GOVERNMENT OF GHANA

TREE CROPS DEVELOPMENT AUTHORITY

Ghana Cocoa Board
Poised to Maintain Premium Quality Cocoa

INTEGRATED PEST MANAGEMENT PLAN (IPMP) FOR THE

GHANA TREE CROP DIVERSIFICATION PROJECT (GTCDP)

Final Report

Seth Larmie, c/o SAL Consult Limited, P O Box GP20200, Accra
May, 2023

TABLE OF CONTENTS

LIST OF TABLES

LIST OF PLATES

LIST OF FIGURES

LIST OF ACRONYMS

CHED	Cocoa Health and Extension Department
COCOBOD	Ghana Cocoa Board
CRI	Crops Research Institute (CSIR)
CRIG	Cocoa Research Institute of Ghana
CSIR	Council for Scientific and Industrial Research
CSIR- CRI	CSIR Crop Research Institute
CSIR-OPRI	CSIR Oil Palm Research Institute
EPA	Environmental Protection Agency
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FASDEP	Food and Agriculture Sector Development Policy
FAGE	Federation of Associations of Ghanaian Exporters
FAO	Food and Agriculture Organisation
FBO	Farmer Based Organizations
FSRP	Food Systems Resilience Project
GoG	Government of Ghana
GRM	Grievance Redress Mechanism
GTCDA	Ghana Tree Crops Development Authority
GTCDP	Ghana Tree Crops Diversification Project
ICRAF	International Council for Research in Agroforestry
IFC	International Finance Corporation
IPMP	Integrated Pest Management Plan
LBC	Licensed Buying Company
METASIP	Medium Term Agriculture Sector Investment Plan
MoFA	Ministry of Food and Agriculture
MOGCSP	Ministry of Gender, Children and Social Protection
MSMEs	Micro Small and Medium Enterprises
NGO	Non- Government Organization
OHS	Occupational Health and Safety
PCU	Project Coordinating Unit
PIU	Project Implementation Unit
POM	Project Operating Manual
PPRSD	Plant Protection and Regulatory Services Directorate
SMEs	Small and Medium Enterprises
SOP	Standard Operating Procedures
SWIMS	Social Welfare Management Information System
TA	Technical Assistance
UNEP	United Nations Environment Programme
WBG	World Bank Group
WHO	World Health Organization

EXECUTIVE SUMMARY

This Integrated Pest Management Plan (IPMP) is intended to standardize pest management practices and address human and environmental safety concerns from the application of chemicals during the implementation of the Ghana Tree Crops Diversification Project (GTCDP). This is in line with national regulatory compliance requirements and along with the World Bank Environmental and Social Standard 3 (ESS3): Resource Efficiency and Pollution Prevention and Management.

The GTCDP aims, among other things, to support the existing capacity of the Ghana Cocoa Board (COCOBOD), and strengthen the nascent organizational capacity of the Tree Crops Development Authority (TCDA), and provide the optimal enabling environment by legalizing and implementing tree crop regulations and agribusiness policies.

In turn, this will ensure that local farmers, traders, and processors are adequately supported and able to generate jobs and profits from the production and processing of cocoa, cashew, coconut and rubber. Moreover, and at the most fundamental level, farmers will receive the necessary assistance to increase productivity. This includes the knowledge and funding necessary to adopt new climate-smart technologies to increase yields, reduce pests and diseases, rehabilitate land, and intensify production sustainably.
The project has four (4) components comprising:
Component 1. Institutional strengthening and value chain governance
Component 2. Improving tree crops productivity and climate resilience
Component 3. Support for Post-Harvest Management, Value Addition and Market Access; and
Component 4. Project Coordination, Management, Monitoring and Evaluation.

The Integrated Pest Management Plan for the GTCDP seeks to address the issues regarding pest or vector management approaches; pesticide use and management; policy, regulatory framework and institutional capacity, and monitoring and evaluation. The project's geographical scope includes five (5) regions and eleven (11) districts with substantial cocoa, cashew, rubber and coconut coverage.

The main activities that may involve the use of pesticides during implementation of the GTCDP will comprise the control of pests, diseases, nematodes and weeds; and prevention of invasive aquatic weeds when herbicides may be used. An overview of some pest and diseases that inflict the project crops and some general management methods to combat key diseases and insects are described in the report.

The Plant Protection and Regulatory Services Directorate (PPRSD) of MoFA, through the support of international development partners, has developed several booklets and manuals to serve as extension guides on integrated pest management practices for crop production. Some relevant ones for this project include manuals for Safe Use of Pesticides; IPM Practices; and Principles and Practices for Integrated Crop and Pest Management.

Some key challenges identified through previous studies as well as our engagement with stakeholders and observations during field visits centre around the following:

- Most farmers cannot afford buying pesticides in large volumes and therefore retailers are obliged to decant into smaller volumes/ containers which then poses handling problems for many shop keepers. The products are therefore supplied in other containers without handling instructions and any associated safety information sheets including expiry dates.
- Some retailers were observed to be selling other items not related to pesticides in their shops. Chances of cross contamination are high
- Retailers affiliated with suppliers receive training through the suppliers themselves but unfortunately there are many others who are not especially in the small communities
- The presence of adulterated and fake products on the market is of considerable concern. There are instances of alteration of expiry dates of pesticides, the change of labels on pesticide containers, and the preparation and bottling of mixtures in already used pesticide containers.
- The low literacy levels of many farmers expose them to these avoidable situations.
- Agricultural practices such as pesticides, antibiotics from fertilizers, and herbicides have serious environmental impacts in aquatic ecosystems. When these three stressors are considered together may result in changes via direct effects from antibiotics that result in bacterial population changes that affect the carbon cycle and can lead to anoxic conditions. Herbicides may affect the growth and diversity of photosynthetic species including primary producers, which affects the entire food chain in a 'bottom-up' capacity (Dodds, Whiles, 2010). Finally, pesticides may directly affect aquatic organisms through interference with normal biological mechanisms and also indirectly through prey-loss.
- Continued usage of pesticides could threaten the survival of small aquatic organisms that form the basis of the food web. In the aquatic ecosystems, runoff of organochlorine insecticides following rain events in adjacent streams lead to severe fish kills and the eradication of the stream invertebrate fauna over stretches of several kilometres.

Appropriate mitigation measures and implementation tools, as well as monitoring indicators, have been provided in the report in the form of an Action Plan to contain adverse occurrences as highlighted around the following areas:

- Abuses associated with pesticide supply and sales;
- General health and safety of farmers and environmental hazards.
- Likely pollution of water resources and aquatic life from pesticide usage;
- Poisoning from improper use of pesticides and disposal of used containers by farmers and farm assistants;
- Production losses from threats from other crop pests and diseases.

Implementation strategies have been proposed, including:

- Formation of Safeguard Team
- Registration and Training of Chemical Retailers
- Awareness Creation and Sensitization Workshops/ Seminars
- Participatory Pest Inventorizing and Monitoring
- Prevention of New Pest Infestation
- Integrated Pest Management Capacity Building
- Participatory Monitoring and Evaluation

An implementation budget of US$226,000 has been proposed.

1.0 INTRODUCTION

The Government of Ghana (GoG) through the Tree Crops Development Authority (TCDA) and Ghana Cocoa Board (COCOBOD) is collaborating with the World Bank to implement the Ghana Tree Crop Diversification Project (GTCDP).

The GTCDP among others aims at supporting the existing capacity of COCOBOD and strengthening the nascent organizational capacity of the TCDA and providing the optimal enabling environment through the legalization and operationalization of tree crop regulations and agribusiness policies. This in turn, will ensure that local farmers, traders, and processors are well supported and able to generate jobs and profits from production of cocoa, cashew, rubber and coconut tree crops. More importantly, and at the most fundamental level, farmers will be provided with the required support to increase productivity. This includes the knowledge and financing to adopt new, climate smart technologies to boost yields, reduce pest and disease, rehabilitate, and sustainably intensify production.

In this case, avoiding deforestation, mitigating the impacts of climate change and contributing to social sustainability. Farmers will also be provided with inputs, extension (technical assistance), organization, and digitization. Without traceable, digital systems in which farmers are uniquely identified, it is more difficult to ensure farmers receive fair prices and premiums for engaging in responsible – child labour free, deforestation free –, climate friendly production systems. Supporting farmers implies supporting the development and take up of practical, cutting-edge research on tree crops. This includes setting up laboratories that enable the transfer of genetic and plant varietals addressing the most critical issues faced on farm. The project design recognizes the need to invest in all these areas in the different segments of the tree crop systems and will support their development.

Project Area

Ghana has a population of about 32 million, with a per annum growth rate of 2.19 %, and a mean population density of 77 persons/km2. The population distribution is varied across the 16 administrative regions and eco-zones of the country, with 68% and 32% living in the rural and urban areas respectively.

About 52% of the labour force is engaged in agriculture, 29% in services and 19% in industry. Approximately, 39% of farm labour force is women. Agriculture contributes to 54% of Ghana's GDP, and accounts for over 40% of export earnings, while at the same time providing over 90% of the food needs of the country. Ghana's agriculture is predominantly smallholder, traditional and rain-fed (SRID, 2001).

About 136,000 km^2 of land, covering approximately 57% of the country's total land area of 238,539 km2 is classified as "agricultural land area" out of which 58,000 km2 (24.4%) is under cultivation and 11,000 hectares under irrigation. About 60% of all farms in the country are less than 1.2 hectares in size, 25% are between 1.2 to 2.0 hectares, with a mere 15% above 2.0 hectares. The mean farm size is less than 1.6 hectares. Small-size and medium-size farms of up to 10.0 hectares account for 95% of the cultivated land (SRID, 2001).

Ghana's farming systems vary with agro-ecological zones. However, certain general features are discernible throughout the country. The bush fallow system prevails wherever there is ample land to permit a plot to be rested enough to recoup its fertility, after one to three years' cultivation. Staple crops are often mixed-cropped while cash crops are usually monocropped.

In the forest zone, tree crops are significant with cocoa, oil palm, coffee and rubber being of particular importance. The food crops in this area are mainly inter-cropped mixtures of maize, plantain, cocoyam and cassava. The middle belt is characterized by mixed or sole cropping of maize, legumes, cocoyam or yam, with tobacco and cotton being the predominant cash crops. Cotton and tobacco are also important in the northern sector, where the food crops are mainly sorghum, maize, millet, cowpeas, groundnuts and yam. Rice is important in all the zones.

Although the majority of rural households keep some sort of livestock, livestock farming is adjunct to crop farming. Poultry predominates in the south, while cattle production is concentrated in the Savannah zones. Sheep and goat production is generally widespread throughout the country (MoFA, 1998).

The GTCDP's geographical scope will include five (5) regions and eleven (11) districts with substantial cocoa, cashew, rubber and coconut coverage, see Figure 1.

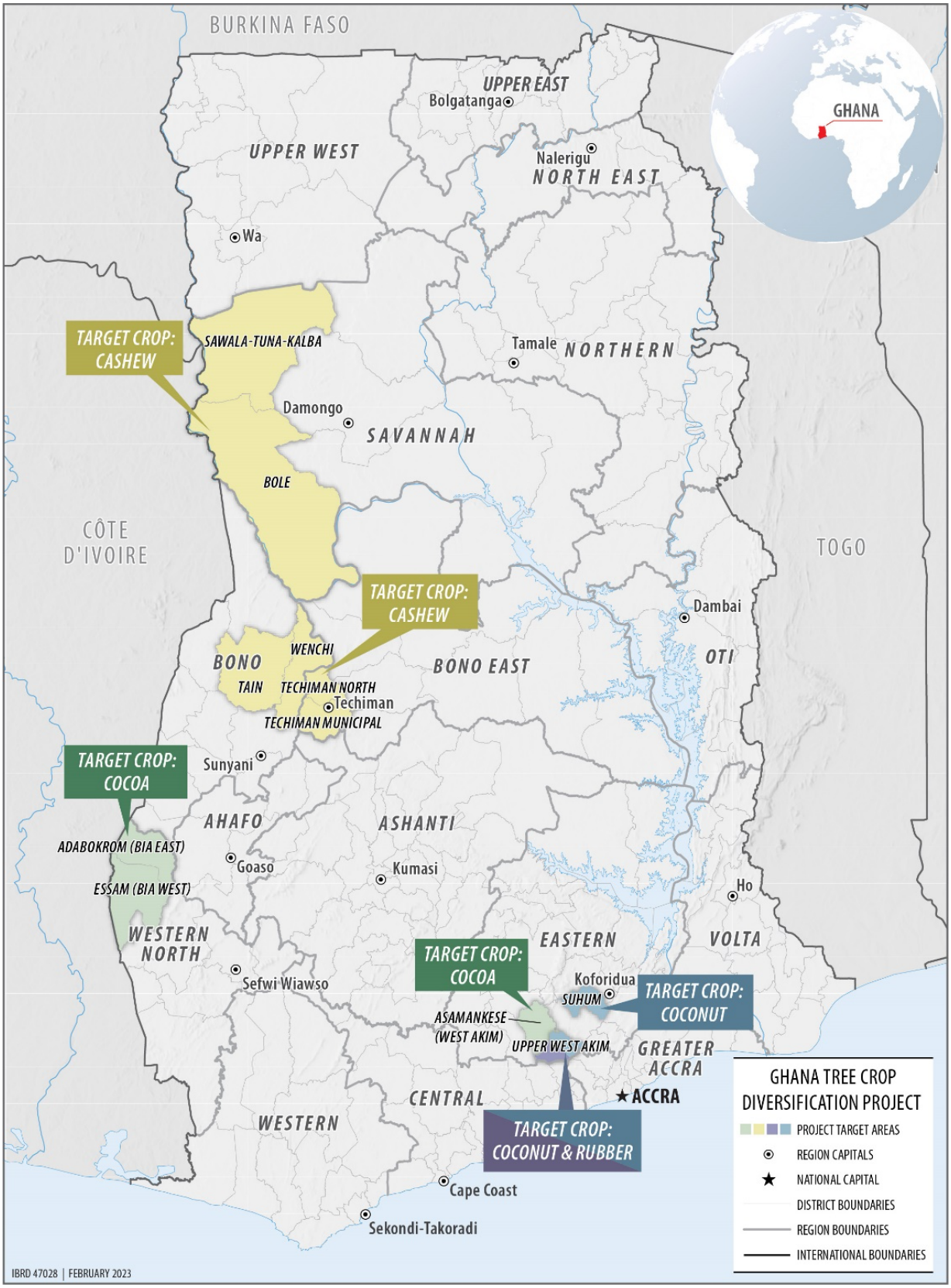

Figure 1: Project target regions and districts

1.1 Objectives of the Integrated Pest Management Plan (IPMP)

The purpose of this IPMP is to standardize pest management practices during project implementation in line with national regulatory compliance requirements, along with environmental and health safety requirements of the World Bank, including the FAO and WHO Guidelines for manufacturing, packaging, labelling, handling, storing, applying and disposing of pesticides. The safety issues for application of chemicals as a part of integrated pest management also will be highlighted.

The specific objectives of the IPMP are to:

- Follow recommended best practices to prepare a pest management plan;
- Assess the current and anticipate pest problems in the programme areas;
- Identify all the E&S risks/impacts associated with pest management and propose strategies for mitigation
- Evaluate the capacity of the country's regulatory framework and institutions to promote and support safe, effective, socially, and environmentally sound integrated pest management and to provide for appropriate institutional capacity support recommendations;
- Ensure compliance with regional standards, laws, and regulations; and
- Develop monitoring and evaluation systems for the various pest management practices of the IPMP based on the government laws and any existing relevant projects (e.g. the World Bank, FAO, WHO, UNEP etc.).

1.2 Rationale for the IPMP

The Integrated Pest management Plan (IPMP) is required to address the risk associated with pesticides and other agrochemicals.

There are community health risks due to potential use of agrochemicals under Component 2 activities. The potential environmental risks and impacts are largely envisaged to be localized and direct but those associated with potential surface water contamination through misuse of agrochemicals and pesticides may traverse communities downstream.

The essence of the IPMP is to also address concerns of relevant stakeholders with regards to pests and pesticides. It stresses the need to monitor and mitigate negative environmental and social risks and impacts of the Project including those associated with the use of pesticides. It seeks to promote ecosystem management with emphasis on human health risk from seed usage, through planting and growth stage and also post-harvest issues including safe crops for consumption. It emphasizes the need for an integrated approach to the management of pests in line with the nation's policy on IPMP as well as World Bank's requirements on integrated pest management and makes provision for adequate measures to enable the project sustain the adoption of IPMP techniques.

1.3 Methodology

The following methodologies/approaches were followed to prepare the IPMP:

- Review of available information
- Engagement with institutions and other bodies with interest and concern for pest management; and
- Reporting

Review of literature

Existing World Bank documents regarding the project (e.g., Project Concept Note - PCN, Project Appraisal Document – PAD, etc.) were reviewed. Background information on pest and pesticide management in Ghana including those found in previous and current World Bank projects such as the Ghana Commercial Agriculture Project (GCAP - P114264) and Food System Resilience Program – Phase 2 (FSRP2 - P178132) were extensively consulted. The World Bank ESS3/ OP 4.09, FAO, WHO International code of conduct on Pesticide Management, UNEP, UNITAR websites were visited.

Institutional and community engagements

Institutions identified include:

- Plant Protection and Regulatory Services Directorate – PPRSD; the Environmental Protection Agency – EPA etc.;
- Farmer and producer organizations; agricultural exporters organizations;
- Non-Governmental Organizations, consumer groups;
- Agrochemicals industry; private crop protection advisory firms.

As part of preparation of this IPMP, the following institutions and communities were selected and engaged to elicit ideas regarding their pest management as well as occupational health and safety practices and concerns:

- MoFA Station Manager, Wenchi
- Private Nursery Operator, Wenchi
- Agricultural Input Supplier, Wenchi
- Wenchi Municipal Assembly Agricultural Officer responsible for Crops,
- Wenchi Municipal Assembly Social Welfare Department
- Amponsakrom CHP compound, Wenchi
- COCOBOD Regional office Koforidua
- COCOBOD District office, Asamankese
- Wurompo Community Farmers Association, Wenchi; and
- Calvary Cocoa Partnership (Kwaku Sae Asafoatse)/ Brekumanso Cooperative/ Amanfrom Cooperative, Asamankese Cocoa District, Lower West Akim Municipal

Reporting

The report describes activities presented in the scope of work including an analysis of issues from the stakeholder consultations as well as integration into national Integrated Pest Management (IPM) programmes.

2.0 OVERVIEW OF THE GHANA TREE CROPS DIVERSIFICATION PROJECT (GTCDP)

The Project Development Objective (PDO) is to improve productivity, increase value added, and promote climate resilience for selected tree crop segments in project areas. . The selected tree crops include cocoa, rubber, cashew and coconut.

The project activities will be organized around three technical components and a fourth focused on project management and monitoring:

Component 1. Institutional Strengthening and Value Chain Governance

The objective of this component is to strengthen the institutional capacity of TCDA and COCOBOD and improve sector governance for competitive and sustainable development of tree crops. This will be achieved by: (i) supporting organizational capacity development of both institutions; (ii) operationalizing policies and regulations meant to improve the enabling environment; (iii) investing in digitizing the value chains for traceability including environmental and social sustainability, and (iv) building the national capacity to monitor and prevent child labour in the tree crop sector.

Subcomponent 1.1. Institutional capacity, policies, and regulations. The project will will support COCOBOB in implementing its Medium-Term Capacity Building strategy. Implementation includes strengthening the operational capacity of its technical departments like the research, monitoring and evaluation department (RM&E), the Cocoa Health and Extension Department (CHED), Quality Control and Cocoa Marketing, as well as the auxiliary departments including human resource, finance, internal audit, and information system departments. The project will also finance the following activities (i) COCOBOD Information Technology (IT) agility and paperless transformation of internal operations, as well as interoperability of administrative processes with the Cocoa Management System (software, IT equipment and training of staff; (ii) technical assistance (TA) to develop a methodology for measuring and monitoring carbon sequestration under cocoa farms, for accessing climate financing; (iii) TA to finalize and implement the policy and standards for cocoa agroforestry. These standards will guide on-farm productivity investments with environmental benefits (including Climate Co-Benefits); and (iv) a study to evaluate and propose modifications to expand cost-effective access to semi-finished cocoa products (liquor, butter, and powder) from free zones companies through regulatory or policy instrument changes. The COCOBOD Project Implementation Unit (PIU) will be responsible for implementing activities under this subcomponent.

For TCDA, the project will finance the Agency to build its organizational capacity to deliver efficient agri-value-chain oriented services. This includes the following activities: (i) conducting a needs assessment, developing a capacity building plan, and implementing this plan for organizational development; (ii) financing the development of administrative policies and manuals for TCDA internal operations; (iii) strengthening the governance of

the cashew, coconut and rubber value chain associations and their respective umbrella organizations. Support will be provided to the Federation of Associations of Ghanaian Exporters (FAGE), Cashew Council Coconut Federation – TCDA's service delivery value chain interlocutors; and (iv) financing the operationalization of the tree crops regulation passed by parliament in early 2023, that would improve the enabling environment, via zonal offices, district assemblies and other entities. TCDA will also carry out consultations and analysis to better understand the impacts of its levies, farmgate access policies, and subsidies on farmers, processors, enterprise owners, and other value chain actors' revenues and performance. TCDA's Project Coordination Unit (PCU) will be responsible for the implementation of the set of activities.

Subcomponent 1.2. Value chain digitization for traceability. Under this subcomponent, the project will finance COCOBOD's "last mile" roll-out of the Cocoa Management System (CMS) in project areas and train staff in the use of the system. The specific activities to finance under CMS include (i) functional operation for traceability (digital grading and sealing); (ii) making digital payments, input distribution, and other farm management services operational; (iii) training of COCOBOD and Licensed Buying Company (LBC) staff linked to quality control company (QCC), Cocoa Marketing Company (CMC), CHED, RM&E on how to use relevant applications of the CMS system; (iv) financing logistics for operationalization i.e. computers, tablets, basic connectivity, and vehicles; (v) capacity building, knowledge exchange, and study tours. The subcomponent will also finance the development and implementation of e-extension modules for CHED, leveraging CMS to offer extension. The financing will support farm-level tree tagging and remote sensing, the subcomponent will also monitor land use changes, study climate change patterns and their impacts, and estimate on-farm biomass and carbon storage that could benefit from climate financing. COCOBOD's PIU with CMS department will be responsible for implementing these activities.
TCDA will be financed to implement an existing blueprint for digitizing the value chains it oversees. Support will be provided for: (i) a web-based platform and apps for licensing and regulating the operations of tree crop value chain actors (including farmers and their FBOs); (ii) the mapping of value chain actors, including the mapping of farm parcels, and other data collection; (iii) the training of value chain associations (the Cashew Council and Coconut Federation) and TCDA staff in the use of the platform; and (iv) the upgrading and maintenance of a database of certified and traceable tree crop value chain actors (on the platform). TCDA's PCU will be responsible for implementing these activities.

Both systems at TCDA and COCOBOD will be designed to be interoperable with other databases to ensure that the digitized systems respond to international and regional quality standards around child labour, forest degradation, and deforestation.

Subcomponent 1.3. Preventing and responding to child labour. Under the subcomponent, an integrated, area-based child labor prevention, identification, and remediation strategy will be applied in the 11 project districts. The project will collaborate in part with the World Bank Ghana Productivity Safety Net Project (GPSNP) second phase and additional financing. The specific activities to be financed under the subcomponent are (i) support to tree crop project communities not supported by GPSNP to implement social protection

interventions. An earmarked fund from the tree crop project will be channeled to the relevant ministry programs for implementation. Funds will be for cash transfers and labor-intensive public works ; (ii) implementation of nationally representative child labor surveys for project tree crops and assessment of prior inter-ministerial interventions in child labor; (iii) set up of a national child labor implementation review committee for harmonizing ministerial interventions; (iv) set up of child labor desk or unit at COCOBOD and TCDA; (v) scaling up of MOGSCP SWIMS and MELR's GCLMS in the project districts currently not implementing these child labor monitoring systems; (vi) development of an interface between GCLMS and COCOBOD's CMS and TCDA's digital platform; (vii) increasing awareness, case management and remediation of child labor. This subcomponent will be implemented by COCOBOD's PIU and TCDA's PCU in collaboration with the GPSNP, Ministry of Local Government and Rural Development (MLGDRD), Office of the Head of Local Government Service (OHLGS), MOGCSP, MELR, Ghana Statistical Services (GSS) and the International Labor Organization (ILO).

Component 2. Improving Tree Crops Productivity and Climate Resilience

This component supports the productivity, profitability, and climate resilience of tree crop farms and these objectives will be achieved by: (i) strengthening research capacity for tree crops and ensuring collaboration with value chain actors to promote demand driven research; (ii) rehabilitating farms affected by cocoa trees disease through the use of a compensation mechanism and adoption of improved cutting, spraying, and other farming practices; (iii) supporting cashew, coconut and rubber nurseries engaged in climate-smart tree multiplication and input delivery centers; (iv) linking private sector service delivery to farmers via the coconut federation, cashew council and FBOs; and (iv) strengthening delivery of climate-smart extension and other relevant services. The component promotes reforestation, restoration of degraded lands, and carbon sequestration to maximize climate co-benefits (CCBs).

Subcomponent 2.1. Demand driven research. The project will finance COCOBOD and the Cocoa Research Institute of Ghana (CRIG) to integrate cutting edge technology into research programs relating to cocoa. Specific activities to be financed are (i) expanding and refurbishing laboratory space and upgrading equipment; (ii) capacity building and formal training of researchers; (ii) documentation of existing knowledge and gaps in current recommendations for CSSVD control; (iii) identification of all major CSSVD strains, early detection for CSSVD and ancillary research; (iv) research in priority topics for cocoa farmers. These activities will be implemented by the Cocoa Research Institute of Ghana (CRIG) under COCBOD PIU's supervision.

In cashew, coconut, and rubber research, activities to be financed are (i) establishing and upgrading in-vitro laboratories for cashew and coconut respectively, to develop high-yielding, pest- and disease-resistant, and climate-resilient tree crop varieties; (ii) capacity building and formal training of researchers; (iii) developing and disseminating appropriately stress-tolerant tree crop varieties for different geographical regions including, highly disease prone ones (iii) research in other priority areas. These activities will be implemented by CRIG, Oil Palm Research Institute (CSIR-OPRI), and the CSIR Crop Research Institute (CSIR-CRI) under the TCDA PCU's supervision. Under this subcomponent, for three years the project will finance TCDA to establish and

institutionalize a market-led tree crops research agenda platform. The platform will be a collaboration with research institutions, value chain actors, farmers and development partners and is expected to be sustainable after the third year.

Subcomponent 2.2 On-farm productivity enhancement and resilience: Under this subcomponent the project will finance COCOBOD's rehabilitation of CSSVD-infested farms. The specific activities to be financed are: (i) core rehabilitation by competitively selected private sector firms -slashing, cutting of diseased and contact trees, application of arboricide, reinspection or retreatment, production and supply of plantain seedlings, production and supply of permanent shade trees, and cocoa saplings; (ii) standard payment to farmers and landlords to compensate for a loss of income from cutting of cocoa trees; (iii) individual contracts with farmers for maintenance - weeding, refilling of cocoa and economic shade trees, pesticide, and fertilizer application; (iv) support for rolling out e-extension on CSA practices in agriculture; (v) certification of all rehabilitated farms.
The project investment for cocoa rehabilitation will be roughly US$ 64.49 million to rehabilitate 25,000 hectares, the bulk share of COCOBOD's project budget. COCOBOD would provide counterpart financing of around US$ 27.5 million.

The project financing for TCDA under this subcomponent in cashew, coconut, and rubber, will support private sector to deliver seeds, saplings, other inputs, and CSA practices to farmers. The activities to be financed include (i) matching grants for private sector nurseries to be able to access loans to scale up multiplication services; (ii) matching grants to input suppliers for certification and to be able to access loans for scale up; (iii) provision of inputs to farmers via private sector; and (iv) delivery of CSA via e-extension and training. Targeting of farmers for access to quality planting materials and inputs will involve the bulk share of spending of TCDA under component 2.2. Farmers will receive a subsidy for these inputs. TCDA's PCU will be responsible for implementing the above activities with support from MOFA departments.

Subcomponent 2.3 Strengthening of FBOs. The subcomponent will also build the capacity of FBOs to enhance their ability to implement and absorb the project's productivity investments. For this, the project will (i) offer training on group dynamics, management, good governance, business development, M&E, and financial literacy; (ii) support the registration of cocoa cooperatives and the development of organizational by-laws if needed, in order to facilitate FBOs' access to rural finance and the establishment of contracts with buyers; (iii) help FBOs develop a strategy to communicate outreach efforts, and (iv) provide technical assistance, including help with logistics and short-term access to expertise and equipment (IT, audio, logistics).

Component 3. Support for Post-Harvest Management, Value Addition, and Market Access

This component will support private investments in secondary value addition of SMEs in cocoa, cashew, and coconut value chains and in cashew and coconut processing units.

The component will involve these activities: (a) the promotion, mobilization and pre-screening of investments proposals via an independent selection committee; (b) the

establishment of a matching grant window within TCDA to partially finance the cost of eligible investments; (c) the technical assistance provided to investors for the detailed preparation of business plans to be presented to financial institutions; (d) technical assistance to investors for the start-up phase of their investments; and (e) support for export fairs in country to link local businesses to buyers.

The project's investment support mechanism will be designed in a way that ensures long-term sustainability. In particular, the following principles will be applied: (i) selection criteria of eligible investments will include indicators to assess the mitigation and adaptation benefits of the investments (with the objective that at least 75 percent of supported subprojects are expected to have CCBs); (ii) investment proposals will include environmental and social assessments in line with World Bank policies and environmental and social standards; and (iii) technical assistance will be provided during the start-up period (a critical phase) to improve sustainability and reduce the risk perceived by participating financial institutions (PFIs).

Component 4. Project Coordination, Management, Monitoring and Evaluation

This component will focus on the establishment of project coordination unit (PCU) at TCDA and project implementation unit (PIU) at COCOBOD for effective coordination, management, and project monitoring and evaluation (M&E). Key activities will include: (i) establishing and maintaining financial management and procurement systems; (ii) reporting on program activities; (iii) ensuring the full implementation of environmental and social safeguards; (iv) maintaining and ensuring the performance of the monitoring and evaluation system; and (v) developing and implementing a knowledge management and communication for development strategy. This component will also be leveraged for designing and monitoring gender, child labor and other inclusion issues that will be internalized to the project. The component will finance the needed recruitments of project personnel and the operating costs of the project. Through component 4, the implementation of a project baseline and impact evaluation with quasi-randomized control trial (including surveys as baseline, midterm and endline) will be financed through an independent firm/s to be hired with the relevant expertise

Selected regions and districts for the implementation of the project are presented in Table 1 below.

Table 1:Selected Regions and Districts for the Ghana Tree Crop Diversification Project

Commodities	Region	District	Selection Criteria	Total Land Area (Ha)	Land area being targeted (Ha)	Socio-economic Characteristics	Commodity Farmer population	Target farmers
Cashew	Savanna	Bole	High cashew production. High levels of poverty. Decline in quality and productivity levels due to inappropriate management practices	963,100	96,310	Population: 115,800 (M=59,903; F= 55,897)	21,509	5,377
		Sawala-Tuna-Kalba	High Level of production Potential for expansion. High levels of poverty. Decline in quality and productivity levels due to inappropriate management practices	460,100	46,010	Population: 112,664 (M=53,004; F= 59,660)	26,889	6,722
	Bono	Wenchi	Major cashew production. Processing area. Research Station. Decline in quality and productivity levels due to inappropriate management practices.	493,900	49,390	Population: 124,758 (M=60,960; F= 63,798)	63,840	15,960
		Tain	High cashew production. High levels of poverty. Decline in quality and productivity levels due to	195,300	19,530	Population: 115,568; (M = 58,382; F=57,186)	39,414	9,854

Commodities	Region	District	Selection Criteria	Total Land Area (Ha)	Land area being targeted (Ha)	Socio-economic Characteristics	Commodity Farmer population	Target farmers
			inappropriate management practices					
	Bono East	Techiman Municipal	Major production and trading hub of cashew in Ghana. Decline in quality and productivity levels due to inappropriate management practices	111,900	11,190	Population: 243,335; (M = 118,699; F=124, 636)	27,365	6,841
		Techiman North	Major production area, Decline in quality and productivity levels due to inappropriate management practices	38,940	3,894	Population: 102,529; (M = 50,248; F=52,281)	33,052	8,263
Rubber	Eastern	Upper West Akim	Predominant production area in Eastern region. Potential Expansion	34,320	8,580	Population: 93,391; (M = 45,548; F=47,843)	2000	500
Coconut	Eastern	Upper West Akim	Predominant production area in Eastern region. Potential Expansion due to proximity to urban market.	34,320	1,000	Population: 93,391; (M = 45,548; F=47,843)	1500	375
		Suhum	Emerging production area in Eastern region. Potential	101,800	1,000	Population: 126,403; (M =	500	125

Commodities	Region	District	Selection Criteria	Total Land Area (Ha)	Land area being targeted (Ha)	Socio-economic Characteristics	Commodity Farmer population	Target farmers
			Expansion due to proximity to urban market.			61,226; F=65,177)		
Cocoa	Western North	Bia East, Adabokrom	High prevalence of CSSVD in the Western North region	23,426.45	10,000	Population: 53,073; (M = 28,154; F=24,919)	8,500	5,500
		Bia West, Essam	High prevalence of CSSVD in the Western North region	26,785.49	10,000	Population: 115,881; (M = 59,955; F=55,926)	8,400	5,500
	Eastern Region	West Akim, Asamankese	High prevalence of CSSVD in the Eastern region	19,744.53	5,000	Population: 120,145; (M = 58,268; F=61,877)	13,500	3,000

Source: Population and Housing Census 2021; Ghana Agriculture Census 2021

3.0 DESCRIPTION OF POLICIES, LEGISLATION AND INSTITUTIONAL FRAMEWORK

The relevant national policies, legislation, institutional frameworks, and standards as well as international conventions necessary to guide the adoption of best integrated pest management methods for the GTCDP are described in this chapter.

3.1 Policy Framework and Guidelines

3.1.1 National Policies

Food and Agriculture Sector Development Policy (FASDEP)

The first FASDEP was developed in 2002 as a framework for the implementation of strategies for the modernization of the agricultural sector. The revised policy, FASDEP II emphasizes the sustainable utilization of all resources and commercialization of activities in the sector with market-driven growth in mind. Enhancement of productivity of the commodity value chain, through the application of science and technology, with emphasis on environmental sustainability. The policy contains policy objective on food security and emergency preparedness to guide the management of pest and disease incidences, and climate change related risks of hazards and disasters affecting agricultural production and productivity.

Guidelines for the National Plant Protection Policy, June 2004

This policy was enacted in 2004 with the goal of achieving an efficient system that ensures that crop losses caused by biological, environmental, and ecological factors are contained in a sustainable, and economical manner. The thirteen (13) principles underlying the policy include:

1. Capacity building at national, regional and district levels
2. Intra and inter-ministerial collaboration
3. Private sector involvement
4. Partnerships with international development partners
5. Regional and international cooperation
6. Legislation
7. Integrated Pest Management (IPM)
8. Coordination of IPM Activities
9. Contribute to IPM research
10. International trade
11. Planting materials production
12. Compliance
13. Participatory approaches and farmer empowerment

Principles 7, 8, and 9 provide for integrated pest management (IPM) issues. Principle 7 on IPM specifically *promotes Integrated Pest Management (IPM) as the standard plant protection strategy for all crops to effectively reduce crop losses with minimum pesticide use.*

The Plant Protection and Regulatory Services Directorate, PPRSD, is the national agency assigned the national mandate to organize, regulate, implement, monitor and coordinate plant protection services needed for sustainable agricultural growth and development.

The PPRSD has adopted the Food and Agriculture Organisation (FAO) definition of pest which is *any form of plant or animal life or any pathogenic organism that is injurious or potentially injurious to plants, plant products, livestock or people; pests include insects and other arthropods, nematodes, fungi, bacteria, viruses, vertebrates and weeds.*

National Water Policy, June 2007

This policy was approved in June 2007 with the aim of providing the framework for the sustainable development of water resources in Ghana. As captured in the policy, the overall goal of the policy is to "achieve sustainable development, management and use of Ghana's water resources to improve health and livelihoods, reduce vulnerability while assuring good governance for present and future generations.

There are number of relevant sections of the policy that pertains to the TCDP. Section 2.2.3 focus on Water for Food Security. The key objectives of the section are to:

- ensure availability of water in sufficient quantity and quality for cultivation of food crops, watering of livestock and sustainable freshwater fisheries to achieve sustainable food security for the country; and
- ensure availability of water in sufficient quantity and quality to support the functions of the eco- systems in providing alternative livelihoods.

Relevant policy measures to be undertaken which are in conformity with the TCDP include:

(a) Policy measure iii - Promote partnership between the public and the private sector in the provision of large commercial irrigation infrastructure taking into consideration effects on economy, culture, environment and health;
(b) Policy measure iv - encourage the efficient use of fertilizers to reduce pollution of water bodies and ensure conservation of water;
(c) Policy measure v - promote and encourage water use efficiency techniques in agriculture and reduce transmission losses of water in irrigation systems; and
(d) Policy measure vi - manage land use and control land degradation, including bush fires, to reduce soil loss and situation of water bodies.

Even though the policy is silent on the use of pests or pesticides, water quality concerns are cited in many instances in the policy document which could generally encompass pollution concerns not only from fertilizers but also from pesticides as well.

National Environment Policy/ Action Plans, 2012

The main objective of this policy is to ensure sustainability by ensuring a sound management of resources and the environment, and to avoid any exploitation of these resources in a manner that might cause irreparable damage to the environment. The policy provides for maintenance of ecosystems and ecological processes essential for the functioning of the biosphere, sound management of natural resources and the environment, and protection of humans, animals and plants and their habitats. The policy objectives seem to be clearly in line with integrated pest

management principles.

3.1.2 Applicable International Requirementss

The relevant international guidelines to assist with the project include the following:

- World Bank Environmental and Social Standards (ESS 3 – Resource Efficiency and Pollution Prevention and Management)
- FAO's International Code of Conduct on Pesticide Management,
- WHO Recommended Classification of Pesticides, and
- Annexes A and B of the Stockholm Convention (*Annex A (Elimination): Parties to take measures to eliminate the production and use of these chemicals listed under this Annex. Annex B (Restriction): Parties must take measures to restrict the production and use of chemicals listed under this Annex)*
- ECOWAS Regulation on the Harmonization of the Rules Governing Pesticides Registration

World Bank Environmental and Social Standards (ESSs)

The World Bank Environmental and Social Standards (ESS) set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing. ESS1, Assessment and Management of Environmental and Social Risks and Impacts, requires environmental and social assessment of projects that are considered to have potential adverse impacts on the environment, people and communities to help ensure that they are environmentally and socially sound and sustainable. The following World Bank Environmental and Social Standards (ESSs) are relevant for the project:

- ESS1: Assessment and Management of Environmental and Social Risks and Impacts
- ESS2: Labour and Working Conditions
- ESS3: Resource Efficiency and Pollution Prevention and Management
- ESS4: Community Health and Safety
- ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- ESS8: Cultural Heritage
- ESS10: Stakeholder Engagement and Information Disclosure

For this report, pest management (which is a requirement of ESS 3) is considered.

