



Cocoa Rehabilitation and Renovation

By ROOTS

The tropical forest regions of West Africa are well-known for playing a crucial part in the world's cocoa industry. West African nations including Ghana, Côte d'Ivoire, Nigeria, and Cameroon provide over 70% of the world's cocoa beans, with Ghana and Cote d'Ivoire being the world's largest producers of cocoa, providing over half of the global supply. A major perennial crop, cocoa beans are used to make chocolate, cocoa liquor, butter, and cocoa nibs, among other products, consumed worldwide. Cocoa in its unprocessed state is primarily used and demanded in the beverage, cosmetics, confectionery, and pharmaceutical industries.

Smallholder farmers and peasants cocoa farmers frequently encounter numerous difficulties that make it challenging for them to continue producing and making a living sustainably. Ageing cocoa trees, for example, results in decreased crop production and the production of worse-quality cocoa beans. Additionally, the persistent risk of diseases such as cocoa swollen shoot virus



and black pod rot further undermines their ability to produce. Furthermore, the combination of poor soil fertility and limited availability of biological inputs, such as compost and mulch, poses challenges for farmers in implementing best practices and enhancing their crop yields. Moreover, the farmers' uncertainties and dangers are compounded by the restricted availability of credit and market information, as well as the fluctuating nature of global cocoa prices.

A February 2024 report from the International Cocoa Organization on forecasts for the 2023/2024 cocoa year reveals an expected significant fall in cocoa production from the top-producing countries due to several factors which include unfavorable weather, old trees, and diseases – a trend that has been observed over the decades. When comparing this to the cocoa season of 2022–2023, they find that the worldwide cocoa supply is predicted to drop by almost 11 percent to 4.440 million tonnes. Global cocoa demand on the other hand is projected to increase by almost 5 percent to 4.779 million tonnes. Unproductive and old trees, diseases, pests, and changing climates all have a detrimental effect on the production of high-quality cocoa – a cause for this prediction, a nightmare that has manifested in cocoa-growing regions of West Africa, the Caribbean, and also Latin America.

Cocoa cultivation in West Africa is facing a severe crisis; a decline in yields, poor soil fertility, inadequate pest and disease management, overaged farms, and other challenges threaten cocoa farmers' livelihoods and the industry's sustainability. Rehabilitating and renovating cocoa farms is becoming increasingly important in addressing these issues. The following write-up will discuss the reasons for the need for cocoa rehabilitation and renovations, strategies and tactics employed, and the advantages of the initiative.

Why is Cocoa Farm Rehabilitation Necessary?

The cultivation of "tree crops" by smallholder farmers presents unique as well as challenging obstacles to sustaining production, material conditions, and livelihoods. Tree crops need maintenance and regular renovation to sustain yields as their production decreases over time. Not only do rehabilitation and renovation apply to cocoa, but also to other crops, including tea, coffee, and palm oil. Rehabilitation and Renovation of cocoa refers to restoring and



rejuvenating cocoa farms to improve their productivity, sustainability, and conservation of the environment. It involves a range of activities aimed at improving cocoa farms' overall health and performance through practices like pruning, replanting, and pest and disease management.

Several challenges tend to undermine the sustainability of cocoa farmers' production. The fall in yields, which has made it difficult to sustain productivity levels, is one urgent concern. Older cocoa trees, barren farmlands, low soil fertility, pests, and diseases—all of which lead to lower yields and lesser-quality cocoa beans—are major contributors to the decline in cocoa yields in the West African region. Cocoa rehabilitation and renovation are required because it tackles these issues by introducing proper agronomic practices, planting disease-resistant cocoa seeds, integrated pest management, and sustainable soil management. According to Adebisi et al., (2021), in Southern Nigeria, the yield of cocoa beans experienced a decline from 334.16 kilograms per hectare in 2004 to 303.69 kilograms per hectare in 2006 before the implementation of cocoa rehabilitation techniques. However, a significant increase was observed after the adoption of these techniques, with yields rising from 411.13 kilograms per hectare in 2014 to 518.95 kilograms per hectare in 2016.

Methods or Approaches of Cocoa Rehabilitation

Cocoa tree rehabilitation can be achieved through total planting, partial planting, and underplanting in addition to pest and soil management techniques.

