

Educating Farmers and Fishermen in Rural Areas in Nigeria on Climate Change Mitigation and Adaptation for Global Sustainability

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Abstract—The impacts of climate change are greatly felt on Nigeria's agricultural sector which in turn affects the economy of the nation. There is an urgent need to educate farmers and fishermen in rural areas in Nigeria on climate change adaptation and mitigation for sustainable development. Through our literature and participant observation, it has been discovered that many farmers and fishermen in rural areas in Nigeria have little or inadequate knowledge about climate change adaptation and mitigation which is essential for global sustainability. This paper seeks to draw the attention of policy makers in government, private sectors, non-governmental organizations and interested individuals to the need to seek for innovative ways of educating farmers and fishermen in rural areas about climate change adaptation and mitigation for global sustainability. This study also explores the effective methods of bridging the communication gaps through efficient information dissemination, intensive awareness outreach, use of climate change poems and blogs, innovative loan scheme to farmers and fishermen, leadership summits on climate change and environmental sustainability in rural areas, etc. to help ensure that farmers and fishermen in rural areas in Nigeria are adequately educated about climate change adaptation and mitigation for global sustainability.

Keywords— Agriculture, Climate Change, Farmers, Fishermen.

I. INTRODUCTION

Climate change is a defining challenge of our time which affects every country in every continent on our planet today. Climate change education is therefore necessary to help nations to learn how to adapt and mitigate effectively.

Developing countries are the most affected by the impacts of climate change and need to seek effective ways to mitigate and adapt effectively to climate change with the help of other developed countries.

Farmers and fishermen in rural areas in Nigeria are not left out on climate change impacts and therefore need to be properly educated on climate change adaptation and mitigation in order to survive and thrive amidst the climate change trends in the 21st century.

This study vividly explores the need to educate the farmers and fishermen in rural areas on climate change mitigation and adaptation for sustainable development locally, nationally and globally. Climate change poems and blogs have been recognized as important tools which can be used in educating these farmers and fishermen in rural areas in Nigeria. In this paper, we shall explore how this can be achieved as well as the effective methods of bridging the communication gaps in rural areas in Nigeria.

II. UNDERSTANDING CLIMATE CHANGE

Climate change is one of the global trends which we must of necessity tackle with urgency

in order to prevent a global warming too unbearable for the survival of mankind and to ensure global sustainability. Climate change education is therefore vital for preparing ourselves for climate change impacts and to learn which actions we can take to prevent an unbearable global warming.

On November 17, 2007, in Valencia, Spain, United Nations Secretary General Ban Ki-Moon described climate change as defining challenge of our age[8].

Climate change is a global problem, and yet each of us has the power to make a difference in our communities and the world at large. Even small changes in our lifestyle and behavior can help reduce greenhouse gas emissions while ensuring a good quality of life for global sustainability.

According to Dr. Margaret Chan, the World Health Organization(WHO) Director-General on the World Health Day 2008,”Climate change is one of the greatest challenges of our time. Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of health: food, air, water. In the face of this challenge, we need champions throughout the world who will work to put protecting human health at the centre of the climate change agenda”[10].

Defining Climate Mitigation and Adaptation

Climate mitigation is any action taken to eliminate or reduce the long-term risk and hazards of climate change to human life, property and the society. The International Panel on Climate Change defines mitigation as: “An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases” [7].

Climate adaptation refers to the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damage, to take advantage of opportunities, or to cope with the consequences [7].

III. IMPACTS OF CLIMATE CHANGE ON NIGERIA’S AGRICULTURAL SECTOR

In developing countries like Nigeria, agriculture plays significant roles in the socio-economic wellbeing of the people. Unfortunately, this sector of the economy (agriculture) has suffered a great deal by the impacts of climate change disasters and other associated risks thereof [1], [2]. Agriculture involves the cultivation of the soil, production of crops, raising of livestock and fisheries, and in different degree how these agricultural produce are prepared and sold in the market.

Agriculture today in Nigeria like any other part of the world is highly dependent on climatic factors like good temperature, precipitation and water supply, etc. and vast majority of the people depend on agriculture as their source of livelihood which provides food, income from investment and employment [1].

Innovative ways of educating farmers and fishermen in Nigeria rural areas on climate change mitigation and adaptation for local and global sustainability seeks to draw the attention of policy makers in government, private sectors, non-governmental organizations, civil society groups, individual farmers and fishermen through their

respective unions on sustainable ways of reducing the disasters and risk associated with the climate change impacts on the society especially, the rural farmers and fishermen which has direct consequences on their livelihood and environmental security.

