Doi: 10.32592/jorar.2023.15.3.2

Theoretical Analysis of Human Intervention in the Formation of Climate Change Phenomenon in Iran

Sanaz Sohrabizadeh[1,2], Amirhossein Bahramzadeh[3], Reza Khani Jazani[3]

Date of submission: 24 Jan. 2023 *Date of acceptance: 14 Jun.2023*

Original Article

Abstract

INTRODUCTION: Climate change is a fact that is known globally, and Iran is a country that has been affected by climate events for a long time and is one of the factors that threaten the stability and flexibility of environmental systems, social systems, and quality of life of people. The current study was performed to explain the phenomenon of climate change in Iran based on the experience of experts and key informants.

METHODS: This qualitative research is a content analysis type. To collect data, in-depth interviews were carried out with 9 experts purposefully and it was continued until the data saturation stage was reached. For the reliability of the data, the strategies of validity, verifiability, trustworthiness, and transferability were used.

FINDINGS: According to the results, two main themes were extracted from the data: 1) Acceptors of human intervention in climate change: who believed in the impact of human activities and the existence of consequences of climate change in Iran; 2) Deniers of human intervention in climate change: that continuous change in climate and its changeable nature has existed forever on the planet and is not an issue that is dependent on human intervention.

CONCLUSION: Based on the findings, it is recommended to raise the level of awareness of society about the issue of climate change, along with training the people and organizations associated with climate change management, to reduce and adjust to the consequences of climate change. In addition, it is suggested to perform a phenomenological qualitative study to explain the phenomenon of the intensification of climate change about the interventions of humans in their environment, and the intensification of the consequences of climate change.

Keywords: Climate changes; Human intervention; Iran

How to cite this article: Sohrabizadeh S, Bahramzadeh AH, Khani Jazani R. **Theoretical Analysis of Human Intervention in the Formation of Climate Change Phenomenon in Iran**. Sci J Rescue Relief 2023; 15(3): 169-176.

Introduction

Since the Industrial Revolution in the early 19th century, the increase in the consumption of fossil energy sources such as coal, oil, and natural gas has led to the significant release of greenhouse gases, especially CO2 gas into the atmosphere (1) and on the other hand, changes in the balance of global energy consumption, along with population growth, has created unprecedented environmental problems, including climate change (2). Climate change is defined as a change in the state of the climate, which results in changes in the average or variety of certain characteristics of the climate and can last for a long time, typically several decades or longer, or a regular change in the state of the atmosphere for several decades or further (3).

If the increase in carbon dioxide concentration and rapid climate change continue on the present trajectory, the economies of poor countries will suffer seriously and will probably suffer much

1-Air Quality and Climate Change Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
2-Department of Health in Disasters and Emergencies, School of Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran
3-Safety Promotion and Injury Prevention Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Correspondence to: Amirhossein Bahramzadeh, Email: Amirhoseinbahramzadeh@sbmu.ac.ir

[DOI: 10.32592/jorar.2023.15.3.2]

more economically than rich countries for the following reasons: (a) They are more exposed to very high temperatures; (b) they are heavily dependent on agriculture, natural resource extraction, and other industrial sectors, all of which are affected by climate change; and (c) control measures for risk management are less in poor countries than in rich countries (4). There are big inequalities in terms of greenhouse gas (GHG) emissions, as well as the extent and severity of adverse consequences of climate change among countries. The countries that have the lowest amount of greenhouse gas production will probably have the greatest consequences because of climate change (5). The greatest impact of climate change will occur in poor countries. Consequently, climate change can directly and indirectly lead people to poverty (6), so the average annual growth rate of poor countries is likely to decrease from 3.2% to 2.6% by 2100 (4).

In addition to the above, climate change has deep consequences on human rights and social justice and violates issues such as the right to access to healthy food and water, health, shelter, and security (7). The negative consequences of climate change can threaten the stability and flexibility of environmental and social systems (8) and people's way of life (6,9). Along with the issues raised, several studies have listed climate change as a serious concern in the field of health (10-12). Several pieces of evidence of the impacts of climate change on human health such as heat-related diseases, vector-borne diseases, diarrhea, and respiratory diseases have been proven (13&14). Collective violence and mental health problems can be other impacts of climate change on the health of communities, especially vulnerable groups such as children, the elderly, and the disabled (15-17).

