



## **CARICOM REGIONAL CODE OF PRACTICE**

**Cocoa – Good Agricultural Practices**

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**CRCP 12: 202X**

*Public Comments - Deadline August 31, 2026*



**CARICOM Regional Organisation for Standards and Quality (CROSQ)**

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## Foreword

This CARICOM Regional Standard CRCP 12: 202X, Cocoa – Good Agricultural Practices, has been developed under the authority of the CARICOM Regional Organisation for Standards and Quality (CROSQ). It was approved as a CARICOM Regional Standard by the CARICOM Council for Trade and Economic Development (COTED) at its XX Meeting in XX.

This draft CARICOM Regional Code of Practice provides a harmonised framework to ensure consistency and reliability in the quality of cocoa production across member states. Its principal foundation is drawn from internationally recognised Good Agricultural Practices for cocoa, with essential elements adapted from the Association of South-East Asian Nations (ASEAN) Good Agricultural Practices for the production of quality cacao beans in the ASEAN Region (2018) and the Malaysian Standard MS 1784: Part 4:2005 – Good Agricultural Practice for Cocoa (*Theobroma cacao* L) developed by the Department of Standards Malaysia. These elements have been tailored to the Caribbean's climatic and production realities to ensure relevance, sustainability, and competitiveness in both regional and global cocoa markets, explicitly recognising that CARICOM cocoa encompasses heirloom cacao, premium fine flavour, origin-specific, and heritage cocoa types. Consequently, these Good Agricultural Practices are designed not only to guarantee rigid food safety and traceability but also to actively preserve the distinct flavour identity and genetic heritage of the region's cocoa.

CARICOM cocoa production includes fine flavour, origin-specific and heritage cocoa types that contribute to the region's reputation in premium cocoa markets. Accordingly, this Code of Practice supports good agricultural practices that safeguard food safety, traceability and environmental sustainability, while also preserving the flavour identity, varietal characteristics and origin attributes associated with Caribbean cocoa.

The development of this draft CARICOM Regional Code of Practice was carried out through a collaborative partnership between the United Nations Industrial Development Organization (UNIDO) and the CARICOM Regional Organisation for Standards and Quality (CROSQ). This partnership included a structured research process to identify and adapt an appropriate standard to enhance the CARICOM cocoa value chain. This code of practice is intended to provide guidance to industry practitioners across CARICOM member states, by facilitating trade both within the CARICOM region and international markets.

This draft CARICOM Regional Code of Practice provides a harmonised framework to ensure consistency and reliability in the quality of cocoa production across member states. Its principal foundation is drawn from internationally recognised Good Agricultural Practices for cocoa, with essential elements adapted from the Association of South-East Asian Nations (ASEAN) Good Agricultural Practices for the production of quality cacao beans in the ASEAN Region (2018) and the Malaysian Standard MS 1784: Part 4:2005 – Good Agricultural Practice for Cocoa (*Theobroma cacao* L) developed by the Department of Standards Malaysia. These elements have been tailored to the Caribbean's climatic and production realities to ensure relevance, sustainability, and competitiveness in both regional and global cocoa markets.

The essential elements of this CARICOM Regional Code of Practice encompass:

- a) Food safety: Emphasising safe use of agrochemicals, proper handling, and traceability.
- b) Environmental management: Promoting soil conservation, biodiversity protection, and climate-smart practices.
- c) Worker health and welfare: Safeguarding labour rights, occupational safety, and fair treatment.
- d) Product quality: Ensuring uniform standards for fermentation, drying, and storage to meet international market requirements.
- e) Documentation and traceability: Establishing transparent records to support certification and market access.

This draft CARICOM Regional Standard is enhanced together with the following CARICOM Regional Standards to provide a holistic approach to cocoa production and processing within CARICOM:

- a) CRS 34:2018, Cocoa and chocolate products – Specification

- a) DCRS 82: 202X Cocoa bean quality – Sampling requirements
- b) DCRS 83:202X Cocoa bean quality – Specification

The tropical climate of CARICOM member states is highly conducive to cocoa production, but CARICOM cocoa producers face declining yields, climate change disruptions, pest and disease outbreaks, aging farmer populations, and weak sector management, all of which threaten competitiveness in premium markets.