Thus, call and mobilization for innovative ways of educating farmers and fishermen in rural areas in Nigeria on climate change mitigation and adaptation for local sustainability is driven from the philosophy that no action taken at national, regional or international levels will be effective until there is a corresponding reduction of climate disasters and risk among the people and communities that are vulnerable to these menace [3].

Arguably, there is a widely consensus among environmentalist and climate change practitioners that man's continued activities and interactions with his environment have had and are still having negative impacts on the environment notwithstanding, the attendant strides man has made in industrialization, technological advancements and development across different human endeavors [4, 1]. Global temperature rise arising from emission of greenhouse gas emissions such as (Carbon dioxide, Methane, Chloro-flouro carbons, Nitrous Oxide and Sulphur hexafluoride) into the atmosphere increases global warming with its attendant negative impacts such as Ozone depletion, acid rain, increasing cases of flooding, hurricane, drought, pollution, among others [5].

[1,2] have separately highlighted the characteristics and impacts of climate change on rural farmers and fishermen in Nigeria as;

1. Increasing heat waves which generate and bring about more extreme temperature and precipitation that prevent crops from growing well. Extreme example of floods and drought harm crops and reduce yields.
2. Ocean acidification arising from increase in atmospheric carbon dioxide affect aquatic animals in the seas and oceans reproductively and many times cause their deaths.
3. Unpredictable rainfall variations in recent times. This affects agricultural produce and farmer's productivity. Delay/ shortage of rainfall period cause farm products to wither and die which impacts on farm yield and income. This affects rice and maize with other crops in quality and quantity. Agricultural produce in Nigeria is mostly rain fed.
4. Rising sea level and ocean surge in most places in the Southern Nigeria in recent times has submerged villages in Lagos and some places in the Niger Delta. Excessive flooding can also lead to soil erosion and destruction of farmlands. Climate change impacts on agriculture (Farming & Fishing) in Nigeria in the following ways: increase in temperature, drought, severe floods, weather fluctuation and extreme weather events. Gas flaring and oil production increase heat level of an area especially, the Ogoni land challenge in the Niger Delta of Nigeria.
5. Climate change also affects the health of the farmers and fishermen in rural areas directly and indirectly. Through the increase of mosquitoes in farmlands and their environs caused by excessive rainfalls, farmers become susceptible to Malaria and other diseases like dengue fever, diarrhea caused by flooding. In severe cases, this can lead to the death of rural farmers and fishermen and thus, there is great need for climate change education to ensure they adapt and mitigate effectively.

IV. Ways of Educating Farmers and Fishermen in rural areas in Nigeria about Climate

Change Mitigation and Adaptation for Global Sustainability

According to Dr. Margaret Chan, the World Health Organization(WHO) Director-General on the World Health Day 2008, ” Every event and every voice on every occasion is needed to give new energy and commitment to making the fundamental changes that will both stabilize the climate and prevent human suffering[10].”

The following are the possible innovative ways of educating farmers and fishermen in rural areas in Nigeria about climate change mitigation and adaptation for global sustainability. Thus, innovative ways of educating both farmers and fishermen in Nigeria’s rural areas on cutting knowledge of climate change mitigation and adaptation for local sustainability seek to address the seemingly communication gap in the modern business of information dissemination which local farmers and fishermen in Nigeria may not be aware of or there is a degree of complexity, laxity and taking for granted on the part of the farmers and fishermen. This innovative and improved ways of educating the local farmers and fishermen in Nigeria are as follows:

- 1. Intensive awareness outreach through individuals, organizations especially climate change oriented non- governmental organizations to the rural farmers and fishermen in collaboration with their respective unions. This interface between climate change oriented organizations with the respective union of farmers and fishermen will deepen the platform for the farmers and fishermen to have greater awareness and understanding on the need for sustainable resource use in the face of climate change impacts.**
- 2. Adequate training and exposure of fishermen and farmers through participatory observation in seminars, workshops, symposium in their locality on the risk, disasters associated with climate change and the sustainable mitigation and adaptation strategies. This training should also have a follow up mechanism to evaluate the level of success and possible challenges.**
- 3. Communicating the critical issues of climate change mitigation and adaptation strategies in their local dialect for easy assimilation. Indigenous people should be incorporated within the climate change oriented NGOs to enable the local fishermen and farmers to have a sense of belonging. These seminars, workshops and symposium manual for farmers and fishermen should also be in their local dialect for the literate ones to read.**
- 4. Climate change NGOS should maximize the leverage of churches, mosques and other social gathering in the villages to disseminate the knowledge/message of climate change mitigation and adaptation strategies because, greater number of these farmers and fishermen are based in our rural areas.**
- 5. Many fishermen, farmers and other villagers are aware of the increasing change in their environment however, many of them still see the changes as an act of God and nothing can done about it. In respect of the above, there should be aggressive utilization of Radio, Television, Newspapers and Magazines in their local language section to enlighten them of the limit of their knowledge and issues in their environment. They**

must be made aware of how man is contributing to the release of excessive greenhouse gases into the atmosphere which can lead to global warming and climate change.

