



Gender-Based Perceptions of Climate Change and Implication for Environmental Education

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Abstract: This paper presents perceptions of climate change in terms of cause-effect-adaptation and the role of Environmental Education (EE). The general understanding of climate change in the context of meaning of the concept, causes, effects and the mitigation was overwhelming because almost every individual was able to express his or her views on the issue. However, it was observed that some issues especially on the causes of climate change could not be clearly related to the local environment. The paper suggests that, climate change is a complex topic whose perceptions vary from one individual to the other and from one geographic space to the other.

Keywords: climate change, environmental education, gender, perception

1. BACKGROUND

Ubiquity of gender inequalities exacerbated by climate change urge the inclusion of a differentiated female-male approach into research and decision-making processes (Kovaleva *et al.*, 2021; Ford, 2009). Climate change now poses the first universal crisis of our planet. It has become an urgent crisis which demands immediate and multi-consolidated effort to abate the impact. It is estimated that rising temperatures will lead to the loss of millions of species and also punctuate water insecurity in the in the next 50 years (Chisanga *et al.* 2022). As the Earth continues to warm, it is now irrefutable that humanity is primarily responsible. This “anthropogenic force” has increased the carbon dioxide (CO₂) content of the Earth’s atmosphere such that even if emissions were to cease today, the mean temperature would still increase by at least 1°C due to the lag effect. The Inter-governmental Panel for Climate Change-IPCC (2022) further predicted that, the amount of CO₂ in our atmosphere will increase temperature by 1.5 °C by 2030, unless clear and unilateral action is taken to curb carbon emissions. Failure to act could result in temperature rises of as much as 6.4°C by 2100, with catastrophic, immeasurable effects on the life of people around the world. Even though climate change and global warming are now widely reported, misconceptions and various perceptions about this phenomenon exist in both the developed and developing nations (IPCC, 2022).

In African, there are diverse and mixed views about the causes and indicators of climate change across and within communities in Africa, despite the evidence of a general awareness. Apata *et al.* (2009) analysed climate change perception and adaptation among arable food crop Farmers in South Western Nigeria using logit regression analysis and concluded that the residents perceive climate change as having a strong spiritual, emotional, and physical dimension. In south western Nigeria, the largest portion of the residents (95%) was convinced that climate change is a sign of divine anger due to many sinners in their midst and God was trying to punish them by bringing floods with serious consequences. Similarly, in Mozambique, people viewed climate change as a punishment from God or a consequence of the 16-year civil war (Shanahan, 2010). Omole (2002) also found that just about 35% of people in Lesotho had a clearer perception of climate change. Although there seem to be some advancement in push for climate action in Zambian context, the understanding climate of change and all climate-linked issues remain quite low among many citizens especially following a long term and wide neglect of the implementation climate change and environmental education in national educational curriculum.

2. METHODS

A descriptive survey was employed because it was a suitable research design for a snapshot learning about how different residents perceived climate change and what environmental education could do to address some issues. Purposive sampling was used and semi-structured interview was administered to 120 households. Descriptive statistics was used to analyse the survey responses in terms of frequencies and percentages by gender (Bryman, 2008). The main questions were as follows: *What in your view is the meaning of climate change?*, *What are the causes of climate change in your area?*, *What in your opinion are the causes of climate change in your area?*, *In your opinion, what must be done and by who in order to reduce the impact of climate change in Misisi compound?*, *What education can enhance your awareness about climate change?* Out of these questions, the following results were gathered.

3. PRESENTATION AND DISCUSSION OF RESULTS

Climate change is indeed, a concept that is quite resistant to homogeneous meaning. Thus, people from various parts of the world interpret climate change according to their experience and not necessarily what is documented in scientific records such as IPCC reports (Salequzzaman, 2009). Interviewed participants had their ways of interpreting climate change. Accordingly to the results in Table One, many (42%) of the participants more especially males (25%) associate the meaning of climate change to change in weather patterns only. Salequzzaman used reconnaissance survey and discovered that 59% of the people of Bangladesh associate climate change with multiple occurrence of heavy rainfall only. Scarcely do they associate other aspects such as cyclones, irregular temperatures and others to climate change. As 8% of the people associate climate change to change in seasons only, others (17%) associated it with both change in weather and seasons concurrently and not independently. The pieces of evidence in Table One generally indicate that 83% of the people were able to associate the meaning of climate change with some issues around the area except for just a few (17%) all of which were females. Muchanga (2011), observed similar pattern among selected residents in Lusaka Province.

