

Communication, Climate Change and Sustainable Living in a Global Environment: Beyond Awareness Creation

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ABSTRACT

This study focuses on the relationship between climate change and sustainable living in global environment. Climate change is the catch-all term for the shift in worldwide weather phenomena associated with an increase in global average temperatures. It is real and temperatures have been going up around the world for many decades. While this temperature increase is more specifically referred to as global warming, climate change is the term currently favoured by science communicators, as it explicitly includes not only Earth's increasing global average temperature, but also the climate effects caused by this increase. While the basics of climate change is well known, that the world is warming due to increased levels of greenhouse gases emitted by humans, the real phenomenon is often reduced to an abstract theory. The evidence clearly points to a warming world, with record temperatures recorded every year, but still some argue that Earth is cooling. Some even argue that global warming is a scam, though overwhelmingly the scientific community has shown that climate change due to a warming world is a reality. The difference in opinion is so much that there is very little room for rational argument. The opinion on climate change is divided not because of the unavailability of proper information, but mostly because of the way the available information is falsely analysed and misrepresented to the public. Communication with the vast majority of people who range from being dismissive to indifferent or undecided about an issue like climate change is not an easy task. This calls for re-examining the approaches to reporting climate change in order to make media audiences and their followers see climate change as a global challenge that needs collective effort to minimise. In discharging this collective responsibility, the media are seen in this study as indispensable vehicles in bringing about change. To achieve this goal, the traditional approaches to mass media reporting on socio-economic cum political issues are considered as insufficient. This study therefore, provides guidelines for effective reporting of climate change.

Keywords: Communication, climate change, global warming, greenhouse emission

INTRODUCTION

There are now more than enough evidences that indicate we are now living beyond the carrying capacity of the earth. Scholars from various disciplines have identified several evidences that suggest that humankind have exceeded the limit permitted by nature with regard to their dependence on natural resources. This action has resulted in various catastrophes. According to Ebohon and Rwelamila (n.d), the environmental consequences of undermining the earth's 'carrying capacity' are frequently witnessed and they result in huge catastrophes such as flooding and landslides, climate change and the extinction of many species of fauna and flora. These occurrences clearly show that humankind has not

been living by the fundamental principles of environmental sustainability which requires that we should satisfy our present needs without jeopardising the opportunity of the future generations to satisfy their own needs (Ebohon and Rwelamila, n.d). In fact, the carrying capacity of the physical and biotic environment has come under considerable pressure and threats from the huge and insatiable needs of mankind for survival. (Ebohon and Rwelamila, n.d). This, according to the authors, is as a result of the increase in global population and the need to match economic growth and development to reduce global poverty, the cost of which is disproportionately shared by developing countries. This

unsustainable way of living with its attendant consequences requires urgent redress. The need to urgently address the problem of unsustainable living was emphasised by [1] when he pointed out that what is clear to all those involved in resolving sustainability problems is that the way in which we use resources and deal with waste products require urgent attention

The result of failure of mankind to harmonise socio-economic activities with the need to protect the environment and preserve the biodiversities that enable sustenance of life on earth [2] has resulted to climate change-a problem that currently threatens the existence of the earth and its inhabitants.

Some of the causes of sustainability crisis have been attributed to economic development strategies and the ever changing lifestyle that have continued to put pressure on the limited natural resources. It is argued that the strategies and processes followed by individuals and nations to achieve economic growth and development have been resources intensive (Ebohon and Rwelamila, n.d). The implication of this approach to economic growth and development is that it results in depletion of natural resources, and environmental degradation, giving rise to sustainability crisis. Environmental pollution, climate change, greenhouse emissions, and decrease in soil fertility among others are all the aftermath of the strategies and processes applied by humans in the pursuit of economic growth and development. If human activities are the cause of unsustainability, the solution to the problem could depend on changing the way we use economic resources and how we relate to the environment. This will involve educating, informing and reorientation of people to understand that climate change results in global warming and that the problem is manmade and can only be reduced through behaviour change. Undoubtedly, the mass media have been for decades associated with providing citizens with the education and information that lead to attitude change, hence they have significant role to play in the climate change debate.

On the surface, climate change communication is about educating, informing, and warning, persuading, mobilising people to act collectively in solving this critical problem. At a deeper level, climate change communication is shaped by our different experiences, mental and cultural models, and underlying values and worldviews. (Anon, n,d) These varied experiences, mental and cultural models make the communicating climate change and its impact on global environment a more complex issue, and journalists on their own part seem not to be sure of the scientific evidence to back up the claims of climate change scientists. Thus, the relationship between scientific experts and news media producers around issues of climate change has been a complicated and often contentious one, as the slow-moving and complex story has frequently challenged, and clashed with, journalistic norms of newsworthiness, speed, and narrative compression [3]. Even as climate scientists have become more concerned by their evidence-based findings involving projected risks, doubts and confusion, communications addressing those risks have increased. [4]. Scientists increasingly have been called upon to speak more clearly and forcefully to the public through news media about evidence and risks—and to do so in the face of rapidly changing news media norms that only complicate those communications. Professional science and environment journalists—whose ranks have been thinned steadily by media industry financial pressures—have meanwhile come under more scrutiny in terms of their understanding; accuracy; and, at times, perceived bias. [5]. This makes it difficult for media reports on climate change to be universally accepted by media content consumers as true and reliable. .

It is against this backdrop that this study explores the role of media practitioners in the campaign against climate change and sustainable living in a global environment, the strategies that can work in reporting climate change issues and how humankind can live more sustainable to sustain our planet

Conceptualisation of Sustainability

Sustainability has been defined in several ways. Some of the definitions are complex while some are said to be oversimplified. [6] argued that the usual association of sustainability crisis with global warming, depletion of fossil fuel deposits and the increased emissions of carbon dioxide into atmosphere is a gross over simplification of the causes of sustainability crisis. According to the author, these explanations overshadows other much more important threats to sustainability of human societies which include the threats posed to the survival of human, plants and animal species by the increasing arsenal of nuclear weapons. However, these unique contributing factors to global sustainability crisis are not as widespread as the traditional causes of sustainability such as the burning of fossil fuel, overstretching of earth resources and greenhouse emissions resulting from industrial production of goods and waste disposals. In addition, the problem of environmental degradation due to soil erosion and the encroachments of urbanization and communication infrastructure on what use to be agricultural areas, and the problem of social injustice and the inability to manage the inequalities caused by economic and political unfairness add new dimension and values to sustainability issues [7].

Sustainability when used with respect to resources refers to using them in the way that could prevent their exhaustions and simultaneously protect the environment and its ecological and biological diversities. The meanings of sustainability will however, continue to evolve as society advances and new technologies replace the old ones. This evolutionary trend is evidenced by the new dimensions sustainability has taken since its inception. [8] stated that the concept of 'sustainability' first emerged in the early 1980s but that the term did not begin to form part of the vocabulary of environmental education until 1990. The author said that sustainability, which was first, brought to limelight by the World Conservation Strategy (IUCN/UNEP/WWF, 1980) and later reinforced by the Brundtland Report (World Commission on Environment and Development, [9] refers to:

(a) The need to balance economic development with environmental conservation;

(b) The need to place any understanding of environmental concerns within a socio- economic and political context;

(c) The need to look at environmental concern and economic concern as one and the same issue.

The attempt to include the multiple dimensions of sustainability in this definition is an indication of its complexity. [10], argued that sustainability is difficult to define or measure because it is by its nature a vague and complex concept. This argument is possibly true because sustainability has no meaning without pinning the usage down to a particular context. [11] stated that there is no generally accepted definition or assessment of technologies of sustainability. They pointed out that in addition to its scientific challenges, the concept is loaded politically. This statement suggests that it has been difficult for scholars of sustainability education to arrive at a consensus definition of the term. In support, [12] noted that 'irrespective of the millions of articles and thousands of proposed definitions of sustainability, the meaning of the concept is still a contested issue'. The complexity of the term has made [13] to suggest that it is probably not possible or even important to arrive at one standard definition of sustainability because such dynamic concept must evolve and be refined as human experience and understanding develop.

