



SAFEGUARDS IMPLEMENTATION AND MONITORING REPORT

ASUNAFO – ASUTIFI HIA

CLIMATE CHANGE DIRECTORATE

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LIST OF ABBREVIATIONS

| | |
|---------|--|
| AfDB | African Development Bank |
| CFU | Colony Forming Unit |
| CIF | Climate Investment Funds |
| CLP | Cocoa Life Programme |
| COCOBOD | Ghana Cocoa Board |
| CORIP | Cocoa Rehabilitation and Improvement Project |
| CRI | Crops Research Institute- CSIR |
| CREMA | Community Resource Management Area |
| CRMC | Community Resource Management Committee |
| CSIR | Council for Scientific and Industrial Research |
| CSO | Civil Society Organisation |
| DA | District Assembly |
| EA | Environmental Assessment |
| EMP | Environmental Management Plan |
| EMT | Executive Management Team |
| EPA | Environmental Protection Agency |
| ESAP | Environmental and Social Assessment Procedures |
| ESIA | Environmental and Social Impact Assessment |
| ESS | Environmental and Social safeguards |
| FC | Forestry Commission |
| FDP | Farm Development Plan |
| FGRM | Feedback and Grievance Redress Mechanism |
| FIP | Forest Investment Programme |
| FORIG | Forest Research Institute of Ghana- CSIR |
| FP | Focal Point/Focal Person |
| FR | Forest Reserve |
| GoG | Government of Ghana |
| GSWG | National REDD+ Gender Sub-Working Group |
| HFZ | High Forest Zone |
| HIA | Hotspot Intervention Area |
| HMB | Hotspot Intervention Area |
| IUCN | International Union for the Conservation of Nature |

| | |
|--------|--|
| JCC | Joint Coordinating Committee |
| LBC | Licensed Buying Company |
| LULUCF | Land Use, Land Use Change and Forestry |
| MDAs | Ministries, Departments and Agencies |
| MESTI | Ministry of Environment, Science, Technology and Innovation |
| MOFA | Ministry of Food and Agriculture |
| MMDA | Metropolitan, Municipal District Assembly |
| MLGRD | Ministry of Local Government and Rural Development |
| NEAP | National Environmental Action Plan |
| NEP | National Environmental Policy |
| NGO | Non-Governmental Organisation |
| PCIs | Principles, Criteria and Indicators |
| PLP | Production Landscape Programme |
| PMU | Project Management Unit |
| RCC | Regional Coordinating Council |
| REDD | Reducing Emissions from Deforestation and Forest Degradation |
| SA | Social Assessment |
| SEA | Strategic Environmental Assessment |
| SAP | Safeguards Action Plan |
| SESA | Strategic Environmental and Social Assessment |
| SHEC | Sub-HIA Executive Committee |
| SIS | Safeguards Information System |
| SRI | Soil Research Institute- CSIR |
| UNDP | United Nations Development Programme |
| UNFCCC | United Nations Framework Convention on Climate Change |
| WB | World Bank |
| WRC | Water Resources Commission |
| WRI | Water Research Institute- CSIR |

1.0 INTRODUCTION

1.1 Background

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 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, and 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 50 per 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 landscape¹. 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 Asunafo – Asutifi HIA is one of the designated landscapes where GCFRP implementation is underway with the support of a consortium made up of Forestry Commission, COCOBOD, World Cocoa Foundation (WCF), Mondelez, United Nations Development Programme, Proforest, Tropenbos Ghana and Touton. The partnership adopts a jurisdictional approach which ensures that all stakeholders

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

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 Enrichment Planting, Modified Taungya System, Trees-On-Farm, Climate Smart Cocoa, Mondelez-UNDP International Cocoa Life Programme, Solidaridad Cocoa Rehabilitation and Improvement Project (CORIP), Proforest Production Landscape Programme and the COCOBOD Cocoa Artificial Hand Pollination. 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 link 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's 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 will be purchasing the ERs generated from the GCRFP, environmental and social risks associated with the GCRFP activities would be 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 GCRFP. Specifically, it details the risks and opportunities, and identifies the World Bank Safeguards policies triggered. The SESA report resulted in an Environmental and Social Management Framework (ESMF) to guide the implementation of the proposed ER programme. The National REDD+ Secretariat (NRS) of the Forestry Commission (FC) ensures that mitigation measures and recommendations in the ESMF applicable to the ER Programme area are implemented.

Table 1: World Bank Operational Procedures triggered by the GCRFP

| World Bank Safeguard Policy | Potential to be Triggered under REDD+ in Ghana |
|-----------------------------------|--|
|-----------------------------------|--|

| | |
|---|---|
| OP 4.01: Environmental Assessment | GCFRP will engage in activities such as tree planting and animal rearing, that use forest resources in the HIAs and potentially impact other environmental areas. These activities may have environmental impacts on a limited scale, but an ESMF has been 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 ESMF guides avoiding or mitigating impacts on natural habitats. |
| OP 4.36: Forests | Forest policy and management are the primary focus of this project, in addition to trees in the agroforestry landscape. The ESMF includes guidance on managing forest ecosystems and their associated resources. |
| 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 cocoa enhancement activities. In addition, key environmental and social issues and risks associated with chemical applications in cocoa have been analyzed in the ESMF. |
| 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 the 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 Implementation and Monitoring Report has been developed to demonstrate 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 Asunafo-Asutifi HIA.

2.0 GENERAL DESCRIPTION OF ASUNAFO - ASUTIFI HIA

2.1 Basic Administration

Located in the Ahafo Region of Ghana, the Asunafo-Asutifi HIA landscape encompasses four administrative districts namely: Asunafo North, Asunafo South, Asutifi North and Asutifi South (Figure 1). Asunafo North Municipality was formerly part of the then-larger Asunafo District from 1988 until the southern part of the district was split off by a presidential decree on 12 November, 2003 (effectively 17 February, 2004) to become Asunafo South District. The remaining northern part was renamed Asunafo North District which was later elevated to municipal status on 29 February 2008. The municipality is located in the western part of Ahafo Region and has Goaso as its capital town. With about 251 communities, the municipality shares boundaries with Asutifi South and Asutifi North in the East, Asunafo South in the Southeast and Asutifi North in the Northeast. The office of the Municipal Chief Executive is at the apex of the municipal administration, followed by the Executive Committee, which serves the executive, as well as the coordinating offices of the assembly.

Asunafo South District was carved out from the then Asunafo District. The Asunafo South District was established by Legislative Instrument L.I. 1773 in 2012. The district shares common boundaries with Asunafo North Municipal in the North, Atwima Mponua District of the Ashanti Region in the east and Juaboso District of the Western North Region in the southwest. The Asutifi South District Assembly is made up of Twenty-Three (23) Elected Members and Eleven (11) Government Appointees; One (1) Member of Parliament and a District Chief Executive. The district has Four (4) Area Councils, namely; Acherensua, Hwidiem, Nkaseim and Dadiesoaba. The district has a total of Twenty-Three (23) Unit Committees.

The Asutifi North District was formerly part of the then-larger Asutifi District since 1988 until the southern part of the district was split off to create Asutifi South District on 28 June, 2012. The remaining northern part is Asutifi North District. The district assembly is located in the eastern part of Ahafo Region and has Kenyasi as its capital town. It shares boundaries with Sunyani Municipality, Tano South Municipality, Dormaa Central Municipality, Asunafo North Municipality and Asunafo South, Ahafo Ano South West and Ahafo Ano North Districts. The district has one constituency and 36 Electoral areas. There are 36 Assembly Members who are elected by universal adult suffrage to represent the various Electoral Areas in the District. In addition, there

are 11 Assembly Members appointed by the government bringing the total number of Assembly Members to 25.

The Asutifi South District has Hwidiem as the capital and it is about 3.2 km² away from the mother District Capital, Kenyasi. The district was created when the Asutifi District Assembly was divided into 2 in 2012. The Legislative Instrument that established the District Assembly is L.I. 2054 of 2012. The district has one constituency with 27 electoral areas and 36 Assembly members. The assembly members comprise of the elected members, one from each of the 27 electoral areas as well as the nine government appointees and are headed by the Presiding Member. There are four area councils namely Hwidiem, Dadiesoaba, Acherensua and Nkaseim.

Table 2: Administrative districts

| Region | District | District Capital |
|--------------|-------------------------|------------------|
| Ahafo | Asunafo North Municipal | Goaso |
| | Asunafo South | Kukuom |
| | Asutifi North | Kenyasi |
| | Asutifi South | Hwidiem |

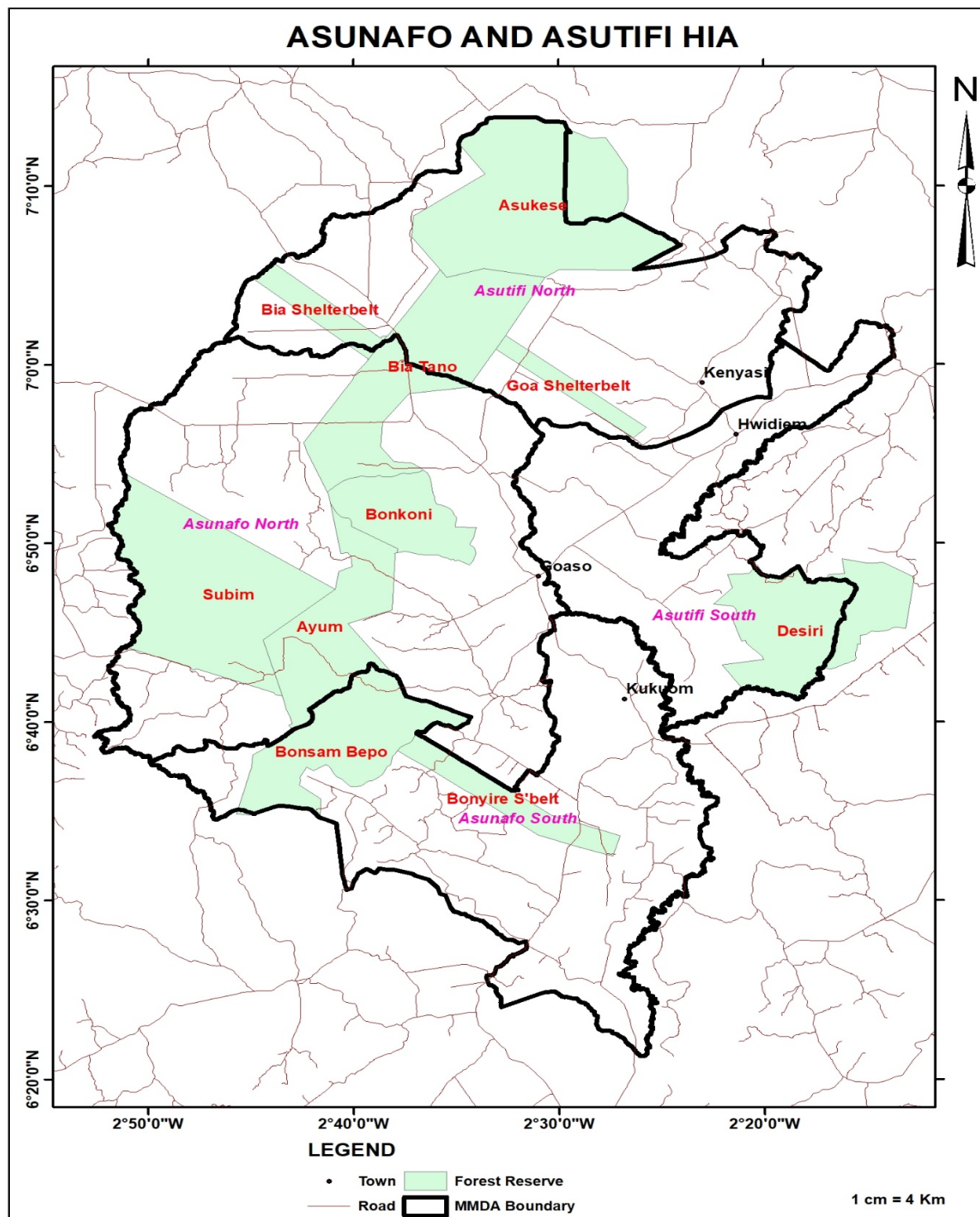


Figure 1: Map of the Asunafo-Asutifi HIA

2.2 Socio-economic, geographic and environmental profile

2.2.1 Asunafo North Municipality

The Asunafo North municipality has a total land size of 1093.7 km² with about 389.7 km² covered by forest reserves (which equates to / represents about 40.93% of the total land area) and makes up about 3.5% of the total land area of Ahafo Region. Agricultural activities, mainly crop

Safeguards implementation & monitoring report

production comes next consuming about 34.06% of the land area; habited area constitutes about 13.16% of the total land area whilst other unspecified uses make up 9.16%. With four (4) urban settlements and two hundred and seventy-one (271) rural settlements, the municipality is predominantly rural. According to the 2010 Population and Housing Census of Ghana (2010 PHC), the urban settlements are Akrodie, Fawohoyeden, Goaso and Mim with a combined population of 60,026 people, which is 44.8% of the population of the Municipality. The densely populated areas in the Municipality are Goaso, Mim, Fawohoyeden, Akrodie, Kasapin and Ayomso. The Municipality has three Traditional Areas: Goaso, Mim and Akrodie.

The municipality has a gently rolling landscape with the topography more rugged towards the north-eastern (Mim Area) and south-western (Abuom Area). The soil type in the municipality is mostly forest ochrosols which supports crops like plantain, cocoyam, cocoa, oil palm, cassava, maize, etc. The municipality is drained by 2 rivers, namely the Goa and the Ayum. The vegetation is mainly characterized by tall trees with evergreen undergrowth and has an abundance of economic trees. Scattered patches of secondary or broken forests are the characteristics of the vegetation. This has been as a result of farming, lumbering and building activities. In the Municipality, the prevalent farming practice is the slash and burn method of land clearing. According to the Asunafo North Municipal Assembly, from the field information gathered from the surveys carried out in the municipality, there is an indication that poultry, cattle, sheep, goats, turkeys, ducks and guinea fowls are the domestic animals reared in the municipality. The population of the municipality according to the 2010 Population and Housing Census (PHC) stood at 124,685 with 62,854 males and 61,831 females; while the Municipal Assembly estimated a figure of 147,290 in 2017, with females and males constituting 50.88% (74,948) and 49.12% (72,342) respectively. The urban areas take up 44.8% whilst rural areas take 55.2% of the population with migrants constituting 39.4% in the municipality. Of the employed population, 60.3 percent are engaged as skilled agricultural, forestry and fishery workers, 13.4 percent in service and sales and 1.7 percent are engaged as managers, professionals, and technicians.

Table 3: Housing stock and Households in the Asunafo North Municipality

| Categories | Asunafo North | Urban | % | Rural | % |
|------------------|------------------|--------|------|--------|------|
| Total Population | 147,290 | 66,026 | 44.8 | 81,264 | 55.2 |

| | | | | | |
|------------------------------|--------|--------|------|--------|------|
| Number of Houses | 18,704 | 5,708 | 30.5 | 12,996 | 69.5 |
| Number of households | 27,232 | 11,041 | 40.5 | 16,191 | 59.5 |
| Average Household size | 4.5 | 4.2 | - | 4.7 | - |
| Average households per house | 1.5 | - | | | |

(Source: Municipal MTDP (2018 – 2021))

2.2.2 Asunafo South District

Asunafo South District has an estimated land size of about 3,737 km². The district is located at the southern part of the Ahafo Region with its capital as Kukuom. The district shares borders with the Asunafo North Municipal to the north and the Juaboso District to the south-west. The district lies within the moist semi-deciduous forest region of Ghana where different tree species of economic value such as Onyina/Ceiba, Dahoma, Sapele are found. The district has two main rivers namely: River Tano and River Sui.

The population of the district according to the 2010 PHC stood at 95,580 with 48,836 males and 46,744 females. With an annual growth rate of 2.6%, the population was estimated at 102,328 as at 2017 with females and males constituting 50.2% and 49.8% respectively. Majority of the population are migrants from other parts of the country who engage in share cropping of cocoa. The population is generally youthful with a potential labour force of about 52.4%. The population density is 87 persons/km² compared to regional estimate of 68 persons/km² as of 2017. Of the employed population, about 74.2 percent are engaged as skilled agricultural, forestry and fishery workers, 9.1 percent in service and sales, 6.6 percent in craft and related trade, and 5.1 percent are engaged as managers, professionals, and technicians. 85 percent of households in the district are engaged in agriculture but is done largely at the subsistence level except cocoa, which is mainly for export. Most households in the district (98.7%) are involved in crop farming, with poultry being the dominant animal reared there. The industrial sector is made up of few agro-processing facilities such as gari processing, cassava, and oil palm processing. The commercial sector deals in trading of manufactured goods like detergents, cutlasses, agro chemicals and cosmetics and foodstuffs such as plantain, cassava, cocoyam, and palm oil. Majority of the people in the district largely depend on the forest resources for their livelihood by engaging in farming, lumbering, hunting, Bee keeping and snail rearing. Among these are timber and other

Non-Timber Forest Products like fruits, mushrooms, herbs and snails. The district has two forest reserves: Bonsam Bepo and Abonyere.

The relatively high population density implies high pressure on land for agro-commodity production since agriculture is the main socio-economic activity of the inhabitants. In terms of the spatial organizations, the human settlements of the district are predominantly rural with 83% of the population being in rural settlements (Table 4). The urban settlements are Kukuom and Sankore which are also the seat of the two traditional councils in the district and which together make up 17% of the population.

Table 4: Household Data of the Asunafo South District

| Categories | Asunafo South | Urban | Rural |
|-------------------------|---------------|--------|--------|
| Total Population | 102,328 | 17,396 | 84,932 |
| Number of households* | 15,220* | 3,404 | 11,816 |
| Number of households* | 20,241* | 5,764 | 14,477 |
| Average Household size* | 4.7 | 4.2 | 4.9 |
| Population per house* | 6.2 | 7.1 | 6 |

(Source: Adapted from District MTDP (2018 – 2021) and the 2010 Population and Housing Census*)

2.2.3 Asutifi North District

With a total land surface area of 936km², the Asutifi North District is one of the smallest in the Brong Ahafo Region (2% of the total land area) but the larger of the two Asutifi districts (Asutifi North and South). The population of the district according to the 2010 PHC stood at 52,259 with 26,761 males 25,498 females and an estimated population of 62,817 as of 2017. The district has a population density of 73 persons/km² which is far above the regional density of 68 person/km². Forest reserves which constitute about 31% of the land area and mining concessions have taken up a significant portion of arable land of the district. Apart from Kenyasi #1, Kenyasi #2 and Ntotroso which are urban settlements, the other communities are predominantly rural. There are three Traditional Councils within the district at Kenyasi #1, Kenyasi #2 and Ntotroso.

The district is endowed with good deeply weathered soil and favourable climate and can boast of a wide variety of forest trees such as Wawa, Esa, Kyenkyen, Odum, Ofram and Fununtum. Aside the forest which also provides timber as a source of revenue and foreign exchange, there are farm crops such as cassava, cocoyam, plantain, yams and other cash crops like cashew, oil palm and cocoa made available in the district that are of a high economic value. The economy is mostly agrarian with most of them being peasant farmers who largely depend on rudimentary methods of farming. Nearly three out of every five persons (58.0%) employed in the district are in skilled agriculture, forestry or fishery while a little over one out of every five (11.2%) persons in the employed population is service or sales workers. Craft and related trade workers form 10.4 percent of the employed population. Since it began in 2004/2005, gold mining has had a significant impact on socio-economic development as jobs have been created, revenue generated, and social responsibility interventions/activities undertaken to complement the effort local government administration. A lot of the local population are also engaged in the service sector in the district. As at March 2017, a total of 1210 (34.8%) out of 3,473 formal sector workers in the district were engaged by Newmont Gold Ghana Limited (NGGL) directly and indirectly.

2.2.4 Asutifi South District

In terms of land area, the Asutifi South District covers about 597.2440 km². It was created from the then Asutifi District in 2012 and shares boundaries with Asutifi North District to the north, Ahafo Ano North Municipal to the east, Asunafo North Municipal to the west, Atwima Mponua District to the south-east, and Asunafo South District to the south-west. The district lies within the forest plateau and has a vegetation type dominated by semi-deciduous forest. Man's activities notably farming, lumbering and occasional bush fires have however disturbed this vegetation. This has transformed some areas into a deprived wood savannah. Such transitional zones could be observed around Kensere and Dadiesoaba. There are however, large areas of forest reserves in the district which include Asukese Forest Reserve, Bia Tam Forest Reserve and Desiri Forest Reserve.

Asutifi South District has a projected population size of about 67,196 as at 2020 with a growth rate of about 2.3 percent. The males in the district constitute 34,942 (52%) while females are 32,254 (48%). The economy of the district is driven by service and administration with pockets

of industrial activities. Agricultural activities in the district are centred mainly on crop production. Agriculture employs about 64% of the potential labour force. 52% of these are males and 48% are females. There are no large-scale farming activities in the district, implying that agriculture is basically subsistence. The major food crops grown are maize, cassava, plantain, and cocoyam. Major vegetables grown are tomatoes, garden egg, okro, and pepper. Cash crops grown include cocoa, oil palm, coffee and cashew.

2.3 Land cover Dynamics of the Asunafo-Asutifi HIA

Understanding the ecological components and characteristics of any landscape is important for developing interventions for the landscape. This is because ecosystems such as forests, wetlands and water bodies perform critical roles that are vital to the well-being of communities, sustainability of agriculture and the sustainability of the environment. The Asunafo-Asutifi HIA, with a total area of 326,811ha has significant socio-economic, ecological, and cultural values. Major land cover types identified include closed forest and open forest, agricultural land, waterbodies and human settlements with forests and cocoa farms being the major land use types in the HIA. Table 5 presents the relative proportions of the land use and land cover types in the landscape.

