SAFEGUARDS MONITORING REPORT

KAKUM HIA

JAN – JUN,
2023

CLIMATE CHANGE DIRECTORATE

(NATIONAL REDD+ SECRETARIAT)

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LIST OF ABBREVIATIONS

COCOBOD	Ghana Cocoa Board
CREMA	Community Resource Management Area
CRMC	Community Resource Management Committee
CSO	Civil Society Organisation
FC	Forestry Commission
FGRM	Feedback and Grievance Redress Mechanism
FR	Forest Reserve
GoG	Government of Ghana
HFZ	High Forest Zone
HIA	Hotspot Intervention Area
HMB	Hotspot Intervention Area Management Board
NCRC	Nature Conservation Research Centre
NGO	Non-Governmental Organisation
PMU	Project Management Unit
REDD+	Reducing Emissions from Deforestation and Forest Degradation, the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
SAP	Safeguards Action Plan
SESA	Strategic Environmental and Social Assessment
SHEC	Sub-HIA Executive Committee
SIS	Safeguards Information System
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

1.0 INTRODUCTION

The Ghana Cocoa Forest REDD+ Programme (GCFRP) is the premier emission reductions programme fully developed from a 25-year Ghana REDD+ Strategy (GRS) by the Government of Ghana through the Forestry Commission (FC) and Ghana Cocoa Board (Cocobod) with funding support from the Forest Carbon Partnership Facility (FCPF) of the World Bank. The programme seeks to significantly reduce carbon emissions resulting from cocoa expansion into forests through the promotion of appropriate climate-smart cocoa production approaches, including intensification and yield enhancement. The programme spans a mosaic landscape that produces commodities of international and national importance; - cocoa, timber, palm oil, food crops. However, the dominant crop in the landscape and also of national importance is the cocoa from which the programme derives the name "Ghana Cocoa Forest REDD+ Programme".

Cocoa is Ghana's most important agricultural commodity, accounting for roughly 57 per cent of all agricultural exports and supporting the livelihoods of about 2.5 million rural farmers and their dependents. Cocoa production is predominant in the High Forest Zone (HFZ) of Ghana. The Western Region holds the largest area of remaining primary forest in Ghana and produces over 50per cent of the country's cocoa beans. However, Ghana's forests have come under severe threat from agricultural expansion, which is the major cause of forest loss, mainly driven by cocoa production. This makes cocoa production the single biggest driver of deforestation in the landscape[1]. Underlying causes for this include limited financial and technical support for sustainable cocoa production leading to expansion into forest areas; legal disincentives to maintaining trees on farms; a lack of land use planning and landscape management; and a lack of collaboration amongst cocoa stakeholders.

In line with the goal of GCFRP, on-the ground implementation of GCFRP is routed through Hotspot Intervention Areas situated within the GCFRP operational area. The Kakum HIA is one of the designated landscapes where GCFRP implementation is underway with the support of a consortium made up of Forestry Commission (FC), COCOBOD, Nature Conservation

[1] Partnership for Productivity Protection and Resilience in Cocoa Landscapes (3PRCL) – Touton https://3prcocoalandscapes.com/about/intro-background

Research Centre (NCRC), World Cocoa Foundation (WCF), Hershey, Ecom, Lindt Cocoa Foundation, Olam, Nyonkopa, and Touton. The partnership adopts a jurisdictional approach which ensures that all stakeholders across the cocoa sector commit to and collaborate on achieving Climate Smart Cocoa which is tied to Ghana's Emission Reduction Programme. Key activities implemented in the HIA include restoration (Enrichment Planting, Modified Taungya System, Tree On Farm), livelihoods improvement interventions and Climate Smart Cocoa. All these interventions are primarily aimed at helping farmers with the necessary ecological and economic investments to ensure sustainable optimum cocoa production.

The United Nations Framework Convention on Climate Change (UNFCCC) requirements as stipulated in the Warsaw Framework for REDD+ recognizes that safeguards are a key part of REDD+ implementation and links the Cancun safeguards to results-based payment. This requires that countries implementing REDD+ should demonstrate how they have addressed and respected safeguards through the implementation of their REDD+ interventions. One of UNFCCC key priorities is ensuring that social and environmental safeguards are adhered to, throughout the REDD+ process. In addition, since the Carbon Fund via the World Bank is purchasing the ERs generated from the GCRFP, environmental and social risks associated with the GCRFP activities are mitigated and addressed using the World Bank safeguards policies and procedures. To comply with the World Bank's safeguards requirements, Ghana has carried out a Strategic Environmental and Social Assessment (SESA) to better understand the environmental and social concerns of the programme, and to better define the necessary mitigation mechanisms and safeguards compliance issues associated with activities to be implemented in the GCFRP. Specifically, it details the risks and opportunities, and identifies the World Bank Safeguards policies triggered. The SESA report resulted in an ESMF to guide the implementation of the proposed ER programme. The National REDD+ Secretariat (NRS) of the Forestry Commission is responsible for ensuring that mitigation measures and recommendations provided in the ESMF applicable to the ER Programme area are implemented.

Table 1: World Bank Operational Procedures triggered by the GCFRP

World Bank Safeguard Policy	**Triggered under REDD+ in Ghana**
OP 4.01: Environmental Assessment	GCFRP will engage IN activities that use forest resources in the HIAs and potentially impact other environmental areas. These activities may have environmental impacts on a limited scale, but a safeguards screening checklist has been prepared to screen activities under the programme and ESMPs subsequently prepared to guide in addressing or mitigating potential impacts.
OP 4.04: Natural Habitats	Some of the HIAs contain critical ecosystems (flora and fauna within and around the forest reserves). GCFRP will enhance the quality of the management of these critical ecosystems and reduce risks associated with cocoa and other agroforestry practices. The ESMP provides guidance on avoiding or mitigating impacts on natural habitats.
OP 4.36: Forest	Forest policy and management are a primary focus of this project, in addition to trees in the agroforestry landscape. The screening done provides guidance on managing forest ecosystems and their associated resource as reflected in the ESMF.
OP 4.09: Pest Management	The project will not directly finance the use of pesticides but will promote integrated pest management (IPM) and climate-smart practices and resilient 'shade' cocoa. The project-specific Pest Management Plan has been prepared. The ESMF provides identification of IPM activities linked to the cocoa enhancement activities. In addition, key environmental and social issues and risks associated with chemical applications in cocoa have been analyzed in the ESMP.
OP 4.11: Physical Cultural Resources	The ESMF and Process Framework incorporate screening to ensure that the project would not have any negative impact on sacred sites. Screening of sites for pilot activities will include specific screening under the ESMF.
OP 4.12: Involuntary Resettlement	No involuntary resettlement is expected. However, as part of plans for ensuring that forests are protected and well managed there will be efforts to reduce encroachment due to expansion of cultivated areas. These restrictions of access will be negotiated with farmers. Inputs and incentives will be offered to increase agricultural productivity within the historical boundaries of admitted farms. Process

	Framework will be used to guide and ensure participatory processes during implementation.

