

# Review Paper

## A Systematic Literature Review Protocol on Climate Change Perception Models



Nasir Amanat<sup>1</sup> , Ali Valinejadi<sup>2</sup> , Younes Mehrifar<sup>3\*</sup> , Mohsen Poursadeqiyani<sup>4\*</sup>

1. Department of Emergency Nursing, School of Nursing and Midwifery, Semnan University of Medical Sciences, Semnan, Iran.
2. Social Determinants of Health Research Center, Semnan University of Medical Sciences, Semnan, Iran.
3. Department of Occupational Health, School of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
4. Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran.



**Citation** Amanat N, Valinejadi A, Mehrifar Y, Poursadeqiyani M. A Systematic Literature Review Protocol on Climate Change Perception Models. *Journal of Advances in Environmental Health Research*. 2022; 10(3):197-204. <http://dx.doi.org/10.32598/JAEHR.10.3.1254>  
 <http://dx.doi.org/10.32598/JAEHR.10.3.1254>



### Article info:

Received: 06 Nov 2021  
Accepted: 18 Feb 2022  
Publish: 01 Jul 2022

### Keywords:

Climate change, Perception, Models

## ABSTRACT

The impacts of climate change can have many facets which are not directly felt. Climate change causes crucial political, economic, and social problems in our world. Inadequate public perceptions of climate change have resulted in little global response to climate change. This systematic review protocol examines existing perception models. First, we searched 3 databases, including PubMed, Scopus, and Web of Science, as well as Google Scholar as a search engine for all documents on the topic words “climate change”, “risk perception”, and “model” and their synonyms in medical subject headings (MESH). All types of journal articles were assessed. No date and language limitations were applied. The articles were evaluated by two independent persons. The results show that in recent years, the number of studies on climate risk perception across countries has increased compared to the total number of scientific publications. In addition, the number of climate change risk perceptions was higher than in other models. Our findings showed that until now, no systematic review has been conducted for models, features, and components of climate change perception. This is the first comprehensive study to assess climate change risk perception models (CCRPM). This study presents climate change perception models.

### \* Corresponding Authors:

Younes Mehrifar, PhD.

**Address:** Department of Occupational Health, School of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

**Phone:** +98 (919) 3700576

**E-mail:** ymehrifar@yahoo.com

Mohsen Poursadeqiyani, PhD.

**Address:** Social Determinants of Health Research Center, Ardabil University of Medical Sciences, Ardabil, Iran.

**Phone:** +98 (912) 7296715

**E-mail:** poursadeghiyan@gmail.com

## 1. Introduction

The impacts of climate change can occur multifaceted [1] and these threats are not directly experienced [2]. Climate change is the core of all external, complex [3], environmental and uncertain problems affecting human health [4] while it is the greatest global health threat of the 21<sup>st</sup> century [5]. Climate change will lead to the displacement of 150 million people in the world over the next 50 years [6]. If the occurrence of climate change is not believed and perceived as a threat, no measures may be taken to mitigate its impact and develop adaptability [7].

The impacts of climate change are linked to poverty and marginalization [8] and have the most severe health effects on vulnerable and poorer populations [9]. Some crucial international frameworks, such as the Sendai framework, the United Nations (UN) framework convention on climate change, and the sustainable development goals of the United Nations emphasize climate change response policies [10, 11]. Sendai's top priority is understanding disaster risk [11]. Risk perception is a subjective assessment [12] and should assess people's perceptions of climate change [13].

Perception of climate change is influenced by individual factors, such as individual experiences and memories of climate events, and various biases [14]. To date, the climate change perception of Van der Linden [15] has been one of the most successful climate change risk perception models (CCRPM), predicting 68% of the variance in climate change risk perceptions. Although the climate change perception was originally tested on a nationally representative sample of the UK population [16], Xie et al. [17] reproduced climate change perception among representative samples of the Australian population, a population that again accounts for 68% of the variance [18]. Hence, cultural processes and structures can be considered major social barriers to be adapted to climate change [19], which are influenced by cultural dimensions [20], personal experiences, and characteristics of people living in cultural contexts and merged with people's attitudes and behaviors [21].

