

Enhancing the Competitiveness of Liberia's Cassava - A Focus on Sustainable Production of Cassava through Good Agronomic Practices



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Cassava as a major staple food in Liberia cut across six Sustainable Development Goals

Cassava is a key food commodity in tropical and subtropical regions of the world. According to Luis Augusto Becerra Lopez-Lavalle *et al* 2021, cassava is an agricultural commodity that has the potential to have a significant global impact on nearly all the Sustainable Development Goals with an emphasis on the following goals: Goal-1 (no poverty), Goal-2 (zero hunger), Goal-3 (good health and well-being), Goal-12 (responsible production and consumption), Goal-13 (climate action), and Goal-15 (life on land).



Photo 1: A Female Farmer enroute to Sell Cassava Tuber in the local market in Greenville, Sinoe County

In Liberia, cassava is the second staple food crop for the majority of rural poor households, thanks to its efficient use of soil moisture, soil nutrients, relatively high degree of tolerance to major pests and diseases, as well as its little or no input requirement.

In south east of Liberia, cassava production and consumption comes second to none. On a daily basis, cassava food products make their way to the dinner table in the form of leafy vegetable, fufu, deepah, GB, dumb-boy, gari, and super gari.

Despite the crop's importance in achieving the above-mentioned SDGs, production is unable to meet the current local and regional demands. According to the CASTRAP baseline survey, the constrain of low productivity is due to poor agronomic practices, lack of access to good planting materials, lack of access to markets, and high levels of post-harvest losses, among others. This article seeks to outline how CASTRAP is supporting smallholder cassava farmers to sustain production through good agronomic practices that adopt climate-smart approaches.

Sustainable cassava production through climate smart site selection and land clearing

The term "sustainability," as it applies to agriculture, describes a holistic, long-term approach

to business on-farm, which means maximizing economic and environmental stability, equity, and health of the farm, business, and family. [Betts 2015](#).

Climate-smart on the other hand is an approach that helps guide actions to transform agri-food systems towards green and climate-resilient practices, Choice of land for cassava production is very essential for sustainable production and climate-resilient practice.

The CASTRAP baseline survey revealed that 87% of the respondent interviewed in south eastern Liberia carried out the slash-and-burn method of farming as opposed to 13% who do not burn their farm. While it is important to use fertile soil for cassava cultivation, it is also important to emphasize the need to avoid cultivating high forested land which might require felling trees and burning bushes to reduce the impact of cassava production on greenhouse gas

emissions and climate change. According to Global Forest Watch, Liberia lost 284kha of humid primary forest between 2002 to 2021 representing 6.4% in this time period. According to Norway's International Climate and Forest Initiative, most deforestation in Liberia is caused by people trying to cover basic needs through shifting agriculture and cassava production is no exception. Across CASTRAP landscape, the Agronomy team is encouraging farmers to adopt permaculture and zero burning.

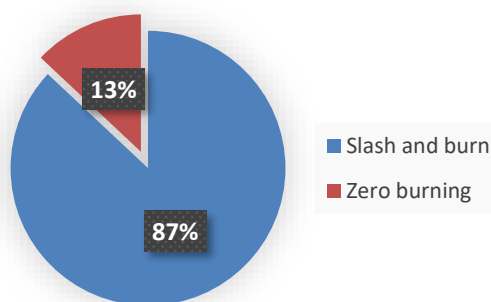


Figure 1: Methods use for land clearing (Source CASTRAP baseline survey)

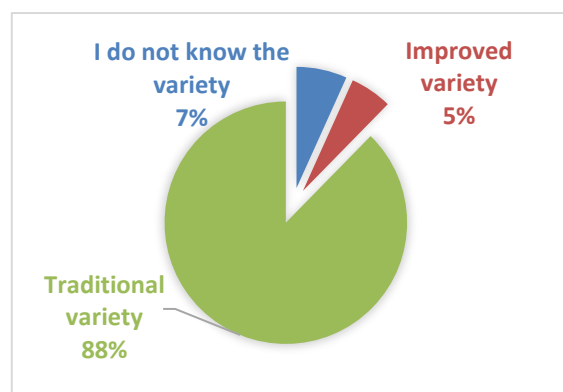
Choice of good cassava variety as related to climate-resilient practice

The choice of a good cassava variety largely depends on the purpose for which the cassava is being cultivated. Climate-resilient cassava varieties have been recommended to help farmers adapt to climate change. To achieve the optimum yield of a given variety, good agronomic practices must be observed irrespective of yielding potential. The best and preferred varieties are those that have the growth and yield attributes required by the end user. In the south eastern part of Liberia for instance, most rural farmers cultivate the traditional varieties due to the unavailability of improved ones (CASTRAP 2021). Even though these respondents cited a lack of improved varieties, their second and third consideration was based on the crop utilization as leafy vegetables or consumption as root. The traditional cassava varieties are very palatable and are sold on the local market for daily household consumption in a different form.

