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Assessment of the Impact of Climate Change or Market Gardening in Akpabuyo Local Government Area of Cross River State

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Abstract

The purpose of this study is to assess the impact of climate change or market gardening in Akpabuyo Local Government Area. The study examined the impacts of climate change on soils and general agricultural using library survey. It was recommended among othets that, by using sustainable practices Improve soil health for a climate resilient garden. Use cover crops in your vegetable garden to recycle nutrient and reduce erosion. More frequent rainfall event and floods are anticipated with climate change. Help excess water slow down, soak in and reduce erosion by generating, a rain garden. Reduce food waste and grow some food locally.

Introduction

Climate is the general weather conditions in an area over a long period Ngigi (2009) defines climate change as a change in climate that is attributed directly or indirectly to human activities, that alters the atmospheric composition of the earth which leads to global, intergovernmental panel on climate change (IPCC) in (2007) said climatic change is the change in the state of the climate that can be identified by the changes in the mean and/or the variability of its properties and that persists for an extended period typically decades longer. Climate change is considered as the most pressing environmental problems facing the globe today, affecting patterns of life and general living conditions.

Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods. It is usually caused by factors such as biotic processes (such as human, animals etc, volcanic eruption etc climate change has repercussion such as upsetting seasonal cycles, harming ecosystems and water supply Odekunle (2014). Climate change has serious impact in agriculture (market gardening) it is important to study because livelihood patterns of millions of people is dependent on agriculture and people depend on it.

Purpose of the study

The main purpose of this study is to assess the impact of climate change on market gardening in Akpabuyo Local Government Area of Cross River State.

1. Identify the causes and effect of climate change on market gardening
2. Examine effect of climate change on agriculture (market gardening especially on crop production
3. Examine impacts of climate change on animals and finally climate change adaptation problems

Market gardening is the work of growing fruits and vegetables on a small farm, and selling them to the public. Market gardening is a type of agriculture that is seen more and more in Europe and other parts of the world. The concept is based on the efficient use of small areas of land using manual labour and simple mechanized equipment, market gardening has many health benefits for consumers, health, fresh, organic products. There are benefits for change mitigation, biodiversity, soil regeneration, it also contributes to local economy, reduces imports needs, and the decentralize system means if one enterprise collapses, it doesn't impact the others and the system is resilient when faced with many challenges economic or environmental land is very accessible to man as you need a very small area to work. Market gardening has proven a real response to covid-19 crisis in regard to the local vegetable supply all over the world.

The scale of urban consumption and waste generation and the negative impacts associated with them varies dramatically from city to city depending on the large part on a city's wealth and size. All which contribute disproportionately to global environmental problems, such as depletion of natural resources and emission of greenhouse gases. Climate change has been expressed as the fall out of human activities including agricultural and industrial production and consumption of their products (UNEP and UN-Habitat 2005) Soltau 2006, Sridhar 2009) production activities are increasing daily, both in intensity and sophistication and in the process, nature is being desecrated through destruction of vegetation and water resources United Nation framework convention on climate change (UNFCCC) defines climate change as a change of climate that is attributable directly or indirectly to human activities and which alters the composition of global atmosphere. Climate is an average weather together with the variability from this average. It is the condition of the weather in a given place over a period of time. The main element of weather itself included temperature, rainfall, due humidity, wind, sunshine, mist, hazard and clouds.

Market gardening as the name implies has to do the commercial, production of vegetables fruits flowers and other plants on a scale larger than a home garden, yet small enough that many of the principles of gardening are applicable the goal as with all farm enterprises is to run operation as a business and to make a profit. A marken garden is a business that providens a wide range and steady supply of fresh province through the local growing season. Climate change has affected planning and growing of crops in Akpabuyo Local Government with the increase in average temperature during the growing season typically causing plants to use more

energy for respiration for their maintenance and less to support their growth. The temperature alteration can take many forms. Changes in average temperature, change day time high and night time low temperature and changes in the timing intensity and duration of extremely hot or cold weather.

Generally, crops are most sensitive to high temperature at the reproductive state (Hafield et al, 2011) plants, responses to each type of temperature alteration is species specific and mediated through both photosynthesis activity for biomass accumulation which is responsible for plant growth and the phonological and morphological changes, which occur during plant development each type of temperature stress has a different effect on crop duration and overall plant productivity.

The effect will depend on how sensitive each specie is at their stage of development when the temperature alteration occurs. Adapting to these effects will require different types of responses. To predict the respsons of species of new temperature alteration, it is necessary to know how the same species has responded in the past to similar change when the temperature is high and at average temperature.

Impact of climate change on market gardening

Climate is considered as the major or determinant of agriculture despite the existent ce of other factors. The variability in rainfall and temperature as perceived by farmers has an impact on their activities a total of 68.8% acknowledged the impact of climate on farming 16.3% said there was none while 15.0% were not aware. Farming in Akpabuyo, Cross River State is largely rain fed and climate change negatively impacts crop productivity be decreasing crop yield and soil fertility, limiting availability of soil water increasing soil erosion and contributing to the spread of pests.