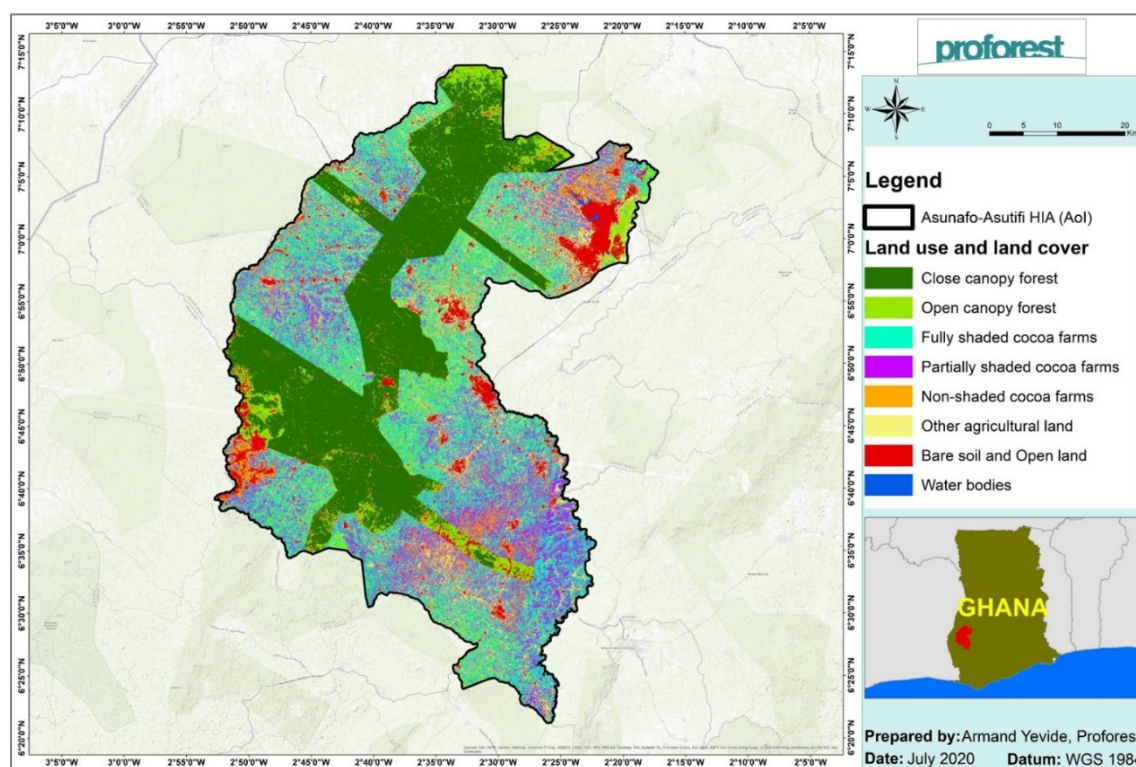


Figure 2: land use and land cover classification output based on the combination of the supervised and unsupervised classification methods

Table 5: Estimated size of the final land use and landcover classes in the Asunafo-Asutifi HIA

| Land use and land cover classes | Area in hectare | Percentage (%) |
|---------------------------------|-------------------|----------------|
| Bare soil and Open land | 22,414.84 | 6.9 |
| Close canopy forest | 85,866.99 | 26.3 |
| Open canopy forest | 33,856.03 | 10.3 |
| Fully shaded cocoa farms | 82,948.20 | 25.4 |
| Non-shaded cocoa farms | 14,250.29 | 4.4 |
| Partially shaded cocoa farms | 45,413.79 | 13.9 |
| Other agricultural land | 41,831.76 | 12.8 |
| Water bodies | 229.58 | 0.1 |
| Total | 326,811.49 | 100.0 |

2.4 Traditional structures

There exists a dynamic traditional authority structure in the HIA. The Akan traditional governance system which is based on kinship and organized in a hierarchy of chieftaincy institution pertains in the HIA. Within the Asunafo-Asutifi HIA, the Traditional Council headed by the Paramount Chief (Omanhene) is the highest traditional authority and accounts directly to the Asantehene. Paramount Chiefs are custodians of the land and natural resources, hence are recipients of royalties from timber and mineral exploration and have statutory and customary ownership rights to land and natural resources within their traditional areas. Traditionally, the HIA is composed of ten (10) traditional councils namely: Akrodie; Goaso; Hwidiem; Kukuom; Mim; Kenyasi #1; Kenyasi # 2; Ntotoroso; Acherensua and Sankore and one divisional council i.e., Ahafo-South Division. Additionally, a fraction of the HIA intrusively falls under the Nkawie Paramountcy in the Ashanti region. Each of the Traditional Council is represented at each of the District Spatial Planning Committee in the HIA. The Stool Lands in the HIA are endowed with timber and mineral resources from which the Traditional Councils receive royalties in accordance with Article 257(6) and Article 267 (6) of the 1992 Constitution

2.5 Settlement pattern, livelihoods and markets

According to a case study on Asunafo-Asutifi HIA by Proforest, the HIA as a whole has an estimated population of 312,435 inhabitants living in clustered settlements (Figure 7 shows the communities within the HIA). The settlement pattern is nucleated with the majority of the population residing in rural areas. Inhabitants of the landscape are mainly indigenes with a considerable migrant population due to rich natural capital endowments, ranging from minerals to timber and arable lands for farming. Land ownership and access rights are governed by traditional systems, with about 80% of the lands owned by Stools. Access to land for farming in the landscape is mainly through family inheritance. Assessment done for the draft management and investment plan for the Asunafo – Asutifi HIA shows the most common type of ownership of farmlands among cocoa farmers sampled was self-ownership (88.01%) for both males and females followed by caretakers (11.0%). About 11% of farms analysed were managed by caretakers and sharecroppers while 88.01% were managed by farm owners who are by extension, responsible for the management of their cocoa farms. A rather small number of the farms (0.99%) are managed by the farm owner with the assistance of a permanent or seasonal hired labourer/worker. The active involvement of farmland owners in management of their respective cocoa farms has promoted cocoa cultivation in the landscape evidenced by the recognition of the farmer union in the HIA as part of the seven cocoa cooperative unions established in Ghana. Sharecropping was the main means of access to land for mainly non-natives for farming in the landscape. *Abunu* and *Abusa* are the main sharecropping arrangements within the landscape with *Abunu* being the dominant type.

Under the *Abunu* tenancy, the proceeds from the harvest or the farm may be divided equally between the tenant and the landowner. Before this division, the harvest from cover crops such as plantain and cocoyam are shared equally, usually after sales, between the landowner and the farmer. During the division of the proceeds, the landowner has the first choice of the products as divided. This old practice that goes back to the pre-independence era, places an initial economic burden on the *Abunu* farmer as he/she is solely responsible for all the labour and cost associated with land preparation and cultivation. The continuous improvement in the producer price of cocoa from the early 1990s incentivised cocoa production and this saw a rapid expansion of the *Abunu* system (Hill, 1963, Ruf, 2011) with natives and non-native farmers practicing it.

In the case of the Abusa, the ratio of the tenant farmer's acreage to that of the landowner is two to one. Again, it is the landowner who has first choice, and in a large number of cases he takes care of the farm and harvests the crops himself. In some cases, however, the tenant farmer is employed to harvest the crop and take care of the farm for one-third of the harvest. In other cases, an entirely new person may be hired to take care of the farm under similar terms. While this arrangement allows those with fewer resources or social networks to move into cocoa production, it does make sharecroppers vulnerable to the whims of their landlords.

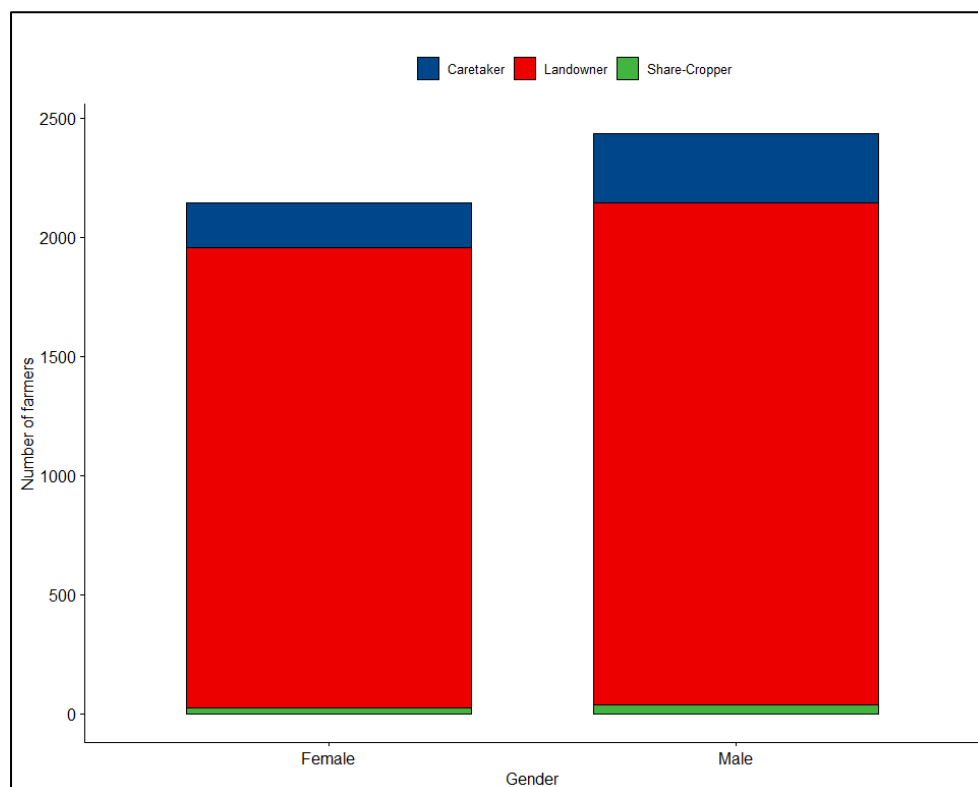


Figure 3: Management (Ownership and Tenancy) of Cocoa Farmlands in the HIA

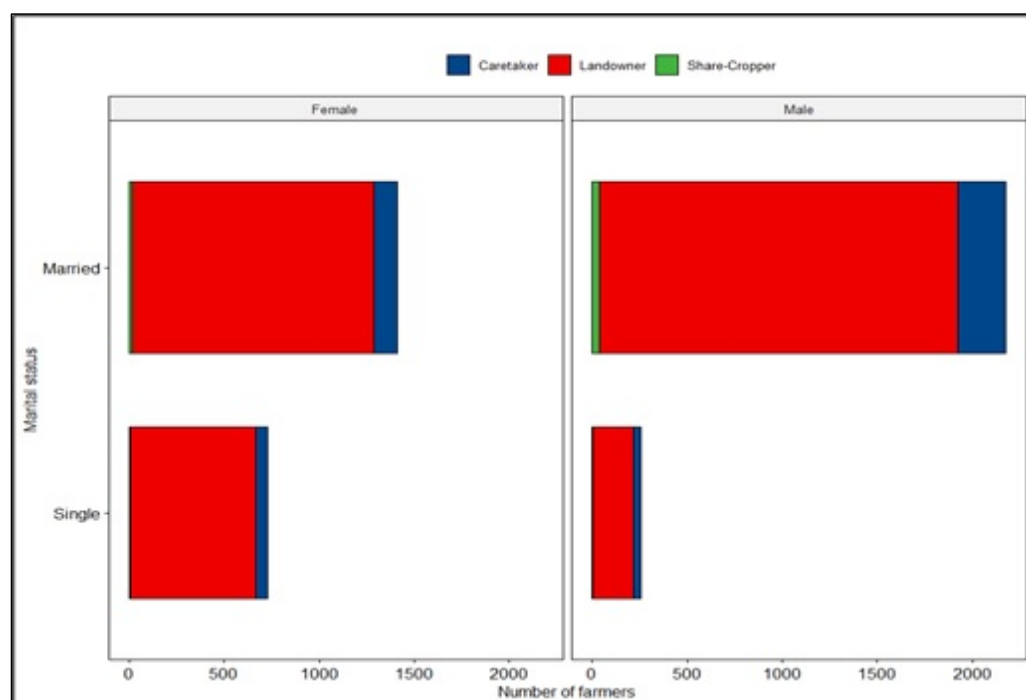


Figure 4: Management (Ownership and Tenancy) of Farmlands by Marital Status

The landscape is one of the major agro-commodity production landscapes in Ghana that is noted for cocoa production and accounts for about 10% of the national cocoa output. Of the total landscape area of 328,512ha, 62% is under agricultural production of which cocoa is a major component. Forest is a significant feature in the landscape, accounting for 32% of the land area. As with most agro-commodity production landscapes, deforestation caused by agricultural expansion into forests, and logging (both legal and illegal), is high in the Asunafo-Asutifi landscape.

Cocoa cultivation is the main socio-economic activity accounting for about 70-80% of the land-use under agriculture. According to the draft management and investment plan for Asunafo-Asutifi HIA, the volume of cocoa production in the landscape from the 2014/2015 – 2018/2019 cocoa seasons was 343,553 metric tons, with Asunafo North accounting for 61% of the total cocoa production in the landscape. Consistent with the general trend in Ghana; cocoa cultivation in the landscape is mainly by smallholder, low-income, aging farmers who cultivate on a rather small-scale with farm sizes ranging from less than a hectare to about ten hectares. Cocoa productivity is generally low with majority of the farmers (>72%) within the low to medium production level (400 – 700kg/ha); a situation that is occasioned by low scale of production,

inadequate investment of inputs, inadequate adherence to good agricultural and environmental practices and the prevalence of low-yielding, old and moribund cocoa farms.

As indicated in the draft management and investment plan for the HIA, the relatively high volume of cocoa production in Asunafo North and Asunafo South is evident with the presence of two vibrant farmer unions, the Asunafo North Municipal Cooperative Cocoa Farmers and Marketing Union and Kukuom (AGL) Cooperative Cocoa Farmer and Marketing Union Ltd with a combined membership of about 10,000 farmers. A relatively much smaller farmer associations: the Biakoye Farmers Association and Ntotroso Cocoa Farmers Association with a combined membership of about 145 farmers exists in the Asutifi North District. Each of the farmer unions in Asunafo North and Asunafo South are made up of cooperative societies at the farming community level. It should however be noted that at the community level not every farmer is a member of the cooperative society. Despite the potential logistical and technical benefits that farmers derive from joining a cooperative society, membership is voluntary and there are always those farmers who choose to be independent and would rather not join. This situation always presents the difficulty of disseminating extension education and support as well as getting reliable data of cocoa productivity and other relevant parameters at the community level.

Information accessed from the Cocoa Health and Extension Division (CHED) at Goaso indicates the presence of 195 Cooperative Societies with membership of 45,598 farmers. The volume (in tons) of cocoa production recorded in the Asunafo-Asutifi HIA in the last five years (cocoa crop seasons) is presented in Figure 5.

Table 6: Cocoa cooperatives within the cocoa districts

| Cocoa district | Cooperatives | Mother Coop |
|-----------------------|---------------------|--------------------|
| <i>Sankore</i> | 167 | 1 |
| <i>Goaso</i> | - | 1 |
| <i>Dadiesoaba</i> | 189 | 1 |

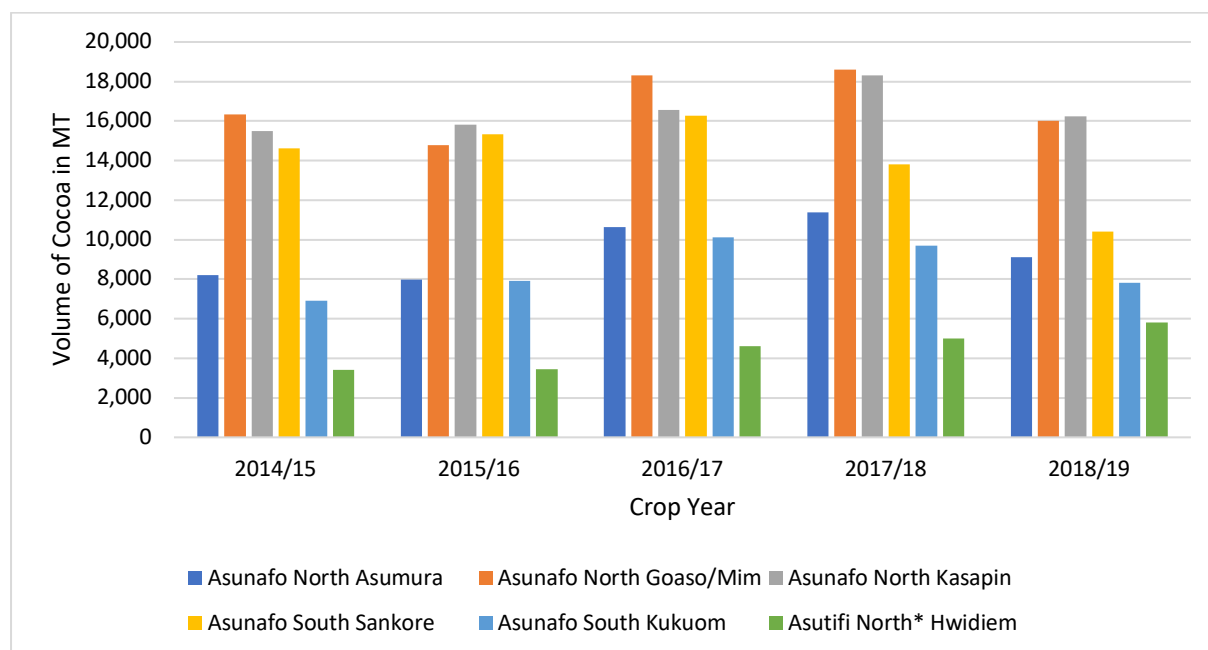


Figure 5: Volume (in tons) of cocoa production in the landscape²

A trend analysis of cocoa production statistics over the past five years (crop season) showed that Asunafo North accounted for about 60% of cocoa production in the HIA, whilst the Asunafo South and Asutifi North together produced about 40% of the total output from the Asunafo-Asutifi HIA.

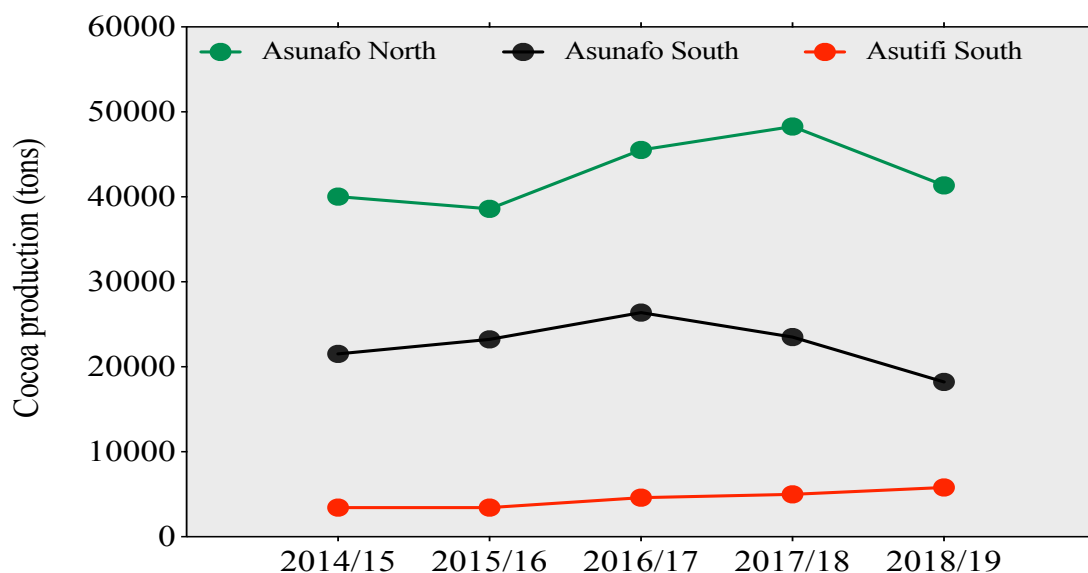


Figure 6: Trends in cocoa production in the HIA

² Asutifi North cocoa is graded and sealed by Quality Control Company in either Goaso or Hwidiem depending on the location of the society or LBCs operations. Data Source: Research, Monitoring and Evaluation Department of COCOBOD, 2020

Results of the farmer database analysis done for the management and investment plan for the HIA showed that cocoa production is generally small-scale with farm size ranging from < 1 ha – > 10 ha across the 41 Societies and this appeared to be a good reflection of the situation in the entire landscape. These results compare well with COCOBOD’s data that puts cocoa farm sizes to be ranging from 0.4 to 4.0 ha with an estimated total cultivation area of about 1.45 million hectares (COCOBOD cited in Anim Kwapong and Frimpong, 2005).

Typical of Ghanaian farming communities, family labour is the most dominant type of labour accounting for about 54% of all types of labour used for farming in the landscape. About 24% of farmer’s use hired labour popularly known as “by day”. The “Nnoboa” or co-operative system accounts for 12%, whilst the sole farmer labour is 10%. In most instances, farmers make use of more than one type of labour mostly depending on the farm size, the particular farming activity being undertaken and the financial position of the farmer to hire labour. This situation has been occasioned by low-scale of production, inadequate investment of inputs, inadequate adherence to good agricultural and environmental practices and the prevalence of low-yielding, old and moribund cocoa farms. There are several initiatives with focus on enhancing cocoa productivity and environmental sustainability in the landscape and these appear to have achieved significant improvement in cocoa productivity and livelihood of farmers. However, these initiatives and interventions are limited in their scope, scale, and time, resulting in uneven impacts across communities within the landscape. Cooperation among the different interventions in the cocoa sector in the landscape appear non-existent, resulting in inconsistent productivity and conflicting sustainability extension messages and practices across the landscape.