ESS3- Resource Efficiency and Pollution Prevention and Management

ESS3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention, and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable. Where projects involve recourse to pest management measures, the

Borrower will give preference to integrated pest management (IPM) or integrated vector management (IVM) approaches using combined or multiple tactics. This standard supports safe, effective, and environmentally sound pest management. It promotes the use of biological and environmental control methods. The policy aims at assisting proponents to manage pests that affect either agriculture or public health, supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. The standard calls for assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users for procurement of any pesticide in Bank-financed projects. It is a requirement that pesticides that will be used, will be manufactured, packaged, labelled, handled, stored, disposed of, and applied according to standards acceptable to the Bank.
This standard will be relevant for the TCDP due to application of pesticides and herbicides to boost productivity of the selected tree crops.

FAO's International Code of Conduct on Pesticide Management
The International Code of Conduct on Pesticide Management is a framework on pesticide management for all public and private entities engaged in or associated with, production, regulation and management of pesticides. It was approved by the FAO conference in June 2013. The Code of Conduct on Pesticide Management sets out a framework and standards of conduct for managing pesticides throughout their life cycle. It is directed primarily at government authorities and the pesticide industry but is also relevant for other stakeholders.

WHO Recommended Classification of Pesticides
The WHO Recommended Classification of Pesticides by Hazard was approved by the 28th World Health Assembly in 1975 and has since gained wide acceptance. The document lisits common technical grade pesticides and recommended classification s together with a listing of active ingredients believed to be obsolete or discontinued for use as pesticides, pesticides subject to the prior informed consent procedure (Rotterdam Convention) limitations to trade because of the Stockholm Convention (Persistent Organic Pollutants) etc

ECOWAS Regulation on the Harmonization of the Rules Governing Pesticides Registration
The Regulation C/REG.3/08/2008 was adopted at the 60th Ordinary Session of the ECOWAS cabinet meeting of Ministers held in Abuja on 17th and 18th May 2008. The regulation aims to harmonize the rules governing registration of pesticides in the ECOWAS region. It defines the requirements for registration of pesticides and the contents of the registration dossier.

3.2 Regulatory Framework

3.2.1 National Laws

The national laws pertaining to integrated pest management (IPM) include the following:

Pesticides Control and Management Act, 1996 (Act 528)
This Act provides for the registration of pesticides and the licensing of pesticides dealers and related matters.

No person shall import, export, manufacture, distribute, advertise, sell or use any pesticide in Ghana unless the pesticide has been registered with the Environmental Protection Agency (sect. 1).
Section 2 allows for the manufacture of pesticides for exportation if certain requirements are met. The Agency shall classify the pesticides for which an application for registration has been made. Pesticides classified as "restricted", "suspended", or "banned" are subject to the Prior Informed Consent Procedure defined in section 41 of this Act (sect. 4).
No person shall import, export, manufacture, distribute, advertise or sell any pesticide except in accordance with a licence issued under this Act. Conditions for licence may be prescribed, from time to time, by the Agency (sect. 17). Section 21 lays down certain rules with respect to use of pesticides and the harvest and sale of foodstuffs on which pesticides have been used.
The powers and functions conferred upon the Agency under this Act shall be exercised by the Environmental Protection Agency Board (sect. 29).
Section 30 provides for the establishment of a Pesticides Technical Committee.

Environmental Protection Agency Act, 1994 (Act 490)
This Act specifies the guideline and rules guiding the dealing with distribution, use and disposal of pesticides in Ghana. The act aims at controlling the volumes, types, components, wastes effects or other sources of pollution elements or substances that are potentially dangerous for the quality of life, human health and the environment. Part II of the Act 490 specifically deals with pesticides control and management, and this was formally an Act on its own (Pesticides Control and Management Act of 1996, Act 528). This section of Act 490 provides the rules for registration, pesticides classification, approval, clearance, using, disposing of and non-disclosure of confidential information, the granting of license, labelling and pesticides inspections.

Environmental Assessment Regulations, 1999 (LI 1652) and its Amendment of 2002, (LI1703)
The regulation makes an environmental assessment mandatory as part of project implementation and permit acquisition process. The Regulations describe the procedures to be followed to obtain permits for both existing and proposed undertakings through the conduct of environmental impact assessments and preparation of environmental management plans. The Environmental Assessment (Amendment) Regulations 2002, LI 1703 establishes the charges to be taken by the EPA for review and issuance of a Permit.

Water Resources Commission Act, 1996 (Act 522)
The Act conferred on the Water Resource Commission (WRC) the mandate to regulate and control the use of water resources through granting of water rights and water use permits. The Water Use Regulations, (L.I.1692) provides the procedure for allocating permits for various water uses including domestic, commercial, municipal, industrial, agricultural, power generation, water transport, fisheries (aqua culture), and recreational.

Section 24 of the Act on Pollution of water states that: *A person who, except in accordance with the provisions of this Act or with the approval of the Environmental Protection Agency (a) interferes with or alters the flow of, or (b) pollutes or fouls, a water resource beyond the level that the Environmental Protection Agency may prescribe, commits an offence and is*

liable on conviction to a tine not exceeding five hundred penalty units or to a term of imprisonment not exceeding two years or to both the fine and the imprisonment.

Plants and Fertilizer Act, 2010 (Act 803)

The Act combines the Seed Inspection and Certification Decree, NRCD 100 of 1972 and the Prevention & Control of Pests and Diseases of Plants Act of 1965, Act 307. The Act provides for the efficient conduct of plant protection to prevent the introduction and spread of pests and diseases to regulate imports and exports of plants and planting materials; the regulation and monitoring of the exports, imports and commercial transaction in seeds and related matters; and control and regulation of fertilizer trade.

Food and Drugs Act, 1996 (Act 523)

Section 13 of the Act deals with prohibition on disposal of chemical substances and it states that: *A person commits an offence if that person uses or disposes of a chemical substance in a manner likely to cause*

(a) contamination of food or water for human or animal consumption, or

(b) injury to, or be dangerous to the health of a person or an animal.

The Act defines a chemical substance to include an insecticide, rodenticide and a pesticide. It stipulates that "chemical substance" means a substance or mixture of substances prepared, sold or represented for use as: (a) a germicide, (b) an antiseptic, (c) a disinfectant, (d) a pesticide, (e) an insecticide, (f) a rodenticide, (g) a vermicide, or (h)a detergent, or any other substance or mixture of substances declared by the Minister, after consultation with the Board, to be a chemical substance.

Some key International Conventions

Ghana is a signatory to many conventions on the protection of the environment, which have relevance to the IPMP under study. Some of these conventions ratified by Ghana pertaining to the Project include:

- International Code of Conduct for the distribution and use of FAO pesticides
- The Basel International Convention on the Transboundary Movement of Hazardous Waste of March 22, 1989;
- Convention concerning protection against the risks of poisoning due to benzene, adopted in Geneva in 1971;
- The Rotterdam Convention on Prior Information and Contentment Principle (PIC)
- Bamako Convention on the Prohibition of the Import into Africa of Hazardous Wastes and on the Control of Transboundary Movements and the Management of Hazardous Wastes Produced in Africa, adopted in Bamako on 31 January 1991;
- The Basel Convention on Persistent Organic Pollutants (POP's), adopted in Stockholm 22 May 2001;
- International Standards for Phytosanitary Measures (ISPM) FAO;
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, adopted on 10 September 1998;
- Vienna Convention for the Protection of the Ozone Layer, adopted on 22 March 1985;
- International Plant Protection Convention adopted on 6 December 1951 and entered into force on 4 April 1991.
- Ramsar Convention on Wetlands for Wetlands of International Importance, adopted on

February 2, 1971 and entered into force in 1972.

Regulatory activities at ECOWAS Level

Members of the ECOWAS countries joined the process of harmonization of the rules defining the accreditation of pesticides in the ECOWAS region in 2005. A regulation was subsequently issued in 2008 after several regional validation workshops. The purpose of this Common Regulatory C / REG.3 / 05/2008 harmonizing the rules governing the registration of pesticides in the ECOWAS region is, in particular, to:

- protect the people and the West African environment against the potential dangers of pesticide use;
- facilitate intra and inter-state trade in pesticides, through the establishment of mutually agreed rules and principles at the regional level to dismantle trade barriers;
- facilitate convenient and timely access to quality pesticides for farmers. This regulation applies to all activities involving experimentation, as well as authorization, trade, use and control of pesticides and bio-pesticides in the Member States.

Ghana, although a stakeholder in the consultations on the harmonization process, the country is yet to implement this common regulatory on pesticides registration.

3.2.2 Regulatory and Institutional Gap Analysis

Previous reports have indicated that, the enactment of laws and policies particularly the EPA Act 1994 (Act 490) by Government of Ghana shows government commitment towards the sound management of pesticides. Consequently, the EPA has established a pesticide management scheme, which involves the management of pesticides from cradle to grave. However, challenges still exist with regards to effective implementation of the established laws and policies. This has been attributed to the absence of a full complement of relevant regulations to give effect to some of the provisions of the law. There is therefore the need to address the gap in the legal framework and other legislative inadequacies by reviewing and enacting the relevant regulations to enhance compliance.

3.3 Administrative and Institutional Capacity

The leading government agencies responsible for the control and management of pest and pesticides include institutions such as the Environmental Protection Agency (EPA), Plant Protection and Regulatory Services Directorate (PPRSD), Ghana Standard Authority (GSA), Food and Drugs Authority (FDA) etc.

The PCU will collaborate with these institutions to achieve the objectives of the IPMP. The mandates of these key institutions are described as follows:

<u>Environmental Protection Agency (EPA)</u>

The EPA is a regulatory body under the Ministry of Environment, Science, Technology and Innovation (MESTI) with the oversight responsibility for pest management and control and it has the following prerogatives:

- The registration of pesticides
- The limitation or banning of the use of a pesticide if necessary

- The granting of licences to all categories of pesticides' resellers
- The levying of penalties.

The Chemical Control and Management Centre (CCMC) of the EPA is responsible for pesticides control and management. It has offices in all regions as well as three district offices. The Agency periodically provides a list of registered pesticides and banned pesticides for public consumption. The recent list is provided in **Annex 1.** The list is periodically updated and there is the need to liaise with the agency for any updates during project implementation.

The Pesticide Technical Committee (PTC) is a committee of the EPA Board. It is the organ for approval of pesticides. The committee consists of 13 members drawn from relevant institutions with expertise in pesticide management. The institution includes:

- The Chemistry Department of the National Nuclear Research Institute (NNRI) of the Ghana Atomic Energy Commission (GAEC);
- Cocoa Services Division of the Ghana Cocoa Board;
- Plant Protection and Regulatory Services Directorate of the Ministry of Food and Agriculture;
- Veterinary Services Department of the Ministry of Food and Agriculture;
- Ministry of Health;
- Ghana Standards Authority;
- Ghana Revenue Authority/Customs Division;
- Association of Ghana Industries;
- Ghana National Association of Farmers and Fishermen;
- Ministry of Lands and Forestry;
- Ministry of Environment, Science, Technology and Innovation (MESTI) through the Environmental Protection Agency (EPA).

<u>The Ghana Standards Authority (GSA)</u>

The GSA is a regulatory body under the Ministry of Trade and Industry (MoTI) with the full responsibility of ensuring the quality of the infrastructure including the Metrology, Standards, Assessment/Test and Quality control (MSTQ). It ensures goods and services are of acceptable quality for both local and international consumers. The Authority makes routine analyses of pesticides residues in fruits and vegetables in order to facilitate the exportations of these products and also protect the public health and ensure safety.

The GSA has offices across the country. GSA has been supported by the World Bank-funded Agriculture Services Sub-Sector Investment Programme (AgSSIP) and United Nation Industrial Development Organisation (UNIDO) to bring its Maximum Residue Limit (MRL) analysis capacity up to ISO 17025 requirements.

<u>Food and Drugs Authority (FDA)</u>

The FDA is a regulatory agency under the Ministry of Health responsible for ensuring that any activity concerning chemicals be registered including, pesticides. By law, the FDA is authorized at any normal hour to inspect any container or package, and if they suspect it to contain any type of pesticide, they are also vested with the authority to seize such products. The FDA has offices across the country.

Customs Division of the Ghana Revenue Authority (GRA)

The Customs Division (CD) of the Ghana Revenue Authority (GRA) is a regulatory body under the Ministry of Finance and Economic Planning and works in close collaboration with the EPA and PPRSD, and reviews the EPA documents, certificates and licenses to make sure they concern the importation of approved chemicals, meat and agrochemical products. The importation reports of chemical products are submitted by the CD to the EPA on a quarterly basis. The CD staff are members to the various technical committees of the EPA including the hazardous waste committee, the pesticide technical committee and other related projects undertaken by the EPA. The Customs Excise and Preventive Services (CEPS) is a member of the national coordination team of the Convention of Stockholm on Persistent Organic Pollutants (POPs).

Ministry of Food and Agriculture (MoFA)- Plant Protection and Regulatory Services Directorate (PPRSD)

The Ministry of Food and Agriculture (MoFA) is the lead agency responsible for the agricultural sector within the context of a coordinated Government Programme. To carry out its function, plans and programmes are coordinated through policy and strategy frameworks. The Ministry is responsible for the regulation of pesticides use in the country. The Plant Protection and Regulatory Services Directorate (PPRSD) of MoFA was established in 1965 by an Act of Parliament: Prevention and Control of Pests and Diseases of Plants Act of 1965 (Act 307) now replaced by "Plants and Fertilizer Act, 2010 (Act 803).

The PPRSD as one of the Technical Directorates of MoFA, is the national institution with the mandate and capacity to organize, regulate, implement and coordinate the plant protection services (including pest management and pesticide use) needed for the country in support of sustainable growth and development of agriculture.

The PPRSD has its headquarters in Pokuase near Accra and there are also regional officers in all the regions of the country. It is also represented at the main entry and exit points throughout the country. It is not directly represented at the district level however, it collaborates with the district MoFA offices to carry out its functions at that level. The PPRSD is divided into four main Divisions and these include:

- Crop Pests & Diseases Management Division
- Pesticide and Fertilizer Regulatory Division
- Ghana Seed Inspection Division, and
- Plant Quarantine Division

Crop Pests & Disease Management Division

The division develops Good Agricultural Practices (GAPs), guidelines for Integrated Pest Management (IPM) of food crops. The division also provides information on pests and disease situation. The division also carries out training in GAPs and provides comprehensive diagnostic and identification services of plant pests and diseases for stakeholders, monitors the pest situation in the country, ensures effective control of plant pests, manages calamity pest outbreaks (e.g. armyworms, grasshoppers etc), and carries out classical bio-control measures (mass rearing and release of bio-agents), and serves as secretariat for National Fruit Fly

Management Committee and National IPM programme.

Pesticide and Fertilizer Regulatory Division
The Division supervises and trains Regulatory Inspectors, publishes information materials, registers and trains pesticides and fertilizer dealers and applicators, keeps records as well as statistics of pesticides and fertilizers and manages pesticide and fertilizer stocks in the country. It supervises bio-efficacy trials carried out by research.

Ghana Seed Inspection Division
The division is responsible for seed certification. Services provided are indicated as follows:

Seed growers: (1) Registration of Seed Growers; (2) Monitoring of seed and planting material production of crop species; (3) Certification of Foundation and Certified Seeds and also Primary and Secondary planting materials (4) Training of major stakeholders (Seed Inspectors, Registered Seed Growers, Seed Dealers, Extension Staff of MOFA and NGO's etc) (5) Facilitation of promotional activities in the seed industry.

Seed dealers: (1) Registration of Seed Dealers; and (2) Monitoring of Seed Dealers' outlets

Seed importers and exporters: (1) Registration of importers; (2) Monitoring of importers' outlets (3) Registration of exporters; and (4) Monitoring of exporters' outlets

Farmers: (1) Education and awareness creation on the benefits of utilization of certified seed/planting materials

National Seed Testing Laboratory (NSTL)
The facility carries out seed sampling and seed quality tests such as moisture, purity, germination and health before seeds are certified for distribution and marketing. The laboratory is yet to be accredited by the International Seed Testing Association (ISTA). The facility is located at Pokuase near Accra.

Seed growers: Seed growers are expected to contact the nearest regional agricultural office and register with the regional/zonal seed coordinator. All the locations of seed fields must be declared at the time of registration for monitoring and field inspection. Registration of seed growers is for two years and renewed annually.

Seed dealers: Seed dealers are also registered at the nearest regional agricultural office by the regional/zonal seed coordinator to qualify as a seed dealer. All dealer outlets are expected to be declared at the time of registration for monitoring. Registration is for two years and renewed annually.

Seed importers: Seed importers are also required to register with the regional/zonal seed coordinator at the nearest regional agricultural office. Registration is for two years and renewable annually. All outlets of the importer must be declared at the time of registration for monitoring. Seeds imported into the country must be declared to the quarantine officers at the entry point and must be accompanied with an international certificate such as ISTA certificate

or its equivalent along with phytosanitary and other relevant certificates.

Seed exporters: To become a seed exporter in Ghana, one needs to register with the regional/zonal seed coordinator at the nearest regional agricultural office. Registration is for two years and renewable annually. All outlets of the exporter must be declared at the time of registration for monitoring. Seed exporters must obtain an international certificate (Orange International Certificate of ISTA) from the National Seed Testing Laboratory (NSTL) along with phytosanitary and other relevant certificates before exportation.

Plant Quarantine Division

This division works closely with the Customs Division of GRA at all the official entry points. It supervises and trains Phytosanitary Inspectors, develops and publishes information material, keeps records of plant imports and exports, identity of the importers and exporters, as well as the pests and diseases of quarantine importance. It issues phytosanitary certificates and import permits according to the International Plant Protection Convention (IPPC) format. It inspects plant materials and makes sure they are free from pests. It also operates the National Sanitary and Phytosanitary Enquiry Point. The division also carries out inspection on marketing quality standards on fresh fruits and vegetables for export. The Division implements relevant International Standards for Phytosanitary Measures (ISPMs).

Ghana Cocoa Board (COCOBOD)

The Ghana Cocoa Board was established by ordinance in 1947 and has a mission to encourage and facilitate the production, processing and marketing of good quality cocoa, coffee and sheanut in all forms in the most efficient and cost effective manner

The current divisions/ subsidiaries of the Board comprise the following:

National Information Centre on Poisons

The National Information Centre on Poisons is located at the Ridge Hospital in Accra and has the following functions:

(a) Help health professionals in making diagnostics and managing intoxications by chemicals (including POPs), toxins, venons and drugs.
(b) Provide information to health professionals on the toxic effects of poisons.
(c) Provide information to the public on prevention and the management of first aid in case of acute intoxication.
(d) Train the public on the devastating effects of chemicals on the environment.
(e) Provide toxicological surveillance through the collection of data on chemical induced incidents, exposure and poisoning.
(f) Organise training sessions on the prevention and management of cases of intoxication for public health inspectors and all authorized agents such as PPRSD.

Currently, Ghana has a one Poison Control Centre located at Ridge Hospital in Accra. However, the centre has only one well qualified staff. Furthermore, there is the need to establish a well-equipped laboratory and provide other logistical support such as computers and modern equipment to enhance their operations.

These laboratories operate according to different methodologies, in the search for residues,

pests / disease and analysis of pesticides, at different levels of use, in water, soil and planting material / seed and animals.

Phytosanitary products manufacturing companies

Phytosanitary products marketed in Ghana are either imported or formulated or packaged by approved companies as distributors in Accra and other cities in the country (Bayer Cropscience SA, Winca Sunshine Agrochemicals, Calli Ghana, Louis Dreyfus Ghana Limited, etc.).

Agricultural Professional Organizations and Civil Society

These organizations are groups of cooperative farmers or Non-Governmental Organisations (NGOs) for the direct acquisition of pesticides from importers or distributors.

Ghana National Association of Farmers and Fishermen (GNAFF)

The Ghana National Association of Farmers and Fishermen is the umbrella organization which seeks the welfare of all member farmers involved in rural agricultural production. It is made up of commodity groups (crops, livestock and fisheries. GNAFF was established in 1992 and has over 1,000 employees. Its mission is to:

(a) facilitate procurement of agricultural inputs (fertilizers, pesticides) and also marketing of members' agricultural produce,
(b) organize training programmes and commodity group visits for exposure among others.

Ecological Restoration Ghana

Ecological Restorations (ER) carries out advocacy, raises awareness and builds capacity on environmental issues including sound management of chemicals including pesticides. These organizations collaborate as part of their activities with a number of stakeholders including professionals in the phytosanitary sector.

Professionals in the Phytosanitary Sector

There are four (4) main professional pesticide associations in Ghana:

(1) CropLife Ghana;
(2) Ghana Agri Input Dealers Association (GAIDA); and
(3) Pesticides Importers Association.
(4) National Seed Trade Association of Ghana (NASTAG)

CropLife - Ghana is the association of agrochemical importers and distributors in Ghana. The association is affiliated with Crop Life Africa Middle East (CLAME). It is currently made up of 16 major agrochemical companies in Ghana and counting. Crop Life Ghana controls about 90% of the fertilizer market as well as about 75% of the pesticide market in Ghana (Annex 2; statistics on fertilizer imports and exports). It is committed to sustainable agriculture through innovative research and technology in the areas of crop protection, non-agricultural pest control, seeds, and plant biotechnology.

The key activities of Crop life Ghana:

(1) promoting responsible uses (RU) and effective handling of Crop Protection Products (CPPs) through effective stewardship programs;
(2) organizing training programs for both members and stakeholders in the industry; and

(3) supporting the regulatory agencies in the formulation of policies on pesticide usage, regulation and inspection.

Ghana Agri Input Dealers Association (GAIDA) and Pesticides Importers Association (PIA) are national bodies of agricultural input dealers in Ghana. Their mission is to provide services and training for Agri- Input Dealers in Ghana for the Development of competitive agri-input market. CropLife-Ghana, GAIDA and PIA are trade union chambers that aim to implement the FAO Code of Conduct.

In the context of Ghanaian law, they constitute effective professional groups with administrative and political authorities. CropLife-Ghana, GAIDA and PIA are considered by the Public Administration as the privileged interlocutors in the phytosanitary profession.

Beside these organisations, there are also various farmers' associations including the Ghana Federation of Agriculture Producers (GFAP), established in 2009. The federation operates with a council made up of representatives of four Farmer Based Organisations (FBOs) - the Apex Farmers Organisation of Ghana (APFOG), Farmers Organisation of Ghana (FONG), Peasant Farmers Association of Ghana (PFAG and the Ghana National Association of Farmers and Fishermen (GNAFF). Integration of these different groups under one federation is much better. Others such as the Vegetable Producers Exporters Association of Ghana (VEPEAG), Ghana Agricultural Associations' Business and Information Centre (GAABIC) and the Seed Producers Association of Ghana (SEEDPAG) also exist to take care of members' interest.

These organizations take care of members' interest and support members to meet the requirements of EPA/PPRSD. All institutions require training support and education of members on statutory obligations and requirements with regard to pesticide trading, use and control.

Distributors and Carriers
Carriers are involved in the distribution of pesticides in Ghana. Generally, these particular actors are found in the sector because of the financial benefits they can draw without being professionals in the sector of phytosanitary products.

Resellers or Distributors
This group is the intermediary between the manufacturing companies and the users who are farmers, a very important link in the sector because of their role in the transport of phytosanitary products, even in villages and camps.

Pesticide Users
It is the farmers who will benefit from the training actions of the national initiatives. These farmers are mainly men, but also women and young people. Users of pesticides include approved applicators who are part of the chain of professionals in the phytosanitary sector.

Agricultural Extension Dissemination
Technology dissemination at the district level is undertaken by trained Agricultural Extension Agents (AEAs) of MoFA at the district level. However, there are challenges with inadequate

number of extension agents resulting in high extension-farmers ratio of 1:2192 (DAES, 2017).

There are also private initiatives and NGOs involved in agricultural advisory services and support to farmers under the private sector. Key among them include:

- CARE International;
- Agricultural Development and Value Chain Enhancement Program (ADVANCE);
- International Fertilizer Development Centre (IFDC); and
- Alliance for Green Revolution in Africa (AGRA).

Most of these private sector entities engage in the distribution of fertilizers and pesticides to farmers to enhance crop yields.

Research Institutions

Academic and research institutions in Ghana continuously play a vital role in developing IPM strategies on pests for several commodities including maize, cowpea, mangoes, lemon, rice, cucumber, cotton etc. In addition, development of alternative management systems for use in communities practicing urban related agriculture, IPM Kit development, demonstration and transfer of technology in IPM have been carried severally. Nevertheless, full adoption has not been very widespread despite the efforts undertaken. The use of pesticides is increasing in spite of the high cost of the products relative to the financial capacity of majority of farmers. One of such major research institutions is the Council for Scientific and Industrial Research (CSIR).

The CSIR is the foremost national science and technology institution in Ghana. It is mandated to carry out scientific and technological research for national development. The Council was established by NLC Decree 293 of 10th October 1968 and re-established by CSIR Act 521 of 26th November 1996. The Council, however, traces its ancestry to the erstwhile National Research Council (NRC), which was established by the Research Act 21 of August, 1958, a little over a year after independence, to organize and co-ordinate scientific research in Ghana and provides the necessary platform for Ghana's accelerated development.

The council is mandated to pursue, among others, the implementation of government policies on scientific research and development, coordinate Research and Development (R&D) activities and other Scientific & Technical (S&T) institutions nationwide and assist the government in the formulation of S&T policies for national development. The CSIR is further required to commercialize appropriate technologies, in partnership with the private sector and other stakeholders, and encourage in the national interest, scientific and industrial research of importance for the development of agriculture, health, medicine, environment, technology and other service sectors of the economy. The council has 13 institutes under its umbrella with offices across the regions in the country. The institutes which activities are directly linked to pesticide use and management in the agricultural sector include but not limited to the CSIR-Crops Research Institute (CRI), CSIR-Savannah Agricultural Research Institute (SARI) and the CSIR-Animal Research Institute, CSIR-Plant Genetic Resource Research Institute (PGRRI) etc.

3.3.1 Institutional Capacity Gaps

Previous studies affirm that, the implementation and enforcement of the established policies and

laws have been hindered as a result of low human and institutional capacity. Institutions involved with pesticides regulation or management do have experts with the necessary qualifications. However, issues of institutional concerns include:

- Remuneration and motivation in most state institutions for experts are so poor while majority of these experts are often poached by foreign and private organisations to leave the government sector.
- Lack of logistics and funds to carry out post registration and licensing monitoring activities on pesticides. All the identified institutions be it in research, regulation, awareness or others would require financial support and improved institutional capacity to be effective in dealing with pesticides. There are also gaps with regards to the extension capacity of IPM approaches and methods. The current agricultural extension agent (AEA) to farmer ratio of one extension officer to 2,000 farmers is high which makes it difficult for farmers to access AEA for services. It is therefore imperative to work towards achieving the UN-recommended ratio of one extension officer to 500 farmers. The GoG has made the necessary efforts to improve the situation through the supply motorbikes, pick-up vehicles and recruitment of extensionists to enhance visibility as well as lower the AEA to farmer ratio.
- Also, the PCU of TCDA and PIU of COCOBOD do not currently have access to the required equipment and capacity for monitoring surface and groundwater quality in project areas. Given the potential pollution of water bodies that may result from agrochemical use and value chain processing activities proposed under the project, it is recommended that the project collaborates with Water Research Institute of the Centre for Scientific and Inductrial Research (WRI-CSIR) which has the capacity to conduct water quality monitoring in line with national regulations.

4.0 EXISTING PESTS AND DISEASES AND THEIR CURRENT MANAGEMENT METHODS

The main activities which may involve the use of pesticides during implementation of the GTCDP will comprise the control of pests, diseases, nematodes and weeds; and prevention of invasive aquatic weeds when herbicides may be used.

The description below covers all the project tree crops namely: cocoa, cashew, coconut and rubber.

4.1 Major Pests and Diseases of project tree crops and Control Practices

4.1.1 Major Pests and Diseases for Cocoa *(Theobroma cacao)*

Cocoa is an evergreen tree in the Malvaceae family that is grown for its seeds (beans). The cocoa tree is a branching tree with simple, pointed (lanceolate) leaves that can reach up to 10cm in width and 61cm in length. The tree bears clusters of pale yellow flowers with five petals and sepals each. Cocoa pods can be green- white, yellow, purplish or red in colour, with 20 to 50 seeds arranged in five distinct rows.

Tables 2 and 3 below provides an overview of some pest and diseases that inflict the Cocoa crop and some general management methods to combat key pests and diseases.

Table 2: Major Pests associated with Cocoa in Ghana

Pest	Damage caused	Causal agent	Comments
Pseudotheraptus devastans (coreid bug)	Deep feeding lesions created on attacked pods causing their deformation	N/A	One of the major field pest on cocoa. Damage very prominent in the first half of the year. A pod feeder.
Mirids	Dark feeding lesions created on attacked pods. Lesions usually invaded by fungal pathogens that cause cherelle wilt of young pods and dieback of stems	N/A	The two dominant ones are *Distantiella theobroma* and *Sahlbergella singularis*
Bathycoelia thalassina (stink bug)	Young pods become riped prematurely with pod deformation after stink bugs attack	N/A	Predominant in the first half of the year.
Defoliator insects	The defoliator caterpillars feed on new flush leaves and young pods resulting in a halt in pod development	N/A	The dominant ones are *Anomis leona* and *Earias biplaga*

Table 3: Major diseases of Cocoa in Ghana

Disease	Symptoms	Causal agent	Comments
Cocoa swollen shoot virus disease	Red vein-banding in young leaves, vein clearing, various forms of mosaic patterns with or without chlorosis in matured leaves, stem and root swellings, pod deformation	Cacao swollen shoot badnavirus species	Several mealybug species serve as vectors of the virus
Black Pod disease	Brown or black spot on cocoa pods which becomes darker and expand to cover the entire pod. Whitish spores are formed within 3-5 days after infection.	*Phytophthora palmivora, Phytophthora megakarya*	
Stem canker	brown or reddish-brown water-soaked lesion with dark brown to black margins on the bark of the trunk. Infection point enlarges and girdles the stem with sometimes exudation of reddish brown liquid	*Phytophthora palmivora, Phytophthora megakarya*	
Thread blight	White, creamy white or black mycelium (thread like) along affected twigs or at the underside of affected leaves. Leaves later become dry and can be seen hanging on the twigs by a thread of the pathogen.	*Marasmiellus scandens*	White, black and brown thread blight have been reported with white thread been the most common.
Pink disease	Pinkish colouration of stem and branches resulting in death of branches. Most prevalent on young cocoa trees	*Erythricium salmonicolor*	
Anthracnose	water-soaked brown patches on leaves which later progress to dark brown patches with yellow halo margins. lesions enlarged and coalesced into large lesions Orange fruiting bodies could be found on infected leaves and pods during later stages infection.	*Colletotrichum gloeosporioides*	
Root rot	Hard, brittle encrustation around the roots which later into black colour. Wilting of leaves and severe die-back	*Phellinus noxious*	
Charcoal Pod rot	Brown spot which later turns black and expand to cover the entire pod. Large numbers of black spores formed on pods during the infection	*Lasiodiplodia theobromae*	

Warty pod	Swellings on surface of pods. The swellings are initially hard but later become soft and watery before becoming black.	Unknown	
Mealy pod	Brown spot which expands and becomes black with mass of white spores which turn pinkish	*Trachysphaera fructigena*	

Plate 1: Symptoms of black pod disease

Plate 2: Swollen shoot disease

Plate 3: Cocoa mirid (L) and Mirid feeding on pod (R)

4.1.2 Major Pests and Diseases for Cashew *(Anarcadium occidentale* Linn.*)*

Cashew, *Anacardium occidentale*, is an evergreen tree in the family *Anacardiaceae* grown for its edible fruits (nuts). The cashew tree has a branching main trunk and characteristic domed crown. The thin foliage of the tree is limited to the ends of the branches and is made up of oval-oblong leathery, shiny dark green leaves. The leaves are smooth with pronounced veins and midrib and possess petioles which are swollen at their base. The tree produces numerous pinkish-white flowers on drooping panicles and a kidney shaped true fruit (nut) which is approximately 3cm long with a gray-brown shell and develops from a fleshy accessory fruit, sometimes referred to as the 'cashew apple'. The cashew apple is pear shaped and red to yellow in color. Cashew trees can reach a height of 12m and have an economic lifespan of 25 years after which time they are replaced in commercial plantations.

Tables 4 and 5 below provide an overview of some pests and diseases that inflict the Cashew crop and some general management methods to combat key diseases and insects.

Table 4: Major Pests of cashew in Ghana

Pest	Damage caused	Causal agent	Comments
Cashew weevil Mecicorynus loripes (Insect pest)	Brown-black gummy frass (insect excrement) on trunk and branches; girdling of branches; plants dying	N/A	Adults large and gray-brown with knobbly appearance; larvae legless grubs which are white with a brown head

Helopeltis schoutedeni Helopeltis anacardia Helopeltis antonii	Deformed leaves with angular lesions along veins; leaves may drop from plant; elongated green lesions on young shoots which may exude gummy substance; dieback of shoots	N/A	Helopeltis bugs are slender with long legs and antennae; antennae twice as long as body; females are red; males brown; nymphs are yellowish in color
Anoplocnemis curvipes	Injection of toxic saliva into plant tissues results in sunken or blistered tissues with drops of gum marking the punctured sites. Feeding lesions turn brown after 24 hours and black in 2-3 days. Young shoots and panicles may die (dieback). Severely attacked trees may appear scorched or burnt. Immature fruits & nuts may abort.	N/A	Anoplocnemis curvipes is a species of sap-sucking insect in the genus Anoplocnemis. They are native to sub-saharan Africa where they are considered a major pest of many types of agricultural plants such as trees and shrubs, including legumes.
Pseudotheraptus devastans	Adults and nymphs suck sap from flushing shoots, inflorescence, apples and nuts. They cause apples and nuts to deform and stop growth of shoots	N/A	*Pseudotheraptus devastans* also known as the Coreid bugs belong to the true bugs (Heteroptera) of the Hemiptera. Being distinguished from other Hemiptera.
Cashew Stem Borer (Apate terebrans)	Visible symptoms include the collection of frass (wood-dust) at the base of infested trees, entry holes on the trunk and branches and gum exudation.	N/A	Larvae (grubs) bore through the trunk and branches causing internal damage. Multiple infestation could occur on a single tree and result in the death of the tree
Cashew branch girdler (Analeptes trifasciata)	Adult beetles girdle to provide suitable breeding sites, in the form of deadwood. Damaged branches are completely girdled resulting in the breaking of affected branches.	N/A	Adult beetles girdle to provide suitable breeding sites, in the form of deadwood. Eggs are laid on cut branch and on hatching, larvae burrow into the wood, feeding on the cut branches

Thrips (Selenothrips sp.)	Larvae from hatched eggs feed in between the epidermal layers of leaves. The injury by the larvae as a result of feeding becomes visible as markings on the leaves (channels). Old leaves develop large holes due to the drying & crumbling of affected portions of the leaf surface.	N/A	Nymphs and adults suck and scrape on the underside of leaves, usually along the main veins.

Table 5: Major Diseases of Cashew in Ghana

Disease	Symptoms	Causal agent	Comments
Fusarium, Sclerotium, Cylindrocladium, Pythium & Phytophthora spp	Nut rot Damping off Seedling blight Root rot	Fungus	These are normally Nursery diseases.
Anthracnose Caused by Colletotrichum gloeosporioides	Starts as reddish-brown necrotic lesion with exudation. Leaves crinkle, flowers wither, blacken and drop Fruits darken, dry and fall or rot.	*Colletotrichum gloeosporioides*	Affects young and tender leaves, apples, panicles, nuts.
Inflorescence blight caused by fungi and insect complex	Small water-soaked lesions. Turn pinkish-brown, enlarge and coalesce. Affected floral parts dry-up and darken. Affects yield through flower loss and immature fruit drop.	*fungi*	Helopeltis is the initial cause of the disease and fungi are mainly secondary
Leaf blight caused by Colletotrichum spp	irregular brown spots, often beginning on the leaf margins. Lesions initially have an irregular yellow halo and may appear watersoaked. Spots coalesce and cause a leaf blight and dark brown streaks develop on leaf petioles. Floral parts may also be blighted.	*fungi*	Wet, rainy conditions favor leaf blight's development, while wind and water aid its spread. Damage worsens when leaf wetness and warm temperatures coincide.
Twig dieback by Lasiodiplodia theobromae &	dieback, cankers, and stem and root rot	*fungi*	Lasiodiplodia theobromae is a plant pathogen with a very wide host range. It causes rotting and dieback

Phomopsis anacardii			in most species it infects. It is a common post harvest fungus disease of citrus known as stem-end rot. It is a cause of bot canker of grapevine.
Leaf rust cause by Cephaleuros virescens	grayish, green, brown or orange cushion-like blotches on the leaf surface. Some hosts may also have diseased twigs and branches that are girdled and stunted with reddish brown fruiting bodies.	*fungi*	Reduce photosynthetic activity of leaves and lead to defoliation.
Gummosis caused by Lasiodiplodia (Diplodia)	Exudation of reddish-brown liquid which turns black Longitudinal cracks with gum exude	*D. natalensis*	Affects main stem & branches
Fruit rot by Lasiodiplodia; Cladosporium & Fusarium spp	Fruit rot caused by Monilinia or Botrytis results in firm, circular spots that spread rapidly over fruit. Monilinia causes dark brown lesions on fruit that eventually turn black from the development of pseudosclerotia (fungal tissue), whereas Botrytis causes light tan to grayish lesions with gray spores.	*fungi*	

Plate 4: Cashew foliage (L) fruit (R)

4.1.3 Major Pests and Diseases for Coconut *(Cocos nucifera)*

The coconut palm, *Cocos nucifera*, is an erect palm in the family Arecaceae. The coconut palm has an erect or slightly curved stem which grows from a swollen base. The stem is smooth, light gray in color and has prominent leaf scars. The stem is topped with a crown of 60–70 spirally arranged leaves. The leaves are long (up to 7m), pinnately divided and composed of 200–250 tapering leaflets. The inflorescence is a spike produced at the leaf axil with 20–60 branches, each with a female flower at the base and many male flowers. The fruit is a drupe containing a single seed. It is ovoid in shape with three sides divided by ridges. The exocarp and the mesocarp make up the husk of the coconut. The seed is protected by a thick, stony shell, or endocarp, and is partially filled with a liquid known as coconut water. The edible endosperm is white and meaty and can be between 1.0 and 2.5cm thick. Coconut palms can reach a height of 30m produce up to 75 fruits a year, and live for up to 90 years.

Table 6 below provides an overview of some pest and diseases that inflict the Coconut crop and some general management methods to combat key diseases and insects.