In a study based on 1,000 years data, Zhang and his colleagues drew the following conclusions about the relationship between climate change and violence: 1) In the pre-industrial period in the Northern Hemisphere, climate change and temperature decline led to reduced agricultural production, expensiveness, war, famine and population decrease (18); 2) In Europe between 1560 and 1660, low temperature was the main cause of agricultural and economic disasters (19); 3) The abundance of wars over the past 1000 years in eastern China has been significantly associated with temperature fluctuations, especially during periods of lower temperatures when agricultural production was lower (20).

An important study by Miguel, Satyanath, and Sergenti in 2004 showed that negative rain growth is a tool for predicting increased conflict and the occurrence of internal conflicts (21) such that the study by Burke et al. in 2009 showed a relationship between temperature anomalies and increased risk of civil war in sub-Saharan Africa (22).

The arid and semi-arid climate in Iran is defined by low rainfall and a high potential for evaporation and transpiration, which has been affected by the abnormal conditions of climate change (23). In addition to famines and floods, the condition of underground water resources is also highly at risk due to excessive exploitation - Iran is among the highest exploiters of underground water in the world (24). The flood of 2001 in Golestan province (the largest in a 200 years), affected more than 27,000 people and led to the death of 247 people and the homelessness of almost 10,000 people in Golestan province; This event is regarded as the most devastating flood in the history of Iran (25&26). In general, Iran faces serious challenges both in terms of long-term famine and floods (27). Currently, there is a basic consensus that human behavior plays an essential role in climate change, such that 97% of climatologists believe that climate change is caused by human activities, especially the combustion of fossil fuels and deforestation of tropical areas (28). The adoption of unsustainable land use policies and practices has led to unsustainable agriculture and deforestation, the result of which is the acceleration of desertification and climate change (29) In addition, inappropriate land use policies such as deforestation, improper use of soil, and overexploitation of natural resources have led to the destruction of the environment, which exacerbates the adverse effects of climate change (30).

To control and adjust the effects of climate change, planning, and policies are focused on reducing greenhouse gas emissions produced by energy, transportation, industry, and agriculture, and public health is often ignored in these plans (31-33). However, since the goal of many climate adaptation policies is to protect human well-being, public health is a natural driver of adaptation programs (34). Sustainable land use centered on family farming is a policy that can be the key to eradicating poverty and promoting food security

[DOI: 10.32592/jorar.2023.15.3.2]

and adaptation to climate change in deprived areas (29).

Iran is a country that has long been affected by climate events such as famines, floods, dust storms, air pollution, and extreme heat, so different aspects of the climate change phenomenon must be understood in Iranian society. The present study has been explained to investigate the difference of opinions related to the phenomenon of climate change and based on the experience of experts and key informants, it analyzes the phenomenon of climate change in Iran. These findings can be used in future planning and policy-making, as well as in choosing adaptive strategies to cope with the consequences of climate events.

Methods

This qualitative research is a conventional content analysis type (35&36). In this study, a qualitative approach was used to understand the experiences and personal views of the participants. This qualitative method was used to develop further research by identifying relevant variables and creating new research questions (37). This method is one of the methods used to analyze written data extracted from interviews (38).

The participants in this research were researchers, experts, and managers related to the field of climate change, including climatology, health in disasters and emergencies, environment, ecology, and sociology of disasters. All participants had academic education and scientific and practical experience related to climate change. To select participants in the research, the purposeful sampling method was used and the number of participants was determined based on the principle of data saturation. Accordingly, data saturation was achieved after 8 interviews, and one more interview was conducted to ensure the absence of new concepts. Therefore, the total number of participants in the research was 9 people.

