and the government should establish strict laws regarding the environment only then states can achieve their environmental goals internationally.

## 7. Informed consent statement

Informed consent was obtained from the participants.

## CRedit authorship contribution statement

**Abeer A. Al-Masri:** Conceptualization, Data curation, Formal analysis, Investigation. **Khalid Mahmood Shafi:** Conceptualization, Data curation, Formal analysis, Investigation. **Hamna Seyyed:** Data entry and analysis. **Sultan Ayoub Meo:** Manuscript writing and editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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