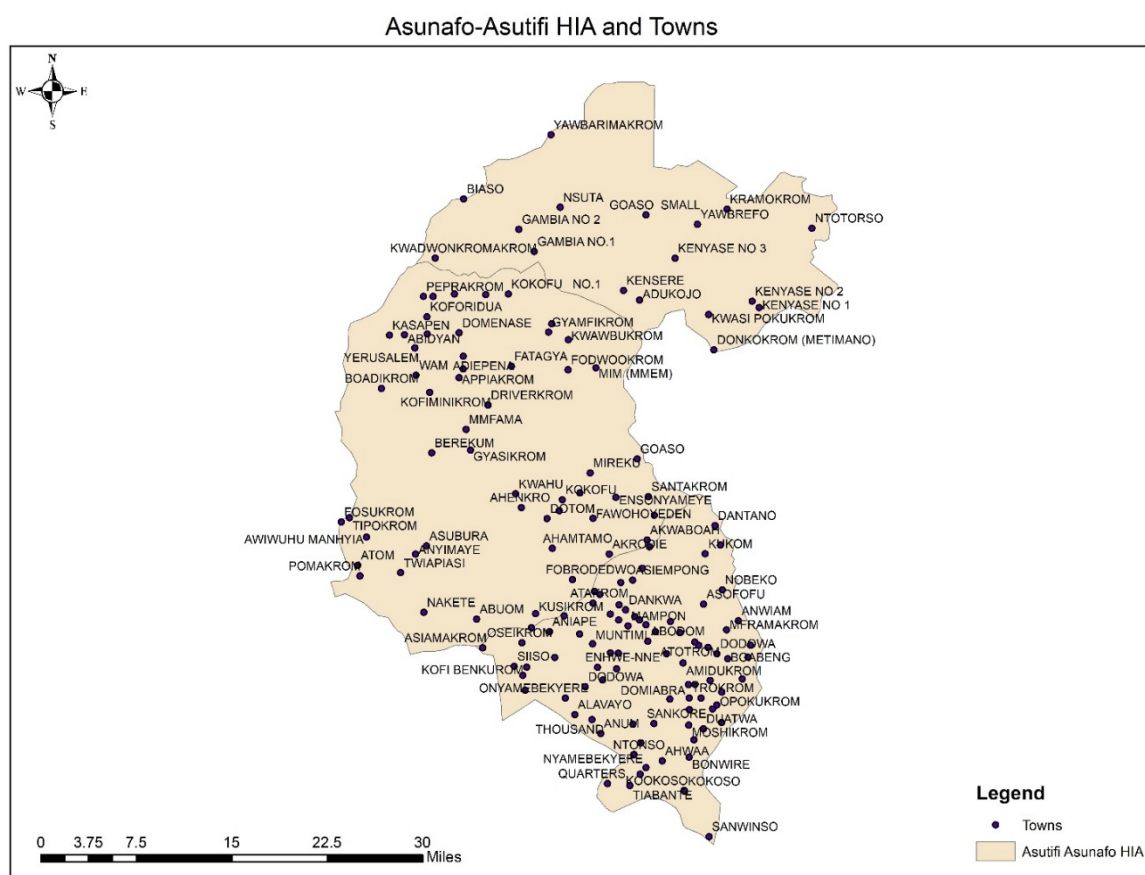


Figure 7: Communities within the HIA

2.6 Cocoa Districts and Cocoa Health and Extension Division Programs

Ghana Cocoa Board (COCOBOD) operates in the seven (7) Cocoa Regions of Ghana namely; Eastern, Ashanti, Central, Ahafo, Western North, Western South and Volta Regions. The seven Cocoa Regions are further divided into 41 Districts, with three of them within the Asunafo-Asutifi HIA (Table 7 & Figure 8).

Table 7: Cocoa districts

| Cocoa District | Office Location | Administrative District | Region |
|------------------------------|-----------------|-------------------------|--------|
| Sankore Cocoa District | Sankore | Asunafo-South | Ahafo |
| Goaso Cocoa District | Goaso | Asunafo-North | Ahafo |
| Asutifi South Cocoa District | Dadiesoaba | Asutifi-North | Ahafo |

The Cocoa Health and Extension Division (CHED) is the unit within Ghana Cocoa Board responsible for the control of cocoa swollen shoot virus disease, rehabilitation of old and

unproductive cocoa farms; extension services within COCOBOD and leads the Cocoa Management System by measuring cocoa farm sizes and rehabilitation of cocoa farms. CHED collaborates with Seed Production and Quality Control Units of the COCOBOD. These units support CHED in raising economic trees and support community sensitization under the Environmental and Social Sustainable Project (ESSP) which has been ongoing since 2019. The Ghana Education Service, and Department of Social Welfare and Community Development also support CHED with awareness creation on gender and child labour issues in cocoa communities. CHED is currently training farmers on Climate Smart Agriculture; and distributing economic shade trees to farmers to be planted in cocoa farms.

The seven Cocoa Regions are further divided into 41 Districts, with three of them within the Asunafo-Asutifi HIA.

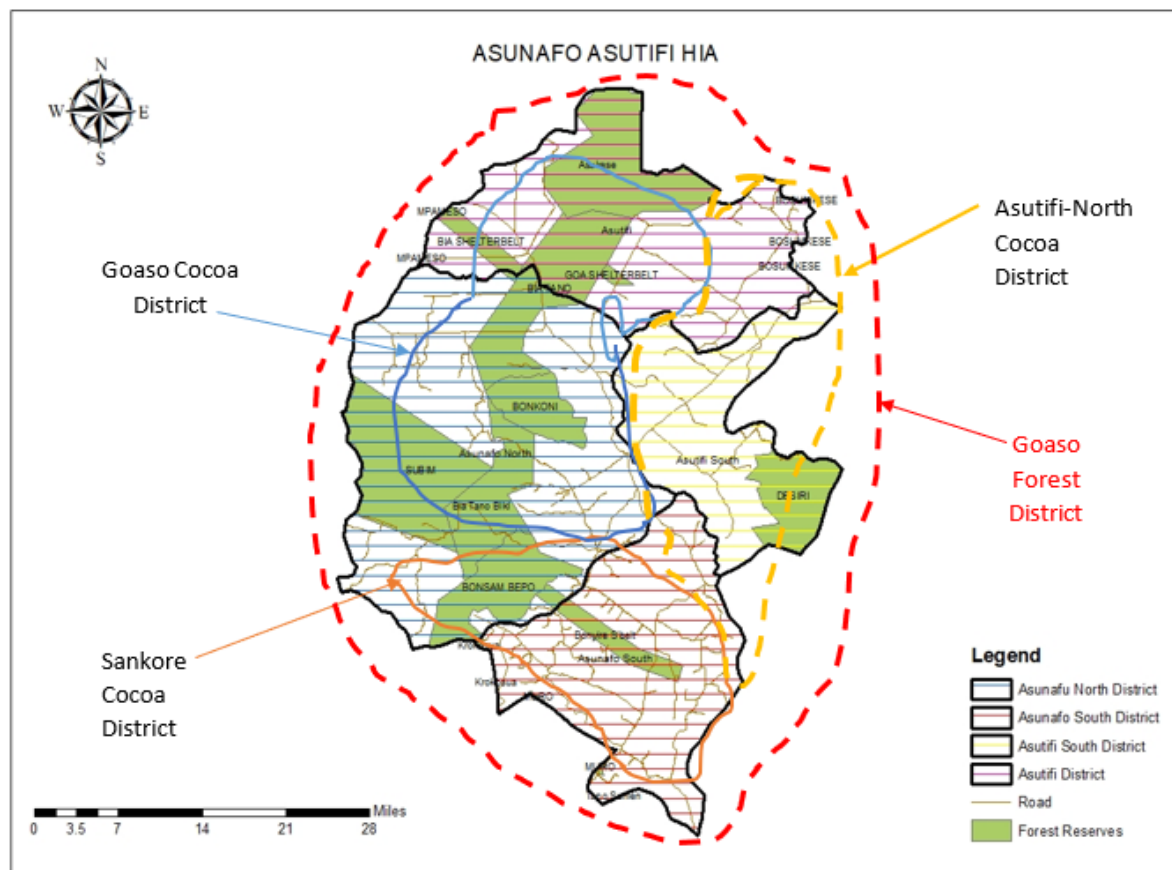


Figure 8: Cocoa districts in the HIA

2.7 Forests, biodiversity, & threats

2.7.1 Conditions of Forest Reserves

Forest condition score assessment³, as presented in the draft management and investment plan of the HIA, showed that all the nine forest reserves in the HIA have experienced various degrees of degradation from human-induced disturbances including logging (legal and illegal), wildfire, encroachment of food crop farms and illegal expansion of admitted farms. The assessment of the forest condition showed that all the nine forest reserves have condition score above 2, which indicate high levels of disturbances.

Table 8: Condition score for forest reserves in the Asunafo-Asutifi HIA

| Forest Reserve | Present Condition Score | Reference Condition Score (RMSC, 2015) |
|---------------------------|-------------------------|--|
| Abonyere Shelterbelt | 6 | N/A |
| Asukese Forest Reserve | 4 | 3 |
| Ayum Forest Reserve | 4 | N/A |
| Bia Shelterbelt | 4 | N/A |
| Bia Tano Forest Reserve | 4 | N/A |
| Bonsambepo Forest Reserve | 4 | 4 |
| Bonkoni Forest Reserve | 3 | N/A |
| Goa Shelterbelt | 4 | 5 |
| Subim Forest Reserve | 3 | N/A |

Source: RMSC, 2015

Among the nine forest reserves, Abonyere Shelterbelt Forest Reserve was found to be the most degraded from logging and farm encroachments and currently dominated by food crop farms, and farm bushes with hardly any significant cover of closed forest. Subim Forest Reserve and Bonkoni Forest Reserve scored the highest condition score of 3. However, Subim Forest Reserve continues to be degraded through illegal logging, extension of cocoa farms within the admitted farm areas and proliferation of illegal food crop farms. The reserve is estimated to have lost

³ The forest condition score system is based on the degree of degradation in the forest at any given time by which a forest could be judged healthy or otherwise. The condition score runs from 1 to 6, with condition 1 being a forest with minimal or no signs of physical disturbance while a condition 5 is a grossly degraded forest reserve, with few upper canopy trees. A condition 6 forest reserve has no significant forest cover at all. Scores 1-3 are low to moderate disturbance, deemed ecologically tolerable, with healthy regeneration of timber trees and other forest plants usually abundant (Hawthorne and Abu-Juam, 1995).

about 52ha of forests every year between 2017 and 2019 (Lossou *et al.*, 2019). Bonkoni FR does not have any existing farmlands but there are high levels of illegal logging activities within the reserve.

Ayum, Asukese, Bonsambepo, Bia-Tano, and Bia Shelterbelt Forest Reserves all scored 4. This implies that these forests have been previously impacted by unsustainable and unregulated logging activities (Hawthorne and Abu-Juam, 1995). Asukese FR was more degraded compared to the reference condition score of 3 (RMSC, 2015). This is partly attributed to the expansion of existing farms beyond their boundaries and the establishment of new farms in the reserve. In addition, there are illegal logging activities that continue to remove trees and destroy the residual forests. Lossou *et al.* (2019) estimated an annual forest loss of 0.65 km², 0.3 km², and 0.09 km² of closed forests for Bonsambepo FR, Bia Shelterbelt FR and Bonkoni FR, respectively. About 11.91 km² of area in Bonsambepo FR has been classified as farmlands.

Abonyere Shelterbelt FR presents a unique situation with a score of 6. The Shelterbelt FR has been grossly degraded to the extent that the existing habitat is almost a savanna. Large portions of the shelterbelt have been taken over by illegal farm, grasses, and the invasive alien, *Broussonetia papyrifera* and *Chromolaena odorata*. Various food crops including rice, maize, cocoyam, yam, and plantain are grown by farmers who have illegally taken over the forest reserve. Few patches of relict forest remained scattered over the landscape. Estimates have shown that the closed forests in the reserve reduced from 36.77 km² in 1990 to 0.39 km² in 2017. On the other hand, the areas occupied by open forests increased from 14.01 km² to 45.23 km² within the same period (Lossou *et al.*, 2019). Goa Shelterbelt with a condition score of 4 appeared to have benefitted from the implementation of enrichment planting and improvement in the monitoring of illegal activities initiated by the Forestry Commission.

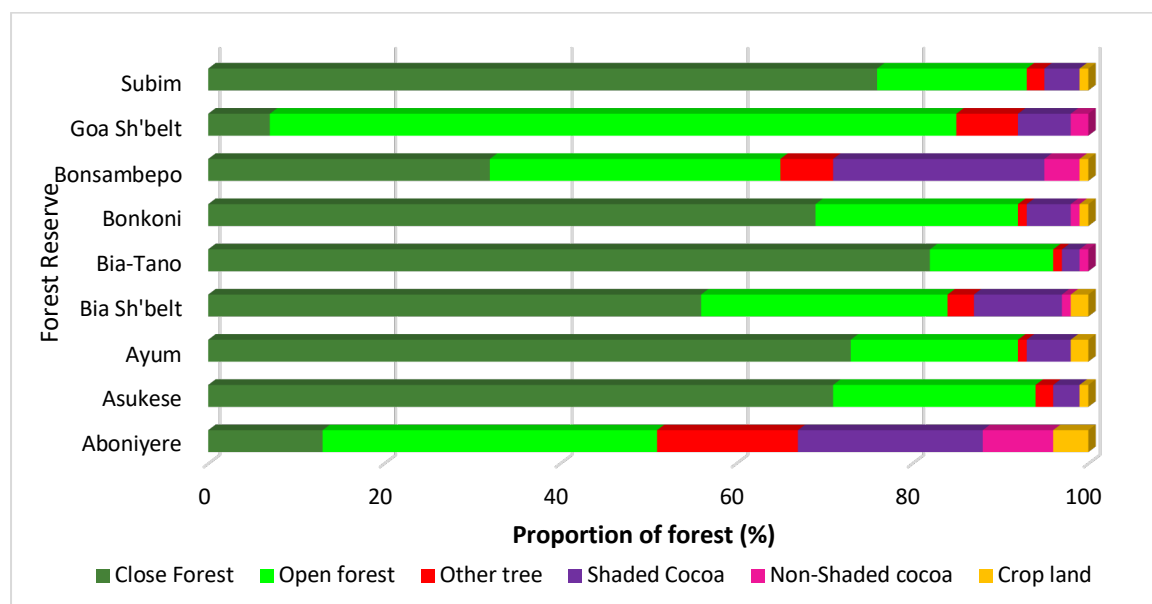


Figure 9: Land-use coverage in forest reserves within the HIA

2.7.2 Overview of Biodiversity of the HIA

With nine forest reserves that together account for about 37% of the land area, the landscape is endowed with rich flora diversity⁴. Flora assessment of the landscape using a stratified random sampling recorded a total of 189 vascular plant species with diameter at breast height of 10 cm and above. The flora community included one Endangered, eighteen (18) Vulnerable and five (5) Near Threatened species. *Tieghemella heckelii*, the only endangered plant species recorded in the study, is one of the important timber species in the timber trade. The species has important ethnobotanical values in the treatment of infections and snake bites (Kipri *et al.*, 2017). The species has been heavily exploited in Ghana leading to declining stock levels in the high forest zone (Oteng-Amoako, 2006). The flora community of the landscape included many Red and Scarlet Star species in both on and off-reserve farmland areas, particularly in the cocoa farms.

Although results of biodiversity assessment⁵ conducted for the management and investment plan indicated that keystone megafauna such as elephant are no longer present in the Asunafo-Asutifi forest enclave, the landscape, was found to be endowed with high diversity of fauna and flora species as well as ecosystems of high conservation significance. Biodiversity assessment of the landscape identified a large fauna and flora community with significant presence of species

⁴ Refer to annex

⁵ Refer to annex

of global conservation concern. These comprised 22 medium to large mammal species of which eleven (11) are of global conservation concern and listed on the IUCN Red List of Threatened species. These include two Critically Endangered (chimpanzee and white-thighed colobus), one Endangered (white-bellied pangolin), three Vulnerable (Olive Colobus, Lowe's monkey and long-tailed pangolin) and five Near Threatened (Forest Buffalo, Bongo, Yellow-backed duiker, Bay Duiker and Slender-tailed squirrel) species.

Out of the over 250 bird species recorded in the landscape, five are of global conservation concern and listed on the IUCN Red List of Threatened Species⁶. These include the hooded vulture, which is listed as Critically Endangered, the grey parrot, which is listed as Endangered, White-necked Picathartes which is listed as Vulnerable and three other species (green-tailed bristlebill, copper-tailed glossy starling and rufous-winged illadopsis) all of which are listed as Near-Threatened on the IUCN Red List of Threatened Species. Other fauna species of global conservation concern with known occurrence in the landscape include the Endangered Home's Hinged Tortoise and the Serrated Hinged Tortoise and West African Dwarf Crocodile both of which are listed as Vulnerable on the IUCN Red List.

According to the people living in the communities, all the waterbodies assessed in the Asunafo-Asutifi landscape were endowed with high diversity of aquatic life. There were two (2) main fish species available in the waterbodies and these are the catfish and tilapia. The African Snakehead, (*Parachanna obscura*), was among the fish species mentioned by respondents in the Goa watershed as being present. The snakeheads are known to thrive in the major watersheds in Ashanti, Brong and Ahafo, Eastern and Western Regions. Snakeheads are likely to be encountered in flood plains, both in the open water and the swamps (Oti, 2003; Brummet and Teugels, 2002). The species abundance is driven by the seasonal patterns.

2.8 Hydrology and water quality assessment of the HIA

The Asunafo-Asutifi HIA has a significant presence of waterbodies with watersheds and riparian buffers in relatively good condition, particularly in forested areas. There are however some potential threats which could be aggravated as human population in the HIA increases over time.

⁶ Refer to annex

All the waterbodies in the Asunafo-Asutifi landscape were found to be used for domestic purposes (i.e., drinking, bathing, cooking) as is the case in most rural areas of Ghana where people rely on surface water, and shallow groundwater as their drinking water source (Yeleeire *et al.*, 2018). All the seven waterbodies sampled were found to be a major source of water for drinking, bathing and farming for the communities through/by which they flow. The most common agricultural use of the water bodies in the HIA were rice cultivation, vegetable farming and spraying of farms including cocoa farms. Rice cultivation was observed to be done right inside the floodplain of the rivers and streams.

The increased habitat-degrading human activities in riparian buffers in off-reserve sections of some of the rivers in the landscape is a source of concern particularly with the high levels of phosphate, turbidity and coliforms observed from the water quality analysis⁷ used for the management and investment plan for the HIA.

The analysis for dissolved oxygen concentrations for waterbodies in the landscape ranged from 2.4 mg/L to 6.13 mg/L. The dissolved oxygen is critical for the survival of all aquatic organisms (not only fish but also invertebrates such as crabs, clams, zooplankton, etc.). As dissolved oxygen levels in water drop below 5.0 mg/L, aquatic life is put under stress. The lower the concentration, the greater the stress. And if dissolved oxygen (DO) levels remain below 1-2 mg/L for a few hours, it can result in large fish kills. This is because 0-2 mg/L of DO is not enough oxygen to support life; 2-4 mg/L will support only a few fish and aquatic insects. Also, 4-7 mg/L is good for many aquatic animals and 7-11 mg/L is very good for most stream fish. For example, the African snakehead fish which was reported to be in the waterbodies in the landscape are air-breathing, therefore, they can survive hypoxic conditions as early as late juvenile stages (USEPA, 2002).

Turbidity measurements for waterbodies in the landscape ranged from 24NTU (Nephelometric Turbidity Unit) in the Bia River to 188NTU in River Bontwi. For drinking water purposes, both Ghana Standards and the WHO set 5NTU as the maximum. All the waterbodies were over the 5NTU limit. This situation is not unusual to this landscape as Ansa-Asare and Gordon (2012) reported the mean turbidity levels in Densu Basin and that of Ayensu and Birim basins all exceeded WHO standards for domestic use. Typically, turbidity increases sharply during and after a rainfall when sediments are carried into the waterbody. Also, high levels of turbidity can be

⁷ Refer to Annex

attributed to poor farming practices that lead to siltation of the river during runoff (Karikari and Ansa-Asare, 2006).

The range for phosphate recorded for the waterbodies ranged from 1.18mg/L to 1.75mg/L, which is above the acceptable maximum level of <0.3mg/L set by WHO. Sources of phosphate include animal wastes, sewage, detergent, fertilizer, and disturbed land. This could indicate the impacts of farming and other human activities on the water bodies in the HIA. Nitrate levels recorded in the waterbodies was significantly low for all the rivers and streams. The highest measurement of 0.6mg/L was recorded for a section of the Ayum River which is very close to a cocoa farm. For drinking water, 10mg/L is the acceptable maximum level. Concentrations over 10mg/L could impact negatively on the freshwater aquatic environment.

The alkalinity of waterbodies in the landscape ranged from 18mg/L for River Bontwi in the Goa watershed to 32mg/L in the Ayum River. These values are well within the WHO acceptable limit of 200 mg/L. Hardness of the waterbodies ranged from 36mg/L for River Bontwi and 76mg/L for River Aboabo. The WHO sets 500mg/L as the highest acceptable limit for hardness for drinking water. The greater the hardness, the harder it is for toxic metals to be absorbed through the gills (Casidddy et al., 2001).

For coliforms, the World Health Organisation (WHO) and Ghana Standard Authority set acceptable limits of 0 cfu/100 ml of total coliforms as acceptable for drinking purposes. However, the values recorded from the total coliform analysis are all above 0 cfu/100 ml and actually very high, making the water unsafe for drinking. This high levels of total coliforms in the study areas are not particularly unusual to the area as Yeleliere *et al.*, (2018) in their 'Review of Ghana's water resources: the quality and management with particular focus on freshwater resources' indicated that almost all surface waters are contaminated with either *Escherichia coli*, faecal coliforms, total coli or total coliforms or all, particularly in surface water. Total coliforms are a major indicator of the general sanitary quality of water (EPA GHANA, 2002). High coliform numbers may be attributed to sewage, land and urban run-off and domestic wastewaters.

Kwaansa-Ansah et al., (2017) reported that samples of fish, cassava and water taken and analysed from Kenyasi, also in the HIA landscape were not safe for consumption since they recorded higher values of cyanide concentrations.

Table 9: Uses of water bodies in the study area for the management and investment plan

| River | Water Use | Watershed |
|-------|-----------|-----------|
|-------|-----------|-----------|

| | | |
|--------------|--|------|
| Ayum 1 | Domestic; Agricultural, including spraying and irrigation; Fishing | Ayum |
| Ayum 2 | Domestic; Agricultural, including spraying and irrigation; Fishing | |
| Aboabo River | Washing bay; Domestic; Agricultural | |
| Goa | Domestic; Agricultural, including spraying and irrigation; Fishing | Goa |
| Abrensene | Domestic; Agricultural, including spraying and irrigation; Fishing | |
| Bontwi | Domestic; Agricultural, including spraying and irrigation; Fishing | |
| Bia | Domestic; Fishing; Agricultural | Bia |

2.9 Ecologically and Culturally Sensitive Areas in the HIA

The landscape is replete with unique habitats of ecological, cultural, and historical significance. Some of the significant culturally sensitive areas in the landscape include the Apomasu shrine in Compartment 152 of Asukese Forest Reserve belonging to the natives of Atronie and Ntotroso, a shrine in Compartment 36 of the Ayum Forest Reserve belonging to the natives of Ayomso, the Obuoho shrine located in Compartment 114 of the Subim FR, belonging to the natives of Fawohoyeden. Aside the sacred groves, there are pools such as the one on the Fetel Stream in Compartment 21 of the Bia Tano Forest Reserve that used to be used by elephants for bathing.

Outside the forest reserves there are other key sensitive areas that require better management and protection in the future. Some of the major rivers and streams drain farmlands and cocoa areas within the landscape with marshy areas that are serve critical needs for local communities. However, some of these sensitive areas are exposed to degradation through human activities and are also subjects of changing management objectives.