Data were collected through semi-structured in-depth interviews that were conducted face-to-face at the participants' workplaces. Each interview lasted between 60 and 100 minutes. To motivate participants to describe their experiences and perceptions, respondents were invited to talk freely about their perceptions and experiences of climate change. All interviews were audio recorded and transcribed verbatim. Each interview was immediately analyzed and the analyzed information became a guide for further data collection.

Data collection and analysis were done simultaneously. For data analysis, content analysis was used with an inductive approach according to the following steps (35): 1) The interviews were read several times to get a general understanding of them; 2) Important sentences were recognized as meaningful units; 3) Meaningful units were condensed into shorter units while keeping the original content; 4) Condensed meaningful units were summarized and coded, and coding quality control was performed by peer review; 5) Different codes were compared to identify differences and similarities and divided into two themes and four categories, and quotes were used to highlight common perceptions and experiences.

Reliability strategies in qualitative studies are equivalent to validity and reliability in quantitative studies. To ensure the reliability of the data, the strategies of validity, trustworthiness, verifiability, and transferability were used. To achieve the criteria of credibility and trust, two approaches of review by the participant and evaluation of the analysis process by peers were used. Regarding member checking, participants were asked about ambiguous terms or possible misconceptions at the time of the interview. In peer review, the data analysis process was independently controlled by a researcher who was not involved in the research project. In order to achieve verifiability and transferability, details of the working method were also provided and a detailed description of the study process was done (39).

Findings

The average age of the participants was 59 years and they had an average of 22 years of scientific-executive experience. Of these, 77.77% were men and 22.22% were women, and all participants had university education at the doctorate level (Table 1).

After analyzing the data, two main themes were extracted: 1) the acceptors of human interference in climate change, including the impact classes of human activities and the existence of consequences of climate change in Iran; and 2) deniers of human intervention in climate change, including categories of continuous climate change and the modifiable nature of climate (Table 2).

[DOI: 10.32592/jorar.2023.15.3.2]

Table 1. Demographic information of the participants

Row	Name	Gender	Age	Education	Work Experience	Specialty
1	Participant 1	Man	76	PhDs	39	Physical Geography(climatology)
2	Participant2	Man	54	PhDs	31	seismologists
3	Participant3	Woman	68	PhDs	25	Physical Geography(climatology)
4	Participant4	Man	60	PhDs	20	Physical Geography(climatology)
5	Participant5	Man	56	PhDs	12	Physical Geography(climatology)
6	Participant6	Man	67	PhDs	21	Physical Geography(climatology)
7	Participant7	Man	63	PhDs	31	Physical Geography(climatology)
8	Participant8	Man	47	PhDs	11	Physical Geography(climatology)
9	Participant9	Woman	41	PhDs	12	meteorology

Table 2. Themes, categories, and subcategories extracted from data

Theme	Category	Subcategory
Climate change acceptors	Human activities	Human interventions
		Changes in land and atmospheric parameters
	The effects of climate change	Economic-social effects
		Health effects
		Political influences
		Risk of natural disasters
Climate change deniers	Continuous change in climate	Changes in climatic variables
		Frequent weather event
	Changeable nature of climate	The natural behavior of weather
		Changeability of the phenomenon

Climate change deniers

This theme included two categories: continuous climate change and the changeable nature of climate.

1- Continuous climate change: Several participants believed that there has been a change in the earth's climate since the creation of the earth. That is, the current climate of Iran is caused by normal changes on the earth and atmospheric parameters, and the phenomenon of climate change is the natural behavior of nature in Iran. They rejected the emergence of climate change as a new phenomenon in recent decades. One participant said: Since climate change has been a natural phenomenon in nature, the emergence of climate change is a non-professional statement that is widely accepted. (P1)

2- Changeable nature of climate: Several participants stated that the word “change” should not be used alongside the word “climate”. Instead, the word “fluctuation” can be used and the term “climate fluctuations” can be the best representation of all climate behavior. Some participants stated that climate change is a recurring phenomenon that has been repeated for many periods in Iran.

Climate change acceptors

This theme included two categories of human activities and the consequences of climate change.