Despite significant advances in understanding the psychological underpinnings of risk perception, little is known about how it applies to climate change [22]. In the model of climate change behavioral intention with nomadic herders in Mongolia was done, the results showed two pathways to climate change behav-

ioral intentions. firstly, community norms regarding climate change activities are directly related with climate change behavioral objectives. and secondly resource loss, biosphere values, and climate change information were associated with constructive stress response, which was connected with climate change risk perceptions [23].

The concept of climate change perception is a framework that has psychological dimensions and comprised predictor variables that are described in continue. Climate change risk perceptions can be defined as a function of cognitive features (i.e., information around climate change), empirical process (i.e., personal experience), and socio-cultural impacts (including societal customs), which finally control key sociodemographic features [18].

The conceptual model derived from Sanders's study on psychosocial determinants of climate change risk perception showed that comprehensive CCRPM can explain approximately 70% of the risk perception variables [16]. Mental models play the main role in problem solving and are at the center of climate change risk perception [24]. It seems necessary to conduct a comprehensive systematic review research to examine the indicators and factors influencing people's risk perception in applying the existing models in different situations and cultures. To develop adaptation policies and measures for climate change, awareness of the general attitudes, beliefs, and perceptions of risks of climate change is necessary [25]. By increasing the public risk perception, communities influence political processes and advance toward the development of climate change policies [26]. To understand the effect of climate change risk perception on life and to choose a strategy for the future, it is essential to study how people perceive the risk of climate change. Therefore, the use of appropriate models can be helpful.

The purpose of this study is to investigate the indicators and factors affecting people's risk perception in various climate change models. Previous research has shown that it is essential to know beliefs, opinions, cultural and religious dimensions, and organizational similarities to effectively and effectively address climate change risks. And based on community values, we can adapt and improve the conditions of our communities and those affected by climate change. This study aims to review CCRPM which significantly contributes to the body of knowledge on the characteristics and indicators of more efficient and effective models of people's perception of climate change and will be helpful for stake-

holders in decision making and valuable in planning to mitigate the impacts of climate change.

## 2. Materials and Methods

### Primary goals

Determination and identification of indicators (effective factors) of public risk perception in climate change models: To identify model indicators of climate change risk perception; to review existing models of climate change risk perception

### Secondary goals

To identify components of climate change risk perception in drought, weather hazards, and other climate change-associated hazards, and to appraise and compare available different models of climate change risk perception

### Study registration

This systematic review study is conducted using the preferred reporting items for systematic reviews and meta-analyses (PRISMA) protocol. [Figure 1](#) shows the protocol used to select the articles.

### Eligibility criteria

This study includes all articles and documents related to elements and conceptual models of climate change perception from 2000 to 2021. We will not consider any limitations in languages and type of study. This content may include all studies related to climate change perception, such as drought, flood, weather events, and so on. This study is conducted and reported according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) model.

### Participants

In this study, no one participates; instead, it has climate change perception models.

### Search strategy

We obtained articles for this systematic review using a three-step procedure. The search strategy is broad and articles containing climate change perception data were selected. First, [Scopus](#), [PubMed](#), [Web of Science](#), databases, as well as [Google Scholar](#) engine were searched for articles. The time frame for inclusion in this systematic review will be from 2000 to July 2021. In the second phase, a comprehensive electronic database was

explored grey literature, such as conferences' abstracts and reports related to climate change risk perception. And, finally, the reference lists were searched for relevant studies not included in our search. The mentioned databases were examined without any limitation on the type of documents. To develop our search strategy, we run the medical subject headings (MESH) search strategy from [PubMed](#). In the next step, the searches are performed using the title tag by keyword and keyword combination in the specified database.