However, by looking at the wide range of sustainability crises: climate change, depletion of resources, pollution, extinction of animal and plant species, challenge to biodiversity, social injustices, one could say that any comprehensive definition of sustainability should highlights the economic, social and environmental implications of unsustainable behaviours, attitudes and action of individuals and business organisations. In support of this view, [14] stated that regardless of the different definitions of sustainability and education for sustainable development, and the lack of consensus over what the concepts

mean, there seems to be general agreement that sustainability is concerned with simultaneous satisfaction of economic, environmental and social needs. This view provides the bases for the argument of the advocates of the 'triple bottom line'.

Is Sustainable Living the Panacea to Climate Change and sustainability Crisis?

Sustainable living refers to living a lifestyle that takes care of the needs of the present and the future generations. With regard to production of goods and services and consumption pattern, sustainable living requires that the production of goods and the rendering of services are planned in such a way that they do not endanger human health and the environment. This implies that entity complying with sustainable living should be conscious of the impacts of its actions on the environment, and take into consideration some measures that can help reduce environmental problems. An individual or organisation that is living or acting sustainably ought to be conscious of the implications of any actions that can lead to unsustainability, and thus take steps to avoid them. [15] stated that "Sustainable living entails ensuring that current patterns of consumption and lifestyles do not endanger the physical base for coming generations". The need to ensure that the economic pillars and the ecology providing life-supports for the present generation subsist must also be recognised. Sustainable living exists if in the process of satisfying human needs, there is a planned system that harmonises both human and environmental ecologies through the use of the right technologies, cooperative economics, and individual resourcefulness [16].

In this study, sustainable living is used in a similar way as [17] used the term, but in a more specific sense to refer to how individuals and organisations relate to the environment, the ecosystem and the economy in order to balance today's needs with the need of future generations of people on earth. Sustainability is thus, used in this study from the managerial and organisational perspective because nowadays, many firms and organisations are making

efforts to implement something sustainable [18]. This means that if individuals, companies and organisations want to do something about or with sustainability, they should know what sustainable means [19].

In the search for a lasting solution to this critical problem, the critical role of the media cannot be ignored. This is more understandable when we realise as [20] argued that western education cannot help in the efforts to making people live a sustainable lifestyle because of its mechanistic and utilitarian market philosophy. He therefore suggested that ecological or whole system thinking be employed to critique the current education theory and practice in order to make it both transformative and transcended. In this regard, the traditional role of the mass media remains essential to modifying the traditional belief that western education is the answer to global ecological problem. [21] stressed the increasing efforts toward creating a sustainable society when he stated that there is a groundswell of thinking and action towards reversing the increasing pressure of global warming on human environment. Meanwhile, the main indicators of climate change and its impact on the environment as measured by the annual Worldwatch State of the World reports, or even as reported in daily newspapers, remains deeply worrying [22]

Although some of the problems already created by sustainability crises are irreversible, there are still much that could be done to mitigate them. However, [23] argued that, it is not possible for our values and behaviours to change unless we change our beliefs. This implies that for the required change to occur there must be transformation of our belief system. With the resulting change and our acting together under the inspiration of a new vision of our role on this planet, humanity could through the transformation of our understanding, be able to extricate ourselves from an outworn worldview and begin to replace the deficient values that have long controlled our culture with new values based on respect for the Earth [24]. While it is through that western education has led to the development of

new technologies and new methods of production aimed at reducing greenhouse carbon emissions, this development has not solved the problem. With an avalanche of new technologies and methods of production in place, the level of pollution, unethical business practices, environmental degradation, over exploitation of natural resources and so on are still on the increase. For instance, with regard to environmental pollution, the continuous anthropogenic emissions of greenhouse gases (GHG) into the atmosphere have brought about the issue of changing climate [25]. The authors argued that climate change and air pollution lead to structural damage of built infrastructure such as transport infrastructure (roads, railway tracks, bridges, tunnels, airports, sea ports, earthworks). This damage to built infrastructure is caused by "extreme weather conditions (e.g. more frequent heat waves and extreme rainfall) and long-lived and slow when derived by changing climatic conditions (e.g. increase in the average annual temperature, overall drier summers and wetter winters); such climatic changes have been confirmed by climate models [26]; [27].

Equally, the transport sector of global economy contributes to air pollution and climate change. According to [28], the transport sector relies mostly on oil production (gasoline and diesel) for its energy supply. Although there is large awareness of the environmental implications of too much dependence of the transport sector on fossil fuels, not much is yet done to reduce the use of fossil fuels as the major source of energy for the transport sector. Unless a solution to the over dependence of the transport sector on oil is found, there is the tendency that the greenhouse effects of the transport sector could continue for long. However, the dependence on cheap and secure oil for energy supply of the transport sector is partly a solution to the energy problem but this makes the climate problem more difficult to solve [29]. With no solution to this problem in sight, greenhouse gas emissions and its effects on climate change have continued to increase. Supporting this view, [30] stated that despite the

longstanding concerns about fossil fuel dependence and strong and rising concerns about climate change, up to now transport's reliance on fossil fuels has not decrease appreciably over time. In the past few decades, these sustainability crises have continued to attract the attention of concerned citizens, organisations and the governments of different countries. In support of this view, [31] stated that the evidence of sustainability is seen in how farmers are starting to manage soil preservation, the new way people now strive to protect species and biological diversity, the emergence of green building, engineering and communities, and the increasing number of businesses selling products of services and preserving natural capital as a matter of conscience and profit [32]. The author argued that sustainability is also evident in education and the emergence of new ways of thinking about human role in nature that extends our perspective to whole system and to the far horizon of imagination [33]. However, it seems these changes in the way of thinking about the earth as observed by [34] are not much visible in the developing nations, especially Africa. Hopefully, there are developments in the ways the media report climate change that have begun to address this problem.

To achieve a true sustainability will require a change in consciousness that leads to new behaviours pattern, new way of thinking and acting that is different from the old ways of thinking and acting that led to sustainability crisis. This is important because there is no way we can experience change in behaviour without a shift in consciousness. A radical shift in consciousness from personal to transpersonal [35] which transformation could create in people could result in a more sustainable living and the protection of the earth. This is possible because the moral, spiritual and ethical changes that result from transformation in the life of an individual make people to see economic (the world of business) beyond profit making, and also to see the need for social justice as an obligation.

In order to confront sustainability issues/problems, the world needs minds

capable of creating new possibilities for meeting basic needs such as energy, water, housing and food; minds that can transform daily experiences into ones that allow a sustainable development, safeguarding opportunities and the environment for future generations. The avenue for producing reflective minds could be provided by the mass media practitioners through renewed climate change reporting.

Theoretical Framework

This study was based on the Theory of Reasoned Action. The choice of this theory was informed by its relevance to the formation of attitudes and behaviour change amongst individuals. The Theory of Reasoned Action is based on the proposition that the behaviour of an individual is determined by the

individual's behavioural intention (BI) to perform that behaviour, which supplies the most accurate prediction of behaviour [36]. Behavioural intention is determined by two factors: one's Attitude toward the behaviour (A) and Subjective Norm (SN) [37]. Attitude toward behaviour is defined as "a person's general feeling of favourableness or unfavourableness for that behaviour" [38]. Subjective Norm is defined as "perception that most people who are important to him think he should or should not perform the behaviour" [39]. Attitude toward behaviour is a function of the result of one's salient belief (B) that performing the behaviour will lead to certain outcomes, and an evaluation of the outcomes (E), that is, rating of the desirability of the outcome.