This draft CARICOM Regional Code of Practice provides a practical framework for supporting farmer livelihoods, safeguarding the environment, promoting regional integration and enhancing market access through alignment with international good agricultural practices certification schemes. Its adoption and implementation should enable CARICOM member states to be better positioned to compete effectively in global markets while maintaining and advancing the reputation of Caribbean cocoa as a premium product.

In formulating this standard assistance was also derived from the following publications which were still current when this standard was being developed:

- Federation of Cocoa Commerce — *Agricultural Practices - in Cocoa Production*
- International Organization for Standardization — ISO 2451:2014 *Cocoa beans – Specification and quality requirements* International Organization for Standardization — ISO 34101-3:2019 *Sustainable and traceable cocoa — Part 3: Requirements for traceability*
- International Organization for Standardization — ISO 34101-4:2019 *Sustainable and traceable cocoa — Part 4: Requirements for certification schemes*
- Fairtrade International — *Fairtrade Standard for Cocoa*
- Fairtrade International — *Standard for small-scale producers*
- International Organization for Standardization — ISO 22000:2018:2018 – *Food safety management systems — Requirements for any organization in the food chain*
- FAO/WHO Codex Alimentarius, Codex Committee on Food Inspection and Certification Systems — *Draft guidelines for the prevention and control of food fraud*
- British Standards Institution — BS EN 17972:2024 – *Food authenticity. Food authenticity and fraud. Concepts, terms and definitions*

## 1 Scope

This draft CARICOM Regional Code of Practice for cocoa provides essential guidelines and technical advice to support farming practices that are environmentally sustainable, socially responsible, and economically viable. It establishes a framework for the production of safe, traceable, and high-quality cocoa beans in CARICOM Member States, ensuring their suitability for human consumption, conversion into value-added cocoa products, and compliance with both regional and international market requirements.

This draft CARICOM Regional Code of Practice focuses primarily on guidelines relating to site history and management of farms, selection of planting materials, soil and substrate management, application of agrochemicals, fertilisers and soil additives, water quality and management, harvesting and post-harvesting handling practices, waste management, biodiversity protection, documentation of farming operations, traceability, and food fraud prevention and food authenticity of cocoa beans.

## 2 Normative references

The following referenced documents are indispensable for the application of this standard. Some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

### **CARICOM Regional Organisation for Standards and Quality (CROSQ)**

- DCRS 82: 202X Cocoa bean quality – Sampling requirements
- DCRS 83:202X Cocoa bean quality – Specification

## 3 Terms and definitions

For the purposes of this standard, the following definitions apply:

### 3.1

#### **agrochemical**

chemical substance used in agriculture to enhance crop production or protect crops, including fertilisers, pesticides, herbicides, and fungicides

### 3.2

#### **agroforestry**

land use management system in which trees or shrubs are grown around or among crops or pastureland

### 3.3

#### **biological contamination**

presence of harmful biological agents or organisms in cocoa bean or cocoa derivatives that may compromise food safety, products quality or sustainability for use

Note 1 to entry: Biological agents or organisms may include pathogenic microorganisms, moulds, yeasts, parasites, pests or other harmful organisms

### 3.4

#### **chemical contamination**

presence of harmful chemical substances, whether naturally occurring or introduced, in cocoa beans or cocoa derivatives during production, harvesting, post-harvest handling, storage, transport or processing

### 3.5

#### **chemical consignment treatment**

application of an approved chemical agent to a cocoa consignment (e.g., during storage or transport) in compliance with national and international safety regulations to prevent contamination, pest infestation, or deterioration of cocoa beans

### 3.6

#### **cocoa bean quality**

cocoa bean conformance to specified requirements of moisture content, physical attributes (external and internal) and aroma as indicated in this standard

### 3.7

#### **cocoa budwood**

disease free stem cutting taken from a mature superior cocoa tree

Note 1 to entry: Cocoa budwood contains healthy normal buds which are primarily grafted onto a rootstock to produce clones of the mother plant.

### 3.8

#### **cocoa budwood garden**

dedicated piece of land used to cultivate high quality, disease resistant and disease free, high yielding cocoa plants used to harvest budwood for propagation

### 3.9

#### **cocoa producer**

individual or company involved in commercial cocoa production

Note 1 to entry: Examples include the plantation owner, small holders, farmer groups, cooperatives, estate owners, processors, and community fermentation centres.