Table1. Perceptions of the meaning of Climate Change

Climate Change is:	Frequency by Gender		Percentage by Gender		Total Frequency	Total percentage
	Female	Male	Female	Male		
Change of weather	20	30	17%	25%	50	42%
Environmental change	10	0	8%	0%	10	8%
Change of seasons	10	0	8%	0%	10	8%
Changing of atmosphere	10	0	8%	0%	10	8%
Change of weather and seasons	0	20	0%	17%	20	17%
I do not know	20	0	17%	0%	20	17%
Total	70	50			120	100%

4. CAUSES OF CLIMATE CHANGE

Having discussed the various meanings of climate change as perceived by participants, it must further be mentioned that there were diverse factors that were perceived to cause climate change. It is fascinating to note that only a few (4.5%) people expressed uncertainty about the causes of climate change. According to further evidence in Table Two, air pollution was regarded to be the major (18.8%) cause of climate change. Karpagam (2007) emphasizes that air pollution and climate change are inextricably linked. The second most frequently cited (13.5% each) causes of climate were attributed to manufacturing industries and change of seasons and weather. Although none of the perceived causal factors of climate change was wrong, some of them did not closely relate to the local area. For example, the issue of manufacturing factory being one of the major contributing factors did not closely relate to the local area because there were no factories in the area. This is where environmental education must play its role in enhancing the people’s ability to relate the problem to the local environment. Whilst most if not all scholars such as Asthana and Asthana (2001) single out carbon dioxide as a chief contributor to climate change, the participants did not perceive it the same way as it only scored 9% or the fourth rank of the factors that were perceived to cause climate change.

However, when given a deeper thought, the carbon dioxide factor could have probably been embedded in air pollution factor and could imply offsite causes of climatic changes as observed by IPCC (2009). Meanwhile, 4.5% of the perceived causes of climate change were attributed to the ozone layer, another factor that provokes deeper understanding to discern what it connoted.

According to Asthana and Asthana (2001) ozone is both a natural and human-made greenhouse gas. When it is in the upper atmosphere is known as the ozone layer and shields life on Earth from the Sun’s harmful radiation cascades such as ultraviolet radiation, which can cause cancer and other damage to plants and animals. However, ozone in the lower atmosphere is a component of smog (a severe type of air pollution) and is considered a greenhouse gas. Unlike other greenhouse gases, which are well-mixed throughout the atmosphere, ozone in the lower atmosphere tends to be limited to industrialized regions and it mostly contributes to the warming in such areas. So the residents were right except, they were less able to sift out the factors which directly relate to the local area. Therefore, such ambiguities on the implication of some responses could only be reduced by implementing environmental education policy. According to the evidence in Table Two, the participants were more conversant with the socio-economic and political causes of climate change than the physical ones. In fact, out of all the factors perceived to cause climate change, only about 9% were classified as physical factors such as variation of solar radiation and deviations in earth’s orbit. Another aspect worth mentioning is that women were able to associate climate change to a wider range (55%) of causal factors than men as indicated in Table Two.

Table2. *Perceptions of the causes of climate change*

Climate change is caused by	Frequency By Gender		Total Frequency	Total Percentage
	F	M		
Carbon monoxide	10	-	10	4.5%
Cutting of trees	10	-	10	4.5%
Burning woods and plastics	10	-	10	4.5%
Change of season & weather	20	10	30	13.6%
Air pollution	20	20	40	18.8 %
Factories manufacturing goods	20	10	30	13.6%
Chemicals destroying air	10	-	10	4.5%
Bad/ illegal substance	10	-	10	4.5%
Variation of solar radiation	-	10	10	4.5%
Ozone layer	-	10	10	4.5%
Deviation of earth’s orbit	-	10	10	4.5%
Carbon dioxide	10	10	20	9 %
Soil acidity by fertilizer	-	10	10	4.5%
I don’t know	10	-	10	4.5%
TOTAL			220	100%

5. EFFECTS OF CLIMATE CHANGE

Although there are other contributing factors (geological) to annual flooding in the study area, evidence in Table Three reveals that 100% of the people in the study area perceived climate change to be contributing to 40% of flooding. Closely connected to the issue of floods were diseases such as cholera and typhoid outbreaks because of the flooding of toilets (pit latrine) to almost roof level, leading to resurfacing of human excreta. Such effects together with loss of property (such as houses and crop fields) as well as high temperature accounted for 10% each. Muchanga (2017) and Chisanga *et al.* (2022) argues that, under the changing climate, many area in the southern half of the country are likely to experience flooding part of which could be augmented by siltation. Climate change was perceived to contribute to 7% of deaths of domestic animals through drowning and 7% of droughts. Such effects were followed by poverty, which accounted for 6% of the effects of climate change as agricultural crops got washed away. Although the effects such as displacement of people and interruption of their movements from one place to the other were ranked the least (3% each), in reality they had the most displacing effect on the people in the target area. The issue of displacement was crucial given that 177 families (985 people) were temporarily relocated to the new area around the National Heroes Stadium for four months from February. According to the general evidence in Table three, almost all the people are able to relate the effects than causes of climate change to the area.

Drought (7%) could probably be the only effect that never perfectly applied to the area. Even though the people had a wider spectrum of the socio-economic effects of climate change, they scarcely related its impact to the local physical environment such as soils, trees and living organisms and others. Given such a case, environmental education can play a major role in enhancing their awareness of the implications of climate change on the local physical environment.