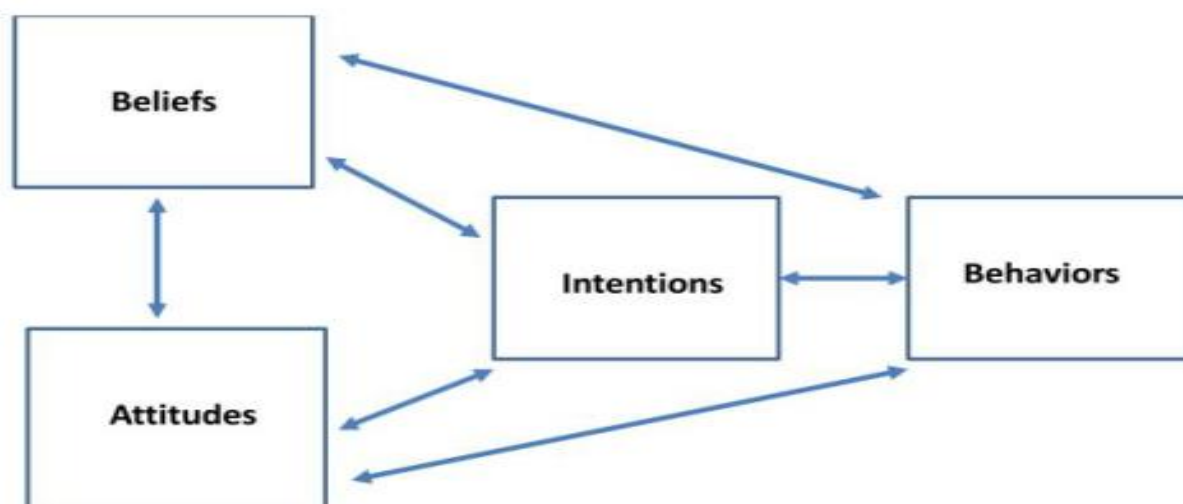


Figure 1: Theory of Reasoned Action

Source: Tello, G. Swanson, D. Floyd, L. and Caldwell, C. 2013. p. 108).

The Theory of Reasoned Action developed by [40] indicates that an individual's behaviour arises from interrelated combination of how one thinks and feels about a concept or idea, which then promotes the intention to act that result in actual behaviour [41]. Sometimes, however, behaviour may be guided mainly by attitudinal considerations (i.e., by beliefs about the possible consequences of the behaviour and the evaluation of these consequences), and normative or control considerations may be irrelevant [42]. Behaviour is the function of one's beliefs, attitudes and intentions.

Bases for Transformation towards Sustainable Living

Presently, there is a growing recognition that sustainability is important. This is evidenced by what organisations, government and educational institutions are doing which indicates recognition that the social and environmental challenges of the 21st century are real and they require that the global economic and political order be grounded in different values and practices [43]. Transformation of learners toward sustainable living in the age of sustainability crisis is important

as a strategy to help reduce human contributions to sustainability problems and issues. Human activities have led to increase in the world energy consumption and this has resulted in increase in greenhouse emissions with its attendant environmental and health consequences. For instance, air pollution has resulted in 800, 000 premature deaths caused by lung cancer, cardiovascular and respiratory illness, increase in the rate of asthma, and coronary diseases as well as impairment of lung function (World Health Organisation, [44]). To reduce these problems require attitude change in the consumption pattern, waste disposal habits, unethical methods of production and other activities that lead to high rate of greenhouse emissions.

Buttressing the increase in the rate of consumption of products that cause toxic waste and pose danger to environment, [45] stated that the average person in a developed country uses 9 times as much fossil fuel and 20 times more aluminium as the counterpart in developing countries. With respect to waste, the average person produces 4 times as much household refuse, 11 times more carbon dioxide, 26 times more chlorofluorocarbons, and 75 times more hazardous wastes while the average Americans use 43 times as much gasoline as average Indians, 45 times as much copper, and 34 times as much aluminium [46]. North Americans have two times the "ecological footprint" of Europeans, and seven times the average footprint of Asians and Africans [47]. These statistics shows that sustainability crisis is not caused by any particular country although some countries with high ratio of energy requirements that lead to carbon emission could be said to be more liable. However, what is important is not the apportioning of blames but the need to take responsibility to control the situation.

Sustainability Discourse

Sustainability is a new concept that emerged as a result of the need to manage natural resources judiciously. [48] acknowledged that although the concept of sustainability has a longer history, it was not earlier than in the 1987 Brundtland Report published by

the World Commission on Environment and Development entitled 'Our common future' that the concept of 'sustainable development' for the first time was introduced in order to establish the linkage between economic development and major environmental problems. According to [49] the World Commission on Environment and Development (WCED) sought to provide for a more sustainable and equitable world, arguing that poverty and consumption levels of developed nations were among the major causes of world's ecological problems.

The Report by the World Commission on Environment and Development (1987) headed by Gro Harlem Brundtland [50] in an effort to link sustainability with economic development [51] defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [52]. It stated that "Sustainable development is a process of change in which the application of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations" [53]. This definition captures two important objectives of any sustainability plan. These are how the present generation could satisfy their own needs and still live enough resources for the future generations to satisfy their needs. However, the [54] definition has been criticised by some people as being too difficult or impossible to translate into action [55]. According to the authors, the critics argue that to use this definition to evaluate policy choices or business decisions and simultaneously avoid making it difficult for the future generations to meet their own needs, requires predicting both their needs and abilities, which in turn requires forecasting their available technologies. Going by the inaccuracy of historical predictions of today's technologies, it is difficult to predict technologies several generations ahead, not to talk of predicting their needs. Thus, the Brundtland Commission's definition seems unhelpful in evaluating the sustainability implications of current

decisions. What could be a more important thing to consider is how the current users of resources could be transformed to live sustainably, so that they could pass on sustainable lifestyle to the future generation and live them to manage their own needs.

Sustainability presupposes that we should make efforts to limit our ecological footprints. According to [56], the new value of sustainability appeals to individual conscience and asks for remorse if one's consumption pattern harms the long-term ecological balance for every other person. This kind of appeal is more of an ethical issue than the thinking pattern prevalent among enterprises. In the world of business, emphasis seems to be on producing large quantity of goods for the global market place and making huge profits. Little or no attention is paid to how this approach to doing business could affect the environment and the survival of the planet. Supporting this view, [57] stated that in the past, marketers largely held the unexamined assumptions that: "Wants are natural and infinite, and encouraging unlimited consumption is good; the planet's resources are infinite; the earth's carrying capacity for waste and pollution is infinite; quality of life and personal happiness increase with increased consumption and want satisfaction".

On the contrary, "...those who press for sustainable practices hold the following principles: wants are culturally influenced and strongly shaped by marketing and other forces; the earth's resources are finite and fragile; the earth's carrying capacity for waste and pollution is very limited; quality of life and personal happiness do not always increase with more consumption and want satisfaction" [58]. This latter view suggests that both individuals and businesses have to live by the principles of sustainability in order to save the earth and humanity from the consequences of unsustainable lifestyle. To do this will require transformation in the lives of individuals, groups and the public. Some companies are already doing something in line with the principles of sustainability. For example, [59]; [60] discussed what some companies are doing to be seen as sustainable. However, no mention was

made of change in attitude or transformation of learners, chief executives of companies (CEO) and employees of organisation as fundamental to achieving sustainability. This study considers it important to talk about transformation in the attitudes and behaviours of people because production and consumption patterns will not change without transformation in our attitudes and behaviours. Also, [12] pointed out that companies that embrace sustainability are expected to make some basic changes in their production and marketing practices and [19] noted that sustainability requires a "harmonised and less exploitative social policies with respect to plants, landscapes, animals..." but both authors did not mention how this could be done.

The advocates of 'triple bottom line' stated that organisations pursuing sustainability should make decisions based on economic returns, environmental protection and social justice [27] in order to ensure eco-efficiency. Thus, the implementation of the triple bottom line concept requires companies to consider the societal effects of their actions [31]. However, the authors argued that there is no guarantee that eco efficiency, fair trade and environmental justice if implemented by all companies, would lead to sustainability. They therefore, suggested that in addition to the triple bottom line, companies should have other bottom lines beyond profit such as ethical bottom line.

The triple bottom line approach to sustainability provides a useful guide. These are important. But going by the fact that sustainability crisis continues to increase in spite of the growing number of organisations implementing the triple bottom line concept, it can be argued that the approach has not reduced the problem. What ought to be the guiding principle of any meaning attached to sustainability is that individuals and organisations should adopt strategies of living that allow the present generation to satisfy their needs without endangering the opportunities of the future generations to meet up their own needs. These strategies ought to be evolving with the changing dimensions of sustainability issues. This

is where education as a continuing process of learning and updating strategies is suggested as fundamental to addressing sustainability crisis.

[35] stated that "Sustainability is a concept, a goal, and a strategy; the concept speaks to the reconciliation of social justice, ecological integrity, and the well-being of all living systems on the planet". The idea of social justice, ecological integrity and enhancing the well-being of every living thing in the above definition correlates with the definition of education for sustainable development (ESD) as provided by the Sustainable Development Education Panel of United Kingdom [34]. It stated that education for sustainable development help people to develop knowledge, values and skills that are useful in making decisions on how to do things either as individuals or as a group, both locally and globally. This implies that education for sustainable development (ESD) is needed as a tool to achieve sustainability, maintain and improve the quality of life of the present and future generation [5].

