PEOPLE'S PERCEPTION OE CLIMATE CHANCE: A SOURCE OF INSPIRATION FOR THE CREATION OF EDUCATIONAL PROGRAMMES

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Abstract

One of the greatest environmental problems confronting the world today is climate change and its related implications. A qualitative study conducted with adults allowed researchers to discover people's ideas (knowledge, opinions feelings) about the phenomenon of climate change. 400 people in Warri town of Delta State were subjected to well-structured questionnaire.

The data obtained were analysed statistically using the percentage tool. Respondents can briefly describe the phenomenon without being able to identify its causes and consequences. Finally, educational programmes trickling down from these results arc proposed.

Keywords: Climate change, Environment education, Awareness, Climate, Weather.

Introduction

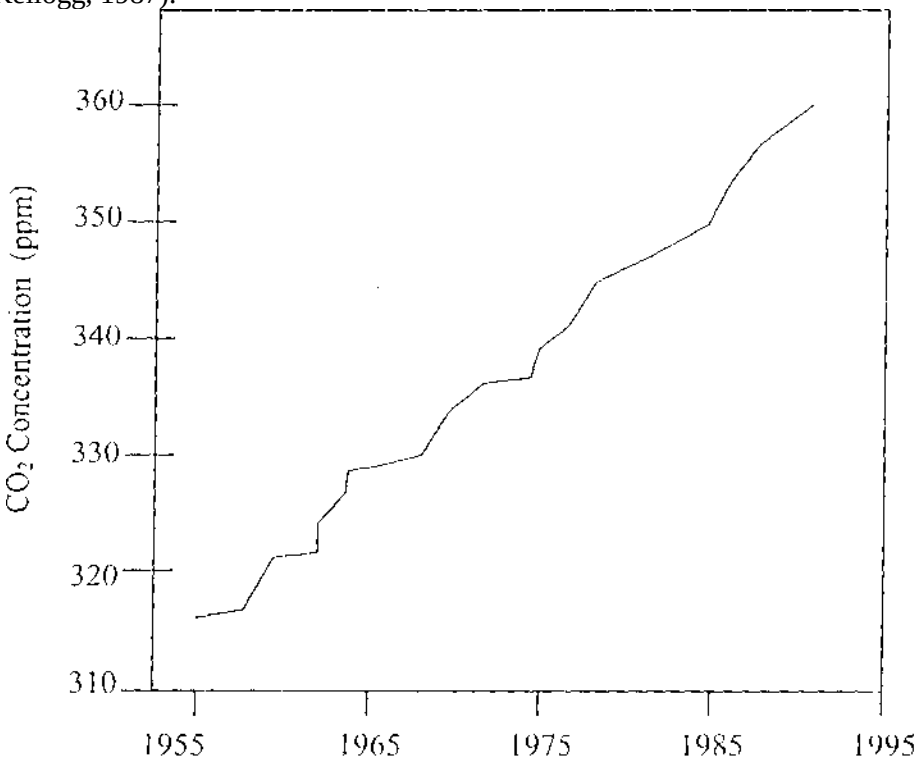
Climate is the average weather conditions measured over a long period of time, usually, over 30 years. It also includes seasonal extremes and variations, locally, regionally or across the globe. In any one location, weather can change rapidly from day to day and year to year, even within an unchanging climate. Changes in weather conditions are influenced by factors such as temperature, precipitation, winds and clouds while changes in climatic conditions arc influenced by slow changes in features like the ocean, the land, the orbit of the earth about the sun and the energy output of the sun.

Definitions of the concept; climate change are many and varied probably because the concept is a mixture of language used by geographers and environmentalists. (JNFCC'C (2000), defines climate change as a change of climate, which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. According to 1PCC (2000), climate change is the variation m the earth's global climate or in regional climates over time. It describes changes in the variability o! the atmosphere over time scales ranging from decades to millions of years.