### Study syntax in databases

**PubMed:** (Theory [title]) or (framework [title]) or (pattern [title]) or (model [title]) and ("risk perception" [Title]) or (understanding [title]) and ("climate change" [title]) or ("global warming" [title]) filters: Full text, meta-analysis, review, systematic review, from 2000/1/1 to 2021/1/1.

**Scopus:** Title (theory) or title (framework) or title (pattern) or title (model) and title ("risk perception") or title (understanding) and title ("climate change") or title ("global warming") and pubyear > 1999 and pubyear < 2021.

**ISI Web of Science:** # 4: # 3 and # 2 and # 1

Indexes = Source citation index (SCI)-expanded, social sciences citation index (SSCI), arts & humanities citation index (A & HCI), emerging sources citation index (ESCI).

Timespan = 2000-2020

# 3: Title: ("climate change") or title: ("global warming")

Indexes = SCI-expanded, SSCI, A & HCI, ESCI

Timespan = 2000-2020

# 2: Title: ("risk perception") or title: (understanding)

Indexes = SCI-expanded, SSCI, A & HCI, ESCI

Timespan = 2000-2020

# 1: Title: (Theory) or title: (framework) or title: (pattern) or title: (model)

Indexes = SCI-expanded, SSCI, A & HCI, ESCI

Timespan = 2000-2020

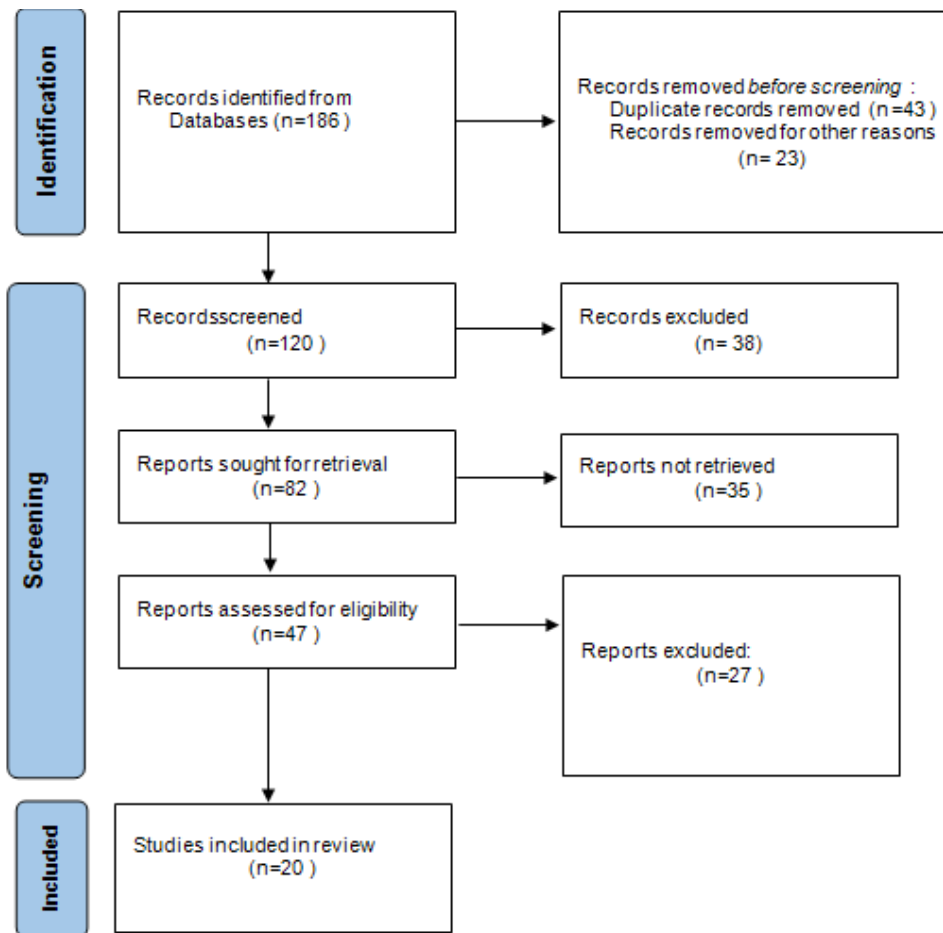


Figure 1. PRISMA flow diagram of the article selection process

**Google Scholar:** Allintitle: “climate change” or “global warming” and “perception” or understanding and pattern or model or theory or framework