This Safeguards Monitoring Report demonstrates how environmental and social safeguards requirements of the World Bank, as well as the relevant national laws and regulations, policies and institutional requirements, are being adhered to throughout the implementation of activities/interventions in the Kakum HIA

2.0 ACTIVITIES/INTERVENTIONS IN KAKUM HIA

2.1 Restoration Activities

Restoration consists of activities that lead to tree planting in on-reserves and off-reserves. Under the emission reduction programme three main restoration activities are recognised in the HIA namely: Modified Taungya System (MTS), Enrichment Planting and Trees on Farm (ToF).

2.1.1 Modified Taungya System (MTS)

This is a system of agroforestry practice where farmers from fringe communities of Degraded Forest Reserves are allocated degraded areas on reserve to undertake plantation development. In this system, farmers provide labour for the site preparation, pegging, planting and tending of the plantation. The Forestry Commission provided logistics (including; pegs, tree seedling and some other farming tools as well as protective clothing) and technical support to the farmers. Farmers were allowed to grow food crops along with the tree seedlings and harvest the crops for themselves whiles tending the tree seedlings for three to four years when tree canopy closes and crop production becomes impossible under the shade. A Benefit Sharing Plan (BSP) was instituted for the MTS with a proportion of 40%: 40%: 15%: 5% to Farmers, Forestry Commission, Community and Traditional Authorities respectively.

The selection of a community or farmer group for the MTS was based on the following criteria among others:

I. Proximity to the planting site: Since the plantation establishment is labour intensive especially during activities such as site preparation, selection of communities or farmer group was based on their proximity and thus those fringing the Forest Reserves are selected. Another reason was that communities are responsible for ensuring that the plantation and the Forest Reserve as a whole is protected from wildfire, illegality, etc. and so communities fringing the reserve were mostly selected.
II. Willingness to participate: As per the Benefit Sharing Plan, proponents are responsible for their individual roles, thus it requires a willing farmer or a community that understand and are willing to invest and wait for the returns in a long term. Some farmers would prefer to be paid for their labour and forfeit future returns.

III. Previous experience: With the implementation of MTS in Ghana nearing two decades, the FC has had a myriad interactions and engagements with communities fringing Forest Reserves and have institutional memory of committed communities based on their past performance. Thus, the selection criteria of farmers also included past community performance in MTS establishment including their ability to protect previous plantation stands established.

IV. Ability to work on the farm: Selection of farmers was also based on their age and health conditions. Strong adults and youth were preferred regardless of the gender.

2.1.2 Enrichment Planting

Enrichment planting was undertaken in a fairly degraded forest with the aim of increasing tree cover by planting tree seedlings within the forest. This plantation model has introduced valuable species to degraded forests without the elimination of valuable individuals already present. In Kakum HIA, the Kakum Forest District manages Enrichment Planting activities. In Enrichment Planting, strips of 5-6-meter width are cut through the degraded portions of the compartment along which tree seedlings are planted and nurtured to increase tree density. This work is done under the supervision of Forestry Commission.

2.1.3 Trees on farms (ToF)

This system of carbon stock enhancement focuses mainly on cocoa farms in off-reserve areas that are unshaded or not fully shaded according to the right regime. Farmers were supported and have incorporated trees in their farms to ensure sustainable yield whilst at the same time contributing to climate change mitigation. By incorporating trees on their farms, they contribute to carbon stock enhancement, which serves as a carbon sink.

In executing this model, COCOBOD and private sector cocoa companies supported ToF implementation since it falls directly within their remit although under strong coordination and partnership with the Forestry Commission and COCOBOD. Farmers benefit from agricultural extension services as well as supervision and logistical support. In this HIA, Assin Fosu Forest District, COCOBOD Districts, and NCRC as well as Cocoa companies such as Ecom and Hershey are leading ToF.

2.2 Climate- Smart Cocoa

Climate-Smart Cocoa (CSC) consists of farm-level activities that lead to increased resilience, carbon sequestration and general improvement in the livelihood of farmers. At this, a number of REDD+ partners in the HIA including COCOBOD and the private sector cocoa companies undertake climate-smart related activities. The Ghana Cocoa Board generally term their version of CSC as Productivity Enhancement Programme (PEP). COCOBOD since 2017 has rolled out the PEPs to shore up cocoa production in the country and consolidate its position as the leading producer of premium quality cocoa beans in the world. The objective of the PEPs is to roll out a set of measures that will improve productivity per hectare and increase cocoa production levels well above 1 million metric tonnes per year (versus an average of 800,000 tonnes per year over the last ten years). The PEPs mainly entail measures to sustainably increase plant fertility; develop irrigation systems; rehabilitate aged and disease-infected farms; increase warehouse capacity; and create an integrated farmer database. Some of the activities under PEPs include the following:

- Cocoa Rehabilitation Programme
- Cocoa Diseases and Pest Control Programme (CODAPEC)
- Cocoa HiTech (Fertilizer) Programme
- Free Hybrid Cocoa Seedling Distribution
- Artificial Hand Pollination
- Mass Cocoa Pruning
- Cocoa Management System (CMS)
- Irrigation

1. Irrigation Cocoa Rehabilitation Programme

Under this programme, COCOBOD bears the full cost of the two-year rehabilitation process which involves the cutting of cocoa trees affected by the Cocoa Swollen and Virus Disease (CSSVD), treating whole farms and replanting them with disease-tolerant, early bearing, and high yielding cocoa hybrid cocoa seedlings as well as complementary plantain suckers to

provide temporary shade for the young cocoa seedlings and recommended desirable shade tree species to provide permanent shade for the newly established cocoa.

2. Cocoa Disease and Pests Control (CODAPEC)

COCOBOD introduced the CODAPEC programme (Mass Spraying) in 2001/2002 to control black pod disease and mirids (capsids) to prevent their effects on cocoa production. The programme comes at no cost to the farmer. Only mapped farms in good condition are considered under this exercise. COCOBOD takes full responsibility of carting chemicals to the regions and districts for onward distribution to farmers through various task forces in districts and communities. The chemicals are allocated to farmers to arrange with supervisors of spraying gangs to plan spraying schedules to spray their farms. There are 2 components involved:

- Capsid control
  i. A 7-member spraying gang (supervisor inclusive) ensures two (2) rounds of insecticides application in April/May and September/October respectively.
  ii. Cocoa farmers are then expected to complement the first two (2) rounds with additional two (2) rounds in June and December within a cropping year.
- Black pod Control
  i. The first three (3) rounds of fungicides application spraying are carried out between 3-4 weeks' intervals by COCOBOD in June, July and August/October.
  ii. Cocoa farmers are encouraged to work closely with the gang to identify which periods within the intervals to complement with additional three (3) rounds application of the fungicides

3. Cocoa HiTech Programme

Management of Ghana Cocoa Board (COCOBOD) re-introduced the Subsidized Fertilizer Programme following evidence of widespread theft, nepotism, favouritism diversion and smuggling which characterized the then 'Free Fertilizer Programme' some years ago.The aim of the fertilizer distribution was to restore soil nutrients depletion to enable a smooth process during cocoa production. The Subsidized Programme, which makes use of the private sector in the distribution processes, seeks to ensure availability, equity, and transparency. The introduction of this new scheme, with active private sector participation, has also helped to

create jobs to boost economic growth in the country. Generally, the Cocoa HiTech Programme has a number of benefits including:

- cutting off the needless politicization, nepotism and theft that hitherto characterized the distribution of fertilizers
- stimulating an industry that is one of Ghana's top earners of foreign exchange and accounts for about 7 percent of gross domestic product.
- eliminating market distortions as well as steps to map cocoa farms and soil, improving sector management, upgrading ports and storage facilities and rehabilitate ageing trees.
- enhancing access of the ordinary cocoa farmer to the right fertilizer which will help stimulate productivity and increase livelihood.
- Promoting a subsidized programme, which makes use of the private sector in the distribution processes, ensures availability, equity, and transparency

The mode of distribution of the farm inputs is done through the following processes:

- Farmer based Cooperatives are formed, in order to facilitate equitable distribution of fertilizers. Each farmer must belong to a community farmer based corporative.
- Cooperatives then must apply for the subsidized fertilizers at COCOBOD. Farmers can therefore apply through these approved farmer-based cooperatives.
- Farmers are given a one-year moratorium for the payment of the subsidized fertilizers.