2.10 Activities/Interventions in Asunafo – Asutifi HIA

2.10.1 Proforest Production Landscape Programme (PLP)

The Production Landscape Programme (PLP) is aimed at helping companies and other stakeholders throughout the agro-commodity production landscape to align with national policy processes to address challenges such as deforestation, child labour, low productivity, smallholder inclusion, access to land, and gender equality inherent in agro-commodity production. The PLP is a three-year programme being implemented in Ghana, Cameroon, Liberia, Indonesia and China, with funding support from the UK Aid through the Forest

Governance, Markets and Climate (FGMC) Programme to help companies align with national initiatives to reduce deforestation and improve social and environmental outcomes of agricultural commodity production. The implementation of the PLP in Ghana, provided the opportunity for Proforest to get actively engaged in the production landscape, bringing on board its vast experience and expertise in responsible sourcing and responsible production principles and approaches to facilitate the development of the Asunafo-Asutifi Landscape Programme.

2.10.2 Mondelez/UNDP Cocoa Life Programme (CLP)

The Cocoa Life Programme (CLP) was launched in 2012 to empower at least 200,000 cocoa farmers and reach one million community members. This effort builds on the Cadbury Cocoa Partnership, which was founded in Ghana in 2008. The programme has three areas of intervention namely: sustainable cocoa farming businesses, empowerment of cocoa communities and forest protection and restoration. Programme activities are currently being implemented by Agro Eco through the cooperative societies of the Asunafo North Municipal Cooperative Cocoa Farmers and Marketing Union. Specific areas of programme intervention include farming, community development, additional livelihood, youth development and environmental sustainability. The Asunafo North Union has 67 primary cooperative societies of which 41 are directly linked to the CLP. Through Cocoa Life, Mondelez will lead project implementation and contribute \$5 million USD over five years to the program. The joint action plan will be executed across key Hotspot Intervention Areas, focusing on:

- Mapping all land uses, including cocoa farms
- Implementing climate smart cocoa practices to increase yields and sustainability
- Improving access to finance to foster good practices by farmers and communities
- Legislative and policy reform to support program implementation
- Coordination and measurement, reporting and verification

2.10.3 Solidaridad Cocoa Rehabilitation and Improvement Project (CORIP)

Funded by the Embassy of the Kingdom of the Netherlands and supported by the Ghana government, the Cocoa Rehabilitation and Improvement Project (CORIP) continues to intensify its operations in the cocoa rehabilitation and replanting programme. This is meant to assist farmers to rehabilitate and replant moribund and diseased cocoa farms. Rehabilitation and replanting of over-aged cocoa trees with hybrid cocoa seedling, plantain suckers and economic shade trees is ongoing in parts of the landscape under the supervision of Cocoa Health and

Extension Division (CHED) of COCOBOD. The CORIP-Ghana when fully adopted and implemented in the Asunafo-Asutifi HIA was to lead to increased productivity and improved tree cover as the aspect of inter-planting the cocoa seedling with indigenous (15 to 18 permanent shade trees per hectare as recommended by COCOBOD) will provide shade and protection to the young cocoa tree.

2.11 Restoration Activities

Restoration consists of activities that lead to tree planting in on-reserves and off-reserve areas. 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).

2.11.1 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 provides logistics (including pegs, tree seedlings and some other farming tools as well as protective clothing) and technical support to the farmers. Farmers are allowed to grow food crops along with the tree seedlings and harvest the crops for themselves while 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) has been 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 were 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 is based on their proximity and thus those fringing the Forest Reserves are selected. Another reason is 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 are 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 who 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 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 include 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 are also based on their age and health conditions. Strong adults and youth are preferred regardless of the gender.

2.11.2 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 Asunafo - Asunafo HIA, the Goaso 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.

2.11.3 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 are 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 support ToF implementation since it falls directly into their remit although under strong coordination and partnership with the Forestry Commission. Farmers benefit from agricultural extension services as well as supervision and logistical support. In this HIA, Goaso Forest District, COCOBOD District, and Mondelez are leading ToF.

2.12 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 PEP include the following:

1. Cocoa Rehabilitation Programme
2. Cocoa Diseases and Pest Control Programme (CODAPEC)
3. Cocoa HiTech (Fertilizer) Programme
4. Free Hybrid Cocoa Seedling Distribution
5. Artificial Hand Pollination
6. Mass Cocoa Pruning
7. Cocoa Management System (CMS)
8. Irrigation

1. 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, favoritism 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 rehabilitating 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 process:

- 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

Cocoa Artificial Hand Pollination started in 2017 against the background that cocoa is naturally pollinated by insects called midges, but with only an average of 10-20% of flowers being pollinated, whilst about 80-90% is aborted. The hand pollination exercise was originally restricted to seed-gardens but has now been extended to farms to boost yield. The selection

criteria of cocoa farms for hand-pollination include hybrid farms; farms that are between 8-20 years; farms free from Cocoa Swollen-Shoot Virus Disease (CSSVD); and accessibility. In addition, farmers must be willing to maintain their farms by brushing regularly, pruning, controlling pests and diseases, as well as the willingness and preparedness to apply the required amount of fertiliser to help achieve the desired results of increased productivity. The artificial hand pollination exercise has been undertaken in some farms and is still ongoing at a steady rate within the Asunafo-Asutifi landscape.

- The processes involved are detailed below: A farm earmarked 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.

2.13 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 Asunafo–Asutifi HIA, the Wildlife Division at the district level embarks on a number of activities including community education and sensitization, as well as patrolling and monitoring of forest reserves for biodiversity protection and conservation.

2.14 Some key project outputs in the Asunafo-Asutifi HIA

- I. Development of the Asunafo-Asutifi landscape governance structure and systems leading to MoU & Partnership formation.
- II. Draft Management and Investment Plan for the HIA
- III. Developed National Climate Smart Cocoa Standard with the Government of Ghana, Civil Society and Cocoa Companies.
- IV. Designed Landscape level Monitoring, Reporting and Verification systems that align with the Ghana Cocoa Forest REDD+ Program methodology.

The outcomes of the project include measurable reductions in deforestation, enhanced community resilience against climate change, significant increases in most farmers' yields and incomes, and the marketing of deforestation-free cocoa beans.

3.0 INSTITUTIONAL SETUP FOR IMPLEMENTING GCFRP ACTIVITIES

NRS has put in place an inclusive and participatory approach for the implementation of all activities. In a broader sense, the main institutions implementing the REDD+ and have interest in environmental and social management include:

- Ministry of Lands and Natural Resources (MLNR);
- Ministry of Food and Agriculture (MOFA);
- Ministry of Environment, Science, Technology and Innovation (MESTI)
- Forestry Commission (FC): - National REDD+ Secretariat (NRS)/Climate Change Directorate (CCD), Forestry Services Division (FSD), Resource Management Support Centre (RMSC);
- Ghana Cocoa Board;
- Metropolitan, Municipal and District Assemblies (MMDAs);
- Environmental Protection Agency (EPA);
- World Bank and other donors.
- Traditional Authorities
- Cocoa Research Institute of Ghana (CRIG)
- Participating Civil Society Organizations (CSOs) / Non-Governmental Organizations (NGOs)
- Participating Private Companies and their representatives in-country
- Community members and farmer groups

Table 10: Organizations/Institutions and Partner Agencies involved in the GCFRP implementation

| NAME OF ORGANIZATION / PARTNERS | CORE CAPACITY AND ROLE |
|---------------------------------|---|
| Forestry Commission of Ghana | Forestry Commission (FC) is the government institution responsible for the sustainable management of Ghana's forest and wildlife resources. Forestry Commission and COCOBOD set the national framework and developed an enabling cocoa policy and strategy around environmental sustainability for this project. The Climate Change Directorate of the FC |

| NAME OF ORGANIZATION / PARTNERS | CORE CAPACITY AND ROLE |
|---|--|
| | <p>was established in 2007 with a mandate to manage forestry-sector initiatives related to climate change adaptation and mitigation, including REDD+. It hosts the National REDD+ Secretariat, which is responsible for coordinating Ghana's REDD+ process. The sector ministry for the FC is the Ministry of Lands and Natural Resources (MLNR). In partnership with Ghana's Cocoa Board, the FC is responsible for this programme, including its design, management, and implementation.</p> |
| Ministry of Lands and Natural Resources (MLNR) | <p>MLNR is the sector Ministry to which the Forestry Commission reports. It is also responsible for coordinating and implementing Ghana's Forest Investment Programme (FIP). The Minister of the MLNR chairs the National REDD+ Working Group (NRWG) which is an intersectoral body that provide oversight, Coordination and Management of the GCFRP.</p> |
| Ghana Cocoa Board (COCOBOD) | <p>Ghana Cocoa Board (Cocobod) is a co-proponent of the GCFRP with the Forestry Commission and together they co-lead the programme implementation. Cocobod is the government institution responsible for the regulation and management of the cocoa sector. Cocobod serve as co-chair, with the Forestry Commission on the GCFRP Joint Coordination Committee to provide strategic coordination and management for implementation of the programme</p> |
| Ministry of Environment, Science and Technology (MESTI) | <p>MESTI is the sector ministry with responsibility to formulate, develop, implement, monitor and evaluate environmental policies in Ghana, including the National Climate Change Policy. MESTI has a seat on the NRWG and is a key partner on all aspects of REDD+.</p> |
| Ministry of Food and Agriculture (MOFA) | <p>MOFA is represented on National REDD+ Working Group (NRWG) and is responsible for ensuring that extension services and interventions related to food and cash crops including oil palm and citrus align with the goals of Ghana's Cocoa Forest REDD+ Programme.</p> |

| NAME OF ORGANIZATION / PARTNERS | CORE CAPACITY AND ROLE |
|--|--|
| Environmental Protection Agency (EPA) | EPA is the National Focal Point for United Nations Convention on Climate Change (UNFCCC) and is responsible for all National Communication to the UNFCCC. EPA ensures that the programme's accounting is reflected in the national accounting. It also hosts Ghana's Climate Change Data Hub, which supports elements of data management and registry. |
| Forestry Research Institute of Ghana (FORIG) | FORIG is a research institute under the Council for Scientific and Industrial Research (CSIR) conducting research on forests and forest products for social, economic and environmental benefits of society. FORIG advises the Joint Coordinating Committee (JCC) and provide technical guidance on the implementation of field activities and development of appropriate systems for the success of the programme. |
| Cocoa Research Institute of Ghana (CRIG) | CRIG is a subsidiary of Cocobod established as a center of excellence for developing sustainable, cost effective, socially and environmentally acceptable technologies for the cocoa industry. CRIG is responsible for all cocoa research that provides information and advice on matters relating to the production of cocoa and other mandate crops |
| National House of Chiefs | The National House of Chiefs is a body of elected representatives from Ghana's Regional Houses of Chiefs that is recognized by the Constitution. It is charged to advice on issues related to culture and chieftaincy and works towards the codification of customary law. The national house of chiefs works with the programme to liaise with Paramount chiefs that have jurisdiction over landscapes within the programme area. They play critical role in the implementation of the Grievance Redress Mechanism and will also provide guidance on issues related to benefit sharing. |
| Solidaridad | Solidaridad is an international civil society organization with over 50 years of experience in developing solutions to make communities more resilient. They promote sustainable production, inclusivity and |

| NAME OF ORGANIZATION / PARTNERS | CORE CAPACITY AND ROLE |
|---------------------------------|--|
| | agricultural service provision for small and medium enterprises. They also work in market integration for smallholders, food security and nutrition, climate-responsiveness, and community development, in collaboration with farmers, miners, workers and local communities. |
| World Cocoa Foundation (WCF) | WCF promotes a sustainable cocoa economy through economic, social and environmental development in cocoa-growing communities. It is organizing an industry commitment to end deforestation and forest degradation. The initiative will develop in consultation with the relevant cocoa producing country governments, farmers and farmer organizations, civil society organizations, development partners, and other stakeholders, measures to end deforestation and forest degradation, while improving the livelihoods of smallholder farmers working in the cocoa supply chain. |
| Produce Buying Company (PBC) | PBC is one of the biggest licensed cocoa buying companies (LBCs) in Ghana, and has the greatest geographical presence, being present in every village/society. |
| Mondelez International | One of the largest snack companies in the world with global net revenues of approximately \$28.7 billion in 2021. They hold the #1 global position in biscuits (cookies and crackers) and #2 in chocolate, while are growing rapidly in baked snacks. They also make and sell gum & candy as well as various cheese & grocery and powdered beverage products in certain markets. They have operations in more than 80 countries and employ around 80,000 in their factories, offices, research & development facilities and distribution activities around the world. Mondelēz International's ultimate goal is to sustainably source all the company's cocoa supply, mainly via Cocoa Life. By working in partnership with farmers, NGOs, suppliers and government institutions, Cocoa Life is part of Mondelēz International's Impact for Growth – a commitment to driving business growth with positive change in the |

| NAME OF ORGANIZATION / PARTNERS | CORE CAPACITY AND ROLE |
|---------------------------------|--|
| | world. Through Cocoa Life, Mondelez will lead project implementation and contribute \$5 million USD over five years to the program. |
| UNDP | UNDP is the UN's global development network, an organization advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. In Ghana, UNDP supports national efforts and capacity building for sustainable human development in line with Ghana's own development strategies. In line with Ghana's Coordinated Program of Economic and Social Development Policies (CPESDP) for 2017-2024, which is anchored in the sustainable development goals (SDGs), the UN Country Team developed and adopted the United Nations Sustainable Development Partnership (UNSDP) 2018-2022. |
| Tropenbos | TBG in Ghana works towards the sustainable management and restoration of the GCFRP landscape through inclusive decision making and sustainable incentives involving local communities, smallholder cocoa farmers, the government at all levels and the private sector. |
| Proforest | <p>Proforest is a unique, non-profit group that support companies, governments, civil society and other organizations to work towards the responsible production and sourcing of agricultural and forest commodities. They support companies throughout supply chains to have positive social and environmental outcomes in the places where commodities are produced.</p> <ul style="list-style-type: none"> • Through consultancy work, they help companies work with their suppliers to take action on sustainability by changing the way commodities are produced and sourced • Supporting collaboration between companies and other stakeholders, including peer companies, governments and civil society |

| NAME OF ORGANIZATION / PARTNERS | CORE CAPACITY AND ROLE |
|---------------------------------|---|
| | <ul style="list-style-type: none"> Developing innovative new methods, tools and guidance to build capacity among companies at all stages of the supply chain and manufacturers, as well as among practitioners and government officials |
| Agro Eco | <p>Agro Eco is an independent advisory organization based in the Netherlands and advises the private sector, NGOs, governments and international organizations in the development of niche markets for quality products. They provide support for farmer supplier group organization, conversion planning, technical assistance, research, preparation of grower group certification, quality programmes, market studies and linkages between exporters and importers to advance truly sustainable Agriculture and environment. Agro Eco is providing training and extension services to the cocoa farmers in the landscape. They track the adoption of climate smart cocoa principles and provide training to trainers on key criteria. They also support Farmer Based Organization development, pilot and scale up deforestation-free cocoa in the landscape.</p> |
| HMB | <p>The HIA encapsulates all the designated Sub-HIAs and therefore connects all HIA communities as though a single harmonized landscape-wide governance and/or jurisdictional entity. Therefore, HMB is the apex decision-making body structure of the HIA governance structure and responsible for guiding and directing all HIA management decisions towards a common vision in the collective good of Sub-HIAs, Zones/CREMAs, CRMC and communities.</p> |

3.1 Coordination of Interventions/Activities at the HIA Level

While NRS directs and coordinates implementation, the actual implementation of priority activities in each HIA rely on a consortium of stakeholders (HIA Implementation Consortium Partners) who live, work, or have investments within the landscape, and have an interest in the

area. The HIA landscape is managed by an HIA Governance Body made up of local land-users, landowners and traditional authorities who organize themselves into a government recognized Natural Resource Management (NRM) structure, like that of the CREMA (i.e., modified CREMA), which accords them the right to manage their natural resources for their benefit.

The Consortium and the HIA Governance Body put in place how best to coordinate all activities related to the programme in the HIA. The NRS and the HIA Consortium carry on a participatory process to build the HIA governance and implementation structure at each location. Following successful negotiation of HIA initiation, the programme supports the requisite steps to establish management boards, prepare HIA constitutions, and hold regular HIA governance meetings. Key decisions of the HIA Governance Board are to determine how best to make the transition to a climate-smart, no deforestation, sustainable cocoa production system in line with the development of a standard. Key activities involve landscape planning, zoning land use practices, approving CSC practices to be adopted by farmers in the HIA, financial planning and management structures, and reaching agreements with the HIA CSC Consortium. Appropriate levels of communications with all stakeholders are achieved through durbars, local FM radio announcements and other media.

3.2 Integration of Stakeholders in the Implementation of Interventions/Activities through the HIA Governance Structure

The HIA is designed to work in collaboration with a formal Consortium of key stakeholders, including private sector cocoa companies, NGOs and government agencies, through an established HIA Implementation Committee with representatives from both the community based HIA Management Board and the Consortium on this committee (Figure 10). The landscape is divided into a series of sub-landscape HIAs (Sub-HIAs) which together cover the area of the whole HIA. Each sub-HIA will provide localized leadership and governance within defined boundaries which reflect divisional or sub-chiefs' jurisdictions and/or appropriate environmental/geographic boundaries. Key aspects of creating or supporting Sub-HIAs are determining the boundaries, the zoning of conservation areas and development areas, as well as the creation of sub-HIA and HIA byelaws and then a Management Plan. At the landscape level, all of the Sub-HIAs have representatives on an umbrella body—the HIA Landscape Management Board. This Board has a formal relationship with the Consortium and is advised by the highest level of Patrons from the Traditional Council.

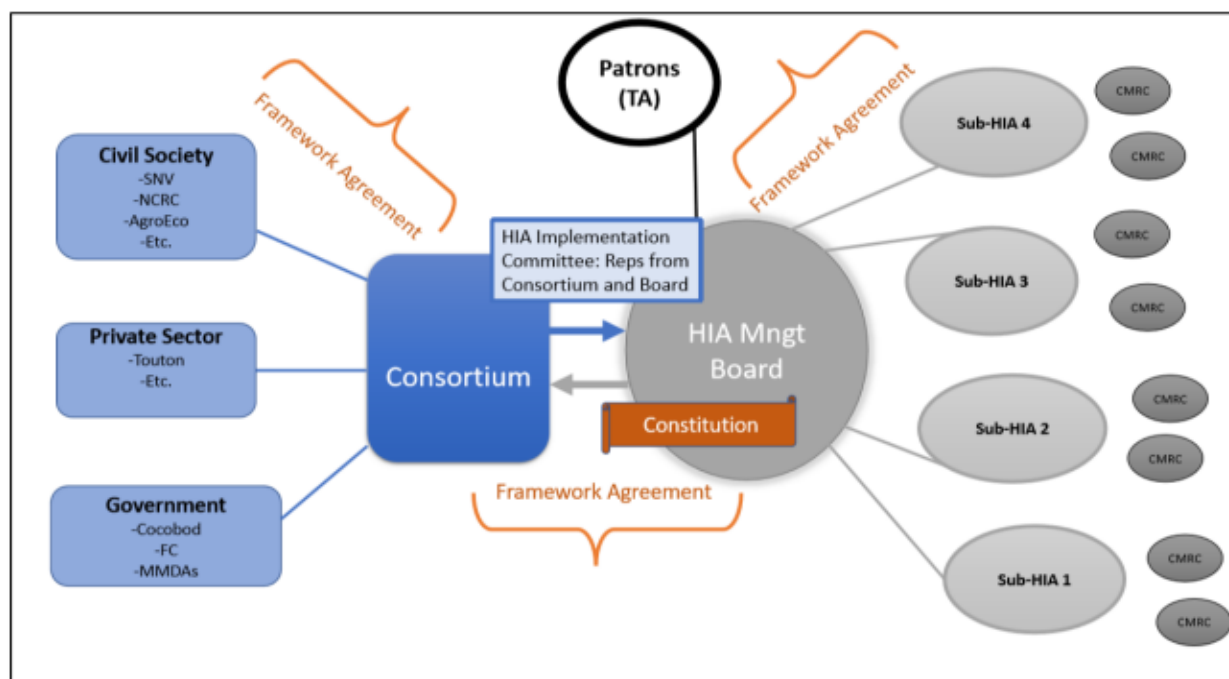


Figure 10: Collaboration within the HIA

The organization of communities for active REDD+ implementation is done at various levels (tiers) to ensure openness, inclusiveness, as well as participatory and transparent process. At the various levels (Community, CREMA/Zone, Sub-HIA and HIA), community-led leadership (Functional Units) is constituted to provide leadership. The Functional Units are the Community Resources Management Committees that provide leadership at the community level, CREMA Executive Committee that provide leadership at the CREMA level, Sub-HIA Executive Committee that provide leadership at the Sub-HIA level and HMB that provide overarching leadership at the HIA level.