**Study register**

In the first step, duplicated studies are removed by the researchers, and secondly, we study article titles to select relevant articles. In the third step, reviewed abstracts and papers that do not satisfy selection criteria will be removed. Relevant data will be extracted separately by the two reviewers and any disagreements between them will be resolved via group discussion. In case of disagreement, a third party is required to resolve the issue. In addition, references to articles from other relevant studies are cited. In addition to reference books, legal documents should also be considered to find relevant data. Finally, we reviewed and extracted, and analyzed the full content of all the articles and related articles.

**Data collection**

After selecting a specific article, the researcher extracts and collects data from the entire text. Each reviewer fol-

lows a pre-developed form. Variables include the type and purpose of the study, research questions, methodology, model used, study date and the target group model (organizational or social), elements of the model, strengths, and weaknesses, and degree of criticism of the model.

**Risk bias**

A given tool cannot be used to assess methodological quality at this stage because no restrictions are applied on the study type. Therefore, the form completed by the researcher is used to evaluate the quality of the model. At this stage, each model was evaluated independently and individually according to its respective evaluation tool. Disagreement between the two researchers on the quality of the paper is resolved by consensus, and if the disagreement persists, the third researcher asks for opinions on the quality of the study.

**Handling missing data**

If we need more data from the original article that is not mentioned, we tried to contact the corresponding author

via e-mail. After 3 times, if we do not get any response from them, that article will be removed from our study.

### Data analysis

Qualitative content analysis was used to analyze the data. This study will extract and examine indices of climate change perception. These models will be categorized based on variables, correlation, kinds, and the efficiency of models.

### 3. Results and Discussion

Table 1 lists the final studies selected by the authors, model type, publication year, and sample size. In recent years, studies related to climate-related risk perception have increased compared to the total number of scientific publications.

**Table 1.** Overview and classification of studies extracted from the systematic literature research

Model	Title	Sample Size	Ref.
Local climate change risk (LCCR) model	Does it matter if people “personally experience” global warming, and if so how?	765	[27]
	The interplay between knowledge, perceived efficacy, and concern about global warming and climate change: A one-year longitudinal study	269	[28]
Moderated mediational analysis (SEM) model	Individualist-collectivist differences in climate change inaction: The role of perceived intractability	162	[29]
	A risk perception model of climate change for university students	125	[30]
Gateway belief(GB) Model	The influence of personality traits on attitudes towards climate change: An exploratory study	194	[31]
	Mindfulness, pro-environmental behavior, and belief in climate change: The mediating role of social dominance	279	[32]
	Mindfulness increases the belief in climate change: The mediating role of connectedness with nature	115	[33]
	Human values and beliefs and concern about the climate change: A Bayesian longitudinal analysis	308	[34]
	The gateway belief model: A large-scale replication	6031	[35]
Domain-context-behavior (DCB) model	The Social-psychological determinants of climate change mitigation intentions and behaviours: A domain-context-behavior (DCB) model. Doctoral dissertation,	501	[36]
Climate change risk perception (CCRP) model	American risk perceptions: Is climate change dangerous?	763	[37]
	Climate change risk perception and policy preferences: The role of affect, imagery, and values	902	[38]
	How and when higher climate change risk perception promotes less climate change inaction	456	[39]
	Climate change risk perceptions, facilitating conditions and health risk management intentions: Evidence from farmers in rural China	1531	[40]
	A changing climate in the Maple syrup industry: Variation in Canadian and U.S.A. producers' climate risk perceptions and willingness to adapt across scales of production	714	[41]
	Drivers of flood and climate change risk perceptions and intention to adapt: An explorative survey in coastal and delta Vietnam	354	[42]
	The role of climate change risk perception, response efficacy, and psychological adaptation in pro-environmental behavior: A two-nation study	6521	[43]
	A social trap for the climate? Collective action, trust, and climate change risk perception in 35 countries	36433	[44]
	Climate change beliefs, risk perceptions, and adaptation behavior among Midwestern U.S. crop farmers	500	[45]
	Predictors of public climate change awareness and risk perception around the world	22438	[46]