Table3. *Perspectives on the effects of climate change*

The effects of climate change are:	Frequency By gender		Total Frequency of responses	Percentage
	F	M		
Floods	70	50	120	40%
Heat/high temperature	20	10	30	10%
Delays in people’s movement	10	-	10	3%
Droughts	10	10	20	7%
Destroys property(houses, crops)	20	10	30	10%
Loss of lives	20	-	20	7%
Poverty	20	-	20	6%
Diseases i.e. cholera	-	30	30	10%
Displacement of people	-	10	10	3%
Toilets flooded	-	10	10	3%
TOTAL			300	100%

6. MITIGATION STRATEGIES, PARTICIPATION AND THE ROLE OF EDUCATION

Among the suggestions made to reduce the impact of climate change, the most common (23%) was construction of good drainage to reduce floods. Beyond any doubt this strategy if implemented could reduce the impact of climate change-related floods in the area. Moreover, it was noted that planting the tree on each household could reduce the impact of climate change by 14%. This is another crucial perspective though its fruition could effectively be realized by embracing the role of environmental education because not everyone in the area would probably appreciate the planting of trees if not sensitised about the project. In fact, about 4.5% of the responses suggested that people be sensitised about the environment if the impact was to be reduced. It was further suggested that good road (9%) be constructed and sharing of ideas (9%) about the problem be effected in the area.

In the words of Ford (2009), climate change is now a major global challenge and thus, needs multi-consolidated ideas to reduce its impact. Therefore, the residents were very succinct by emphasizing the need to share the ideas to reduce the impact of climate change. Waste and litter burning, good planning, stopping vehicles that release a lot of smoke and the use of technology that is friendly to the ozone layer were highly recommended. Generally, almost all (95.5%) suggestions to reduce the impact related very well to the local environment. Much as we appreciate the suggestions given by residents on how to mitigate the impact of climate change in the area, it was noted that individual responsibility in reducing the impact was barely suggested. As the majority (53%) of the people felt it was the government’s responsibility to reduce the impact of climate change in the area, others (13%) projected the responsibility to the companies. Moreover, some (7% each) perceive it was the Non-Governmental Organizations (NGOs) duty. Special recognition must be given to 7% of the people who suggested that both the lower and the middle class must unite to formulate the solution. Nevertheless, if each individual was to directly suggest him or herself as part of the solution, individual responsibility in reducing the impact would be more clearly emphasized. Similarly, 13% of the people also suggested that all the people must be involved; this is very crucial especially if directly applied to the whole area. It must generally be noted that most (73%) of the people push the responsibility to reduce the impact of floods outward (for example to the government) rather than inwards (individual level). This necessitates the need for environmental education to enhance individual awareness in the reduction of climate change impact. In fact, the people of participants perceived Environmental Education (EE) to have higher (58%) chances of enhancing people’s awareness of climate change issues as compared to Climate Change Education (CCE) with 42%. However, the two subthemes of education are inextricably linked.

Table4. Perception on mitigation strategies of the impact of climate change

Mitigation strategy	Female	Male	Total frequency	Percentage
Use ozone friendly technology	10	-	10	4.5%
Stop all smoking vehicles	-	10	10	4.5%
Plant a tree on each house	20	10	30	14%
Good drainage	30	20	50	23%
Good planning	10	-	10	4.5%
Build roads	20	-	20	9%
Share ideas about the problem	20	-	20	9%
Control litter burning	-	10	10	4.5%
I do not know	10	-	10	4.5%
Build good houses	10	-	10	4.5%
Reduce carbon emission	-	20	20	9%
Sensitise about the environment	-	10	10	4.5%
Reduce waste	-	10	10	4.5%
TOTAL			220	100%

7. CONCLUSION AND RECOMMENDATIONS

The paper shows the general understanding of climate change in term of meaning of the concept, causes, effects and mitigation among 120 participants. The study found an overwhelming diversity of perspectives as every participant was able to express his or her views on the issue. However, it was observed that some issues especially on the causes of climate change could not be clearly related to the local environment. Moreover, people were more familiar with socio-economic and political causes of climate change than physical causes. Although they suggested quite a good number of locally significant mitigation strategies, many participants felt not to be part of the solution as they just projected it on others especially the government. The final analysis showed that environmental education and climate change education can enhance their awareness about climate change issues in the area. The study hereby, recommends that a deliberate environmental and climate change education policies be effectively implemented to enhance understanding of climate change issues. Both men and Women must be part of gender agenda in climate change adaptation planning. Moreover, sensitizing the residents on their individual role to reduce climate change impact must be a priority because they seemed to just blame it on others. They must also be educated on how to clearly relate various issues of climate change especially the ‘causes’ to the local area. It is important to realize that a solution or complication to a problem lies in how people perceive it hence, the need for EE and CCE as suggested by the participants.

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