



## Climate Changes Knowledge and Awareness among People in Tabuk Region, Saudi Arabia

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### Abstract

In the last decade, there is a growing interest among the researchers to develop tools for measurement of understanding and knowledge among people to the effect of climate changes. This includes individual interviews, questionnaires and case studies. This study aims to determine the level of awareness and knowledge on climate changes among 150 individuals representing the community of Tabuk region (Saudi Arabia). Interestingly, the respondents showed moderate knowledge and understanding towards climate change issues causes, impacts and proposed solutions. The level of self-reported knowledge was considerably high in this study amounted to nearly 87% and that noticeably indicates dependence of individuals on traditional knowledge in receiving recent updates and information about progressing climate change. It was concluded that the public understanding and knowledge among residents of Tabuk is moderate. Future efforts are necessary to enhance the distribution (using social media, television and newspapers) of general knowledge and information about climate changes among the Saudi people.

**Keywords:** Climate Change; Knowledge; Attitude; Tabuk; Saudi Arabia

### Introduction

Undoubtedly, the human activities have a strong relationship with current and accelerated climate changes (e.g. global warming). The global warming is resulted from accumulation of greenhouse gases in the atmosphere due to intensive using fossil fuels and deforestation and vegetation cover reduction [1]. Therefore, the adverse effect of climate changes has been highlighted in several discussions among the researchers in different parts of the world [2]. Briefly, the “global warming” means the existence of climate changes which leads to elevation on air temperature. The agency which is responsible for forecasting the elevation in the temperature level is the Intergovernmental panel on climate change (IPCC). In the IPCC reports, the probable increase of temperature level was predicted to range from 1.5-4.5°C [3].

The common sense or knowledge is an essential source for individual adaptation strength [4]. The knowledge, practice and belief are the most important components in development of ecological knowledge. This process is complicated as it relies on various generation and transfer procedures [5]. Hence, changing the people attitude is resulting from advancing the ecological knowledge on climate change. This eventually will contribute in reduction of the negative effects of climate change on the quality of human life [4].

According to Semenza, *et al.* [6], human beings are currently influencing the complication of the global climate change. In other words, the human beings will indirectly affect the natural systems and make them more vulnerable [3]. Due to that fact, the normal individuals and even decision makers have an important role in reducing the climate changes [7]. According to Moser [7], in order to reduce the effects of climate changes, it is crucial to understand the difference among understanding (having current knowledge/information), perception (points of view, interpretation according to one's belief), and engagement (action in cognitive and behavioural contexts).

According to Lernzoni and Pidgeon [8] and Franzen and Vogl [9], the people's perception, understanding and knowledge about climate changes depend strongly on culture and background of the nation. Hence, the effective act of people is correlated with their knowledge and perception. That is the reason of which many people in the world are considering the climate changes as a serious issue [10].

On the other hand, the failure in considering the people views and values will have negative impact on developing effective decisions for the climate change management [11]. This delicate issue

will require wide acceptance among the public prior to practically apply it [12].

There are many studies were carried out to determine the public awareness and perception of climate change in various parts of the world [9]. However, there is no such study to assess the knowledge to climate changes in Saudi Arabia especially northern part including Tabuk. Therefore, the present study aims to measure the level knowledge awareness and perception towards climate changes among residents of Tabuk, Saudi Arabia.

### Materials and Methods

Application of the broad-scale knowledge about climate change was done in this study to measure the level of people’s awareness and knowledge towards climate changes. This scale is This scale is distributed among many general and overlapping categories; knowledge about how the climate system works; specific knowledge about the causes, consequences, and potential solutions to global warming; contextual knowledge placing human-caused global warming in historical and geographic perspective; and practical knowledge that enables individual and collective action.

A total of 150 individuals form Tabuk region were involved in this study to respond to the designed questionnaire. The questionnaire was adapted from Leiserowitz., *et al.* [13]. This questionnaire consisted of several questions measuring; the social information (age, education and accommodation). The self-reported knowledge (Have you ever heard of climate change or global warming?). Climate Change Beliefs and Worry (2 items and the final score is 2). Degree of worriedness (Very worry, Somewhat worry, Not very worry, Not worry at all) was also assessed in this study. To measure the understanding of the “Greenhouse Effect”, 5 items (i.e. questions) were included in this questionnaire with final score 5. However, understanding the Difference between Weather and Climate was measured using 9 items and the final score of this section is 9. Knowledge on Fossil Fuels (3 items and the final score of this section is 6). Knowledge on Causes of Global Warming (10 items and the final score of this section is 10). Understanding the impacts of Climate Change (5 items and the final score of this section is 5). Knowledge Suggested Solutions for Climate Change (10 items and the final score of this section is 10).