1. Total Replanting

It involves clearing the entire area and planting new cocoa seedlings from scratch. This method is typically used when the soil is severely degraded or infested with pests or diseases, and a complete overhaul is necessary. While it can be effective, it is often more expensive and time-consuming than other methods. In West Africa region countries like Cameroon, Côte d'Ivoire, Ghana, and Nigeria where cocoa is produced, the method is not favorable because of harsh weather conditions for example, a rehabilitation program launched by the Ghanaian government in 2011 through the Ghana Cocoa Board (COCOBOD)



to address the problems of low yield and disease-infected farms, particularly those affected by the Cocoa Swollen Shoot Virus (CSSV). Through the process of rehabilitation, the majority of smallholder farmers lost their farms and means of subsistence because the program's goal was to clear the entire plantation and plant new ones. When the land went bare and there were no trees left to provide the seedlings shade, the majority of them perished and the farms never recovered as planned. Because the approach that was employed was not environmentally and economically sustainable, smallholder farmers in Ghana's Western Region, where cocoa is grown mostly in Ghana, have expressed their dissatisfaction with the program and have demonstrated against it.

2. Partial Replanting

Partial replanting is the removal of dead or diseased trees and replacing them with new seedlings each year in blocks or strips. In this method, income continues to be generated while replanting. This method is suitable for areas where the soil is still fertile and only a portion of the trees need to be replaced. However, it may not address underlying soil issues or pest problems that contribute to the decline of the original trees.

3. Underplanting

The most economical and sustainable of all rehabilitation and renovation methods is underplanting (Merle, 2013). This sustainable cocoa rehabilitation method involves replanting new cocoa seedlings between the existing old trees, using the desired spacing. In this method, the smallholder farmer can continue to make some amount of money from the older cocoa trees while the younger ones are growing. The process of newly planted cocoa seeds or seedlings bearing fruit typically requires a duration of 3-4 years. This phase facilitates the creation of robust roots, a healthy canopy, and the beginning of reproductive growth, resulting in the production of cocoa pods of exceptional quality. Ensuring the effective transition from seedling to the fruiting stage requires optimal growing circumstances, which encompass sufficient moisture, appropriate temperature, and suitable light exposure.

The approach allows farmers to:



- Increase the overall productivity of the farm by filling in gaps and reducing the distance between trees,
- Introduce new high-yielding varieties and disease-resistant rootstocks,
- Enhance soil fertility and structure by incorporating organic matter improving soil health, and
- Gradually replace old or unproductive trees with new ones while ensuring a continued and increased yield over time.

The practice of underplanting is beneficial not only because it allows smallholder farmers to temporarily keep older trees as a source of income while growing new cocoa plants, but also because it is the least expensive method. It is also advantageous as it allows older cocoa trees to provide temporary shade for the younger cocoa plants, and open spaces to be filled with income-earning crops like yam, cassava, plantains, bananas, pawpaw, and cocoyams.

Process of Underplanting Method of Rehabilitation

The following are steps and processes of rehabilitating using the underplanting method:

1. Site Selection and Field Preparation

- Identify areas with aged cocoa trees that are 20 - 30 years old and have poor fruiting capacity, and also disease-affected trees.
- Clear the area around the existing trees of weeds, debris, and any dead or diseased trees.
- Mark the areas to be underplanted with stakes and strings, creating a grid pattern to guide the planting.

2. Planting

- Prepare the underplanting materials (seedlings or grafted plants) by removing excess soil from the roots and pruning the stem to about 10 cm - 15 cm from the ground, which will give the underplanted material a better chance to establish itself well in its new environment. It also ensures healthy growth, reduces transplant shock and promotes a strong, vigorous plant.



- Plant the underplanted material in the marked area, spaced about 4.5 m x 4.5 m apart, depending on the variety and local conditions.
- Water the plants thoroughly after planting and apply bio-inputs as a starter fertilizer if necessary.
- Plant shade trees around underplanted seedlings to protect young plants during hot or dry weather.

3. Mulching and Irrigation

- Apply a layer of organic mulch (cocoa pulp, palm frond, vermicompost, or straw) around each plant to retain moisture, suppress weeds, and regulate soil temperature.
- Water the plants regularly, especially during hot or dry weather, to ensure that the plants receive adequate moisture.

4. Pruning and Training

- Prune the underplanted trees to promote a strong, well-balanced structure and encourage fruiting.
- Train the plants to grow upward and outward, using stakes or pruning to shape the canopy.
- Remove any weak or damaged branches to prevent competition for resources.

5. Pest and Disease Management

- Monitor the underplanted area regularly for signs of pest or disease, such as aphids, mealybugs, weevils, cocoa mirids, cocoa swollen shoot virus, black pod rot, frosty pod rot, and root rot infections.
- Apply organic or integrated pest management techniques to control infections and prevent damage.
- Regularly inspect the underplanted area for signs of nutrient deficiencies or water stress and adjust fertilization and irrigation accordingly.
- Monitor soil compaction and use techniques like cover cropping to alleviate compaction and improve soil structure.

Gradually remove old cocoa plants after about three to four years, when the underplanted trees start fruiting.



