



Over the next weeks, people from all over the world are converging in Egypt for COP27 to discuss climate change, its impact and to propose solutions to resolve it. The fact is true that climate change is impacting the world in a way that threatens human existence on this planet and requires urgent action. Like fire consuming a forest in a dry season and destroying everything in its way, climate change is threatening life on planet earth in the long run.

We have seen the impact of climate change in all parts of the world: melting ice in the glaciers, rising sea levels, extreme heat in summer and unbearable cold in winter across Europe and North America. The unprecedented flooding that engulfed Pakistan in 2022 also happened in most parts of the world, with bridges collapsing and communities being wiped out by torrential floods. Across West Africa, flooding in 2022 destroyed crops, especially rice and maize in a way that has never been seen before. Rural communities are uncertain now on harvests this year and what the impact on food security will be in 2023. Rural urban migration may increase due to crop failure from irregular rainfall pattern and polluted water bodies.

How did we get here?

There is no single answer to this question, but most people agree that climate change is the result of human activity. According to the United Nations¹, climate change is the result of long term shifts in temperatures and weather patterns. These shifts may be natural, but since the 1800s, human activity has been the main driver of climate change, primarily due to the burning of fossil fuels (like coal, oil and gas), which produces heat trapping gases. As greenhouse gas emissions blanket the earth, they trap the sun's heat. This leads to global warming and climate change. The world is now warming faster than at any point in recorded history.

The world recognized this several decades ago and in March 1995, the UNFCCC mobilized humanity to the Conference of the Parties (COP). Since then, efforts have been made at national levels to stop GHG emissions. This global call is achieving some results but not enough because the problem seems to be aggravated, with scientist predicting global average precipitation increasing by 7% for each degree of warming, which means we are looking at a future with much more rain and snow, and a higher risk of flooding to some regions. With a 2°C temperature increase, heavy rain events are expected to become 1.7 times more likely and 14% more intense².

As the world is called upon to act and restore our planet, this article serves to propose a time tested nature based solution for climate change adaptation in Sub Saharan Africa, a region that bears the highest impact of climate change despite contributing the lowest to GHG emissions.

Scientist around the world agree that the immediate and quickest solution to climate change is the reduction in GHG emissions through the phasing out of fossil fuels. While not a substitute for the rapid phase out of fossil fuels, nature based solutions have an important role to play in adapting to a changing climate. According to FEMA, "*nature based solutions are sustainable planning, design, environmental management and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience.*"³

This article gives a successful example of such a solution in the Sudanian Savannah Zone, comprising 2.7 million square kilometers of land and inhabited by humans and a great diversification of flora and fauna. In this zone, the shea tree is the dominant tree species with the 2 billion shea trees growing naturally. They can be found integrated with crops on smallholder farms, creating an agroforestry landscape that acts like a carbon sink and is resilient to climate change. However, this landscape is at risk, with an estimated 8 million shea trees disappearing every year.

Fig 1: Shea Tree Growing Location⁴



From March 2021 to December 2022, the Global Shea Alliance (GSA) piloted a shea agroforestry farming model in Nigeria that seeks to restore degraded shea parklands and promote community resilience to climate change, as part of the 'Global Alliance against Climate Change Plus (GCCA+)' project, in partnership with the European Union.

The Shea Agroforestry Farming Model promotes the presence of diverse tree species on farms, the intercropping of staple crops and vegetables, the production of organic fertilizer and apiculture. Each element of the model represents, at the same time, an income stream as well as providing ecosystem services to the farm. This model shows that local communities can feed themselves and improve their resilience to climate change whilst at the same time restoring degraded shea parklands. This agroforestry practice supports food production, helps improve water and air quality, improves soil health and promotes wildlife habitat.

1 Trees on Farms

Shea trees do well when they are integrated with other tree species on the same piece of land. Empirical evidence shows that the integration of different tree species with crops and livestock on the same piece of land can prevent environmental degradation, improve agricultural productivity, increase carbon sequestration and support healthy soil and healthy ecosystems while providing stable incomes and other benefits to human welfare.

The shea agroforestry model promotes the integration of food crops and shea trees on the same piece of land through intercropping. This integration is carried out to diversify production systems to create environmental, economic and social benefits through complementary interactions between the system components. This helps provides ecosystem services for the shea landscape.

2 Intercropping

Intercropping is an old farming system in West Africa where farmers plant different types of crops on the same piece of land. A typical farmer in rural West Africa will plant cereals, grains, tubers, fruits and vegetables on the same land during each crop season. This allows them to obtain all their nutritional needs from the same source. The selection of crops is carried out by local communities based on their needs, the crop types that do well in the locality as well as market access after harvest. With the help of an agronomist, land is prepared and the best yielding seeds are selected and planted. The farmers, working in groups, provide all the care needed on the farm until harvest. This practice helps produce a greater yield on a given piece of land by making use of resources that would otherwise not be utilized by a single crop.

3 Organic Fertilizer Production

Farmers around the world apply fertilizers on their farms for higher yield and to balance the nutrients available in a given soil. Most of these fertilizers are inorganic and whilst they help improve yield, they eventually destroy the soil health and the ecosystem. With the help of an expert, local ingredients like animal waste, shea cake, rice or maize husk is prepared and mulched into fertilizers. Since different crops require different fertilizers, the soil is tested in a lab to confirm the available ingredients before the fertilizer is prepared. To ensure balanced soil health for the crops, fertilizers that contain the missing nutrients are intentionally produced.

4 Apiculture

Apiculture, the technical term for beekeeping is the maintenance of bee colonies in manmade beehives. Apiculture is an important part of the shea agroforestry model as it provides income from honey, bee wax and propolis for farmers. The presence of the bees helps improve pollination and attracts other insects to the farm. The income from beekeeping makes it an attractive venture for farmer groups and the pollination by the bees helps improve crop yields. With the help of experts, beehives were produced and placed at different locations on the farm.

5 Impact

After 1.5 years of implementation, the shea agroforestry farm has shown promising results to increase climate and economic resilience in shea producing communities. Crop productivity has increased, thanks to the increased soil nitrogen content and increased pollination. Women shea collectors have also been able to earn income

from the different crops grown year round and have seen their livelihoods improve as a result. The best testament of this impact is the level on which specific practices and components of the shea agroforestry farming model have been replicated, first on the beneficiaries' own family farms and then in the wider community. Now, the Global Shea Alliance and its members are looking to expand this model across the Sudanian Savannah Zone to support rural communities' adaptation to climate change. To learn more about the Global Shea Alliance and its programs, please visit www.globalshea.com

Authors:

Aaron Adu
Managing Director
Global Shea Alliance



Marie Veyrier
Development Director
Global Shea Alliance



¹www.un.org

²<https://scied.ucar.edu/learning-zone/climate-change-impacts/predictions-future-global-climate>

³<https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions>

⁴ www.globalshea.com