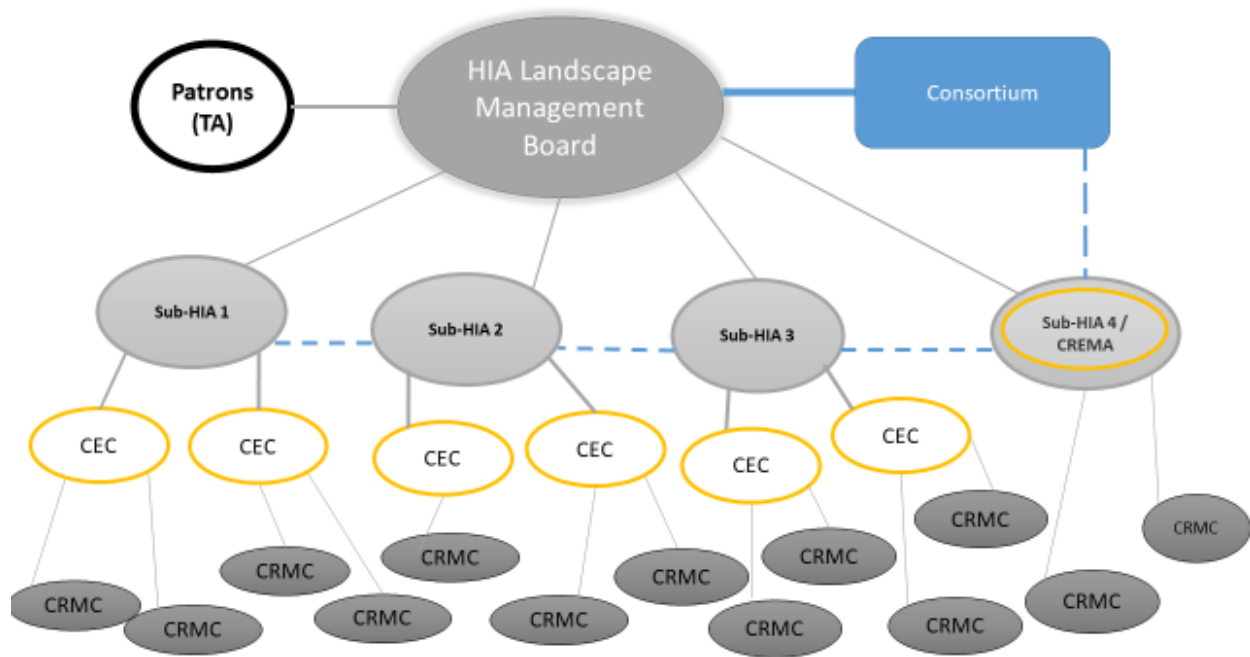


Figure 11: Tiers of the governance structure within the HIA

3.3 HIA functional units

3.3.1 Community Resources Management Committee (CRMC)

The Community Resources Management Committee (CRMC) is the basic unit of the HIA governance structure yet most crucial in that the strength of the entire structure depends on the quality of persons forming the CRMC who direct and mobilise farmers for action at the community level. Within each constituent community of the HIA, the CRMC has a representation of all identifiable interest groups. This structure is built on existing community governance and decision-making structures and is tasked with the implementation and/or enforcement of CREMA, SUB HIA and HIA management decision within the respective communities.

3.3.2 Community Resources Management Area (CREMA)

Community Resources Management Area (CREMA) or Zone is the next phase of the HIA governance structure designed to achieve a landscape-wide governance structure. CREMA is defined as a geographically defined area that includes one or more communities that have agreed to manage natural resource in a sustainable manner guided by constitution and enacted by-laws. In the CREMA/Zone formation, several CRMC communities are clustered together based on commonality of traditional boundaries, proximity, cultural or traditional ties. The term zone is conveniently used to denote the cluttered area/group that is worked on to achieve a CREMA

status. This implies that areas designated as zones do not have bylaws but rather have rules and regulations to guide their operations owing to the relatively longer time and rigorous process involved in obtaining bylaws. At the Zonal level, elections are conducted to elect Zonal/CREMA Executives, known as the CREMA Executives, that have oversight responsibility over the CRMCs.

3.3.3 Sub-Hotspot Intervention Area (SUB-HIA)

In the HIA governance structure, the Sub-HIA is the third tier that encapsulates the CREMA and the adjoining Non-CREMA Area (NCA). In other words, several CREMAs and NCA subsume under a given Sub-HIA. The tier covers an expanse area same as, or normally larger than a CREMA area. It is managed by a Sub-HIA Executive Committee (SHEC) with equitable representation of all its constituent groupings and is responsible for decisions of collective interest. Similar to the formation of the CREMA, several zones are grouped together to form the Sub-HIAs based on political-administrative district boundaries, sizes of their communities and their population. Each sub-HIA has a seven-member SHEC who are elected from the respective CREMAs and NCAs constituting that particular sub-HIA. The Asunafo-Asutifi HIA has six Sub-HIAs: Asunafo South, Asunafo North, Asutifi North, Asutifi South, Asuokor-Ayum. Each sub-HIA is entitled to 1-2 patrons who are drawn from the traditional authorities or influential community members (Sub-Chiefs). They serve as advisers to the sub-HIA and are the final arbiters in traditional matters arising from activities within the sub-HIA. Patrons also act in making peace and unity in order to advance development within the sub-HIA.

3.3.4 Hotspot Intervention Area Management Board (HMB)

The HIA encapsulates all the designated Sub-HIAs and therefore connects all HIA communities as though a single harmonized landscape-wide governance and/or jurisdictional entity. Therefore, HMB is the apex decision-making body structure of the HIA governance structure and is responsible for guiding and directing all HIA management decisions toward a common vision for the collective good of Sub-HIAs, Zones/CREMAs, CRMC and communities. The HMB was set up by a conscious consideration of creating space for a balanced representation of individuals from the Sub-HIA level to be well represented on the HMB. The selection of HMB representatives is subjected to a robust, competitive electoral process involving nominations, vetting, manifesto reading, and voting by a secret ballot.

The HMB, together with the HIA functional Units including the CRMCS, CECs, SHECs, are expected to play important roles at the landscape level including but not limited to the following:

- ❖ Commits to implement 'CREMA-type' landscape planning and management processes
- ❖ Commits to building local governance institutions to manage the cocoa landscape
- ❖ Commits to supporting farmers in the adoption of climate-smart cocoa practices, with attention to gender and youth
- ❖ Commits to participate in the identification of cocoa farms in the landscape including on-reserve
- ❖ Commits to participate in GCFRP activities within the landscape
- ❖ To educate communities on the importance of conservation of the natural and cultural resources and to stem further habitat degradation.

4.0 STAKEHOLDER ANALYSIS

4.1 Stakeholder Identification and Mapping

Stakeholder mapping provides adequate understanding of the position and relevance of each stakeholder when evaluated by the same key criteria and compared to each other and also helps in visualizing the often-complex interplay of issues and relationship. Key stakeholders identified included the traditional authorities, local governance institutions, forestry offices, agriculture development departments, cocoa companies, licensed buying companies (LBCs), farmer groups, civil society organizations (CSOs) and related sectors. These were categorized into five (5) major groups: (i) public sector agencies, (ii) private sector, (iii) traditional authority, (iv) Civil Society Organizations/Non-governmental Organizations and (v) community-based actors such as farmer associations and agro-commodity producers. According to the draft Asunafo Asutifi Management Plan, a stakeholder mapping analysis was done using Mendelow's Stakeholder Mapping Matrix (1991), otherwise called the power-interest matrix to identify stakeholders conflicting elements and determine their potential role, power, and influence in the landscape as far as the implementation of GCFRP activities in the HIA are concerned.

Table 11: Stakeholder Matrix Model Explained with Implication on Programme Implementation

| No | Category of Matrix | Explanation and Implication | Stakeholders in the HIA |
|----|--|--|--|
| 1. | Low Interest and Low Power (LL) – Minimal Effort | <ul style="list-style-type: none"> • They are more likely to accept what they are told and follow instructions. • Can be largely ignored when considering project planning. • Ethically, it is considered that ignoring them may awaken their interest. • Monitor (Minimum Effort) | <ul style="list-style-type: none"> • Lands Commission • Office of the Administrator of Stool lands (OASL) |
| 2. | High Interest and Low Power (HL) | <ul style="list-style-type: none"> • Should be duly considered during implementation phase. • Keep informed and not underestimated. • Can lobby others to join forces to exert pressure | <ul style="list-style-type: none"> • Municipal and District Assemblies (MDAs) • Cocoa Forest Initiative Secretariat • Civil Society Organizations • Donor Partners |

| | | | |
|----|---|--|--|
| 3. | Low Interest and High Power (LH) – Keep Satisfied | <ul style="list-style-type: none"> • Keep satisfied and remains dormant. • If they become more interested, they can easily become key players. | <ul style="list-style-type: none"> • Traditional Authority |
| 4. | High Interest and High Power (HH) – Key Players/Participation | <ul style="list-style-type: none"> • Have high influence on programme implementation. • Could inhibit the achievement of project objectives. • Manage closely | <ul style="list-style-type: none"> • Forestry Commission • National REDD+ Secretariat • Ghana Cocoa Board • Ministry of Lands and Natural Resources • Ministry of Food and Agriculture • Private sector companies • Farmers and Farm-based Organization |

Source: Asunafo Asutifi draft Management Plan being developed with support from Proforest and partners.

The tool identified the National REDD+ Secretariat of the Forestry Commission, COCOBOD and the private sector (cocoa companies) as the three most important stakeholders as far as the implementation of the GCFRP is concerned. The tool also identified the traditional authority as stakeholder with a lot of influence that must be engaged always. Important stakeholder such as the local government, MoFA, CSO, CBOs, development agencies, Farmer-based organizations, are potential key implementation partners and these must be engaged actively for the successful implementation of the programme.

4.2 Public Consultations

Public consultations placed centrally to safeguards implementation of activities/interventions at both national and sub-national levels. Public consultations were organised through meetings, community engagements, trainings and workshops. A series of information sharing and consultative programmes were undertaken to enhance awareness of the program and ensure that there is shared understanding of the critical roles of key stakeholders. Stakeholders consulted included Cocoa Private Sector actors', Multi-stakeholder Policy Actors. Legislators,

MMDA's, NRWG, Traditional Authorities. A summary of public consultations that took place are detailed below:

Box 1: Public Consultation 1

Engagement and Sensitization of Safeguards Focal Persons

Between the periods 7th- 8th and 20th- 21st February 2018, Safeguards Focal Persons (SFP) were sensitized and trained on key global, donor and national level safeguards requirements for REDD+ implementation. The SFPs were drawn from the Regional, District and Park offices of FSD and WD. 71 SFPs were convened and trained on the requisite safeguards requirements for REDD+ implementation at Anita Hotel, Kumasi. Opinions and recommendations were also solicited from participants with regards to how best to implement REDD+ activities.

Box 2: Public Consultation 2

Engagement of community members and other stakeholders

NRS engaged community members and other stakeholders in 10 districts within the 6 HIAs to sensitize them on REDD+ Safeguards in collaboration with CSOs within the landscapes. These engagements occurred in 10 forest districts across all the six Hotspot Intervention Areas (HIAs) Identified for the GCFRP. The districts are Sefwi Wiawso, Cape Coast (Kakum National Park Area), Kade, Bechem, Juaso, Goaso, Nkawie, Ho, Begoro and Juaboso. Participants were 850 consisting of 580 males (about 70%) and 270 females (representing about 30%). These landscape activities were done in active collaboration with some Civil Society Organizations in Ghana namely Civic Response, International Union for Conservation of Nature (IUCN) and HATOF Foundation.

Box 3: Public Consultation 3

Training on SIS and FGRM for REDD+ regional and district safeguards focal persons

The Climate Change Department (CCD) organized a two-day training workshop on the functions of Ghana's REDD+ SIS and FGRM at the Forestry Commission Training Centre (FCTC) in Kumasi from 19th - 20th June, 2018 for regional and district safeguards focal persons within the High Forest Zone of the GCFRP. The selected 71 Safeguards Focal Persons (SFPs) were trained on the functions of Ghana's REDD+ SIS and FGRM. Feedback

and recommendations were solicited from the SFPs on where and how to improve the SIS and FGRM.

Box 4: Public Consultation 4

Safeguards monitoring exercise

To ensure a successful REDD+ implementation, there was the need to monitor and evaluate activities undertaken during the readiness phase and seek suggestions to effectively implement the REDD+ programme. The objective of the field visit was to get feedback from stakeholders on the effectiveness of the safeguards capacity building workshop held in 2018 to achieve effective REDD+ safeguards implementation. Another objective was to go through pre-screening exercise of sub-projects under the GCFRP with Safeguards Focal Persons (SFPs) to identify potential environmental impact. The field visit commenced on 4th of March and ended on 15th March, 2019.

Box 5: Public Consultation 5

Stakeholder Engagement on Safeguards Implementation

32 Safeguards Focal Persons across the GCFRP operational area including FSP from the Asunafo-Asutifi HIA were engaged on safeguards implementation in 2019. The engagement was to share experiences and perspectives on how SFP could deliver on safeguards mandates.

Box 6: Public Consultation 6

Consultative workshops to inform on tree tenure and benefit sharing plan for REDD+

7 consultative workshops conducted in Kakum, Begoro, Kade, Sefwi-Wiawso, Juaboso-Bia, Nkawie and Juaso.

Box 7: Public Consultation 7

REDD+ Awareness Creation and Sensitization of Stakeholders

Over 15 Awareness Creation and Sensitization events were undertaken including meetings with Executive Management Team (EMT), GCFRP Launch, Safeguards workshops, TV and Radio shows etc.

5.0 INSTITUTIONAL SETUP AND RESPONSIBILITY FOR ENVIRONMENTAL AND SOCIAL SAFEGUARDS IMPLEMENTATION AND REPORTING

5.1 Implementing institutions

NRS has put in place a robust institutional arrangement for the implementation, monitoring and reporting of safeguards in close collaboration with EPA, the National Safeguards Working Group as well as partner organizations supporting the implementation of ER activities.

At the national level, Environment and Social Safeguards staff are recruited as part of the national level Project Management Unit (PMU). The PMU Safeguard Specialists are responsible for operationalizing all safeguards aspects of the GCFRP and overseeing and organizing all activities related to safeguards trainings, monitoring, and reporting within the program area. This team receives all of the safeguards information and data from the regional/district-level Safeguards Focal Points in order to review and further analyse the data as required, provide final verification, and where questions or gaps arise, work with the Regional/district level focal points to make corrections and improvements.

The national level PMU safeguards specialists play a key role in ensuring safeguards compliance and are further responsible for

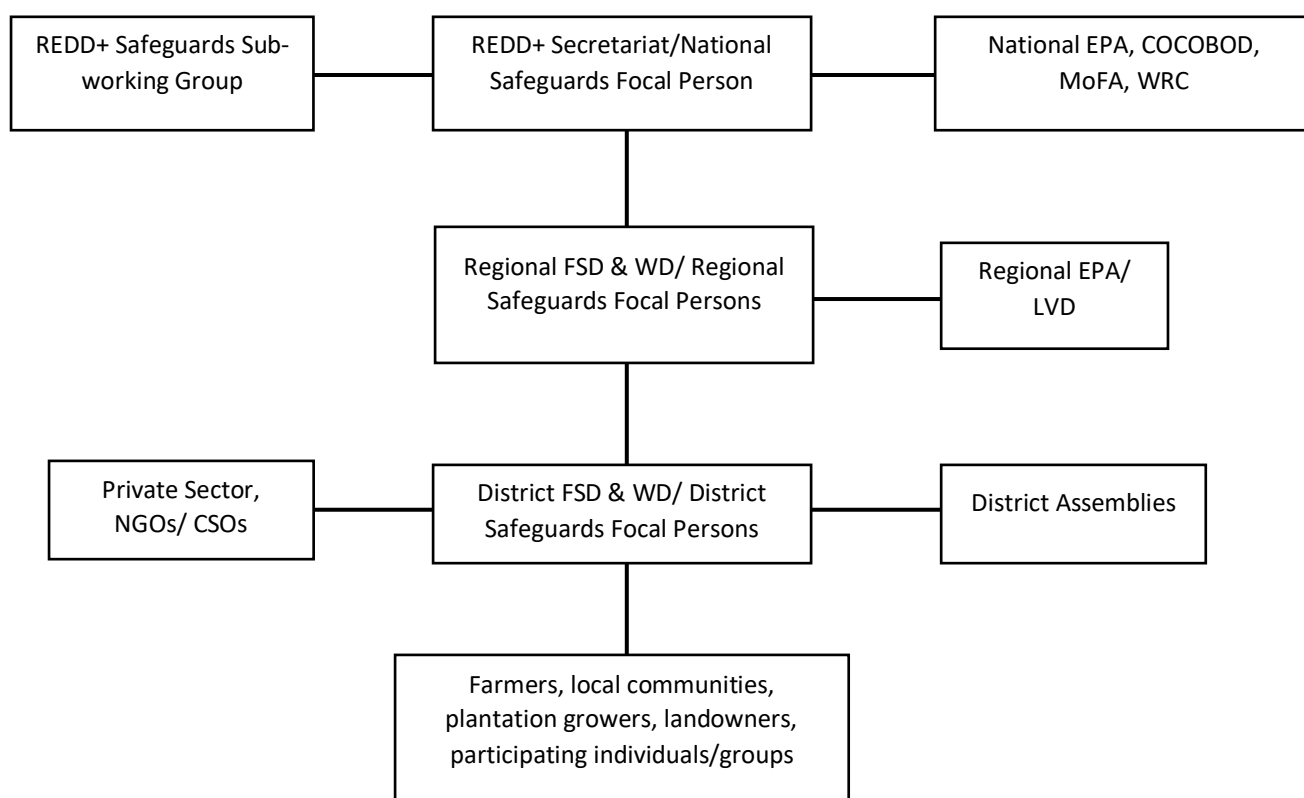
- Coordinating environmental and social safeguards across the HIAs;
- Providing leadership across the regional and district levels for the implementation of safeguards;
- Providing guidance and project level info and tools on safeguards for all stakeholders;
- Managing the environmental and social safeguard experts at ER program areas;
- Coordinating all safeguard activities with donors, implementing agencies and other potential investors; and
- Overseeing all environmental and social safeguard training and capacity building.

At the regional and districts levels, regional/district level Environmental and Social Safeguards Focal Points are in place. They:

- work closely with the national level NRS Environmental and Social Safeguards (ESS) Focal Points to ensure that all environmental and social safeguards issues are incorporated into Bid and specifications documents for all sub project types;

- ensure that safeguards issues are included as part of the training at District level and contractors invited to participate;
- draft safeguards report based on collated documents and reports from district activities as part of usual regional reporting on the project;
- are the first point of contact for the district in case of any challenging issues on project-related safeguards - land, environmental, safety and health and draw the FC ESS Focal Point's attention in case of lack of resolution;
- collaborate with relevant authorities (chiefs and elders) and other community members and facilitate the implementation of subprojects and implementation of any other safeguards related activity; and
- perform any other related activities that may be assigned by the NRS ESS Focal Point to whom s/he will report.

Below is the diagram illustrating safeguards implementation:



5.2 Collaborating Institutions

NRS supervises on-ground safeguards implementation including screening and monitoring of interventions/activities captured under the Ghana Cocoa Forest REDD+ Programme. This exercise is usually done collaboratively between NRS and other key partners such as the Environmental Protection Agency (EPA) and the HIA Management Board (HMB). The EPA being the statutory regulator of the environment provides technical support to complement the efforts of the NRS. The EPA undertakes training and sensitization programmes focusing on safe handling of agro-chemicals, safety issues, and protection of natural resources including forest, biodiversity and water. The EPA collaborates with key institutions like the District Assemblies and the Departments of Agriculture (under the Ministry of Food and Agriculture) in providing these services.

Also, the Ghana Cocoa Board being one of the proponents of GCFRP undertakes measures to safeguard adherence through Climate Smart Cocoa, training on safe use of agro-chemicals, compost application, training on approved/recommended agrochemicals, and on-farm biodiversity conservation. The private sector cocoa companies similarly undertake such activities as part of their commitment to safeguards implementation. The Civil Society Organizations (NGOs) /Non-Governmental Organization (NGOs), on the other hand, promote the uptake of safeguards implementation among farmers at the community level. The CSOs/NGOs regularly interface with farmers/ farmer groups on a number of capacity building activities on safe compliance. All these are done in collaboration with the Regional/District level Safeguards Focal Points.

These important contributions from the GCFRP partners result to many positive outputs including yield improvement leading to hunger and poverty alleviation, biodiversity improvement and forest protection, to mention a few.

5.3 Safeguards Information System (SIS)

As part of requirements from the UNFCCC for receiving results-based payment under REDD+, countries are expected to provide information on how they are addressing and respecting safeguards. In addition, the UNFCCC requirements also require that information on the implementation of the safeguards associated with REDD+ activities at sub-national and site levels is collected and provided as evidence that the safeguards have been addressed and respected in

practice. This would include demonstrating that safeguards measures, processes / procedures have been applied as well as monitoring the impacts of REDD+.

Although there are no official guidelines, Parties to the UNFCCC have agreed on some broad guidance on the characteristics of a SIS. It should:

- provide transparent and consistent information that is accessible by all relevant stakeholders and updated on a regular basis;
- be transparent and flexible to allow for improvements over time;
- provide information on how all the safeguards referred to in Appendix I to decision 1/CP.16 are being addressed and respected;
- be country-driven and implemented at the national level; and
- build upon existing systems, as appropriate.

Reliable safeguards information is important not only for achieving REDD+ in a sustainable manner but can serve possible broader sustainable development and other national policy, goals (as well as other international reporting obligations). For Ghana, which has multiple reporting commitments linked to relevant agencies/initiatives (e.g., Cancun, FCPF Carbon Fund, Green Climate Fund, national and other safeguards) an SIS that is able to provide information to all of them, is a cost-effective approach. A comprehensive review of policies/laws/ regulations has been undertaken as part of the development of the SIS (safeguards information needs of the SIS), specific indicators and criteria were developed to serve as a basis for implementing and monitoring safeguards (Policies, Criteria and Indicators (PCIs)).

In the case of the Cancun safeguards, Ghana has determined 'what type' of information is needed to demonstrate whether they are being addressed and respected. This has been done in accordance with Ghana's clarification of the Cancun safeguards. It is worth noting that the clarification specifies how the general principles outlined in the Cancun safeguards translate into specific principles and objectives that are to be followed and promoted in the context of the implementation of REDD+ interventions in Ghana, and which are anchored in the country's policies, laws and regulations (PLRs). The clarification, interpretation or description was an essential step in the design of an effective safeguard governance framework for REDD+ for two reasons:

- It is one of the foundations of the Safeguard Information System (SIS) as it is key to determining the types of information that are to be gathered by the SIS; and
- It is central to the preparation of the summary of information, as it helps to determine the information that should be provided to the UNFCCC to demonstrate how the safeguards are being addressed and respected.

Ghana's approach to the development of safeguards Principles, Criteria and Indicators (PCIs) within the country's context involved the identification of key elements from existing mandatory and voluntary safeguards standards/frameworks such as the UNFCCC (Cancun) Safeguards and World Bank Operational Policies, that relate to the rights of local communities; inclusive participation of all relevant stakeholders; equitable sharing of benefits and risks; gender mainstreaming; Free, Prior and Informed Consent (FPIC); enhancement of biological diversity and ecosystem services, and other key issues that affect social and environmental performance of REDD+ programmes and/or projects.

An initial identification/drafting of PCIs was carried out by a technical team through a step-wise approach, after which the draft PCIs were subjected to stakeholder consultations at the local and national levels for feedback and finalization. The safeguard information needs of the SIS is outlined in the framework document of the SIS.

