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Agroecology as A Means of Combating Desertification and Deforestation

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Abstract

Recognized as effective and sustainable by agronomists for years, agroecology finally has its place in +global debates: it was at the heart of discussions at the One Planet Summit. But is it really a large-scale solution to combine environmental preservation, food security and socio-economic development? Faced with the ecological crisis from which agriculture is suffering and the negative and limited impacts of the "green revolution", multiple approaches aim to implement agroecological agriculture. Agroecology responds to the future challenges of humanity (food security, development of countries in the South, jobs, ecological transition of production and consumption methods). But its generalization requires support and appropriate public policies

Keywords: Agroecology; Environment preservation; Green revolution; Food security

Introduction

Agriculture, probably the most climate-dependent human activity, is both a victim and a culprit of climate change but can also be a solution to the climate change crisis. In Africa, the challenge for agriculture is to ensure the food and nutritional security of the population, a guarantee of social peace and sustainable development in a context of climate change. Agriculture is, however, directly and indirectly affected by climate change much more negatively in developing countries. According to CILSS (2016) (Permanent Inter-State Committee for the Fight against Drought in the Sahel), the evolution of the climate in sub-Saharan Africa is characterized by irregular rainfall, the resurgence of heavy rains, floods and the significant increase temperatures. Agroecology refers to all the techniques aimed at practicing agriculture that is more respectful of the environment [1-4]. Agroecology can contribute, through appropriate techniques, to capturing carbon in the soil. Plants are one of the best ways to naturally absorb carbon from the atmosphere. Thus, the soils of agricultural plots can become carbon sinks to capture CO_2.

Place of Agriculture in Climate Change

Today, agriculture faces two challenges simultaneously: ensure food and nutrition security by producing more nutritious food adapt to climate change and contribute to mitigating its impacts by reducing greenhouse gas emissions. The United Nations Framework Convention on Climate Change (UNFCCC) defines the climate change as a change in climate that is directly or indirectly related to human activity and which alters the composition of the atmosphere, in addition to climate variability observed over comparable periods [5-8]. The impacts of climate change are multiple: decreases in agricultural yield, occurrence of extreme climatic events, modification rain cycles (causing long and recurrent droughts), modification of soil structure and water sources, loss of biodiversity, snowmelt, etc.

Causes of Climate Change

Greenhouse gases (GHGs) are the main causes of climate change. These gases contained in the atmosphere and which can be of natural or anthropogenic origin, absorb or emit heat in the earth's atmosphere, thus creating the greenhouse effect, increasing the temperature around the earth, thus causing the change climatic. There are four types of GHGs:

a. Carbon monoxide (CO_2)-which represents 76% of GHGs comes from deforestation, different land uses, urbanization, waste incineration, industrialization, the use of 'fossil fuels.

b. Methane (13%) comes from agricultural production, household waste dumps, coal mines, etc.,

c. Nitrogen oxide (5%) emanating from the use of pesticides and chemical fertilizers, industrial activities, fossil fuels, the combustion of waste, etc.

d. Fluorocarbons and hydrofluorocarbons (6%) from air conditioners, refrigerators, and various industrial processes.

Several sectors of activity (including agriculture) are the source of GHGs. Regarding agriculture, at the same time as it is impacted by climate change, it contributes up to 25% to GHG emissions, especially when it is not practiced in a sustainable way.

Agroecological Transition a Response to the Challenges of Climate Change

Agroecology is a response so that agriculture can effectively fight against global warming. Indeed, this makes it possible to engage in a global and systemic reflection making it possible, in the long term, to reduce greenhouse gas emissions thanks to the preferential use of organic nitrogen and the development of legumes, the technique of methanization livestock manure or the development of agroforestry

Trees and hedges contribute to the sustainability of agriculture by protecting and enriching the soil with carbon, reducing the risk of water stress, providing natural shelter for livestock, sheltering crop auxiliaries and promoting biodiversity [9-11].

The Fight Against Desertification, a Global Challenge

Desertification is defined by the degradation of soils and therefore the loss of their fertility. It is due to several phenomena:

A. wind or water erosion,

B. long-term loss of natural vegetation,

C. deterioration of their physical, chemical or biological properties.

What is the Link Between Desertification and Human Activities?

Our activities have an impact on soil quality through: Deforestation, excessive use of pesticides, the mechanization of intensive agriculture. Exposing the soil and weakening its biodiversity (earthworms, mushrooms, etc.), these activities weaken the soil in the face of climate change, which in turn accentuates desertification.

Conclusion

It can nevertheless be concluded that, worldwide, natural systems are affected by changes in regional climate, in particular by rising temperatures, and that this warming is most likely due to greenhouse gas emissions originating anthropogenic. Nevertheless, countries now have a historic opportunity to embark on a path of green, resilient and inclusive development. Decisions taken today will determine how far the world makes further progress in development, sustainable job creation and resilient, low-carbon economic transformation.

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