1) Human activities: Human interventions have facilitated the emergence of climate change in Iran. Human activities have led to global warming mainly through the destruction of forests, consumption of fossil fuels, air and sea pollution, industrial activities, greenhouse gases, and excessive population growth. Global warming has been mentioned as a new challenge caused by human interventions in Iran and other countries. The significant growth of population in the world can be seen as the main reason for global warming, which has also affected Iran. One of the interviewees stated: that humans destroyed ecosystems to seek their profit. No one thinks about the consequences of their activities, which can cause global warming and threaten human life (P2). Air pollution can be considered one of the most important climate challenges of several cities in the center of Iran. Air pollution can be a sign of warming the air and lead to an increase in temperature. Climate changes have directly and indirectly affected Iranian society in different ways. Categories of economic, social, health, environmental, and political effects were extracted as the points affected by climate change in Iran.

2) Consequences of climate change: In Iran, the dearth of rain along with extreme weather events has led to increased energy consumption,

[DOI: 10.32592/jorar.2023.15.3.2]

reduced water resources and the spread of drought, which has weakened vital sectors including agriculture and manufacturing and processing industries that are dependent on the agricultural sector. Accordingly, unemployment and high living costs have led to increasing poverty in Iran, especially in rural areas that depend on agricultural and livestock production. A participant stated: The cycle of climate change, unemployment, and poverty has increasingly repeated in society and has led to more poverty. For example, we have lost our agricultural capacity due to warming and drought (P5).

Poverty has been the most important economic consequence of climate change in Iran. Poverty caused by climate crises has created unfavorable conditions for people's livelihoods, which has led to the forced migration of residents of these areas. For example, increased crime, insecurity, marginalization, fake jobs, and poor social connections have been cited as important consequences of the disaster of poverty. An interviewee pointed out that drought has led to migration and urban marginalization in some areas such as Sistan in the southeast of Iran, and the increase of marginalized people in cities has led to poverty, crime, and insecurity. (P7)

In Iran, climate change can affect people's health through various climate-related challenges, including limited sources of clean water, dust storms, air pollution, and food insecurity. For example, scarcity of healthy water sources due to drought and temperature increase can increase diseases transmitted through vectors and chronic kidney disease due to dehydration. In addition, dust storms have caused acute and chronic respiratory diseases and cancer in affected areas such as Khuzestan province. All the socio-economic and environmental challenges of climate events will lead to numerous mental health problems among the affected people. For example, climate-related migrations and displacements are likely to cause depression, anxiety, and stress disorders among IDPs who are forced to migrate due to livelihood challenges in their home regions, one participant noted:

Malnutrition and physical and mental problems have been reported in some areas affected by the drought. In addition, dust storms have led to an increase in respiratory diseases among affected people living in western Iran (P9).

Internal and external conflicts can be considered as important political consequences of climate change in Iran. For example, the water crisis has led to internal conflicts among farmers in Yazd and Isfahan provinces regarding the use of shared water resources. In addition, there have been external conflicts regarding shared water resources (Tigris and Euphrates) between Iran and some neighboring countries (Iraq). The current dust storms in Khuzestan province have created many conflicts between the affected residents and the government, which ultimately led to a crisis.

Since the affected cities and villages are evacuated due to the drought, the security of the country can be threatened. This migration has led to marginalization, events of war, and terrorism among the host and displaced population and has made many areas insecure. One of the participants said: That conflict and war over water will be an important challenge in Iran due to the consequences of climate change. Dust storms have recently caused internal and external conflicts (P4).

Climate change has increased the frequency and magnitude of natural disasters in Iran. For example, the increase in the earth's temperature and dearth of rainfall has led to an increase in floods and droughts in Iran. In addition, low vegetation cover as well as extreme heat is probably the cause of dust storms in the western and southern regions of Iran. The melting of ice sheets on Earth could activate faults and cause earthquakes in some areas. The drying up of several rivers and lakes and deforestation, especially of the Zagros forests, can accelerate flooding. A participant who was an experienced geologist stated: It is likely that climate change will increase the frequency and magnitude of future earthquakes in Iran. One scenario is the melting of natural ice that may activate the faults.