### Statistical analysis

The descriptive statistics were calculated using the software package of SPSS (version 13.5). Frequencies, mean, and standard deviation for the questionnaire items and scores were calculated.

### Results

A total of 150 respondents were involved in this study in order to determine the level of public knowledge and awareness towards the climate changes in some cities of Tabuk, Saudi Arabia. As presented in Figure 1, 57% of the respondents at university level of education. The self-reported knowledge towards climate changes was almost 87% among people in Tabuk as shown in Figure 2.

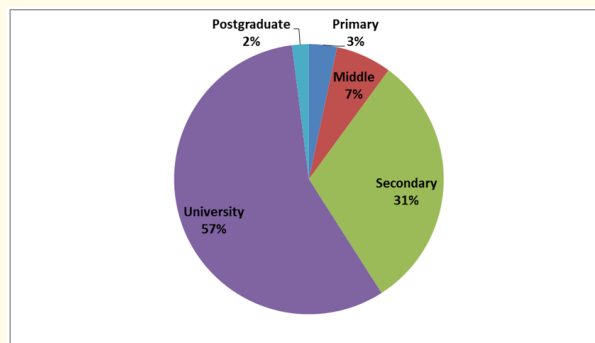


Figure 1: The education level of the correspondents.

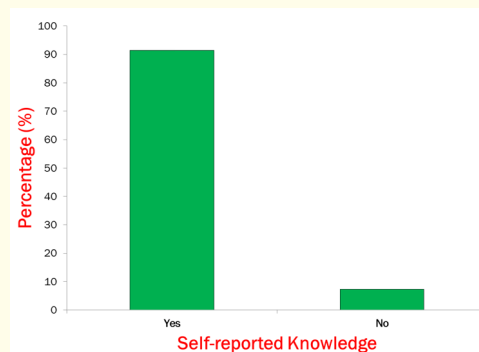
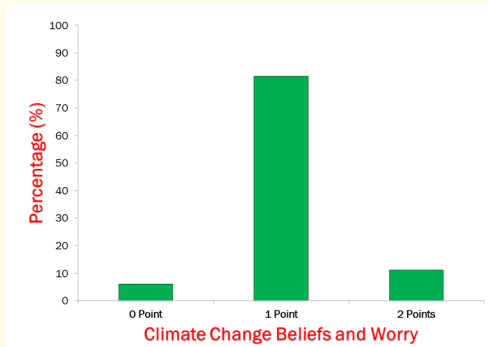
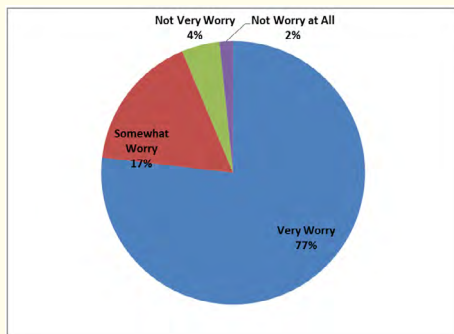


Figure 2: The self-reported knowledge towards climate changes among people in Tabuk, Saudi Arabia.

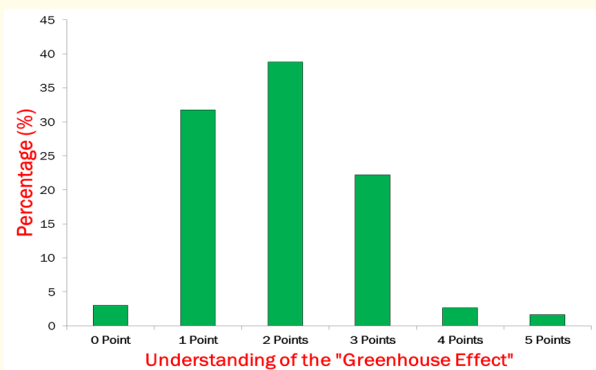
The people in Tabuk have medium knowledge on climate change beliefs and worry as 82% of them scored 1 point and 2 points (Figure 3). However, the people with no knowledge (0 points) comprised around 18%. A 76.82% of the people are “Very Worry” about climate changes, meanwhile, 1.67% showed no worry at all (Figure 4). In the item to investigate the understanding of the "Greenhouse Effect" most people (39%) scored 2 points, meanwhile, the people who scored the final score were only 1.65% (Figure 5).