Although the problem of definition is not the central issue in this discussion, the ambiguity or multifaceted meaning of the term presents its own problem. If we cannot get the meaning correct, it is possible that we cannot also get the solution to the problem right. In support of this view, [41] noted that when trying to identify the essential features of sustainable development, which would allow understanding and providing the models of the management of sustainable development, their comparison and clarification of their processes, one faces a theoretical issue with the conceptual description and assessment of sustainable development. However, we cannot continue to dissipate energy in contesting the meaning of sustainability while the environment and economic crisis it creates keep claiming it tolls on the ecosystem and human health. What is important to bear in mind is that we cannot ignore sustainable living in the struggle to reduce poverty. To do so will instead of reducing poverty, make it worse. This is because the effects of global warming and environmental degradation and resource depletion could increase poverty and endanger

human health. Sustainability crisis, poverty and human health are interconnected. Therefore, they cannot be thought of separately. Solution to the problems requires the application of system thinking. This thinking pattern links all things together in the process of making decisions and taking of actions.

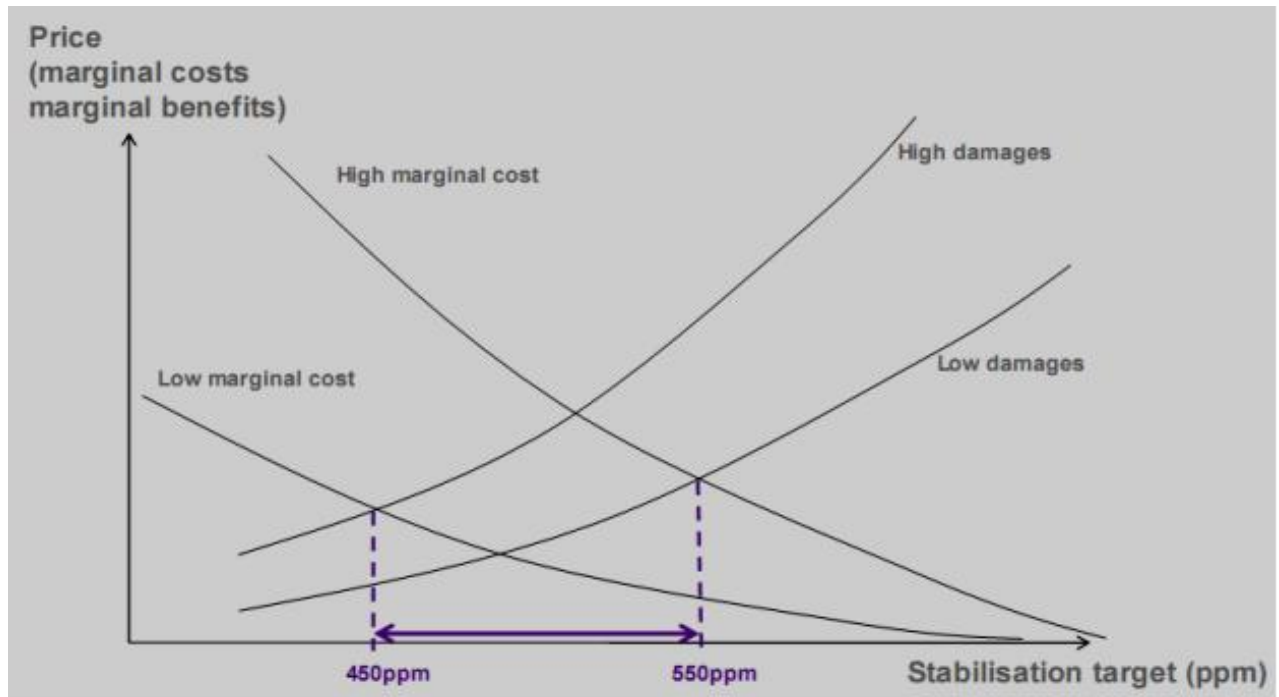
Sustainability issues challenges sociologists, environmentalists and even the economists as well as the journalists. Each of this group has been seeking for answers to the problem. Perhaps the economists could play some important role in deciding the issue. So can the sociologists and environmental scientists. For instance, economists could help in developing global poverty reduction strategies, population issues, and even climate change analysis. To this challenge, literature indicated that economists have not been out of the race in the search for solution to sustainability issue. Supporting this view, [11] stated that the issue of global climate change and how to tackle it has put economics to a severe test in which economists have been challenged to think afresh about how to model (or at least how to conceptualise) such fundamental notions as risk, uncertainty, and discounting..

Some leading economists [2], [3], [4], [5] have analysed the economics of climate change by assessing the scale of action required and the optimal CO₂e atmospheric stabilisation levels. The analysis was aimed at finding out whether it would be cheaper to reduce emissions now or pay at some time in the future in order to adapt to a changing climate [19]. Majority of the economic analysts found it optimal to pursue greenhouse gas emission reduction by following a more gradualist course starting with the reduction at far lower levels than what Stern review advocated for the near future [34]; [35] review analysis found that "the benefits of strong and early action far outweigh the economic costs of not acting", and asked for stabilising greenhouse gas atmospheric concentrations at ≈ 550 parts per million (ppm) of carbon dioxide or CO₂-equivalent (CO₂e) [7]. This implied that Stern suggested immediate action and not less than 25% CO₂e reduction by 2050 over the 1990s

levels [3]. Nordhaus meanwhile concluded that taking of action to reduce greenhouse gas emission was not urgent.

[9]; [10] asked the question: What is the level of CO₂e stabilisation levels

in terms of balancing the needs of future generations with those of current generations? The search for answer to the question using analysis based on different discount rates (Figure 4) led to two different conclusions.



Finding the optimal stabilisation point, cost benefit analysis (Hepburn, 2008 adapted from Stern, 2007 as cited in Broer, S. 2012, p.29.).

While [11] 0.1% discount placed a relatively high value on the wellbeing of future generations, Nordhaus 6% discount rate placed less value on the wellbeing of future generations [7]. This analysis and the estimates of carbon emission reductions proposed by economic analysts could be helpful to some extent. However, the application of these proposals and estimate is limited by our inability to correctly predict what could be the needs of the future generations and the level of carbon emission reduction that will be required to enable them meet their needs. Moreover, it is not only the high level of carbon emissions that is the cause of sustainability crisis. There are myriads of other factors. So, the economists need to first of all, think of sustainability in interconnected sense and not as an isolated concept.

A Problem arises when we think of human problems and global issues in a disconnected sense. Building a sustainable society will require recognising the interconnectedness between all things. This is because as the system thinking model indicates, the different aspects of sustainability: environment, economic and social aspects and even the political are all interconnected [55]. Also, because the Earth is a system, what affects one part could affect the other parts as well. In the words of [29], 'the concept of sustainable development has crystallised down to three main pillars: economic development, social development and environmental protection. The connections between these three aspects require that the development perspective should take cognisance of the environmental

implications of any economic development aimed at achieving economic growth and poverty reduction. The Brundtland Commission definition of sustainability adequately took care of the interconnections between the economy, environment and social justice. According to the report, sustainable development “integrates economic and ecology in decision making to protect the environment and to promote development” [55]. At each point, making connections between economic decisions and their implications on the ecology could help in creating a sustainable society.

It can be said that the World Commission on Environment and Development advocated system thinking approach as a way to resolving sustainability crises. The Commission’s Report is systemic in the sense that it acknowledged the interconnections between economic, environmental, social factors and the welfare of human beings. Supporting the view that what affect the economy will also affect social life of people and the environment, [7] argued that meeting environmental criteria in a society without meeting the economic and social goals concerning justice and equity does not make for sustainability. For instance, when environmental laws protect the cutting down of trees in community forests while the rural population live in poverty, there is the tendency that the rural poor will engage in cutting down of trees to eke out their living against the environmental laws. This likely action of the rural population could expose the soil to the effects of global warming and leads to desertification and the depletion of biodiversity that support human life. For instance, the European Space Agency has estimated that about 35% of the land of Greece faces a very high risk of desertification in the 21st century because of climate change and the resulting global warming, [40]. This situation is not limited to Greece. Every other country in the world faces similar danger.