4. Free Hybrid Cocoa Seedling Distribution program

Every year, Ghana Cocoa Board (COCOBOD) through the Seed Production Division (SPD) raises disease-tolerant hybrid cocoa seedlings for distribution to farmers free of charge. The initiative is aimed at increasing cocoa production and incomes of cocoa farmers.

Distribution of the seedlings to farmers is mostly done from May – July every year to enable farmers plant them. The mode of distribution takes the following processes:

- The seedlings are raised by the Seed Production Division (SPD) at over 380 nursery sites established in communities across the cocoa regions.
- The Cocoa Health and Extension Division (CHED) distributes the seedlings using farmer data.

5. Artificial Hand pollination programme

This is done to induce pollination of matured cocoa trees top enhance productivity. The processes involved are detailed below:

- A farm ear-marked for pollination must be pruned two months before it is pollinated
- Transfer of pollen grains is aided by forceps and containers
- Application of fertilizers is essential to support pod setting and development

6. Mass cocoa pruning programme

A strategy to prune all productive cocoa across all cocoa growing regions and districts. To this end COCOBOD has supplied 100,000 motorized pruners to various farmer cooperatives to encourage pruning and weeding/slashing as pruning is the master key that unlocks flowering in cocoa to aid flowering and pod setting. It also helps to reduce the incidence of pests and diseases that affects cocoa farms.

7. Cocoa Management System (CMS)

Popularly known as Cocoa farmer census is a program under which all cocoa farmers are enumerated with their data captured including useful sociodemographic characteristics. Their farm sizes and other farm characteristics are also captured. This data will eventually be the platform upon which essential services like cocoa farmers pension scheme would be rolled out for farmers by COCOBOD

8. Irrigation

Due to climate change and its devastating effects COCOBOD has embarked on an aggressive irrigation programme to bring irrigation to the farm gate of the ordinary cocoa farmer as a climate change mitigating and coping strategy. To this end a lot of boreholes have been sunk and solar powered to irrigate some clusters of farms in the various district. Plans are far advanced to dam some big rivers in the cocoa districts for irrigation purposes.

2.3 Wildlife Conservation and Protection

The Wildlife Division of the Forestry Commission has a mission to ensure conservation, sustainable management and development of Ghana's wildlife resources for socio-economic benefit to all segments of society. Specially, the Division has adopted the following strategies:

- Protect and develop Ghana's permanent estate of wildlife-Protected Areas (PAs).
- Promote management and development of wildlife outside wildlife-Protected Areas.
- Develop Eco- tourism potentials of the PAs.
- Promote the development of wildlife - based enterprises.
- Develop linkages with other agencies and NGOs whose activities impact wildlife.
- Assist local communities to develop and manage own reserves
- Foster closer collaboration with communities closer to PAs through the promotion of community resource management areas (CREMA).
- Promote public awareness and education on wildlife management issues.

In line with the above, in the Kakum HIA, the Wildlife Division at the district level embarked on a number of activities including community education and sensitization, protection of cocoa farms against elephant crop raiding, and livelihood improvements. These included

- Radio programmes
- School visits for World Wildlife Day Celebration
- Community visits
  - Information Centres
  - Group meetings
- Woodlots establishment
  - 10000 seedlings supplied during Green Ghana Day
- Organization and training of community wildlife volunteer groups
- Logistical support
  - Cutlasses
  - Wellington Boots
  - Rain coats
- Bee keeping alternative livelihoods support
- Elephant crop raiding intervention
  - 10 affected farmers supported with pepper fences
  - Interventions done in collaboration with NADMO

2.4 Kakum Agroforestry Landscape Project

The Kakum Cocoa Agroforestry Landscape Program is to transform the Kakum Cocoa Forest landscape into a more sustainable agroforestry area. It is in partnership with the Hershey Company, Ghana Cocoa Board, Forestry Commission, Nature Conservation Research Centre (NCRC) and Ecom Agrotrade Limited. The program seeks, among other things to develop landscape governance and management system to raise cocoa productivity and promote shaded cocoa agroforestry, reduce deforestation and forest degradation and diversify and improve farm income for long term sustainability. The project timeline is 2018 – 2023. Specifically, the project seeks to:

i. Develop a Landscape Governance & Management System
ii. Raise Cocoa Productivity and Support Cocoa Agroforestry
iii. Reduce Deforestation and Forest Degradation
iv. Diversify and Improve Farmer Incomes
v. Long term sustainability of the Landscape Program
vi. No new deforestation
vii. Increase cocoa productivity

The project has thus far made some key achievements with regards to these objectives

Key Achievements	
Landscape governance	• Set up Community governance bodies managing 20,000+ ha for cocoa sustainability and forest protection • Established 3 Sub-HIAs. • 4 CREMAs established with total of 69 elected members and fully completed constitutions and rules and regulations • 32 Community Resource Management Committees established across 43 communities • HIA Management Board Established

Reducing deforestation & forest protection	• Established Consortium of 10 cocoa & forestry sector partners • Developed and implementing HIA M&E system • Completed Kakum landscape forest monitoring baseline (2000-2015) • Protecting 38,000 ha of natural forest across landscape of 118,000 ha • Supported CREMAs to adopt local rules and regulations on shade trees, CSC practices, and forest protection • More than 50,000 tree seedlings distributed and planted
Income diversification	• Developed Kombo Nut botanical value chain • Trained 913 farmers (534 women) in sustainable Kombo Nut harvesting and drying
Others	• Published Kakum 2021 M&E Report • Trained 20 Forest Monitoring Guards • Established 3 CREMA Trust Funds to ensure sustainability of CREMAs • Trained 2500 farmers on Climate Smart Cocoa production

3.0 UPTAKE OF SAFEGUARDS IN REDD+ PROGRAMMES/ACTIVITIES AT THE HIA LEVEL

Generally, the mix of projects/interventions being implemented in the Kakum HIA have contributed to many transformational positive impacts with minimal risks/impacts. This attests to the fact stakeholders have taken safeguards adherence extremely seriously following the capacity building/training on safeguards in project implementation. Additionally, community people engaged during the monitoring exercise attested to the numerous trainings/capacity building opportunities they have received from various stakeholders on a number of topics. The topics include climates-smart cocoa, farmer business school, safe handling of agro-chemicals, proper disposal of agrochemicals, compost/organic fertilizer application, buffer zone protection, wildlife and forest protection, to mention a few. Again, it came to light that there has been deep involvement of local traditional systems and decision-making processes throughout REDD+ related activities fostering many impacts including community ownership and acceptance of the Ghana emission reduction programme. The rights and knowledge of local communities were observed to have been strictly respected including taboos and totems, experience/knowledge in cocoa farming and traditional conflict resolution mechanisms.