According to [Table 1](#), out of 21 studies conducted, 2 studies were conducted in the field of local climate change risk, 2 studies in the field of moderated mediational analysis, 5 studies in the field of gateway belief, 1 study in the field of domain-context-behavior, and 10 studies in the field of climate change risk perception. The first significant increase in the number of absolute studies occurred in 2017, shortly after excessive global warming and melting of Antarctic glaciers, floods, and storms.

This study was conducted to investigate existing models of climate change perception around the world. Widespread awareness of climate change reduces the underestimation or overestimation of risks and the powerlessness to take action. There are currently different types of climate change perception models with different elements and accessories [46, 47]. This systematic review provides detailed information about the patterns and components of climate change perception in the context of different communities and risk factors.

A combination of results, features, and limitations of the model are also considered. Screening of articles using pre-selected keywords has helped to explore quality literature and findings in the form of research gaps, future research avenues, and conceptual frameworks. In the initial search, articles with relevant keywords are included in the study, and then the quality of the articles is checked by two raters. To develop an integrated model, it seems necessary to identify the components, models, and risk perception of climate change, as well as examine their strengths and weaknesses to develop a comprehensive model. As the use of climate change perception models increases, so does the researcher's knowledge [48].

This study is one of the first studies to develop a comprehensive model of climate change risk perception that distinguishes between factors, patterns, structures, and interactions between them and ultimately leads to the creation of a new approach to risk perceptions in the climate change structure for disaster managers and policymakers to plan and enhance the risk management process. Our study contributes to the climate change perception literature in two ways. First, it provides a complete picture of climate change patterns and risk perception. Second, the climate change risk perception framework and derived future research directions provide a model for researchers interested in climate change risk management.

Due to the complexity of the methodology, this research can be used to develop operational models to optimize and apply climate change risk perception management, effective and timely response, and reduce its

consequences. Although the targets of this examination had strengths, there are a few limitations. Even though the danger notion is thought to be a prerequisite for action, the alternate danger notion will not always result in taking primary and critical actions. Additionally, this work warrants further research.

## 4. Conclusion

A systematic review protocol was conducted to study the subject of climate change perception models and the different methods and approaches used to study these models and the results obtained were analyzed. A total of 186 articles were identified, most of which were published in the last decade. The results and conclusions of this study can contribute to research in a similar direction worldwide. Therefore, more attention should be paid to studying the impact of climate change on the demand for climate change perception models. The most notable issues are climate change risk perception patterns, social norms, knowledge, and emotions; how to influence the scale and nature of risk perception. However, little is known about other models and technologies in the world. Given the urgent need for further research, especially in research projects, the model will address some of these issues.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of the [Semnan University of Medical Science](#) and was registered with the IR.SEMUMS.REC.1400.285.

### Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

### Authors' contributions

All authors equally contributed to preparing this article.

### Conflict of interest

The authors declared no conflict of interest.

### Acknowledgments

We thank our colleagues at the Health in Emergency and Disaster Research Center for their insightful comments and contribution to this study supporting study.