In line with this, a web-based REDD+ Safeguards Information System (SIS) has been developed to provide transparent and consistent information that is accessible by all relevant stakeholders. The web-based SIS platform provides information on how REDD+ Social and Environmental safeguards are being addressed and respected throughout implementation of the REDD+ programme. The web platform was developed after a series of engagements by stakeholders. The web platform was developed by the ICT department of FC with financial support from SNV Netherlands Development Organization under the project "Operationalizing national safeguards for results-based payment from REDD+" with funding from the German Government. The SIS web address is www.reddsis.fcghana.org. This SIS was launched officially on 21st December, 2020. The FC has demonstrated its dedication to boosting accountability, improving livelihoods and enhancing ecosystem resilience. The launch positioned Ghana again for positive and ambitious climate mitigation and adaptation action.

Through this participatory process it was determined that Ghana's SIS will report on the information:

1. Cancun safeguards;
2. ESMF process, policy, and outcome indicators on risks, opportunities and how they are being addressed from the project to national levels;
3. GCFRP benefit sharing;
4. Co-benefits;
5. FGRM: Indicators on grievance redress (conflicts and resolutions);
6. Additional indicators that will be determined to support effective implementation, as required.

The functions of the SIS are closely linked to the institutional arrangements, as the functions may be carried out by a single, or multiple agencies/institutions. Core functions considered by Ghana are:

- **Collection:** process of collecting raw data through information systems and sources.
- **Compilation:** process of acquiring requested information from the relevant systems and sources.
- **Aggregation:** process of aggregating, into a central repository/database, the information provided by the relevant sources and systems for the purpose of analysis.
- **Analysis:** process of undertaking a qualitative assessment of the information in order to determine to what extent the safeguards are being addressed and respected.
- **Dissemination of information:** process of disseminating, both internally (national level) and externally (international reporting) through appropriate means (e.g., website, reports, meetings with relevant stakeholders, etc.)

The SIS is populated with information that covers all the activities being carried out by NRS and all proponents of the GCFRP. Stakeholders are continuously educated on how to access and navigate the SIS web platform. The web platform provides information on the Climate Change Directorate (NRS), its functions and mandate as well as the purpose of the SIS.

The information on the web platform has been categorized per HIA under the consultations section, with GCFRP area wide (National and Sub-national) reports and documents uploaded to the library page (publications and documents). Information that is HIA specific is uploaded and

updated under the respective HIA as and when necessary. This includes data on the governance structure set up, the REDD+ activities undertaken and feedback from stakeholders. Information on the institutional arrangements under the GCFRP is also provided.

The programmes page has been populated with information on the various activities been carried out in the HIA, by which proponent of the programme and the timeframe. The FGRM page provides stakeholders with information on what FGRM is and its modalities. The page also has feedback in the form of videos from project proponents as well as various means of contact and reporting of feedback and grievances like hotlines and forms.

A SIS mobile application is been developed by the ICT department of FC with support from SNV. This mobile app is intended to be used for project screening and monitoring, providing information on GCFRP activities as well as FGRM reception and reporting.

6.0 COMPLIANCE WITH ENVIRONMENTAL AND SOCIAL SAFEGUARDS IMPLEMENTATION

A key activity under this programme is to clearly identify the associated potential environmental and social issues and concerns, both positive and negative. Thus, the potential impacts/risks of project/activities on various components of the environment and society in the HIA were identified and appropriate mitigation measures provided.

The key project activities that were screened for potential risks and for which mitigation measures were provided comprise the following:

Component One: Forest Restoration

- Modified Taungya System (MTS)
- Enrichment Planting
- Trees on farm (ToF)

Component Two: Climate smart cocoa

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

Component Three: Additional livelihoods Activities/Interventions

- Train and promote economically viable and environmentally sound on-farm income diversification options:
 - Vegetable farming
 - Bee-keeping
 - Animal husbandry

6.1 Approach to the Safeguards Monitoring

Monitoring was done to ensure / verify ESS compliance under these activities. Compliance with ESS implementation is done in two parts, namely:

- a) Addressing Safeguards: that is, confirming existence of National legislative instruments, policies and measures on REDD+ Safeguards. Addressing REDD+ Safeguards could also involve National Policy Reforms that aims at reducing/ mitigating social, environmental, or economic risks from REDD+ programs/project implementation.

- b) Respecting Safeguards: relating to activities undertaken to ensure that program activities triggering/ relating to safeguards requirements are being adhered to, including screening of program/project activities and outputs for risks and pre-determining measures to forestall/mitigate the risks.

6.2 Safeguards compliance of legislature and policy reform

The GCFRP is implementing an integrated set of activities (land use, policy reform on tree tenure, climate smart cocoa, community-based livelihoods, etc.) aimed at empowering local farming communities by amplifying their voice and agency in the planning, implementation, and monitoring of program activities. This program is building on the long tradition of social forestry in Ghana whereby CREMA has long since been established for the management of natural resources. To enhance greater inclusion and active participation, the HIA consortium has signed contracts (Addendum to the Framework Agreement) with each farmer or via farmer groupings or associations and has begun the registration of all committed cocoa farmers. Furthermore, a Farmers Contract is signed between the farmer, the HIA Governance Board and the licensed buying company consortium for future purchase. All registered cocoa farmers receive a photo ID card, an executed contract and regular training. Each HIA CSC Consortium has put together a farmer engagement package that gives farmers access to the agronomic, economic and knowledge resources to be able to achieve and maintain substantial yield increases. The engagement package includes farmer's access to:

- hybrid cocoa seeds, seedlings, or other types of planting material that are recommended under the CSC Good-Practice Guidelines;
- fertilizer (organic or inorganic) and pest/disease management products so that they can reduce losses and increase productivity on farm;
- technical extension and training opportunities to enable them to understand and follow the CSC Good-Practice Guidelines, improve their practices, and increase yields;
- professionalization services or business training opportunities so that interested farmers can realize and maximize benefits from yield increases through improved record keeping and financial literacy, enhanced professional capacity, and more detailed planning of their farm management (Farmer Business School (FBS));

- credit facilities to support their farming practices and management decisions, and to an insurance product that will reduce the considerable risk of losses associated with changing rainfall patterns and temperatures; and
- shade tree planting material and promotion of assisted natural regeneration and maintaining mature shade trees.

6.3 Tree tenure

Tree tenure is understood to refer to the bundle of rights over tree and tree products, each of which may be held by different people at different times. These rights include the right to own, inherit, dispose, use and exclude others from using trees and tree products. The concept of benefit-sharing refers to specific forms of responsibility to direct returns from the exploitation of natural resources, be they monetary or non-monetary, to various actors in the activity and the local communities, in recognition of their rights, roles and responsibilities in the activity.

The various national afforestation programs invest huge capital in creating forest estates with government, private sector, and community partnerships. However, most analyses of the underlying challenges to achieving legality in the management of off-reserve forest resources in Ghana and sustainable forest management in general conclude that ‘existing tree tenure regimes is largely regarded as a disincentive to sustainable forest management’ and inadequacies in the legislation and/or misinterpretations of the very complex texts relating to tree tenure and benefit sharing are at the root of the problem. Some major safeguards implications of this includes:

- Tree tenure arrangements for naturally occurring forest trees outside forest reserves where the farmers are not entitled to economically benefit from the revenue that accrue from harvesting the trees. This is a great disincentive to encouraging shaded cocoa farming systems and in broader agro-forestry systems.

6.3.1 Mitigation measures

Under the Forestry Component of the Natural Resources and Environmental Governance Technical Assistance (NREG TA), the Ministry of Lands and Natural Resources (MNLN) engaged the services of a firm to help design options for tree tenure regimes with accompanying benefit sharing mechanisms in Ghana in consultation with the FC and a wide range of stakeholders. The

result of this work is expected to contribute significantly to Ghana's drive at halting deforestation, enhancing its forest estate and promoting good forest governance.

The major tree management regimes considered in this exercise are based on four main categories of arrangements viz: Naturally occurring trees on-reserve; Naturally occurring trees off-reserve; Planted trees on-reserve; and Planted trees off-reserve. Tree tenure reform and fair benefit sharing reforms are anticipated in forest and wildlife policy and this study is part of the effort by the MLNR to give currency to the policy intentions. Current tree tenure and benefit sharing are, however inadequate, based on statutory legislation and/or customary laws.

Based on synthesis of the views of various stakeholders and their preferred options for tenure and benefit sharing reform, recommendations have been made on the optimal reform options for the various tree management regimes identified. Recommended reforms, which are essential to the overall success of the programme identified through the assessment of Policies, Laws and Regulations (PLRs) and their relation to safeguards requirements include:

- Passage of the Wildlife Resources Management Bill which will support effective implementation of the 2012 Forest and Wildlife Policy.
- Policy reform on tree tenure
- Policy reform on cocoa farm inputs
- Policies to address carbon transaction rights and benefit-sharing arrangements

While efforts are still underway to put in place land-use management plan and tree tenure policy reform, the Feedback and Grievance Redress Mechanism (FGRM) that has been operationalized under the GCFRP addresses issues related to these as much as possible. Another related safeguards issue identified within the GCFRP Landscape is the absence of a comprehensive national land-use plan for the country. Though the Land Use and Spatial Planning Act 2016 provides a general framework for the development of land use plans, the Act does not specifically address forested areas or agricultural lands as the focus is skewed towards urban and peri-urban planning.

As a form of mitigation, the Forest Reserve Areas are being protected against encroachment by expansionist agriculture as well as against illegal harvesting of trees. The Forestry Commission

has trained personnel to patrol the forest reserve areas. In Off-Reserve areas, extension services being provided by Agric and Cocobod extension officers are intensified and advocacy for intensification is being made as well as capacity building regarding Climate-Smart Cocoa practices are being done to reduce further deforestation outside forest reserves for agricultural purposes. These extension services as well as protection of forest is serving as a short to medium term measure whilst engagement with the Ministry of Lands and Natural Resources and the Land Use and Spatial Planning Department to elaborate clear Land Use Plan for Forest Areas.

6.4 Tree registration

As agroforestry practices are being introduced to cocoa communities, trees from different species are planted on farms. Registering these trees is critical as it give farmers tree ownership and benefit financially from any revenue generated from their sale. Also registering planted trees provides farmers rights of alienation such that, should their registered cocoa tree get destroyed during the felling of economic shade trees, they will receive compensation from the timber merchant. To mitigate this action, Ghana's MLNR, along with FC, created a tree registration form to facilitate tree registration process. The cocoa and chocolate-producing companies undertook a first-of-its-kind initiative step to digitize this form into an innovative mobile application – with capability to work both on and offline. With the many sensitizations and capacity building on forest restoration, protection of existing trees and incorporating trees on farms, a major risk is the non-registration of most farmer planted trees. This in part reduces farmer confidence and trust in the rights and benefits from tree tenure being promised. Thus, the expeditious actions towards national validation and rolling out of tree registration modalities is crucial to the attainment of expected outcome.

6.5 REDD+ Gender mainstreaming

Gender considerations are essential to REDD+. Gender sensitive initiatives have the potential to become a conservation, poverty reduction and climate mitigation strategy. Thus REDD+ projects are designed and implemented with a gender-sensitive perspective to be efficient and effective in decreasing the gender gap. FC partnered with the International Union for the Conservation of Nature (IUCN), to develop a roadmap that would guide the design and implementation of a gender-sensitive REDD+ strategy in Ghana, which recognizes and protects the rights and interests of women and other vulnerable groups. The National REDD+ Gender Sub-Working Group (GSWG) was established as a multi-stakeholder gender advocacy group to spearhead the

gender mainstreaming process and provide technical support in the review of REDD+ documents and processes to ensure gender sensitivity, as well as capacity building at the grassroots level. The GSWG was convened and subsequently trained in Accra, on Climate Change, REDD+ and its status in Ghana, the links between gender, REDD+ and safeguard issues and the importance of mainstreaming gender considerations into the REDD+.

The GSWG also liaises with decentralized institutions such as the district offices of key Government Agencies, District Assemblies, Traditional Authorities, Local Communities and Civil Society Organizations to implement actions at the sub-national level. The members of the GSWG who include representatives from different Ministries, Departments and Agencies (MDAs), Traditional Authorities, Local Communities, Academia, Private Sector and NGO/Civil Society Organizations also developed an operational plan and budget for the implementation of actions in the Gender and REDD+ Road Map.

In all activities undertaken by NRS, it is ensured there is at least 40% women representation. These include meetings, workshops, trainings and even constitution of committee members. The various structures that make up the HIA governance structure also ensure gender equity through free and fair processes. Per the Gender Action Plan:

- Training materials on sustainable management of forests and REDD+ are developed to be accessible to women.
- Training programmes (workshops, consultative meetings) on gender and REDD+ issues for implementing partners working on REDD+ issues are organised as part of sensitisation and education.
- NRS has identified and documented good practices and actions in other forest management / conservation initiatives that have fully and effectively integrated women and gender considerations.
- The capacity of local women in project areas are built to actively participate in REDD+ activities.
- Equal access and control are given to women and men in relation to tools, equipment, technology and resources needed to engage in REDD+ activities.
- NRS identified potential risks of REDD+ implementation on rights and livelihoods (with particular attention to land and natural resource use; full and effective consultation and

participation; fair access to information, education to enable decision-making and consent; and equitable distribution of benefits).

- Local women are informed of their rights, safeguards and their capacity built to use FGRM or protocols systems if safeguards are violated.

6.6 Uptake of Safeguards in REDD+ Programmes/Activities at the HIA Level

Generally, the mix of projects/interventions being implemented in the Asunafo-Asutifi HIA have contributed to many transformational positive impacts with minimal risks/impacts. This attests to the fact that stakeholders have taken safeguards adherence extremely seriously following the capacity building/training on safeguards in project implementation. Additionally, community members interacted with 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 climate-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. It worthwhile to share that gender has been progressively integrated and mainstreamed in project implementation by the project proponents.

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 12: Results of monitoring of activities in the HIA