The planet Earth is surrounded by a mixture of gases and particles called atmosphere, The atmosphere stretches for over 500km up from the earth's surface. The average composition of the atmosphere close to the surface of the Earth is approximately, 78% nitrogen (N_2), 21% oxygen (0.i. 0.03% carbon dioxide (CO2). The other 0.97% consists of mainly argon (Ar), water vapor (IDO) and very small amounts of suspended particles and other gases such as methane. The Earth is heated In the sun; solar radiation passes through the atmosphere and is absorbed at the earth's surface (except for a small portion that is reflected back into space). This heat is readily lost; it is emitted from the surface as infra-red radiation. Fortunately, this infra-red radiation cannot escape from the atmosphere as easily as the solar radiation can enter, causing the temperature of the atmosphere to rise. The phenomenon where the earth behaves as a heat blanket is known as green house. Where it not for this natural green house effect, (he earth would be at least - 30°C and life as we know it would not exist. However, recent human activities arc enhancing the natural green house effect. Within (he past few decades human activities have increased the concentrations of green house gases (CO:, Cll_4, water vapour, O3, CFCs, N_20) in the atmosphere. Scientists believe that the addition of green house gases from these human activities have thrown the natural green house effect out of balance and that the atmosphere is trapping too much heal and causing the temperature of the earth to rise (Nilsson and Pitt, 1994). This is known as the enhanced green house effect or global warming. For example, since 1957, a record of the amount of CO: present in the atmosphere has been kept at Mauna Loa in Hawaii (Fig. 1). This record shows a clear increase in the amount of $C0_2$ in the atmosphere of 0.3% per year The saw tooth shape is due to annual fluctuation of $C0_2$ concentration in the atmosphere arising from the annual growth cycle. Within this period $C0_2$ concentration had risen to 310ppm and by 1980 the levels of $C0_2$ in the atmosphere had reached 339ppm (Bolin, 1986). It is estimated that by 2075. **atmospheric** CO2 **levels** will **be** 500 - 600 ppm (Bolin, 1986). These values in turn can he translated

into temperature increases. It has been ascertained that a doubling of CO? concentration in the atmosphere, the temperature is predicted to increase between 1"C and 4°C (IPCC, 1990; Dickinson, 1986 and Cess and

Potter, 1984). This compares with the estimate of 4- 6°C made by Arrenhius at the beginning of the century (Kellogg, 1987).



Pig. 1: Atmospheric Concentration ol'$C0_2$ in Hawaii (Owen and Buchdahl, 2002).

The phenomenon of global warming has propelled our climate into a new state of instability. This new era of climate is the most profound threat facing humanity today. Climate change is far more than a merely environmental issue. Its dimensions cut to the core of our economic and political lives - even to our basic existence as an organized species. The doubling of $C0_2$ and its associated temperature rise could result to the melting of ice caps leading to sea level rise and eventually drowning of low islands and coastal areas including major cities. For example, 40,000 inhabitants was recently relocated from the island homes in the South Pacific because the area is being submerged by rising sea levels (Koplow and Martin, 1998). On the other hand, increased ambient temperatures may lead to reduced precipitation and increased rate of evapotranspiration and this would create severe moisture stress for crops in many areas (Climate Institute, 1988). Less precipitation and higher temperatures in the farm lands of Southern hemispheres might reduce yields sufficiently to cause losses of as much as $100 million per year (Smit, 1987). The regional distribution of cropland, and the type of crop grown on that land, would change as temperatures rise. A doubling of CO? levels would raise temperatures sufficiently to lengthen the growing season by 3 weeks (Wittwer, 1984), which would allow land presently under forage crops or even uncultivated land, to produce food crops such as cabbage, broccoli, carrots and peas. Climate is also bad for human health. Increased ambient temperature may likely result to the spread of certain diseases; malaria for instance could reach part of Europe including the United Kingdom. Heat-induced deaths are likely to increase, especially among the elderly. For example, the incidence of heat wave that swept across Europe resulting to the death of about 35,000 (Epstein, 2004).

In view of these realizations, it is useful to examine the perception the people hold on this all-important environmental issue. The primary objective of this paper is to assess the scope of knowledge, opinions and feelings of the phenomenon and consequences of climate change. The paper proposes an approach that draws upon the relevance of education in creating environmental awareness and in changing human behaviour and responses.

Methodology *Study Area*

The study area is Warri, which is located in Warri-Soulh Local Government Area of Delta Warri is situated Southern part of the State which is enclosed between Latitude 5° 37'N and 5”59 N and Longitude 6°

15[1]E and 6°28[1]B. It is a major urban city in the Niger Delta area, where a number of industrial plants (e,g. iron and steel, oil and gas, refinery, petrochemical, rubber, and paints) companies are located. It is estimated that 15,000kg of industrial/domestic solid wastes are generated daily in the area (NDDC, 2001).

Previous study of the meteorology of the area (Gobo, 1998), reveals the average atmosphere temperature to be 25.50 °C in the rainy season and 30.0 °C in the dry season. The daily relative humidity values range from 55.50 percent in dry season to 96.00 percent in rainy season. Rainfall in the area averages 2500mm annually. The rainfall pattern shows two identifiable seasons; (he ram\ season (April to October) and the relatively short dry season (November to March).