Discussion and Conclusion

The current research was conducted to explain the phenomenon of climate change in Iran based on the experience of key experts. Two themes of climate change acceptors and climate change deniers were extracted from the data. Climate change deniers believe that the nature of climate is changeable and stable for a long time. However, climate change acceptors pointed out the important role of human interventions as well as the effects of climate change on society.

Climate change deniers are divided into two categories: 1) continuous climate change and 2)

[DOI: 10.32592/jorar.2023.15.3.2]

the changeable nature of climate. The first group believes that climate change has been an old natural phenomenon in the world and is not a new issue. Traces of this theory can be found in the political decisions of other countries, like the decision of the president of the United States of America to withdraw from the Paris Agreement in 2001 (40). The second group believes that climate has a changeable nature and that word “change” is an exaggeration of climate fluctuations, this group attributes climate phenomena to inevitable or natural causes and exaggerates the effect of human interference (41).

Acceptors of climate change are put in two categories: 1) human activities and 2) the consequences of climate change. Among the acceptors of climate change, a significant number were in the first category and agreed that what has appeared as climate change is the result of current human activities. For example, excessive use of fossil fuels and emission of greenhouse gases can be important causes of global warming and sea level rise (42). Based on this, human interventions may intensify the effects of climate change in Iran. For example, deforestation and destruction of vegetation along with extremely hot weather probably caused dust storms in the western regions of Iran (43).

According to the findings, the second class of climate change acceptors referred to social, economic, health, environmental and political effects that affect people's way of life. The socio-economic consequences of climate change have led to a decrease in the annual economic growth rate of poor countries from 3.2% to 2.6% (7) and have been a driving force in increasing migration and conflict rates (44). Our data showed that the most political effects of climate change in Iran are likely to be serious conflicts over water. Articles have reported that climate change is one of the factors associated with collective violence (15) and similarly, the findings of this study showed that poverty related to climate may lead to crime, violence and other anti-social behavior.

Regarding the health consequences of climate change according to our findings, heat-related disorders, vector-borne, food- and water-borne diseases, respiratory and allergic disorders, malnutrition, and mental health problems were reported in various climate change studies (7). ,16,17,45,46). The health of vulnerable groups such as children, the elderly, pregnant women, and the disabled are likely to be more at risk in areas affected by climate change (12,47). According to the findings, climate change can trigger the risk of weather disasters. Evidence has shown that there is a clear relationship between climate change and an increase in weather-related disasters (48). Climate dangers affect people's welfare through death and injuries and reduce the flexibility of communities (9), which must be managed by reducing vulnerabilities and increasing coping capacities.

Due to the approach of the researchers in the interviews, it was possible for all the participants to freely express their opinions and experiences, which is one of the most important strengths of this research. One of the limitations of this study could be the possibility of not covering the opinions of all climate change experts due to the small sample size. In addition, the results may not be comparable with studies conducted with a quantitative approach.

It was found that climate change has only been raised by some experts as a hot topic for scientific discussions and without any effort to reduce its effects on people's lives. Although climate change has been denied by some governments and politicians, it directly and indirectly affects the quality and way of human life in various ways, therefore, in the current situation, informing about the consequences of climate change, especially in different classes of society, should be taken into consideration and the current study can affect the perceptions of the communities about climate change. It is specifically suggested to plan strategies to reduce the effects of climate change. One of the most important strategic measures is to increase the sensitivity of society regarding the issue of climate change. In addition, more research based on the body of society can lead to information to know and reduce the effects of climate change.

Acknowledgments

This study was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences, Tehran, Iran (ethical code: IR.SBMU.RETECH.REC.1395.416.

Informed consent: All participants signed a written consent form. During and after the research, the principle of confidentiality and privacy of individuals was respected and the personal information of the participants in the study was used only in this research.

[DOI: 10.32592/jorar.2023.15.3.2]

Conflict of Interests

They have no conflict of interest.