Table 6: Diseases and Pests associated with Coconut

Disease	Symptoms	Causal agent	Comments
Bud rot and nutfall *Phytophthora spp.* (fungal)	Chlorosis of youngest open leaves; leaves rapidly turning necrotic; necrotic spots on leaf bases; unopened spear leaves can be pulled away from the plant easily; removal of unopened spear leaves reveals soft, pink-red tissue with foul smell; leaf necrosis spreading through central crown leaves; woody parts of plant may have water-soaked, pink lesions with dark borders; infected inflorescences abort nuts.	Fungal	Palms between 14 and 40 years old most susceptible; emergence favoured by high rainfall.
Lethal yellowing disease (locally called Cape St. Paul wilt disease, CSPWD)	Premature dropping of fruit; fruit with brown-black water-soaked appearance; necrosis of inflorescences; flower stalks turn black; lower, older leaves turning yellow; entire crown turning yellow; yellow leaves turn brown, dry out and hang from canopy.	Bacterium: Phytoplasma	Transmitted by leaf hoppers (Vector of CSPWD is unknown
Coconut leaf spot *Curvularia pseudobrachyspora*	Circular brown spots, surrounded by yellow halo appear on leaf surfaces. The spots enlarge and coalesce into irregular shapes. The centre of the spot dries out, becoming greyish.	Fungus	Usually attacks seedlings in the nursery and young transplants in the field

Pest	Damage caused.	Causal agent	Comments
Coconut bug *Pseudotheraptus devastans*	Damaged and/or aborted flowers; sunken necrotic lesions and scars on nuts; Lesions and scars appear brown in color. Young nuts may exude gum (gummosis) and die; many nuts fall from tree; adult insect is a brown-red with well-developed wings; nymphs are brown-red or green in color with long antennae and feed at the calyx of the nut	Insect	The coconut bug is one of the most damaging pests of coconut in Africa; just two bugs per palm can cause severe damage
Coconut rhinoceros beetle *Oryctes monoceros*	V-shaped or triangular cuts in palm fronds or holes in leaf midribs caused by beetles boring into crown to feed; excreted plant tissue and insect droppings emerging from the entrance holes adult insect is a large black beetle with a curved horn on its head; horns in males are larger than horns in females. Larvae are creamy white grubs with brown heads and 3 sets of prolegs at the anterior (head) end.	Insect	Beetles are nocturnal and fly at night; also a damaging pest of oil palm.
Termites (*Odontotermes* spp)	They usually attack seedlings and damage the plant. Holes or small grooves filled with pieces of the bark appear on the surface of the trunk	Insect	Termites are social insects and attack seedlings in groups/colonies
Palm weevil (*Rhynchophorus phoenicis*)	Larvae feed on soft plant tissue on the inner tissues of plant. Holes appear in the bark with plant tissue sticking out.	Insect	Damage on the outside of the plant cannot be noticed until plant begins to die.
Eriophyid coconut mite *Aceria guerreronis*	The mites suck sap from young nuts. Generally they feed on meristematic zone, i.e., the area which is covered by perianth. The infestation starts very early. As the nut develops the feeding leaves brown fissures that extending down from the perianth. The nut becomes small and distorted.	Mites	The mites spread through the wind. It causes yield loss from 30 to 60 per cent.

Plate 5: Stem bleeding and eventual trunk collapse

Plate 6: Lethal yellowing infected coconut

Plate 7: Leafroller (Hedylepta blackburni) adult (R) and Lavae feeding on leaves

4.1.4 Major Pests and Diseases for Rubber *(Hevea. brasiliensis)*

H. brasiliensis is a tall deciduous tree growing to a height of up to 43m in the wild, but cultivated trees are usually much smaller because drawing off the latex restricts the growth of the tree. The trunk is cylindrical and may have a swollen, bottle-shaped base. The bark is some shade of brown, and the inner bark oozes latex when damaged. The leaves have three leaflets and are spirally arranged. The inflorescence includes separate male and female flowers. The flowers are pungent, creamy-yellow and have no petals. The fruit is a capsule that contains three large seeds; it opens explosively when ripe.

Table 7 below provides an overview of some pest and diseases that inflict the Rubber crop and some general management methods to combat key diseases and insects.

Table 7: Major diseases of Rubber in Ghana

Disease	**Symptoms**	**Causal agent**	**Comments**
Root disease Two main types: *Fomes noxious* and *Fomes lignosus*	Plant decomposition and putrefaction. The decay may be hard, dry, spongy, watery, mushy, or slimy and may affect any plant part. As the disease progresses, the infected tissue becomes rotten. Trees develop a generally unthrifty appearance with leaf yellowing, halted root growth, wilt, small leaves, early leaf fall and small, shrivelled fruit. Infected trees will eventually die.	Fungus The fungus has highly branched rhizomorphs that help it to spread from infected tree to healthy trees.	It is the most destructive root pathogen of rubber trees
Leaf disease (*Corynespora cassiicola)*	When it attacks the rubber tree, all the leaves fall prematurely	Fungus	
Anthracnose	It commonly infects the developing shoots and leaves. The fungus characteristically produces spores in tiny, sunken, saucer-shaped fruiting bodies known as acervuli The disease manifests as sunken spots or lesions of various colours in leaves, stems, fruits, or flowers, and some infections form cankers on twigs and branches	Anthracnose caused by *Colletotrichum gloeosporoides*	• Is one of the most severe diseases of Hevea brasiliensis.
Mistletoe Attack	Mistletoe can be seen physically growing on rubber trees		Mistletoes are easily recognized and are

			especially prominent in the canopies of rubber trees

Plate 8: Fungus causing stem canker disease

Plate 9: Branch of rubber tree after fungal disease

4.2 Management and Use of Pesticides – Existing Practices

Production and importation of Pesticides

Pesticide products are imported through mother companies represented at the national level or active matters for formulation purposes. Some of these companies include: Abuakwa Formulation Unit, Wienco, Dizengoff, CHEMICO, Reiss & Co., Calli Ghana. The volume of pesticide imports for the year 2020 is provided in the table below.

Table 8: Summary of Pesticides Imports in 2020

Chemical Type	Unit	Quantity
Insecticides	Mt	6,354.1
Herbicides	Mt	30.154.1
Fungicides	MT	1,105

Source: EPA/CCMC, 2021

Selling and Distribution of Pesticides

The above listed companies have their network of distributors and retailers who supply to farmers. Some key challenges identified through previous studies as well as our engagement and observations during visits centre around the following:

- Most farmers can not afford buying pesticides in large volumes and therefore retailers are obliged to decant into smaller volumes/ containers which then poses handling problems for many shop keepers. The products are therefore supplied in other containers without handling instructions and any associated safety information sheets including expiry dates.
- Some retailers were observed to be selling other items not related to pesticides in their shops. Chances of cross contamination are high
- Retailers affiliated to suppliers receive training through the suppliers themselves but unfortunately there are many others who are not especially in the small communities
- The presence of adulterated and fake products on the market is of considerable concern. There are instances of alteration of expiry dates of pesticides, the change of labels on pesticide containers, and the preparation and bottling of mixtures in already used pesticide containers.
- The low literacy levels of many farmers expose them to these avoidable situations.

Pesticides Usage by farmers

In many communities, the farmers hire the services of the young men who have organized themselves into teams to spray farms. However, this comes at a cost to the farmer especially the female farmers who may not have any other option. For those who cannot afford their services, they then have to spray their farms themselves and risk exposure to the hazards posed by the chemicals.

Farmers use various types of applications and in most cases lack the appropriate personal protective equipment (PPEs) such as hand gloves, overalls etc. The time of spray during the day is sometimes not appropriate. Farmers have been observed spraying during hot afternoons without PPEs and are then exposed through inhalation and skin contacts.

Due to lack of adequate education, farmers tend to over spray their farms leading to high wastage of chemicals and sometimes contamination of farm produce.

Management of Pesticide Containers

The management of pesticides containers is under the responsibility of resellers and farmers because of the retail sales system. They find themselves with the most important share of the empty containers which are differently managed.

- Sales to pesticides buyers who do not have empty containers and who straightforward reuse these containers;
- Sales for other uses

- Farmers/buyers reuse empty containers for storage purposes at household levels.

Littering of farms with empty pesticide containers
With big commercial farms or companies, management of pesticide containers is expected to be clearly stated in their environmental management plans (EMP) to the EPA. Usually, these companies indicated that they would liaise with the appropriate MoFA office to provide guidance on the disposal of the containers.

Facilities for the treatment of large empty containers are not known to be installed or in use in the country at the moment. Such facilities will be useful for the treatment of high-capacity drums for recycling or reuse. This project may leverage on the on going World Bank funded Food System Resilience Programme Phase 2 (FSRP-2) for a collection and disposal plan for used pesticide containers. The PMU/ PIU may engage the FSRP-2 accordingly. Currently there are few accredited private companies recycling empty pesticide containers and other plastics. Farmers supported by the project should be linked to these companies for efficient disposal of empty containers.

<u>Accidents resulting from Pesticide Use</u>
As regards the sanitary consequences of the use of pesticides, there could be death or intoxication. Indeed, cases of lethal intoxication have been recorded for human, and animals.. The Ghana Poison Control Centre is expected to keep records on pesticide poisoning and accidents. The existence of the Centre is not very popular among many Ghanaians. The Centre needs to be supported for the collection and keeping of accurate statistics on these events. Currently, the data on pesticide poisoning and accidents resulting from pesticides use or disposal is fragmented and remains in the various newspapers that have reported such cases, and various hospital cases. There is the need to create awareness that will target the different pesticide users in order to avoid accidents and incidents. A visit to a Community based Health Planning and Services (CHPS) Compound in Wenchi during this study did not reveal any serious cases of accidental poisoning or fatality.

5.0 POTENTIAL IMPACTS AND CHALLENGES ASSOCIATED WITH PROJECT INTERVENTIONS

This section describes the potential risks/impacts associated with the procurement, transport, storage, use / handling and disposal of pesticide as follows:

Table 9: Summary of project activity relating to agrochemical usage and potential impacts

No.	Project activity	Potential impact/ Issues	Receptors
1.	Public transportation of agro chemicals by retailers and farmers	• Passenger contamination • Inhalation of product vapours • Inhalation of contaminated dust; • Skin burns from contact. • Accidental spills; contamination of soil and groundwater resources through leaching in the event of a traffic accident	Retailers Farmers General public
2.	Storage of agro chemicals	• Non-compliance with national regulations and FAO standards on pesticide storage and/or obsolete stocks; • Lack of training of pesticide traders. • Odour nuisances; • Contact with the skin during handling; • Bioaccumulation of pesticides. • In the event of an uncontrolled spill or leak- Soil contamination and Surface Water Contamination	Farmers Retailers Land/ Soils Water resources
3.	Handling of agro chemicals	• Insufficient training and awareness-raising activities for authorised distributors; • Lack of supervision of phytosanitary agents and producers. • Inhalation of vapors; • Dermal contact by splash during preparation • Contamination of water sources by washing containers; • Accidental spills and contamination of soil and groundwater resources • Adverse impacts on biodiversity e.g., useful insects, birds, natural enemies etc.	Farmers Workers involved in cocoa rehabilitation Retailers Land/ Soils Water resources; Biodiversity
4.	Disposal of used packaging/ containers	• Failure of the empty packaging management system (storage, collection, transport, rinsing and compaction)	Farmers Retailers Land/ Soils Water resources

No.	Project activity	Potential impact/ Issues	Receptors
		• Lack of appropriate equipment for the disposal of empty packaging. • Health concerns related to the ingestion of pesticide residues when reusing empty containers (plastic cans and metal drums) that have not been properly cleaned; • Dermal and respiratory conditions • Chronic intoxication of personnel in the distribution Chain • Spill of product on soils; • Contamination of surface and groundwater • Littering of farms	
5.	Disposal of cleaning water	• Information and awareness system failure • Low level of public awareness of the health risks associated with handling pesticides • Acute poisoning of fish and other crustaceans • Pollution of points (wells) and water bodies (ponds). • Water contamination by runoff or by wind action;	Farmers Retailers Land/ Soils Water resources Biodiversity
6.	Disposal of obsolete stocks	• Insufficient training and awareness-raising activities for authorised distributors; • Non-compliance with national regulations and FAO standards on disposal of obsolete stocks; • Lack of disposable facilities	Farmers Retailers Land/ Soils Water resources

5.1 Impact of Pesticides on Aquatic Ecosystems

Agricultural practices such as pesticides, antibiotics from fertilizers, and herbicides have serious environmental impacts in aquatic ecosystems. When these three stressors are considered together may result in changes via direct effects from antibiotics that result in bacterial population changes that affect the carbon cycle and can lead to anoxic conditions. Herbicides may affect the growth and diversity of photosynthetic species including primary producers, which affects the entire food chain in a 'bottom-up' capacity (Dodds, Whiles, 2010). Finally, pesticides may directly affect aquatic organisms through interference with normal biological mechanisms and also indirectly through prey-loss.

Pesticides in wetlands may be highly dangerous stressors, as is the timing of pesticide exposure. Exposure during insect emergence period to which many aquatic predators are biologically synched to could be detrimental to fish and other species populations, the effect of which is likely to echo throughout the entire food web. These effects are especially important to consider for migratory species whose loss could affect both marine and freshwater ecosystems.

Continued usage of pesticides could threaten the survival of small aquatic organisms that form the basis of the food web. In the aquatic ecosystems, runoff of organochlorine insecticides following rain events in adjacent streams lead to severe fish kills and the eradication of the stream invertebrate fauna over stretches of several kilometres.

Implementing alternative farming practices such as crop rotation, organic farming, and biological pest control to reduce pesticide use and runoff from agricultural nonpoint source pollution will decrease its negative impact on water quality and aquatic life.

5.2 Effects of Pesticides on Human Health

Exposure to pesticides is inevitable; there are different modes through which humans get exposed to pesticides. The mode of exposure is an important factor as it also signifies the concentration of pesticides exposure. Pesticides are believed to cause many disorders in humans and wildlife. Pesticides have shown to be involved in the pathogenesis of Parkinson's and Alzheimer's diseases as well as various disorders of the respiratory and reproductive tracts. Oxidative stress caused by pesticides is an important mechanism through which many of the pesticides exert their harmful effects. Oxidative stress is known to cause DNA damage which in turn may cause malignancies and other disorders. Many pesticides have shown to modulate the gene expression at the level of non-coding RNAs, histone deacetylases, DNA methylation patterns suggesting their role in epigenetics

General Health Problems and Environmental Challenges associated with Pesticides

There are acute and chronic health effects, and these effects may manifest as local or systemic effects. They include skin irritations, such as itching, rashes, blisters, burns, wounds, irritation of throat leading to cough or difficulty in breathing with or without wheezing or choking, chest pain, burning mouth and throat with pain on swallowing, runny nose, sore throat, headache, dizziness, sudden collapse with or without unconsciousness.

Others include eye irritation, blurred vision, lots of tears or saliva or mucus secretion and sweating, nausea, vomiting, chest infections due to aspiration of vomits, fever, abdominal pain or discomfort, diarrhoea, uncontrolled urination and defaecation, slowing of heartbeat or rapid heartbeat, weakness including muscles for breathing, muscle twitching or pains, tremors, convulsion, coma, hallucinations, pain and numbness in legs, allergic reactions. Others are problems with liver, kidney, or nerves functions, improper functioning of the heart etc. The table below provides a summary of pesticide problems relating to human health, environment and crops.

Table 10: Pesticide problems relating to Health, Environment and Crops

Hazards to Health	Hazards to Environment	Hazards to Crops
Acute poisoning: 3 million poisonings including 20,000 unintentional deaths occur annually (WHO). Symptoms of acute poisoning include severe headaches, nausea, depression vomiting, diarrhoea, eye irritation, severe fatigue and skin rashes.	Contamination of drinking water and ground water. Water contamination kills fish. Soil contamination. Wildlife and domestic animals can be killed by spray drift or drinking contaminated water.	Pesticide resistance: 520 species of insects and mites, 150 plant diseases; and 113 weeds are resistant to pesticides (FAO). Resistance can create treadmill syndrome, as farmers use increasing inputs to little effect, while elimination of beneficial insects Causes secondary pest outbreaks.
Chronic ill-health problems can affect women and men, girls and boys exposed to pesticides, whether because of their occupation or because they live near areas of use. Such problems can include neurological disorders, cancers, infertility and birth defects and other reproductive disorders.	Exposure may also cause infertility and behavioural disruption. Persistence in the environment and accumulation in the food chain leads to diverse environmental impacts. Loss of biodiversity in natural and agricultural environments	High cost of pesticides can lead to falling incomes for farmers: Newer products are often safer, but are more expensive. Farming communities lose knowledge of good horticultural practices and become dependent on expensive external inputs.

5.3 Improper Pesticide Usage and Disposal of Pesticide Containers

This is caused by poor knowledge, inadequate equipment and storage, application of unregistered and non-approved pesticides and the use of an excessive dosage. With an average annual use of 12,355 mt of pesticides over the period 2007 – 2010, pesticides use is relatively moderate in Ghana, EPA/CCMC 2021.

Comparatively, it seems the inappropriate use of pesticides is reflected in the pesticide content on vegetables. A recent study by Yafetto et al., 2019 indicate that vegetables produced by farmers in Ghana are significantly contaminated and have poor microbiological quality that could potentially result in outbreak of foodborne illnesses.
Improper use of pesticides during storage is a concern as pesticide residues above the MRLs are likely to occur.

Pesticide containers have been found to be reused at homes. Improper washing or cleaning could lead to harmful consequences where containers are reused as food or drink containers. The population groups at risk include women, children, elderly and rural farmers who are mostly illiterate and principal users of empty containers without proper treatment. An increase in pesticide containers in the project area is expected during the implementation stage and

proper collecting system and disposal is required to minimize reuse of containers for domestic activities.

5.4 Abuses in Pesticide Supply and Sales

The abuses associated with the supply and sale of pesticides are likely to occur under the Project and these abuses include:

- Use of banned and or unregistered pesticides
- Decanting of pesticides into improper containers without appropriate labels and use information at the retail level and farm gate points
- Supply and sale by unauthorized persons /persons without EPA/PPRSD license and permits
- Supply and sale of adulterated and or expired pesticides

5.5 Risks Identified through Stakeholder Consultations

The TCDP has prepared a comprehensive Stakeholder Engagement Plan (SEP) as part of its safeguard instruments, which seeks to:

- Identify and categorize the stakeholders of the project based on their level of interest and influence, and extent to which they are impacted by the project;
- Develop an effective two-way communication channel between project proponents and stakeholders;
- Effectively communicate key project information such as implementation timelines and work schedules to stakeholders, particularly project affected communities and persons;
- Provide opportunities for stakeholders to express their views and make inputs into the project through continuous involvement and providing feedback on their contributions; and
- Establish a mechanism for receiving and addressing grievances in a timely manner.

The process and channels for engaging stakeholders on project issues including those related to IPMP are captured in the SEP report. Furthermore, during the preparation of this report, some relevant stakeholders were engaged to provide an insight into pesticide use as well as health and safety issues especially at the community/ farmer level. Two (2) key project regions were selected namely, Bono and Eastern Region. The two regions are noted for Cashew and Cocoa production respectively. Coconut and rubber production are also found in the Eastern region. The results of the engagement in the two regions provide a good reflection of the issues within the sector.

Focus group discussions were held with Farmer Based Organizations at Wenchi and Asamankese namely:

- Wurompo Community Farmers Association, and
- Calvary Cocoa Partnership (Kwaku Sae Asafoatse)/ Brekumanso Cooperative/ Amanfrom Cooperative, Asamankese Cocoa District, Lower West Akim Municipal

Key interviews were held with the following:

- MoFA Station Manager, Wenchi
- Private Nursery Operator, Wenchi
- Agricultural Input Supplier, Wenchi
- Wenchi Municipal Assembly Agricultural Officer responsible for Crops,
- Wenchi Municipal Assembly Social Welfare Department
- COCOBOD Regional office Koforidua
- COCOBOD District office, Asamankese

The outcome of the engagement is described in detail in the **Annex 2** and summarized below:

- Logistical challenges. Most of the institutions rely on externally funded projects to survive
- Communication gaps between institutions and also between departments within institutions, especially at the Assembly level
- High labour and equipment costs are a major source of stress to farmers
- Assistance from children is critical to the farmer because of cost considerations but these are limited to, as much as possible, off school times especially weekends.
- Children are increasingly showing less interest in farm work and this is a source of concern to farmers.
- Most farmers cannot afford buying pesticides in large volumes and therefore retailers are obliged to decant into smaller volumes/ containers which then poses handling problems for many shop keepers.
- The products (agrochemicals) are supplied in other containers without handling instructions and any associated safety information sheets including expiry dates.
- Some retailers were observed to be selling other items not related to pesticides in their shops. Chances of cross contamination are high
- Retailers affiliated to suppliers receive training through the suppliers themselves but unfortunately there are many others who are not especially in the small communities
- The presence of adulterated and fake products on the market is of considerable concern. There are instances of alteration of expiry dates of pesticides, the change of labels on pesticide containers, and the preparation and bottling of mixtures in already used pesticide containers.
- The low literacy levels of many farmers expose them to severe risks.
- Smuggling of banned chemicals into the country
- Lack of logistics including adequate extension personnel for regular field monitoring
- Non availability of approved chemicals at the community level
- Lack of awareness of measures/structures available for disposal of waste containers by farmers
- Non availability of personal protective equipment for farmers
- High illiteracy rate among farmers hence inability to read, understand and adequately follow instructions on labels on agrochemical containers
- Insufficient comprehension and appreciation of the dangers posed by agrochemicals on the health and safety of the sprayers, farmers and the community in general
- Lack of regular training programmes on pesticide use

6.0 INTEGRATED PEST AND PESTICIDE MANAGEMENT ACTION PLAN

6.1 Integrated Pest Management Plan

The PPRSD of MoFA, through the support of international development partners including the German Development Cooperation (GTZ) and the United States Agency for International Development (USAID), has developed separate booklets and manuals to serve as extension guides on integrated pest management practices for crops production.

The PPRSD Manual for Safe use of Pesticides:

- Provides guidance to farmers and stakeholders involved in pest management and related fields.
- Offers practical and informative guidance on how to comply with legislations and best practices regarding the use, transportation and storage of pesticides by stakeholders.
- Provides insight into the disposal of obsolete pesticide stocks and empty pesticide containers.
- Promotes safe and healthy practices associated with the overall use of pesticides.
- Seeks to contribute to minimizing the potential risks involved in handling and application of pesticides by suggestion precautionary measures.

The Manual for IPM Practices for the production of various crops

- Recognizes the most common pest, diseases and weeds that attack crops in the field and in storage;
- Identifies the damage done by particular pests and diseases at different growth stages of crops;
- Provides knowledge and understanding regarding the options that are available for effective IPM of major crop pests, diseases ad weeds;
- Works with farmers on how to apply IPM methods to manage crop pests, diseases and weeds to achieve sustainable and environmentally sound crop production

The Integrated Crop and Pest Management (ICPM) provides the following generalized Principles and Practices which are applicable to the various tree crops under the GTCDP:

Table 11: General Principles for Integrated Crop and Pest Management

Principle	Description
Principle 1	Obtain good seeds
Principle 2	Select well drained fertile soils for the nursery and the farm
Principle 3	Plant crop rotation with other crops
Principle 4	Adopt appropriate planting distances and planting patterns
Principle 5	Plant crops at appropriate times so that their growth coincides with low pest and disease incidence
Principle 6	Weed early and regularly/ carefully
Principle 7	Adopt good soil management practices
Principle 8	Adopt suitable water management practices
Principle 9	Visit fields regularly
Principle 10	Maintain high levels of sanitation in the field
Principle 11	Manage pests and diseases efficiently
Principle 12	Enhance and protect the populations of natural enemies
Principle 13	Minimize the application of chemical pesticides

Principle 14	Harvest timely and adopt good harvesting methods
Principle 15	Adopt good, clean storage systems

Sources: MoFA-PPRSD/GTZ: Integrated Pest Management Extension Guide 4/Integrated Pest Management Extension Guide 2

6.1.1 Preventive Methods

Preventive control including the destruction of the causative agent in the fields of the target and surrounding crops are described below. Many farmers are comfortable with the use of crushed neem grains with oil to prevent insect attack. The following methods as summarised below are confirmed as suitable for preventive control purposes.

Prophylactic measures

In many crops, seeds are used as propagation material. They can be contaminated (internally and externally) by fungi, bacteria, viruses, and nematodes. These parasites will develop with the germination and growth of plants. Prophylactic measures consist of:

- use only seeds, seedlings of known and certified origin produced by official bodies. The seeds can be disinfected, by fumigation or by coating;
- choose soils with good natural drainage, suitable for planting;
- destroy the residues of previous crops. Plant residues (stems, roots) or even fruits and tubers that remain in the plots after harvest often contain pests or diseases, thus constituting a source of infestation for the next crop. Indeed, parasites can survive during the dry season and infest the next crop. It is recommended to (i) burn stems and stubble, (ii) compost with residues;
- rotate crops, i.e., plant crops that do not have any pests in common (rotation of cereals with root and tuber crops). Crop rotation prevents the proliferation of diseases and pests by breaking their development cycle;
- make physical barriers by protecting crops from pest attack by nets. Vertical nets, insect-proof plastic films, silica-based inert powders with abrasive and drying properties.

Genetic control

This control technique is based on the use of resistant or disease tolerant varieties. The cultivation of resistant varieties is the simplest and often least costly solution for the farmer in his fight against plant diseases. In the absence of adequate resistance characteristics, the tolerance can be used, with the proviso that tolerant plants can be infected and serve as a reservoir of germs and therefore a source of contamination for sensitive varieties.

Cultural or agronomic control

This control is carried out by adopting favourable cultural techniques. These include: ploughing, adequate cropping system, good date of planting or planting, cover crops, weeding.

Biological control

This is a method of pest control of crops (insects, mites, rodents, etc.), diseases (fungal, bacterial, viral, etc.) or weeds (weeds) by means of living organisms' antagonists, called biological control agents or auxiliaries of crops. Biological control ensures the preservation of fauna or flora useful (create environments favourable to the development of auxiliaries.).

An auxiliary is defined as a predatory or parasitic animal that, by its way of life, assists in the

destruction of pests that are harmful to crops. Most of these auxiliaries are insects (usually wasps), and a small proportion of nematodes and mites. Auxiliary organisms have demographics related to those of the populations of their "hosts". They are dependent on the density of the pest populations (disease, pest and weed).

Environmental management practices

Planting hedges: predators need this resource to reach sexual maturity and thus reproduce, providing prey / replacement hosts, shelter during work or treatment on the plot.

Grass strips: the implementation of grass strips is relatively simple, inexpensive and their impact is fast. Different and complementary devices can be set up according to the auxiliaries that one seeks to promote. Grass strips make it possible to meet the specific requirements (varieties of pollen, nectar) of many auxiliaries, to give them easier access to these resources, and to attract them to the immediate vicinity of crops

6.1.2 Curative Fight Methods

Farmers encountering pest problems usually rely on competent MoFA services to receive control advice that they will apply in the field. Additionally, the decentralization of the PPRSD offices across the country plays a very important advisory role at this level. Neem grains and other pesticide mixtures help control the diseases and pests identified in the target crops. Some of the curative fight control include:

Mechanical control

There are several physical processes that can reduce parasite populations or bio- aggressors when they are already installed in cultivated plots:

Destruction of diseased or infested plants: This method is particularly indicated in cases where there is a disease that can disperse quickly in the plots (fungi, viruses, nematodes, etc.). It is the case of fruit fly (*Rhagoletisochraspis*), plants affected by the disease should be isolated, desiccated and buried or incinerated; Plants affected by the disease should be isolated, desiccated and buried or incinerated;

Trapping pests (insects and rodents): it is achieved by the installation of traps classic (trapping live animals) type box with a rocking input system. It is a very effective method but quite restrictive and time consuming (takes time). Trapping is also used to estimate a population of animals (rodents) on a plot.

Biological control

Inundative release of auxiliary or predatory insects, and parasitoid: In all ecosystems, there are organisms called "auxiliaries" which are natural enemies of "pests". Biological control consists in favouring the populations of these auxiliaries by releases. This keeps the "pest" populations under control. An example is the Trichogram flood release to control sugar cane drillers.

Plant extracts or biopesticides: Many plants produce insecticidal substances that can be sprayed on crops after extraction. It is a preparation based on Neem, Tobacco and papaya leaf. In Ghana, very few programs are being developed to initiate experimentation with the use of biological pesticides

Reasonable chemical control

The application of pesticides at effective doses during treatments that are as few as desirable, carried out at the most appropriate times and with the required treatment equipment. This control method has the advantage of:

- effectively protecting its crop and harvest;
- respecting maximum pesticide residue limits (MRLs);
- improving its income by reducing the use of inputs (fertilizer and especially pesticides)

Additionally, subregional initiatives led by Institut Togolaise de Recherche Agronomique (ITRA) and Institut de Conseil d'Appui Technique (ICAT) in Togo have led to convincing results. The use of chemical pesticides is being replaced by biocidal plant extracts such as "neem" (Azadirachta indica), Lannea microcarpa, red pepper, cow dung, etc., which are used as a natural pesticide.

ITRA has particularly initiated the experimentation of the use of biological pesticides (especially extracts of the leaves of "neem" or Azadirachta indica) on vegetable crops. However, certain constraints have been encountered in the purification of the molecule extracted from the "neem". The difficulties of using these approaches by farmers are related to the availability of neem leaves and grains and the influence of climatic conditions in coastal areas. Other promising tests have also been made from papaya leaf extracts. These different results of proven initiatives could be capitalized as part of integrated pest management in Ghana.

6.1.3 Pest Management Plan for Cocoa

Pest	**Control / management**
Pseudotheraptus devastans (coreid bug)	Cultural practices such as chupon removal serves as the first line of defense aimed at reducing pest populations in the field. Encouraging the establishment of *Oecophylla longinoda* (red weaver ants) as natural enemies against pest in farms. Application of COCOBOD approved insecticides as a last resort.
Mirids	Cultural practices such as chupon removal serves as the first line of defense aimed at reducing pest populations in the field. Encouraging the establishment of *Oecophylla longinoda* (red weaver ants) as natural enemies against pest in farms. Application of COCOBOD approved insecticides as a last resort.
Bathycoelia thalassina (stink bug)	Application of COCOBOD approved insecticides.
Defoliator insects	Cultural practices such as chupon removal serves as the first line of defense aimed at reducing pest populations in the field. Encouraging the establishment of *Oecophylla longinoda* (red weaver ants) as natural enemies against pest in farms. Application of COCOBOD approved insecticides as a last resort.
Disease	**Control/Management**
Cocoa swollen shoot virus disease	Eradication (cutting-out) and replanting with tolerant materials

Black Pod disease	Cultural practices: reduction of shade, removal of heavy canopy through pruning, regular weeding, draining stagnant waters, removal of diseased pods Application of approved fungicides during the black pod season
Stem canker	Scrapping of affected area to expose internal tissues to light and air followed by coating of scrapped surface with a recommended fungicide
Thread blight	Affected parts of the tree should be removed and burnt Tress should be sprayed with an approved fungicide
Pink disease	Pruning and burning of affected parts followed by application of approved fungicides
Anthracnose	Application of approved copper based fungicides at two weekly intervals
Root rot	Infected trees and roots should be uprooted and burnt. Affected area should be replanted after at least 12 months
Charcoal Pod rot	Control of insect pest which create wounds on pods. Removal of infected pods from the farm.
Warty pod	Good farming practices
Mealy pod	Good farm sanitation and removal of infected pods

6.1.4 Pest Management Plan for Cashew

Pest	**Control / management**
Cashew weevil *Mecicorynus loripes* (Insect pest)	Remove bark from infested areas and destroy any larvae or pupae found, this process should be repeated every month for up to six months; severely infested trees should be removed and destroyed; remove all adult weevils from tree prior to destruction and also remove bark and kill all larvae and pupae.
Helopeltis schoutedeni *Helopeltis anacardia* *Helopeltis antonii*	Monitor crop regularly for signs of damage; conserve populations of natural enemies, weaver ants can reduce populations; avoid interplanting cashew with other crops which are hosts for helopeltis bugs such as tea and cotton
Anoplocnemis curvipes	Spraying cashew trees with Neem seed extract and cymethoate (synthetic insecticide) significantly reduced the incidence of these pest.
Pseudotheraptus devastans	Formicidae, such as the weaver ants, Oecophylla albicrus, Oecophylla congensis, and Oecophylla longinoda, have been successfully used as biocontrol agents against P. devastans and Pseudotheraptus. Where necessary, synthetic pyrethroids such as cypermethrin and alpha-cypermethrin, could be recommended. Avoid intercropping with alternative host plants (e.g. cowpea, cotton and cocoa)

Cashew Stem Borer *(Apate terebrans)*	Practice good farm sanitation by regular weeding and disposal of refuse, especially pruned branches. Remove and burn heavily infested trees to avoid population build up. Prodding the exit holes with a spoke to kill the grubs and adults. Regular monitoring of trees. Plugging of exit holes.
Cashew branch girdler *(Analeptes trifasciata)*	Adults which are visible can be destroyed physically. Cutting off and burning infested branches as well as collection and burning of fallen ones could slow population build as the pest has a long developmental period. Insecticide application is mostly effective to control the pest.
Thrips (Selenothrips sp.)	Apply Cyperdim at a rate of 45 ml/15 L of water for young trees. For matured trees, apply Cyperdim at a rate of 24 ml/11.5 L of water.

Disease	**Control/Management**
Fusarium, Sclerotium, Cylindrocladium, Pythium & Phytophthora spp	Provide adequate drainage in the beds and polythene bags. Ensure seedlings germinate promptly Avoid over-shading Spraying with fungicides containing copper and metalaxyl is recommended.
Anthracnose Caused by *Colletotrichum gloeosporioides*	Regular high sanitation maintenance Pruning and removal of affected parts Spray with 0.2% copper oxychloride, 0.3% Mancozeb, 1% Metalaxyl
Inflorescence blight caused by fungi and insect complex	Combined spraying of fungicides and insecticides is recommended.
Leaf blight caused by *Colletotrichum spp*	Best control is achieved by combining e.g. cultural, resistance and use of fungicides Prune or stake plants to improve air circulation and reduce fungal problems. Make sure to disinfect your pruning shears (one-part bleach to 4 parts water) after each cut. Keep the soil under plants clean and free of garden debris.
Twig dieback by *Lasiodiplodia theobromae & Phomopsis anacardii*	Prune affected branches below point of infection and burn them. Spray pruned surfaces with copper fungicides. Spraying may be done twice in a year (May-June and Oct-Nov)
Leaf rust cause by *Cephaleuros virescens*	Cultural practices are recommended and Good farm management is recommended.
Gummosis caused by *Lasiodiplodia* (Diplodia)	Remove affected tissue and apply copper fungicides slurry
Fruit rot by *Lasiodiplodia; Cladosporium & Fusarium spp*	Best control is achieved through combination of strategies including cultural, resistance and use of fungicides

6.1.5 Pest Management Plan for Coconut

Disease	Control / Management
Bud rot and nutfall *Phytophthora spp.* (fungal)	Control of the disease is reliant on good sanitation practices and the use of appropriate systemic fungicides (Fosetyl-aluminium); remove all infected debris and dead trees from plantation and destroy; irrigate trees early in the day to allow surfaces to dry off during the day.
Lethal yellowing disease (locally called Cape St. Paul wilt disease, CSPWD)	The most effective method of managing the disease is to plant resistant coconut varieties.
Coconut leaf spot *Curvularia pseudobrachyspora*	Prune affected leaves and apply fungicide (mancozeb)
Pest	**Control / management**
Coconut bug *Pseudotheraptus devastans*	Natural enemies of the coconut bug include weaver ants, conserve bushes and trees around plantation which are habitats for weaver ants or intercrop with mango, guava or citrus which are attractive to weaver ants; connect canopy with ropes or sticks to allow weaver ants to move between trees
Coconut rhinoceros beetle *Oryctes monoceros*	Practise Integrated Pest Management (IPM). Destroy any decaying logs in plantation by chopping and burning to kill any larvae that may be inside; remove any dead trees from plantation and destroy by burning; plant a cover crop to deter egg laying by females as they do not lay eggs in areas covered by vegetation; hooked wire can be used to extract larvae that are boring into young crowns. Keep farm clean and monitor the farm during the day and at night. Use chemical pesticides judiciously.
Termites (*Odontotermes* spp)	Practise IPM. Dip seedlings in termiticides before planting in the field. Carefully destroy homes/mounds of termites whilst wearing protective clothing. Use chemical pesticides judiciously.
Palm weevil (*Rhynchophorus phoenicis*)	Employ IPM strategies. Maintain general hygiene on the farm. Remove infested palm stems. Pheromone traps can be used together with insecticides in the 'lure and kill' technique. Release natural enemies or biological control agents such as the Red-eyed assassin bug (*Platymeris laevicollis)*
Eriophyid coconut mite *Aceria guerreronis*	Provide proper fertilizer and water for trees to withstand mite damage. Encourage natural enemies (*Oecophylla longinoda)* of mite in the orchard. If infestation is severe, apply suitable insecticide by root feeding or stem injection.

6.1.6 Pest Management Plan for Rubber

Disease	Control / Management
Root disease Two main types: *Fomes noxious* and *Fomes lignosus*	When the rubber tree is 2 years and above, rigorous inspection is carried to detect if the tree is infested.

	Fomes detection is carried out by a gang of 5 people who walk through the farm line by line (row by row). All trees suspected of having disease are identified (tagged) A second more precise level of detection to confirm the presence of Fomes is carried out Once confirmed, treatment begins Detection of a dead, infected or contaminated tree is carried out as follows: In the actual row: detection of the four neighbouring trees (two on each side of the dead or infected tree). In the neighbouring row: detection of the two trees directly opposite the dead or infected or contaminated tree. Treatment combines both mechanical action (partial or total isolation) and chemical action with fungicide granules. Currently, Sumi 8 (i.e., Diniconazole) which is a systemic fungicide is used for the control of Fomes. Treatment depends on the classification category as follows: Dead tree: removal of the tree with its lateral and the tap roots or total isolation. Infected tree: partial isolation by a 30 to 40cm deep trench 1m from the trunk; fungicide treatment with 30g of Sumi 8 around the collar. Contaminated tree: partial isolation by a 30 to 40em deep trench 1m from the trunk; fungicide treatment with 25g of Sumi 8 around the collar. Healthy neighbour: fungicide treatment with 25g of Sumi 8 around the collar. Treatments are carried out twice a year for three consecutive years.
Leaf disease (*Corynespora cassiicola)*	Detection Procedure Visual inspection of the canopy (leaves) for one or more of the signs and symptoms at the onset of refoliation. On a large-scale farm such as an estate, planes are used. Motorized sprayer can also be used. This should be done four (4) times within the same period.
Anthracnose	Plantation should be sited in well-drained soil Maintenance of soil fertility Use of recommended fungicides
Mistletoe Attack	Mistletoe should be removed physically by pruning with the use of secateurs, cutlass or any appropriate tool. There is no known chemical control or prevention method at the moment in Ghana. Where many new trees are being planted, control mistletoe in any surrounding infested trees to reduce the infestation of new trees. For treatment of existing trees, it is important to remove mistletoe before it produces seed and spreads to other limbs or trees. Mechanical control through pruning the affected tree branches is the most effective method for mistletoe removal.