## References

- [1] Raymond C, Horton RM, Zscheischler J, Martius O, AghaKouchak A, Balch J, et al. Understanding and managing connected extreme events. *Nat Clim Change*. 2020; 10(7):611-21. [DOI:10.1038/s41558-020-0790-4]
- [2] Farrokhi M, Khankeh HR, Amanat N, Kamali M, Fathi M. Psychological aspects of climate change risk perception: A content analysis in Iranian context. *J Educ Health Promot*. 2020; 9:346. [DOI:10.4103/jehp.jehp\_415\_20] [PMID] [PMCID]
- [3] Kloeckner CA. Towards a psychology of climate change. In: Leal Filho, W. (eds). *The Economic, Social and Political Elements of Climate Change*. Climate Change Management. Springer, Berlin, Heidelberg. [DOI:10.1007/978-3-642-14776-0\_11]
- [4] Evans GW. Projected behavioral impacts of global climate change. *Annu Rev Psychol*. 2019; 70(1):449-74. [DOI:10.1146/annurev-psych-010418-103023] [PMID]
- [5] Costello A, Abbas M, Allen A, Ball S, Bell S, Bellamy R, et al. Managing the health effects of climate change: Lancet and University College London Institute for Global Health Commission. *Lancet*. 2009; 373(9676):1693-733. [DOI:10.1016/S0140-6736(09)60935-1]
- [6] Watts N, Adger WN, Agnolucci P, Blackstock J, Byass P, Cai W, et al. Health and climate change: Policy responses to protect public health. *Lancet*. 2015; 386(10006):1861-914. [DOI:10.1016/S0140-6736(15)60854-6]
- [7] Lowe T, Brown K, Dessai S, de França Doria M, Haynes K, Vincent K. Does tomorrow ever come? Disaster narrative and public perceptions of climate change. *Public Underst Sci*. 2006; 15(4):435-57. [DOI:10.1177/0963662506063796]
- [8] Finkbeiner EM, Micheli FJ, Bennett NL, Ayers AL, Le Cornu E, Doerr AN. Exploring trade-offs in climate change response in the context of Pacific Island fisheries. *Mar Policy*. 2018. [DOI:10.1016/j.marpol.2017.09.032]
- [9] Haworth EA. The role of public health in climate change and sustainability: what should the Australian public health response be? *Aust N Z J Public Health*. 2014; 38(4):311-3. [DOI:10.1111/1753-6405.12255] [PMID]
- [10] UN (General Assembly). *Transforming our world: The 2030 agenda for sustainable development* [Internet]. 2015. [Link]
- [11] Myanmar. *Sendai framework for disaster risk reduction. 2015-2030* [Internet]. 2015. [Updated 2016 September 7]. Available from: [Link]
- [12] Niemeyer S, Petts J, Hobson K. Rapid climate change and society: Assessing responses and thresholds. *Risk Anal*. 2005; 25(6):1443-56. [DOI:10.1111/j.1539-6924.2005.00691.x] [PMID]
- [13] Becken S, Lama AK, Espiner S. The cultural context of climate change impacts: Perceptions among community members in the Annapurna Conservation Area, Nepal. *Environ Dev*. 2013; 8:22-37. [DOI:10.1016/j.envdev.2013.05.007]
- [14] Patt AG, Schröter D. Perceptions of climate risk in Mozambique: Implications for the success of adaptation strategies. *Glob Environ Change*. 2008; 18(3):458-67. [DOI:10.1016/j.gloenvcha.2008.04.002]