Furthermore, the non-carbon component of the emission reduction programme has been much emphasized. Greater number of communities have been supplied with farm inputs such as cocoa and shade tree seedlings free of charge to enhance contributions towards emission reductions and yield enhancement.

The adherence of the safeguard in the REDD+ implementation the HIA has helped to maximize both environmental and social benefits with some examples below:

- improved vegetative or tree cover in the project communities
- improved environmental integrity of the project landscape
- Lead to livelihood improvement of beneficiary communities
- improved resilience to climate change
- Encourage knowledge sharing among beneficiaries and communities
- Increased livelihood and economic activities of beneficiary communities
- Enhanced health standards
- Good time management for productive activities

- Reduced conflicts and enhance peaceful co-existence amongst community members
- Accelerated development of communities
- Improved income for farmers

Table 2: Results of monitoring of activities in the HIA

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
Modified Taungya System	Poor records of primary supply and contract workers	4.01 Environmental Assessment	• Proper records of workers are kept and updated as appropriate	• Records of workers	
	Failure to honour MTS benefit arrangement	4.04 Habitats	• Ensured engagement of MTS beneficiaries on the right percentages due them.	• Records of engagement	
	Unavailability and no/limited use of personal protective equipment	4.36 Forests	• Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate. • Education and sensitization were done on the need for and proper usage of PPEs	• Records of PPE supply • Confirmation with workers	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Limited awareness creation programs on health and safety including chemical handling.		• Design and implementation of awareness creation programs to educate persons on protecting workers' health and safety including paying attention to chemical handling was done • Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate.	• Confirmation with workers • On-site verification with farmers	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
Enrichment planting	Poor records keeping of primary supply workers Poor records keeping of contract workers	4.01 Environmental Assessment 4.04 Habitats	• Employment and other opportunities were given to local communities as much as possible. • Proper records of workers are kept and updated as appropriate	• Confirmation with communities	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Unavailability and no/limited use of personal protective equipment	4.36 Forests	• Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate. • Education and sensitization were done on the need for and proper usage of PPEs	• Site observation • Confirmation with communities	
	Limited awareness creation programs on health and safety		• Design and implementation of awareness creation programs to educate persons on protecting workers' health and safety including paying attention to chemical handling was done • Workers wore suitable Personal Protective Equipment (PPE) as appropriate.	• Confirmation with communities • On-site verification with farmers	
	Delay in payment of contract workers		• Ensured workers were paid on time	• Records of payments	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
Trees on Farms	Disturbance of flora and fauna	4.01 Environmental Assessment 4.04 Habitats 4.09 Pest Management 4.36 Forests	• Environmentally sensitive sites and unnecessary exposure or access to sensitive habitats were avoided • Planting was designed to include both exotic and indigenous plants (desirable trees) in the right proportions and positions • Organic farming practices were implemented and this helped minimize the use of inorganic fertilizers and herbicides that are major contributors to soil and surface water quality deterioration • Labour-intensive approach using simple farm tools like hoes and cutlasses was employed.	• Site observation • Training report (annual composite report-2019-2021)	
	Planting more trees than required leading to over-shadowing of cocoa farms.		• Farms were mapped to determine actual farm sizes and site/area specific conditions to avoid over supply of seedlings • Thinning out was done to adjust the number of trees on the farms	• Site observation • Records of seedlings supplied	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Limited understanding on shade tree management.		• Education/ adequate trainings were provided to farmers	• Training report	
	Destruction from harvesting of timber resources on farm		• A grievance mechanism was established to ensure any complaints/comments regarding the Project is received and responded to in a timely manner, providing solutions and taking corrective measures as appropriate • Appropriate sanctions were applied on offenders including fines and jail sentences	• FGRM operationalized • Reports	
	Failure to register trees in the name of farmers		• Sensitisation on tree ownership scheme • Records of farmers are kept	• Training reports • Records of farmers	
	Limited awareness creation on health and safety including tools and equipment handling		• Design and implementation of awareness creation programs to educate persons on protecting workers' health and safety including paying attention to chemical and equipment handling was done	• Training report • On-site verification with farmers	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• Workers wore suitable Personal Protective Equipment (PPE) as appropriate		
	Unavailability and no/limited use of personal protective equipment		• Workers wore suitable Personal Protective Equipment (PPE) as appropriate. • Education and sensitization were done on the need for and proper usage of PPEs	• Records of PPE supply • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
Climate Smart Cocoa	Exposure of local folks (farmers) to chemicals during and after application of agrochemical on cocoa farms.	4.01 Environmental Assessment 4.04 Habitats	• Workers wore suitable Personal Protective Equipment (PPE) as appropriate. • Education and sensitization were done on the need for and proper usage of PPEs • The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where	• Records of PPE supply • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
		4.09 Pest Management	possible, mechanical weed control was considered instead of the use of weedicides.		
	Generation of fumes and noise pollution during cutting down of diseased or over-aged cocoa trees.	4.36 Forests	• Minimized burning of biomass as much as possible • Fire was used only in situations where this was effective and least environmentally damaging • The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where possible, mechanical weed control was considered instead of the use of weedicides. • Wearing of ear plugs	• Site observation • Records of PPEs provided • Training report	
	Disturbance of flora and fauna		• Environmentally sensitive sites and unnecessary exposure or access to sensitive habitats were avoided	• Site observation • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• Planting was designed to include both exotic and indigenous plants (desirable trees) in the right proportions and positions • Organic farming practices (planting nitrogen-fixing species, agroforestry practices, composting, application of organic fertilizers) were implemented and this helped minimize the use of inorganic fertilizers and herbicides that are major contributors to soil and surface water quality deterioration • Labour-intensive approach using simple farm tools like hoes and cutlasses was employed.		
	Land clearing and vegetation loss at rehab farms		• Organic farming practices (planting nitrogen-fixing species, agroforestry practices, composting, application of organic fertilizers) were implemented and this helped minimize the use of inorganic fertilizers and herbicides	• Site observation • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			that are major contributors to soil and surface water quality deterioration • Labour-intensive approach using simple farm tools like hoes and cutlasses was employed. • Felled trees and cleared under- brushes were chipped and formed into windrows and allowed to decompose and/or used as pegs for planting • Replanting of desirable species after establishment of farms		
	Encroachment into forests		• Sensitisation on intensification	• Training reports	
	May accelerate erosion by water		• Sensitive sites with high erosion risk were identified and were not cultivated. Vegetation of such areas was maintained to help control erosion as well as to ensure soil stability	• Site observation •	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• Implementation of standard erosion and sediment control best management practices		
	Potentially pollute/contaminate water bodies with (herbicides, pesticides, insecticides, weedicides, ash, dust)		• The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where possible, mechanical weed control was considered instead of the use of weedicides. • Promotion of buffer zones along the local streams to ensure their integrity and protection of other aquatic life forms. The buffer reserves serve as natural filters for surface runoff from the planting areas. The reserves also play a major role in protecting the banks of the waterways from channel erosion.	• Site observation • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• Farmers trained and provided with tools to create buffer of no-spray zones in farms with close proximity to water body(s) • Farmers whose farms located along water bodies were provided with technical assistance to leave a vegetation cover as a buffer zone along the water bodies. • Implementation of standard erosion and sediment control best management practices • Organic farming practices (planting nitrogen-fixing species, agroforestry practices, composting, application of organic fertilizers) were implemented and this helped minimize the use of inorganic fertilizers and herbicides that are major contributors to soil and surface water quality deterioration • Proper disposal of used chemical cans		