6.2 Pesticide Management Action Plan

The Action Plan presents opportunities for eliminating and/ or mitigating the identified risks to ensure an environmentally and socially friendly project and also to provide safe working conditions. The Plan sets out specific objectives and targets defining the way various identified issues are to be addressed.

The issues highlighted in Chapter 5 are summarized as follows:

- Poor farmer knowledge leading to improper storage, handling, application and disposal of pesticides;
- Abuses associated with pesticide supply and sales;
- General health and safety of farmers and environmental hazards.
- Likely pollution of water resources and aquatic life from pesticide usage;
- Poisoning from improper use of pesticides and disposal of used containers by farmers and farm assistants;

Appropriate mitigation measures and implementation tools as well as monitoring indicators are required to be instituted to contain any adverse occurrence. The key actors to be involved in the implementation of the mitigation and management need to be identified as well. Table below provides the action plan for pest and pesticide management during the implementation of the GTCDP.

Table 12: Integrated Pest and Pesticide Management Action Plan

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
Improper storage of pesticides	Store all pesticides in a lockable, bunded container or store that has sufficient space in which to capture any spills without contaminating the environment.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Proper storage of pesticides in lockable, bunded containers	• Lockable, bunded containers • Store with adequate space to capture spills	TCDA/ COCOBOD/ Project Agrochemical Dealers/ Farmers
	Stores should be set away from water sources, residential and built-up areas, as well as livestock and food storage areas.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Stores kept away from water sources and dwellings, from livestock and food storage areas	• Adequate distance (>1km) from water sources and dwellings, from livestock and storage areas	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Procure spill kits and institute suitable control measures in case of accidental spillage.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Adequate management of accidential spillage	• Spill kits on site	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Store all pesticides in their original, labeled containers and ensure that storage instructions are followed.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Pesticide storage instructions followed	• All pesticides stored in original, labeled containers	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Keep a register of all pesticides procured, recording when they were received, the amount used,	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Proper records of pesticides procured and usage	• Register of pesticides procured and used	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
	the amount remaining in store, and their location.				
	Keep SDS at appropriate locations in storage facilities.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	SDS immediately available for reference purposes	• Safety Data Sheets (SDS) on site	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Warehouses must have appropriate ventilation, secondary containment, and emergency showers and kits.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Adequately designed and safe warehouses	• Warehouses with adequate ventilation, secondary containment and showers/ kits	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
Improper handling of pesticides	Operators must read, understand, and follow product label directions for mixing, safety, application, and disposal; use trained personnel for critical operations (e.g., mixing, transfers, filling tanks, and application).	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Trained operators for mixing, safety application and disposal of pesticides	• Trained operators	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Insist that correct PPE (e.g., gloves, overalls, eye protection) for each exposure route listed in the SDS be worn at all times	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Correct PPEs used when handling and applying pesticides	• Correct PPEs available on site • PPEs used by farmers and other operators	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
	when handling and applying pesticides.				
	Mandate that any mixing and filling of pesticide tanks occur in a designated filling area. This should be set away from watercourses and drains. If on concrete, water should be collected in a separate sump and disposed of as a hazardous waste.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Mixing and filling of pesticide tanks/ bottles in designated areas	• Designated filling areas away from watercourses (>1km)	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Ensure that spills are cleaned up immediately using appropriate spill kits; spills should not be washed away into watercourses or drains.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Immediate cleaning of spills	• Appropriate spill kits for immediate cleaning of spills	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
Improper application of pesticides	Give preference to the application method with the lowest EHS risk.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Safest application method applied	• Safest application method in use	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Select pesticide application technologies and practices designed to minimize off-	Follow the WB EHS Guidelines for perennial crops and	Off site movement and runoff minimized	• Documented pesticide application technologies and practices	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
	site movement or runoff (e.g., low-drift nozzles, using the largest droplet size and lowest pressure that are suitable for the product).	the IPM approaches and methods			
	Establish buffer zones around watercourses, residential and built-up neighborhoods, as well as livestock and food storage areas.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Safe water courses and dwellings, and livestock and food storage areas	• Adequate buffer zones (>1km)	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Ensure that all equipment is in good condition and properly calibrated to apply the correct dosage.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Correct dosages applied	• Equipment calibration records	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Insist that applications occur under suitable weather conditions; avoid wet weather and windy conditions.	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Safe water courses and dwellings, and livestock and food storage areas	• Sensitized farmers on appropriate weather conditions to apply pesticides	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Educate farmers on proper use of pesticides and pesticide use hazards	Pesticide hazards and use guide manual or leaflet for the project (include simple pictorial presentations)	Proper use of pesticides by farmers and farm assistants	• Number of cases of pesticide poisoning occurring under the project	TCDA/COCOBOD, Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
	Control and supervise pesticide use on farms	Adoption of IPM approaches/ techniques	Farmers trained in IPM techniques	• Number of farmers trained, Training records	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Monitor pesticide residue in crops	Random sampling procedure for crops and storage products	Pesticide residue in crops within acceptable limit/MRL	• Levels and trend of pesticide residue in sampled crops • Number of times exported crops are rejected due to pesticide residues	TCDA/ COCOBOD
Improper disposal of pesticides	Any unused dilute pesticide that cannot be applied to the crop, along with rinse water, and out-of-date or no-longer approved pesticides, should be disposed of as a hazardous waste, as per FAO guidelines.	Implement the WB EHS Guidelines for perennial crops and FAO guidelines	Safe disposal of unused dilute pesticides	• Records of safe disposal of unused dilute pesticides	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Empty pesticide containers, foil seals, and lids should be triple rinsed, and washings used in the pesticide tank should be sprayed back onto the field or disposed of as hazardous waste in a manner consistent with FAO guidelines and according to the	Implement the WB EHS Guidelines for perennial crops and FAO guidelines as well as manufacturers' directions	Safe disposal of empty pesticide containers	• Records of safe disposal of empty pesticide containers	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
	manufacturer's directions. Containers should be stored safely and securely under cover prior to their safe disposal; they should not be used for other purposes.				
Pollution of water resources and aquatic life	Control and supervise pesticide use by farmers	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Farmers trained in IPM techniques	• Number of farmers trained, Training records	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Proper disposal of pesticide waste containers by resellers/farmers as described above	Pesticide container collection and disposal plan	Pesticide container disposal plan developed and implemented	• Number of farmers/ resellers aware of pesticide container disposal plan	PCU/GTCDP; PIU/ COCOBOD
	Monitor pesticides in water resources	Environmental quality monitoring plan (with support from the CSIR- Water Research Institute)	Pesticide concentration in water resources	• Levels of pesticides in water resources	PCU/ PIU; CSIR- Water Research Institute
Poisoning from improper disposal of pesticide containers	Educate farmers and local communities on health hazards associated with use of pesticide containers	Pesticide hazards and use guide manual or leaflet for the project	Farmers, FBOs, local communities educated on pesticide health hazards	• Number of cases of pesticide poisoning through use of pesticide containers; • Number of farmers returning empty pesticide containers at collection points; • Number of farmers, FBOs, resellers trained in proper cleaning of pesticide containers	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Properly dispose pesticide containers	Pesticide container cleaning and disposal plan	Pesticide container cleaning and disposal plan developed and implemented		TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
Threat from other crop pests and diseases	Educate and train farmers to adopt good agricultural practices (GAP)	Follow the WB EHS Guidelines for perennial crops and the IPM approaches and methods	Farmers trained in IPM techniques and GAP	• Number of farmers trained, Training records • Incidence of crop pests Production losses from crop pests	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Apply EPA approved and PPRSD recommended pesticides if necessary WHO hazard class I and II pesticides should not be purchased, used and stored under this program. (If needed, there should be proper control methods concerning the manufacture, procurement, distribution and/or use of these chemicals. These chemicals should not be accessible to personnel without proper training, equipment, and facilities to properly handle, store, apply and dispose of these products)	Inspection of pesticides at farm/storage gate prior to use (Project Policy)	Applied pesticides registered and approved by key stakeholders and in conformity with IPM principles	• Records of pesticides applied at each farm	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
Abuses in pesticide supply and sales	Identify all pesticide distributors and resellers interested in providing services and products to farmers under the Project	Registration policy for all interested distributors and resellers under project	Only approved and licensed dealers and resellers supply pesticides under project	• Company registration documents • Evidence of license/permit to operate in pesticides • Evidence of location and contacts of suppliers/resellers	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Confirm status and integrity of pesticides supplied under project	All pesticides are to be in the original well labeled pesticide containers prior to use No decanting of pesticides under this project Inspection of pesticides at farm gate prior to use	Only approved and registered pesticides used under project Banned pesticides avoided Fake and expired pesticides avoided Integrity of pesticide guaranteed at farm gate level	• List of pesticides supplied and used in line with Ghana EPA and USEPA list of registered and approved pesticides • Cases of pesticides found in non-original containers • inspection records for pesticides at farm gate prior to use	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Avoid large size pesticide containers to minimize decanting cases	Decanting policy (No decanting of pesticides under project)	All pesticides delivered for use are in the original containers	• Cases of pesticides found in non-original containers	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
Impact on post-harvest losses due to pests	Provide adequate and proper storage facilities	Post-harvest loss reduction plan based on IPM techniques in place	Post-harvest losses avoided or minimised Applied pesticides	• Number of farmers trained in IPM techniques for post-harvest storage; • Number and condition of storage facilities in use	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
	Monitor incidence of post-harvest pests		registered and approved by key stakeholders and in conformity with IPM principles	• Number of cases of post-harvest pests	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Confirm status and integrity of pesticides at storage gate prior to use	Inspection of pesticides at farm/storage gate prior to use (Project Policy)		• Records of pesticides applied at storage sites/ rooms	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
General health and safety of farmers/crops and environmental hazards	Educate farmers to adopt GAP based upon IPM techniques; and do not use chemical pesticides unless advised by PPRSD	IPM techniques with emphasis on cultural and biological forms of pest control	Compliance with national IPM policy and WB policy on Pest/ pesticide management	• Number of farmers trained in IPM techniques; • Number of farmers implementing IPM on their farms • Frequency of chemical • pesticides usage	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Provide PPEs to farmers for pesticide use in the fields	Health and safety policy for farm work	Farmers and accompanying dependants (children) protected against pesticide exposure in the fields	• Quantities and types of PPEs supplied or made available under the project	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Educate farmers/ farm assistants in the proper use of pesticides	Pesticide hazards and use guide manual or leaflet for the project (incude simple pictorial presentations	Farmers know and use pesticides properly; pesticide hazards and use guide leaflet or flyers produced	• Number of farmers trained in pesticide use; • Number of farmers having copies of the pesticide • hazard and use guide flyers;	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Properly dispose obsolete and unused pesticides	Obsolete and unused pesticide disposal plan	Obsolete and unused pesticide disposal plan prepared and	• Relationship between pesticide supply and usage	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

Impact issue / Pest & pesticide threat/ risk	Mitigation Measures	Implementation tool	Expected result	Monitoring indicators	Responsibility/ Key implementing actors
			implemented. All obsolete pesticides to be taken back by the suppliers.		
	Educate farmers to obtain or purchase quantities of pesticides required at a given time and to avoid long term storage of pesticides	Pesticide use policy/plan	Only pesticides needed are purchased; long term storage of pesticides by farmers avoided	• Relationship between pesticide supply and usage	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Provide emergency response to pesticide accidents and poisoning	Emergency response plan	Pesticide accidents and emergencies managed under the project	• Number of pesticide accidents and emergencies	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers
	Educate farmers/ farm hands on the proper use of pesticides	Pesticide hazards and use guide manual or leaflet for the project (include simple pictorial presentations)	Farmers know and use pesticides properly; pesticide hazards and use guide leaflet or flyers produced	• Number of farmers trained in pesticide use; • Number of farmers having copies of the pesticide hazard and use guide flyers;	TCDA/ COCOBOD/ Project Agrochemical dealers/ Farmers

7.0 PROGRAMME TO MEET REQUIREMENTS

GTCDP will implement the following strategies to achieve an effective pest and pesticide management system:

7.1 Formation of Safeguard Team

The TCDP will be responsible for the IPM interventions applicable to cashew, coconut and rubber whilst the COCOBOD will focus on cocoa interventions. The E&S specialists at both the PCU-TCDA and PIU-COCOBOD will assist project contractors, agricultural input suppliers and FBOs in selecting and assembling a team to implement all safeguard provisions, including the IPMP as described in the ESMF. The Safeguard Specialists will provide training to these designated individuals, who will submit periodic reports to the PCU and PIU. The Team may meet monthly or as agreed upon by the parties to the parties to review safeguard performance, including pest and pesticides management and monitoring measures, identify gaps and challenges, and propose corrective actions for the future. The ESMF for the project contains the Team and Committee's specific responsibilities.

The Safeguard team will among others:

- Coordinate all pesticide management activities across all projects
- Provide leadership in pesticide use and management for the project components and entire project sites
- Provide guidance and project level information and tools on safeguards for all stakeholders
- Coordinate all pesticide management activities with the EPA, MoFA, and other implementing agencies
- Facilitate all environmental and social safeguard training and capacity building activities
- Any other activities/ responsibilities that may emerge

7.2 Registration and Training of Chemical Retailers

To ensure sanity in the agrochemical retail business, the TCDP will notify pesticide distributors or publish in the national dailies that all interested pesticide distributors or resellers interested in providing services or products for the Project are to register with TCDP by providing specific requested information, including but not limited to the following:

- Certificate of registration or incorporation with the Register General's Department of Ghana;
- License or permit to operate from EPA or PPRSD;
- Locations of company; and
- Types of activities or services or products to be provided.

All distributors and sellers of pesticides who have registered with the project will be required to attend an orientation workshop. The workshop will cover the following topics, but not exclusively:

- EPA registered and banned pesticides; and
- EPA and PPRSD requirements on purchase, supply, and distribution of pesticides safely.

7.3 Awareness Creation and Orientation Workshops/ Seminars

The PCU-TCDA and PIU-COCOBOD Safeguard specialists will develop and implement a plan to communicate the Integrated Pest Management Plan to all project actors and participants in the beneficiary regions and districts. They will establish continuous communication with national regional pest and pesticide management organizations.

In addition, the PCU and PIU will organize orientation workshops on IPM techniques and the IPMP for primary communities who are at the forefront of pesticide use and are likely to be exposed to its dangers.
The efforts to raise awareness creation will include, among other things, discussions with project actors and participants (pesticide distributors and resellers, farmers, farm assistants) about the significance of pest and pesticide management in the context of this IPMP and the national IPM strategy, as well as the avenues created or available for obtaining appropriate pesticides.

TCDP will ensure that all project participants have access to information on crop pests and diseases, MoFA-PPRSD IPM strategies regarding pest control, declared pest plants, current EPA list of registered and banned pesticides, and the USAID/USEPA list of approved pesticides. Beneficiary farmers who are illiterate will receive key information on crop pests and diseases, IPM strategies for pest control, and pesticide use toolkits in formats that are easy to read and comprehend (pictorial presentations) and translated into at least two local languages. The awareness-raising programme will be conducted, every three or six months, to acclimate communities and farmers to the schedule.

The project Safeguard Specialists will incorporate pest management awareness issues into all environmental training programs.

7.4 Participatory Pests Inventory and Monitoring

The project will track and record all pest cases, whether minor or major, in a PPRSD pest inventory register. The PCU and PIU will therefore establish a working relationship with the PPRSD from the onset. It will identify the types, abundance, location of invasive plant species, as well as the date of first sighting or report. This data will be collected through implementation of a surveillance or monitoring system, periodic surveys, and feedback from farmers and FBOs. The data will be managed in a standardized manner to enable the identification of trends.

The PCU and PIU safeguard specialists will coordinate the pest management process with all relevant water resource regulators and users (WRC, VRA, Fisheries Commission) and other significant land users within the project areas (such as traditional authorities and landowners, cattle rearers and herders in the project-targeted areas). Any receptor (land or water) that may have been affected by pest management activities will be identified and incorporated into planning process. Significant neighboring water and land managers will be contacted, consulted when appropriate, and management activities will be coordinated with government agency representatives and other water and land users.

7.5 Prevention of new Pest Infestations and Management of Established Pests

TCDP and COCOBOD will endeavour to treat and manage new pest infestations as soon as they are identified and this will be accomplished by:
Surveillance, Early Detection and Eradication: A system will be established for the reporting and identification of unusual plants, animals, and pests. PPRSD will conduct regular pest surveys to detect new infestations, and a rapid response procedure for managing new infestations will be implemented.
Prevention of Spread: This IPMP establishes protocols for effectively managing risks associated with all human-assisted transport of declared pests.

The IPMP will ensure that existing pest infestations are managed effectively. Regular reviews of pest management priorities will be conducted. As applicable, these will include the elimination of Class 3 pests (environmental weeds). The impact on non-target species, particularly those with ecological significance, will be reduced to minimum.

7.6 Integrated Pest Management Capacity Building

The project will use Farmer Field Schools (FFS), Farmer Participatory Research (FPR), and Participatory Learning (PL) to make research results more understandable and useful to farmers through capacity building.
Farmers will be capable of correctly identifying and diagnosing pests and pest-related problems. In addition, they will be able to comprehend the trophic relationships that make biological control possible and use this knowledge to guide pesticide and other interventions. trophic relationships that make biological control possible and use this knowledge to guide pesticide and other kinds of interventions. Through the use of participatory approaches, the project will strengthen local capacity to ensure the rapid adoption of ecologically sound and environmentally friendly management practices, particularly among smallholder farmers. Farmers will gain an understanding of cultural, biological, and ecological processes underlying IPM options and use this knowledge to select methods that minimize production and post-harvest storage.

Implementation of IPMP will be anchored at the regional level by MoFA and COCOBOD, with action on the ground by farmer groups who will receive training and advisory services from MoFA and COCOBOD as well as appropriate NGOs, who will have completed Training of Trainers (ToT) sessions. Training at all levels will be based on participatory learning modules for IPM information delivery capacity building. To promote adult learning, the participants will be equipped with facilitation, group dynamics, and non-formal education techniques. The focus of farmer training will be on group learning for informed IPM decision-making. Through farmer-led field trials and discussions on practical aspects of crop production and pest management, including indigenous and traditional knowledge and technologies, the group will engage in experimental learning. ToT-trained male and female extension agents will facilitate farmer group learning.

Agro-ecosystem Analysis (AESA), which involves a comparison of IPM practices with standard farmer practices, will facilitate group decision-making. At each AESA, farmers observe, document, and monitor changes in soil, crop and trophic relationships that influence crop growth. Based on their own analyses, farmers analyze and discuss their findings and recommend corrective action. Group learning enhances scientific literacy, community ownership of biological and ecological information and knowledge, and habits of making informed decisions. In addition, trained farmers and association leaders will be expected to encourage the secondary adoption of proven options. For instance, trained leaders of farmers' associations will be expected to assist in training of new farmers through farm visits and demonstrations. In addition, the trained farmers will organize field days to train and educate other farmers on the new or improved IPM techniques they have learned. they have learned. Representatives of the PCU and PIU, MoFA extension officers, COCOBOD, local community leaders, NGOs, local community FM stations, researcher institutes, and national extension services may attend the field day.

The capacity building will include training workshops and production of guidance reports and tools. The following training programmes are recommended:

Table 13: Training modules and proposed participants

No	Training content	Participants	Mode of delivery	Frequency of training
1.	• World Bank ESF and ESSs; • The World Bank ESS3/ OP 4.09, • WB EHS Guidelines on perennial crops • FAO, WHO International code of conduct on Pesticide Management • IPM approaches and techniques • Digital crop pest diagnosis and management, as well as awareness on possible pests/vectors, using climate information for safe pesticides use	PCU/ TCDP; PIU-COCOBOD E&S specialists, Agrochemical suppliers, FBOs etc	Workshop	Quarterly
2.	• ESMF Screening Checklist, • EPA register of pesticides • ToR for PCU/ PIU E&S Specialists • ToR for Safeguard Team and Focal persons	PCU/ TCDP; PIU-COCOBOD E&S specialists, Agrochemical suppliers, FBOs etc	Workshop	Once
3.	• Preparation of Terms of Reference for Pest Management Plans	RC/ MAFFS safeguard persons, PCU safeguard specialist	Workshop	Quarterly
4.	• Pest Management Plans • Grievance redress registration and resolution forms • Safeguard reporting formats	PCU/ TCDP; PIU-COCOBOD E&S specialists, Agrochemical suppliers, FBOs etc	Workshop	Quarterly

7.7 Training Responsibilities

The PCU/PIU with input from PPRSD/EPA will undertake training needs assessment across sites; and organize appropriate workshops to develop participatory learning modules.

The PPRSD with input from the EPA, will

- liaise with appropriate farmers' associations to plan training implementation;
- provide technical support such as in preparing and delivering specific training materials, and evaluating resource materials;
- identify and select suitable local training resource persons and materials; and
- prepare training progress reports.

MoFA and COCOBOD (Regional/District Officers) will collaborate with farmers'/agriculture associations to

- identify and organize farmer groups for training (i.e. use of farmer field school to teach farmers on the efficient and responsible use of pesticides and chemical fertilizers and sound agricultural practices);
- prepare, organize and supervise training implementation plan;
- verify reports of persisting pest problems and farmers training needs;
- monitor performance of farmer trainers and post-training assignments; and
- prepare training progress reports.

Farmers and local communities as the principal beneficiaries, will be organized into farmer groups for training and adoption of IPM practices. The farmers will be facilitated to set up Community IPM Action Committees to coordinate IPM activities in their areas.

International research institutions such as the ICRAF may be considered to train farmers on the digital crop pest diagnosis and management, as well as awareness on possible pests/vectors, using climate information for safe pesticides use.

7.8 Participatory Monitoring and Evaluation

There will be biannual monitoring and evaluation of activities to determine the level of progress being made with regard to pest and pesticide management and control issues identified in the IPMP. In addition to the monitoring indicators provided in the action plan under the previous section, the following performance indicators will be used.

Table 14: Performance Indicators

No	Area	Indicators
1	Training and awareness creation	• Types and number of participatory learning modules (PLM) delivered; • Category and number of extension agents and farmers trained and reached with each PLM; • Category and number of participants reached beyond baseline figures; • Practical skills/techniques most frequently demanded by extension agents and farmers; and • Crop management practices preferred by farmers.
2	Technology acceptance/ field application	• Category and number of farmers who correctly apply the skills they had learnt; • New management practices adopted most by farmers; • Category and number of other farmers trained by project trained farmers; • Types of farmer-innovations implemented; • Level of pest damage and losses; • Rate of adoption of IPM practices; • Impact of the adoption of IPM on production performance of farmers
3	Project direct benefits	• Increase in crop production; • Increase in farm revenue; • Low incidence of pests and diseases • Social benefits: e.g., improvement in the health status of farmers; • Level of reduction of pesticide purchase and use; and • Number of projects co-families using preventive mechanisms against diseases.

7.9 Reporting and Reviews

Annual progress reports will be prepared by the PCU/PIU. The reports will indicate the pest cases identified and treated using IPM approaches, location of pests, level of success of treatment, the amount and type of herbicide/pesticide used, level of cooperation from farmers and other relevant information (e.g., training programmes organized, farmer field schools held etc.). The report will also include incidents and accidents associated with agrochemical use or related to the implementation of this plan.

The PCU/ PIU will undertake annual pest and pesticide control and management reviews to confirm the implementation of the various control measures or programmes or actions outlined in the IPMP. Recommendations from the reviews will help the PCU/PIU to refocus and plan effectively towards achieving planned targets. The management review team will include, among others:

- PCU (TCDP)/ PIU (COCOBOD)
- Representative of the MoFA/ PPRSD; and
- Representatives of the EPA

7.10 Institutional Arrangements

The TCDP and COCOBOD will establish working relationships with some key institutions at the project onset through MoUs. It is expected that some of these institutions may have ESMS in place. Key institutions and their roles will comprise the following:

PPRSD/ MoFA

PPRSD will ensure the internal monitoring of the implementation of the environment and health component of the IPMP and will regularly report to the PCU (GTCDP) and PIU (COCOBOD). It will participate in the training of the regional and district agents to be contracted by the project.

EPA

The EPA will be responsible for the external monitoring of the "environment" component of the implementation of the IPMP as well as approved/registered agrochemicals.

CSIR- Research laboratories

They will assist in the analysis of environmental components (analyzes of pesticide residues in water, soil, plants, agricultural harvest, fish, food, etc.) to determine the various parameters of pollution, contamination and toxicity related to pesticides

Farmer Organizations/ Beneficiary Communities

They must have and apply the procedures and good environmental practices concerning the use and the ecological and safe management of pesticides

They will participate in the sensitization of populations, social mobilization activities. They will also participate in the supervision and external monitoring of the implementation of the measures recommended under the IPMP

NGOs/ CSOs

NGOs and other environmental organizations of civil society can also participate in informing, educating and raising awareness among agricultural producers and the population on the environmental and social aspects related to the implementation of the IPMP, but also to monitoring of the implementation and monitoring of the environment.

7.11 Disclosure of IPMP

The World Bank policies require that environmental reports for projects are made available to project affected groups, local NGOs, and the public at large. Public disclosure of EIA documents or environmental reports is also a requirement under Ghana EIA procedures. TCDP/ COCOBOD will make available copies of the IPMP in selected public places especially the project districts and regions as required by law for information and comments. Public notice in the media should be served for that purpose. The notification should be done through a newspaper or radio announcement or both. The notification should provide:

- a brief description of the Project;
- a list of venues where the IPMP report is on display and available for viewing;

- duration of the display period; and
- contact information for comments.

The EPA will select display venues upon consultation with TCDP and COCOBOD but would be expected that the venues or places will include the project locations or local communities.

7.12 Grievance Redress

Grievance mechanisms provide a formal avenue for affected groups or stakeholders to engage with the project implementers or owners on issues of concern or unaddressed impacts. Grievances are any complaints or suggestions about the way a project is being implemented. They may take the form of specific complaints for damages/injury, concerns about routine project activities, or perceived incidents or impacts. Identifying and responding to grievances supports the development of positive relationships between projects and affected groups/communities, and other stakeholders.

The World Bank policy requires that concerns should be addressed promptly using an understandable and transparent process that is culturally appropriate and readily acceptable to all segments of affected communities, at no cost and without retribution. Mechanisms should be appropriate to the scale of impacts and risks presented by a project. The project ESMF has developed a grievance management process to serve as a guide during project implementation which incorporates any concerns that may arise from the IPMP activities.

7.13 Implementation

An estimated budget of US$226,000 is required to implement the action plans prepared for the IPMP including training. The components of the budget are presented in the table below:

Table 15: Implementation Budget

No.	Activity	Description	Total, US$
1.	**Capacity building**		
1.1	Orientation and training workshops	US$20,000 per year for 3 years An estimated number of 15 persons (at an average cost of US$100 per person) from the various agro-input dealers groupings	60,000.00
1.2	Training of Trainers	US$4,000 per year for 3 years 10 selected persons identified as trainers and given training annually at an estimated cost of US$100 per person	12,000.00
1.3	Farmer group trainers	US$9,000 per year for 3 years About 50 farmers participating in the programme will receive training on the IPMP every year at an average cost of US$100 per person.	27,000.00

	Sub total		*99,000.00*
2.0	**Support/ Advisory Services**		
2.1	Registration of pesticide suppliers	Annual registration	6,000.00
2.2	IPM problem diagnosis	$6,000 per year for 3 years Annual identification and documentation of pest management challenges on the project	18,000.00
2.3	Field guides/ IPM materials	Production of materials and simple manuals with illustrations that would be relevant for onsite training of farmers and other farmhands	8,000.00
2.4	Public awareness/ sensitization campaigns	$5,000 per year for 3 years Campaigns within project regions and districts (FM stations, schools etc.)	15,000.00
2.5	Pest / vector surveillance	Constant watch on the population dynamics of pests, its incidence and damage on each crop at fixed intervals to forewarn the farmers to take up timely crop protection measures.	10,000.00
2.6	Laboratory analysis support-MRLs	-	20,000.00
	Sub total		*77,000.00*
3.0	**Environmental management**		
3.1	Pesticide monitoring in surface water bodies in or around project areas with support from CSIR- Water Research Institute	$15,000 per year for 3 years	45,000.00
3.2	Preparation of annual environmental reports	-	5,000.00
	Sub total		*50,000.00*
	TOTAL		**226,000.00**

ANNEXES

Annex 1: EPA Revised Register of Pesticides, 2020

Annex 2: Stakeholder Engagement

ANNEX 1: Revised Register of Pesticides – January 2020

(A) Fully Registered Pesticides (FRE)
(A1a) Insecticides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Abalone 18 EC	FRE/2006/1583G January 2020	Abamectin (18g/l)	II	Insecticide for the control of red spider mite, two-spotted spider mite and tomatoes russet mite in tomatoes	Calli Ghana Limited, Accra
2.	Abamet	FRE/2099/1577G January 2020	Abamectin (92%)	II	Insecticide for the control of two-spotted mite in cotton and tomato	Rainbow AgroSciences Co. Ltd., Tema
3.	Aceta Star 46 EC	FRE/18100/1394 G August 2018	Bifenthrin (30g/l) + Acetamiprid (16g/l)	II	Insecticide for the control of capsids in cocoa	Adama West Africa Ltd., Accra
4.	Actara 240SC	FRE/18227/1407 G September 2018	Thiamethoxam (240g/kg)	III	Insecticide for the control of mirids in cocoa	Overseas Warehouse Ghana Ltd., Accra
5.	Agro-thoate 40EC	FRE/1710/1226G October 2017	Dimethoate (400g/l)	II	Insecticide for the control of insect pests in vegetables	Reiss & Co. Ghana Ltd., Accra
6.	Akape 20SC	FRE/1902/1518G October 2019	Imidacloprid (20%)	III	Insecticide for the control of insect pests in vegetables	Agrimat Ltd., Madina
7.	Akate Master	FRE/2005/1602G March 2020	Bifenthrin (27g/l)	II	Insecticide for the control of capsids in cocoa	Chemico Limited, Tema
8.	Alphacep 10 EC	FRE/1902/1488G June 2019	Alpha-cypermethrin (100g/l)	III	Insecticide for the control of insect pests in vegetables and fruits	Agrimat Ltd., Madina
9.	Ataka Super EC	FRE/1957/1559G October 2019	Emamectin Benzoate (19.2g/l)	III	Insecticide for the control of diamondback moth and cotton bollworm in cabbage and cotton	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra
10.	Attack 1.9 EC	FRE/1804/1304G February 2018	Emamectin-benzoate (1.9%)	II	Insecticide for the control of insect pests in vegetables	Agrimat Limited, Madina

11.	Aventall 300WG	FRE/18139/1420 G November 2018	Indoxacarb (300g/kg)	III	Insecticide for the control of insect pests in fruits, vegetables, rice and cotton	Jingbo Agrochemicals Tech. Gh. Co. Ltd., Accra.
12.	Bastion Extra	FRE/19202/1482 G March 2019	Imidacloprid (3%)	II	Insecticide for the control of rice hoppers, aphids, thrips, whiteflies, termites, beetles and soil borne insects in cereals, vegetables, fruits and cotton	Macrofertil Ghana Ltd., Accra
13.	Belt Expert 480SC	FRE/18185/1307 G April 2018	Flubendiamide (240g/l) + Thiacloprid (240g/l)	II	Insecticide for the control of insect pests in cotton	RMG Ghana Ltd., Accra
14.	Betallic Super	FRE/1825/1337G July 2018	Pirimiphos methyl (400g/l) + Permethrin (75g/l)	II	Insecticide for the control of insect pests in maize and cowpea	Bentronic Productions, Kumasi
15.	Bomec EC	FRE/19202/1455 G February 2019	Abamectin (18g/l)	II	Insecticide for the control of aphids, caterpillars, whiteflies, grasshoppers and bollworms in vegetables and fruits	Macrofertil Ghana Ltd., Tema
16.	Bonlambda 2.5 EC	FRE/19149/1458 G February 2019	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Bon Agro Co. Ltd., Kumasi
17.	Box 18EC+	FRE/20145/1598 G March 2020	Abamectin (1.8%)	II	Insecticide for the control of bollworms, red spider mites, cabbage worm, psyllas in soybean, cotton, and tangerine	Jubaili Agrotec Ltd., Kumasi
18.	Buffalo Supa 40EW	FRE/1723/1211G October 2017	Acetamiprid (400g/l)	III	Insecticide for the control of insect pests in vegetables and fruit crops	Thomhcof Company Limited, Kumasi
19.	Bypel 1	FRE/19133/1576 G November 2019	*Perisrapae Granulosis* virus + *Bacillus thuringiensis* (5%)	II	Bio-insecticide for the control of whiteflies and worms in vegetables and fruits	Abbnak Agro Services, Kumasi
20.	Callifan Super 200 EC	FRE/1906/1451G February 2019	Acetamiprid (100g/l) + Bifenthrin (100g/l)	II	Insecticide for the control of mirids in cocoa	Calli Ghana Co. Ltd., Accra

21.	Calthio Mix 485WS	FRE/1906/1445G February 2019	Imidacloprid (350g/kg) + Thiram (100g/kg) + Metalaxyl (35g/kg)	II	Insecticide/fungicide for the control of insect pests and fungal diseases in maize	Calli Ghana Co. Ltd., Accra
22.	Campaign	FRE/18185/1281 G January 2018	M*etharhizium anisoplae* (ICIPE 69)	U	Bio-insecticide for the control of thrips in pepper	RMG Ghana Ltd., Accra
23.	Carinho WP	FRE/18202/1377 GAugust 2018	Carbendazim (500g/kg)	II	Insecticide for the control of leaf spot, leaf mould and stem rot in vegetables	Macrofertil Gh. Ltd., Tema
24.	Chlorlet 48EC	FRE/18145/1430 G December 2018	Chlorpyrifos - ethyl (48%)	II	Insecticide for the control of insect pests in rice and cotton	Jubaili Agrotec Ltd., Kumasi
25.	Colam 247 ZC	FRE/1899/1311G April 2018	Thiamethoxam (141g/l) + Lambda-cyhalothrin (106g/l)	II	Insecticide for the control of insect pest in rice, tomato, cotton, beans, cabbage and watermelon	Rainbow Agrosciences Co. Ltd., Tema
26.	Condor SL	FRE/1825/1331G July 2018	Imidacloprid (20%)	II	Insecticide for the control of insect pests on vegetables	Bentronics Productions
27.	Condifor Super	FRE/1843/1352G July 2018	Imidacloprid (20%)	II	Insecticide for the control of insect pests in vegetables	Kumark Company Ltd, Kumasi
28.	Confidor 200 OD	FRE/20185/1518 G January 2020	Imidacloprid (200g/l)	III	Insecticide for the control of mirids in cocoa	RMG Ghana Limited, Accra
29.	Conti-halothrin 2.5EC	FRE/1978/1573G October 2019	Lambda-cyhalothrin (60%)	II	Insecticide for the control of insect pests in vegetables and pulses	Five Continents Imp. & Exp. Ltd., Accra
30.	Conti-zol	FRE/1978/1572G October 2019	Diazinon (25g/l)	II	Insecticide for the control of insect pests in vegetables	Five Continents Imp. & Exp. Ltd., Accra
31.	Control 5WDG	FRE/1804/1305G February 2018	Emamectin benzoate (5%)	II	Insecticide for the control of aphids, worms and borers in vegetables	Agrima t Limited , Madina
32.	Cydim Super EC	FRE/1802/1261G January 2018	Dimethoate (400g/l) + Cypermethrin (36g/l)	II	Insecticide for the control of aphids, caterpillars, whiteflies, grasshoppers and bollworms in vegetables	Agrima t Limited , Madina

33.	Cymethoate Super EC	FRE/1705/1144G July 2017	Dimethoate (400g/l) + Cypermethrin (36g/l)	II	Insecticide for control of aphids, caterpillars, whiteflies, grasshoppers, bollworms in vegetables and cotton	Chemico Ltd., Tema
34.	Cypadem 43.6EC	FRE/1957/1554G October 2019	Dimethoate (400g/l) + Cypermethrin (36g/l)	II	Insecticide for the control of insect pests in vegetables and field crops	Wynca Sunshine Agric Prod & Trading Co. Ltd., Accra
35.	Cypercal 50 EC	FRE/2006/1580G January 2020	Cypermethrin (50g/l)	II	Insecticide for the control of insect pests in cotton	Calli Ghana Company Ltd., Accra
36.	Cypersect Super EC	FRE/1825/1333G July 2018	Dimethoate (400g/l) + Cypermethrin (36g/l)	II	Insecticide for the control of aphids, caterpillars, whiteflies, grasshoppers and bollworms in vegetables	Bentronics Productions, Kumasi
37.	D-Ban Super 48 EC	FRE/1843/1350G July 2018	Chlorpyrifos (48%)	II	Insecticide for the control of insect pests in vegetables	Kumark Co. Ltd., Kumasi
38.	Dean 62 EC	FRE/19202/1462G March 2019	Imidacloprid (50g/l) + Emamectin benzoate (12g/l)	II	Insecticide for the control of moth, caterpillars, whiteflies, aphids and ants in cereals, vegetables and sugarcane	Macrofertil Ghana Ltd., Tema
39.	Decis Forte 100 EC	FRE/17185/1161G July 2017	Deltamethrin (100g/l)	II	Insecticide for the control of insect pests in vegetables	RMG Ghana Ltd., Accra
40.	Devaxam 25 WG	FRE/1710/1229G October 2017	Thiamethoxam (15%)	II	Insecticide for the control of insect pests in vegetables	Reiss & Co. Ghana Ltd., Accra
41.	Diazol 50 EW	FRE/17100/1235G November 2017	Diazinon (500g/l)	II	Insecticide for the control of insect pests in vegetables	Adama West Africa Ltd., Accra
42.	Dimeking 400EC	FRE/1899/1435G December 2018	Dimethoate (400 g/l)	II	Insecticide for the control of insect pests in fruits, cotton and vegetables	Rainbow AgroSciences Company Limited, Accra
43.	Dimex 400 EC	FRE/17202/1204G October 2017	Dimethoate (400g/l)	II	Insecticide for the control of aphids, fruit flies and leaf miners in vegetables, fruits and pineapples	Macrofertil Gh. Ltd., Tema