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|-------------------------|---|--|--|--|----------|
| Modified Taungya System | Generation of smoke from burning of biomass (debris and logs) during land preparation | 4.01 Environmental Assessment 4.04 Natural Habitats 4.36 Forests | <ul style="list-style-type: none"> Biomass generated was used as firewood and also as pegs Minimized burning of biomass as much as possible Workers were required to wear 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 | <ul style="list-style-type: none"> Site observation Records of PPEs provided FGRM operationalized | |
| | Exposure of workers / communities to smoke generated during land preparation | | <ul style="list-style-type: none"> Minimized burning of biomass as much as possible | <ul style="list-style-type: none"> Site observation Records of PPEs provided | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|--|--|----------|
| | | | <ul style="list-style-type: none"> • Fire was used only in situations where this was effective and least environmentally damaging • Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate (boots and protective clothes) • 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. Practically, recorded grievances were checked at various points including the district offices of Forestry Commission and COCOBOD. | <ul style="list-style-type: none"> • FGRM operationalized | |
| | Reverse gains from carbon sequestration – | | <ul style="list-style-type: none"> • Minimized burning of biomass as much as possible | <ul style="list-style-type: none"> • Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|--|----------|
| | adding carbon into the atmosphere | | <ul style="list-style-type: none"> • Fire was used only in situations where this was effective and least environmentally damaging | | |
| | Risks of modification of natural habitat | | <ul style="list-style-type: none"> • Environmentally sensitive sites and unnecessary exposure or access to sensitive habitats were avoided • 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 • Planting was designed to include both exotic and indigenous plants in the right proportions and positions • Organic farming practices (planting nitrogen-fixing species, agroforestry practices, composting, application of organic fertilizers) were implemented and | <ul style="list-style-type: none"> • Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|----------------------------|-----------------|---|---|----------|
| | | | <p>this helped minimize the use of inorganic fertilizers and herbicides that are major contributors to soil and surface water quality deterioration</p> <ul style="list-style-type: none"> Labour-intensive approach using simple farm tools like hoes and cutlasses was employed. | | |
| | Impacts on flora and fauna | | <ul style="list-style-type: none"> Environmentally sensitive sites and unnecessary exposure or access to sensitive habitats were avoided Planting was designed to include both exotic and indigenous plants 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 | <ul style="list-style-type: none"> Site observation Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|-------|-----------------|---|-------------------------------------|----------|
| | | | <p>fertilizers and herbicides that are major contributors to soil and surface water quality deterioration</p> <ul style="list-style-type: none"> Measures to correct low soil pH were implemented as much as possible: <ul style="list-style-type: none"> Farmers were assisted to avoid the use of acidifying nitrogen-based fertilizers where soil pH was low as part of the regular community-level trainings conducted by COCOBOD Extension Officers as well as other institutions such the Department of Agric and the Environmental Protection Agency (EPA) Efficient fertilizer use considers the prescribed dosage, period or timing and intervals of application, and release properties | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---------------------------------------|-----------------|--|---|----------|
| | | | <ul style="list-style-type: none"> Labour-intensive approach using simple farm tools like hoes and cutlasses was employed. | | |
| | Risks of Accelerated erosion | | <ul style="list-style-type: none"> 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 Implementation of standard erosion and sediment control best management practices | <ul style="list-style-type: none"> Site observation | |
| | Risks of Planting single tree species | | <ul style="list-style-type: none"> Planting was designed to include variety of both exotic and indigenous plants in the right proportions and positions Planned and strategized the procurement of diversified seedlings | <ul style="list-style-type: none"> Site observation Records of seedlings supplied | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|--|----------|
| | Alterations in local natural water cycles/ hydrology | | <ul style="list-style-type: none"> 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. Implementation of standard erosion and sediment control best management practices ensured throughout the project cycle. | <ul style="list-style-type: none"> Site observation | |
| | Risks of pollution / contamination of water bodies (herbicides, pesticides, insecticides, weedicides, ash, dust) | | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Site observation Number of farmers trained Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|-------|-----------------|---|-------------------------------------|----------|
| | | | <ul style="list-style-type: none"> 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 assistance to leave a vegetation cover as a buffer zone along the water bodies. | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|---|---|----------|
| | | | <ul style="list-style-type: none"> 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 | | |
| | Impacts of Poor site selection | | <ul style="list-style-type: none"> Ensured good site selection taking into consideration condition score, natural regeneration potential and basal area | <ul style="list-style-type: none"> Site observation | |
| | Risks of Improper disposal of chemical containers | | <ul style="list-style-type: none"> The use of agrochemicals including inorganic fertilizers, weedicides and pesticides was reduced as much as possible. Where possible, mechanical | <ul style="list-style-type: none"> Training report Awareness creation materials displayed | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|-------------------------------------|-----------------|---|---|----------|
| | | | weed control was considered instead of the use of weedicides <ul style="list-style-type: none"> Complied with the requirements of applicable waste management regulations for the management of all waste generated as a result of the project activities Education and sensitization on the proper disposal of hazardous waste and material | <ul style="list-style-type: none"> List of approved and unapproved agrochemicals shared | |
| | Risks of disposal of polybags | | <ul style="list-style-type: none"> Education and sensitization on the proper disposal of polybags | <ul style="list-style-type: none"> Site Observation | |
| | Potential Land allocation conflicts | | <ul style="list-style-type: none"> Forest Management plan was prepared for all sites to also reflect community expectations Technical assistance offered in land allocation A grievance mechanism was established to ensure any complaints / comments | <ul style="list-style-type: none"> Forest Management plan FGRM operationalized On-site verification with farmers | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|---|---|----------|
| | | | regarding the Project is received and responded to in a timely manner, providing solutions and taking corrective measures as appropriate | | |
| | Inadequate engagement with local communities | | <ul style="list-style-type: none"> Stakeholder consultations were 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 Equal opportunity was given to all abled bodied persons who wanted to participate | <ul style="list-style-type: none"> Engagement report Forest Management plan | |
| | Poor records of primary supply and contract workers | | <ul style="list-style-type: none"> Proper records of workers are kept and updated as appropriate | <ul style="list-style-type: none"> Records of workers | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|---|---|----------|
| | Unfair allocation of more lands to families/persons/groups | | <ul style="list-style-type: none"> Equal opportunity was given to all abled bodied persons who wanted to participate 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 | <ul style="list-style-type: none"> On-site verification with farmers FGRM operationalized | |
| | Failure to honour MTS benefit arrangement | | <ul style="list-style-type: none"> Ensured engagement of MTS beneficiaries on the right percentages due them. | <ul style="list-style-type: none"> Records of engagement | |
| | Low percentage of women accessing lands | | <ul style="list-style-type: none"> Equal opportunity was given to all women who wanted to participate | <ul style="list-style-type: none"> Records of farmers | |
| | Unavailability and no/limited use of personal protective equipment | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Records of PPE supply Confirmation with workers | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|---------------------|---|-------------------------------|---|--|----------|
| | Limited awareness creation programs on health and safety including chemical handling. | | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> On-site verification with farmers Confirmation with workers | |
| Enrichment Planting | Improper disposal of polybags | 4.01 Environmental Assessment | <ul style="list-style-type: none"> Education and sensitization on the proper disposal of polybags | <ul style="list-style-type: none"> Site Observation | |
| | Poor record keeping of primary supply workers | | <ul style="list-style-type: none"> Employment and other opportunities were given to local communities as much as possible. | <ul style="list-style-type: none"> Confirmation with communities | |
| | Poor record keeping of contract workers | 4.04 Natural Habitats | <ul style="list-style-type: none"> Proper records of workers are kept and updated as appropriate | | |
| | Unavailability and no/limited use of | 4.36 Forests | <ul style="list-style-type: none"> Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate. | <ul style="list-style-type: none"> Confirmation with communities Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------------|--|--|---|--|----------|
| | personal protective equipment | | <ul style="list-style-type: none"> Education and sensitization were done on the need for and proper usage of PPEs | | |
| | Limited awareness creation programs on health and safety | | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Confirmation with communities On-site verification with farmers | |
| | Delay in payment of contract workers | | <ul style="list-style-type: none"> Ensured workers were paid on time | <ul style="list-style-type: none"> Records of payments | |
| Trees on Farms | Disturbance of flora and fauna | 4.01 Environmental Assessment 4.04 Natural Habitats | <ul style="list-style-type: none"> Environmentally sensitive sites and unnecessary exposure or access to sensitive habitats were avoided Planting was designed to include both exotic and indigenous plants in the right proportions and positions | <ul style="list-style-type: none"> Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|---|--|---|----------|
| | | 4.09 Pest Management 4.36 Forests | <ul style="list-style-type: none"> 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. | | |
| | Planting single tree species | | <ul style="list-style-type: none"> Planting was designed to include variety of both exotic and indigenous plants in the right proportions and positions Planned and strategized the procurement of desirable and diversified seedlings | <ul style="list-style-type: none"> Site observation Records of seedlings supplied | |
| | Planting/ keeping shade tree with undesirable characteristics e.g., Disease prone shade trees, host of pest and diseases, easily broken branches etc. | | | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|--|---|----------|
| | Planting inadvisable shade tree species e.g., invasive species | | | | |
| | Planting more trees than required leading to over-shadowing of cocoa farms. | | <ul style="list-style-type: none"> Farms were mapped to determine 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 | | |
| | Limited understanding on shade tree management. | | <ul style="list-style-type: none"> Education/ adequate trainings were provided to farmers | <ul style="list-style-type: none"> Training report | |
| | Destruction from harvesting of timber resources on farm | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> FGRM operationalized Reports | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|--|----------|
| | | | <ul style="list-style-type: none"> Appropriate sanctions were applied on offenders including fines and jail sentences | | |
| | Failure to register farmers | | <ul style="list-style-type: none"> Records of farmers are kept | <ul style="list-style-type: none"> Records of farmers | |
| | Limited awareness creation on health and safety including tools and equipment handling | | <ul style="list-style-type: none"> 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 were required to wear suitable Personal Protective Equipment (PPE) as appropriate | <ul style="list-style-type: none"> Training report On-site verification with farmers | |
| | Unavailability and no/limited use of personal protective equipment | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Records of PPE supply Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|---------------------|---|---|---|--|----------|
| Climate Smart Cocoa | Exposure of local folks (farmers) to chemicals during and after application of agrochemical on cocoa farmers. | 4.01 Environmental Assessment 4.04 Natural Habitats 4.09 Pest Management 4.36 Forests | <ul style="list-style-type: none"> 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 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. | <ul style="list-style-type: none"> Records of PPE supply Training report | |
| | Generation of fumes during cutting down of diseased or over-aged cocoa trees. | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Site observation Records of PPEs provided | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|----------------------------|-----------------|--|--|----------|
| | | | pesticides was reduced as much as possible. Where possible, mechanical weed control was considered instead of the use of weedicides. | | |
| | Impacts on flora and fauna | | <ul style="list-style-type: none"> • Environmentally sensitive sites and unnecessary exposure or access to sensitive habitats were avoided • Planting was designed to include both exotic and indigenous plants 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 | <ul style="list-style-type: none"> • Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|--|----------|
| | | | <ul style="list-style-type: none"> Labour-intensive approach using simple farm tools like hoes and cutlasses was employed. | | |
| | Land clearing and vegetation loss at rehab farms | | <ul style="list-style-type: none"> 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. Felled trees and cleared under- brushes were chipped and formed into windrows and allowed to decompose and/or used as pegs for planting | <ul style="list-style-type: none"> Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|---|---|----------|
| | Risks of accelerated erosion | | <ul style="list-style-type: none"> 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 Implementation of standard erosion and sediment control best management practices | <ul style="list-style-type: none"> Site observation | |
| | Risks of pollution / contamination of water bodies with herbicides, pesticides, insecticides, weedicides, ash, dust) | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Site observation Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|-------|-----------------|---|-------------------------------------|----------|
| | | | <p>for surface runoff from the planting areas.</p> <p>The reserves also play a major role in protecting the banks of the waterways from channel erosion.</p> <ul style="list-style-type: none"> • 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 | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|--|---|----------|
| | | | 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 | | |
| | Risks involved with the harvesting of timber resources | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> FGRM operationalized | |
| | Cultivating cocoa without adherence to the buffer zone policy | | <ul style="list-style-type: none"> Farmers trained and provided with tools to create buffer of no-spray zones in farms in close proximity to water body(s) | <ul style="list-style-type: none"> Training report Site observation | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|--|---|----------|
| | | | <ul style="list-style-type: none"> Farmers whose farms are 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 | | |
| | Increase in pests and disease due to too much shade and undesirable shade trees | | <ul style="list-style-type: none"> Producers (farmers) trained on 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. | <ul style="list-style-type: none"> Site observation Training report | |
| | Involve the use of unapproved/ not recommended | | <ul style="list-style-type: none"> Raised awareness on the list of approved agro-inputs and the list shared/pasted at vantage points for public viewing | <ul style="list-style-type: none"> Confirmation with communities | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|--|---|----------|
| | agrochemicals (weedicides, pesticides, insecticides etc.) | | | <ul style="list-style-type: none"> List of approved and unapproved agrochemicals shared | |
| | Over-use of agro-inputs such as fertilizers and agro-chemicals. | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Training report List of approved and unapproved agrochemicals shared | |
| | Use of fire during land preparation | | <ul style="list-style-type: none"> Fire was used only in situations where this was effective and least environmentally damaging Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate. | <ul style="list-style-type: none"> Site observation Records of PPEs provided | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|--|----------|
| | Limited and/or untimely supply of cocoa seedlings | | <ul style="list-style-type: none"> Seedlings were supplied on time to meet onset of reliable rainfall Seedlings were sourced within close proximity/catchment area | <ul style="list-style-type: none"> Records of seedlings supply | |
| | Establishing new farms cocoa farms within forest reserves. | | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Engagement/training Reports Records of admitted farms DA by-laws | |
| | Generation of hazardous waste such as arboricides, herbicides, | | <ul style="list-style-type: none"> Mass sprayers who spray agro-chemicals for farmers have been cautioned and | <ul style="list-style-type: none"> Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|--|----------|
| | weedicides, and pesticides. | | educated on proper disposal of chemical containers after use | <ul style="list-style-type: none"> Awareness creation materials displayed List of approved and unapproved agrochemicals shared FGRM operationalized | |
| | Risks with transportation of hazardous chemicals (arboricides, herbicides, weedicides, and pesticides) | | <ul style="list-style-type: none"> Famers have been encouraged to report hazardous activities of neighbors to through the FGRM for correction remedy Training on safe chemical application was given Trained spraying gangs (farmer) on how to wear PPEs and the essence of PPEs. | | |
| | Improper disposal of hazardous waste | | | | |
| | Poor storage of hazardous chemicals | | | | |
| | Recycle of hazardous chemicals | | | | |
| | Improper or poor records keeping of direct workers | | | <ul style="list-style-type: none"> Records of workers | |
| | | | | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|--|--|----------|
| | Improper or poor records keeping of contracted workers | | <ul style="list-style-type: none"> • Employment and other opportunities were given to local communities as much as possible. • Proper records of workers are kept and updated as appropriate | | |
| | Improper or poor records of primary supply workers | | | | |
| | Potentially could cause or aggravate land-use conflicts | | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | COMMENTS |
|----------|---|-----------------|--|--|----------|
| | | | <ul style="list-style-type: none"> 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 | | |
| | Unavailability and no/limited use of personal protective equipment | | <ul style="list-style-type: none"> Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate. Sensitization was done on the need for and proper usage of PPEs | <ul style="list-style-type: none"> Confirmation with workers | |
| | Limited awareness creation of programs on health and safety including chemical handling | | <ul style="list-style-type: none"> Design and implementation of awareness creation programs to educate persons on protecting workers' health and safety including paying attention to chemical handling was done | <ul style="list-style-type: none"> Training report On-site verification with farmers | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|--|---|--|---|--|----------|
| | | | <ul style="list-style-type: none"> Workers were required to wear suitable Personal Protective Equipment (PPE) as appropriate | | |
| Additional livelihoods Activities/Interventions | Generation of smoke from burning of biomass (debris and logs) during land preparation for vegetable farming | 4.01 Environmental Assessment 4.04 Habitats 4.09 Pest Management 4.36 Forests | <ul style="list-style-type: none"> Most biomass generated was used as firewood and also as pegs Minimized burning of biomass as much as possible Workers were required to wear 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 | <ul style="list-style-type: none"> Site observation Records of PPEs provided FGRM operationalized | |
| | Exposure of workers / communities to smoke | | <ul style="list-style-type: none"> Minimized burning of biomass as much as possible | <ul style="list-style-type: none"> Site observation Records of PPEs | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|---|---|----------|
| | generated during land preparation for vegetable farming | | <ul style="list-style-type: none"> Fire was used only in situations where this was effective and least environmentally damaging Workers were required to wear 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 | <ul style="list-style-type: none"> FGRM operationalized | |
| | Risks of pollute/contaminate water bodies (herbicides, pesticides, insecticides, weedicides, ash etc.) | | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Site observation Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|-------|-----------------|---|-------------------------------------|----------|
| | | | <ul style="list-style-type: none"> 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 assistance to leave a vegetation cover as a buffer zone along the water bodies. | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|---|---|----------|
| | | | <ul style="list-style-type: none"> 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 | | |
| | Potential Risks of locating activities within buffer zones or water bodies | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Site observation Training report | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|-------------------------------------|-----------------|---|---|----------|
| | | | <p>protecting the banks of the waterways from channel erosion.</p> <ul style="list-style-type: none"> Farmers trained to create buffer of no-spray zones in farms in 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 preparation | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Site observation Records of PPEs provided Training report FGRM operationalized | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|---|---|----------|
| | | | <ul style="list-style-type: none"> Minimized burning of biomass as much as possible Workers were required to wear 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 | | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Training report List of approved and unapproved agrochemicals shared | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|---|---|----------|
| | | | <ul style="list-style-type: none"> Education and sensitization were done on the proper use and dosage of agro-inputs | | |
| | Limited and/or untimely supply of cocoa seedlings | | <ul style="list-style-type: none"> Seedlings were supplied on time to meet onset of reliable rainfall Seedlings were sourced within close proximity/catchment area | <ul style="list-style-type: none"> Records of seedlings supply | |
| | Lead to the transportation of hazardous chemicals (herbicides, weedicides, and pesticides) | | <ul style="list-style-type: none"> Mass sprayers who spray agro chemicals for farmers have been cautioned and educated on proper disposal of chemical containers after use Farmers have been encouraged to report hazardous activities of neighbours to through the FGRM for correction remedy Training on safe chemical application was given | <ul style="list-style-type: none"> Training report 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 | | | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|---|-----------------|---|--|----------|
| | Improper storage of hazardous waste | | <ul style="list-style-type: none"> Trained farmers on how to wear PPEs and the essence of PPEs. | | |
| | Improper or poor records keeping of workers | | <ul style="list-style-type: none"> Employment and other opportunities were given to local communities as much as possible. Proper records of workers are kept and updated as appropriate | <ul style="list-style-type: none"> Records of workers | |
| | Potential aggravation of land-use conflicts | | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | COMMENTS |
|----------|--|-----------------|--|-------------------------------------|----------|
| | | | <ul style="list-style-type: none"> 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 | | |
| | Low percentage of women in livelihood improvement activities | | <ul style="list-style-type: none"> 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 | | |
| | Prioritization of a few demographic in terms of labour | | | | |
| | Unfair selection of beneficiaries | | | | |

| ACTIVITY | RISKS | OP TRIGGERED | MITIGATION MEASURES | INDICATOR/ MEANS OF VERIFICATION | COMMENTS |
|----------|--|-----------------|--|---|----------|
| | Limited awareness creation of programs on health and safety issues | | <ul style="list-style-type: none"> 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 were required to wear suitable Personal Protective Equipment (PPE) as appropriate | <ul style="list-style-type: none"> On-site verification with farmers | |

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).

7.0 OPERATIONALISATION OF FEEDBACK AND GRIEVANCE REDRESS MECHANISM (FGRM)

Feedback and Grievance Redress Mechanism (FGRM) is generally designed to be the “first line” of receipt and response to stakeholder feedback and/or concerns from implementation of GCFRP activities. This mechanism provides an enabling environment and structures for stakeholders to provide feedback and also access support for conflict resolution resulting from the program activities. Not all complaints/ conflicts are handled through the FGRM. Complaints of acts of criminal nature or grievances that allege corruption, coercion, or major and systematic violations of rights and/or policies are normally referred to organizational accountability mechanisms or administrative or judicial bodies for formal investigation, rather than to FGRMs for collaborative problem solving.

Broadly, the FGRM is operationalized in four steps. Parties seeking to have any REDD+ dispute resolved would file their complaint with the Safeguards Focal Person (SFP) at the district office (FSD) including the offices of the MMDAs within the ER program area where it will be received and processed before it is communicated through the Regional Safeguards Focal Person to the National FGRM coordinator to ensure transparency and the effective exercise of oversight responsibility.

1. If the parties are unable or unwilling to resolve their dispute through negotiation, fact-finding or inquiry a mediator chosen with the consent of both parties would be assigned to assist the Parties to reach a settlement.
2. Where the mediation is successful, the terms of the settlement shall be recorded in writing, signed by the mediator and the parties to the dispute and lodged at the FGRM registry. The terms of the settlement will be binding on all parties.
3. If the mediation is unsuccessful, the Parties will be required to submit their dispute for compulsory arbitration, by a panel of 5 arbitrators, selected from a national roster of experts.
4. The awards of the arbitration panel will be binding on the Parties and can only be appealed to the Court of Appeal. All questions of law would be referred to the High Court.

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

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 Asunafo - Asutifi HIA, there have been a few reports on grievances and feedback has been received.

Some documented activities under the FGRM are presented in annex 2.

8.0 INSTITUTIONAL STRENGTHENING AND CAPACITY BUILDING

Capacity building is viewed as more than training. It is human resource development and includes the process of equipping individuals with the understanding, skills and access to information, knowledge for successful implementation of the proposed projects. It also involves organizational development, the elaboration of relevant management structures, processes and procedures, not only within organizations but also the management of relationships between the different organizations and sectors (public, private and community).

In every engagement with stakeholders, the opportunity is taken to continuously build their capacities and provide updates on activities within the HIA and GCFRP as a whole.

Table 13: List of some Institutional strengthening and capacity building events

| S/N | Institution | Topics |
|-----|----------------------------|--|
| 1 | National REDD+ Secretariat | <ol style="list-style-type: none"> 1. Training on safeguards for REDD+ Regional and District focal persons 2. REDD+ Safeguards Training- Goaso Forest District 3. Engagement of community members and other stakeholders on REDD+ safeguards 4. Training on SIS and FGRM for REDD+ regional and district safeguards focal persons 5. REDD+ safeguards landscape monitoring and training |
| 2 | Wildlife Division | <ol style="list-style-type: none"> 1. Engagement of communities on livelihood improvements 2. Sensitization and education of communities on environmental protection |
| 3 | Forest Services Division | <ol style="list-style-type: none"> 1. Engagement of fringe communities on fire management 2. Engagement of fringe communities on shade tree management 3. Engagement of communities on conflict resolution |
| 4 | Ghana Cocoa Board | <ol style="list-style-type: none"> 1. Training of farmers on safe chemical application 2. Training of farmers on compost preparation and compost application 3. Training of farmers on buffer zone protection |

| | | |
|--|--|--|
| | | <ol style="list-style-type: none">4. Training of farmers on good agronomical practices5. Training of farmers on wildlife protection and conservation6. Training of farmers on proper disposal and storage of chemical waste.7. Engagement of farmers on shade tree management8. Training of farmers on additional livelihoods9. Training of farmers on financial management and records keepings. |
|--|--|--|

9.0 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: Lists of stakeholders engaged/trained****Training on safeguards for REDD+ Regional and District Focal Persons**

| | | | | |
|-------------------|--------------|----------|-----------|--|
| Lucy Amoh Ntim | ARM | Sunyani | 277019009 | lucyamohntim@live.co.uk |
| Oliver Chelewura | Park Manager | Sunyani | 200579502 | chelwra@yahoo.com |
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| Emmanuel Owusu | ADM | Dormaa | 208277175 | nana04gh@yahoo.com |
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| Abraham Essel | ADM | Atebubu | 548572171 | abrahamessel@gmail.com |

Participants list for REDD+ Safeguards Training and consultation- Goaso Forest Districts

| Name | Community | Contact |
|---------------------|----------------------|-----------|
| Evans Anane | E.T. Ventures | 542081434 |
| John Herman Antwi | Kataban Timbers | 243336952 |
| Thomas Antwi | Assembly Ltd | 249646928 |
| Thomas Antwi no. 2 | Assembly Ltd | 547613268 |
| Augustine Peprah | Asunafo North MA | 202368407 |
| Andrews Akafo | Asunafo North MA | 502006256 |
| Francis Awuku Ofori | SPD- Cocobod | 243634269 |
| E. O. Aduamah | MOFA | 208511357 |
| Hon. Theo | | |
| Daniel Amponsah G. | 1/C CREMA | 248209861 |
| Ebenezer Larbi | Div. Police HQ | 241506128 |
| Emmanuel Davidson | Municipal fire -OPTS | 549262499 |
| Gertrude Tetteh | FC-CCU | 247714079 |
| Rhoda Donkor | FC-CCU | 542546427 |
| Raymond K. Sakyi | FC-CCU | 201424410 |

| Name | Community | Contact |
|----------------------------|-----------------------------|-----------|
| Samuel Dotse | HATOF | 506679055 |
| Agnes Bananzi | Asutifi North Dist. DPO | 243475496 |
| Eric Gyamfi | UNDP-Goaso | 247436524 |
| Peter Kofi Beyeseh | Forestry | 244686552 |
| Charity Darko | FSD | 244646692 |
| Alex Oduro Kwarteng | FSD | 244778967 |
| Sylvester Agyemang Prempeh | FSD | 504841799 |
| Evelyn A. Konadu | FSD | 244966062 |
| Faustina Asante- Boateng | FSD | 244025212 |
| Francis Sarfo | FSD | 241207451 |
| Emmanuel Boateng | Asutifi South Planning off. | 206644289 |
| Paul Osei | Parks * Gardens | 244247124 |
| Sylvia Amoah | FSD | 240581660 |
| Grace Gyabaah | FSD | 244990296 |
| Ernest Adofo | FSD | 244819978 |
| Joseph Abilla | FSD | 243224731 |
| Lucy Amoah Ntim | FSD, Sunyani | 277019009 |
| Gertrude Bempong | FSD Goaso | 244960990 |
| Ntiamoah Micheal | FSD Goaso | 208217705 |
| Albert Awuah | FSD Goaso | 246277977 |
| Solomon Tengey | FSD Goaso | 244748377 |
| Loverth Kusi Nuaku | FSD - Goaso | 243755500 |
| John Atta | CHED - Goaso | 207333464 |
| Ameah Jacob | Kukuom | 243378287 |
| Adomdar Kwadwo | Ayonso | 545253911 |
| Opoku Gabriel | Goaso - FSD | 241047611 |
| Kwabena Sarpong | Goaso - FSD | 249757127 |
| Paul Boateng | Bediako - Chief | 542817261 |
| Amuzu Daniel | Goaso | 249761976 |
| Kofi Nsia K'dua | Goamu - K'dua | |

| Name | Community | Contact |
|---------------------------|---------------------------|-----------|
| Nana Kwasi Appiah | Chief - Nkensere | 544349892 |
| Nana Owusu Stephen | Nkobeahene - Nkensere | 245747212 |
| Nana Oduro Mensah | Nkyidomhene - Nkensere | 559977626 |
| Toffie Agyei | Nkensere C'ttee Chairman | 20306698 |
| Owusu Abraham | Nkensere | 243715029 |
| Agartha Afriye | Bediako - Ass member | 242909068 |
| Nana Gyamena | Abuasuppanin - Bediako | 27699788 |
| Teye Daniel | CREMA SEC - Bediako | 274684587 |
| Ababio Yeboah Emmanuel | Ayomso -Assemblyman | 249131930 |
| Yakubu B. B. Adams | Assemblymen Gambia 2 | 54155108 |
| Kwaku Bonsu | Community Member Gambia 2 | 551978266 |
| Nana Karim Saaina | Comm. Chairman Gambia 1 | 542846797 |
| Hon. Kwabena Dausa | Assemblyman Akrodie | 545873919 |
| Hon. Issahaku Iddrisu | Assemblyman Mim | 242883912 |
| Hon. Thomas Obeng Twumasi | Assemblyman Goaso | 243988872 |
| Gabriel Baafi | Comm. Ch. Mim | 243858349 |
| Nana Kofi Karikari | Chief Gambia 1 | 222467783 |
| Nana Bofuo Baah | Gyasehene - Kasapin | 241299985 |
| Hon. Benard Nti | Ass. Man -Biaso | 236051937 |
| Thompson Addo | C'ottee Chairman-Biaso | - |
| Nana Osei Kwabena | Dwatoahene- Asumura | 209391290 |
| Kofi Awuah Brobbey | Kenyasi No.1 T/C | 244521061 |
| Nna Adututu Forkuo | Dominase-Kyidohene | 547730493 |
| Nana Agyapong | Dominase-Kontihene | 242688771 |
| Nana Awuah Asibru | Akrodie-Akomhene | 242849593 |
| Nana Poku Kumah | Akrodie- Atipemhene | 273439883 |
| Nana kwame Opoku | Gambia NO.2 Hene | 243711738 |
| Nana Yaw Bofah | Mim - Nkobeahene | 242254079 |
| Nana Boakye Dankwah | Fawohoyeden-Chief | 244149616 |
| Nana Opoku Acheamfoh | Fawohoyeden- Nkobeahene | 206303517 |

| Name | Community | Contact |
|------------------------|-----------------------------|-----------|
| Nana Kofi Yeboah | Kenyasi I - Omanhene Kyeame | 242135273 |
| Nana Wireko Ampem | Kukuom -Kontihene | 246909197 |
| Nana Yaw Agyei | Kukuom-Mawerehene | 243969877 |
| Hon. Theophilus K. Adu | Assemblyman -Kensare | 556930679 |
| Antwi Mustapha | Akrodie | 556646429 |
| Kwasi Bio | Ayomso-comm.member | 243722117 |
| Raymond Kofi Sakyi | CCU-FC | 201424410 |
| Gertrude Tetteh | CCU-FC | 247714079 |
| Rhoda Donkor | CCU-FC | 542546427 |
| Enerst Adofa | F.S.D | 244819978 |
| Sylvester | F.S.D | 504841799 |
| Else Lossou | F.S.D | 265331951 |
| Lucy Amoh Ntim | F.S.D | 277019009 |
| Nana Kwabena Sarpong | Goaso -Omanhene rep | 245772411 |
| Samuel Dotse | HATOF | 506679055 |
| Sylvia Amoah | FSD | 240581660 |
| Kwame Asirifi | Asumura | 508707739 |
| Samuel Owusu | Asumura | 209603422 |
| Benard A. Otchere | FSD | 248985455 |
| Mashud Ibn Salam | FSD | 505005003 |
| Rashida Babie | FSD | 546553615 |
| Awarf K. Douglas | FSD | 249462447 |
| Solomon Tengey | FSD | 244748377 |
| Amankwah Jemima | FSD | 242664475 |
| Kofi Asiamah | Kenyasi | 248993978 |

Annex 2: Some recorded FGRM

The Feedback and Grievance Redress Mechanism was found to be operationalized at the institutional level. A number of cases of feed/grievance had been reported. In all cases responsible institutions had taken steps and had resolved those cases. The table below highlights on cases reported and the processes used in resolving them.