Study Population

Using the interview method, we had a preliminary survey of neighboudhoods around the city's industrial establishments. The purpose of this preliminary survey was to identify probable respondents that may have experienced one form or the other of environmentally problems or may have read/heard of such environmental issues. From this preliminary survey *we* identified 470 people, however the study compromised of 400 randomly selected respondents that were mostly oil gas company workers and civil/public service workers. The choice of this category of respondents is based on the assumption that they have better perception of environmental problems (Chokor, 1988).

Study Instrument

In order to collect data with which to assess the people's perception on the phenomenon T climate change and its related problems, a well-structured questionnaire was designed. The contact and collect method was used to administer and retrieve the questionnaires. Data collected from respondents were analyzed using simple statistical tool of percentage.

The questionnaire began with requests for demographic data of the respondents and three i3> issues / or questions to which they were expected to respond.

The questionnaire focused on the following issues:

Issue I: Centered on Meaning of Climate Change

- What is Weather?
- What is Climate?
- What is Climate Change?
- List 5 substances that contribute to climate change.

Issue 2: Effects of Climate Change

- Flooding and erosion
- Emergence and spreading of diseases (e.g. skin cancer)
- Low agricultural yield
- Disruptions in rainfall pattern
- Increased ambient temperatures

Issue 3: Possible Action

- Participants were asked to think of ways to improve their knowledge of climate change and related problems.

On the issues centered on effects of climate change, respondents were expected to state whether or not they are aware or not of the effects of climate change from the list presented. On the issue centered on possible action, respondents were asked to identify interventions that will improve the present situation.

Results and Discussion

Demographics

The response rate was 100 percent with 400 responses received. Respondents provided answers to all questions or issued raised and no data was treated as missing values. Data from the demographic section yielded information about respondent's demographic characteristics (Table I).

Table 1: Demographic Characteristics of Respondents

Characteristics	No.	(%)
Gender		
- Male	361	90.25
- Female	39	9.75
Marital Status		
- Single	197	49.25
- Married	203	50.75
Age		
21-30	67	16.75
31-40	229	57.25
41-50	83	20.75
51-60	21	5..25

361 of the respondents, which represent 90.25%, were males and 39 (9.75%) were females. This implies that, a reasonable number of work force within the oil/gas and civil/public service sectors males. Majority of the respondents were within the age group of 31 and 40. Most of the respondents were married (50.75%) while (49.25%) were single.

Table 2: Respondents' Ideas/ Knowledge on Climate Change

Issues on Pollution	**People's Responses n = 400 (100)**
Definition of weather	289(72.25)
Definition of climate	137(34.25)
Definition of climate Change	9(2.25)
Substances that contribute to climate change	7(1.75)

Table 2 presents respondents' ideas/ knowledge on the concept of climate change 2% respondents, which represent 72.25%, gave satisfying definitions of weather. Definitions such as ''the state of the atmosphere at a particular time and place" were common. However, only 34.25% *of* respondents provided good definition of the term, climate. A common error in the definitions provided by the other respondents (65.75%) was in their inability to define the period of weather observation. Definitions such as "climate is the average weather conditions of a place over a long period of time" were common. 39lof the participating respondents (97.75%) could not provide a simple definition for climate change. They associated climate change with environmental conditions such as sunshine, wind, precipitations, rainfall, and temperature. Definitions such as, "climate change is when climate change", "climate change occurs when weather change" were common. Also cere few respondents (1.75%) gave examples of substances that can contribute to climate change. Smooe and dust particles were common examples of substances listed by the respondents.

To conclude on the subject of respondents' knowledge or idea of climate change we can say that they (the respondents) have very narrow knowledge of the concept especially as it relates to meaning / definition.

Tsible 3: Respondents' Knowledge of the Consequences of Climate Change

Issues	People's responses n = 400 (100)	
	Aware	Unaware (%)
Flooding and erosion	76(19)	324(81)
Emergence and spreading of diseases	15(3.75)	385(96.25)
Low agricultural yield	65(16.25)	335(83.75)
Disruption of rainfall pattern	83 (20.75)	317(79.25)
Increased ambient temperatures	I 17(29.25)	283(70.75)

Respondents were presented with a list of the consequences of climate change and were requested to indicate whether they are aware or not. Table 3, gives the consequences of climate change and the number of respondents that arc aware or not. Over 70 % of the respondents are unaware of the consequences of climate change. The most widely recognized effect is increase m ambient temperature (29.25%) followed by disruption of rainfall pattern (20.75%) and Hooding and erosion (19 %). The number of respondents indicating that their unawareness of the effects of climate change even amongst the elites is a clear indication of knowledge gap in environmental issues.