44.	Dimiprid 20 SL	FRE/1710/1228G October 2017	Imidacloprid (200g/l)	II	Insecticide for the control of insect pests in vegetables	Reiss & Co. Ghana Ltd., Accra
45.	Dursban 4E	FRE/1805/1383G August 2018	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of scale, borers, cockroaches and mosquitoes	Chemico Limited
46.	Ekuapa 2.5 EC	FRE/1823/1303G February 2018	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Thomas Fosu Enterprise, Kumasi
47.	Ema Star 112EC	FRE/19100/1542 G October 2019	Emamectin benzoate (48g/l) + Acetamiprid (64g/l)	II	Insecticide for the control of whiteflies, diamondback moth, aphids in okra and eggplant	Adama West Africa Ltd, Accra
48.	Eradicoat T GH	FRE/19125/1535 G October 2019	Maltodextrin (282g/l)	III	Insecticide for the control of insect pests in fruits, vegetables and Fall armyworm in maize	Positiveware Trading Company Limited, Accra
49.	Evict EC	FRE/1953/1476G March 2019	Lambda-cyhalothrin (2.5%)	II	Insecticide for the control of insect pests in vegetables and pulses	L'espoir Co. Ltd., Accra
50.	Evisect S50 SP	FRE/1906/1446G February 2019	Thiocyclam oxalate (500g/kg)	II	Insecticide for the control of leaf miner in oil palm	Calli Ghana Co. Ltd., Accra
51.	Evite 340WP	FRE/18139/1418 G November 2018	Tebufenozide (300g/kg) + Emamectin benzoate (40g/kg)	II	Insecticide for the control of armyworms, bollworms, corn borers, plutella of cabbage and cereals	Jingbo Agro. Tech. Gh. Co. Ltd., Accra.
52.	Fastrack 10 SC	FRE/1902/1487G June 2019	Alpha-cypermethrin (100g/l)	III	Insecticide for the control of insect pests in vegetables and fruits	Agrimat Ltd., Madina
53.	Fipro 50EC	FRE/1908/15322 G October 2019	Fipronil (500g/l)	II	Insecticide for the control of insect pests in vegetables and cereals	Dizengoff (Ghana) Limited, Accra
54.	Fixe 50 SC	FRE/18202/1376 G August 2018	Fipronil (50g/l)	II	Insecticide for the control of caterpillars, weevils, fire ants, termites in vegetables	Macrofertil Gh. Ltd., Tema
55.	Flash Akate	FRE/2005/1603G March 2020	Sulfoxaflor (20g/l)	II	Insecticide for the control of mirids in cocoa	Chemico Limited, Tema
56.	Frankocylon 2.5 EC	FRE/1739/1178G September 2017	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Frankatson Limited, Accra
57.	Frankofen 20 EC	FRE/1939/1490G June 2019	Fenvalerate (200g/l)	II	Insecticide for the control of insect pests in vegetables	Frankatson Ltd., Accra

58.	Furadan 3G	FRE/1805/1384G August 2018	Carbofuran (3%)	II	Insecticide for the control of insect pests in rice, vegetables and oil palm	Chemico Ltd., Tema
59.	Galil 300SC	FRE/19100/1543 G October 2019	Imidacloprid (250g/l) + Bifenthrin (50g/l)	II	Insecticide for the control of mirids in cocoa	Adama West Africa Ltd, Accra
60.	Golan 20SL	FRE/1908/1531G October 2019	Acetamiprid (200g/l)	II	Insecticide for the control of insect pests in vegetables, citrus, cotton, coffee and maize	Dizengoff (Ghana) Limited, Accra
61.	Hitcel	FRE/1810/1299G February 2018	Profenofos (40%) + Cypermethrin (4%)	III	Insecticide for the control of insect pests in field crops	Reiss & Co (Ghana), Accra
62.	Hoprole 30 WG	FRE/1899/1324 G May 2018	Indoxacarb (95%)	II	Insecticide for the control of diamondback moth, beetles, caterpillars and cabbage moth in cabbage, tomatoes and cowpea	Rainbow Agrosciences Co. Ltd., Tema
63.	Insector T 45	FRE/19202/1467 G March 2019	Imidacloprid (350g/kg) + Thiram (100g/kg)	III	Insecticide/fungicide for the control of aphids, leafhoppers, insect pests anf fungal diseases in cereals	Macrofertil Ghana Ltd., Tema
64.	Inspire 30EC	FRE/1806/1371G August 2018	Etofenprox (303.68g/l)	III	Insecticide for the control of mirids in cocoa	Calli Ghana Co. Ltd., Accra
65.	Karto 2.5 EC	FRE/1710/1227G October 2017	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Reiss & Co. Ghana Ltd., Accra
66.	K D 415 EC	FRE/1805/1382G August 2018	Chlorpyrifos (400g/l) + Lambda-cyhalothrin (15g/l)	II	Insecticide for the control of scale and borers in cereals and vegetables	Chemico Limited
67.	Kilsect 2.5 EC	FRE/1825/1330G July 2018	Lambda-cyhalothrin (25g/l)	II	Insecticide for control of insect pests in vegetables	Bentronics Productions
68.	K-Lambda	FRE/1786/1157G July 2017	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Joyful Agro Services, Kumasi
69.	K-Optimal EC	FRE/17202/1205 G October 2017	Acetamiprid (20g/l) + Lambda-cyhalothrin (16g/l)	II	Insecticide for the control of insect pests in vegetables	Macrofertil Gh. Ltd., Tema

70.	Klopar 24 SC	FRE/18133/1316 G April 2018	Chlorfenapyr (240g/l)	II	Insecticide for the control of mites, armyworm, diamondback moth and cotton bollworm in vegetables	Abnark Agro Services Enterprise, Kumasi
71.	Lambda-M 2.5% EC	FRE/1927/1526G October 2019	Lambda-cyhalothrin (25g/l)	III	Insecticide for control of pests in vegetables and flowers	Multivet Ghana Limited, Accra
72.	Lambad 2.5 EC	FRE/1881/1408G August 2018	Lambda-cyhalothrin (25g/l)	III	Insecticide for the control of insect pests in cereals and vegetables	B. Kaakyire Agrochemical Co. Ltd., Kumasi
73.	Lambdacot EC	FRE/1758/1255G November 2017	Lambda-cyhalothrin	II	Insecticide for the control of	Afcott Ghana Ltd., Accra
			(25g/l)		insect pests in vegetables and pulses	
74.	Lambda Master 2.5 EC	FRE/1782/1164G August 2017	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Cropstar Enterprise, Kumasi
75.	Lambda Plus	FRE/1930/1477G March 2019	Lambda-cyhalothrin (2.5%)	II	Insecticide for the control of insect pests in vegetables and pulses	Natosh Enterprise, Kumasi
76.	Lambda Power	FRE/17166/1183 G September 2017	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Dasimah Enterprise, Adum-Kumasi
77.	Lambdaking 2.5EC	FRE/1899/1423G December 2018	Lambda-cyhalothrin (2.5%)	II	Insecticide for the control of insect pests in vegetables	Rainbow AgroSciences Company Limited, Tema
78.	Lambda Super 2.5 EC	FRE/1843/1349G July 2018	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in stored cereals, cowpea and soybean	Kumark Company Limited, Kumasi
79.	Lamsate EC	FRE/20145/1600 G March 2020	Dimethoate (300g/l) + Lambda-cyhalothrin (15g/l)	III	Insecticide for the control of aphids, thrips, planthoppers, whiteflies in cowpea, soybean, cotton, maize, sorghum, millet, melons and yams	Jubaili Agrotec Ltd., Kumasi
80.	Levo 2.4SL	FRE/1908/1529G October 2019	Oxymatrin (2.4%)	III	Insecticide for the control of insect pest in vegetables and fruit crops	Dizengoff Ghana Ltd., Accra
81.	Lufu 150SC	FRE/2043/1589G January 2020	Thiamethoxam (100g/l) + Deltamethrin (50g/l)	II	Insecticide for the control of capsids in cocoa	Kumark Co. Ltd., Kumasi
82.	Master 2.5EC	FRE/1822/1412G October 2018	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Annoh & Sons Enterprise, Accra

83.	Marshal 480 EC	FRE/1805/1385G August 2018	Carbosulfan (480g/l)	II	Insecticide for the control of scale, nematodes and symphilids in pineapple	Chemico Limited, Tema
84.	Mectin 1.8EC	FRE/1908/1530G October 2019	Abamectin (18g/l)	II	Insecticide for the control of leafminers, spidermites, caterpillars and thrips in citrus, cotton, vegetables and maize	Dizengoff Ghana Ltd., Accra
85.	Methoate 40EC	FRE/1825/1332G July 2018	Dimethoate (400g/l)	III	Insecticide for the control of insect pests in vegetables and fruit crops	Bentronics Productions. Kumasi
86.	M-Fos 48 EC	FRE/1927/1481G March 2019	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of insect pests in vegetables and outdoor public health purposes	Multivet (Gh) Ltd., Accra
87.	Monceren GT 390 FS	FRE/18185/1309 G April 2018	Imidacloprid (233g/l) + Thiram (107g/l) + Pencycuron (50g/l)	II	Insecticide/fungicide for the control of insect pests, rhizoctonia and fusarium in cotton and for seed treatment	RMG Ghana Ltd., Accra
88.	Movento 100 SC	FRE/17185/1156 G July 2017	Spirotetramat (100g/l)	III	Insecticide for the control of insect pests in fruits and vegetables	RMG Ghana Ltd., Accra
89.	Nemaran 3GR	FRE/1899/1313R April 2018	Carbofuran (3%)	II	Insecticide for the control of insect pests in vegetables, sugarcane, cotton, rice and groundnut	Rainbow Agrosciences Co. Ltd., Tema
90.	Pawa 2.5 EC	FRE/1805/1381G August 2018	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Chemico Limited. Tema
91.	Perfecto 175 SC	FRE/1910/1485G June 2019	Imidacloprid (125g/l) + Lambda-cyhalothrin (50g/l)	II	Insecticide for the control insect pests in vegetables and cereals	Reiss & Co (Gh) Ltd., Accra
92.	Plan D 2.5 EC	FRE/1802/1400G August 2018	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Agrimat Limited , Madina
93.	Polytrin 50 EC	FRE/1825/1290G January 2018	Cypermethrin (50%)	II	Insecticide for the control of insect pests in vegetables	Bentronic Productions, Kumasi
94.	Porselen 5 SG	FRE/1899/1366G August 2018	Emamectin Benzoate (5%)	III	Insecticide for the control of worms and other insect pest in cabbage	Rainbow Agrosciences Co. Ltd., Tema

95.	Protect 1.9EC	FRE/1908/1528G October 2019	Emamectin-benzoate (1.9%)	III	Insecticide for the control of insect pests in cotton, vegetables and maize	Dizengoff (Ghana) Limited, Accra
96.	Protecta CCA-Oxide Type	FRE/17132/1146 R July 2017	Chromium trioxide (27.9%) Arsenic acid (24.6%) + Cupric oxide (11.3%)	II	Insecticide for wood treatment	Byes & Ways Co. Ltd., Accra
97.	Proteus 170 O-TEG	FRE/18185/1308 G April 2018	Thiacloprid (150g/l + Deltamethrin (20g/l)	II	Systemic insecticide for the control of mirids in cocoa	RMG Ghana Limited, Accra
98.	Punto SL	FRE/1899/1427G December 2018	Imidacloprid (200g/l)	II	Insecticide for the control of aphids and whiteflies in egg-plant,	Rainbow AgroSciences
					tomatoes and sweetpotatoes	Company Limited, Accra
99.	Pyperfos Plus	FRE/17166/1188 G September 2017	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of insect pests in cereals and vegetables	Dasimah Enterprise, Adum-Kumasi
100	Pyrical 5G	FRE/1906/1447G February 2019	Chlorpyrifos-ethyl (50g/kg)	II	Insecticide for the control of insect pests in vegetables	Calli Ghana Company Ltd., Accra
101	Pyrical 480 EC	FRE/1706/1244G November 2017	Chlorpyrifos - ethyl (480g/l)	II	Insecticide for the control of insect pests in pineapples	Calli Ghana Co. Ltd., Tema
102	Chlorfox 480 EC	FRE/1799/1162G August 2017	Chlorpyrifos - ethyl (480g/l)	II	Insecticide for the control of insect pests in vegetables and field crops	Rainbow Agrosciences, Tema
103	Rainlambda 2.5 EC	FRE/1799/1147G July 2017	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Rainbow Agrosciences Co. Ltd., Tema
104	Rainlambda Plus EC	FRE/1899/1426 G December 2018	Dimethoate (300g/l) + Lambda-cyhalothrin (15g/l)	II	Insecticide for the control of leaf feeding beetles, leaf sucking bugs, pod sucking bugs and pod borers in cowpea and soybean	Rainbow Agrosciences Co. Ltd., Tema
105	Raintham 350 SC	FRE/1799/1173G September 2017	Thiamethoxam (350g/l)	III	Insecticide for the control of insect pests in vegetables and fruit crops	Rainbow AgroSciences Co. Ltd., Tema

106	Rimon 10 EC	FRE/17100/1239 G November 2017	Novaluron (100g/l)	III	Insecticide for the control of insect pests in cabbage, tomato and pepper	Adama West Africa Ltd., Accra
107	Sanitox 20EC	FRE/1822/1411G October 2018	Fenvalerate (200g/l)	II	Insecticide for the control of insect pests in vegetables and cowpea	Annoh and Sons, Accra
108	Savahaler WP	FRE/18202/1376 G August 2018	Methomyl (250g/kg)	II	Insecticide for the control of insect pests in vegetables, fruits, cotton and soybean	Macrofertil Gh. Ltd., Tema
109	Seed Power 44 WS	FRE/1708/1180G September 2017	Imidacloprid (200g/kg) + Metalaxyl (200g/kg) + Anthraquinone (40g/kg)	II	Insecticide/fungicide for the control of insect pest, downy mildew and damping off diseases in cereals, soybean and seed treatment	Dizengoff (Ghana) Limited, Accra
110	Seed Shield	FRE/1957/1552G October 2019	Imidacloprid (350g/l)	III	Insecticide for the control of insect pests in field crops	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra.
111	Select Plus 315EC	FRE/1710/1233G October 2017	Profenofos (300g/l) + Lambda-cyhalothrin (15g/l)	II	Insecticide for the control of aphids, bollworms, leafworms and armyworms in cotton, vegetables and cereals	Reiss & Co. Ghana Ltd., Accra
112	Shocker 20 EC	FRE/18226/1363 G July 2018	Bifenthrin (200g/l)	II	Insecticide for the control of insect pests in vegetables and pulses	Rapid Lion Gh. Ltd., Kumasi
113	Sinoban EC	FRE/1822/1410G October 2018	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of insect pests in vegetables	Annoh and Sons, Accra
114	Sivanto Energy 085 EC	FRE/18185/1310 G April 2018	Flupyradifurone (75g/l) + Deltamethrin (10 g/l)	II	Insecticide for the control of mirids in cocoa	RMG Ghana Ltd., Accra
115	Striker 2.5 EC	FRE/19202/1462 G March 2019	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of aphids, bollworms and diamondback moth in cereals and vegetables	Macrofertil Ghana Ltd., Tema
116	Success Appat	FRE/1705/1167G September 2017	Spinosad (0.24g/l)	U	Insecticide for the control of fruit flies in fruits and vegetables	Chemico Ltd, Tema
117	Sumico 20 EC	FRE/1843/1346G July 2018	Fenvalerate (200g/l)	II	Insecticide for the control of insect pests in vegetables	Kumark Company Limited, Kumasi

118	Sumitox 20 EC	FRE/18226/1362 G July 2018	Fenvalerate (200g/l)	II	Insecticide for the control of insect pests in vegetables and cowpea	Rapid Lion Gh. Ltd., Kumasi
119	Sumitex 40 EC	FRE/1843/1351G July 2018	Dimethoate (400g/l)	II	Insecticide for the control of mealybugs, mites, thrips, greenflies and borer larvae in vegetables and pineapples	Kumark Company Limited, Kumasi
120	Sunhalothrin 2.5EC	FRE/2057/1586G January 2020	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables and pulses	Wynca Sunshine Agric Products & Trading Co., Ltd, Accra
121	Sun-Lambda EC	FRE/1957/1557G October 2019	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of diamondback moth and cotton bollworms in cabbage and cotton	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
122	Sunpyram 20WG	FRE/2057/1584G January 2020	Nitenpyram (20%)	II	Insecticide for the control of chewing and	Wynca Sunshine Agric
					sucking insect pests in tree crops	Prdt & Trad. Co. Ltd, Accra
123	Sunpyrifos 48 EC	FRE/1957/1555G October 2019	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of insect pests in crops	Wynca Sunshine Agric Prod & Trading Co., Ltd., Accra
124	Sun-Thiame WDG	FRE/1957/1558G October 2019	Thiamethoxam (25%)	II	Insecticide for the control of planthoppers and aphids in rice and cotton	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
125	Tanalith c 3310	FRE/1843/1372G August 2018	Cupricoxide (11.29%) +Arsenic pentoxide (17.3%) + Chromium trioxide (30.29%)	II	Insecticide for wood treatment	Du Paul Wood Treatment Gh. Limited, Takoradi
126	Termikill 20EC	FRE/1710/1234G October 2017	Chlorpyrifos ethyl (200g/l)	II	Insecticides for the control of insect pest in vegetables	Reiss & Co. Ghana Ltd., Accra
127	Termiking 480EC	FRE/1899/1428G December 2018	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of insect pests of vegetables and field crops	Rainbow AgroSciences Co. Ltd., Accra

128	Thodan Super 35SC	FRE/1810/1297G February 2018	Acetamiprid (2%) + Lambda-cyhalothrin (1.5%)	I V	Insecticide for the control of mirids in cocoa	Reiss & Co (Ghana), Accra
129	Thunder 145 OD O-TEQ	FRE/18185/1431 G December 2018	Imidacloprid (100g/l) + Beta- cyfluthrin (45g/l)	II	Insecticide for the control of leaf eating insects and bollworms in cotton	RMG Ghana Limited, Accra
130	Tihan 175- OD-TEQ	FRE/18185/1432 G December 2018	Flubendiamide (100g/l) + Spirotetramat (75g/l)	III	Insecticide for the control of lepidoptera and sucking pest in cotton and vegetables	RMG Ghana Limited, Accra
131	Tornado EC	FRE/20145/1596 G March 2020	Dimethoate (40%)	III	Insecticide for the control of insect pest in rice, cotton, citrus and vegetables	Jubaili Agrotec Ltd., Kumasi
132	Tricel 48 EC	FRE/1910/1483G June 2019	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of cutworms and aphids in cereals and cotton	Reiss & Co (Gh) Ltd., Accra
133	Trigger 10 CS	FRE/1708/1179G September 2017	Lambda-cyhalothrin (100g/kg)	II	Insecticide for the control of insect pest in vegetables	Dizengof f (Ghana) Limited, Accra
134	Verate 200 EC	FRE/1999/1501G June 2019	Fenvalerate (200g/l)	II	Insecticide for the control of stalkborer, bollworms, cotton stainers in cotton, maize and sorghum	Rainbow AgroSciences Co. Ltd., Tema
135	Vigilant 25 EC	FRE/1910/1484G June 2019	Bifenthrin (25g/l)	II	Insecticide for the control of aphids, bollworm, jassids, whiteflies, mites and hoppers in cotton and mango	Reiss & Co (Gh) Ltd., Accra
136	Viper 46EC	FRE/1906/1441G February 2019	Acetamiprid (16g/l) + Indoxacarb (30g/l)	II	Insecticide for the control of lepidoptera, sucking and biting insects	Calli Ghana Co. Ltd., Accra
137	Viper Super 80EC	FRE/1806/1370G August 2018	Indoxacarb (60g/l) + Acetamiprid (20g/l)	II	Insecticide for control of cocoa mirids	Calli Ghana Co. Ltd., Accra
138	Wonder 2.5 EC	FRE/18147/1294 G January 2018	Lambda-cyhalothrin (2.5%)	II	Insecticide for the control of insect pests of vegetables	Errands4u, C4 - 68, DTD, Madina, Accra
139	Zerofl y Screen	FRE17125/1214G October 2017	Deltamethrin (4g/kg)	II	Insecticide for the control of insect pests on livestock	Vestergaard Frandsen West Africa, Accra

(A) Fully Registered Pesticides (FRE)
(A1b) Insecticides for Public Health Purposes

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Actellic 300 CS	FRE/1706/1251G November 2017	Pirimiphos-methyl (300g/l)	III	Insecticide for public health purposes	Calli Ghana Co. Ltd., Tema
2.	Actellic 300 CS	FRE/1906/1439G February 2019	Pirimiphos-methyl (300g/l)	III	Insecticide for public health purposes	Calli Ghana Co. Ltd., Accra
3.	Cypex Maxi Smoke Generator	FRE/1802/1402G August 2018	Potassium Chlorate (20% w/w) + Cypermethrin (13.5% w/w)	II	For general indoor disinfection	Agrimat Limited, Madina
4.	Dusfos 480 EC	FRE/1825/1285G January 2018	Chlorpyrifos - ethyl (480g/l)	II	Insecticide for outdoor public health purposes	Bentronic Productions, Kumasi
5.	Fendona 5SC	FRE/18206/1268G January 2018	Alpha-cypermethrin (50g/kg)	III	Insecticide for public health purposes	Josann Agro Consult (J.A.C) Ltd., Accra
6.	Ficam VC 80WP	FRE/19183/1569G October 2019	Bendiocarb (80%)	II	Insecticide for public health purposes	Bayer West-Central Africa S.A, Accra
7.	Goliath Gel	FRE/19206/1454G February 2019	Fipronil (0.05%)	III	Insecticide for the control mosquitoes, housefly and cockroaches	Josann Agro Consult Ltd., Accra
8.	Hercules Extra 20 SC	FRE/1802/1401G August 2018	Fipronil (200g/l)	II	Insecticide for public health purposes	Agrimat Limited, Madina
9.	Hercules 50 SC	FRE/1802/1260G January 2018	Fipronil (50g/l)	II	Insecticide for public health purposes	Agrimat Ltd., Madina
10.	Inesfly SP Coating	FRE/17104/1216G October 2017	Alpha-cypermethrin (0.7%) + D-Allethrin (1%) + Pyriproxyfen (0.063%)	IV	Insecticide coating for public health purposes	Inesfly Africa Ltd., Accra
11.	Inesfly Floor Cleaner	FRE/17104/1217G October 2017	Alpha-cypermethrin (1.0%) + D-Allethrin (1.0%) + Pyriproxyfen (0.01%)	IV	Insecticide for public health purposes	Inesfly Africa Ltd., Accra

12.	Inesfly Body Repellent	FRE/18154/1406G August 2018	Pyrethrum extract (1.2%) + Piperonyl butoxide (0.3%) + Ethanol (7.5%)	III	Insecticide for repelling mosquitoes	Inestfly Africa Ltd., Accra
13.	Inesfly 5A IGR	FRE/17143/1138G April 2017	Diazinon (1.5%) + Chlorpyrifos (1.5%) + Pyriproxifen (0.063%)	II	Insecticide for public health purposes	Inesfly Africa Limited, Accra
14.	KD 215EC	FRE/1705/1168G September 2017	Chlorpyrifos (200g/l) + Lambda-cyhalothrin (15g/l)	II	Insecticide for outdoor public health purposes	Chemico Limited, Tema
15.	K-Othrine Moustiquaire 1% SC	FRE/1702/1158G July 2017	Deltamethrin (1%w/w)	III	Insecticide for public health purposes	Agrimat Ltd., Madina
16.	K-Othrine 250WG	FRE/19183/1568G October 2019	Deltamethrin (250g/kg)	II	Insecticide for public health purposes for the control of mosquitoes	Bayer West-Central Africa S.A, Accra
17.	Pyriforce 480 EC	FRE/17202/1210G October 2017	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for outdoor public health purposes	Macrofertil Gh. Ltd., Tema
18.	Pyrinex 48 EC	FRE/17100/1238G November 2017	Chlorpyrifos - ethyl (480g/l)	II	Insecticide for outdoor public health	Adama West Africa Ltd., Accra
19.	Suncombi 30EC	FRE/1957/1553G October 2019	Fenitrothion (25%) + Fenvalerate (5%)	II	Insecticide for public health purposes	Wynca Sunshine Agric Products & Trading Co., Limited, Accra
20.	Supercare SC	PCL/19173/1435G August 2019	Beta-cyfluthrin (12.5%)	II	Insecticide for the control of mosquitoes, houseflies, ants, cockroaches and fleas	Agromonti Co. Ltd., Accra
21.	Terminus 480 EC	FRE/1816/1269G January 2018	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for outdoor public health	Kurama Company Limited, Accra
22.	Total Flying/ Crawling insecticide	FRE/1898/1405G August 2018	Parallethrin (0.1%) + Cyphenothrin (0.14%) + Deltamethrin (0.17%) + Tetramethrin (0.3%)	II	Insecticide for public health	Total Gh. Ltd., Accra
23.	Vectobac G	FRE/1802/1264G January 2018	*Bacillus thuringiensis*, serotype H-14, 3000 *Units/mg*	IV	Insecticide for the control of mosquito larvae	Agrimat Limited, Madina

24.	VectoBac WG	FRE/1780/1145G July 2017	*Bacillus thuringiensis* subsp. *Israelensis* 3000 ITU/mg	IV	Insecticide for the control of larvae of mosquitoes	Challux Ltd., Accra
25.	VectoBac 12AS	FRE/1802/1262G January 2018	*Bacillus thuringiensis, serotype H-14, 3000 Units/mg*	IV	Insecticide for the control of mosquito larvae	Agrimat Limited, Madina
26.	Vectolex WG	FRE/1802/1263G January 2018	*Bacillus sphaericus (3000 ITU/mg)*	IV	Insecticide for the control of mosquito larvae	Agrimat Limited, Madina

(A) Fully Registered Pesticides (FRE)

(A1c) Insecticides for Stored Produce

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Agro Blaster	FRE/1876/1283G January 2018	Pyrethrum (1%)	II	Insecticide for the control of insect pests in stored grains	Equatorial Healthcare Services Ltd., Accra
2.	Ateco Super 25 EC	FRE/1843/1348G July 2018	Pirimiphos-methyl (250g/l)	II	Insecticide for the control of insect pests in stored cereals, cowpea and soybean	Kumark Company Limited, Kumasi
3.	Dastoxion T	FRE/17166/1192R October 2017	Aluminium phosphide (57%)	Ib	Insecticide for the control of insect pests in stored produce	Dasimah Enterprise, Kumasi
4.	Degesch Plate	FRE/17185/1152R July 2017	Magnesium phosphide (56%)	Ib	Insecticide for the control of insect pests in stored grains	RMG Ghana Ltd., Accra
5.	Protex 57TB	FRE/1826/1279R January 2018	Aluminium phosphide (57%)	Ib	Insecticide for the control of insect pests in stored produce	The Candel Ltd., Accra
6.	Super Agro Blaster	FRE/1876/1282G January 2018	Pyrethrum (10%)	II	Insecticide for the control of insect pests in stored grains	Equatorial Healthcare Services Ltd., Accra
7.	Thomaxin P	FRE/1890/1302R February 2018	Aluminium phosphide (57%)	Ib	Insecticide for the control of insect pests in stored produce	Thomas Fosu Ent., Kumasi
8.	Zerofly Storage Bag	FRE/17125/1214G October 2017	Deltamethrin (3g/kg)	II I	Insecticide for the control of insect pests in stored grains	Vestergaard Frandsen West Africa, Accra

(A) Fully Registered Pesticides (FRE)
(A2) Fungicides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Acticide EPW	FRE/1920/1493G June 2019	Diuron (20%) + Carbendazim (9%) + 2-octyl-2H-isothiazol-3-one (2.8%)	II	Fungal and algal paint preservative	BBC Industrials Company Ltd., Accra
2.	Agrithane 80WP	FRE/1802/1399G August 2018	Mancozeb (800g/kg)	III	Fungicides for the control of leaf spots, mildew, leaf blight and scab in vegetables	Agrimat Limited, Madina
3.	Agro Comet 72 WP	FRE/1810/1298G February 2018	Copper (I) oxide (60%) + Metalaxyl (12%)	III	Fungicide for the control of *Phytophthora spp.* in cocoa	Reiss & Co (Ghana), Accra
4.	Antracol 70 WP	FRE/17185/1160G July 2017	Propineb (700g/kg)	III	Fungicide for the control of fungal diseases in vegetables	RMG Ghana Ltd., Accra
5.	Athlete 80WP	FRE/19202/1464G March 2019	Fosetyl-aluminium (800g/kg)	III	Fungicide for the control of mildew and *Phytophtora sp.,*	Macrofertil Ghana Ltd., Tema
					Pythium plasmopara and *Bremia sp.* in pineapples and fruit trees	
6.	Banjo Forte 400SC	FRE/19100/1541G October 2019	Fluazinam (200g/l) + Dimethorph (200g/l)	III	Fungicide for the control of *Phytophthora megakarya* in cocoa	Adama West Africa Ltd., Accra
7.	Benco 80 WP	FRE/1825/1336G July 2018	Mancozeb (800g/kg)	III	Fungicide for control of leaf spots, mildew, leaf blight and in vegetables, fruits and ornamentals	Bentronics Productions. Kumasi
8.	Bosun 300SC	FRE/18139/1419G November 2018	Boscalid (20%) + Kresoxim-methyl (10%)	III	Fungicide for the control of powdery mildew, anthracnose, mould, rust and leaf spots in vegetables and fruits	Jingbo Agrochemicals Tech. Gh. Co., Ltd., Accra.
9.	Caldo Bordeles Valles 20WP	FRE/18137/1436G December 2018	Bordeaux mixture (Copper (II) Sulphate + Ca (OH_2) (200g/kg)	III	Fungicide for the control of diseases in vegetables and fruits	Miqdadi Company Limited, Accra

10.	Callet 50WP	FRE/20145/1599G March 2020	Carbendazim (50%)	III	Fungicide for the control of *Pyricularia oryzae* in paddy rice	Jubaili Agrotec Ltd., Kumasi
11.	Calliete 80 WP	FRE/1706/1246G November 2017	Fosetyl-aluminium (800g/kg)	III	Systemic fungicide for the control of *phytophtor*a in pineapple	Calli Ghana Co. Ltd., Accra
12.	Callis 400 OL	FRE/1706/1245G November 2017	Thiophanate-methyl (400g/l)	III	Fungicide for the control of yellow and black sigatoka in bananas	Calli Ghana Co. Ltd., Accra
13.	Champion WP	FRE/2005/1606G March 2020	Copper Hydroxide (77%)	III	Fungicide for the control of fungal diseases in cocoa and coffee	Chemico Limited, Accra
14.	Chemoliette 80 WP	FRE/1705/1141G July 2017	Fosetyl-aluminium (800g/kg)	III	Systemic fungicide for the control of *phytophtora* diseases in pineapple	Chemico Ltd., Tema
15.	Conti-Zeb	FRE/1978/1571G October 2019	Mancozeb (800g/kg)	III	Fungicide for the control of leafspots, mildew, leafblight and scab in vegetables and fruits	Five Continents Imports & Exports Ltd., Accra
16.	Cuprofix 30 Disperss	FRE/1705/1142G July 2017	Mancozeb (30%) + Metallic copper (12%)	II	Fungicide for the control of powdery mildew, anthracnose, leaf and fruit spots in vegetables	Chemico Ltd., Tema
17.	Cuprozin 35WP	FRE/2008/1587G January 2020	Copper oxychloride (35%)	II	Fungicide for the control of diseases in vegetables	Dizengoff Ghana Ltd., Accra
18.	Curenox 50WP	FRE/18137/1437G December 2018	Copper Oxychloride (50%)	III	Fungicide for the control of diseases in fruits and vegetables	Miqdadi Company Limited, Accra
19.	Daszeb 80 WP	FRE/17166/1185G September 2017	Mancozeb (800g/kg)	III	Fungicide for the control of fungal diseases in cereals, cotton, sweetpotato and vegetables	Dasimah Enterprise, Adum-Kumasi
20.	Dizole 250 EC	FRE/1899/1364G August 2018	Difenoconazole (250g/l)	III	Fungicide for the control of leaf blight and leaf spot in banana, carrots and tomatoes	Rainbow Agro Sciences Co. Ltd., Tema
21.	Delco 75WP	FRE/1843/1373G July 2018	Copper Hydroxide (75%)	III	Fungicide for the control of blackpod disease in cocoa	Kumark Company Limited, Kumasi

22.	Fantic Plus 69WP	FRE/1906/1448G February 2019	Cuprous oxide (60%) + Benalaxyl-M (9%)	III	Fungicide for the control of *Phytophtora megakarya* in cocoa	Calli Ghana Co. Ltd., Accra
23.	Five Star 325 SC	FRE/1899/1329G May 2018	Azoxystrobin (200g/l) + Difenoconazole (125g/l)	III	Fungicide for the control of brown spot, blackspot, rust and white mould in cabbage, cowpea, soybean, bulb vegetables, groundnut and sweetpotatoes	Rainbow Agroosciences Co. Ltd., Tema
24.	Folicur 250 EW	FRE/19185/1473G March 2019	Tebuconazole (250g/l)	II	Fungicide for the control of black and yellow sigatoka in plantain and banana	RMG Ghana Limited, Accra
25.	Goldazim 500 SC	FRE/1816/1272G January 2018	Carbendazim (500g/l)	III	Systemic fungicide for the control of diseases in fruits and vegetables	Kurama Company Limited, Accra
26.	Impulse 800 EC	FRE/19185/1471G March 2019	Spiroxamine (800g/l)	II	Fungicide for the control of black and yellow sigatoka in plantain and banana	RMG Ghana Limited, Accra
27.	Ivory 80WP	FRE/1906/1440G February 2019	Mancozeb (800g/kg)	III	Fungicide for the control of diseases in vegetables and fruits	Calli Ghana Co. Ltd., Accra
28.	Kabazeb 80 WG	FRE/1781/1139G April 2017	Mancozeb (800g/kg)	III	Fungicide for the control of blight, leafspot, rust, downy mildew and scab	B. Kaakyire Agrochemical , Kumasi
29.	Kentan 40WG	FRE/2006/1581G January 2020	Copper Hydroxide (400g/kg)	III	Fungicide for the control of blackpod disease in cocoa	Calli Ghana Company Limited, Accra
30.	Kilazeb 80 WP	FRE/1843/1355G July 2018	Mancozeb (800g/kg)	III	Fungicide for the control of leaf spots, mildew, leaf blight and scab in vegetables and fruits	Kumark Co. Ltd., Kumasi
31.	Kocide 2000 WP	FRE/1706/1248G November 2017	Cupric hydroxide (53.8%)	III	Fungicide for the control of diseases in cocoa	Calli Ghana Co. Ltd., Accra
32.	Mancozan 80 WP	FRE/17202/1193G October 2017	Mancozeb (640g/kg) + Metalaxyl (80g/kg)	III	Fungicide for the control of blight, leafspot and scab in vegetables	Macrofertil Gh. Ltd., Tema
33.	Mancozan Super WP	FRE/19202/1465G March 2019	Mancozeb (640g/kg) + Metalaxyl (80g/kg)	II	Fungicide for the control of blight, leafspot and scab in fruits and vegetables	Macrofertil Gh. Ltd., Tema

34.	Mandazim WP	FRE/20145/1595G March 2020	Mancozeb (63%) + Carbendazim (12.5%)	III	Fungicide for the control of late leaf spot and peanut rust in groundnuts	Jubaili Agrotec Ltd., Kumasi
35.	Maneb 80 WP	FRE/1822/1413G November 2018	Maneb (80%)	III	Fungicide for control of fungal diseases in vegetables, cereals, citrus, avocados and mangoes	Annoh & Sons Enterprise, Achimota-Accra
36.	Manlax	FRE/1899/1424G December 2018	Mancozeb (64%) + Metalaxy (8%)	III	Fungicide for the control of downy mildew, late and early blight in lettuce, onions and sweetpotatoes	Rainbow AgroSciences Company Limited, Tema
37.	Metalm 72WP	FRE/1816/1273G January 2018	Cuprous oxide (60%) + Metalaxyl (12%)	III	Fungicide for the control of black pod disease in cocoa	Kurama Company Limited, Accra
38.	Nativo 300 SC	FRE/19185/1427G March 2019	Tebuconazole (200g/l) + Trifloxystrobin (100g/l)	III	Fungicide for the control of fungal diseases in vegetables	RMG Ghana Ltd., Accra
39.	Nordox Super 75 WG	FRE/17185/1151G July 2017	Cuprous oxide (86%)	III	Fungicide for the control of *P. palmivora* and *P. megakarya* in cocoa	RMG Ghana Ltd., Accra
40.	Ortiva Top	FRE/2006/1581G January 2020	Azoxystrobin (200g/l) + Difenoconazole (125g/l)	III	Fungicide for control of leaf spot and *Anthracnose* of tomatoes	Calli Ghana Co. Ltd., Accra
41.	Prozole 250 EC	FRE/1999/1494G June 2019	Propiconazole (250g/l)	III	Fungicide for the control of diseases in rice and pineapple	Rainbow Agrosciences Company Limited, Tema
42.	Raintebzol 75 WG	FRE/1799/1174G September 2017	Tebuconazole (75%)	III	Fungicide for the control of leaf spots, mildew, leaf blight, scab in fruits and vegetables	Rainbow AgroSciences Co. Ltd., Tema
43.	Raintebzol 430 SC	FRE/1799/1172G September 2017	Tebuconazole (430g/l)	III	Fungicide for the control of rust, leaf spots, mildew, leaf blight in fruits and vegetables	Rainbow AgroSciences Co. Ltd., Tema
44.	Ridomil Gold Plus 66 WP	FRE/17185/1150G July 2017	Cuprous oxide (60%) +Metalaxyl-M (6%)	III	Fungicide for the control of *P. palmivora* and *P. megakarya* in cocoa	RMG Ghana Ltd., Accra
45.	Royal Cop 77 WP	FRE/1843/1372G July 2018	Copper Hydroxide (77%)	III	Fungicide for the control of blackpod disease in cocoa	Kumark Company Limited, Kumasi

46.	Shavit F 715 WP	FRE/18100/1275G January 2018	Folpet (700g/kg) + Triadimenol (15g/kg)	III	Fungicide for the control of diseases in vegetables	Adama West Africa Ltd., Accra
47.	Skystar 280SC	FRE/1899/1434G December 2018	Azoxystrobin (20%) + Propiconazole (8%)	III	Fungicide for the control of leaf spots, mildew, leaf blight, scab and anthracnose in vegetables	Rainbow AgroSciences Company Limited, Tema
48.	Skyrobin 50 WG	FRE/1705/1171G September 2017	Azoxystrobin (500g/kg)	III	Fungicide for the control of mildew, leaf blight, scab and anthracnose in vegetables	Rainbow AgroSciences Company Limited, Tema
49.	Sphinx star 480WDG	FRE/18100/1315G April 2018	Chlorothalonil (400g/l) + Dimethomorph (80g/l)	III	Fungicide for the control of diseases in vegetables	Adama West Africa Ltd, Accra
50.	Sun-Anil SC	FRE/1957/1549G October 2019	Pyrimethanil (50g/l)	III	Contact fungicide for the control of downy	Wynca Sunshine Agric.
					mildew of tomatoes and cucumber	Products & Trading Co. Ltd., Accra.
51.	Suncozeb 80WP	FRE/1957/1557G October 2019	Mancozeb (800kg/kg)	III	Fungicide for the control of leaf spots, mildew, leaf blight and scab in vegetables	Wynca Sunshine Agric Products & Trading Co Ltd, Accra
52.	Sun-Vege	FRE/2057/1579G January 2020	Dimethorph (50%)	III	Fungicide for the control of downy mildew and early blight in cucumber	Wynca Sunshine Agric Products & Trading Co Ltd, Accra
53.	Sustain	FRE/18185/1280G January 2018	*Trichoderma asperellum* TRC (900)	U	Bio-fungicide for the control of RKN in beans	RMG Ghana Ltd., Accra
54.	Thiopsin 70WP	FRE/1781/1137G April 2017	Thiophanate-methyl (700g/kg)	III	Fungicide for the control of leaf spot, mildew leaf blight and scab in vegetables and fruits	B. Kaakyire Agrochemicals , Kumasi
55.	Top Cop	FRE/1805/1387G August 2018	Sulphur (50%) + Copper (8%)	III	Fungicide / miticide for the control of diseases in vegetables	Chemico Limited, Tema
56.	Topsect 70WP	FRE/1825/1296G January 2018	Thiophanate-methyl (70%)	III	Fungicide for the control of fungal diseases in crops	Bentronic Productions, Kumasi
57.	Trimangol 80WP	FRE/1805/1388G August 2018	Maneb (80%)	III	Fungicide for the control of leaf spots, downy mildew, fruit rot in cereals and vegetables	Chemico Limited. Tema

58.	Trustar 85WG	FRE/1899/1328G May 2018	Azoxystrobin (49%) + Tebuconazole (36%)	IV	Fungicide for the control of diseases in rice, soybean, tomato and banana	Rainbow Agroosciences Co. Ltd., Tema
59.	Vamos 500SC	FRE/19100/1540G October 2019	Fluazinam (500g/l)	III	Fungicide for the control of *Phytophthora megakarya* in cocoa	Adama West Africa Ltd., Accra
60.	Victory 72WP	FRE/1708/1148G July 2017	Mancozeb (64%) + Metalaxyl (8%)	III	Fungicide for the control of fungal diseases in vegetables and fruits	Dizengoff (Ghana) Ltd., Accra
61.	Volley 88 OL	FRE/19206/1453G February 2019	Fenpropimorph (880g/l)	II	Fungicide for the control of *Mycosphaerella musicola and Mycosphaerella fijiensis* in banana	Josann Agro Consult Ltd., Accra
62.	Zeb-care 80WP	FRE/20145/1597G March 2020	Mancozeb (80%)	II I	Fungicide for the control of fungal diseases in fruits and vegetables	Jubaili Agrotec Ltd., Kumasi

(A) Fully Registered Pesticides (FRE)
(A3) Herbicides

Note: For this project, Glyphosate, even though it is approved by the Ghana EPA, will not be used due to the associated adverse environmental, soil life and human health impacts.