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Involve the harvesting of timber resources		• A grievance mechanism was established to ensure any complaints/comments regarding the Project is received and responded to in a timely manner, providing solutions and taking corrective measures as appropriate • Appropriate sanctions were applied on offenders including fines and jail sentences	• FGRM operationalized • Reports	
	Cultivating cocoa without adherence to the buffer zone policy		• Farmers trained and provided with tools to create buffer of no-spray zones in farms with close proximity to water body(s) • Farmers whose farms located along water bodies were provided with technical assistance to leave a vegetation cover as a buffer zone along the water bodies. • Technical officers and farm inspectors sampled and visited farms to check compliance	• Training report • Site observation	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Increase in pests and disease due to too much shade and undesirable shade trees		• Producers (farmers) trained on shade management (pruning techniques) to reduce unnecessary shade • Producers (farmers) trained to control pest using the Integrated Pest Management (IPM) techniques to use only approved crop protection products for all other crops fields.	• Site observation • Training report	
	Involve the use of unapproved/ not recommended agrochemicals (weedicides, pesticides, insecticides etc.)		• Raised awareness on the list of approved agro-inputs and the list shared/pasted at vantage points for public viewing	• Training report • List of approved and unapproved agrochemicals shared	
	Over-use of agro-inputs such as fertilizers and agro-chemicals.		• The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where possible, mechanical weed control was considered instead of the use of weedicides.	• Training report • List of approved and unapproved agrochemicals shared	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• Education and sensitization were done on the proper use and dosage of agro-inputs		
	Use of fire during land preparation		• Fire was used only in situations where this was effective (spot burning) and least environmentally damaging • Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate. • Creation of fire belts	• Site observation • Records of PPEs provided	
	Limited and/or untimely supply of cocoa seedlings		• Seedlings were supplied on time to meet onset of reliable rainfall • Seedlings were sourced within close proximity/catchment area	• Records of seedlings supply	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Establishing new farms/ cocoa farms within forest reserves.		• Admitted farmers that expanded beyond allowed limits were made to return to the permitted areas only • District Assembly by-laws used to support the conservation of dedicated forests and to sanction encroachment • Farmers trained and encouraged to involve in alternative livelihood programs to prevent the risk of expansion in to protected areas. • Sensitisation on intensification	• Engagement/training Reports • Records of admitted farms • DA by-laws	
	Generation of hazardous waste such as aboricides, herbicides, weedicides, and pesticides.		• Mass sprayers who spray agro-chemicals for farmers have been cautioned and educated on proper disposal of chemical containers after use • Famers have been encouraged to report hazardous activities of neighbors through the FGRM for correction remedy	• Training report • Awareness creation materials displayed • List of approved and unapproved agrochemicals shared	
	Lead to the transportation of hazardous chemicals				

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	(aboricides, herbicides, weedicides, and pesticides) (spillage during transportation)		• Training on safe chemical application was given • Trained farmers on how to wear PPEs and the essence of PPEs.	• FGRM operationalized	
	Improper disposal of hazardous waste				
	Poor storage of hazardous chemicals				
	Recycle/reuse of hazardous chemical containers				
	Improper or poor records keeping of direct workers		• Employment and other opportunities were given to local communities as much as possible. • Proper records of workers are kept and updated as appropriate	• Records of workers	
	Improper or poor records keeping of contracted workers				

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Improper or poor records of primary supply workers				
	Potentially could cause or aggravate land-use conflicts		• A grievance mechanism was established to ensure any complaints/comments regarding the Project is received and responded to in a timely manner, providing solutions and taking corrective measures as appropriate • Stakeholder consultations done to identify best practices and guide implementation in partnership with traditional authorities • Forest Management plan prepared for all sites to also reflect community expectations • Admitted farmers that expanded beyond allowed limits were made to return to the permitted areas only	• FGRM operationalized • Forest Management plan • Engagement/training Reports • Records of admitted farms • DA by-laws	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• District Assembly by-laws used to support the conservation of dedicated forests and to sanction encroachment		
	Unavailability and no/limited use of personal protective equipment		• Workers wore suitable Personal Protective Equipment (PPE) as appropriate. • Education and sensitization were done on the need for and proper usage of PPEs	• Confirmation with workers	
	Limited awareness creation of programs on health and safety including chemical handling		• Design and implementation of awareness creation programs to educate persons on protecting workers' health and safety including paying attention to chemical handling was done • Workers wore suitable Personal Protective Equipment (PPE) as appropriate	• Training report • On-site verification with farmers	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
Additional livelihoods Activities/Interventions	Potentially pollute/contaminate water bodies (herbicides, pesticides, insecticides, weedicides, ash etc.)	4.01 Environmental Assessment 4.04 Habitats 4.09 Pest Management 4.36 Forests	• The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where possible, mechanical weed control was considered instead of the use of weedicides. • Promotion of buffer zones along the local streams to ensure their integrity and protection of other aquatic life forms. The buffer reserves serve as natural filters for surface runoff from the planting areas. The reserves also play a major role in protecting the banks of the waterways from channel erosion. • Farmers trained and provided with tools to create buffer of no-spray zones in farms with close proximity to water body(s) • Farmers whose farms located along water bodies were provided with technical	• Site observation • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			assistance to leave a vegetation cover as a buffer zone along the water bodies. • Implementation of standard erosion and sediment control best management practices • Organic farming practices (planting nitrogen-fixing species, agroforestry practices, composting, application of organic fertilizers) were implemented and this helped minimize the use of inorganic fertilizers and herbicides that are major contributors to soil and surface water quality deterioration		
	Potentially could be located within buffer zones or water bodies		• Promotion of buffer zones along the local streams to ensure their integrity and protection of other aquatic life forms. The buffer reserves serve as natural filters for surface runoff from the planting areas. The reserves also play a major role in protecting	• Site observation • Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			the banks of the waterways from channel erosion. • Farmers trained and provided with tools to create buffer of no-spray zones in farms with close proximity to water body(s) • Farmers whose farms located along water bodies were provided with technical assistance to leave a vegetation cover as a buffer zone along the water bodies. • Technical officers and farm inspectors sampled and visited farms to check compliance		
	Use of fire during land maintenance		• Fire was used only in situations where this was effective and least environmentally damaging • Most biomass generated was used as firewood and also as pegs	• Site observation • Records of PPEs provided • Training report • FGRM operationalized	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
			• Minimized burning of biomass as much as possible • Workers wore suitable Personal Protective Equipment (PPE) as appropriate • A grievance mechanism was established to ensure any complaints/comments regarding the Project is received and responded to in a timely manner, providing solutions and taking corrective measures as appropriate		
	Over-use of agro-inputs such fertilizers and agro-chemicals		• The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where possible, mechanical weed control was considered instead of the use of weedicides. • Education and sensitization were done on the proper use and dosage of agro-inputs	• Training report • List of approved and unapproved agrochemicals shared	
	Lead to the transportation of			• Training report	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	hazardous chemicals (herbicides, weedicides, and pesticides)		• Mass sprayers who spray agro chemicals for farmers have been cautioned and educated on proper disposal of chemical containers after use • Famers have been encouraged to report hazardous activities of neighbours to through the FGRM for correction remedy • Training on safe chemical application was given • Trained farmers on how to wear PPEs and the essence of PPEs.	• Awareness creation materials displayed • List of approved and unapproved agrochemicals shared • FGRM operationalized	
	Generation of hazardous waste such as herbicides, weedicides, and pesticides.				
	Improper disposal of hazardous waste				
	Improper storage of hazardous waste				
	Improper or poor records keeping of workers		• Employment and other opportunities were given to local communities as much as possible. • Proper records of workers are kept and updated as appropriate	• Records of workers	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Potentially could cause or aggravate land-use conflicts		• A grievance mechanism was established to ensure any complaints/comments regarding the Project is received and responded to in a timely manner, providing solutions and taking corrective measures as appropriate • Stakeholder consultations done to identify best practices and guide implementation in partnership with traditional authorities • Forest Management plan was prepared for all sites to also reflect community expectations • District Assembly byelaws used to support the conservation of dedicated forests and to sanction encroachment • Admitted farmers that expanded beyond allowed limits and were made to return to the permitted areas only	• FGRM operationalized • Forest Management plan • Engagement/training Reports • Records of admitted farms • DA by-laws	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
	Low percentage of women in livelihood improvement activities		• Employment and other opportunities were given to local communities as much as possible. • Equal opportunity was given to all abled bodied persons who wanted to participate • Gender empowerment trainings were carried out for farmers	• Records of farmers • Training reports	
	Prioritization of a few demographic in terms of labour				
	Unfair selection of beneficiaries				
	Limited awareness creation of programs on health and safety issues		• Design and implementation of awareness creation programs to educate persons on protecting workers' health and safety including paying attention to chemical and equipment handling was done • Workers wore suitable Personal Protective Equipment (PPE) as appropriate	• Training report • On-site verification with farmers	