Table 4: Respondents' Perception on the Seriousness of the Effects of Climate Change

Effects of Climate Change	No. of Respondents		
	Very Serious	Serious	Slightly Serious
Flooding and erosion	69(90.79)	7(9.21)	
Emergence and spreading of diseases	-	3(20.00)	12(80.00)
Low agricultural yield	21(32.31)	36(55.39)	8(12.30)
Disruption of rainfall pattern	83(100)	-	-
Increased ambient temperatures	117(100)	-	-

When respondents that were aware of the effects of climate change were asked specifically to indicate the seriousness of these effects using a three-point scale corresponding to very serious, serious and slightly serious (Table 4), increased in ambient temperatures and disruption of rainfall pattern was perceived by respondents to be very serious (100%) followed by Hooding and erosion (90.79%). The perception of increase ambient temperature, disruption rainfall pattern and flooding and erosion as a consequence of climate change is not surprising. Heat wave and unpredicted rainfall pattern experienced by respondents coupled with reported cases of flooding and erosion (World Bank Report, 1985) in the study area provided the basis for this.

Environmental Education: An Agenda for Action

The single most important environmental issue threatening the existence of planet Earth today is climate change (Nilsson and Pitt, 1994 and IPCC, 1990). For everyone living on this earth to decide to protect themselves from environmental hazards either by taking to responsible environmental behaviour or by taking care of their general stale of health (through exercise and good nutrition), it is important for them to first be aware of these hazards and their effects. Empowerment tor environmental protection requires giving to the people the true capacity to cope with the changing environment, for increased social awareness, higher levels of social and economic participation and the utilization of new insights on ecological processes of change and self-renewal. Onokerhorave (1995) is of the view that the single most important activity that will enhance environmental management and sustainable development in the medium to long term is to raise well informed future generations with a strong commitment to sustained management of natural resources. Chokor (1988). agreed that, a successful policy on environmental protection must hinge on public support. That, the degree of support of the public for environmental programme depends on the extent of individuals and groups awareness of environmental problems.

From the findings of the study, it is clear that respondents had not yet achieved that level of

awareness on environmental issues such as climate change. The focus of this paper is on promoting creating environmental awareness through the relevance of environmental education. Barr (2003), observed that, greater knowledge of environmental principles and theories through environmental education enhances individual's ability to participate. According to the Tbilisi Declaration (TICHE, 1977) environmental science education is a process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, attitudes, motivations, commitments, and skills to work individually and collectively toward solutions of current problems and the prevention of new ones.

The goals of environmental science education as outlined by the 1977 Tbilisi Intergovernmental Conference on Environmental Education is as follows:

Awareness: To help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems and / or issues.

Sensitivity: To help social groups and individuals gain a variety of experiences in and acquire a basic understanding of the environment and its associated problems and / or issues.

Attitudes: To help social groups and individuals acquire a set of values and feelings of concern for the environment and motivation for actively participating in environmental improvement and protection.

Skills: To help social groups and individuals acquire skills for identifying and solving environmental problems and / or issues.

Participation: To provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems and/ or issues.

Environmental education can be achieved through formal education (curriculum based) and lion-formal education. For the purpose of this paper the non-formal education is proposed. Non- formal education is instruction that is structured to take place outside the context of a formal school. Formal learning is only the beginning. Today, we can gain information and knowledge through the media, our workplaces, and community activities. Non-formal education offers hands-on experiences as well as more traditional modes of learning As an agendum the following initiatives should form the pivot for providing the necessary non-formal environmental education for action.

- A strategy to people's involvement is the need to create an aggressive awareness campaign through the use of electronic media day (radio/television). In addition, the use of traditional mode of communication, which involves the use of town criers, village square meetings and the use of local church assembly, was advocated. That his method will break the barrier created by language, the near absence of electricity, and non-accessibility to electronic or print media.
- Establishment of National Climate Information Centre with the sole responsibility of monitoring and collaborating climate change issues especially research and development was also suggested.
- Environmental education should be a component of our educational curriculum because such a programme will increase people's perception and consequently behaviour and the quality of responses and reactions to environmental problems. It will also create public commitment and responsibility to policies.

Conclusion

This study offers first hand information on the conceptions shared by respondents about climate change and its related consequences. The paper has identified low level of awareness of climate change and its related environmental consequences amongst respondents in Warn metropolis of Delta State. Application of environmental education through non-formal education approach is suggested as a good entry point in the promotion of environmental awareness amongst our people.

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