### 3.10

#### **competent authority**

governmental or regulatory body designated by law to exercise authority and perform specified functions within a particular area of responsibility

Note 1 to entry: Ministers, Ministries, State Entities, or subdivisions of a Ministry or State Entity administering any legal requirement pertaining to produce safety and quality

### 3.11

#### **composting**

natural process of recycling organic material such as leaves and vegetable scraps into a rich soil amendment

### 3.12

#### **cultural control**

practice of modifying the growing environment to reduce the prevalence of unwanted pests.

### 3.13

#### **deforested natural forest land**

land converted from natural forest after the cut-off date specified by national legislation, competent authority requirements, or relevant international market requirements

### 3.14

#### **environmental management**

use and conservation of natural resources, protection of habitats and control of hazards

### 3.15

#### **fine flavour cocoa**

characterised by a complex sensory profile, composed of well-balanced core attributes with complementary, aromatic and flavour notes which are clearly perceived and identified

### 3.16

#### **food safety**

refers to handling, preparing and storing food in a way to best reduce the risk of individuals becoming sick from foodborne illnesses

### 3.17

#### **heavy metal**

naturally occurring or anthropogenic metallic and metalloid elements that can accumulate in cocoa production systems through soil, water, atmospheric deposition, agricultural inputs, processing, storage, or transportation

Note 1 to entry: Certain heavy metals may be absorbed by cocoa trees and transferred to cocoa beans, where excessive concentrations can present food safety concerns and may be subject to national or international regulatory limits.

Note 2 to entry: Heavy metals in cocoa production include cadmium and lead.

### **3.18**

#### **heirloom cacao**

varieties “handed down” from generation to generation

Note 1 to entry: Heirloom cacao refers to rare, old-growth cultivated varieties (cultivars) of the cocoa tree (*Theobroma cacao*) that are actively preserved and celebrated for their exceptional, complex flavour profiles rather than their bulk yield

### **3.19**

#### **Integrated Pest Management (IPM)**

system of preventative and control measures used to prevent, minimise or eliminate pests where necessary, with a combination of methods while limiting the use of pesticides and with a resultant minimum impact on human health, the environment and non-target organisms

### **3.20**

#### **intercropping**

practice involving growing two or more crops in proximity

### **3.21**

#### **organic waste**

any biodegradable material of plant or animal origin.

Note 1 to entry: This includes, but is not limited to, agricultural residues (such as pruning materials and cocoa shells), food scraps, and animal manure.

Note 2 to entry: It can also include animal and plant based material and degradable carbon such as paper, cardboard and timber.

### **3.22**

#### **pest**

organism that is capable of causing injury and loss to cocoa.

Note 1 to entry: A pest could be an insect, other invertebrate, fungus, bacterium, virus, weed or vertebrate.

### **3.23**

#### **pest resistance**

heritable change in the sensitivity of a pest population that is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label recommendation for that pest species'

### **3.24**

#### **pest resurgence**

rapid reappearance of a pest population in injurious numbers, usually brought about after the application of a broad-spectrum pesticide has killed the natural enemies which normally keep a pest in check

### **3.25**

#### **physical contamination**

presence of foreign physical matter in cocoa beans or cocoa derivatives that may compromise food safety, product quality or suitability for use

Note 1 to entry: physical matter includes stones, glass, metal, plastic, wood, soil, hair, fibres or insect fragments.

### **3.26**

#### **post-harvest**

critical initial processing stages immediately following the harvesting of cocoa pods: pod-breaking, fermentation, and drying

Note 1 to entry: Post-harvesting includes pod breaking, bean extraction, fermentation, drying, sorting, grading, storage, packaging and transport of cocoa beans. Its primary goal is to convert perishable, bitter wet seeds into stable, flavourful cocoa beans ready for commercialisation.

### **3.27**

#### **protected species**

species of animal or plant which is forbidden by law to harm or destroy

### **3.28**

#### **pruning**

deliberate removal of selected vegetative parts of a cocoa tree to improve tree health, canopy management, productivity, accessibility, and the efficiency of pest and disease management

### **3.29**

#### **sanitation**

practice of maintaining clean conditions through the removal of waste, debris, contaminated materials, and potential sources of pests and disease

### **3.30**

#### **shade trees**

trees intentionally established or retained within cocoa farms to provide shade and environmental protection for cocoa trees

Note 1 to entry: which may also supply additional products and services, including timber, fruits, biodiversity conservation, soil improvement, carbon sequestration, and other ecosystem benefits.