ACTIVITY	RISKS	OP TRIGGERED	MITIGATION MEASURES	INDICATOR/ MEANS OF VERIFICATION	REMARKS
Wildlife protection and management	Public health risks resulting from poor beekeeping management practices	4.01 Environmental Assessment 4.04 Habitats 4.36 Forests	• Beehives sited in safe environment away from settlements and people • Protective gears put on when performing operational activities on beehives • Honey extraction equipment kept safe and professionally cleaned during and after use • Community members sensitized on the locations of beehives • Warming signals strategically placed in locations of beehives to turn off people	• State of beekeeping protective gears and extraction equipment • Field observation • Report • Evidence of warning signals	
	Elephant crop raiding		• Fringe communities sensitized and educated on elephant behaviour • Fringe communities trained on elephant crop raiding mitigation measures • Supported farmers with pepper fence defence	• Reports • Field observation • Interviews	

NB: With regards to Personal Protective Equipment (PPE), stakeholders are entreated to protect themselves as much as possible even in the absence of industrial grade PPE. That is, clothing that covers every inch of the body like PPE would (long sleeved shirts, jeans, boots/footwear, mask).

4.0 FEEDBACK AND GRIEVANCE REDRESS MECHANISM (FGRM)

NRS has made provisions for FGRM hotlines and stakeholders have been made aware of this through sensitization and awareness creation. While activities are being implemented within the Kakum HIA, there have been a few reports on grievances, and feedback has been received.

Support is provided by private sector, NGOs/CSOs, and other stakeholders necessary for helping local actors submit their grievances.

The ERPD identified potential conflict sources for categorising grievances. The potential conflict sources are;

- Resource use and access
- Land and tree tenure
- Benefit Sharing
- Safeguards
- Participation and inclusiveness
- Capacity-Building

5.0 CONSULTATIONS, TRAININGS AND CAPACITY BUILDING ACTIVITIES

In every engagement NRS has with stakeholders, the opportunity is taken to continuously build their capacities on REDD+ topics and provide updates on activities within the HIA and GCFRP as a whole. Partners also carry out trainings and capacity building activities within the landscape.

Table 3: Consultations, trainings and capacity building activities

INSTITUTION/ FACILITATOR	ACTIVITY	RECIPIENTS
ECOM	Livelihood improvement: Farmers trained on Chilli pepper and Maize at Besease, Kwafo, Beyeden, Anyinabrem to enhance livelihood improvement.	210 (124 M & 86 W) farmers
	Women (economic) empowerment: Farmers trained on financial literacy (P&L). Participants were from Kwafo, Beyeden, Homaho, Besease, Beyeden, Ayigo, Muoho	112 (15 M & 97 W) farmers
	Preserving Ecosystem: Farmers received training on Ecosystem Preservation and CSA	961 (458 M & 503 W) farmers
	Farmer Field School (FFS): Farmers received training on FFS such as GAP, GEP & GSP. Topics treated include but not limited to; Harvest and post harvest, IPM, soil health, safe disposal of empty agrochemicals containers	1420 (813 M & 607 W) farmers
	CLMRS: Awareness creation through training for staff and committees (100% target achieved)	86% of farmers

	Training of farmers on discrimination, force labor, child labor, workplace violence and harassment (86% of farmers trained)	
	Gender & empowering youth: Farmers trained on gender policy and youth empowering. Youth farmers trained on financial and business skills	255 farmers 104 youth farmers
FC (WD)	Elephant crop raiding mitigation: Farmers were trained on how to mitigate elephant crop raiding, on ten demonstration plots. The training aims to strengthen human elephant co-existence	100 farmers
	Wildlife Conservation capacity buiding for wildlife volunteer groups	11 community wildlife volunteer groups
	Wild animal disease surveillance training	LE & GC unit
	Wildlife trafficking and investigators training	LE & GC unit
Assin North District Assembly	Public education on climate change and tree planting	Local stakeholders
	Public education on Environmental Degradation	Local stakeholders
NRS	Strengthening awareness on the benefits-sharing arrangement under the GCFRP. To ensure community led, transparent and participatory approach to the benefit-sharing arrangements, the need for safeguards adherence was emphasized to avoid or minimize any complaints or grievances that may arise during this process.	55 (37 M & 18 F) beneficiaries
	Community engagement on community and farmer benefits. The need for safeguards compliance was heavily addressed and the	34 (24 M & 10 F) beneficiaries

	availability of the FGRM was communicated again	
Hershey	Forest Monitoring training for forest guards	20 Forest Monitoring Guards
	Training on Climate Smart Cocoa production	2500 farmers

6.0 RECOMMENDATIONS AND NEXT STEPS

The proponents of GCFRP as well as implementing partners (from government, private sector and CSOs/NGOs) have exhibited strong dedication to sound environmental and social safeguards measures in the implementation of interventions/activities under GCFRP by demonstrating robust compliance to both national and the World Bank safeguards policies. By involving communities in methods that provide them with environmental and financial benefits, the programme has a strong potential to increase carbon stocks (achieve emissions reductions) in the High Forest Zones by reducing deforestation and forest degradation. Certain negative environmental and social effects (soils, water supplies, biodiversity, and some socioeconomic issues) that result from GCFRP implementation have been identified and mitigated against thereby maximizing the reputational, economic and social benefits of the programme

The recommended mitigation measures are sufficient to protect the environment and promote social growth.