Table 14: FGRM recorded

| Institution | Number of Feed / Grievance received | Nature of feedback/Grievance | Status |
|--------------------|--|--|---------------------------|
| FSD | 25 | Access to fertile land within degraded forest reserves to undertake MTS where they are able to produce enough crops for sale | N/A |
| Cocobod | 29 | Access to free and improved cocoa and tree seedlings reduce the stress of having to purchase them by farmers | N/A |
| COCOBOD | 20 | Limited supply of cocoa and tree seedlings | Resolved through dialogue |

Annex 3 – Forest reserves condition scores and biodiversity assessment*Table 15: 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 16: 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 17: Ten most important tree species identified in forest ecosystems

| Species | Frequency |
|---------------------------------|-----------|
| <i>Celtis mildbraedii</i> | 182 |
| <i>Broussonetia papyrifera</i> | 107 |
| <i>Triplochiton scleroxylon</i> | 106 |

| | |
|-----------------------------------|----|
| <i>Nesogordonia papaverifera</i> | 77 |
| <i>Ricinodendron heudelotii</i> | 69 |
| <i>Calpocalyx brevibracteatus</i> | 64 |
| <i>Hymenostegia afzelii</i> | 64 |
| <i>Diospyros canaliculata</i> | 53 |
| <i>Sterculia rhinopetala</i> | 47 |
| <i>Discoglyprena caloneura</i> | 40 |

Table 18: Ten most important tree species identified on cocoa farms

| Species | Frequency |
|------------------------------|-----------|
| <i>Morinda lucida</i> | 77 |
| <i>Persea americana</i> | 57 |
| <i>Citrus sinensis</i> | 31 |
| <i>Carica papaya</i> | 20 |
| <i>Terminalia superba</i> | 18 |
| <i>Milicia regia</i> | 16 |
| <i>Antiaris toxicaria</i> | 15 |
| <i>Ficus exasperata</i> | 15 |
| <i>Ficus vogeliana</i> | 12 |
| <i>Holarrhena floribunda</i> | 12 |

Table 19: Red and Scarlet star rating of plant species recorded in the forests

| Species | Star Rating |
|------------------------------------|-------------|
| <i>Chidlowia sanguinea</i> | Blue |
| <i>Brevia leptosperma</i> | Blue |
| <i>Xylia evansii</i> | Blue |
| <i>Afzelia bella</i> | Red |
| <i>Amphimas pterocarpoides</i> | Red |
| <i>Anopyxis klaineana</i> | Red |
| <i>Antrocaryon micraster</i> | Red |
| <i>Canarium schweinfurthii</i> | Red |
| <i>Ceiba pentandra</i> | Red |
| <i>Celtis zenkeri</i> | Red |
| <i>Daniellia ogea</i> | Red |
| <i>Distemonanthus benthamianus</i> | Red |
| <i>Guarea cedrata</i> | Red |
| <i>Lovoa trichilioides</i> | Red |
| <i>Mansonia altissima</i> | Red |
| <i>Piptadeniastrum africanum</i> | Red |
| <i>Pycnanthus angolensis</i> | Red |
| <i>Terminalia superba</i> | Red |
| <i>Albizia ferruginea</i> | Scarlet |
| <i>Antiaris toxicaria</i> | Scarlet |
| <i>Entandrophragma angolense</i> | Scarlet |

| | |
|------------------------------------|---------|
| <i>Entandrophragma candollei</i> | Scarlet |
| <i>Entandrophragma cylindricum</i> | Scarlet |
| <i>Entandrophragma utile</i> | Scarlet |
| <i>Guibourtia ehie</i> | Scarlet |
| <i>Khaya grandifoliola</i> | Scarlet |
| <i>Khaya ivorensis</i> | Scarlet |
| <i>Milicia excelsa</i> | Scarlet |
| <i>Milicia regia</i> | Scarlet |
| <i>Nauclea diderrichii</i> | Scarlet |
| <i>Pouteria altissima</i> | Scarlet |
| <i>Pterygota macrocarpa</i> | Scarlet |
| <i>Tieghemella heckelii</i> | Scarlet |
| <i>Triplochiton scleroxylon</i> | Scarlet |

Table 20: Red and Scarlet star rating of plant species recorded in cocoa farms

| Species | Star rating |
|----------------------------------|-------------|
| <i>Pycnanthus angolensis</i> | Red |
| <i>Albizia ferruginea</i> | Scarlet |
| <i>Antiaris toxicaria</i> | Scarlet |
| <i>Entandrophragma angolense</i> | Scarlet |
| <i>Khaya grandifoliola</i> | Scarlet |
| <i>Milicia excelsa</i> | Scarlet |
| <i>Milicia regia</i> | Scarlet |
| <i>Milicia regia</i> | Scarlet |
| <i>Pouteria aningeri</i> | Scarlet |
| <i>Pterygota macrocarpa</i> | Scarlet |
| <i>Triplochiton scleroxylon</i> | Scarlet |

Table 21: Red and Scarlet star rating of plant species recorded in the cropland

| Species | Star rating |
|------------------------------------|-------------|
| <i>Afzelia bella</i> | Red |
| <i>Amphimas ptreapioides</i> | Red |
| <i>Ceiba pentandra</i> | Red |
| <i>Celtis zenkeri</i> | Red |
| <i>Daniellia ogea</i> | Red |
| <i>Distemonanthus benthamianus</i> | Red |
| <i>Pouteria altissima</i> | Red |
| <i>Pycnanthus angolensis</i> | Red |
| <i>Terminalia ivorensis</i> | Red |
| <i>Terminalia superba</i> | Red |
| <i>Albizia ferruginea</i> | Scarlet |
| <i>Antiaris toxicaria</i> | Scarlet |
| <i>Entandrophragma angolense</i> | Scarlet |
| <i>Entandrophragma candollei</i> | Scarlet |

| | |
|---------------------------------|---------|
| <i>Milicia excelsa</i> | Scarlet |
| <i>Milicia regia</i> | Scarlet |
| <i>Pterygota macrocarpa</i> | Scarlet |
| <i>Triplochiton scleroxylon</i> | Scarlet |

Table 22: Plant Species of Global Conservation significance recorded in the Asunafo-Asutifi HIA

| Species | IUCN Red List Category |
|------------------------------------|------------------------|
| <i>Tieghemella heckelii</i> | Endangered |
| <i>Albizia ferruginea</i> | Vulnerable |
| <i>Anopyxis klaineana</i> | Vulnerable |
| <i>Antrocaryon micraster</i> | Vulnerable |
| <i>Bombax brevicuspe</i> | Vulnerable |
| <i>Entandrophragma angolense</i> | Vulnerable |
| <i>Entandrophragma candollei</i> | Vulnerable |
| <i>Entandrophragma cylindricum</i> | Vulnerable |
| <i>Entandrophragma utile</i> | Vulnerable |
| <i>Guarea thompsonii</i> | Vulnerable |
| <i>Khaya grandifoliola</i> | Vulnerable |
| <i>Khaya ivorensis</i> | Vulnerable |
| <i>Nauclea diderrichii</i> | Vulnerable |
| <i>Milicia regia</i> | Vulnerable |
| <i>Nesogordonia papaverifera</i> | Vulnerable |
| <i>Pterygota macrocarpa</i> | Vulnerable |
| <i>Sterculia oblonga</i> | Vulnerable |
| <i>Terminalia ivorensis</i> | Vulnerable |
| <i>Vitex ferruginea</i> | Vulnerable |
| <i>Brevia leptosperma</i> | Near Threatened |
| <i>Chrysophyllum albidum</i> | Near Threatened |
| <i>Lannea welwitschii</i> | Near Threatened |
| <i>Milicia excelsa</i> | Near Threatened |
| <i>Pouteria altissima</i> | Near Threatened |

Table 23: Mammal Species of global and national conservation concern and forest reserve sites of their recorded presence in the HIA

| Species | | Threat status | National | Sites |
|------------------------------------|-----------------|---------------|------------|-------------------|
| <i>Pan troglodytes verus</i> | Chimpanzee | CR | Schedule I | Subim, Bonsambepo |
| <i>Loxodonta africana cyclotis</i> | Forest Elephant | VU | Schedule I | Asukese |

| | | | | |
|--------------------------------|--------------------------------------|----|--------------|--|
| <i>Colobus vellerosus</i> | White-thighed Colobus | CR | Schedule I | Bonsambepo, |
| <i>Procolobus verus</i> | Olive Colobus | VU | Schedule I | Bonkoni |
| <i>Cercopithecus lowei</i> | Lowe's monkey | VU | Schedule II | Asukese, Bonkoni, Ayum, Subim, Bonsambepo |
| <i>Anomalurus pelii</i> | Pel's Flying Squirrel | DD | Schedule II | Asukese, Bia-Tano, Ayum, Bonkoni, Bonsambepo |
| <i>Syncerus caffer nanus</i> | Forest Buffalo | NT | Schedule II | Bonkoni, Bia-Tano, Subim |
| <i>Tragelaphus eurycerus</i> | Bongo | NT | Schedule I | Bonsambepo, Bonkoni |
| <i>Cephalophus silvicultor</i> | Yellow-backed duiker | NT | Schedule I | Ayum |
| <i>Cephalophus dorsalis</i> | Bay Duiker | NT | Schedule II | Asukese, Ayum, Bia-Tano, Bonkoni, Bonsambepo |
| <i>Protoxerus aubinnii</i> | Slender-tailed squirrel | NT | Schedule III | Bia Tano |
| <i>Phataginus tricuspis</i> | White-Bellied / Tree Pangolin | EN | Schedule I | Asukese, Bonkoni, Ayum, Bia Tano |
| <i>Phataginus tetradactyla</i> | Black-bellied / Long-Tailed Pangolin | VU | Schedule I | Asukese, Bia Tano |
| <i>Civettictis civetta</i> | African Civet | | Schedule I | |
| <i>Genetta pardina</i> | Forest Genet | | Schedule I | |
| <i>Mellivora capensis</i> | Honey Badger | | Schedule I | |
| <i>Nandinia binotata</i> | Two-Spotted Palm Civet | | Schedule I | |
| <i>Perodicticus potto</i> | Bosman's Potto | | Schedule I | |
| <i>Galagoides demidovii</i> | Galago demidoff | | Schedule I | |
| <i>Epixerus ebii</i> | Palm Squirrel | | Schedule I | |

Table 24: Avifauna Species of global conservation concern recorded across some of the reserves in the HIA

| Species | | Threat status | Sites |
|----------------------------------|---------------------------|---------------|-------------------------|
| <i>Necrosyrtes monachus</i> | Hooded Vulture | CR | Ayum |
| <i>Psittacus erithacus</i> | Grey Parrot | EN | Ayum |
| <i>Picathartes gymnocephalus</i> | White-necked rockfowl | VU | Ayum, Subim, Bonsambepo |
| <i>Bleda eximia</i> | Green-tailed bristle-bill | NT | Ayum, Subim |

| | | | | |
|---------------------------------|--|-------------------------------|----|-------------|
| <i>Lamprotornis cuprecauda</i> | | Copper-tailed glossy starling | NT | Ayum, Subim |
| <i>Rufous-winged Illadopsis</i> | | Illadopsis rufescens | NT | Subim/Ayum |

Table 25: Reptile species of global conservation concern recorded across some of the reserves in the HIA

| Species | | Conservation Status (IUCN) | Site of Occurrence |
|------------------------------|------------------------------|----------------------------|----------------------|
| Common Name | Scientific Name | | |
| Home's Hinged Tortoise | <i>Kinixys homeana</i> | EN | Bia-Tano |
| Serrated Hinged Tortoise | <i>Kinixys erosa</i> | VU | Asukese |
| West African Dwarf Crocodile | <i>Osteolaemus tetraspis</i> | VU | Bia-Tano, Bonsambepo |

Annex 4 - Water quality Assessment*Table 26: Physico-Chemical Water Quality Analysis*

| Sample ID | Temp (°C) | Dissolved Oxygen (mg/L) | Turbidity (NTU) | Conductivity (µS/cm) | pH | Phosphate (mg/L) | Nitrate (mg/L) | Alkalinity (mg/L) | Hardness (mg/L) |
|--------------|--------------|-------------------------------|--------------------|-------------------------|------|---------------------|-------------------|----------------------|--------------------|
| Ayum River 1 | 25.9 | 3.44 | 46.3 | 153.1 | 6.55 | 1.39 | 0.4 | 32 | 52 |
| Ayum River 2 | 25.4 | 6.13 | 107 | 157.3 | 6.59 | 1.25 | 0.6 | 34 | 52 |
| Aboabo | 25.4 | 5.02 | 44 | 162.1 | 6.56 | 1.18 | 0.4 | 38 | 76 |
| Goa River | 25.6 | 4.29 | 37.7 | 85.9 | 6.52 | 1.36 | 1.0 | 20 | 44 |
| Abrensene | 24.4 | 3.57 | 41.5 | 102.5 | 6.52 | 1.54 | 1.3 | 26 | 52 |
| Bontwi | 24.9 | 2.4 | 188 | 93.2 | 6.56 | 1.46 | < | 18 | 36 |
| Bia River | 27.3 | 2.8 | 24 | 128.3 | 6.57 | 1.75 | 0.4 | 28 | 52 |

(Source: Water Sample from Field Assessment, 2020)

Table 27: Total Coliform Analysis for Water bodies in the Study Area

| Sample Water | Total Coliform Count /100ml (cfu) | | | Mean |
|-----------------------|-----------------------------------|-------------------|-------------------|--------------------|
| Ayum 1 (upper course) | 2.4×10^7 | 2.3×10^7 | 2.4×10^7 | 2.36×10^7 |
| Ayum 2 (Lower course) | 9.3×10^8 | 9.0×10^8 | 9.2×10^8 | 9.19×10^8 |
| Aboabo | 4.3×10^6 | 4.0×10^6 | 4.0×10^6 | 4.1×10^6 |
| Goa River | 2.4×10^9 | 2.3×10^9 | 2.3×10^9 | 2.33×10^9 |
| Abrensene | 4.3×10^8 | 4.0×10^8 | 4.2×10^8 | 4.17×10^8 |
| Bontwi River | 2.9×10^9 | 2.9×10^9 | 2.9×10^9 | 2.9×10^9 |
| Bia River | 1.5×10^8 | 1.5×10^8 | 1.5×10^8 | 1.5×10^8 |

(Source: Water Sample from Field Assessment, 2020)

Annex 5 - Ecologically and culturally Sensitive Areas in the HIA

Figure 12: A shrine in Ayum Forest Reserve belonging to natives of Ayomso



Figure 13: The Obuoho Shrine of the natives of Fawohoyeden located in the Subim Forest Reserve



Figure 14: A swamp pool in Compartment 21 of Bia-Tano Forest Reserve

Table 28: Ecologically sensitive habitats and areas within selected forest reserves in the HIA

| Forest Reserve | Hill Sanctuary | Swamp | Cultural | Provenance/Convalescence |
|-----------------|--|--|----------------------------------|---|
| Asukese | Suafe Hill (Compartment 114, 139 and 139) | Pool (Compartment 152) | Apomasu Shrine (Compartment 152) | Compartment 29, 39, 54, 65, 87, 88, 96, 116, 157 and 183 |
| Ayum | | Pool (Compartment 10) | Shrine (Compartment 36 and 47) | Compartment 19, 20 and 57 |
| Bia Shelterbelt | | Pool (Compartment 1, 8 and 14) | | Compartment 3, 12, 21, 23 and 24 |
| Bia Tano | | Pool/swamp (Compartment 21, 58 and 99) | | Provenance trial for <i>Chrysophyllum</i> spp. (Compartment 103 and 105) Provenance trial for <i>Guibourtia ehie</i> (Compartment 73 and 74) |
| Bosambepo | Compartment 24, 31, 32, 32A, 34, 35, 37, 38, 39, 40, 41-47 | | | <i>Aninigeria</i> spp. trial (Compartment 76), <i>Entandrophragma utile</i> trial (Compartment 90) |

| | | | | |
|---------|--|-----------------------------|--------------------------------|--|
| Bonkoni | | Pool (Compartment 28) | | |
| Subim | | Pool (Compartment 89) | Shrine (Compartment 114) | |

Annex 6 - Tree Species Densities in Cocoa Production Areas*Table 29: Distribution of trees on farm according LBCs*

| Company | # of Individual trees | # of species | # of family |
|----------------------------|-----------------------|--------------|-------------|
| Transroyal Company Limited | 733 | 68 | 32 |
| Adwumapa Buyers | 654 | 70 | 32 |
| Nyonkopa | 614 | 66 | 29 |
| FEDCO | 613 | 64 | 27 |
| Olam Ghana Limited | 545 | 64 | 29 |
| ECOM | 530 | 63 | 32 |
| PBC | 453 | 68 | 33 |
| Kuapa | 484 | 61 | 28 |

Table 30: Desirable and Undesirable non-cocoa tree species

| Desirable Species | | | Undesirable Species | |
|------------------------------|-----------------|--|-----------------------------|-----------------|
| Scientific name | Local name | | Scientific name | Local name |
| <i>Terminalia ivorensis</i> | <i>Emire</i> | | <i>Musanga cecropioides</i> | <i>Odwuma</i> |
| <i>Terminalia superba</i> | <i>Ofram</i> | | <i>Ceiba pentandra</i> | <i>Onyina</i> |
| <i>Milicia excelsa</i> | <i>Odum</i> | | <i>Blighia sapida</i> | <i>Akye</i> |
| <i>Alstonia boonei</i> | <i>Nyamedua</i> | | <i>Carapa procera</i> | <i>Sua-Bese</i> |
| <i>Pycnanthus angolensis</i> | <i>Otie</i> | | <i>Cola gigantea</i> | <i>Watapuo</i> |

Table 31: List of flora species of global conservation concern and their abundance

| Vulnerable species | Conservation Status (IUCN) | Abundance |
|---|----------------------------|-----------|
| <i>Albizia ferruginea</i> | VU | 37 |
| <i>Antrocaryon micraster</i> | VU | 8 |
| <i>Entandrophragma angolense</i> | VU | 64 |
| <i>Entandrophragma candollei</i> | VU | 1 |
| <i>Entandrophragma utile</i> | VU | 1 |
| <i>Khaya grandifolia</i> | VU | 2 |
| <i>Khaya ivorensis</i> | VU | 17 |
| <i>Milicia regia</i> | VU | 98 |

| | | |
|---|----|----|
| <i>Nauclea diderrichii</i> | VU | 2 |
| <i>Nesogordonia papaverifera</i> | VU | 50 |
| <i>Pterygota macrocarpa</i> | VU | 10 |
| <i>Sterculia oblonga</i> | VU | 7 |
| <i>Terminalia ivorensis</i> | VU | 68 |
| <i>Chrysophyllum albidum</i> | NT | 4 |
| <i>Lannea welwitschii</i> | NT | 56 |
| <i>Milicia excelsa</i> | NT | 86 |
| <i>Pouteria altissima</i> | NT | 8 |

Annex 7: List of approved and banned agro chemicals

| TRADE NAME | ACTIVE INGREDIENT | PRE-HARVEST INTERVAL | RE-ENTRY INTERVAL | DOSAGE |
|-----------------|-----------------------------------|----------------------|-------------------|----------------------|
| AKATE MASTER | <i>BIFENTRIN</i> | 21 DAYS | 48 HRS | 100 ML/ 11L of water |
| AKATE STAR 3 EC | <i>BIFENTRIN</i> | 21 DAYS | 48 HRS | 20 ML/ 11L of water |
| ACTARA | <i>Thiamethoxam</i> | 21 DAYS | 48 HRS | 17ML/11L of water |
| ACETA STAR | <i>Acetamiprid&Bifenthrin</i> | 21 DAYS | 48 HRS | 120ML/11L of water |

| | | | | |
|----------------|---|---------|--------|--------------------|
| ACATI POWER | <i>Thiamethoxam</i> | 21 DAYS | 48 HRS | 20ML/11L of water |
| PRIDAPOD | <i>IMIDACLOPRID</i> | 21 DAYS | 48 HRS | 20ML/11L of water |
| VIPER SUPER | <i>INDOXACARB AND ACETAMIPRID</i> | 21 DAYS | 48 HRS | 105ML/11L of water |
| GALIL 300 | <i>IMIDACLOPRID AND BIFENTRIN</i> | 21 DAYS | 48 HRS | 13ML/11L of water |
| AF CONFIDENCE | <i>CAPSAICIN</i> | 21 DAYS | 48 HRS | 200ML/11L of water |
| SIVANTO | <i>FLUPYRADIFURONE</i> | 21 DAYS | 48 HRS | 40ML/11L OF WATER |
| NORMAX 150 | <i>ALPHA-CYPERMETHRIN TEFLUBENZURON</i> | 21 DAYS | 48 HRS | 52 ML/11L WATER |
| BUFFALO SUPER | <i>ACETAPRIMID</i> | 21 DAYS | 48 HRS | 98ML/11L WATER |
| THODAN SUPER | <i>LAMBDA CYHALOTHRIN+ACETAMIPRID</i> | 21 DAYS | 48 HRS | 110ML/11L WATER |
| A1 | <i>IMIDACLOPRID</i> | 21 DAYS | 48 HRS | 20ML/11L WATER |
| CALLIFAN SUPER | <i>BIFENTHRIN+ACETAMIPRID</i> | 21 DAYS | 48 HRS | 20ML/11L WATER |
| AKATE GLOBAL | <i>THIAMETHOXAM</i> | 21 DAYS | 48 HRS | 20ML/11L WATER |
| RAGENT 200 | <i>FIPRONIL</i> | 21 DAYS | 48 HRS | 17ML/11L WATER |

FUNGICIDES

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

| | | | | |
|------------------------|---|---------|----------------|------------------------|
| <i>SidalcoDefender</i> | <i>DicopperChloride trihydroxide,SC</i> | 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 | 3 Bags/ acre |

| | | |
|-----------------------|---|--------------|
| | +18 | |
| Dua Pa | NPK 3-25-18- 7CaO+45+6MgO+0.3(B+Zn) | 3 Bags/ acre |
| 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 salts and esters
11. Dinitro-orthocresol (DNOC) and its salts (such as ammonium salt, potassium salt and sodium salt)
12. Endria
13. HCH (mixed isomers)
14. Heptachlor
15. Hexachlorobenzene
16. Parathion
17. Pentachlorophenol and its salts and esters
18. Toxaphene
19. Mirex
20. Methamidophos (Soluble liquid formulations of the substance that exceed 600 g active ingredient/l)
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 suspensions (CS))
24. Mephosfolan (Soluble liquid formulations of the substance that exceed 1000 g active ingredient/l)