References

1. Amiri MJ, Eslamian SS. Deficit irrigation is the way to improve water productivity in agriculture. In: Agriculture in Zagros region and adaptation for sustainable development. Yasoj Islamic Azad University; 2009.
2. Amiri MJ, Eslamian SS. Investigation of Climate Change in Iran. J Environ Sci Technol 2010; 3(4): 208-16.
3. Naderi M, Raeisi E, Zarei M. The impact of halite dissolution of salt diapirs on surface and ground water under climate change, South-Central Iran. Environ Earth Sci 2016; 75(8): 708.
4. Moore FC, Diaz DB. Temperature impacts on economic growth warrant stringent mitigation policy. Nat Clim Chang 2015; 5(2): 127–31.
5. Patz JA, Gibbs HK, Foley JA, Rogers J V, Smith KR. Climate change and global health: quantifying a growing ethical crisis. Ecohealth 2007; 4(4): 397–405.
6. Hallegatte S, Fay M, Barbier EB. Poverty and climate change: introduction. Environ Dev Econ 2018; 23: 217–33.
7. Levy BS, Patz JA. Climate change, human rights, and social justice. Ann Glob Heal 2015; 81(3): 310–22.
8. Nkoana EM. Climate change adaptation tools at the community level: an integrated literature review. Sustainability 2018; 10(796): 1–21.
9. O'Brien G, O'Keefe P, Wisner B. Climate change and disaster management. Disasters 2006; 30(1): 64−80.
10. Frumkin H, Hess J, Luber G, Malilay J, McGeehin M. Climate Change: The Public Health Response. Am J Public Health 2008; 98(3): 435–45.
11. Haines A, Kovats RS, Campbell-Lendrum D, Corvalan C. Climate change and human health: Impacts, vulnerability and public health. Public Health 2006; 120(7): 585–96.
12. Ahdoot S, Pacheco SE. Global climate change and children's health. Pediatrics 2015; 136(5): 992-7.
13. Hess JJ, McDowell JZ, Luber G. Integrating climate change adaptation into Public Health Practice: Using Adaptive Management to Increase Adaptive Capacity and Build Resilience. Environ Health Perspect 2012; 120(2): 171–9.
14. Campbell-Lendrum D, Woodruff R. Comparative Risk Assessment of the Burden of Disease from Climate Change. Environ Health Perspect 2006; 114(12): 1935–41.
15. Levy BS, Sidel VW, Patz JA. Climate change and collective violence. Annu Rev Public Health 2017;38:241–57.
16. Paavola J. Health impacts of climate change and health and social inequalities in the UK. Environ Heal 2017; 16: 61–76.
17. Stewart AJ. Psychiatry's Role in responding to climate change. Acad Psychiatry 2018; 42: 327–8.
18. Zhang DD, Brecke P, Lee HF, He YQ, Zhang J. Global climate change, war, and population decline in recent human history. Proc Natl Acad Sci 2007; 104(49): 19214–9.
19. Zhang DD, Lee HF, Wang C, Li B, Pei Q, Zhang J, et al. The causality analysis of climate change and large-scale human crisis. Proc Natl Acad Sci 2011; 108(42): 17296–301.
20. Zhang DD, Zhang J, Lee HF, He Y. Climate change and war frequency in Eastern China over the Last Millennium. Hum Ecol 2007; 35(4): 403–14.
21. Miguel E, Satyanath S, Sergenti E. Economic shocks and civil conflict: an instrumental variables approach. J Polit Econ 2004; 112(4): 725–53.
22. Burke MB, Miguel E, Satyanath S, Dykema JA, Lobell DB. Warming increases the risk of civil war in Africa. Proc Natl Acad Sci 2009; 106(49): 20670–4.
23. Alizadeh-Choobari O, Najafi MS. Extreme weather events in Iran under a changing climate. Clim Dyn 2018; 50(1): 249–60.
24. Döll P, Müller Schmied H, Schuh C, Portmann FT, Eicker A. Global-scale assessment of groundwater depletion and related groundwater abstractions: Combining hydrological modeling with information from well observations and GRACE satellites. Water Resour Res 2014; 50(7): 5698–720.
25. Sharifi F, Samadi SZ, Wilson C. Causes and consequences of recent floods in the Golestan catchments and Caspian Sea regions of Iran. Nat Hazards 2012; 61(2): 533–50.
26. Modarres R, Sarhadi A, Burn DH. Changes of extreme drought and flood events in Iran. Glob Planet Change 2016; 144: 67–81.
27. Madani K. Water management in Iran: what is causing the looming crisis? J Environ Stud Sci 2014; 4(4): 315–28.
28. Patz JA, Frumkin H, Holloway T, Vimont DJ, Haines A. Climate Change. JAMA 2014; 312(15): 1565-80.
29. Niemeyer J, Vale MM. Obstacles and opportunities for implementing a policy-mix for ecosystem-based adaptation to climate change in Brazil's Caatinga. Land Use Policy 2022; 122: 106385.
30. Scarano FR. Ecosystem-based adaptation to climate change: concept, scalability and a role for conservation science. Perspect Ecol Conserv 2017; 15(2): 65–73.
31. Georgeson L, Maslin M, Poessinouw M, Howard S. Adaptation responses to climate change differ between global megacities. Nat Clim Chang 2016; 6(6): 584–8.
32. Aylett A. Institutionalizing the urban governance of