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Adom 48 SL	FRE/1767/1258G December 2017	Glyphosate (410g/l)	III	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Jakess Agro Company Ltd, Kumasi
2.	Adupa Wura SL	FRE/1825/1288G January 2018	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in arable crops	Bentronic Productions, Kumasi
3.	Adwumaden Ye	FRE/17166/1182G September 2017	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in arable crops	Dasimah Enterprise, Adum-Kumasi
4.	Adwumapa SL	FRE/1771/1191G September 2017	Glyphosate (41%)	III	Herbicide for the control of annual, perennial broad-leaf weeds and grasses in cereals and vegetables	Chinese Woman Agrochemical, Kumasi

5.	Adwumamu Hene 41SL	FRE/1930/1478G March 2019	Glyphosate (41%)	II	Herbicide for the control of annual, perennial broad-leaf weeds and grasses in cereals and vegetables	Natosh Enterprise, Kumasi
6.	Adwuma Wura 480 SL	FRE/1843/1344G July 2018	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Kumark Company Limited, Kumasi
7.	Agil 100 EC	FRE/17100/1236G November 2017	Propaquizafop (100g/l)	III	Herbicide for the control of grasses in pineapple, cotton, groundnut, soybean, vegetables and yam	Adama West Africa Ltd., Accra
8.	Agro 2,4-D 72 SL	FRE/1710/1230G October 2017	2, 4-D Amine (720g/l)	II	Selective herbicide for the control of	Reiss & Co. Ghana Ltd.,
					broadleaf weeds and sedges in cereals and sugarcane	Accra
9.	Agro-Ametryn 500SC	FRE/1710/1234G October 2017	Ametryn (500g/l)	II	Herbicide for the control of annual broadleaf weeds and grasses in fruits and sugarcane	Reiss & Co. Ghana Ltd., Accra
10.	Alligato r 400 EC	FRE/17202/1195G October 2017	Pendimethalin (400g/l)	III	Herbicide for the control of grasses in rice	Macrofertil Gh. Ltd., Tema
11.	Amazone 10 WP	FRE/1906/1452G February 2019	Pyrazosulfuron-ethyl (100g/kg)	U	Herbicide for the control of grasses and broadleaf weeds in rice	Calli Ghana Co. Ltd., Accra
12.	Amino 72 SL	FRE/1805/1380G August 2018	2, 4-D Amine (720g/l)	III	Selective herbicide for the control of broad-leaved weeds and sedges in cereals and sugarcane	Chemico Limited, Tema
13.	Aminespray 720SL	FRE/1899/1433G December 2018	2,4-D Amine (720g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds in cereals, sugarcane and citrus	Rainbow AgroSciences Co. Ltd., Tema
14.	Aminoforce 72SL	FRE/18145/1320G May 2018	2,4-D Amine (720g/l)	II	Herbicide for the control of broadleaf weeds and sedges in cereals and tree crops	Jubaili Agrotec Ltd., Kumasi
15.	Anna	FRE/ 1822/1414G November 2018	2,4-D Amine (720g/l)	II	Selective herbicide for control of weeds in rice, maize, sorghum	Annoh and Sons Enterprise, Accra

16.	Anigramo Super 20 SL	FRE/18122/1278R January 2018	Paraquat dichloride (200g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses	Asantepon Farms, Kade
17.	Aniphosate 41 SL	FRE/18122/1277G January 2018	Glyphosate (410g/l)	III	Herbicide for annual, perennial broadleaf weeds and grasses in cereals and vegetables	Asantepon Farms, Kade
18.	Arsenal Gen 2SL	FRE/18206/1266G January 2018	Imazapyr (250g/l)	II	Selective post emergence herbicide for the control of grasses in cereals	Josann Agro Consult (J.A.C) Ltd., Accra
19.	Baccara 435 EC	FRE/1906/1444G February 2019	Propanil (260g/l) + 2,4 D Amine (175g/l)	II	Herbicide for the control of broadleaf weeds and grasses in rice	Calli Ghana Company Ltd., Accra
20.	Basagran 480 SL	FRE/18206/1265G January 2018	Bentazon (480g/l)	II	Herbicide for the control of broadleaf weeds in beans, groundnut and maize	Josann Agro Consult (J.A.C) Ltd., Accra
21.	Bastnate 200 SL	FRE/1999/1500G June 2019	Glufosinate-ammonium (200g/l)	II	Herbicide for the control of annual and perennial broadleaf weeds in banana, plantain, mango and pineapple	Rainbow AgroSciences Company Limited, Tema
22.	Benapa 460 SL	FRE/1899/1326G May 2018	Bentazone (400g/l) + MCPA (60g/l)	II	Contact and selective post-emergence herbicide for the control of grasses in rice, maize, sorghum and sugarcane	Rainbow Agrosciences Co. Ltd., Tema
23.	Benaxone	FRE/1825/1334G July 2018	Paraquat (276g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds	Bentronics Productions, Kumasi
24.	Bextra 72SL	FRE/1825/1289G January 2018	2, 4-D Amine (720g/l)	II	Selective herbicide for the control of broadleaf weeds in maize, rice and sorghum	Bentronic Productions, Kumasi
25.	Bisonric e 400SC	FRE/1899/1375G August 2018	Bispyribac sodium (400g/l)	III	Selective herbicide for the control of grasses and broadleaf weeds in rice	Rainbow Agro Sciences Co. Ltd., Tema
26.	Bonamine 720 SL	FRE/19149/1459G February 2019	2,4-D Amine (720g/l)	II	Herbicide for the control of broadleaf weeds and grasses in rice and maize	Bon Agro Co. Ltd., Kumasi

27.	Bonsate 480 SL	FRE/19149/1459G February 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual and perennial weeds on non-crop lands	Bon Agro Co. Ltd., Kumasi
28.	Butaforce EC	FRE/18145/1322G May 2018	Butachlor (500g/l)	III	Pre-emergent herbicide for the control of grasses and broadleaf weeds in rice, soybean, cotton and vegetables	Jubaili Agrotec Ltd., Kumasi
29.	Butaplus EC	FRE/1843/1354G July 2018	Butachlor (50%)	II	Pre-emergence herbicide for soyabean, cotton, rice, groundnuts and vegetable	Kumark Co. Ltd., Kumasi
30.	Calliherbe 720 SL	FRE/1906/1443G February 2019	2,4-D Amine (720g/l)	II	Herbicide for the control of broadleaf weeds in cereals and tree crops	Calli Ghana Co. Ltd, Accra
31.	Canphosate SL	FRE/18147/1292G January 2018	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds	Errands4u, C4 - 68, DTD, Madina, Accra
32.	Canquat Super SL	FRE/18147/1293R January 2018	Paraquat dichloride (20%)	II	Herbicide for control of grasses and broadleaf weeds in cereals and vegetables	Errands4u, C4 - 68, DTD, Madina, Accra
33.	Capizad EC	FRE/17202/1209G October 2017	Haloxyfop-R-methyl (104g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Macrofertil Gh. Ltd., Tema
34.	Chemosate Super EC	FRE/1705/1143G July 2017	Glyphosate (360g/l)	III	Herbicide for the control of annual and perennial weeds in crops	Chemico Ltd., Tema
35.	Chemopax 500 SC	FRE/2005/1605G March 2020	Ametryn (485g/l) + Trazine (15g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds	Chemico Limited, Tema
36.	Chemostor m 500EC	FRE/2905/1604G March 2020	Pendimethalin (500g/l)	III	Pre-emergent herbicide for the control of weeds in cereals, cotton and soybean	Chemico Limited, Tema
37.	Chemoxone SL	FRE/1805/1391G August 2018	Paraquat dichloride (200g/l)	II	Herbicide for the control of broadleaf weeds and grasses	Chemico Limited, Tema
38.	Chemuron 80 WP	FRE/1805/1392G August 2018	Diuron (800g/kg)	III	Herbicide for the control of grasses in pineapples, citrus and mangoes	Chemico Limited, Tema

39.	Chemovar 80 WP	FRE/1805/1393G August 2018	Bromacil (800g/kg)	III	Herbicide for the control of grasses and broadleaf weeds in pineapples	Chemico Limited, Tema
40.	Cleanspray 80 SG	FRE/1999/1499G June 2019	2,4-D Amine (800g/kg)	II	Herbicide for the control of annual broadleaf weeds and grasses in millet	Rainbow AgroSciences Co. Ltd., Tema
41.	Condax WP	FRE/1978/1570G October 2019	Bensulfuron-methyl (30%)	III	Systemic herbicide for the control of annual and perennial broadleaf weeds in rice	Five Continents Imp. & Exp. Ltd., Accra
42.	Conti-quat	FRE/1978/1574R October 2019	Paraquat dichloride (276g/l)	II	Herbicide for the control of annual, perennial broad-leaf weeds and grasses in field crops	Five Continents Imp. & Exp. Ltd., Accra
43.	Corta 480 EC	FRE/19202/1468G March 2019	Triclopyr (480g/l)	III	Herbicide for the control of broadleaf weeds in oil palm, rice and sugarcane	Macrofertil Ghana Ltd., Tema
44.	Cotbond 560 SL	FRE/1758/1256G November 2017	Propanil (360g/l) + 2, 4-D Amine salt (200g/l)	II	Herbicide for the control of grasses and weeds in rice	Afcott Ghana Ltd., Accra
45.	Conti-sul WP	FRE/1865/1274G January 2018	Acetolachlor (25%) + Bensulfuron-methyl (5%)	III	Herbicide for the control of annual, perennial weeds in rice	Five Continents Imports & Exports, Accra
46.	Dekel 170 EC	FRE/19100/1548G October 2019	Propaquizafop (50g/l) + Oxyfluorfen (120g/l)	III	Herbicide for the control of grasses and broadleaf weeds in onion, legume and cotton	Adama West Africa Ltd. Accra
47.	Diuron Plus	FRE/1843/1356G July 2018	Diuron (80%)	III	Herbicide for the control of annual and perennial grasses and broadleaf weeds in pineapples, citrus and mangoes	Kumark Co. Ltd
48.	Eduodzi 480 SL	FRE/1999/1505G June 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in vegetables and cereals	Rainbow AgroSciences Co. Ltd., Tema
49.	Eduodzi 757 SG	FRE/1999/1506G June 2019	Glyphosate (757g/kg)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds	Rainbow AgroSciences Co. Ltd., Tema

50.	Ervextra 720 SL	FRE/19202//1469 G March 2019	2, 4-D Amine (720g/l)	II	Selective herbicide for the control of broadleaf weeds in rice, maize, oil palm, coconut, rubber and sugarcane	Macrofertil Ghana Ltd., Tema
51.	Fenfen 240 EC	FRE/1999/1498G June 2019	Oxyfluorfen (240g/l)	I V	Herbicide for the control of annual, perennial broadleaf weeds and grasses in groundnut, fruit trees, onion and cotton	Rainbow AgroSciences Company Limited, Tema
52.	ForceUp SL	FRE/18145/1319G May 2018	Glyphosate (41%)	III	Herbicide for the control of weeds	Jubaili Agrotec Ltd., Kumasi
53.	Forpine 80 WP	FRE/1899/1364G August 2018	Bromacil (80%)	III	Herbicide for the control of weeds in pineapples and citrus	Rainbow Agro Sciences Co.Ltd., Tema
54.	Fos-lade Super 15 EC	FRE/1890/1300G February 2018	Fluazifop-p- butyl (150g/l)	III	Selective herbicide for the control of annual, perennial grasses in broadleaf crops	Thomas Fosu Enterprise, Kumasi
55.	Franko 2, 4- D	FRE/1739/1177G September 2017	2,4-D Amine salts (720g/l)	II	Herbicide for the control of broadleaf weeds and sedges in rice, maize, sorghum, millet and sugarcane	Frankatson Limited, Accra
56.	Frankosate 41 SL	FRE/1739/1175G September 2017	Glyphosate (410g/l)	III	Herbicide for the control of broadleaf weeds, sedges and grasses in orchards	Frankatson Limited, Accra
57.	Frankosulfuron	FRE/1939/1489G June 2019	Nicosulfuron (40g/l)	III	Herbicide for the control of grasses in maize	Frankatson Limited, Accra
58.	Gallant Super	FRE/1805/1390G August 2018	Haloxyfop (108g/l)	III	Post emergence herbicide for the control of broadleaf weeds in vegetables	Chemico Limited
59.	Garlon 4E	FRE/1905/1575G November 2019	Triclopyr (480g/l)	III	Herbicide for use as tree killer and the control of broadleaf weeds	Chemico Limited. Tema
60.	Glycel 41SL	FRE/1910/1515G July 2019	Glyphosate (410g/l)	II	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Reiss & Co. (Ghana) Ltd., Accra
61.	Glycot 41 SL	FRE/1758/1253G November 2017	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals	Afcott Ghana Limited, Accra

62.	Glyking 480 SL	FRE/1999/1502G June 2019	Glyphosate (480g/l)	III	Herbicide for the control annual, perennial grasses and broadleaf weeds on non-crop and farm lands	Rainbow AgroSciences Co. Ltd., Tema
63.	Glyphader 75 SG	FRE/17202/1197G October 2017	Glyphosate (757g/kg)	III	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Macrofertil Gh. Ltd., Tema
64.	Glyphader 480 SC	FRE/17202/1202G October 2017	Glyphosate (480g/l)	III	Herbicide for the control of broadleaf weeds and grasses in cereals and vegetables	Macrofertil Gh. Ltd., Tema
65.	Glyphapat	FRE/17166/1190G September 2017	Glyphosate (757g/kg)	III	Herbicide for the control of annual, perennial broad-leaf weeds and grasses in soybean, cotton	Dasimah Enterprise, Adum-Kumasi
66.	Glyfos 41SL	FRE/1802/1403G August 2018	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Agrima t Limited, Madina
67.	Glygold 41 SL	FRE/1953/1475G March 2019	Glyphosate (410g/l)	III	Herbicide for the control of perennial grasses, broadleaf weeds, sedges and aquatic weeds in arable crops	L'espoir Co. Ltd., Accra
68.	Glyphosate 95% Technical	FRE/1857/1397G August 2018	Glyphosate Ammonium Salt (95 % Min)	III	Herbicide for the control of broadleaf weeds and grasses in maize	Wynca Sunshine Agric Products & Trading, Accra
69.	Glyphosate 88% Technical	FRE/1857/1398G August 2018	Glyphosate Ammonium Salt (88 % Min)	III	Herbicide for the control of broadleaf weeds and grasses in maize	Wynca Sunshine Agric Products &Trading, Accra
70.	Guardforce OD	FRE/18145/1429G December 2018	Nicosulfuron (4%)	III	Herbicide for the control of annual grass weeds	Jubaili Agrotec Ltd, Kumasi
71.	Halaxy 108 EC	FRE/1899/1314G April 2018	Haloxyfop-P-Methyl (108g/l)	I V	Herbicide for the control of annual and perennial weeds in cereals, leafy vegetables, pineapple, soybean and cowpea	Rainbow AgroSciences Co. Ltd., Tema

72.	Herbaking 720 SL	FRE/1999/1497G June 2019	2,4-D Amine (720g/l)	II	Herbicide for the control of broadleaf weeds and grasses in sorghum, maize, coffee and citrus	Rainbow AgroSciences Company Limited, Tema
73.	Herbazol	FRE/1945/1507G June 2019	2,4-D Amine (760g/l)	II	Herbicide for the control of broadleaf weeds and sedges in cereals and tree crops	J. K Duku Enterprise, Kumasi
74.	Herbextra 72 SL	FRE/1843/1340G July 2018	2,4-D Amine (720g/l)	II	Selective herbicide for the control of	Kumark Co. Ltd., Kumasi
					broadleaf weeds in rice, maize, sorghum, millet and sugarcane	
75.	Herbimais WG	FRE/17202/1198R October 2017	Atrazine (750g/kg) Nicosulfuron (40g/kg)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize	Macrofertil Gh. Ltd., Tema
76.	Herbisuper S	FRE/17202/1199G October 2017	Acetachlor (300g/l) + Simazine (200g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize	Macrofertil Gh. Ltd., Tema
77.	Hero Super 108 EC	FRE/1843/1373G August 2018	Haloxyfop methyl (108g/l)	III	Herbicide for the control of annual grasses in vegetables and pulses	Kumark Co. Ltd., Kumasi
78.	Kabaherb SL	FRE/1881/1409G October 2018	2,4-D Amine Salts (720g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in rice	B. Kaakyire Agrochemical Co. Ltd., Kumasi
79.	Kabasate 41SL	FRE/1881/1416G October 2018	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	B. Kaakyire Agrochemical Co. Ltd., Kumasi
80.	Kalach 360 SL	FRE/1706/1249G November 2017	Glyphosate (360g/l)	III	Herbicide for the control of broadleaf weeds and grasses in cereals and vegetables	Calli Ghana Co. Ltd., Accra
81.	Kalach Extra 70SG	FRE/1706/1250G November 2017	Glyphosate (700g/kg)	III	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Calli Ghana Co. Ltd., Accra
82.	Komanda	FRE/1927/1480G March 2019	Glyphosate (410g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in maize, sugarcane and fruit trees	Multivet (Gh) Ltd., Accra

83.	Kumnwura SL	FRE/1825/1284G January 2018	Glyphosate (410g/l)	III	Herbicide for the control of annual and perennial broadleaf weeds and grasses	Bentronic Productions, Kumasi
84.	Kurasate 360 SL	FRE/1816/1271G January 2018	Glyphosate (360g/l)	III	Herbicide for the control of grasses and broadleaf weeds	Kurama Company Limited, Accra
85.	Kwatrikwa 20 SL	FRE/1802/1404G August 2018	Paraquat (20%)	II	Herbicide for the control of annual,	Agrimat Limited, Madina
					perennial grass and broadleaf weeds	
86.	Ladaba 75 SG	FRE/17202/1200G October 2017	Glyphosate (757g/kg)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals, vegetables and plantation crops	Macrofertil Gh. Ltd., Tema
87.	Lagon 575S C	FRE/19185/1474G March 2019	Aclonifen (500g/l) + Isoxaflutole (75g/l)	III	Pre-emergent herbicide for the control of grasses and broadleaf weeds in maize	RMG Ghana Limited, Accra
88.	Landlord 360 SL	FRE/18185/1317G April 2018	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in crops	RMG Ghana Ltd., Accra
89.	Maestro 960 EC	FRE/1999/1496G June 2019	Metolachlor (960g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in maize	Rainbow AgroSciences Company Limited, Tema
90.	Multi 2, 4-D SL	FRE/1927/1479G March 2019	2,4-D Amine Salt (720g/l)	II	Herbicide for the control of annual broadleaf weeds in maize and rice	Multivet (Gh.) Ltd., Accra
91.	Nico 40OD	FRE/18139/1421G November 2018	Nicosulfuron (40g/l)	III	Herbicide for the control of grasses and broadleaf weeds in cereals	Jingbo Agrochemicals Tech. Gh. Co. Ltd., Accra.
92.	Nico Plus OD	FRE/1843/1353G July 2018	Nicosulfuron (4%)	III	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Kumark Company Limited, Kumasi
93.	Nicocal 40 OD	FRE/1825/1338G July 2018	Nicosulfuron (400g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Bentronic Productions. Kumasi

94.	Nicoherb 40 OD	FRE/1945/1461G February 2019	Nicosulfuron (40g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	J. K Duku Enterprise, Kumasi
95.	Nicokin g 75WG	FRE/1899/1326G August 2018	Nicosulfuron (750g/kg)	III	Herbicide for the control of annual, perennial grasses and	Rainbow AgroSciences Co. Ltd., Tema
					broadleaf weeds in maize	
96.	Nicopat Super	FRE/17166/1187G September 2017	Nicosulfuron (40g/l)	III	Herbicide for the control of annual grasses and broadleaf weeds	Dasimah Enterprise, Adum-Kumasi
97.	Nnoboa 41 SL	FRE/1945/1457G February 2019	Glyphosate (41%)	III	Herbicide for the control of annual, perennial grasses and broadleaf in cereals and vegetables	J. K Duku Enterprise, Kumasi
98.	Nwura Wura 360SL	FRE//1757/1218G October 2017	Glyphosate (360g/l)	III	Herbicide for the control of grasses and broadleaf weeds	Wynca Sunshine Agric Prod & Trading Co. Ltd., Accra
99.	Oboafo 480 SL	FRE/17202/1208G October 2017	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Macrofertil Gh. Ltd., Tema
100.	Ogyefo 72 SL	FRE/1890/1301G February 2018	2,4-D Amine (720g/l)	II	Herbicide for the control of post emergent annual weeds in rice	Thomas Fosu Enterprise, Kumasi
101.	Oyeadieyie 41 SL	FRE/1739/1176G September 2017	Glyphosate (410g/l)	III	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Frankatson Limited, Accra
102.	Orizo Plus SL	FRE/1826/1323G May 2018	Propanil (360g/l) + 2,4-D Amine salts (200g/l)	II	Selective herbicide for the control of grasses and broadleaf weeds in rice	The Candel Company Limited, Accra
103.	Panicumma x Cleaner 100EC	FRE/18139/1422G November 2018	Quizalofop-P-Ethyl (100g/l)	II	Systemic herbicides for control of *Panicum maximum,* annual and perennial weeds	Jingbo Agrochemical s Technology, Gh. Ltd., Accra
104.	Paracot SL	FRE/1758/1254R November 2017	Paraquat dichloride (200g/l)	II	Non-selective herbicide for the control of grasses and broadleaf weeds in maize, sorghum, yam, cassava and sugarcane	Afcott Ghana Ltd., Accra

105.	Pencal 500 EC	FRE/1906/1449G February 2019	Pendimethalin (500g/l)	II	Herbicide for the control of grasses and broadleaf weeds in rice and maize	Calli Ghana Co. Ltd., Accra
106.	Pendico 50 EC	FRE/1910/1486G June 2019	Pendimethalin (500g/l)	III	Herbicide for the control of broadleaf	Reiss & Co (Gh) Ltd., Accra
					weeds in cereals, cotton and soybean	
107.	Pendigan 400 CS	FRE/18100/1276G January 2018	Pendimethalin (400g/l)	II	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Adama West Africa Ltd., Accra
108.	Pendipax	FRE/2099/1588G January 2020	Pendimethalin (500g/l)	II	Herbicide for the control of annual grasses and broadleaf weeds in maize and sugarcane plantation	Rainbow AgroSciences Co. Ltd., Tema
109.	Pendi Plus 400 EC	FRE/2043/1590G January 2020	Pendimethalin (40%)	III	Herbicide for the control of annual grasses and broadleaf weeds in maize, onion, cotton and rice	Kumark Co. Ltd., Kumasi
110.	Power 41 SL	FRE/1945/1456G February 2019	Glyphosate (41%)	III	Herbicide for the control of annual, perennial grasses and broadleaf in cereals and vegetables	J. K Duku Enterprise, Kumasi
111.	Pronil Plus SL	FRE/1825/1335G July 2018	Propanil (360g/l) + 2, 4 D Amine Salt (200g/l)	III	Selective herbicide for the control of annual and perennial grasses and broadleaf weeds in rice	Bentronics Productions. Kumasi
112.	Propacal-Plus 480EC	FRE/1843/1342G July 2018	Propanil (240g/l) + 2, 4-D isobutylate (240g/l)	II	Selective herbicide for the control of annual and perennial grasses and broadleaf weeds in rice	Kumark Co. Ltd., Kumasi
113.	Propaforce Plus EC	FRE/18145/1321G May 2018	Propanil (36%) + 2, 4-D Isobutyl Ester (20%)	III	Herbicide for the control of weeds in rice	Jubaili Agrotec Ltd., Kumasi
114.	Propapat Plus	FRE/17166/1186G September 2017	Propanil (360g/l) + 2, 4-D Amine (200g/l)	III	Herbicide for the control of annual, perennial weeds in arable crops	Dasimah Enterprise, Adum-Kumasi
115.	Ricetop	FRE/1899/1425G December 2018	Propanil (360g/l) + 2,4 D Amine (200g/l)	III	Herbicide for the control of *Amaranthus retroflexus, Digitaria spp., Echinochloa spp., Panicum spp.* in rice	Rainbow AgroSciences Company Limited, Tema

116.	Ricecare 240 SC	FRE/1899/1327G May 2018	Penoxsulam (240g/l)	I V	Herbicide for the control of broadleaf weeds and sedges in field crops	Rainbow Agrosciences Co. Ltd., Tema
117.	Ricenice 360 EC	FRE/1999/1495G June 2019	Propanil (360g/l)	III	Herbicide for the control of *Amaranthus retroflexus, Digitaria spp.,* and *Echinochloa spp.*in rice	Rainbow AgroSciences Co. Ltd., Tema
118.	Ricestar 300 WP	FRE/1705/1170G September 2017	Bensulfuron-methyl (120g/kg) + Bispyribac-sodium (180g/kg)	III	Herbicide for the control of annual grasses, broadleaf weeds and sedges in rice	Chemico Limited, Tema
119.	Ridmax 510 SL	FRE/1899/1325G May 2018	Glyphosate IPA (300g/l) + 2,4-D IPA (210g/l)	III	Herbicide for the control of annual, perennial weeds in field crops	Rainbow Agrosciences Co. Ltd., Tema
120.	Rid Out 480 SL	FRE/1999/1503G June 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds on non-crop and farm lands	Rainbow AgroSciences Co. Ltd., Tema
121.	Rid Over 757 SG	FRE/1999/1504G June 2019	Glyphosate ammonium (75.7%)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in arable and plantation crops	Rainbow AgroSciences Co. Ltd., Tema
122.	Rigold 432 EC	FRE/17202/1207G October 2017	Propanil (360g/l) + Triclopyr (72g/l)	III	Herbicide for the control of grasses and broad leaf weeds in rice	Macrofertil Gh. Ltd., Tema
123.	Rondo 48SL	FRE/1710/1232G October 2017	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Reiss & Co. Ghana Ltd., Accra
124.	Rondo 75.7S G	FRE/1710/1231G October 2017	Glyphosate (757g/kg)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in vegetables and cereals	Reiss & Co. Ghana Ltd., Accra
125.	Roundup 450 Turbo	FRE/17202/1201G October 2017	Glyphosate (450g/l)	III	Herbicide for the control of annual grasses and broadleaf weeds in cereals and vegetables	Macrofertil Gh. Ltd., Tema
126.	Sharp 480 SL	FRE/1843/1341G July 2018	Glyphosate (480g/l)	III	Herbicide for the control of annual and perennial grasses and	Kumark Co. Ltd., Kumasi

					broadleaf weeds in cereals	
127.	Shye Nwura SL	FRE/1825/1287G January 2018	Glyphosate (41%)	III	Herbicide for the control of annual and perennial broadleaf weeds and grasses	Bentronic Productions, Kumasi
128.	Sikosto 360 SL	FRE/1816/1270G January 2018	Glyphosate (360g/l)	III	Non-selective herbicide for the control of annual, perennial grasses and broadleaf weeds	Kurama Company Limited, Accra
129.	Sinosate 41 SL	FRE/1825/1291G January 2018	Glyphosate (41%)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses	Natosh Enterprise, Kumasi
130.	Special 30 WP	FRE/17202/1206G October 2017	Diuron (560g/kg) + Bromacil (240g/kg)	II	Herbicide for control of weeds in pineapple	Macrofertil Gh. Ltd., Tema
131.	Squad	FRE/1906/1450G February 2019	Pendimethalin (300g/l) + Clomazone (150g/l)	II	Herbicide for the control of grasses and broadleaf weeds in rice	Calli Ghana Co. Ltd., Accra
132.	Stomp 445 CS	FRE/18206/1267G January 2018	Pendimethalin (445g/l)	II	Herbicide for the control of broadleaf weeds and grasses in maize, cotton and tomatoes	Josann Agro Consult (J.A.C) Ltd., Accra
133.	Sun Agogo 33EC	FRE/1957/1561G October 2019	Pendimethalin (33%)	III	Herbicide for the control of grasses and broadleaf weeds in cereals and vegetables	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra.
134.	Sun-Anico OF	FRE/1957/1551R October 2019	Atrazine (20%) + Nicosulfuron (3%)	III	Herbicide for the control of broadleaf weeds and grasses in maize	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
135.	Sun 2,4-D Amine 72SL	FRE/2057/1578G January 2020	2, 4-D Amine (720g/l)	II	Herbicide for the control of broadleaf weeds, grasses and sedges in cereals and sugarcane	Wynca Sunshine Agric Products & Trading Co. Ltd., Accra
136.	Sun 2,4-D PRO 560 EC	FRE/1757/1222G October 2017	2, 4-D Amine (360g/l) + Propanil (200g/l)	II	Herbicide for the control of broadleaf weeds and grasses	Wynca Sunshine Agric Products & Trading Co., Ltd., Accra

137.	Sun-Bromacil 80WP	FRE/1857/1359G July 2018	Bromacil (800g/kg)	III	Herbicide for the control of broadleaf weeds and grasses in pineapples	Wynca Sunshine Agric Products & Trading Co., Limited, Accra
138.	Sunbuzin 70WP	FRE/1957/1566G October 2019	Metribuzin (700g/kg)	III	Herbicide for the control of broadleaf weeds in soybean	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra.
139.	Sun-Diuron 80WP	FRE/1857/1360G July 2018	Diuron (800g/kg)	III	Herbicide for the control of weeds in pineapples, mangoes and cashew	Wynca Sunshine Agric Products & Trading Co., Limited, Accra
140.	Sunfuron 40OD	FRE/1957/1565G October 2019	Nicosulfuron (40g/l)	III	Herbicide for the control of broadleaf weeds in maize	Wynca Sunshine Agric Prdts & Trading Co. Ltd, Accra
141.	Sunfuron 75WDG	FRE/1757/1224G October 2017	Nicosulfuron (750g/kg)	III	Herbicide for the control of broadleaf weeds in cereals and vegetables	Wynca Sunshine Agric Products & Trading Co., Ltd., Accra
142.	Sunfuron 80WP	FRE/1757/1223G October 2017	Nicosulfuron (800g/kg)	III	Herbicide for the control of broadleaf weeds in cereals and vegetables	Wynca Sunshine Agric Products & Trading Co., Ltd., Accra
143.	Sun-Gallop	FRE/1957/1564G October 2019	Haloxyfop-P-methyl (108g/l)	III	Pre-emergence herbicide for the control of annual broadleaf weeds in cereals and beans	Wynca Sunshine Agric Prdts & Trading Co. Ltd, Accra
144.	Sunphocate 360SL	FRE/1957/1562G October 2019	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial grasses in onion, garlic, tulips and cotton	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra.
145.	Sunphosate 360 SL	FRE/1757/1220G October 2017	Glyphosate (360g/l)	III	Herbicide for the control of broadleaf weeds and grasses in cereals and vegetables	Wynca Sunshine Agric Products & Trading Co., Ltd., Accra
146.	Sunphosate 757 G	FRE/1757/1221G October 2017	Glyphosate (757g/kg)	III	Herbicide for the control of broadleaf weeds and grasses in ceteals and vegetables	Wynca Sunshine Agric Products & Trading Co., Ltd.,

						Accra
147.	Sunphosate Plus	FRE/1957/1560G October 2019	Glyphosate (30%) + MCPA (6%)	III	Herbicide for the control of broadleaf weeds and grasses in rubber and citrus plantations	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
148.	Sunphosate Ultra SL	FRE/1957/1563G October 2019	Glufosinate Ammonium (200g/l)	III	Non-selective systemic herbicide for the control of weeds in rubber and citrus plantations	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra.
149.	Sun-Ameso	PCL/1957/1369R August 2019	Atrazine (500g/l) + Mesotrione (50g/l)	II	Herbicide for the control of broadleaf weeds ad grasses in maize	Wynca Sunshine Agric. Pdts & Trading Co. Ltd., Accra
150.	Sun-Atrazine 80 WP	PCL/1957/1384R August 2019	Atrazine (800g/l)	II	Herbicide for the control of annual grasses and broadleaf weeds in pineapple, maize and cereals	Wynca Sunshine Agric. Pdts & Trading Co. Ltd., Accra
151.	Sun-Atrazine 80 WP	PCL/1957/1383R August 2019	Atrazine (800g/kg)	II	Herbicide for the control of annual grasses and broadleaf weeds in pineapple, maize and cereals	Wynca Sunshine Agric. Pdts & Trading Co. Ltd., Accra
152.	Sun-Paraquat G	PCL/1957/1385R August 2019	Paraquat dichloride (200g/kg)	II	Herbicide for the control of annual grasses and broadleaf weeds in fruit trees, plantation crops and maize	Wynca Sunshine Agric. Pdts & Trading Co. Ltd., Accra
153.	Target 240 SL	FRE/1899/1312G April 2018	Imazethapyr (240g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in soybean and cowpea	Rainbow Agrosciences Co. Ltd., Tema
154.	Topstar 400SC	FRE/19183/1567G October 2019	Oxadiargyl (400g/l)	III	Pre-emergent herbicide for the control of annual, perennial grasses and broadleaf weeds in rice	Bayer West-Central Africa S.A, Accra
155.	Voila EC	FRE/18202/1378G August 2018	Pretilachlor (225g/l) + Pyribenzoxim (15g/l)	III	Herbicide for the control of grasses and broadleaf weeds and sedges in rice	Macrofertil Gh. Ltd., Tema
156.	Weedcot SL	FRE/1758/1257G November 2017	2, 4-D Amine (720g/l)	II	Selective herbicide for the control of broadleaf weeds in cereals	Afcott Ghana Ltd., Accra

157.	Weed Magic 41 SL	FRE/1825/1295G January 2018	Glyphosate (41%)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Bentronic Productions, Kumasi
158.	Weed Out SL	FRE/1825/1286G January 2018	Glyphosate (410g/l)	III	Herbicide for the control of annual and perennial broadleaf weeds and grasses	Bentronic Productions, Kumasi
159.	Weed Up	FRE/1822/1415G November 2018	Glyphosate (41%)	III	Herbicide for the control of annual and perennial grasses and broadleaved weeds	Annoh and Sons Agro-chem, Accra
160.	Weed Well SL	FRE/1843/1343G July 2018	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Kumark Company Limited, Kumasi
161.	Wynna 360 SL	FRE/1857/1318G April 2018	Glyphosate (360g/l)	III	Herbicide for the control of grasses and broadleaf weeds and grasses	Wynca Sunshine Agric Products & Trading, Accra
162.	Zoomer 390 SC	FRE/18100/1394G August 2018	Glyphosate (360g/l) + Oxyfluorfen (300g/l)	III	Herbicide for the control of annual and perennial broadleaf weeds and grasses	Adama West Africa Ltd., Accra

(A) Fully Registered Pesticides (FRE) (A4)
Plant Growth Regulators

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Callel 480 SL	FRE/1706/1247G November 2017	Ethephon (280g/l)	III	Plant Growth Regulator for degreening of pineapple	Calli Ghana Co. Ltd., Accra
2.	Callel 480 SL	FRE/1906/1442G February 2019	Ethephon (280g/l)	III	Plant Growth Regulator for degreening of pineapple	Calli Ghana Co. Ltd., Accra
3.	Chemophon 480 SL	FRE/1805/1386G August 2018	Ethephon (480g/l)	III	Plant growth regulator for degreening of pineapples	Chemico Limited, Tema
4.	Ethemax 480 SL	FRE/1799/1225G October 2017	Ethephon (480g/l)	III	Plant Growth Regulator for degreening of vegetables	Rainbow AgroSciences Co. Ltd., Tema
5.	Flower up 40SL	FRE/1857/1396G August 2018	Ethephon (40%)	III	For the acceleration of maturation in tomatoes and banana	Wynca Sunshine Agric Products & Trading Co. Ltd., Accra

6.	Hevetex	FRE/19202/1466G March 2019	Ethephon (5%)	III	Ethylene generator for stimulation of latex production	Macrofertil Ghana Ltd., Tema
7.	Mat 480 SL	FRE/17202/1194G October 2017	Ethephon (480g/l)	III	Plant growth regulator for de-greening of pineapples	Macrofertil Gh. Ltd., Tema
8.	RyzUp 40 SG	FRE/1780/1252G November 2017	Gibberellic acid 1.279 billion ITU/l	U	Plant growth regulator for banana	Challux Ltd., Accra

(A) Fully Registered Pesticides (FRE)

(A5) Molluscicide

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor

(A) Fully Registered Pesticides (FRE)
(A6) Nematicides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Agrocelhone NE	FRE/17136/1149G July 2017	Dichloropropene (60.8%) + Chloropicrin (33.3%)	II	Nematicide for the control of nematodes	Spica Ghana Ltd., Accra
2.	Carbodan 3G	FRE/1843/1347G July 2018	Carbofuran (3%)	II	Nematicide/ Insecticide for the control of nematodes in vegetables	Kumark Company Limited, Kumasi
3.	Velum Prime 400 SC	FRE/19185/1470G March 2019	Fluopyram (400g/l)	III	Nematicide for the control of nematodes in pepper, tomatoes and okro	RMG Ghana, Limited, Accra

(A) Fully Registered Pesticides
(FRE) (A7) Adjuvants

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Break-thru S240	FRE/17157/1213G October 2017	Polyether-polymethylsiloxane-copolymer (1000g/l)	U	Surfactant to improve the spreading, wetting and penetration of water-based pesticide formulations on leaves of vegetables, fruits and arable crops	Evonik West Africa, Accra