Some qualities of good cassava variety are as followed:

- Early maturity (6-9 months after planting)
- Good yield (20-30 tons per hectare),
- Long tuber storage in the soil,
- Tolerance to major pests and diseases (Cassava Mosaic Virus CMV, Cassava Brown Streak Disease CBSD, cassava mealybug), etc.

Liberia has improved varieties that meet some of the above mention qualities of a good cassava variety. However, most of the said varieties have not been documented and cataloged for easy traceability. According to CASTRAP baseline, 95.6% of farmers sourced their planting materials from their own farms, 3.8% from the market, and 0.6% from non-governmental organizations (NGOs).



In keeping with Liberia's Nationals Cassava Sector Strategy to select 5 improved varieties for maximum output, CASTRAP is partnering with the Central Agriculture Research Institute (CARI) to introduce two of its improved varieties across the project landscape in the south east.



Photo 2: Increasing Farmers' access to improved planting materials in Niapliakpo, Grand Kru County

The project has distributed approximately 313,000 cassava cuttings enough to plant 78 acres to more than 440 farmers across the project landscape. Before the close of the project, the agronomy team will come up with complete documentation of the two varieties as research and data collection on growth and yield are currently taking place across 15 demonstration sites.

Choice of Land Preparation for Planting (Methods of Planting)

The way land is prepared for cassava cultivation is commonly referred to as the method of planting in Liberia and this method

has a significant influence on the growth, yield, and return on investment. In the south east where the average farming size is 1.4 acres and 87 % of the farming population carrying out slash and burn, it was also reported that 99.8% of them used manual labor and hand tools such as cutlass, and hoe for land preparation through harvest either due to unavailability of machinery or cost associated with the use. Flatbed (planting on flat land) is the most common planting method used in Liberia. However, another form of flatbed which required zero tillage called the god-bless-you method is predominantly used in the south eastern part of Liberia.



Photo 3; (A) Female farmer planting cassava using the **flatbed method**, (B) Use of **God-Bless-You** method without covering cassava cuttings with soil, (C) A female farmer planting using the **mound and ridge** method of planting

Flatbed (planting on flat land) - no heap form, minimum tillage usually where the farmers insert or buried the cassava cutting. This method is the most common practice all over Liberia since it required less labor, less time, and is less costly.

God Bless You - this method of planting is most commonly practiced in the south eastern part of Liberia. This method required zero tillage after the land is clear of weeds and debris. In this method, the farmer cut the stem cuttings about 30 -40 cm long and places the cutting on the surface of the soil without covering it. This exposes the planting material to extreme environments such as excessive sunshine, and pest attack. As the name denotes, if god-bless the cassava cuttings will grow, otherwise, it might be feasted upon by this extreme environmental factor. This method results in poor root penetration, poor root development, and poor yield.

Mound - is the piling of soil into heaps of 30 to 60 cm height for cassava cultivation using hand tools or machinery. This practice is common but rarely adopted by most farmers because it is time-consuming, labor-intensive, and costly.

Ridge - unlike mound is a horizontal line of heaps formed by piling up soil using hand tools or machinery. This practice is also common but rarely adopted because it is time-consuming, labor-intensive, and costly as well.

Under the CASTRAP, 99 % of our farmers have transmissioned from this traditional (God-Bless-You) method of planting to a flatbed method. Farmers are also being encouraged to adopt the mound and ridge land preparation even though it comes with extra labor but promises a higher yield and more income as compared to the flatbed. The project also established 15 demonstration sites across the project landscape where these three improved land preparations are closely being compared for growth and yield attribute through the farmer field school (FFS) approach to convince farmers.

Reference

Acevedo, M., Pixley, K., Zinyengere, N. *et al.* A scoping review of adoption of climate-resilient crops by small-scale producers in low- and middle-income countries. *Nat. Plants* **6**, 1231–1241 (2020). <https://doi.org/10.1038/s41477-020-00783-z>

Augusto Becerra Lopez-Lavalle *et al* 2021, Identification of Cassava Varieties in Ex-Situ Collections and Global Farmer's Fields, DOI: 10.5772/intechopen.99110, <https://www.intechopen.com/chapters/78062>

Cassava Transformation Project (CASTRA), 2021, A Baseline Survey of the Cassava Sector in Liberia's South East Counties (REPORT), <https://cerathdev.org/cassava-transformation-project/> Global Forest Watch, Liberia, <https://www.globalforestwatch.org/dashboards/country/LBR>. April 20, 2023

Norway's International Climate and Forest Initiative, Fact about Liberia, <https://www.nicfi.no/partner-countries/liberia>, April 20, 2023

N. Betts, 2015, Introduction to Sustainable Agriculture, <http://omafra.gov.on.ca/english/busdev/>

Ministry of Agriculture, 2019, Liberia National Cassava Sector Strategy, <https://ekmsliberia.info/document/liberia-national-cassava-sector-strategy/> April 23, 2023