Some recommendations to further enhance programme implementation were drawn based on monitoring of the safeguards implementation:

- There is a need to strengthen partnership and coordination with key stakeholders at the HIA level
- Regular and timely monitoring of activities/interventions undertaken by partners is encouraged
- Continuous stakeholder engagement with project proponents on safeguards implementation is recommended

ANNEXES

Annex 1: Stakeholders consulted/engaged

KAKUM

ATTENDANCE SHEET

SAFEGUARDS MONITORING

NAME	M/F	ORGANIZATION	LOCATION	CONTACT	SIGN
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KAKUM

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KAKUM

Forestry Commission

GhREDD+

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KAKUM

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Annex 2: Pictures

Consultations, trainings, and capacity building activities carried out by project proponents




Annex 3: Forest reserves condition scores and biodiversity assessment

Table 4: Description of Forest Condition score

Score	Designation	Description
1	Excellent	Few signs (<2%) human disturbance, with good canopy and virgin or late secondary forest throughout
2	Good	Less than 10% heavily disturbed. Logging damage restricted or light and well dispersed. Fire damage none or peripheral
3	Slightly degraded	Obviously disturbed or degraded and usually patchy, but with good forest predominant; maximum 25% with serious scars and poor regeneration; maximum 50% slightly disturbed, with broken upper canopy
4	Mostly degraded	Obviously disturbed and patchy, with poor quality forest predominant; 25-50% with serious scars; maximum 75% disrupted canopy or forest slightly burned throughout
5	Very poor	Forest with coherent canopy < 25% or more with half the forest with serious scars and poor regeneration; or almost all heavily burned with conspicuous pioneer species throughout
6	No significant forest left	Almost all deforested with savanna, plantation, or farm; <2% good forest; or 2-5% very disturbed forest remaining; or 5-10% left in extremely poor condition

Table 5: Star rating system for plant species in Ghana

Star Rating	Description
Black	Highly significant in context of global biodiversity; rare globally and not widespread in Ghana
Gold	Significant in context of global biodiversity; fairly rare globally/nationally
Blue	Mainly of national biodiversity interest, e.g., globally widespread, nationally rare; or globally rare but of no concern in Ghana due to commonness

Scarlet	Common and widespread commercial species with potential seriously threatened by overexploitation
Red	Common and widespread commercial species; under significant pressure from exploitation
Pink	Common and widespread commercial species; not currently under significant pressure from overexploitation
Green	Species common and widespread in tropical Africa; no conservation concern
Others	Unknown, or non-forest species

Table 6: Ten most important tree species identified in forest ecosystems

Species	**Frequency**
Celtis mildbraedii	182
Broussonetia papyrifera	107
Triplochiton scleroxylon	106
Nesogordonia papaverifera	77
Ricinodendron heudelotii	69
Calpocalyx brevibracteatus	64
Hymenostegia afzelii	64
Diospyros canaliculata	53
Sterculia rhinopetala	47
Discoglypremna caloneura	40

Table 7: Ten most important tree species identified on cocoa farms

Species	**Frequency**
Morinda lucida	77
Persea americana	57
Citrus sinensis	31
Carica papaya	20
Terminalia superba	18

Milicia regia	16
Antiaris toxicaria	15
Ficus exasperata	15
Ficus vogeliana	12
Holarrhena floribunda	12

Table 8: Red and Scarlet star rating of plant species recorded in cocoa farms

Species	**Star rating**
Pycnanthus angolensis	Red
Albizia ferruginea	Scarlet
Antiaris toxicaria	Scarlet
Entandrophragma angolense	Scarlet
Khaya grandifoliola	Scarlet
Milicia excelsa	Scarlet
Milicia regia	Scarlet
Milicia regia	Scarlet
Pouteria aningeri	Scarlet
Pterygota macrocarpa	Scarlet
Triplochiton scleroxylon	Scarlet

Table 9: Red and Scarlet star rating of plant species recorded in the cropland

Species	**Star rating**
Afzelia bella	Red
Amphimas ptrecapioides	Red
Ceiba pentandra	Red
Celtis zenkeri	Red
Daniellia ogea	Red
Distemonanthus benthamianus	Red
Pouteria altissima	Red

Pycnanthus angolensis	Red
Terminalia ivorensis	Red
Terminalia superba	Red
Albizia ferruginea	Scarlet
Antiaris toxicaria	Scarlet
Entandrophragma angolense	Scarlet
Entandrophragma candollei	Scarlet
Milicia excelsa	Scarlet
Milicia regia	Scarlet
Pterygota macrocarpa	Scarlet
Triplochiton scleroxylon	Scarlet

Table 10: Animal observation indices for 2023

SPECIES	**Jan**		**Feb**		**Mar**		**Total**
	No.	**C/E**	**No.**	**C/E**	**No.**	**C/E**	
African Civet	3	0.0037	5	0.0074	8	0.0135	16
African Giant Rat	2	0.0025	0	0.0000	0	0.0000	2
Bay Duiker	13	0.0159	4	0.0059	20	0.0338	37
Black Duiker	12	0.0147	8	0.0118	8	0.0135	28
Blk &Wht Colobus	11	0.0135	21	0.0311	33	0.0558	65
Bongo	3	0.0037	4	0.0059	0	0.0000	7
Brush-Tail Porcupine	7	0.0086	6	0.0089	13	0.0220	26
Bush Baby	47	0.0576	63	0.0932	87	0.1470	197
Bushbuck	3	0.0037	4	0.0059	6	0.0101	13
Bush rat	0	0.0000	0	0.0000	2	0.0034	2
Cusimanse	0	0.0000	0	0.0000	20	0.0338	20
Elephant	27	0.0331	6	0.0089	17	0.0287	50
Flying Squirrel	0	0.0000	1	0.0015	0	0.0000	1
Giant Forest hog	0	0.0000	0	0.0000	3	0.0051	3
Maxwell's Duiker	46	0.0564	67	0.0991	37	0.0625	150