- [15] Van der Linden S. Determinants and measurement of climate change risk perception, worry, and concern. In: van der Linden S, editor. *The Oxford Research Encyclopedia of Climate Change Communication*. Oxford: Oxford University Press; 2017. pp. 34-51. [DOI:10.1093/acrefore/9780190228620.013.318]
- [16] Van der Linden S. The Social-Psychological determinants of climate change risk perceptions: Towards a comprehensive model. *J Environ Psychol*. 2015; 41:112-24. [DOI:10.1016/j.jenvp.2014.11.012]
- [17] Xie B, Brewer MB, Hayes BK, McDonald RI, Newell BR. Predicting climate change risk perception and willingness to act. *J Environ Psychol*. 2019; 65:101331. [DOI:10.1016/j.jenvp.2019.101331]
- [18] van Eck CW, Mulder BC, van der Linden S. Climate change risk perceptions of audiences in the climate change blogosphere. *Sustainability*. 2020; 12(19):7990. [DOI:10.3390/su12197990]
- [19] Jones L, Boyd E. Exploring social barriers to adaptation: Insights from Western Nepal. *Glob Environ Change*. 2011; 21(4):1262-74. [DOI:10.1016/j.gloenvcha.2011.06.002]
- [20] Whitmarsh L. Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Glob Environ Change*. 2011; 21(2):690-700. [DOI:10.1016/j.gloenvcha.2011.01.016]
- [21] Bickerstaff K. Risk perception research: Socio-cultural perspectives on the public experience of air pollution. *Environ Int*. 2004; 30(6):827-40. [DOI:10.1016/j.envint.2003.12.001] [PMID]
- [22] Sunstein CR. *Risk and reason: Safety, Law, and the Environment*. Cambridge: Cambridge University Press; 2002. [Link]
- [23] Sattler DN, Bishkhorloo B, Graham JM. Climate change threatens nomadic herding in Mongolia: A model of climate change risk perception and behavioral adaptation. *J Environ Psychol*. 2021; 75:101620. [DOI: 10.1016/j.jenvp.2021.101620]
- [24] Bostrom A. Mental models and risk perceptions related to climate change. *Oxford Res Encyclop Climate Sci*. 2017. [Published online: 28 June 2017]. [DOI:10.1093/acrefore/9780190228620.013.303]
- [25] Sakurai R, Jacobson SK, Kobori H, Primack R, Oka K, Komatsu N, et al. Culture and climate change: Japanese cherry blossom festivals and stakeholders' knowledge and attitudes about global climate change. *Biol Conserv*. 2011; 144(1):654-8. [DOI:10.1016/j.biocon.2010.09.028]
- [26] Leiserowitz AA, Kates RW, Parris TM. Do global attitudes and behaviors support sustainable development? *Environ Sci Policy Sustain Dev*. 2005; 47(9):22-38. [DOI:10.3200/ENVT.47.9.22-38]
- [27] Akerlof K, Maibach EW, Fitzgerald D, Cedeno AY, Neuman A. Do people "personally experience" global warming, and if so how, and does it matter? *Glob Environ Change*. 2013; 23(1):81-91. [DOI:10.1016/j.gloenvcha.2012.07.006]
- [28] Milfont TL. The interplay between knowledge, perceived efficacy, and concern about global warming and climate change: A one-year longitudinal study. *Risk Anal*. 2012; 32(6):1003-20. [DOI:10.1111/j.1539-6924.2012.01800.x] [PMID]