- 6. Leveraging the opportunities in information and communication technology(ICT) can be used in educating the rural farmers and fishermen. There are literate ones among them that can leverage on this platform.**
- 7. Innovative loan scheme can be given to farmers and fishermen by the climate change NGOs to our rural farmers and fishermen to alleviate the risk and dangers associated with climate change. This loan scheme can also empower the farmers to purchase relevant educational materials which will help to deepen their knowledge about climate change impacts, adaptation and mitigation.**
- 8. Educational blogs can be used to inform, enlighten and educate farmers and fishermen in Nigeria especially the internet literate ones about climate change mitigation and adaptation. These blogs which are meant to be highly interactive allows the farmers and fishermen to also contribute their ideas, suggestions and feedback to the climate change educators and bloggers for global sustainability.**
- 9. Poetry has also been discovered as a great tool which can be used to educate farmers and fishermen in Nigeria about climate change mitigation and adaptation. The Project Green Initiative which is an arm of the Benjy Poetry And Music Global Concepts is a good example of a social enterprise which is very passionate about educating the communities which includes the fishermen and farmers in Nigeria about climate change mitigation and adaptation. The Project Green Initiative creatively uses the tool of poetry which focuses on climate change to educate farmers and fishermen in Nigeria.**

Below are our climate change poems which can be used to educate farmers and fishermen in rural areas on climate change adaptation and mitigation:

POEM: KEEP CLEAN, STAY COOL

**Keep clean, Stay cool
Be disciplined and dutiful
Think positive, Think creative
Be passionate and innovative**

**Keep clean, Stay cool
Make the earth bright and beautiful
Help make the earth a better place
Earth's pollution we must efface**

**Keep clean, Stay cool
Be diligent, Be careful
Pick the trash and keep clean
Throw the trash into the waste bin**

**Keep clean, Stay cool
With poetry as a tool**

**Go green, Keep clean
With a formidable team**

**Keep clean, Stay cool
With a heart so grateful
Enjoy the beauty of nature
Help create a sustainable future**

**Keep clean, Stay cool
Drink freely from wisdom's pool
Feel the gentle whispering breeze
Enjoy the sweet fragrance of peace**

**Keep clean, Stay cool
Be disciplined and dutiful
Help make the world a better place
Put a smile on someone's face.**

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The second poem "Plant a Tree" below advanced by the Benjy Poetry And Music Global Concepts vividly outlines in a poetic manner the benefits of tree planting which is one of the climate change mitigation strategies for global sustainability.

POEM: PLANT A TREE

**Trees provide us with oxygen.
Trees help keep the environment clean.
Trees help to purify the air;
Increasing moisture as they transpire.**

**Trees help to prevent water pollution.
Trees help to prevent soil erosion.
Trees conserve energy.
It is so beautiful to plant a tree.**

**Trees absorb odors and pollutant gases.
Trees provide shade for the masses.
Trees cool the streets and the cities.
Trees create economic opportunities.**

**Trees are like the lungs of the planet.
Preserver and greener of the earth.
Trees matter beautifully and truly.
Be dutiful to plant a tree.**

**Trees provide a canopy.
A shade for the hungry.
A shade from the raging heat.
A beautiful place for retreat.**

**Trees provide food.
Trees provide wood.
Trees combat climate change.
When properly managed.**

**Trees slow runoff and hold soil in place.
As beauty and bliss, they embrace.
Trees help us appreciate nature.
Plant a tree for the future.**

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V. CONCLUSION

Educating farmers and fishermen in rural areas in Nigeria on climate change adaptation and mitigation is an urgent task which needs to be undertaken by governmental agencies, NGOs, community leaders, and passionate climate change professionals for our sustainable development in Nigeria.

Leadership summits on climate change and environmental sustainability, intensive awareness outreach, climate change poems and blogs, have been recommended as important tools which can be used in climate change education in rural areas for sustainability locally, nationally and globally.

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