Climate change can also increase the threat of wildfires. Wildfires pose major risk to farmlands grasslands and range lands. Temperature and precipitation changes will also very likely expand the occurrence and range of insects, weed and pest control. Changes in agricultural productivity (marker gardening) climate change can make conditions better or worse for growing crops in different regions e.g. changes in temperature, rainfall, and forest free day are leading to longer growing seasons in almost every state. A longer growing seasons can have both positive and negative impacts for raising food. Some farmers may be able to plant longer maturing crops or more crop cycle altogether while others may need to provide more irrigation over a longer, hotter growing season. Air pollution may also damage crops plants and forest. When plants absorb large amounts of ground level ozone, they experience reduced photosynthesis, slower growth, and higher sensitivity to diseases. Climate change can also increase the threat of wildfires, wildfires; pose major risk to farmland, grasslands and rangelands. Temperature and precipitation changes will also very likely expand the occurrence and range of insects, weeds and diseases this could lead to a greater need for weed and pest control.

Pollination is vital to more than 100 crops grown in Nigeria warmer temperature and changing precipitation can affect when plants bloom and when pollinators, such as bees and butterflies, come out if mismatches occur between when plants flower and when pollinators emerge, pollination could decrease.

Impacts to soil and water resource

According to the assessments on market gardening climate change is expected to increase the frequency of heavy precipitation which can harm crops by eroding soil and depleting soil nutrients. Heavy rains can also increase agricultural runoff into oceans, lakes and streams. This runoff can harm water quality especially if agriculturalherbicides/pesticides were used on farms uphill (Williams & Ambe, 2019).

Climate change is impacting market gardening crops cultivation negatively with the main problem being water scarcity/insecurity which pushes market gardeners to adopted different irrigation practices in order to adapt to the adverse climate condition. Climate change is a big threat to Nigerian food security, affecting both subsistence and commercial farming. Climate change causes an increase of diseases and pest thereby declining agricultural production declining rainfall in some areas has caused increasing desertification. Climate change is impacting market gardening crop cultivation negatively with the main problem being water scarcity/insecurity which pushes market gardeners to adopt different irrigation practices in order to adapt to the adverse climatic conditions.

Climate change adversely affects availability and accessibility to water and water resources across the world (fisher et al, 2007), kemp et al., 2018 Zaveri and Lobell, 2019) studies show that climate change is already participating increasingly drier weather and climatic conditions across the world making it difficult for farmers and livestock keepers to sustain their livelihood (Save et al, 2012; Elliot et al 2014, FAO et al, 2018). With the recurrence of extreme weather event like rising temperature, scanty and erratic rainfall and extreme sunshine, dwindling supplies of water and resources are predicted to become the norm rather than the exception worsening the already precarious situation of smallholder agro-pastoralist (Woznicki et al 2015; Rosa et al 2020, theory et al 2020 across different parts of the world, water shortages are already occurring at an alarming rate precipitating famine, malnutrition, dead of livestock and wildlife and crop failure Thomas 2008 Xiong et al, 2010). This has made the practice of irrigation widespread as an adaptation measure to counter the adverse effects of climate change induced water scarcity.

The adverse effects of climate change are felt the most in Africa where a large proportion of the population depends on agriculture and livestock keeping for survival (Awazi and Tchambam 2019) due to the weather events, especially prolong dry spells scanty and erratic rainfall and drought are pushing farmers to practice irrigation in order to cushion themselves from the shocks of water scarcity (FAO 2021).

Among the farmers mostly involved in different irrigation practices faced with extreme weather event are gardeners (Soumaoro, 2021) market gardening being a farming practice regaining intensive care, most market gardeners have adopted irrigation in order to guard against the adversities of climate change especially extreme sunshine, rising temperature scanty and erratic rainfall and dryness (Soumaoro, 2021).

Solution to problem of climate change market gardening

According to internet scholar from university of Maryland has advice market gardeners on how to solve the problem of climate change:

1. By using sustainable practices. Sustainable gardening and landscaping techniques can slow future warming by reducing carbon emission and increasing carbon storage in soil and plants. You can adapt your gardens and green spaces and make them more resilient to climate change by adding nature plant diversity improving soil health, growing heat tolerant vegetable crops and using storm water management practices.
2. Improve soil health for a climate resilient garden. Use cover crops in your vegetable garden to recycle nutrient and reduce erosion.
3. More frequent rainfall event and floods are anticipated with climate change. Help excess water slow down, soak in and reduce erosion by generating, a rain garden.
4. Reduce food waste and grow some food locally

Way forward

Climate change is a reality and is affecting market gardening negatively with communities in Akpabuyo Local Government Area of Cross River Nigeria farmers should be taught on climate change such as increase in temperatures decrease in current amount of rainfall. Farmers are actually suffering from the negative impacts of climate variability like decreased yield of crops, increase in pest and diseases, soil erosion and floods, if not checked this impact will increase in future.

We recommended that policies geared towards the implementation of adaption strategies should emphasize the crucial role of providing information on better production techniques and on climate change and create financial means through which farmers can afford credit schemes to enable them to adapt. Government can also link with financial institution and offer financial assistance to farmers at very low interest rate.

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