[DOI: 10.32592/jorar.2023.15.3.2]

climate change adaptation: Results of an international survey. Urban Clim 2015; 14: 4–16.
33. Araos M, Austin SE, Berrang-Ford L, Ford JD. Public Health Adaptation to Climate Change in Large Cities. Int J Heal Serv 2016; 46(1): 53–78.
34. Watts N, Amann M, Ayeb-Karlsson S, Belesova K, Bouley T, Boykoff M, et al. The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health. Lancet 2018; 391(10120): 581–630.
35. Graneheim U, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today 2004; 24(2): 105-2.
36. Elo S, Kyngäs H. The qualitative content analysis process. J Adv Nurs 2008; 62(1): 107–15.
37. Sohrabizadeh S. A qualitative study of violence against women after the recent disasters of Iran. Prehosp Disaster Med 2016; 31(4): 407–12.
38. Shiri T, Azimi N. A comparative study of qualitative content analysis and hermeneutics.JSS 2013; 4(15): 79–99.
39. Shenton AK. Strategies for ensuring trustworthiness in qualitative research projects. Educ Inf 2004; 22(2): 63–75.
40. Park JD, Nishitani K, Kokubu K, Freedman M, Weng Y. Revisiting sustainability disclosure theories: Evidence from corporate climate change disclosure in the United States and Japan. J Clean Prod 2023; 382: 135203.
41. Rasulo M. Dialogic patterns of the oppressor-oppressed dynamic in climate change denial. J Pragmat 2022; 189: 147–59.
42. Franchini M, Mannucci PM. Impact on human health of climate changes. Eur J Intern Med 2015; 26: 1–5.
43. SDS. Sand and Dust Storms in Asia and the Pacific: Opportunities for regional cooperation and action. Bangkok; 2018. Available from: https://www.unescap.org/sites/default/files/UNESCAP SDS Report_1.pdf
44. Burrows K, Kinney PL. Exploring the Climate Change, Migration and Conflict Nexus. Int J Environ Res Public Health 2016; 13(4): 443.
45. Rudolph L, Gould S. Climate Change and health inequities: a framework for action. Ann Glob Heal 2015; 81(3): 432-44..
46. Hayes K, Blashki G, Wiseman J, Burke4 S, Reifels L. Climate change and mental health: risks, impacts and priority actions. Int J Ment Health Syst 2018; 12: 28.
47. Robichaud P. Is ignorance of climate change culpable? Sci Eng Ethics 2017; 23: 1409–30.
48. Birkmann J, Teichman K. Integrating disaster risk reduction and climate change adaptation: key challenges-scales, knowledge, and norms. Sustain Sci 2010; 5: 171–84.

[DOI: 10.32592/jorar.2023.15.3.2]