Besides the unsustainable activities that the rural poor might engage in, multinational corporations sometimes act even more unsustainably and help to make the rural population poorer. In the Niger Delta Region of Nigeria, for

example, the unsustainable activities of the multinational oil companies operating in the region have left the environment and the sources of living of the rural people devastated. Oil spillage in the Niger Delta region has destroyed all the aquatic life and the farm lands that support the life of the farming population in the area [13]. The authors stated that the Niger Delta environment has suffered degradation resulting from gas exploration, water pollution and land degradation from oil spillage, gas flaring and canalization. [9] noted that such devastating activities on people who depend on environment to eke out a living have several other effects. These effects have economic, social as well as health and psychological dimensions [8]. The neglect of the environment by the multinational oil companies operating in the Niger Delta area of Nigeria suggests unethical business practices by the companies. The companies seem to concentrate on profit making without taking into consideration the environmental and health implications of their activities.

On the other hand, the citizens of Niger Delta who are not satisfied with the activities of the oil companies operating in the area break pipelines to tap oil illegally. Their grievances also emanate from Nigerian government neglect of the people and suspected government’s collusion with the oil companies to create environmental problems in the Niger Delta region. Supporting the view that government takes no action to restrain the companies from unsustainable practices, and the reactions of the youths of the region, [18] narrated a story of how he met with some Niger Delta youths during an awareness campaign and confronted them on why they were breaking pipelines. The answer given to him was that since all government plans are always in the pipeline, they were breaking the pipelines to pull them out [43]. When business is done for profits without consideration for healthy environment, the multiplier effects create further sustainability problems. Perhaps, it is human failure not to take into consideration the different dimensions of sustainability when working to achieve a particular goal that could be responsible for the escalating

sustainability crisis. In support of this view, [41] stated that sustainable development must be understood as a type of development which aims to integrate production with resource conservation and enhancement and links both to providing an adequate livelihood base and equitable access to resources. This integrative approach could be a meaningful way of tackling sustainability issues. This is because it is holistic as it is systemic.

Underscoring the importance of integrative approach to addressing sustainability problems, [7] noted that it is widely perceived that integrative approaches are needed to address problems in environmental management so as to achieve sustainable development. Supporting the view that sustainability can only have a complete meaning if the economic, social and environmental dimensions are taken into account, [14] stated that sustainable development is to be understood as a three-dimensional normative concept:

i. The ecological dimension is concerned with preserving natural life support systems by improving the quality of the environment, reducing pollutions for the future generations and using resources in sustainable ways.

ii. The economic dimension aims at ensuring economic prosperity through effective use of resources, providing people with employment, good income, and making technological progress.

iii. The socio-cultural dimension aims at resolving social justice and solidarity by promoting a just distribution of wealth and income, ensuring education, legal rights, cultural identity and diversity, and so on. However, [1] failed to mention the need for developing the political will to take sustainability into account during policy making as well as the implementation of measures that can enhance it.

Even with respect to the highly industrialised nations of the West often accused of contributing high level of greenhouse emissions that cause environmental problems and climate change, it is not finding technical solution to the problems that matters. They need to see sustainability problem from a less fragmented point of view could be more important than all the technical innovations aimed at reducing

sustainability crisis. In this sense, the West needs to consider ecological aspect of sustainability as of equal importance to the economic and the social aspects. In support, [51] suggested that "From global perspective, the western industrialised nations have to improve first of all in the ecological dimension", They noted that in the long run, sustainable development will only be possible if socio-cultural and economic conditions are also taken into consideration.

Processes of Transformation towards Sustainable Living

Transformation in attitudes and behaviours is something that comes about when an individual, government or leaders of organisations begin to think in a new way that helps them to see the need for change. Transformation is taking place in different part of the world. For instance, [47] stated that "a quiet transformation is taking place in communities all over North America and around the world". This indicates that individuals, government and businesses in different countries are beginning to embrace new way of thinking. In support, [9] stated that thousands of citizens and their governments are embracing a new way of thinking and acting with a view to creating a better future. The reasons for embracing this new pattern of thinking according to the author vary but they include a desire to improve the quality of community life, protect the environment, and take part in making decisions that affect us; concern about poverty and other social conditions, whether in faraway countries or in our own towns; longing for a sense of satisfaction that money cannot buy; and pride in the legacy left for our children. However, it is incomprehensible to argue that individuals, organisations and governments of different countries have begun to embrace a new way of thinking towards sustainability when we are still experiencing a surge in sustainability crisis caused by human actions.

Sustainability Practices in Africa, Asia, and Europe.

The level of consciousness and practices of sustainability differ from country to country. In the developing countries of

the world, how the people behave and act with respect to caring for the environment, control of greenhouse emissions, management of soil fertility and even the housing systems and so on are different from how the same issues are handled in developed nations. Supporting this view, [7] said that it should always be noted that the criteria of sustainability may differ from ecosystem to ecosystem, zone to zone, nation to nation. This implies that it will be wrong to generalise the practice of sustainability around the world. As a result of these differences, there is the possibility that students who come from different cultures to study under the Global Education system, especially those from the developing nations and emerging economies will have something to learn with regard to living sustainable lifestyle. In this section, sustainability practices in developing countries and some developed nations of the world are examined.

Africa

The practice of sustainability in Africa is not entirely new. In the traditional African society, the fertility of agricultural land was maintained through the process of land rotation and shifting cultivation. However, the creation of the needed awareness to cope with the increasing needs for sustainable living seems to be low in Africa. In this regard, Van Wllgen, Le Maltre and Cowling (n.d) pointed out that those that promote the establishment of forests to offset CO₂ increases have fundamental problems with programs that remove trees, and thus biomass. The authors argued that the potential for carbon sequestration through this process in South Africa is small, whereas the possibility of biodiversity loss is large. However, with particular reference to the study done by [6], a village in the middle Belt of Nigeria, the authors reported that "there is some evidence that points towards unsustainability". They reported that "with both the legume and cereal categories the production trend over the ten years was broadly in a decline... The area planted to all legumes is perceived to have increased, and this was typically said to be due to a reduction in yield".

Sustainability in Africa is measured mainly from agricultural perspective. In this regard, sustainability is viewed in two ways: sustainability as an approach and sustainability as a property. According to [23], sustainability as an approach looks at some practices as 'sustainable' while others are not. The result of this view is typically a package of 'good' practice such as crop rotation, soil conservation, low or reduced use of fertilizer, pesticide, fossil fuels, and so on [5]; [6]. Progress towards sustainability can be monitored in this regard by simply noting the implementation of 'good' practices [14]. However, it is not sufficient to measure the practice of sustainability by looking at what these authors termed good practices. In some cases, conclusions reached by looking at 'good' practices may not reflect how other resources that have not been used could be used by the same people that adopt good practice in some areas they have mastery of. For instances, how does a society that adopt crop rotation, uses low fertilizer content and practice soil conservation, handle the issue of recycling, proper waste disposal and so on? In addition, with the increasing rate of globalization and its attendant mass production of goods and services, sustainability indicators cannot be based on mere observation of good agricultural practices. The ways we use the manufactured goods, our pattern of consumption and our relationship with biodiversity now matter as well.

On the other hand, sustainability from the system property perspective aims to define the ability of the system to exist in some preferred state and continue to deliver its products over time [20]. This view presents more problems in terms of definition and measurement than a simple list of 'good' practice, not least being the need to identify the system boundaries and time scale (Morse *et al.* 2001). However, the study reveals the two broad perspectives and suggested ways of addressing these problems.

With respect to the practice of sustainability by universities in Africa, they could be said to be not completely left out in the global race to create a sustainable society. As noted by [46] "There is enough evidence nationwide to detect an arms-race of sorts among

universities competing for green status. Recent national campaigns related to carbon neutrality, green buildings, local food, renewable energy and sustainability reporting have boosted sustainability activities at campuses across the globe”.

