

CSA technologies/practices that are more useful for Climate Change in the Southeastern region

1. Land Application of manure and compost will:
 - a. Add organic matter to the soil
 - b. Improved soil structure and H₂O infiltration
 - c. Add nutrients
 - d. Sequester carbon in the soil
 - e. Improved soil health
2. Agro-forestry tree crops planting:
 - a. Sink carbon
 - b. Provide soil cover
3. Mulching:

This approach helps to maintain moisture, temperature, weed control, etc.
4. Intercropping/crop rotation
5. Use of improved planting materials
6. System of Rice Intensification (SRI) method

Benefits in using CSA practices on our farms

- Increased food security
- Increase in production and income
- Soil conservation
- Increase farmers resilience
- Improve farmers capacity for informed decision making
- Increase in soil moisture content on farmers' fields
- Increase in employment

Barriers for adopting the available CSA technologies

- Farmers feel limited to new technologies
- Some CSA practices are labor intensive
- Illness associated with lowland farming (Such as schistosomiasis and leech)
- Appropriate equipment are available, but costly.
- Lack of access to loan by farmers
- Low level of Agriculture Extension and Advisory Services (AEAS) to clientele
- Farmers mindset about compensation for new technologies

Some CSA technologies adopted/used in the Southeastern region

- Intercropping
- Crop rotation
- Minimum tillage
- Slash & Mulch
- System of Rice Intensification (SRI) method
- Grow drought tolerant crops such as cassava
- Use improved varieties
- Practice backyard gardens
- Avoid shifting cultivation (slash and burn)
- Practice Agro-Forestry



Climate Smart Agriculture (CSA) in Liberia

FACT SHEET

CSA Technologies/Practices Adopted and Used by some smallholder farmers in Grand Bassa, Rivercess and Sinoe Counties



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LIBERIA

Liberia is situated on 9.8 million hectares (ha) of land space. Land area available in the country for farming is estimated at 41% of the total land space or 4.02 million ha. Of this arable land space 600,000 hectares is lowland.

Farming practices in Liberia is predominantly subsistence in nature, rainfall dependent, where the smallholder farmers practice shifting cultivation using small hand tools as well as unimproved local seeds as planting materials, resulting into low agricultural production and productivity. Yield of agriculture enterprises is always low. For example, the yield of improved rice varieties cultivating in the country is around 3 tons/ha.

Liberia staple food crops: Rice and cassava
Tree crops: Rubber, cocoa, oil palm and coffee.

2008 National Population and Housing Census (NPHC) recorded number of farming households at 670,295. Disaggregated into crop farming households as 287,300 and livestock farming households at 2,650.

CLIMATE CHANGE PHENOMENA IN LIBERIA

Liberia is among nations around the world experiencing climate change over the last seven (7) decades. For instance, experts have observed in Liberia that mean annual temperature has increased by 0.8°C between 1960 and 2006 with an average rate of 0.18°C per decade (Bateman *et. al.*, 2000).

This increased in mean annual temperature and changes in others climatic parameters like prolong and erratic rainfall patterns, flooding, as well as storm are affecting the Liberia agriculture sector and consequently threaten the viability of farm production and productivity in many ways including diseases outbreaks, crop failure and reduced yield.

Farming depends on the weather and most farming practices are season-based. Moreover, Season is

determined by certain weather patterns and climatic conditions. Changes in climatic conditions can have profound impacts on crop, animal and fish farming productivity.

CSA CONCEPT, DEFINITION AND ITS PRACTICES

CSA is that farming system that could also generate meaningful mitigation benefits by increasing carbon sinks, as well as reducing emissions per unit of agricultural product.

It is farming that sustainably increases productivity, enhances the resilience of livelihoods and ecosystems, reduces and/or removes greenhouse gases (GHGs) and enhances the achievement of national food security and development goals (FAO definition).

Climate-smart agriculture (CSA) is an integrated approach to address the interwoven challenges pose by food insecurity and climate change.

CSA Three Pillars

1. Mitigation
2. Adaptation
3. Productivity (MAP)

CSA Practices to increase productivity

1. Improve soil fertility and health
2. Soil water availability
3. Reduced loss of nutrient – rich topsoil

CSA Practices for Adaptation to climate change

1. Contour ploughing and/or tillage
2. Ridges
3. Surface mulching
4. Land terracing
5. Agroforestry

CSA Practices to Mitigate Greenhouse Gases Emissions

1. Organic matter addition to soil
2. Inclusion of tree crops in fields
3. Integrated soil fertility management

4. Irrigated paddy rice production using System of Rice Intensification (SRI)

Conservation Agriculture

Conservation Agriculture (CA) is based on three (3) principles. These principles include:

1. No soil disturbance by tilling (i.e. minimal or zero tillage)
2. Ensure that the soil is covered
3. Rotate crops

Farm lands cover 4.02 million ha in Liberia, ensuring the production of food, feed, fiber and rearing of livestock as well as fish farming. Conservation agriculture is the most widespread sustainable management practice to improve soil health and sequester Carbon. This CSA technology has been observed and adopted in some of the counties (Sinoe, Grand Gedeh, and Rivercess) in Liberia.

However, conventional tillage is still the predominant farmland preparation method adopted in Liberia farming system. Therefore, the adoption of conservation agriculture needs to be promoted to deliver multiple benefits, such as:

1. Preventing soil disturbance through minimal or zero tillage, mitigating soil CO₂ emissions to the atmosphere;
2. Protecting soil surface with crop residues such as mulching, reducing soil erosion and enhancing soil health and soil C sequestration by applying compost and/manure to cultivated land as source of fertilizer, soil amendment and increased soil organic matter;
3. Introducing cover crops to improve soil biodiversity, soil health and increase soil C stocks in degraded farmland by 2030;
4. Reducing applications of synthetic fertilizer and pesticides as well as reduced emission of methane, nitrous oxide and CO₂ by using SRI and other practices;
5. Scaling up/out conservation agriculture to 50% of the current area cultivated with the main annual staple crops such as rice, cassava, corn, and

vegetable, Liberia with large area of land cover with forest has the potential to sink and sequester quantity of Carbon over some 20 to 50 years.