2.	EOS	FRE/17100/1237G November 2017	White summer spray oil (800g/l)	U	Adjuvant for public health use	Adama West Africa Ltd., Accra

(A) Fully Registered Pesticides (FRE)

(A8) Biocides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Nalco 303MC	FRE/20200/1591G January 2020	1-(2-hydroxyethyl)-2-alkyl (C-18)-2-imidazoline	U	Diesel biocide	Nalco Champion, Gh., Ltd, Accra
2.	PermaClean PC-11	FRE/20200/1593G January 2020	2,2 Dibromo-3-nitrilopropionamide	U	Control bacteria fouling of ultrafiltration units, non potable reverse osmosis membranes and peripheral systems	Nalco Champion, Gh., Ltd, Accra
3.	PermaClean PC-56	FRE/20200/1592G January 2020	5-Chloro-2-methyl- 4-isothiazoline-3-one + 2-Methyl-4-isothiazoline-3-one	U	For controlling bacteria fouling of ultrafiltration units, non potable reverse osmosis membranes and peripheral systems	Nalco Champion, Gh., Ltd, Accra
4.	Promex CHS-3	FRE/1920/1491G June 2019	Dihydroxy-2, 5-dioxahexane 20% + 5- chloro-2-methyl-4-isothiazolin-3-one (1%)	II	For controlling bacteria and fungi in aqueous solution	BBC Industrials Company Ltd., Accra
5.	Promex DB- 20	FRE/1920/1492G June 2019	2, 2-Dibromo-3-nitrilopropionamide (20%)	II	For controlling bacteria and fungi in aqueous solution	BBC Industrials Company Ltd., Accra

(B) Provisionally Cleared Pesticides (PCL)

(B1) Insecticides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Acati Power SL	PCL/19228/1455G October 2019	Thiamethoxam (200g/l)	II	Insecticide for the control of mirids in cocoa	Alive Industries, Accra
2.	Actaladiz 240SC	PCL/2008/1541G January 2020	Thiamethoxam (200g/l)	II	Insecticide for the control of mirids in cocoa	Dizengoff Ghana Ltd., Accra

3.	Adepa Agro Organic Pesticide	PCL/19193/1332 G May 2019	Ethyl palmitate	U	Insecticide for the control of mites, ticks, caterpillars, mealybugs and bacteria blight in vegetables, cashew, mango and citrus	Kwadutsa and Joam Co. Ltd., Suame-Kumasi
4.	Afford 50 WG	PCL/1999/1358G July 2019	Pymetrozine (500g/kg)	II	Insecticide for the control of aphids and whiteflies in cucumber, tomato, and vegetables	Rainbow Agrosciences Co. Ltd., Tema
5.	Agropy 5 EW	PCL/19197/1075G January 2019	Pyrethrum (50g/l)	II	Insecticide for the control of mirids in cocoa	Yayra Glover Ltd., Suhum
6. \	Akate Aduro 27 EC	PCL/2008/1549G January 2020	Bifenthrin (27g/l)	II	Insecticide for the control of capsid bugs in cocoa	Dizengoff Ghana Ltd., Accra
7.	Akate Asa	PCL/19196/1459G October, 2019	Bifenthrin (3%)	II	Insecticide for the control of mirids in cocoa	Pear River Co. Ltd., Accra
8.	Akate Brafo 40 EC	PCL/2006/1510G January, 2020	Acetamiprid (20g/l) + Bifenthrin (20g/l)	II	Insecticide for the control of mirids in cocoa	Calli Ghana Company Limited, Accra
9.	Akate Kaptain	PCL/19207/1313G April 2019	Etofenprox (300g/l)	II	Insecticide for the control of mirids on cocoa	Soiless Limited, Accra
10.	Akate Star 3.5EC	PCL/19232/1454G October 2019	Bifenthrin (3.5g/l)	II	Insecticide for the control of mirirds in cocoa	Alu Africa Ltd., Accra
11.	AF Confidence	PCL/20245/1604G March 2020	Bifenthrin (15g/l)	II	Insecticide for the control of mirids on cocoa	New Okaff Industries Ltd., Kumasi
12.	Alti-Lambda 2.5 EC	PCL/19121/1334G July 2019	Lambda-cyhalothrin (2.5%)	II	Insecticide for the control of insect pests in vegetables and pulses	Altimate Agrochemicals Ltd., Somanya
13.	Alti-Pyrifos 48 EC	PCL/19121/1341G July 2019	Chlorpyrifos - ethyl (480g/l)	II	Insecticide for the insect pests in field crops and outdoor public health purposes	Altimate Agrochemicals Ltd., Somanya
14.	Alti-Sulphur WP	PCL/19121/1338G July 2019	Carbendazim (5%) + Imidacloprid (2%) + Lambda-cyhalothrin (2%) + Sulphur (3%)	II	Insecticide/fungicide for the controlof insect pests and fungi in vegetables, banana, citrus, food and floral crops	Altimate Agrochemicals Ltd., Somanya
15.	Ba-Pyrifos 48%EC	PCL/2081/1535G January 2020	Chlorpyrifos (480g/l)	II	Insecticide for the control of coleoptera, diptera, homoptera and lepidoptera in rice and vegetables	B. Kaakyire Agrochemicals , Kumasi

16.	Bif 30 ULV	PCL/19177/1458G October 2019	Bifenthrin (3.0 ± 0.3%)	II	Insecticide for the control of insect pests of cocoa	Spenshell Co, Ltd., Accra
17.	Centrole 20SG	PCL/2099/1540G January 2020	Dinotefuran (200g/kg)	II	Insecticide for the control of brown planthopper and rice planthopper in rice	Rainbow AgroSciences Co. Ltd., Tema
18.	Chemaprid Super 60EC	PCL/1905/1470G November 2019	Acetamiprid (30g/l) + Lambda-cyhalothrin (30g/l)	II	Insecticide for the control of insect pests in vegetables	Chemico Limited, Tema
19.	Chemomect in 50SG	PCL/1905/1471G November 2019	Emamectin-benzoate (50g/kg)	II	Insecticide for the control of Fall armyworm in maize	Chemico Limited, Tema
20.	Cisthrin	PCL/1999/1479G November 2019	Deltamethrin (12.5g/l)	II	Insecticide for the control of borers, aphids, bollworm, cutworm, mango weevil and strainers in maize, cassava, yam, sorghum, groundnuts and vegetables	Rainbow AgroSciences Co. Ltd., Tema
21.	Crownpyrif o s 48EC	PCL/19229/1495G January 2020	Chlorpyrifo s (480g/l)	II	Insecticide for the control of leafminers, thrips, caterpillars, beetles, flies, bugs and moth in vegetables	Agro Crown West Africa Co. Ltd., Kumasi
22.	Defiance 48 ME	PCL/1908/1434G August 2019	Beta-cyfluthrin (4.5%) + Emamectin-benzoate (0.3%)	II	Insecticide for the control of insect pests and spidermites in vegetables	Dizengoff Ghana Ltd., Accra
23.	Deltaplan 12.5EC	PCL/1816/1270G December 2019	Deltamethrin (12.5%)	II	Insecticide for the control of insect pests in vegetables and cereals	Kurama Company Ltd., Accra
24.	Diz-Lambda 2.5EC	PCL/2008/1546G January 2020	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables	Dizengoff Ghana Ltd., Accra
25.	Diz-Pyrifos 480 EC	PCL/2008/1545G January 2020	Chlorpyrifos-ethyl (480g/l)	II	Insecticide for the control of insect pests in vegetables	Dizengoff Ghana Ltd., Accra
26.	D-Lion Akate Global 4000	PCL/19208/1428G August 2019	Thiamethoxam (350g/l)	II	Insecticide for the control of mirids in cocoa	Desert Lion International Ltd., Kumasi
27.	D-Lion Desband	PCL/19208/1431G August 2019	Chlorpyrifo s (480g/l)	II	Insecticide for the control of aphids, thrips, fruitflies and stem borers in arable crops	Desert Lion International Ltd., Kumasi
28.	DimeCrow n 400 EC	PCL/19229/1496G January 2020	Dimethoate (400g/l)	II	Insecticide for the control of insect pests in vegetables`	Agro Crown West Africa Co. Ltd.,

						Kumasi
29.	EmaCare	PCL/1945/1439G October 2019	Emamectin-benzoate (1.92%)	II	Insecticide for the control of Fall Armyworm in maize	Jubaili Agrotec Limited, Kumasi
30.	Ex-icute/Rapid-O SL	PCL/20262/1502G January 2020	Clove oil (6%) + Sesame oil (5%) + Rosemary oil (3%)		Insecticide for the control of Fall Army worm in maize	Nanam Ventures, Tema
31.	FreeDome Bait	PCL/19252/1366G July 2019	Spinosad (0.05%)	II	Insecticide for the control of fruitfly in mango	Home of Quality Products, Accra
32.	Furabak 3%G	PCL/2081/1528R January 2020	Carbofuran (3%)	II	Insecticide/ nematicide for the control of cane beetles, aphids, rice stem borers and nematodes	B. Kaakyire Agrochemicals , Kumasi
33.	Imunit	PCL/20206/1520G January 2020	Alpha-cypermethrin (75g/l) +Teflubenzuron (75g/l)	II	Insecticide for the control of Fall Armyworm in maize	Josann Agro Consult Ltd., Accra
34.	Kilambda 25EC	PCL/19249/1412G August 2019	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of diamondback moth, cabbage, bollworm and leaf miner in cabbage	Karida Agro Trading Co. Ltd., Accra
35.	Konmidor 200SL	PCL/19249/1409G August 2019	Imidacloprid (200g/l)	II	Insecticide for the control of insect pests in cereals and vegetables	Karida Agro Trading Co. Ltd., Kumasi
36.	Lagano 2.5EC	PCL/19184/1380G August 2019	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of aphids, beetles, thrips and larvae of lepidoptera in cotton and vegetables	Ganorma Agrochemicals Ltd., Tamale
37.	Lambdacrown	PCL/19229/1398G August 2019	Lambda-cyhalothrin (25g/l)	II	Insecticide for the control of insect pests in vegetables and fruits	Agro Crown Co. Ltd., Kumasi
38.	Leadrole 80 WG	PCL/1999/1352G July 2019	Ethiprole (40%) + Imidacloprid (40%)	II	Insecticide for the control of aphids, brown plant hopper and whiteflies in cotton, vegetables and rice	Rainbow AgroSciences Co. Ltd., Tema

39.	Leopard 20 SL	PCL/19137/1473G November 2019	Imidacloprid (200g/l)	II	Insecticide for the control of mango hopper, aphids, leafminers, jassids in mango, okra and groundnut	Miqdadi Co. Ltd., Accra
40.	Magicforce Gold	PCL/19145/1438G October 2019	Lambda-cyhalothrin (15g/l) + Acetamiprid (20g/l)	II	Insecticicide for the control of beet army worm, aphids, stem borers, beetles, leafhoppers, bollworm, leaf miner, diamond backmoth in cabbage, cucumber, okra, pepper, maize, sorghum, rice, legumes, mango and citrus	Jubaili Agrotec Ltd., Kumasi
41.	Nova BTK	PCL/1905/1464G October 2019	*Bacillus thuriengensis* (32000iu/mg)	II I	Insecticide for the control of fall armyworm in maize	Chemico Ltd., Tema
42.	Organic Bug Buster	PCL/19247/1314G April 2019	*Metarhizium anisopliae* + *Beauveria bassiana*	II	Insecticide for the ontrol of Fall Armyworm and aphids in maize and okra	GWorld Gh. Ltd., Accra
43.	Organic JMS Stylet Oil	PCL/2008/1547G January 2020	White Mineral Oil	U	Insecticide/ fungicide for the control of aphids, mites, thrips, powdery mildew, botrytis and rust in vegetables and fruits	Dizengoff Ghana Ltd., Accra
44.	Orizon 120 SC	PCL/2008/1544G January 2020	Acetamiprid (100g/l) + Abamectin (20g/l)	II	Insecticide for the control of insect pests and soil nematodes in vegetables and citrus	Dizengoff Ghana Ltd., Accra
45.	Ozoneem 1EC	PCL/19216/1460G October 2019	Azadirachtin (1%)	II	Insecticide for the control of fall armyworm, diamondback moth in maize, okra and cabbage	Karsam Macro Ltd., Kumasi
46.	Protocol EC	PCL/19121/1339G July 2019	Acetamiprid (15g/l) +	II	Insecticide for the control of insect pests in	Altimate Agrochemicals
			Lambda-cyhalothrin (20g/l)		rice, maize, cotton, beans and leafy vegetables	Co. Ltd., Somanya
47.	Pyrethrum 5EW	PCL/19257/1469G November 2019	Pyrethrum (50g/l)	II	Insecticide for the control of chewing and sucking insect pests in outdoor and protected crops	Nkye Kya Ltd., Accra

48.	Rocket 20EC	PCL/20145/1600G March 2020	Chlorpyrifos - ethyl (20%)	II	Insecticide for the control of insect pest in cotton, citrus and vegetables	Jubaili Agrotec Ltd., Kumasi
49.	Rockot Extra 75 WG	PCL/1999/1482G November, 2019	Thiamethoxam (750g/kg)	II I	Insecticide for the control of insect pests in rice, cotton, vegetables and sugarcane	Rainbow AgroSciences Co. Ltd., Tema
50.	Rockstar 2.5 EC	PCL/19213/1315 G May 2019	Bifenthrin (2.5%)	II	Insecticide for the control of mirids in cocoa	Crop Doctor, Kumasi
51.	Ronfos 550 EC	PCL/1999/1353G July 2019	Profenofos (500g/l) + Lufenuron (50g/l)	II I	Insecticide for the control of podborers, bollworm, beet armyworm, leafmoths in kidney bean, tomato and cabbage	Rainbow AgroSciences Co. Ltd., Tema
52.	Sauveur 62EC	PCL/1906/1333 G May 2019	Acetamiprid (32g/l) + Lambda-cyhalothrin (30g/l)	II	Insecticide for the control of Fall Armyworm in maize	Calli Ghana Co. Ltd., Accra
53.	Seizer EC	PCL/19100/1311G April 2019	Bifenthrin (100g/l)	II	Insecticide for the control of mirids in cocoa	Adama West Africa Ltd., Accra
54.	Spartan 300 OD	PCL/1999/1360G July 2019	Imidacloprid (210g/l) + Beta- cyfluthrin (90g/l)	II	Insecticide for the control of armyworm, stem borer and bollworms in rice and maize	Rainbow AgroSciences Company Ltd., Tema
55.	Spur 19.6 EC	PCL/19249/1415G August 2019	Emamectin-benzoate (19.6g/l)	II	Insecticide for the control of caterpillars and aphids in tomato, garden eggs and onion	Karida Agro Trading Co. Ltd., Kumasi
56.	Stink EC	PCL/2081/1529G January 2020	Dimethoate (30%) + Lambda-cyhalothrin (1.5%)	II	Insecticide for the control of aphids, leafhoppers, borers and weevils in vegetables, cotton and sweet potato	B. Kaakyire Agrochemicals , Kumasi
57.	Strike 1.9EC	PCL/2081/1532G January 2020	Emamectin-benzoate (19.2g/l)	II	Insecticide for the control of leaf-eating beetle, spiny bollworm	B. Kaakyire Agrochemicals , Kumasi
					and pink bollworm in okro	
58.	Striker Super 70 EC	PCL/2081/1533G January 2020	Acetamiprid (50g/l) + Emamectin-benzoate (20g/l)	II	Insecticide for the control of Fall Armyworm in maize	B. Kaakyire Agrochemicals , Kumasi
59.	Sultan 400SL	PCL/2099/1539G January 2020	Bisultap (400g/l)	II	Insecticide for the control of armyworm and stem borers in maize and rice	Rainbow AgroSciences Co. Ltd., Tema

60.	Superkill 150 SL	PCL/19219/1308G April 2019	Acetamiprid (100g/l) + Cypermethrin (50g/l)	II	Insecticide for the control of mirids in cocoa	Kugyam Enterprise, Accra
61.	Supertop EC	PCL/2043/1525G January 2020	Acetamiprid (20g/l) + Lambda-cyhalothrin (15g/l)	II	Insecticide for the control of insect pests in tomato	Kumark Co. Ltd., Kumasi
62.	Sunpri-Lam 25EC	PCL/1957/1449G October 2019	Cypermethrin (2.5%) + Chlorpyrifos (22.5%)	II	Insecticide for the control of aphids, jassids, thrips, whiteflies, bollworms and cutworm in eggplant, cotton, tomatoes and lettuce	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
63.	Sun-Prida	PCL/1957/1452G October 2019	Imidacloprid (200g/l)	II	Insecticide for the control of aphids in cowpea and tomato	Wynca Sunshine Agric. Prod & Trading Co. Ltd., Accra
64.	Termidor SC	PCL/19206/1393G August 2019	Fipronil (25g/l)	II	Insecticide for the control of termites in cabbage, onion, eggplant and maize	Josann Agro Consult Ltd., Accra
65.	Termifos 48 EC	PCL/19249/1494G December 2019	Chlorpyrifos (480g/l)	II	Insecticide for the control of mealybugs, thrips, leafminers and aphids in vegetables and for wood treatment	Karida Agro Trading Co. Ltd., Kumasi
66.	Termichem 5SC	PCL/1905/1426G August 2019	Fipronil (50g/l)	II	Insecticide for the control of termites on wood	Chemico Limited, Tema
67.	Transform Akate	PCL/19251/1349G July 2019	Isoclast (240g/l)	U	Insecticide fir the control of mirids and shield bugs in cocoa	Agri Plus Horizon Farms Ltd., Accra
68.	Trika Expert G	PCL/1808/1261G December 2018	Lambda-cyhalothrin (25%)	II	Insecticide for the control of insect pests in vegetables	Dizengoff (Ghana) Ltd., Accra
69.	Trivor 310 DC	PCL/20100/1516G January 2020	Acetamiprid (186g/l) + Pyriproxyfen (124g/l)	II	Insecticide for the control of mirids in cocoa	Adama West Africa Ltd., Accra
70.	Uphold 360SC	PCL/1905/1465G October 2019	Methoxyfenozide (300g/l) + Spinetoram (60g/l)	II I	Insecticide for the control of fall armyworm in maize	Chemico Limited, Tema

71.	Warrior Super 26EC	PCL/2081/1534G January 2020	Sophora flavescen plant extract (25%) + Emamectin-benzoate (1%)	II I	Insecticide for the control of fall armyworm in maize	B. Kaakyire Agrochemicals , Kumasi
72.	Withoate 40EC	PCL/19137/1474G November 2019	Dimethoate (400g/l)	II	Insecticide for the control of aphids, jassids and beetles in sweet potato and vegetables	Miqdadi Co. Ltd., Accra
73.	WormAtak EC	PCL/1914/1364G July 2019	Teflubenzuron (50g/l) + Cypermethrin (20g/l)	II I	Insecticide for the control of Fall Armyworm (FAW) in maize	Afropa Gh. Ltd., Accra
74.	Zinda 50EC	PCL/19249/1405G August 2019	Diazinon (50%)	II	Insecticide for the control of insect pests in cereals, groundnut and vegetables	Karida Agro Trading Co. Ltd., Kumasi
75.	Zukadoc 46 EC	PCL/19213/1328 G May 2019	Indoxacarb (30g/l) + Acetamiprid (16g/1)	II I	Insecticide for the control of insect pests in okro	Crop Doctor, Kumasi

(B) Provisionally Cleared Pesticides (PCL)

(B1a) Insecticides for public health purposes

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Agrifog Maxi Smoke Generator	PCL/19173/1467G November 2019	Deltamethrin (14%)	II I	Insecticide for the control of household insect pests	Agromonti Co. Ltd., Accra
2.	Bacto Power	PCL/19248/1322 G May 2019	*Bacillus thuringiensis israelensis* (BTI)	II	Insecticide for the control of mosquito larvae	Comforter Gh. Business Ltd., Accra
3.	D-Lion Bedbug	PCL/19208/1374G August 2019	Thiamethoxam (12.6%) + Lambda-cyhalothrin (9.4%)	II	Insecticide for the control of bedbugs	Desert Lion International Limited, Accra
4.	Dulux Mosquito Protect	PCL/19115/1456G October 2019	Deltamethrin (0.1w/w)	II	Insecticide for the control of mosquitoes and other public health purposes	M & K Co., Ltd., Accra
5.	Fludora Fusion	PCL/19183/1443G October 2019	Clothianidin (500g/kg) + Deltamethrin (62.5g/kg)	II	Insecticide for indoor and outdoor spray of mosquitoes	Bayer West-Central Africa S.A, Accra
6.	Heaven Insecticide Spray	PCL/19230/1404G August 2019	Tetrafluthrin (0.10%) + Beta-cypermethrin	II	Insecticide for public health purposes	Menkish Impex Ltd., Accra

			(0.05%)			
7.	Heaven Black Mosquito Coil	PCL/19230/1390G August 2019	Tetrafluthrin (0.03%)	II	Insecticide coil for the control of mosquitoes	Menkish Impex Ltd., Accra
8.	SumiShield 50WG	PCL/19209/1302G March 2019	Clothianidin (500g/kg)	II I	Insecticide for public health purposes for the control of anopheles mosquitoes	Worldwide Healthcare Ltd., Accra

(B) Provisionally Cleared Pesticides (PCL)

(B1b) Insecticides for stored produce

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Devathrin 10 SC	PCL/1910/1320G July 2019	Alpha-cypermethrin (100g/l)	II	Insecticide for the control of storage insect pests in cocoa	Reiss & Co. (Gh) Ltd., Accra
2.	Storecare	PCL/19145/1346G July 2019	Malathion (2%)	III	Insecticide for the control of *Sitophilus zeamais* in stored rice and maize	Jubaili AgroTec Ltd., Kumasi

(B) Provisionally Cleared Pesticides (PCL)

(B2) Fungicides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Aflasafe GH02	PCL/19217/1303G May 2019	Four atoxigenic *Aspergiluss flavus* strains (0.0005%)	U	Fungicide for the control of aflatoxins in maize, groundnuts and sorghum	International Institute of Tropical Agriculture (IITA), Accra
2.	AgroSar 70WP	PCL/19179/1453G October 2019	Copper Hydroxide (70%)	III	Fungicide for the control of blackpod disease in cocoa	Moor Co. Ltd., Accra
3.	Arrest 325SC	PCL/19189/1468G November 2019	Azoxystrobin (200g/l) + Difenoconazole (125g/l)	II I	Fungicide for the control of leafspot, leaf blight, blast, black spot, rust and brown spot in cereals and vegetables	Matrix Innovation Ltd., Accra
4.	Banko D 450 SC	PCL/2006/1511G January 2020	Chlorothalonil (400g/l) + Difenoconazole (50g/l)	II I	Fungicide for the control of *Alternaria sp*., *Phytophthora* and Anthracnose in vegetables and mango	Calli Ghana Co. Ltd., Accra

5.	Cabrio Duo	PCL/19206/1391G August 2019	Dimethomorph (72g/l) + Pyraclostrobin (40g/l)	II	Fungicide for the control of blackpod disease in cocoa	Josann Agro Consult Ltd., Accra
6.	Comet Plus 475EC	PCL/20206/1522G January 2020	Fenpropimorph (375g/l) + Pyraclostrobin (100g/l)	II I	Fungicide for the control of black and yellow sigatoka in banana	Josann Agro Consult Ltd., Accra
7.	D-Lion Fungicide 2020 WP	PCL/19208/1429G August 2019	Copper (77%)	II I	Fungicide for the control of spot, citrus canker and blackspot disease in vegetables, watermelon and citrus	Desert Lion International Ltd., Kumasi
8.	Fomestop IGR	PCL/19256/1457G October 2019	Triadimenol	II	Fungicide for the control of white rot in rubber plants	Ghana Rubber Estates Ltd., Takoradi
9.	Forum R	PCL/20206/1601G March 2020	Copper oxychloride (67.2%w/w) + Dimethomorph (6.0%w/w)	II	Fungicide for the control of *Phytophthora palmivora*, *Phytophthora megakarya* in cocoa	Josann Agro Consult (J.AC.) Ltd., Accra
10.	Fungus Fighter Plus	PCL/19133/1402G August 2019	Mancozeb (800g/kg)	II I	Fungicide for the control of downy mildew in fruits and vegetables	Abbnak Agro Services, Kumasi
11.	Germ Kill 50WP	PCL/19249/1408G August 2019	Copper oxychloride (350g/kg) + Metalaxyl (150g/kg)	II I	Fungicide for the control of diseases in fruits and vegetables	Karida Agro Trading Co. Ltd., Kumasi
12.	Guardian Xtra WP	PCL/1999/1478G November 2019	Carbendazim (80%)	II	Fungicide for control of *Botrytis, sclerotinia* and blue mould in beans,	Rainbow AgroSciences Co. Ltd., Tema
					onions, tomatoes and citrus	
13.	Kabendazim 50WP	PCL/2081/1530G January 2020	Carbendazim (50%)	II I	Fungicide for the control of anthracnose, leaf spots and other fungal diseases in vegetables and cereals	B. Kaakyire Agrochemicals , Kumasi
14.	Manco-care	PCL/19145/1348G July 2019	Mancozeb (800g/kg)	II I	Fungicide for the control of early and late blight, buck eye rot, leafspot, blast, sigatoka and tip rot in vegetables, tomato and plantain	Jubaili Agro. Tec Ltd., Kumasi
15.	Mangoda 10WG	PCL/19249/1406G August 2019	Difenoconazole (100g/kg)	II	Fungicide for the control of fungal diseases in fruits and vegetables	Karida Agro Trading Co. Ltd., Kumasi

16.	Mirage 450 EC	PCL/20100/1515G January 2020	Prochloraz (450g/l)	II I	Fungicide for the control of fusarium wilt in cowpea	Adama West Africa Ltd., Accra
17.	Orvego	PCL/20206/1521G January 2020	Ametoctradin (300g/l) + Dimethomorph (225g/l)	II	Fungicide for the control of blackpod disease in cocoa	Josann Agro Consult Ltd., Accra
18.	Rescue 76WP	PCL/2008/1550G January 2020	Propineb (70g/l) + Cymoxanil (6g/l)	II	Fungicide for the control of fungal diseases in crops	Dizengoff Ghana Ltd., Accra
19.	Rover	PCL/1908/1433G August 2019	Chlorothalonil (500g/l)	II I	Fungicide for the control of diseases in vegetables	Dizengoff Ghana Ltd., Accra
20.	Seed Care	PCL/20145/1553G March 2020	Imidacloprid 95%, Thiram	II	For rice blast, rice plant hopper in rice	Jubaili Agro. Tec Ltd., Kumasi
21.	Shaolin 62.5W G	PCL/1999/1480G November 2019	Cyprodinil (37.5%) + Fludioxonil (25%)	II	Fungicide for the control of fungal diseases in tomato, mango, green pepper, carrot and pawpaw	Rainbow AgroSciences Co. Ltd., Tema
22.	Skope 370 WP	PCL/19213/1327 G May 2019	Mancozeb (320g/kg) + Azoxystrobin (50g/kg)	II I	Fungicide for the control of leafspot in tomato	Crop Doctor, Kumasi
23.	Splendid 800 EC	PCL/1999/1359G July 2019	Spiroxamine (800g/l	U	Fungicide for the control of black sigatoka in banana	Rainbow AgroSciences Co. Ltd., Tema
24.	Sun-Azodi	PCL/1957/1450G October 2019	Azoxystrobin (250g/kg)	II	Fungicide for the control of downy mildew and white mould in tomato	Wynca Sunshine Agric Products & Trading Co. Ltd., Accra
25.	Sun-Cotala WP	PCL/1957/1445G October 2019	Copper hydroxide (770g/kg)	II I	Fungicide for the control of angular leaf spot in cucumber	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
26.	Sunkopper 77WP	PCL/1957/1446G October 2019	Mancozeb (480g/kg) + Metalaxyl (100g/kg)	II I	Fungicide for the control of downy mildew in cucumber	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
27.	Sun-Lonil WP	FRE/2057/1585G January 2020	Chlorothalonil (75%)	II I	Fungicde for the control of downy mildew and early blight in cucumber and tomatoes	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra

28.	Supreme 325 SC	PCL/1910/1317 G May 2019	Azoxystrobin (200g/l) + Difenoconazole (125g/l)	U	Fungicide for the control of leaf blight, powdery mildew, early and late blight, blast, downy mildew in vegetables and cereals	Reiss and Co (Gh) Ltd., Accra
29.	Top Pro	PCL/19249/1416G August 2019	Chlorothalonil (75%)	II	Fungicide for the control of early blight, downy mildew in cucumber	Karida Agro Trading Co. Ltd. Kumasi
30.	X-Glider	PCL/19137/1475G November 2019	Azoxystrobin (200g/l) + Difenoconazole (125g/l)	II I	Fungicide for the control of anthracnose in watermelon	Miqdadi Co. Ltd., Accra

(B) Provisionally Cleared Pesticides (PCL)

(B3) Herbicides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	AB-Xtra 72SL	PCL/20233/1552G January 2020	2, 4-D Amine Salt (720g/l)	II	Herbicide for the control of broadleaf weeds in rice	AB Benaldo Trading Co., Kumasi
2.	Adwuma Boss 48 SL	PCL/19249/1418G August 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in field crops	Karida Agro Trading Co. Ltd., Kumasi
3.	Adwuma Boss-G	PCL/19249/1344G December 2019	Glyphosate (757g/kg)	III	Herbicide for the control of annual, perennial broadleaf	Karida Agro Trading Co.

4.	Adwuma Super 48 SL	PCL/1943/1372G August 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual broadleaf weeds and grasses in arable crops	Kumark Co. Ltd., Kumasi
5.	Agronil 36 EC	PCL/1910/1318 G May 2019	Propanil (360g/l)	III	Herbicide for the control of annual grasses in rice	Reiss and Co. (Gh) Ltd., Accra
6.	Altibroma 80 WP	PCL/19121/1340G July 2019	Bromacil (800g/kg)	III	Herbicide for the control of annual, perennial roadleaf weeds in arable crops	Altimate Agrochemicals Ltd., Somanya
7.	Altisate 41 SL	PCL/19121/1335G July 2019	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in arable crops	Altimate Agrochemicals Ltd., Somanya
8.	Amega 360 SL	PCL/2043/1524G January 2020	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize	Kumark Co. Ltd., Kumasi
9.	AminoForce	PCL/19145/1441G October 2019	2, 4-D Amine Salt (720g/l)	III	Herbicide for the control of broadleaf weeds in maize	Jubaili Agrotec Limited, Kumasi
10.	AtraCrown	PCL/19229/1497R January 2020	Atrazine (800g/kg)	II	Herbicide for the control of annual grasses and broadleaf weeds in maize	Agro Crown West Africa Co. Ltd., Kumasi
11.	Atraforce 50SC	PCL/20145/1558R March 2020	Atrazine (500g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in maize, yam, sugarcane, orchards, oil palm and citrus	Jubaili Agrotec Ltd., Kumasi
12.	Atraforce 80WP	PCL/20145/1557R March 2020	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in maize and sugarcane	Jubaili Agrotec Ltd., Kumasi
13.	Atraking 80 WP	PCL/1999/1422R August 2019	Atrazine (800g/kg)	II	Herbicide for the control of annual broadleaf weeds and grasses in maize, sorghum, sugarcane and yam	Rainbow AgroSciences Co. Ltd., Tema

14.	Atrakin g 500SC	PCL/1999/1423R August 20019	Atrazine (800g/l)	II	Herbicide for the control of annual broadleaf weeds and grasses in maize, sorghum, sugarcane and yam	Rainbow AgroSciences Co. Ltd., Tema
15.	Atraplus 600SC	PCL/1999/1476R November 2019	Atrazine (300g/l) + Terbutylazine (300g/l)	II	Herbicie for the control of annual broadleaf weeds and grasses in maize and sorghum	Rainbow AgroSciences Co. Ltd., Tema
16.	Atrazila 80 WP	PCL/2043/1526R January 2020	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in arable crops	Kumark Co. Ltd., Kumasi
17.	Atrazila 500 SC	PCL/2043/1527R January 2020	Atrazine (500g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in arable crops	Kumark Co. Ltd., Kumasi
18.	Barizaa 360SL	PCL/19184/1381G August 2019	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in cereals and vegetables	Ganorma Agrochemicals Ltd., Tamale
19.	Batrazine 80WP	PCL/2081/1531R January 2020	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize and sugarcane	B. Kaakyire Agrochemicals, Kumasi
20.	Bellazine 500SC	PCL/1905/1466R October 2019	Atrazine (250g/l) + Cyanazine (250g/l)	II	Herbicide for the control of annual grasses and broadleaf weeds in maize and sugarcane	Chemico Limited, Tema
21.	Bencinate 53 WP	PCL/1910/1319 G May 2019	Mefenacet (500g/kg) + Bensulfuron-methyl (30g/kg)	U	Herbicide for the control of grasses, sedges and broadleaf weeds in paddy rice	Reiss and Co. (Gh) Ltd., Accra
22.	ButaCrown 50 EC	PCL/19229/1498G January 2020	Butachlor (500g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in rice	Agro Crown West Africa Co. Ltd., Kumasi
23.	Comot 41 SL	PCL/19121/1336G July 2019	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in arable crops	Altimate Agrochemicals Ltd., Somanya

24.	Council Activ 30 WG	PCL/20183/1514G January 2020	Triafamone (15%) + Ethoxysulfuron (15%)	II	Herbicide for the control of grasses, sedges and broadleaf weeds in rice	Bayer West-Central Africa SA., Accra
25.	BonNico	PCL/20149/1508G January 2020	Nicosulfuron (40g/l)	III	Herbicide for control of annual, perennial grasses and broadleaf weeds in maize	Bon Agro Co. Ltd., Kumasi
26.	Bonquat 276 SL	PCL/20149/1507R January 2020	Paraquat (276g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Bon Agro Co. Ltd., Kumasi
27. B	Bonzine 80WP	PCL/20149/1508R January 2020	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals	Bon Agro Co. Ltd., Kumasi
28.	ButaClear 50EC	PCL/19184/1378G August 2019	Butachlor (50%)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in paddy rice, soybean, cotton, groundnut and vegetables	Ganorma Agrochemicals Ltd., Tamale
29.	Bylor 500EC	PCL/1999/1354G July 2019	Butachlor (500g/l)	III	Herbicide for the control of annual grasses and broadleaf weeds in groundnut and rice	Rainbow AgroSciences Co. Ltd., Tema
30.	Conti-sate SL	PCL/2078/1501G January 2020	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in arable crops	Five Continents Import & Export Co. Ltd., Accra
31.	Crownquat	PCL/19229/1401R August 2019	Paraquat dichloride (276g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in field crops	Agro Crown Co. Ltd., Kumasi
32.	Crownsate	PCL/19229/1399G August 2019	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in field crops	Agro Crown Co. Ltd., Kumasi
33.	Diuron Super 80WP	PCL/19249/1410G August 2019	Diuron (80%)	II	Herbicide for the control of broadleaf weeds in sugarcane	Karida Agro Trading Company Ltd. Kumasi

34.	Diz-Paraquat 20SL	PCL/2008/1548R January 2020	Paraquat dichloride (200g/l)	II	Herbicide for the control of annual, perennial weeds and grasses in cereals and fruits	Dizengoff Ghana Ltd., Accra
35.	D-Lion Glyphosate	PCL/19208/1361G July 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial weeds in arable crops	Desert Lion Int. Ltd., Accra
36.	Dzokpata 276SL	PCL/1999/1477R November 2019	Paraquat dichloride (276g/l)	II	Herbicide for the control of broadleaf weeds and grasses in plantation and tree crops	Rainbow AgroSciences Co. Ltd., Tema
37.	Erase 480 SL	PCL/19213/1310G April 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in arable crops	Crop Doctor, Kumasi
38.	Eserewura	PCL/1908/1420G August 2019	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial weeds in non-crop lands	Dizengoff Ghana Ltd., Accra
39.	Faaba Soja 10 SL	PCL/1943/1371G August 2019	Imazethapyr (10g/l)	II	Herbicide for the control of annual, perennial weeds in maize	Kumark Co. Ltd., Kumasi
40.	Fastherb 720SL	PCL/19249/1411G August 2019	2,4-D Amine (720g/l)	III	Herbicide for the control of broadleaf weeds in rice	Karida Agro Trading Company Ltd. Kumasi
41.	Flysate	PCL/20145/1601G March 2020	Glyphosate (41%)	III	Herbicide for the control of annual, perennial weeds in cereals and vegetables	Jubaili Agrotec Ltd., Kumasi
42.	ForceUp Granular	PCL/19145/1284G February 2019	Glyphosate Mono-ammonium salt (757g/kg)	III	Herbicide for the control of annual, perennial weeds in citrus	Jubaili Agrotec Ltd., Kumasi
43.	Ganico 40SC	PCL/19184/1379G August 2019	Nicosulfuron (40g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in maize, sorghum and millet	Ganorma Agrochemicals Ltd., Tamale
44.	Ganoquat Super	PCL/1930/1463R October 2019	Paraquat dichloride (200g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize and other crops	Natosh Enterprise, Kumasi

45.	Ganorherb SL	PCL/19184/1382G August 2019	2,4-D Amine Salt (720g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in cereals	Ganorma Agrochemicals Ltd., Tamale
46.	Ganorsate 360 SL	PCL/19184/1376G August 2019	Glyphosate (360g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in arable crops	Ganorma Agrochemicals Ltd., Tamale
47.	Ganorzine 80WP	PCL/19184/1377R August 2019	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial broadleaf weeds in maize, sugarcane, pineapple, sorghum and yam	Ganorma Agrochemicals Ltd., Tamale
48.	Gramoda Super	PCL/19249/1345R July 2019	Paraquat dichloride (200g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize	Karida Agro Trading Company Ltd. Kumasi
49.	Gramoking 276 SL	PCL/1999/1425R August 2019	Paraquat dichloride (276g/l)	II	Herbicide for the control of grasses and broadleaf weeds in tree crops, maize, cowpea, cotton and pineapple	Rainbow AgroSciences Co. Ltd., Tema
50.	Gramofox Super	PCL/20260/1523G January 2020	Paraquat dichloride (200g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds	Placenta Agrochemicals & Trading Enterprise, Kumasi
51.	Gramoquin Super	PCL/20237/1519R January 2020	Paraquat dichloride (276g/l)	II	Herbicide for the control of broadleaf weeds and grasses in arable crops	K.K Rich Enterprise, Kumasi
52.	Groquat Super 27.6 SL	PCL/19175/1395R August 2019	Paraquat dichloride (20%)	II	Herbicide for the control of broadleaf weed and grasses in	Wamwus Agropham Ltd, Kumasi
					cereals, vegetables and fruit trees	
53.	Hadop	PCL/19249/1493G December 2019	Haloxyfop-methyl (108g/l)		Herbicide for the control of annual and perennial grass weeds in watermelon, onions, cabbage, groundnut and soybean	Karida Agro Trading Co. Ltd., Kumasi
54.	Hao Nico	PCL/19258/1492G December 2019	Nicosulfuron (40g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize	Agrohao Ghana Co. Ltd., Kumasi