Asia

In Asia, some countries experience similar sustainability practices. Such developing countries of Asia are as well agro-based economies. Findings from the study by [45] showed that there is declining output of agricultural products in Asian countries leading to cultivation of wider area of land. The researchers attributed this decline in production to decreasing soil fertility, and this is an evidence of unsustainability

Many Asian countries belong to the developing countries of the world where how domestic and industrial products and resources are used is said to have adverse effects on human health. According to [51], “Asian developing country’s economies have experienced increasing environment burden with the rapid growth of their economies. The practice of ‘pollute now, clean up later’ caused many environmental problems and created difficulties for further development efforts”. [48] said the environmental problems in Asian developing countries (ADC) include sandstorms, acid rain, widespread water pollution, forest depletion, intensive soil erosion, floods, siltation, solid waste pollution, dumpsite accidents, and so on. This situation calls for evolving new environmental strategies to deal with the problem.

Furthermore, [57] stated that in developing countries in Asia and other parts of the world, most energy sources in the home come from solid fuels such as coal, biomass (firewood, crop residue and animal dung). They pointed out that the particulate matter (PM), which includes CO, NO_x Sox, which results from the combustion of these fuels inside residential homes in the process of cooking has an adverse impact on people’s health. According to the United Nation Development Programme and World Health Organisation (UNDP/WHO) respectively 2009 report [54], 56% of the people in developing countries still depend on solid fuels for cooking and 2

million deaths annually are associated with the indoor burning of solid fuels in unventilated kitchens, 44% of these deaths are children and 60% of adult deaths are women. This pattern of living suggests that Asian countries and many other developing countries, though not highly industrialised, still live unsustainable lifestyle.

In addition, because Asia’s countries are still developing and like many other places in the world, the build environment through its construction operations, deconstructions and demolitions are responsible for more than 50% of all national greenhouse gas emissions [59]. In the building technology, for example, interior installation of Air conditioning (AC) technologies for cooling in India, China, and Indonesia is happening at a rapid tempo more than was ever experienced in US and Japan [8]. In China, pollution rate is said to be very high. In support, [13] stated that “In almost every large city in China, the evidence of air pollution is evident. The local will tell you it is “fog”, which is not entirely wrong as the pollutants mix with the moisture in the air and hang in there undissipated by the sun”. The level of pollution is such that anybody can directly look at the sun during high noon and not worry about eye damage as the air pollution serve as a protective insulation [27].

With the growing population of Asia’s countries and increasing urbanization, there is the likelihood that the use of greenhouse emission technologies will increase by over 50% in the next two decades. The implication of this is that “any claim and ambitions for more sustainable futures in Asia are severely compromised by the widespread and rapid take-up of energy-intensive methods for cooling interior spaces” [9]. For instance, in Malaysia, several incidents clearly indicated that the environmental problems due to imbalance development growth caused devastation to the environment and brought miseries to the people [10]. As a way out, the authors opined that it is the responsibility of educators to instill awareness among students on preserving the environment through proper curriculum design. They said that the survey on environmental

awareness and life styles showed that Malaysians have low to moderate level of understanding of environmental issues. The findings of this study provide basic information of the level of understanding of environmental issues among students from developing countries. As noted by [17] the result of survey studies so far conducted on environment showed that the low level of understandings of environmental issues have continued to make us experience the problems of environmental pollution, sewage disposal in rivers, open burning, haze problem because the knowledge and awareness of Malaysians are not up to the level to think about adverse long term effect of this pollution on national economics and their life.

Writing on environmental problem in Asia, Savage, [11] stated that in the environmental area, Asia is a curse, victim and benefactor of environmental problems, climate change problems and outcomes. They said that in rising to the challenges of development, and providing better qualities of living and standard of life, Asian governments have not been equal to the task in bringing to the communities and citizens the best environmental goods. With the increasing population of Asian countries, it is envisaged that it will be difficult for the governments of Asian countries to deliver to the citizens' developmental and environmental desirables. Supporting this view, [21] said that among the top 10 poorest countries in the world, five are from Asia (China, India, Pakistan, Bangladesh and Indonesia). It is argued that large populations still plague the environmental and developmental deliverables for China (1.3 billion), India (1.1 billion), Indonesia (240 million), Pakistan (172 million), Bangladesh (147 million), and the Philippines (90 million), and in other Asian states, rapidly growing populations (Lao PDR, Cambodia, Timor Leste) and aging populations (Japan, Singapore, South Korea, Thailand) are issues of concern for their governments and these have different environmental implications and impacts [28]. The authors noted that for small countries like Brunei, Singapore, and Kuwait which are wealthy oil producers or refiners have

large income per head but carbon impacts is much higher than large countries like India, Indonesia or Thailand.

However, with the growing economy of some Asian countries and the increasing cooperation between Asian countries like China, India with developed and developing nations, it can be said that is not absolutely correct to argue that all Asian countries will continue to be plagued by poverty and environmental issues. Asian countries like China, India and Malaysia are top sending countries of students to Europe for higher education (see table 1 and 2). Students from countries like China could have knowledge of sustainability going by the fact that "In recent years, there have been a several initiatives in China of a local and regional nature that draw upon ideas in industrial ecology and that attempt to implement various forms of eco-industrial development" [50] The authors however, failed to acknowledge that China is a capitalist-driven economy and like all capitalist economies, the country could place more interest in making profit than ensuring eco-friendly environment. It is likely that going by the nature of competition between China and other big economies like the U.S of America, Chinese eco-drive could be overshadowed by the quest for rapid economic growth and development.

The problem of sustainable development is made complex by the driving forces of capitalism. Capitalism and globalization creates disparities between the rich and the poor nations of the world. In the developed countries, the desire for economic growth and development push countries to exceed the limit of desirable exploitation of natural resources and industrial production, leading to excessive carbon emissions. In the other hand, the poor countries depend on the industrial products of the developed nations and reusing of good. In the words of Savage, [7], "The rich thrive on tapping resources from global environment while the poor have to eke out a living from recycling and reusing goods". As the poor nations strive to survive in a world that the big nations dominate economically, enough attentions is not paid to sustainable living. This disparity

of wealth between and within countries makes it difficult to enact policies to reduce carbon emissions and pollutions because both the rich and poor in both the rural and urban areas are contributors to environmental problems: the rich leave a massive ecological footprint around the world by their environmentally unfriendly conspicuous consumption; while the poor do not have clean water, modern sanitation and proper refuse disposal systems which undermine the cities' general public health [4]. The authors submitted that "the continuing disparities of wealth and status in many cities in Asia will remain a challenge for the development of environmentally sustainable cities".

Furthermore, in Vietnam, the Government's effort to guide the country from a centrally-planned economy toward a market economy succeeded and made Vietnam to open up its economy to the rest of the world, thus making significant progress and has since opened significant progress in the process of trade liberalization since 1989 [21]. The authors argued that while this has been successful in generating strong economic growth, it has created threats to the country's environment which can be seen in the degradation of the nation's environment in the areas of forest depletion, decline in biological diversity, soil degradation (marine and inland), water contamination, air pollution and the problems in solid and hazardous waste management and so on [25]. With respect to the level of consciousness about environmental sustainability that most companies in Vietnam have, they have to some extent included environmental management in their operations but they have not inculcated it in their overall management framework [1]. According to the authors, environmental management in Vietnam is not yet considered to be an issue which needs to be dealt with systematically. It follows from the foregoing that while the citizens are aware of environmental challenges and the need for creating a sustainable environment, their transformation toward making the environment sustainable remains unaddressed.