- [29] Xiang P, Zhang H, Geng L, Zhou K, Wu Y. Individualist-collectivist differences in climate change inaction: The role of perceived intractability. *Front Psychol.* 2019; 10:187. [DOI:10.3389/fpsyg.2019.00187] [PMID] [PMCID]
- [30] Fang SC, Yu TY. A risk perception model of climate change for university students. *J Balt Sci Educ.* 2015; 14(3):339-50. [DOI:10.33225/jbse/15.14.339]
- [31] Rothermich K, Johnson EK, Griffith RM, Beingolea MM. The influence of personality traits on attitudes towards climate change-An exploratory study. *Pers. Individ Differ.* 2021; 168:110304. [DOI:10.1016/j.paid.2020.110304]
- [32] Panno A, Giacomantonio M, Carrus G, Maricchiolo F, Pirchio S, Mannetti L. Mindfulness, pro-environmental behavior, and belief in climate change: the mediating role of social dominance. *Environ Behav* 2018; 50(8):864-88. [DOI:10.1177/0013916517718887]
- [33] Wang J, Geng L, Schultz PW, Zhou K. Mindfulness increases the belief in climate change: The mediating role of connectedness with nature. *Environ Behav.* 2019; 51(1):3-23. [DOI:10.1177/0013916517738036]
- [34] Prati G, Pietrantoni L, Albanesi C. Human values and beliefs and concern about climate change: A Bayesian longitudinal analysis. *Qual Quant.* 2018; 52(4):1613-25. [DOI:10.1007/s11135-017-0538-z] [PMID] [PMCID]
- [35] van der Linden S, Leiserowitz A, Maibach E. The gateway belief model: A large-scale replication. *J Environ Psychol.* 2019; 62:49-58. [DOI:10.1016/j.jenvp.2019.01.009]
- [36] van der Linden S. The social-psychological determinants of climate change risk perceptions, attitudes, and behaviours: A national study. *Environ Educ Res.* 2016; 22(3):434-5. [DOI:10.1080/13504622.2015.1108391]
- [37] Leiserowitz AA. American risk perceptions: Is climate change dangerous? *Risk Anal.* 2005; 25(6):1433-42. [DOI:10.1111/j.1540-6261.2005.00690.x] [PMID]
- [38] Leiserowitz A. Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Clim Change.* 2006; 77(1):45-72. [DOI:10.1007/s10584-006-9059-9]
- [39] Wang C, Geng L, Rodríguez-Casallas JD. How and when higher climate change risk perception promotes less climate change inaction. *J Clean Prod.* 2021; 321:128952. [DOI:10.1016/j.jclepro.2021.128952]
- [40] Li W, Yuan K, Yue M, Zhang L, Huang F. Climate change risk perceptions, facilitating conditions and health risk management intentions: Evidence from farmers in rural China. *Clim Risk Manag.* 2021; 32:100283. [DOI:10.1016/j.crm.2021.100283]
- [41] Caughron A, Legault S, Haut C, Houle D, Reynolds TW. A changing climate in the maple syrup industry: Variation in Canadian and USA producers' climate risk perceptions and willingness to adapt across scales of production. *Small-Scale For.* 2021; 20(1):73-95. [DOI:10.1007/s11842-020-09457-2]
- [42] Ngo CC, Poortvliet PM, Feindt PH. Drivers of flood and climate change risk perceptions and intention to adapt: An explorative survey in coastal and delta Vietnam. *J Risk Res.* 2020; 23(4):424-46. [DOI:10.1080/13669877.2019.1591484]
- [43] Bradley GL, Babutsidze Z, Chai A, Reser JP. The role of climate change risk perception, response efficacy, and psychological adaptation in pro-environmental behavior: A two nation study. *J Environ Psychol.* 2020; 68:101410. [DOI:10.1016/j.jenvp.2020.101410]
- [44] Smith EK, Mayer A. A social trap for the climate? Collective action, trust and climate change risk perception in 35 countries. *Glob Environ Change.* 2018; 49:140-53. [DOI:10.1016/j.gloenvcha.2018.02.014]
- [45] Mase AS, Gramig BM, Prokopy LS. Climate change beliefs, risk perceptions, and adaptation behavior among Midwestern US crop farmers. *Clim Risk Manag.* 2017; 15:8-17. [DOI:10.1016/j.crm.2016.11.004]
- [46] Lee TM, Markowitz EM, Howe PD, Ko CY, Leiserowitz AA. Predictors of public climate change awareness and risk perception around the world. *Nat Clim Change.* 2015; 5(11):1014-20. [DOI:10.1038/nclimate2728]
- [47] Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: Elaboration and explanation. *BMJ.* 2015; 349:g7647. [DOI:10.1136/bmj.g7647] [PMID]
- [48] Etana D, van Wesenbeeck CF, de Cock Buning T. Socio-cultural aspects of farmers' perception of the risk of climate change and variability in Central Ethiopia. *Clim Dev.* 2021; 13(2):139-51. [DOI:10.1080/17565529.2020.1737796]