55.	Haoquat 276 SL	PCL/19258/1491R December 2019	Paraquat (276g/l)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize and non-crop lands	Agrohao Ghana Co. Ltd., Kumasi
56.	Haosate	PCL/19258/1487G December 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual and perennial weeds in non-crop lands	Agrohao Ghana Co. Ltd., Kumasi
57.	Haothapyr	PCL/19258/1489G December 2019	Imazethapyr (240g/l)	II	Herbicide for the control of annual grasses and broadleaf weeds in soybean	Agrohao Ghana Co. Ltd., Kumasi
58.	Hao 2, 4-D	PCL/19258/1488G December 2019	2,4-D Amine (720g/l)	III	Herbicide for the control of broadleaf weeds and grasses in rice and maize	Agrohao Ghana Co. Ltd., Kumasi
59.	Herbamine	PCL/20237/1518G January 2020	2,4-D Amine (720g/l)	III	Herbicide for the control of broadleaf weeds in cereals and sugarcane	K.K Rich Enterprise, Kumasi
60.	Herbacrown	PCL/19229/1400G August 2019	2, 4-Dimethyl Amine Salt (720g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in field crops	Agro Crown Co. Ltd., Kumasi
61.	Herbtryn SC	PCL/1999/1481G November 2019	Ametryn (500g/l)	II	Herbicide for the control of grasses and broadleaf weeds in banana, pineapple, plantain and sugarcane	Rainbow AgroSciences Co. Ltd., Tema
62.	Legumeforce 70WP	PCL/19145/1437G October 2019	Imazethapyr (70%)	II	Herbicide for the control of broadleaf weeds and grasses in leguminous crops	Jubaili Agrotec Co. Ltd., Kumasi
63.	Intter 75WD G	PCL/20234/1517G January 2020	Glyphosate (75%)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in eucalyptus	Miro Forestry (Ghana) Ltd., Agogo
64.	Kingforce	PCL/19258/1490G December 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in cereals, vegetables and fruit trees	Agrohao Ghana Co. Ltd., Kumasi

65.	King Kong	PCL/19149/1486G December 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial weeds and grasses in cereals, vegetables and fruit trees	Bon Agro Co. Ltd., Kumasi
66.	Liberator 500 SC	PCL/20183/1513G January 2020	Flufenacet (400g/l) + Diflufenican (100g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds and sedges in cotton	Bayer West-Central Africa S.A, Accra
67.	Megazine 3030	PCL/19208/1427R August 2019	Atrazine (250g/l) + Cyanazine (250g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in weeds	Desert Lion International Ltd., Kumasi
68.	Mofarno 160EC	PCL/2008/1543G January 2020	Quizalofop-p-methyl (35g/l)	III	Herbicide for the control of annual grasses and broadleaf weeds in soybean	Dizengoff Ghana Ltd., Accra
69.	Multisate 41 SL	PCL/1927/1350G July 2019	Glyphosate (41%)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in arable crops	Multivet (Gh) Ltd., Accra
70.	M-Quat 20 SL	PCL/1927/1351R July 2019	Paraquat dichloride (200g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in arable crops and non-cropland	Multivet (Gh) Ltd., Accra
71.	NicoCrown 40 OD	PCL/19229/1499G January 2020	Nicosulfuron (40g/l)	III	Herbicide for the control of annual grasses and	Agro Crown West Africa
					broadleaf weeds in maize	Co. Ltd., Kumasi
72.	Nicoda 40 OD	PCL/19249/1413G August 2019	Nicosulfuron (40g/l)	III	Herbicide for the control of weeds in maize	Karida Agro Trading Company Ltd. Kumasi
73.	Nicoking Super 230 OD	PCL/1999/1329 G May 2019	Atrazine (200g/l) + Nicosulfuron (30g/l)	III	Herbicide for the control of broadleaf weeds and grasses in maize	Rainbow Agrosciences Co. Ltd., Tema
74.	Nicotop 4% OD	PCL/19213/1309G April 2019	Nicosulfuron (40g/l)	II	Herbicide for the control of annual grasses and broadleaf weeds in maize	Crop Doctor, Kumasi

75.	Nico Master	PCL/1935/1330 G May 2019	Nicosulfuron (4%)	III	Herbicide for the control of annual and perennial grasses in maize	K. Badu Agrochemicals , Kumasi
76.	Ohyew 55 EC	PCL/19213/1325 G May 2019	Clethodim (55g/l)	III	Herbicide for the control of broadleaf weeds and grasses in cassava	Crop Doctor, Kumasi
77.	Ogyama	PCL/19213/1324 G May 2019	Haloxyfop-R-Methyl (70g/l)	II	Herbicide for the control of annual and perennial grass weeds in casava	Crop Doctor, Kumasi
78.	Pantera 40EC	PCL/2006/1512G January 2020	Quizalofop-P-Tefuryl (40g/l)	III	Herbicide for the control of annual and perennial grasses in vegetables and beans	Calli Ghana Company Limited, Accra
79.	Parakin 276 SL	PCL/1999/1424R August 2019	Paraquat dichloride (276g/l)	II	Herbicide for the control of grasses and broadleaf weeds in tree crops, maize, cowpea, cotton and pineapple	Rainbow AgroSciences Co. Ltd., Tema
80.	Penox 8 OD	PCL/19213/1326 G May 2019	Penoxsulam (8g/l)	U	Herbicide for the control of broadleaf weeds, sedges and grasses in rice	Crop Doctor, Kumasi
81.	PropaCrown EC	PCL/19229/1500G January 2020	Propanil (300g/l) + 2, 4- D Amine Salt (200g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in rice	Agro Crown West Africa Co. Ltd., Kumasi
82.	Raptor	PCL/19206/1392G August 2019	Imazamox (40g/l)	U	Herbicide for the control of annual broadleaf weeds and	Josann Agro Consult Ltd., Accra
					grasses in groundnut and soybean	
83.	Rezim 80 WP	PCL/1999/1421R August 2019	Atrazine (800g/kg)	II	Herbicide for the control of annual broadleaf weeds and grasses in maize, sorghum, sugarcane and yam	Rainbow AgroSciences Co. Ltd., Tema
84.	Rezim Max 90 WG	PCL/1999/1484R November 2019	Atrazine (900g/kg)	II	Herbicide for the control of annual broadleaf weeds and grasses in maize, sorghum, sugarcane and yam	Rainbow AgroSciences Co. Ltd., Tema

85.	Rice-Adwuma	PCL/1957/1367G August 2019	Bispyribac-sodium (400g/l)	III	Herbicide for the control of annual, perennial grasses, broadleaf weeds and sedges in direct-seeded rice	Wynca Sunshine Agric. Pdts & Trading Co. Ltd., Accra
86.	Ricecare Super 60 OD	PCL/1999/1357G July 2019	Cyhalofop-butyl (60g/l) + Penoxsulam (10g/l)	IV	Herbicide for the control of annual broadleaf weeds in transplanting and direct seeding rice fields	Rainbow AgroSciences Company Ltd., Tema
87.	Ricestar 320 EC	PCL/1999/1356G July 2019	Pretilachlor (300g/l) + Pyribenzoxim (20g/l)	II	Herbicide for the control of annual weeds in paddy rice and transplanting rice fields	Rainbow AgroSciences Company Ltd., Tema
88.	Rice Mega 400SC	PCL/19249/1414G August 2019	Bispyribac-sodium (400g/l)	III	Herbicide of rthe control of grass weeds in rice	Karida Agro Trading Company Ltd. Kumasi
89.	Ridmax 75SG	PCL/1999/1355G July 2019	Glyphosate (750g/kg)	III	Herbicide for the control of annual, perennial broadleaf weeds and grasses in field crops	Rainbow AgroSciences Company Ltd., Tema
90.	Riz-Diz 100SC	PCL/2008/1542G January 2020	Bispyribac-sodium (100g/l)	III	Herbicide for the control of annual broadleaf weeds and grasses in rice	Dizengoff Ghana Ltd., Accra
91.	Russel 260 OD	PCL/1908/1432G August 2019	Terbuthylazine (200g/l) + Mesotrione (40g/l) + Nicosulfuron (20g/l)	III	Herbicide for the control of annual grasses and broadleaf weeds in arable crops	Dizengoff Ghana Ltd., Accra
92.	Sasa 48%	PCL/1943/1370G August 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in cereals and vegetables	Kumark Co. Ltd., Kumasi
93.	Sidal 2, 4-D	PCL/2066/1551G January 2020	2, 4-D Amine Salt (720g/l)	II	Herbicide for the control of broadleaf weeds in rice	Sidalco Gh. Ltd., Accra
94.	Sun-Aceto EC	PCL/1957/1447G October 2019	Acetochlor (900g/l)	III	Herbicide for the control of annual and perennial weeds in maize, soybean, cotton and peanut	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra.

95.	Super Nicogan 800 WDG	PCL/19100/1312G April 2019	Mesotrione (570g/kg) +Nicosulfuron (230g/kg)	III	Herbicide for the control of weeds in maize	Adama West Africa Ltd., Accra
96.	Supreme 48 SL	PCL/19121/1337G July 2019	Glyphosate (480g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in arable crops	Altimate Agrochemicals Ltd., Somanya
97.	Supremo	PCL/20149/1506G January 2020	Imazethapyr (240g/l)	II	Herbicide for the control of annual grasses and broadleaf weeds in soybean	Bon Agro Co. Ltd., Kumasi
98.	Sunsate 41SL	PCL/1825/1274G December 2018	Glyphosate (410g/l)	III	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize, soybean and tomatoes	Bentronic Productions Kumasi
99.	Supercrown	PCL/19229/1461G October 2019	Bispyribac-sodium (400g/l)	II	Herbicide for the control of grasses and broadleaf weeds in rice	Agro Crown Co. Ltd., Kumasi
100.	Traceforce	PCL/19145/1436G October 2019	Acetochlor (250g/l) + Prometryn (150g/l)	III	Herbicide for the control of annual weeds in groundnuts, maize and soyabean	Jubaili Agrotec Ltd. Kumasi
101.	Tradazine 80WP	PCL/19249/1417R August 2019	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial grasses and broadleaf weeds in maize	Karida Agro Trading Company Ltd. Kumasi
102.	Trazine 80 WP	PCL/1925/1363R July 2019	Atrazine (800g/kg)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in arable crops	Bentronic Productions, Kumasi
103.	Trazine 500 SC	PCL/1925/1362R July 2019	Atrazine (500g/l)	II	Herbicide for the control of annual, perennial broadleaf weeds and grasses in arable crops	Bentronic Productions, Kumasi
104.	Tropica EC	PCL/1999/1483G November 2019	Acetochlor (900g/l)	III	Herbicide for the control of grasses and broadleaf weeds in maize, cotton, groundnut and sugarcane	Rainbow AgroSciences Co. Ltd., Tema

105.	United Force 360 SL	PCL/19145/1279G February 2019	Glyphosate isopropylamine (240g/l) + 2,4-D Amine (120g/l)	III	Herbicide for the control of annual, perennial broadleaf weeds in maize, yam, sugarcane, oil palm and citrus plantations	Jubaili Agrotec Ltd., Kumasi
106.	Wadwumanie	PCL/19175/1394G August 2019	Glyphosate (410g/l)	III	Herbicide for the control of annual and perennial weeds in citrus, pear and paddy rice	Wamwus Agrochemical Ltd., Kumasi
107.	WeedBlock 62.5 ME	PCL/19100/1323 G May 2019	Imazethapyr (37.5g/l) + Propaquizafop (25g/l)	III	Herbicide for the control of grasses and broadleaf weeds in cowpea	Adama West Africa Ltd., Accra
108.	Weedcut 20 SL	PCL/20145/1603R March 2020	Paraquat dichloride (200g/l)	II	Herbicide for the control of grasses and broadleaf weeds in rice and vegetables	Jubaili Agrotec Ltd., Kumasi
109.	Xtra Force SC	PCL/19145/1342G July 2019	Atrazine (250g/l) + Metolachlor (250g/l)	II	Herbicide for control of annual, perennial broadleaf weeds and grasses in maize, yam, sugarcane, oil palm and citrus plantations	Jubaili Agrotec Ltd., Kumasi
110.	Xtrariz 100 SC	PCL/1910/1321 G May 2019	Bispyribac-sodium (100g/l)	III	Herbicide for the control of post-emergent weeds in rice	Reiss and Co. (Gh) Ltd., Accra

(B) Provisionally Cleared Pesticides

(PCL) (B4) Plant Growth Regulator

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Atonik SL	PCL/1906/1472 G November 2019	Sodium 0nitrophenolate (2g/l) + Sodium p-nitrophenolate (3g/l) + Sodium snitroguaiacolate (1g/l)	II I	Plant Growth Regulator to improve crop development in ric	Calli Ghana Co. Ltd., Accra
2.	Great Paclo	PCL/19190/1331G May, 2019	Paclobutrazol (50%)	II	Plant Gowth Regulator to Regulates growth of treetops in mango	Matrix Innovation Ltd

3.	Paclo Super	PCL/19249/1407G August 2019	Paclobutrazol (500g/kg)	II	Plant Gowth Regulator to Regulates growth of treetops in mango	Karida Agro Trading Co. Ltd., Kumasi
4.	Sun-Mequat SL	PCL/1957/1444G October 2019	Chlormequat (50%)	II I	Growth Regulator in anti-lodging of cotton	Wynca Sunshine Agric Prdt & Trad. Co. Ltd, Accra.

(B) Provisionally Cleared Pesticides (PCL)

(B5) Nematicide

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Sun-Foza	PCL/1957/1451G October 2019	Fosthiazate (5%)	II	Nematicide for the control of root-knot nematode in cucumber	Wynca Sunshine Agric. Products & Trading Co. Ltd., Accra
2.	Nemover 10GR	PCL/2099/1538G January 2020	Fosthiazate (93%)	II	Nematicide for the control of cyst nematodes and wireworms in okro, cowpea and banana	Rainbow AgroSciences Co. Ltd., Tema
3.	Vytal 3G	PCL/2006/1505G January 2020	Oxamyl (30g/kg)	II	Nematicide for the control of nematodes and soil insects in tomatoes	Calli Ghana Company Limited, Accra

(B) Provisionally Cleared Pesticides

(PCL) (B6) Repellants

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	AV 5055	PCL/19221/1365G May 2019	Anthraquinon	III	Avicide for repelling birds in rice fields	API Produce Enterprise Ghana, Accra
2.	Bird Away GL	PCL/1957/1448G October 2019	Methyl anthranilate (261g/l)	III	Bird repellent for the control	Wynca Sunshine Agro Products and Trading Company (Gh) Ltd., Accra
3.	D-Lion Snake Repellant	PCL/19208/1430G August 2019	Chlorpyrifos (480g/l) + Diazinon	III	Snake repellant for the control of snakes and public health	Desert Lion International Ltd., Kumasi

(B) Provisionally Cleared Pesticides (PCL)

(B7) Rodenticide

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1	Super Guard	PCL/1902/1396R August 2019	Bromodialone (2.5%)	Ib	Rodenticide for the control of mice	Agrimat Ltd., Madina
2	Baraki 0.005% RB	PCL/1902/1397R August 2019	Bromodialone (0.005%)	Ib	Rodenticide for the control of mice	Agrimat Ltd., Madina

(B) Provisionally Cleared Pesticides (PCL)

(B8) Biocides

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	Biopol FI 31	PCL/20261/1536 R January 2020	5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one	II	Biocide/In-can preservative for the control of bacteria, yeasts and fungi	Azar Chemicals Ltd., Accra
2.	Fungipol 237G	PCL/20261/1537 R January 2020	Carbendazim + Diuron + Octylisothiazolone	II	Biocide/film preservative for the control of fungi, yeasts and algae	Azar Chemicals Ltd., Accra
2.	Versalis e®-BIOC 2000	PCL/19240/1307 G April 2019	Glutaraldehyde (40-50%)	II	Biocide for the control of microbes	Versalis Zeal Limited, Takoradi

(B) Provisionally Cleared Pesticides (PCL)

(B9) Bactericide

No.	Trade Name	Registration No. / Date of Issue	Concentration of Active Ingredient	Hazard Class	Uses	Local Distributor
1.	BBS Master WP	PCL/20263/1554 G March 2020	Oxolinic Acid (Oxolinic acid copper 20% WP)	II I	Bactericide for the control of mango blackspot disease	Bomart Farms

(C) Banned Pesticides

No	Name of Pesticide
1.	2,4,5-T and its salts and esters
2.	Aldrin
3.	Binapacryl
4.	Captafol
5.	Chlordane
6.	Chlordimeform
7.	Chlorobenzilate
8.	Dichlorodiphenyltrichloroethane (DDT)
9.	Dieldrin
10.	Dinoseb and its salts and esters
11.	Dinitro-*ortho*-cresol (DNOC) and its salts (such as ammonium salt, potassium salt and sodium salt)
12.	Endrin
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/l)
23.	Parathion (all formulations – aerosols, dustable powder (DP), emulsifiable concentrate (EC), granules (GR) and wettable powders (WP) – of this substance are included, except capsule suspensions (CS))
24.	Phosphamidon (Soluble liquid formulations of the substance that exceed 1000 g active ingredient/l)
25.	Dustable powder formulations containing a combination of Benomyl at or above 7%, Carbofuran at or above 10% and Thiram at or above 15%
26.	Methyl Bromide
27.	Chlordecone

28.	Alpha hexachlorocyclohexane
29.	Beta hexachlorocyclohexane
30.	Lindane
31.	Pentachlorobenzene
32.	Technical Endosulfan and its related isomers

Summary of Register of Pesticides as at January 2020

Category	FRE	PCL	Banned	Total
Insecticides	139	75	32	246
a. Public health	26	8	0	34
b. Stored produce	8	2	0	10
Fungicides	62	30	0	92
Herbicides	162	110	0	272
Plant Growth Regulators	8	3	0	11
Molluscicide	0	0	0	0
Rodenticides	0	2	0	2
Nematicides	3	3	0	6
Adjuvants	2	0	0	2
Biocides	5	3	0	8
Bactericide	0	1	0	1
Repellents	0	3	0	3
Total	415	240	32	687

Legend to Register of Pesticides

FRE - Full Registration (valid for 3 years)	The Agency may approve and register a pesticide subject to such other conditions as it may determine and may only register a pesticide if it is satisfied that the pesticide is safe and effective for the use for which it is intended and that the pesticide has been tested for efficacy and safety under local conditions (Section 31, Part II of Act 490)
PCL - Provisional Clearance Permit (Valid for a maximum of 1 year)	Where in respect of an application for registration of a pesticide, the Agency is satisfied that most information required for its registration has been provided to the Agency, and the pesticide does not present a toxicological risk to people, animals, crops or the environment, it may clear the pesticide for use without the registration, and this clearance shall be known as provisional clearance and shall be temporary pending the registration by the Agency of the pesticide (Section 32, Part II of Act 490)
Experimental permit	The Agency may authorize the importation of unregistered pesticide if the pesticide is imported for experimental or research purposes and not for distribution Section 28, (2), (a), (i)
General use pesticides (G)	Pesticides when applied for the use for which it is registered will not have unreasonable adverse effects on people, animals, crops or on the environment (Section 30 (1), (a) of Part II of Act 490)
Restricted use pesticides (R)	Pesticide when used in accordance with widespread commonly recognized practice in the absence of additional regulatory restrictions may cause unreasonable adverse effect on people, animals, crops or on the environment (section 30 (1), (b) of Part II of Act 490). Such pesticides are restricted for use on only selected crops by competent pesticide applicators and should be sold by dealers licensed to handle restricted pesticides

Suspended or Banned Pesticides	Pesticide when used in accordance with widespread commonly recognized practice even in the presence of additional regulatory restrictions will cause unreasonable adverse effect on people, animals, crops or on the environment. Such pesticides are prohibited for use in the country (Section 30, (1), (c).

Annex 2: Stakeholder Engagement

The table below has the summary of details regarding engagements on Pest Management held with various identified stakeholders at Wenchi in the Wenchi Municipal of the Bono Region as well as Regional and District Cocoa Health and Extension Divisions of COCOBOD at Koforidua and Asamankese respectively, in the Eastern Region.

Contact Person(s)	Location/District	Role	Contact No.	Issues/Concerns Raised and Information Received
1. Wenchi Municipal Agriculture Department				
John Osei Gyimah	Wenchi - Wenchi Municipal	Municipal Agriculture Officer In-Charge of Crops	0243441353	**Pest and Diseases management** • The department of agriculture provides general extension services on crops to farmers with issues of pest and insects management very paramount
2. Ghana Health Service – CHPS Compound				
Halidu Ngmen-yelle Asantewaa Elizabeth	Amponsakrom - Wenchi Municipal Amponsakrom - Wenchi Municipal	In-Charge Midwife	0249847817 0549322893	**Occupational Health and Safety** • Two staffs handle reported cases since its inception in 2019. • Skin infections, malaria and urinary tract infections are the major reported cases at the facility • Other reported cases are snake bites and wounds sustained on the farm from machetes • Provides antenatal services but lacks delivery equipment to provide delivery services • Reported cases of chemical poisoning from used agrochemicals containers happens sparingly with children been the victims • Cases of chemical poisoning and other health concerns are mostly reported during the active farming season when it is raining • Reported cases of chemical poisoning are treated with activated charcoal and hydrocortisone • Generally, abuse of agrochemicals resulting in health concern is not a problem • Averagely, 15 persons visit the facility in a day, this number shoots up to about 30 during the raining seasons • Facility currently has one bed, detains patients only for some few hours and do not admit patients • Do not have adequate personnel, space and equipment to operate optimally and effectively
3. Wurompo Cashew Framers and Marketing Association				
Stephen Opoku Angelina Asantewaa	Wurompo –Wenchi Municipal Wurompo –Wenchi Municipal	Farmer Farmer	0546460173 0246012398	**Pest and Diseases management** • Farmers use fertilizers for farming • Farmers do not spray cashew fruits • One of the challenges encountered is the stem borer insects that bore holes in the stem of the cashew which eventually cause the plant to fall • High farm sanitation and hygiene is able to minimize insects and pest infestation • Red ants can be used to control the insects that attacks the cashew crop

Contact Person(s)	Location/District	Role	Contact No.	Issues/Concerns Raised and Information Received
Akosus Adei	Wurompo –Wenchi Municipal	Farmer	0541497878	• Farmer use weedicides to control weeds when cashew is below 2 years **Occupational Health and Safety** • No issue of contamination and poisoning from agrochemicals has been recorded in the community • The farmers burn used agrochemical containers and also bury them • Farmers use nose mask and hand gloves when using chemicals • Farmers are trained on how to use chemicals by agrochemical dealers (Donewell Agro Ventures) and agriculture extension officers
Robert Nsiah	Wurompo –Wenchi Municipal	Farmer	0551973626	
Francis Okrah	Wurompo –Wenchi Municipal	Farmer	0549383074	
Vida Gyebune	Wurompo –Wenchi Municipal	Farmer	0248961511	
John Okrah Saase	Wurompo –Wenchi Municipal	Farmer	0549398640	
David Boachie	Wurompo –Wenchi Municipal	Farmer	0550839478	
Isaac Manu	Wurompo –Wenchi Municipal	Farmer	0547147082	
Comfort Nduro	Wurompo –Wenchi Municipal	Farmer	0541297798	
Kwao Joseph	Wurompo –Wenchi Municipal	Farmer	0546359815	
Alexander Boakye	Wurompo –Wenchi Municipal	Farmer	-	
Mahama Kremoh	Wurompo –Wenchi Municipal	Farmer	-	
Abraham Anane	Wurompo –Wenchi Municipal	Farmer	-	
4. Donewell Agro Ventures – Agro Input Dealer				

Contact Person(s)	Location/District	Role	Contact No.	Issues/Concerns Raised and Information Received
Samuel Kwame Fosu	Wenchi – Wenchi Municipal	Director	0244047267 0265897818	**Pest and Diseases Management** • Sells agrochemicals supplied by Yara and Chemico to farmers in Wenchi and its environs • Educates farmers on how to use PPEs and chemicals when they purchase agro inputs but not all of them adhere or use the information provided • Collaborates with EPA to dispose-off used agrochemical containers collected from farmers • Representatives of the company provides training to farmers on the usage of agrochemicals • Selling of fake agrochemicals is a concern, as most farmers cannot differentiate genuine products from the fake ones
5. Wenchi Agriculture Station				
Sylvester de Clerg Mensah Wisdom Dabuo	Wenchi – Wenchi Municipal Wenchi – Wenchi Municipal	Station Manager Nursery Manager	0242540354 0553393417	**Pest and Diseases management** • Insects and pest such as Stem Borer and Tea Mosquito Bug feeds on growing stem, tissues, fruits and flower buds • Fungi disease is also problem for cashew crops • Farm sanitation helps to manage pest and insects infestation drastically • Biologically, red ants can be used to control the insects on the cashew farms • New varieties that are been used are resistant to infestation, resulting in minimal use of chemicals • Farmers are generally encouraged not to spray cashew fruits • Herbicides are used to control weeds on the farm during the early stages of the farm, weeding with cutlass is done subsequently • Farmers do not spray the farms when the cashew is 2 years and over • There are education on the transport, storage and disposal of used agrochemical containers by NGOs and MoFA **Occupational Health and Safety** • PPEs are worn before the use of chemicals • Cost of safety materials affect and discourage usage by farmers • There has not been cases of chemical poisoning and contamination from used agrochemical containers • Farmers generally do not have adequate knowledge on health and safety issues • Used agrochemical containers are given out to input dealers (Donewell Agro ventures), the bottles are perforated to prevent usage
6. Henry 86 Enterprise – Input dealer				

Contact Person(s)	Location/District	Role	Contact No.	Issues/Concerns Raised and Information Received
Henry Osabutey	Wenchi – Wenchi Municipal	Director	0502209292	**Pest and Diseases management** • Company uses fungicides (ridomil) and insecticides (Golan) to control insects that attack the seedlings in the nursery • Company buys the chemicals from Donewell Agro Ventures in Wenchi **Occupational Health and Safety** • Workers of the company use PPEs when handling and using chemicals • Company has not recorded any issues of chemical poisoning and contamination among workers
7. Cocoa Health and Extension Division(COCOBOD) Eastern Regional Office – Koforidua				
Abdul-Majid Mumupi	Cocoa Health and Extension Division, Ghana Cocoa Board, Eastern Regional office.	Regional Manager	0244885598	**Pest and Diseases management** • The major pests that affects cocoa plants and beans are Capsid, Sting Bug and Cocoa Mosquitoes. Others are Caterpillar, stem borers, Termites and Coreid Bug. • Diseases that mainly attacks cocoa plants and beans are black pod, swollen shoot, stem canker, and pink diseases. Others are blast thread disease, anthrax nose and damping-off (nursery disease) • Chemicals for controlling pest in cocoa farms are Akati Commandore, Buffalo Supper, Acatara, AF Confidence and seizure. • Chemicals that are used to manage diseases that affects cocoa are Agro Comet, Ridomil fungi kill and Nordox fungicides. • Farm sanitation helps to manage pest and diseases infestation to the minimum. • Farmers also use cultural and natural means such as regular weeding and pruning to fight pest and disease infestation on farms. • Some farmers use fertilizers once a year and continuously for three years, have a leave period of a year and start all over again. • Fertilizers that are used for cocoa cultivation are Jay Kay, Cocoa Feed Plus, Ammonium Sulphate, Cocoa Ahoden, Cocoa Agyenkwa, Cocoasett and agro pie (organic fertilizer) • Pest and disease infestation on cocoa farms result in about 30% yield reduction, affects livelihood of farmers due to low income and increase in cost of production. • Inputs are supplied by COCOBOD **Occupational Health and Safety** • Farmers are exposed to a number of hazards like inhalation of hazardous chemicals, falling objects, cut and injuries, slip, trips and falls. Farmers are also exposed to skin and eye irritation due to contact with hazardous chemicals and risk of been bitten by reptiles.
Samuel Owusu-Ansah	Cocoa Health and Extension Division, Ghana Cocoa Board, Eastern Regional office.	Operations Officer 1	0244563044	
Prince Kyei Ofori-Attah	Cocoa Health and Extension Division, Ghana Cocoa Board, Eastern Regional office.	Operations Officer 2	0243377619	

Contact Person(s)	Location/District	Role	Contact No.	Issues/Concerns Raised and Information Received
				• Training provided to famers by some suppliers and COCOBOD on chemical applications, proper storage of chemical, ways of disposing chemical containers, maintenance of machinery and PPE usage. • Used chemical containers are mostly buried in trenches, issued to suppliers or incinerated. • The use of chemicals presents risk of pollution to water bodies and underground soil. • Some fertilizers also destroy useful microbes in the soil. • Farmers who come into contact with chemical experience skin rashes and vomiting. • COCOBOD organizes regular health screenings to farmers. • Majority of famers use PPE while working with hazardous substances. • There has not been any recorded issues of chemical poisoning and contamination among farmers and workers.
8. Cocoa Health and Extension Division – Asamankese, Eastern Region				
Abubakar Sadik Ibrahim	Cocoa Health and Extension Division, COCOBOD, Asamankese District office.	District Cocoa Officer	0242508445	**Pest and Diseases management** • The pests that attack cocoa plants and beans are Cocoa Shield Bug, Sting Bug and Cocoa Mosquitoes • The main diseases that attack cocoa plants and beans is swollen shoot. Others include; Cocoa Stem Canker, black pod and pink disease. • Chemicals for controlling pest in cocoa farms are Actara, Okum Akate, Akate captain, Akate Master, and E Master. • The predominant fungicide for managing cocoa diseases are Ridomil Gold, Kocide, Nordox, Royal Corp and Agro Comet. • Farm sanitation helps to manage pest and diseases infestation to the minimum. • Farmers also use Good Agronomic Practices (GAP) methods such as regular weeding and pruning to fight pest and disease infestation on farms. Regular hand weeding is carried out 3-4 times in a year for young cocoa trees. **Occupational Health and Safety** • Regular training provided to famers by the district on chemical usage, storage, proper disposal of chemical containers and appropriate use of PPE. • Used chemical containers are mostly buried in dug trenches. Farmers also gather used chemical containers after thorough rinsing. • Farmers are advised not to use chemicals for to control weeds • Farmers use appropriate PPEs when handling agrochemicals.
David Okyere Awuku	Cocoa Health and Extension Division, COCOBOD, Asamankese District office.	District Extension Coordinator	0242480469	
Shine E. Kubuafor	Cocoa Health and Extension Division, COCOBOD, Asamankese District office.	Community Extension Agent, Coordinator of Gender, Child Labour and Environmental Issues	0246505344	
9. Cocoa Farmers Association – Asamankese, Eastern Region Asamankese Cocoa District, Lower West Akim Municipal				

Contact Person(s)	Location/District	Role	Contact No.	Issues/Concerns Raised and Information Received
Calvary Cocoa Partnership (Kwaku Sae, Asafoatse)/ Brekumanso cooperative/ Amanfrom cooperative				
Ebenezer Atiemo Akumaa Agyate John Yaw Mnatey Amankwa Enoch Paulina Tetteh Alice Amponsah Otopah Johnson Faustina Kwapong Owusu Ansah Samuel Ntow Apentneg Larbi Emmanuel	Brekumanso Brekumanso Amanfrom-Hills Amanfrom-Hills Asafoatse Asafoatse Amanfrom-Hills Kwaku Sae Asafoatse Kwaku Sae Kwaku Sae	Farmer Farmer Farmer Framer Farmer Farmer Farmer Farmer Farmer Farmer Farmer	0559627295 0207673050 0553380978 0547057214 0208348508 0543382750 0544267860 0201385913 0543224126 0207358897 0543262250	**Pest and Diseases management** • The main pests that attack cocoa plants are Akate, Cocoa mosquito, Sting Bug and Stem Borers • The main cocoa diseases are cocoa swollen shoot virus and blackpod diseases. • The pest extract water from cocoa pods resulting in poor development of beans. This affects yield and income. • The main chemicals for controlling pest in cocoa farms are Akate Wura, Akate master and AF Confidence. • The chemicals are purchased at the agrochemical shop on the premises of the District Cocoa Office • Farmers use fertilizers for farming. The main fertilizer used is Cocoa Agyenkwa. • Regular hand weeding is carried out 3-4 times in a year for young cocoa trees. • Farmers are educated by COCOBOD on regular basis (monthly). • COCOBOD supplies chemical to farmers and organize mass spraying twice yearly on farms. Mass spray team comprise of 6 members and a supervisor. **Occupational Health and Safety Concerns** • Farmers are exposed to inhalation hazardous chemicals resulting in headaches and dizziness. • Irritation of skin caused by contact with chemicals. • Farmers are informed to wash hands regularly with soapy water. • Chemical containers are washed thoroughly and sold to scrap dealers for recycling. • There are about 10 CHPs compound and a district hospital to serve the health need of farmers in district. • COCOBOD provides regular(monthly) training to farmers on chemical usage, storage, proper disposal of chemical containers, appropriate use of PPE, child labour and environmental issues. Last training was held on 27th February, 2023. • Farmers are cautioned not to use chemicals for weeding. Weedicides affects soil structure and hardens the soil preventing absorption of rain water. • The use of chemicals in farms also kills useful microbes in the soil. • Inorganic fertilizers are applied every 2 years. • Excessive use of fertilizer causes soil pollution with the tendency of reducing life span of harvested food crops inter-planted with cocoa. • About 90% of farmers use appropriate PPE when handling agrochemicals.

Annex 1: Stakeholders Attendance Sheet

Title of Project: GTCDP

Date: 22/02/23 Time: 11:25am Venue: Amponsahkrom – Kenchi Municipa

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1	Agmen-yelle Halidu	GHS / Amponsahkrom	In-charge	0249847817	
2.	Asantewaa Elizabeth	GHS / Amponsahkrom	Midwife	0549322893	

Title of Project: GTCDP

Date: 22/02/23 Time: 9:25am Venue: Ekumfi Municipal Assembly

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1.	John Osei Gyimah	Dept of Agric	Municipal officer in-charge of crops	0243441353	oseigyimah.john@gm.com
2.	Abdulai Jimba Ibrahim	Dept of Social welfare & Community Dev't	Head of Dep't	0200860600	jymba@yahoo.com

Title of Project: GTCDP

Date: 22/02/23 Time: 7:20 am Venue: Kurempo

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1	Stephen Opoku	Wenchi Municipal	Farmer	0546480173	
2	Angelina Asafenaa	Wenchi Municipal	Farmer	0246012398	
3	Akosua Adei	Wenchi Municipal	Farmer	-	
4	Robert Nfiah	Wenchi Municipal	Farmer	0541497878	
5	Francis Okrah	Wenchi Municipal	Farmer	0551973626	
6	Vida Gyebun	Wenchi Municipal	Farmer		
7	John Obrah Saase	Wenchi Municipal	Farmer	0549383074	
8	David Boakhie	Wenchi Municipal	Farmer	0248961511	
9	Isaac Mamu	Wenchi Municipal	Farmer	0549398640	
10	Comfort Nduro	Wenchi Municipal	Farmer	0550829478	
11	Kwaa Joseph	Wenchi Municipal	Farmer	0547147082	
12	Alexander Boakye	Wenchi Municipal	Farmer	0541297798	
13	Mahama Kramo	Wenchi Municipal	Farmer		
14	Abraham Ahame	Wenchi Municipal	Farmer	0546359815	

Title of Project: GTCDP

Date: 21/02/23 Time: 4:55pm Venue: Klenelw

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1	Samuel Kwame Fosu	Agro input dealer	Donewell Agro Director	0244-047-267 026-5897818	donewellagro@yahoo.co

SAL CONSULT LIMITED STAKEHOLDER MEETING ATTENDANCE SHEET

Title of Project: GTCDP

Date: 21/02/23 Time: 2:30pm Venue: Wenchi Agric Station

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1	Sylvester de Clerq Mensah	Wenchi Agric Station	Station Manager	0242540357	declercq2015@gmail.com
2	Wisdom N. Dabuo	Wenchi Agric Station	Nursery Manager	0553378417	wisdomdabuo2022@gmail.com

Scanned with CamScanner

SAL CONSULT LIMITED STAKEHOLDER MEETING ATTENDANCE SHEET

Title of Project: GTCDP

Date: 31/03/22 Time: 3:40pm Venue: Kenchi

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1	Henry Osabutey	Henry Sb ent.	Director	0502209292	henrybutey@gmail.com

Scanned with CamScanner

Title of Project: GHANA TREE CROPS DIVERSIFICATION PROJECT

Date: 02/08/2023 Time: 9:30AM Venue: REGIONAL MANAGER'S OFFICE.

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1	ABDUL-MAJID Mumuni	CHED (COCOBOD)	R.M	0244885598	abdulmajidmumuni@yahoo
2	Prince Kyei Opoku	CHED (COCOBOD)	PTO (OPS2)	0243377619	Kyeiatta@yahoo.com
3.	SAMUEL OKUSU ANSAH	CHED (COCOBOD)	PTO (OPS1)	0245763044	soansah97@gmail.com

Date: 02/03/2023 Time: 12:40 Venue: DISTRICT MANAGERS OFFICE

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1.	Abubakar Sidik Ibrahim	CHED - Asamankese	D.C.O	0242508445	
2.	DAVID OKYERE AKUOKU	CHED - Asamankese	DEC	0242480469	
3.	Shine E. Kubuafor	CHED - Asamankese	CEA, Gender.	0246505344	

No.	Name	Organization/District/Community	Position	Phone No.	Email / Sign
1.	Ebenezer Atiemo	Brekumaso Cor-	Farmer	055'962729[illegible]	
2.	Akumaa Agyate	✓ —	Farmer	0207673050	
3.	John Yaw Manley	Amanfrom Hills	✓	0553350978	
4.	Amankaa Enock	✓ ✓	✓	0547057214	
5.	Paulina Tetteh	Asafoatse	✓	0208348508	
6.	Alice Amponsah	✓	✓	0543352750	A. A.
7.	Obopah Johnson	Amanfrom Hills	✓	0544267860	
8.	Faustina Kwapong	Kweku Sae Cor.	✓	0[illegible]13[illegible]913	F. K.
9.	Owusu Anochi Samuel	Asafoatse	✓	0543204126	
10.	Mbow Apenteng	Kweku Sae	✓	0207358877	
11.	Larbi Emmanuel	Kweku Sae	✓	0543262250	

Annex 2: Photos of Engagement with Stakeholders

	
Engagement with Wenchi Municipal Agriculture Manager and other officials	**Engagement with Wenchi Agriculture Station Officer In-Charge of Crops**
	
Engagement with Wurompo Cashew Farmers and Community Development and Social Welfare	**Engagement with Wenchi Municipal Head of Marketing Association**

	
Engagement with officials of Ghana Health Service at Amponsakrom CHPS Compound	**Engagement with Agro input dealer at Wenchi**
	
Women undertaking potting in preparation for cashew seedlings at Wenchi Agriculture Station	**Engagement at Cocoa Health and Extension Division (COCOBOD) Eastern Regional Office**

	
Engagement at Cocoa Health and Extension Division (COCOBOD) District Office – Asamankese, Eastern Region	**Engagement with farmer based organisations – Asamankese, Eastern Region.**