# Agroforestry: A Tool to Save the Planet

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**ABSTRACT**

Agroforestry is a traditional land use system that may contribute to the solution of environmental degradation that arises due to natural and anthropogenic activities. Agroforestry is the practice of deliberately integrating woody vegetation (trees or shrubs) with crops and/or animal systems to benefit from the resulting ecological and economic interactions. Agriculture is currently a major net producer of greenhouse gasses and one of the reasons for the current biodiversity crises. Climate change has a great impact on agricultural ecosystems. Moreover, urbanization, industrialization and population explosion results in unbalanced environment. Agroforestry systems incorporating trees in crop cultivation or livestock systems can help to enhance carbon sequestration and to compensate for ongoing biodiversity loss. Agroforestry provides numerous provisioning, regulating, cultural and supporting ecosystem services and environmental benefits while promoting eco-intensification based on a more efficient use of the resources.

## INTRODUCTION

The increased pressure on the world natural resources which arises from population growth as well as economic pressure has resulted in unsustainable use of natural resources and environmental instability. The unstable nature of the world climate, attributed to human activities, depletion of forest cover due to increased hunger for forest and non-forest products has caused a lot of environmental problems such as, land erosion, flooding, frequent and severe storm, depletion of soil fertility, natural disaster as well as seasonal changes of world climate. These negative effect on the world ecosystem required a crucial

attention. Agroforestry System (AFS) is a multiple land-use system in which agricultural crops and woody perennials are grown on the same land management unit (Owunubi and Otegbeye 2012). As it is a land use system that has the potential of improving agricultural land use while providing lasting benefits and alleviating adverse environmental effects at local and global levels.

- Turning biodiversity-rich areas into intensified, monoculture farming, drives land degradation and soil erosion, threatening the world's food supplies. According to the Director-General of the FAO (Food and Agriculture Organization of the UN), "the increasing loss of biodiversity for food and agriculture puts food security and nutrition at risk".

- Global farming has reached a crisis point. Intensified land use and inefficient human systems threaten food security and drive biodiversity loss and climate change. Half the world's fertile soil is already lost and, with an estimated 60 years of topsoil left, we need a farming strategy that restores soil and secures food production.

It is possible to put global agriculture into a climate-smart future and the solution already exists. Practised around the world, it's known as regenerative agroforestry. Agro-forestry practices are being increasingly advocated as possible remedies.

**Types of agroforestry systems:**

**Intercropping:** This involves growing trees and crops together in the same field. The crops can be planted around the trees, or the trees can be interspersed among the crops.

**Alley cropping:** This involves planting rows of trees or shrubs alongside rows of crops. The crops are typically grown in the alleys between the rows of trees or shrubs.

**Silvopasture:** This involves integrating trees and pasture for grazing animals, such as cows or goats. The animals can graze under the trees, and the trees can provide shade and protection from the elements.

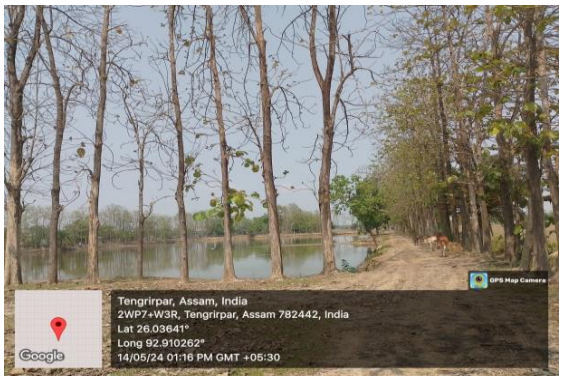
**Homegardens:** This type of agroforestry involves growing a diverse mix of crops, trees, and animals in a small area surrounding a house. Homegardens are common in tropical and subtropical regions and can provide food, fuel, and other products for households.