Generally, rehabilitation and renovation of trees also include the following activities:

Soil Analysis and Testing: Soil analysis and testing is a crucial step in cocoa rehabilitation and renovation. This involves collecting soil samples from the farm and sending them to a laboratory for analysis to determine the nutrient content, pH level, and other factors that affect soil fertility. The results of the analysis provide valuable information on the soil's nutrient status, allowing farmers to identify any deficiencies or imbalances that need to be addressed. This information is used to develop a fertilizer plan that ensures the trees receive the necessary nutrients to thrive.

Plant Assessment and Pruning: Plant assessment and pruning are crucial tasks in cocoa rehabilitation and renovation. Throughout this procedure, farmers evaluate the vitality and composition of their cocoa plants, detecting any feeble or infected branches that require elimination. Pruning entails the deliberate removal of branches to manage the development of the tree, enhance the flow of air, and facilitate the absorption of sunlight to the fruit-bearing branches. Practicing appropriate pruning techniques also aids in diminishing the occurrence of diseases and pests, enhancing crop production, and elevating the general calibre of cocoa beans.

Pest and Disease Management Planning: This involves identifying common pests and diseases that affect cocoa trees in the region, such as fungal diseases like Black Pod Rot and pests like Mirids. Farmers develop a plan to manage these threats, which may include using integrated pest management (IPM) strategies like crop rotation, biological control, and cultural controls like pruning and sanitation. The goal is to minimize the use of chemical pesticides and fungicides, while still protecting the trees from harm.

Training and Capacity Building for Smallholder Farmers: Training and capacity building for smallholder farmers is an inherent component of cocoa rehabilitation and renovation. This involves providing farmers with the knowledge and skills they need to manage their farms effectively, including best practices in pruning, fertilization, pest management, and other aspects of cocoa cultivation. Trainers may also guide market access, pricing, and business management to help farmers maximize their returns. By empowering smallholder farmers with new skills and knowledge, they can increase their productivity, income, and competitiveness in the market.



Benefits of Cocoa Rehabilitation

Rehabilitation of cocoa using a suitable method can help farmers significantly improve cocoa yield and quality, leading to increased farm profitability. Improved yields are achieved through better tree health, increased canopy cover, and soil improvement, all of which result from rehabilitation measures such as pruning, composting, and mulching. Better bean quality is also achieved through improved fermentation conditions and reduced impurities. As a result, farmers can command a higher price for their high-quality beans on the market, increasing their revenue.

Rehabilitation can also reduce costs associated with disease management, pest control, and labor, as healthier trees require less maintenance. Rehabilitation can also improve farmers' overall well-being by providing them with better working conditions, improved sanitation, and reduced exposure to pests and diseases.

It also enhances soil fertility and biodiversity through various means. Soil restoration is achieved through replanting with new, high-yielding cocoa varieties, applying organic amendments such as compost or manure to improve soil structure and fertility, and implementing soil conservation measures like terracing, contour farming, and mulching to reduce soil erosion. The growth of new vegetation, including shade trees and cover crops, can lead to increased carbon sequestration, mitigating climate change.

Cocoa rehabilitation promotes biodiversity by incorporating agroforestry practices such as planting shade trees and cover crops, which create a more diverse ecosystem and support beneficial insects like bees and butterflies. Crop rotation is also implemented to break disease and pest cycles, reduce soil-borne diseases, and improve soil fertility.

Better pest and disease management is a critical component of rehabilitation, as it helps to reduce the impact of these threats on cocoa yields and quality. By implementing integrated pest management (IPM) strategies, farmers can reduce and avoid the use of chemical pesticides and fungicides, minimizing the risk of resistance and environmental contamination. This approach also helps



to promote a balanced ecosystem, where beneficial insects and microorganisms play a key role in maintaining a healthy farm environment.

Additionally, rehabilitation programs can help to promote sustainable agriculture practices, such as conservation agriculture and agroforestry, which can improve soil health, reduce erosion, and increase biodiversity. By improving farmer livelihoods, rehabilitation programs can help to ensure the long-term sustainability of cocoa production and the well-being of farming communities.

In conclusion, cocoa rehabilitation is a vital step towards sustainable cocoa production. By addressing the challenges faced by cocoa farmers, rehabilitation can have a wide-ranging impact on the sector. Not only can it improve cocoa yields and quality, leading to increased profitability for farmers, but it can also contribute to sustainable agriculture by promoting soil health and reducing the use of chemical pesticides and fungicides. Rehabilitation is critical for long-term sustainability because it helps to build farmer capacity and resilience. By providing training and technical assistance to smallholder farmers, rehabilitation programs can equip them with the skills they need to adapt to changing environmental conditions and respond to emerging threats like climate change. This not only helps farmers maintain their livelihoods but also ensures that they can continue to produce high-quality cocoa for years to come.

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