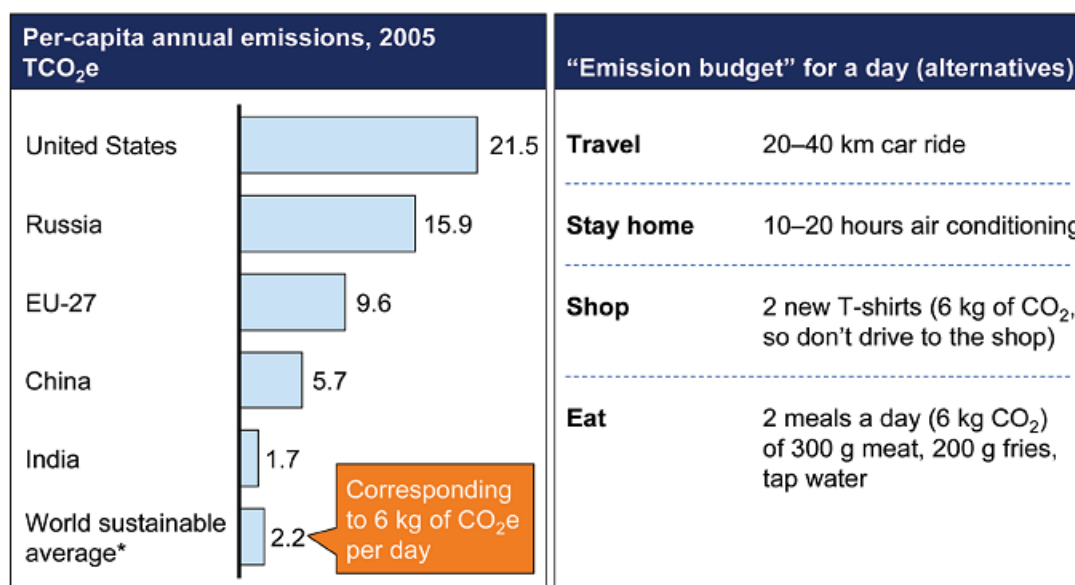
Europe

Europe is largely an industrial nation and the mere mention of the name is associated with high rate of greenhouse emissions. However, government and industries have been putting in place measures aimed at reducing greenhouse emissions, especially with the recognition of the dangers of climate change, carbon emissions and depletion of ozone layer. These measures have led to the reduction in the quantity of greenhouse emissions from some of the European countries. The UK for example is said to have been responsible for 15% of the cumulative emissions since 1750, but it is responsible for only 2% of current global emissions [55]. It was however, noted that these figures do not include carbon emissions from land use changes or from unsustainable use of forests, which also vary considerably by country neither were they adjusted to include the full global warming impact of carbon emissions from air travel, or the net effect of imported and exported goods, or greenhouse gasses other than CO₂ [7].

However, the fact remains that developed nations depends largely on energy that come from the burning of fossil fuels for their energy needs, and the UK is typical in this respect, deriving 90% of its total energy needs from fossil fuels [6]. The implication of this UK dependence on fossil fuels for her energy requirements is that she faces great challenge when it comes to drastic curtailments in energy use in order to reduce its effects on climate change. As stated by [19], UK CO₂ emissions in 2004 were 556 Mt CO₂ (DEFRA, 2007a), and this contributes about 2% of the world's total emissions. With these high energy requirements for UK industries and its implications on climate change, it is expected that universities in the United Kingdom will place high priority on teaching students to live sustainable lifestyle and engage in sustainable business activities. However, the UK is not alone in this high energy needs among Western nations. Countries like America, Russia, China and so forth also depend much on energy from fossil fuel. When per capita CO₂ emissions from fossil fuels at Global level was considered, statistics showed that USA contributes largest amount of

emissions, followed by Australia, UK, France, Mexico, China, while India, Bangladesh, Afghanistan in that order, contribute the least [58]. Also, for 2005

emissions, Europe still ranks third, implying high ratio of carbon emissions contribution



Current per capita emissions and world sustainable average emissions for 2050 to meet stabilisation levels of 550 ppm CO₂e.

Source: Beinhocker *et al.*, 2008 as cited in Broer, S., 2012, p.34)

For both years, the global statistics failed to take into account the CO₂ emissions of countries in Africa. In this sense, it cannot be said to be completely a global measure. It can however be said that most of the countries in Africa are not highly industrialised but this does not mean that they have zero fossil fuel consumption. Apart from indoor fossil fuel, the percentage of carbon emissions from fossil fuel in Africa is limited to the few countries where oil production takes place.

Role of the Media in Reducing Climate Change

The media are considered by many as key to any social change effort. This explains why the mass media have been at the vanguard of bringing about change through the use of persuasive communication. The media are paramount in climate change communication, though there are other ways that have been explored in the process of providing the world population with climate change stories. In preparing the media to face the growing climate change challenge, a

number of important organisations have recognised the need to educate and empower a broad range of scientists and journalists to be more effective at communicating about the complexities of climate science and about the societal and economic impacts of a warming climate [15]. The authors, for instance, noted that organisations such as Climate Communication have been launched to support scientists in their dealings with media, while the United Nations Intergovernmental Panel on Climate Change itself has continued to focus on the communication of climate science. The Earth Journalism Network, Society of Environmental Journalists, Poynter Institute, and the International Centre for Journalists have worked to build media capacity globally to cover climate change stories. Efforts at Stanford University, the University of Oxford, Massachusetts Institute of Technology, Harvard University, and the University of Rhode Island sponsor programming and fellowships that in part help bolster journalism in this area. . [7]. Through face-to-face workshops and online efforts, The Yale Project on Climate

Change Communication has sought to link the media and science communities. Meanwhile, powerful, widely read sites and blogs such as "Dot Earth," hosted by the New York Times, Climate Central, Real Climate, The Conversation, and Climate Progress have fostered professional dialogue, greater awareness of science, and called attention to reporting and communications issues. Journalists and scientists have had ongoing conversations as part of the regular publication and reporting processes, and professional conferences and events bring the two communities together. Issues that continue to animate these discussions include conveying the degree to which climate science can be said to be "settled" and how to address uncertainty. Through some of these capacity-building efforts, news media have become increasingly aware of audience dynamics including how citizens respond to pessimistic reports, or "doom and gloom," versus solutions-oriented reports. Professional dialogue has also revolved around the ethical dimensions of conveying a story at the level of global importance. Still, with issues of climate change communication on display for more than two decades now, certain tensions and dynamics persist [3]. Notably, journalists seek clarity from scientists, while climate change experts and advocates for and against taking climate action often continue to demand that journalists resist the temptation to oversimplify or hype the latest empirical findings, while at the same time urging that journalists do not underestimate potential climate risks. [10].

As several decades of awareness-raising and initiatives to engage the public have shown, climate change does not communicate itself [46]. A burgeoning evidence base on the social science of climate change communication now provides many explanations for why engaging on climate change can be challenging. Climate science is filled with uncertainties, a notorious stumbling block for communicating with non-scientists. [12]. For some, the topic can seem abstract and intangible. For others, the abstract statistics that define the climate discourse can feel distant from their day-to-day experiences. In some nations, the issue is politically

polarised; in others, the absence of a public and political discourse is the problem. [60]. But the same social science literature that documents the challenges posed by engaging the public with climate change also provides some robust guidance for how to communicate more effectively. That our worldviews, values and social norms dictate how we receive information and apply it to our own lives is well understood. It has also long been recognised that the messenger is at least as important, if not more so, than the message itself. Scientists are trusted in society and there are wealth of opportunities to engage the public around key moments in the climate change calendar, [15] such as using the media to reach out to millions of people globally on the issue of climate change and the need for sustainable living as the most important step to checking climate change and the resultant global warming and its consequences to lives on earth.

It is possible to communicate climate science in a way that makes message easier for non-scientific audiences to understand, and makes it more relevant to their lives and experiences. [12]. According to [20], connecting with your audience on the basis of shared values builds trust between the communicator and the audience. There may be no 'magic words' that will resonate universally, but there are better and worse ways to start a conversation about climate change; more and less effective ways to use language and narratives. The possible guidelines to follow in order to effectively communicate climate change have been provided by [21]:

- Be a confident communicator: Scientists are generally highly trusted. By using an authentic voice, you can communicate effectively with any audience.
- Talk about the real world, not abstract ideas: Although they define the science and policy discourse, the 'big numbers' of climate change (global average temperature targets and concentrations of atmospheric carbon dioxide) do not relate to people's day-to-day experiences. Start your climate conversation on common ground, using clear language and examples your audience is more likely to be familiar

with.

- Connect with what matters to your audience: Research consistently shows that people's values and political views have a bigger influence on their attitudes about climate change than their level of scientific knowledge. Connecting with widely-shared public values, or points of 'local interest' in your communication and engagement makes it more likely that your science will be heard.
- Tell a human story: Most people understand the world through anecdotes and stories, rather than statistics and graphs, so aiming for a narrative structure and showing the human face behind the science when presenting information will help you tell a compelling story.
- Lead with what you know: Uncertainty is a feature of climate science that should not be ignored or sidelined, but can become a major stumbling block in conversations with non-scientists. Focus on the 'knowns' before the 'unknowns' and emphasise where there are areas of strong scientific agreement around a topic.
- Use the most effective visual communication: Choosing images and graphs is just as important to do in an evidence-based way as verbal and written communication. This is important in both audio and audio-visual mass communication channels such as radio and television and even in the print media such as newspaper and leaflets.