**Agroforestry in forestry plantations:** This involves integrating trees with other crops or animals within forestry plantations. This can help to diversify income streams and enhance the environmental and social benefits of plantations.

**Urban agroforestry:** This involves incorporating trees and other plants into urban and peri-urban areas, including in gardens, parks, and along streets. Urban agroforestry can help to improve air quality, reduce heat island effects, and provide other environmental and social benefits.

Oke (2008); agreed that agroforestry can provide new and useful solutions to many of the adverse consequences of human land use, including increased diversification of agricultural production system, increased yield of crops and livestock. Ajake (2012) also recognized the function of forest trees in term of income generation, good medicare, employment generation, raw materials, and provision of food among others. Agro forestry is increasingly promoted for restoring forest, degraded environment, reducing greenhouse gases, and gaining other co-benefits. Adekunle (2006) added that the tree litters in alley cropping fascilitate nutrient cycling, help in

suppression of weed as well as control of soil erosion.






**Benefits of Agroforestry systems:**

1. **Increased carbon sequestration**: Agroforestry systems can help to sequester carbon dioxide from the atmosphere, as trees and other perennial plants absorb and store carbon in their wood, leaves, and roots. This can help to mitigate the impacts of climate change, as increased atmospheric $CO_2$ is a major contributor to global warming.

2. **Improved soil health:** Agroforestry systems can help to improve soil health by providing cover, adding organic matter, and increasing soil water-holding capacity. This can lead to increased crop yields and reduce the need for chemical fertilizers and pesticides.

3. **Biodiversity conservation:** Agroforestry systems can provide habitat for a wide range of species, including birds, insects, and mammals. This can help to support biodiversity and maintain ecosystem functions.

4. **Enhanced water management:** Agroforestry systems can help to regulate water flow and reduce erosion, as trees and other vegetation intercept and slow the movement of water. This can help to prevent soil degradation

and protect against flooding and landslides.

5. **Increased income and food security:** Agroforestry can provide farmers with a range of products, including timber, fuelwood, non-timber forest products, and food. This can help to diversify their income streams and increase food security.

**Agroforestry Benefits to Rural Communities**:

1. **Economic benefits:** Agroforestry can provide a range of products that can be sold or used by the community, including timber, fuelwood, non-timber forest products, and food. This can help to diversify income streams and increase economic stability for households and communities.
2. **Improved food security:** Agroforestry systems can provide a source of food for communities, including fruits, nuts, and vegetables. This can help to increase food security and reduce reliance on imported food.
3. **Enhanced environmental health:** Agroforestry systems can help to protect and restore the environment, including soil, water, and biodiversity. This can help to improve the overall health and well-being of communities.
4. **Increased social capital:** Agroforestry can foster a sense of community and cooperation, as it often involves collective planning and management of land and resources. This can help to build social capital and strengthen community ties.
5. **Improved education and training:** Agroforestry can provide opportunities for education and training, including learning about sustainable land use practices and the value of natural resources. This can help to build knowledge and skills within communities.

**Regenerative agroforestry: a major solution**

Regenerative agroforestry is a resilient and future-proof agricultural method that could help solve the climate crisis. This smart farming system enables economically viable production while restoring land, mitigating climate change, protecting biodiversity and enhancing food security for growing populations. It's a nature-based practice that is globally applicable and affordable and we already know how to implement it. Regenerative agroforestry is one of the most promising solutions to today and tomorrow's biggest global challenges.

## CONCLUSION:

These human disturbances and unsustainable use of natural ecosystem which posed a lot threat to local biodiversity; leading to environmental degradation need to be addressed. Therefore, there is need to embrace agroforestry a promising land use system that involves the integration of variety of trees species with herbaceous crops and / animal in some form of special arrangement or temporal sequence. These systems have the ability to increase the biodiversity and increase the overall productivity consumed by household. It also reduces soil loss and improves the physical, chemical properties of soil and at the same time helps in climate change mitigation for the sustainability of the environment.

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