### **3.31**

#### **soil additive**

any material, organic or inorganic, that should be applied to soil to improve its physical, chemical, or biological properties.

Note 1 to entry: Examples include white lime for pH adjustment, compost for organic matter enrichment, and carbon-rich soil amendments.

### **3.32**

#### **soil fertility**

ability of a soil to sustain agricultural plant growth

Note 1 to entry: Soil fertility provides a suitable plant habitat and supports sustainable and consistent yields of high-quality cocoa.

### **3.33**

#### **substrate**

medium or material that should be used to support plant growth, particularly in nurseries or controlled environments.

Note 1 to entry: Examples include soil, compost, sand, or other mixtures designed to provide nutrients, aeration, and water retention.

### 3.34

#### **terroir**

unique interaction of a cocoa tree's genetic composition with the environmental conditions of a defined geographical area, including climate, soils, topography, biodiversity and local ecosystem characteristics, together with the influence of plantation management, harvesting and post-harvest practices, resulting in distinctive physical, chemical, sensory and quality characteristics of cocoa beans and derived cocoa products.

Note 1 to entry: Terroir contributes significantly to the expression of fine flavour cocoa and may influence the development of characteristic aroma and flavour attributes such as fruity, floral, nutty, spicy, woody or caramel notes.

Note 2 to entry: Terroir is the result of the interaction between genetics, environment and human management practices and may vary between countries, regions, communities, farms and individual production sites.

### 3.35

#### **variety**

genetically distinct type of cocoa characterised by one or more identifiable traits

Note 1 to entry: including plant morphology, productivity, disease response, bean characteristics, processing performance, and flavour attributes, which distinguish it from other cocoa types.

Note 2 to entry: In trade and casual industry contexts, "variety" is often used loosely; however, precise technical communication should specify whether the plant material is a clone, hybrid, family, or accession to avoid operational confusion.

## 4 General recommended practices

### 4.1 General

4.1.1 Cocoa production should be planned and managed in a manner that supports food safety, environmental protection, worker welfare, traceability, quality and long-term farm productivity.

4.1.2 The application of this standard should be proportionate to the scale, complexity, resources and risk level of the farm or operation. Small farms may use simplified practices, records and controls where these are sufficient to manage food safety, quality, environmental and traceability risks.

### 4.2 Site history and management for new establishment

4.2.1 The site history and management of the cocoa farm should be documented. The documentation should provide a clear and verifiable record of the production area, including past land use, current land use and relevant management practices. Key areas for consideration include:

- a) the previous and present use of the production area and adjoining sites should be known and documented at an appropriate level;

NOTE Examples of documentation can include farmer declarations, community verification, extension officer reports, GPS coordinates, photographs and local land-use history.

- b) cocoa should not be planted on recently deforested natural forest land;

NOTE This does not prevent the rehabilitation, replanting or restoration of historical cocoa lands, degraded agricultural land, abandoned farms or logged-over land, where legally permitted and where no further conversion of natural forest occurs.

- c) domestic and wild animals should be kept out of cocoa production, fermentation, drying and storage areas through appropriate measures based on risk;

NOTE Measures can include fencing where feasible, controlled livestock access, confinement of animals to designated livestock areas, barriers around drying areas, exclusion from post-harvest areas and hygiene controls

- d) potential contamination from polluted surface water, flooding, leaking, leaching, overflowing water, contaminated soil, heavy metals, previous land use or other contaminants should be identified;
- e) remedial action should be taken where a significant contamination risk is identified through a site-specific risk assessment;
- f) the site-specific risk assessment should consider, where relevant:
  - 1) cadmium and lead levels;
  - 2) previous industrial or mining activity;
  - 3) drainage and flooding;
  - 4) salinity in coastal zones;
  - 5) pesticide residues in former intensive agricultural lands; and
  - 6) other potential sources of physical contamination, chemical contamination, or biological contamination.
- g) corrective actions should be developed based on advice from the national competent authority, qualified professional or other recognised technical source, and should be documented, implemented and monitored;
- h) cocoa production should not be carried out on sites where potentially harmful substances may contaminate cocoa beans, unless the risk has been assessed and effectively controlled;

NOTE Critical contaminants in cocoa soils can include heavy metals, such as lead and cadmium, pesticide residues and trace elements, such as mercury and arsenic. Cadmium may be naturally elevated in some soils and can be managed through soil testing, pH management, organic matter management, cultivar or rootstock selection where applicable, and segregation of high-risk bean lots.