Mona Monkey	178	0.2181	136	0.2012	127	0.2146	441
Mongoose	29	0.0355	29	0.0429	21	0.0355	79
Nile Monitor lizard	8	0.0098	2	0.0030	2	0.0034	12
Potto	12	0.0147	6	0.0089	5	0.0084	23
Red River Hog	10	0.0123	27	0.0399	39	0.0659	76
Royal Antelope	13	0.0159	5	0.0074	7	0.0118	25
Spot-Nose Monkey	38	0.0466	28	0.0414	10	0.0169	76
Tortoise	0	0.0000	2	0.0030	0	0.0000	2
Tree Hyrax	17	0.0208	34	0.0503	85	0.1436	136
White bellied pangolin	4	0.0049	1	0.0015	2	0.0034	7
White-breasted Guineafowl	5	0.0061	0	0.0000	0	0.0000	5
Yellow -Backed Duiker	2	0.0025	11	0.0163	5	0.0084	18
TOTAL	**490**	**0.6003**	**470**	**0.6953**	**557**	**0.9410**	**1517**

Annex 4: List of approved and banned agro chemicals

TRADE NAME	ACTIVE INGREDIENT	PRE-HARVEST INTERVAL	RE-ENTRY INTERVAL	DOSAGE
AKATE MASTER	*BIFENTRIN*	21 DAYS	48 HRS	100 ML/ 11L of water
AKATE STAR 3 EC	*BIFENTRIN*	21 DAYS	48 HRS	20 ML/ 11L of water
ACTARA	*Thiamethoxam*	21 DAYS	48 HRS	17ML/11L of water
ACETA STAR	*Acetamiprid&Bifenthrin*	21 DAYS	48 HRS	120ML/11L of water
ACATI POWER	*Thiamethoxam*	21 DAYS	48 HRS	20ML/11L of water
PRIDAPOD	*IMIDACLOPRID*	21 DAYS	48 HRS	20ML/11L of water
VIPER SUPER	*INDOXACARB ANDACETAMIPRID*	21 DAYS	48 HRS	105ML/11L of water
GALIL 300	*IMIDACLOPRID AND BIFENTRIN*	21 DAYS	48 HRS	13ML/11L of water
AF CONFIDENCE	*CAPSAICIN*	21 DAYS	48 HRS	200ML/11L of water
SIVANTO	*FLUPYRADIFURONE*	21 DAYS	48 HRS	40ML/11L OF WATER
NORMAX 150	*ALPHA-CYPERMETHRIN TEFLUBENZURON*	21 DAYS	48 HRS	52 ML/11L WATER
BUFFALO SUPER	*ACETAPRIMID*	21 DAYS	48 HRS	98ML/11L WATER
THODAN SUPER	*LAMBDACYHALOTHRIN+ACETAMIPRID*	21 DAYS	48 HRS	110ML/11L WATER

A1	*IMIDACLOPRID*	21 DAYS	48 HRS	20ML/11L WATER
CALLIFAN SUPER	*BIFENTHRIN+ACETAMIPRID*	21 DAYS	48 HRS	20ML/11L WATER
AKATE GLOBAL	*THIAMETHOXAM*	21 DAYS	48 HRS	20ML/11L WATER
RAGENT 200	*FIPRONIL*	21 DAYS	48 HRS	17ML/11L WATER

FUNGICIDES

TRADE NAME	**ACTIVE INGREDIENT**	**PRE-HARVEST INTERVAL**	**RE-ENTRY INTERVAL**	**DOSAGE**
RidomilGold	*CuprousOxide&Mefonoxam*	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
Funguran-OH	*CupricHydroxide*	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
Metalm72WP	*Metalxyl*	21 DAYS	12 HRS (0.5 DAY)	1 Sachet/ 16L of water
*Fungiki **l** 50WP*	*Metalxyl*	21 DAYS	12 HRS (0.5 DAY)	1 Sachet/ 16L of water
Kocide2000	*CupricHydroxide*	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
CopperNordox75WG	*CuprousOxide*	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
Champion	*CupricHydroxide*	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water

SidalcoDefender	*DicopperChroride trihydroxide,SC*	21 DAYS	24 HRS (1 DAY)	150ML/ 16L of water
Fantic	Benalaxyl M+Copper(I)Oxide	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
Forum R	homorph + 400 g/kg Co	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
Vamos 500SC	500 g/L Fluazinam	21 DAYS	24 HRS (1 DAY)	75ML/ 16L of water
Banjo Forte 400 SC	methomorph + 200 g/L	21 DAYS	24 HRS (1 DAY)	75ML/ 16L of water
Royal Cop 50WP	50% Copper (II) hydroxide	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water
Delco 75WP	75 % Cupper (I) oxide	21 DAYS	24 HRS (1 DAY)	1 Sachet/ 16L of water

FERTILIZERS GRANULAR (ORGANIC)

TRADE NAME	**ACTIVE INGREDIENTS**	**DOSAGE**
Asaasewura	NPK 0-22-18+9CaO+75+MgO	3 Bags/ acre
Cocofeed	NPK 0-30-20	3 Bags/ acre
Cocoa Master	NPK-1-21-19+9CaO+65+6MgO +18	3 Bags/ acre
Dua Pa	NPK 3-25-18-	3 Bags/ acre

	7CaO+45+6MgO+0. 3(B+Zn)	
Ferta Agra Cacao Sup	NPK 3-21e20+10CaO+55+5Mg O+0.5(B+Zn)	3 Bags/ acre
So Aba Pa	NPK 4-22-18+4CaO+45+5MgO +0.5B+0.2Zn	3 Bags/ acre
Adom Cocoa Fertilizer	NPK2-23- 18+8 CaO+6SO3+6MGO +0.5ZN+0.5B	3 Bags/ acre
Adehye Cocoa Fertiliz	NPK2-23- 18+8 eCaO+6SO3+6MGO +0.5ZN+0.5B	3 Bags/ acre
Sidalco	NPK 6:0:20 + Trace elements (Mg, Fe, Mn,Cu,Zn)	21 DAYS
Lithovit	Urea+Carbonates of Ca and Mg+Trace elements	21 DAYS

List of banned agro-chemicals

GAMALIN 20 (DDT)

UNTENT

COCOSTAT

KABAMALT

PARAQUATS

Banned pesticides

1. 2,4,5-T and Its salts and esters

2. Aldrin

3. Binapaeryt

4. Cantalo

5. Chlordane

o Clordinciorn

7. Chlorobenzilate

8. Dichlorodiphenyitrichloroethane(DDT)

9. Dieldrin

10. Dinoseb and its calts and esters

11. Dinitro-orthocresol (DNOC) and its salts (such as ammonium salt, potassium salt and sodium salt)

I2. Endria

13. HCH (aixed isomere)

14. Heptachlos

15. Hcxachlorobenxene

16. Parathion

17. Pentachlorophenol and its salts and esters

18. Toxaphene

19. Mirex

20. Methamidophos (Soluble Iquid formulations of the substance that exceed 600 g active ingredient/I)

21. Methyl-parathion (emulsifiable concentrates (EC) with at or above 19.5% active ingredient and dusts at or above 1.5% active ingredient)

22. Monocrotophos (Soluble liquid formulations of the substance that exceed 600 g active ingredient/D

23. Parathion (all formulations - aerosols, dustable powder (DP), emulsifiable concentrate (EC), granules (CB) and wettable powders (WP) - of this substance are included, except capsule suspendions (CS))

24. Mosphamidon (Soluble liquid formulations of the substance that exceed 1000 1 active ingredient/I)