**Figure 3:** The knowledge score of climate change beliefs and worry among people in Tabuk, Saudi Arabia.

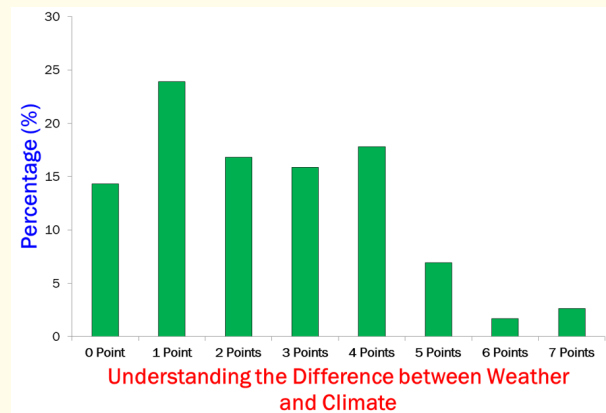


**Figure 4:** The degree of worry towards climate change among people in Tabuk, Saudi Arabia.

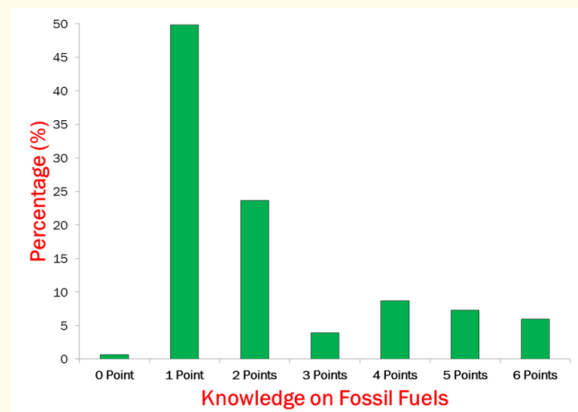


**Figure 5:** Level of understanding of the "Greenhouse Effect" among people in Tabuk, Saudi Arabia.

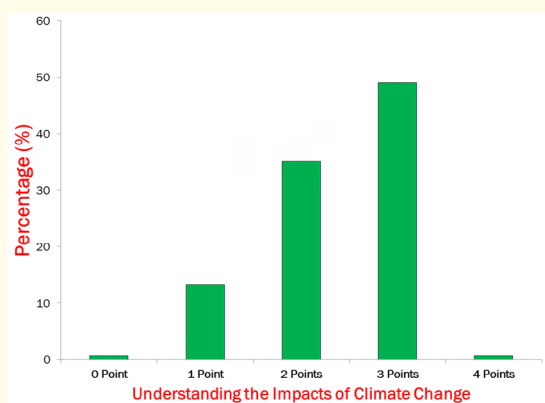
In this study, few people had the ability to differentiate between weather and climate (3% of people scored 7 points out of 9) (Figure 6). A less than 45% of the people showed fair knowledge on the nature of fossil fuels (Figure 7). On the other hand, a 25% of the correspondent showed good knowledge on climate change impacts (Figure 8). However, almost 74% of the people showed poor knowledge on the causes of global warming. Almost 60% of the people had poor knowledge on the suggested solutions for the climate change issue.



**Figure 6:** The knowledge score of difference between weather and climate among people in Tabuk, Saudi Arabia.



**Figure 7:** The knowledge of the nature of fossil fuels among people in Tabuk, Saudi Arabia.



**Figure 8:** The degree of understanding the impacts of climate change among people in Tabuk, Saudi Arabia.

## Discussion

This study aimed to determine the general public knowledge and awareness towards climate changes among people in Tabuk, Saudi Arabia. The study involved 150 subjects responded to the questionnaire to measure different items of knowledge and awareness of climate change.

Usually, the individuals showed medium level of knowledge on climate changes including impacts, causes and proposed solution. Therefore, a weak linkage between climate change and environmental behavior is reported. This statement has been reported earlier by Boillat and Berkes [14]. In this study, most of the people depend on traditional resources for acquiring the knowledge about climate changes. Yet, this source of knowledge is known for its weak influence on people with omitting their education level or background [15]. The public perception towards climate changes can be structured by individual experience [16]. Other individual experience for gaining knowledge is through media (television, radio and newspaper). The media are known to be more influential compared to traditional knowledge sources [17,18].

General knowledge about climate changes are not in the line of scientific prospective and observations (mostly increase temperature and carbon dioxide levels) [19]. However, there are some people (very few) who have the correct and accurate knowledge about various aspects of climate changes. These people also showed how these climate changes would affect human life and its future and quality. Therefore, activation the role of different tools (e.g. media and social networks) is important to increase the degree of knowledge and perception towards climate changes among the people. This also will help the public for figure out some solution to minimize the adverse effect of climate changes [20].

In conclusion, the people in Tabuk showed considerable amount of knowledge and awareness towards climate change reflecting moderate information background. Future research focusing on measuring the knowledge, perception and awareness among different types of people in the community is needed. This will give a general overview about current level of knowledge towards climate changes among Saudi people. On the other hand, this will have sound impact on the future development and decision making process. The scale of the study should be broadening to involve several regions in Saudi Arabia.

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