- i) sites used for production should comply with applicable national requirements relating to land use, zoning, protected areas, watercourses, forest conservation, environmental protection and crop production.

### 4.3 Farm planning and layout

**4.3.1** Farm planning should include the preparation of a site map showing how the farm is to be developed or managed. The site map should identify, where practicable:

- a) production plots or blocks;
- b) watercourses, springs, wetlands, drains and other water sources;
- c) slopes, erosion-prone areas and drainage lines;
- d) access routes and storage areas;
- e) fermentation, drying and post-harvest areas, where applicable;
- f) agroforestry zones, shade trees and windbreaks;
- g) protected or sensitive areas; and
- h) variety, clone or planting material blocks, where known.

**4.3.2** The farm layout should provide appropriate plant spacing to support sunlight penetration, reduce competition for nutrients and water, facilitate field operations, improve air circulation and promote healthy growth and long-term productivity of cocoa trees.

**4.3.3** For the most appropriate layout, the farmer should be guided by advice from the relevant competent authority, extension service, qualified agronomist or recognised cocoa specialist.

NOTE Site maps can include simple sketch maps, GPS maps, mobile-application maps or extension-assisted maps.

#### **4.4 Agroforestry establishment and shade planning**

**4.4.1** Cocoa trees may be established as part of an existing agroforestry system or on previously disturbed, abandoned, degraded or logged-over land, where legally permitted.

**4.4.2** Establishment should not involve conversion of protected forest, high-conservation-value forest or other environmentally sensitive areas.

**4.4.3** Where cocoa is to be established in open or exposed land areas, temporary and permanent shade should be established before, or in coordination with, the planting of new cocoa trees.

**4.4.4** Shade trees should be arranged to shelter and protect young cocoa plants, support soil moisture retention, reduce heat stress and contribute to a suitable farm microclimate.

NOTE Additional guidance is provided in Annex A.

#### **4.5 Environmental and legal risk assessment**

**4.5.1** Environmental and legal aspects that may affect the site should be identified before production activities begin.

**4.5.2** Tiered approach may be used to identify environmental and legal risks, including:

- a) simple environmental risk checklist for small farms;
- b) formal environmental impact assessment, where required by law or for large-scale establishment; and
- c) additional assessment for protected areas, steep slopes, wetlands, riparian zones, landslide-prone areas or other sensitive areas.

EXAMPLE Relevant issues can include previous land use, ownership and tenure records, land disputes or encumbrances, erosion risk, flooding, contamination, drainage limitations, salinity, nutrient depletion, deforestation risk, protected-area restrictions and access to water.

#### **4.6 Climate resilience and business continuity**

**4.6.1** Cocoa producers, cooperatives and post-harvest facilities should identify practical measures to reduce disruption from drought, intense rainfall, flooding, hurricanes, landslides, pest outbreaks and other climate-related events.

**4.6.2** Measures may include drainage maintenance, shade management, windbreaks, soil cover, water harvesting, emergency storage protection, post-storm inspection and arrangements for shared fermentation or drying support.

### **5 Planting materials**

#### **5.1 General**

**5.1.1** Planting material should be produced, selected, obtained or purchased in accordance with the requirements of the competent authority, where applicable.

**5.1.2** Planting material should be selected based on its suitability for the production objective, site conditions and intended market. The following factors should be considered, where applicable:

- a) disease tolerance and pest resistance;
- b) yield potential;
- c) flavour potential;
- d) intended market use and market preference;
- e) genetic identity;
- f) soil type, nutrient status and drainage;

- g) shade, rainfall and altitude;
- h) pest and disease pressure;
- i) input requirements; and
- j) risk of nutrient runoff or other environmental impacts.

**5.1.3** High yield alone should not be used as the sole basis for selection, particularly where cocoa is intended for fine flavour, origin-specific, heritage or speciality markets.

## **5.2 Sourcing of planting material**

**5.2.1** Planting material should be sourced, where practicable, from nurseries, seed gardens, cocoa budwood gardens, mother-scion gardens, competent authorities, research institutions, trained nursery holders, trained smallholder farmers, cooperatives or other recognised sources.

**5.2.2** Farmers should be guided by the competent authority, extension service or other authorised body when sourcing planting material.

**5.2.3** Sourcing guidance should support pest and disease risk reduction, genetic identity, planting material quality and traceability.