Climate change is considered by many as the most pressing issue of our time. However, the most pressing issues of our time are often the most polarized, and this is certainly true of climate change [3]. To get past the political gridlock, many environmental leaders urge advocates to make the issue more visible, more emotional, and, above all, more urgent in the minds of everyday citizens. [26]. The desire for urgency makes sense in many ways. Heat-trapping emissions from fossil fuels have already disrupted Earth's climate system. At this very moment, the resulting changes are undermining human health and harming the natural places on which people depend. [31]. Our action or inaction on climate policy

today will continue to reverberate, for better or worse, far into the future.

But from a communications perspective, [37]. argued that we are not so sure that upping the urgency factor is the best approach. The full-frontal, factual assault has not been sufficient to motivate behaviour and policy changes [33]. Some communicators have intentionally sowed doubt, confusion, and science scepticism. When public opinion is divided, policy progress slows, as elected officials and other policymakers hesitate to take stances that alienate constituents. [21].

Knowing this, vested interests often manufacture misunderstanding or polarize issues. This is why some lobbyists work to foster political polarization as part of their toolkit for safeguarding an issue from regulation. The fossil fuel industry for instance, has encouraged both doubt and controversy on climate change. Countering misinformation with fact-based rebuttals rarely works. [8] stated that a good deal of research into the psychology of persuasion finds that yelling louder from an entrenched position doesn't just fall flat, it can actually be counterproductive. Advocates need not fall into this trap, whether they work on climate or on other issues. Instead, they can make progress by looking for "side doors" to engage people in different perspectives, rather than trying to knock down the front door with a barrage of facts. [2]. These side doors frame a problem in ways that aren't clearly marked as "Left" or "Right," leaving open the possibility of true dialogue with diverse, even antagonistic, audiences.

Journalists as advocates of climate change can catch spot or side door this opportunity finding space for depolarized discussions by looking for communications opportunities off the beaten path, away from the boisterous "argument culture" fostered by sensational journalism and dog-eat-dog politics. With a well-coordinated plan for embedding new frames into the ways these institutions engage the public; this approach can have a surprisingly wide reach. [6].

Media report can achieve greater effect and induce attitude change if journalists report the views of trusted voices on

social issues than just concentrating on the views of recognised climate change advocates or those of the climate change sceptics. Climate change reporters on the media should not assume that opposition to or apathy about climate change is rooted in ignorance. That assumption leads science communicators to try to educate audiences by citing all the facts. However, research indicates that ideology, social identity, and trust have much greater influence on how people make sense of complex or controversial topics. That means an individual's willingness to accept facts is incumbent upon his or her trust of, and respect for, the source of information. Ideally, you want to build this level of trust with your audiences, but that comes from repeated positive interactions over time. So if a journalist is trying to initiate productive conversations about climate change with new audiences, it is vital to get trusted scientific or natural resource experts in your community to offer evidence and testimonials. In many cases, journalists face the temptation of reporting the huge impact of climate change at global level without emphasis on local climate change impacts, their causes and responses (Anon, n.d). While it is important to convey a sense of urgency about the immediate consequences of climate change because lives, livelihoods, infrastructure, species, and ecosystems are at stake and we need to act now to address changes that are underway, and to reduce the impacts of threats on the horizon, it is advisable that media reporters should focus on local climate change impacts and responses. The goal of such messages should be to empower people to act, not to shame them into doing so. Focusing too much on causes may alienate people who may feel they are being judged for their personal contributions to greenhouse gas emissions. Regardless of our individual carbon footprints, we are all in this together. Everyone has a role to play in climate adaptation, and you can communicate that there are lots of ways for different people to take action in their communities, and lots of compelling reasons for them to do so. For example, flooding of roads, tree damage from invasive species, loss of

food crops from drought are all local examples that journalists should highlight as the immediate consequences and supporting evidences of climate change.

Select photos that bring your messages to life. This is because Climate change has an image problem, often associated with distant places like the Arctic Circle, and big data like the beleaguered hockey stick graph. If we want people to care enough about climate change to act, we need to show them impacts that are closer to home, responses that are within reach, and role models who look like them. Climate Visuals, an evidence-based resource for climate communication, recommends depicting the following:

- **Faces** - Use photos that show individuals or small groups of people in real places or situations, experiencing or responding to a climate-change impact. Viewers should be able to read the emotions clearly on individual faces. For example: A family standing in front of their flooded home.

- **Actions** - Couple images of impacts with images that demonstrate measures that people can feasibly take in their own lives to respond to or prepare for climate change. For example: A homeowner installing a rain garden.

- **Before-and-after** - Contrast is a powerful tool. Use images to illustrate a concept that is fundamental to climate change, but difficult to put into words: change over time. Show a familiar place before and after it was affected by dramatic impact. For example: Before and after a flood, drought, or invasive-species infestation.

- **Scale** - Although it is helpful to show climate response on a personal level, it's not productive to show climate responsibility on a personal level. If you must talk about causes of climate change, zoom out to emphasize that it is a problem of scale. For example: Hundreds of fossil-fuel burning cars on a congested highway, not an individual driving his fossil-fuel burning car to the mall.

The language used in reporting climate change can be a source of concern and a problem to people if they are two

technical to be understood by mass media content consumers and their followers. Therefore, avoid technical jargon, instead using language that can be understood by anyone. Acronyms, and abstract concepts can make people who are not part of the associated profession feel like outsiders. For certain audiences, jargon will be interpreted as a secret code or a red herring, intended to conceal or mislead. And some terms like “resilience” can have different meanings in different contexts, making them sound vague or elastic. In general, technical language makes it harder for people to understand what reporters are trying to communicate. That wastes the time of the audience and even that of the reporter who can be said not to have communicated since what was reported could not be understood by all. Messages should be clear, concrete, and accessible to anybody. Say what you mean in plain language, and engage audiences in feedback dialogue rather than lecturing to them. This can help reporters to establish a rapport based on mutual understanding and encourage more audience participation in the climate change debate, a development that could make some audiences become more open to nuance and complexity.

[17] noted that when the “usual suspects” are the only voices on an

issue, the public quickly begins to doubt their authenticity. Ensuring that trusted messengers are part of the framing effort can help avoid this problem. In addition, the use of candid images to report climate change has proved to be more effective in inducing behavioural change. Investigation by [8] on the Climate Visuals project revealed that candid images of real people were viewed as more authentic and engaging than staged photos, and that imagery of easily identifiable “environmentalists” protesting increased people’s cynicism, whereas images of regular citizens engaged in climate change solutions tended to produce positive reactions in viewers. This finding provides support for using candid images reflecting the consequences of climate change in reporting rather than the use of shock images that are not verifiable as fear appeals to make their audience accept the reality of climate change.

These communication media can be used to create shock factors to make people realise the damage they are doing to the environment. Documentaries and videos with trees and gardens damaged, for example, and their effects on the environment could be shown on televisions at intervals and posted on social media to serve as reminders to people of the effects of unsustainable human activities on the environment.

CONCLUSION

The activities of individuals contribute largely to sustainability crisis. Therefore, the way individuals use resources need to be sustainable. Our pattern of consumption needs to be regulated. Equally, human activities such as deforestation, bush burning, improper waste disposals, and the way we make use of the soil can all lead to sustainability crisis. The media should intensify awareness campaigns on control of greenhouse emissions. It is important that people should be made to understand that these problems are the results of unsustainable human activities, and we can reduce the impacts of climate change on human lives and the biosphere by changing our attitudes towards the environment. The traditional mass media, social media platforms and networking, video

sharing, e-mails, instant messaging utilisation have proved to be productive in changing behaviours and human attitudes in several social, political and economic situations. The advocates of climate change cannot do much without the full engagement of the media in the climate change discussions.

Business organisations need to act sustainably. This study recommends that organisations should be part of the global movement for creating a sustainable society. In order to take active part in negotiating the path to sustainability, it is important that organisations should do business in sustainable and ethical manners. The drive for profit and growth should be balanced with the need to pursue sustainability [34]. As suggested by [60] companies must balance more carefully

their growth goals with the need to bring about sustainability. The best way to do this should be for companies to think less of making all the profits they need for shareholders without concern

for the environment, resource conservation and the future of the next generations. Organisations should work towards transforming their employees to act and live sustainably.

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