## **5.3 Heritage and regionally important cocoa material**

**5.3.1** Consideration should be given to the conservation, responsible use and protection of heritage and regionally important cocoa germplasm.

**EXAMPLE** Suitable planting material may include Criollo, Trinitario, Imperial College Selection (ICS), Trinidad Selected Hybrids (TSH), Georland Selection (GS), local landraces and other nationally or regionally recognised varieties, clones or hybrids.

**5.3.2** Planting material should be selected and managed to reduce the risk of misidentification, varietal mixture, genetic dilution or displacement of heritage cocoa material by unsuitable generic bulk cocoa varieties.

**NOTE** Heritage and regionally important cocoa material can vary among Member States. Specific examples may be included in an informative annex or national guidance.

## **5.4 Source identification and traceability**

**5.4.1** Records of the source of planting material should be maintained, where available.

**5.4.2** Source and traceability records should include, where applicable:

- a) seed source;
- b) clone, family, accession, variety or hybrid name;
- c) seed garden, cocoa budwood garden, mother-scion garden, nursery, farm, farmer group, cooperative or other source;
- d) name and status of the supplying institution, nursery, seed orchard, cocoa budwood garden, producer, farmer group, cooperative or other supplier;
- e) level of varietal purity, where known;
- f) batch number, lot identification or other identification mark;
- g) date of receipt, propagation, grafting or production;
- h) rootstock source, where grafted material is used;
- i) scion or budwood source, where grafted material is used;
- j) grafting date, where known;
- k) nursery operator or propagator, where applicable; and
- l) certification, inspection or plant health status, where available.

**5.4.3** Traceability records should enable planting material to be linked, where practicable, to its source, genetic identity, batch or lot identification, production date, propagator, nursery operator, supplier and distribution, transfer or sale record.

## **5.5 Nursery and planting material management**

**5.5.1** Nurseries or other suppliers of cocoa planting material should maintain procedures, where practicable, to support genetic integrity, physical labelling, separation of planting material, sanitation and traceability.

**5.5.2** These procedures should include, where applicable:

- a) verification of genetic identity and scion or cocoa budwood source, where known;
- b) separation of different clones, varieties, accessions, families or batches;
- c) clear labelling or other identification of planting material;
- d) phytosanitary and sanitation controls;
- e) inspection before distribution, transfer or sale; and
- f) traceability from source material to distribution, transfer or sale.

## **5.6 Protected varieties**

Where protected varieties are used, the farm, nursery, cooperative or other supplier should obtain the necessary authorisation in accordance with applicable plant variety protection and intellectual property legislation.

## **5.7 Seed treatment and plant health**

**5.7.1** Appropriate seed treatments should be carried out and recorded, where applicable.

**5.7.2** Planting material should be free from quarantine pests and diseases and should comply with national plant health regulations.

**5.7.3** Nursery inspection and sanitation procedures should be established, implemented and documented, where applicable.

## **6 Soil management and conservation**

### **6.1 General**

**6.1.1** Soil management practices should maintain soil health, improve soil structure and fertility, reduce erosion and compaction, and support long-term cocoa productivity.

**6.1.2** Soil management should also support climate resilience, water retention and flavour development, particularly where cocoa is produced for fine flavour, origin-specific, heritage or speciality markets.

### **6.2 Soil assessment**

**6.2.1** When establishing new cocoa production areas, soil and site conditions should be assessed, where practicable. The assessment should consider, where applicable:

- a) soil pH;
- b) organic matter content;
- c) drainage;
- d) soil texture;
- e) nutrient status;
- f) slope and erosion risk;
- g) previous land use;

- h) potential sources of contamination; and
- i) other locally relevant soil conditions.

**6.2.2** Soil assessment should take into account soil types and landscapes found across CARICOM Member States, including volcanic soils, alluvial soils, limestone-derived soils, acidic soils, clayey soils, hillside soils and other locally important soil conditions.

### **6.3 Soil fertility and organic matter**

Farmers should use appropriate practices to maintain or improve soil fertility, soil structure and organic matter. Such practices should include:

- a) composting;
- b) mulching;
- c) cover cropping;
- d) retaining leaf litter and crop residues;
- e) using disease-free organic waste;
- f) maintaining shade trees and ground cover;
- g) applying suitable organic soil amendments; and
- h) minimising unnecessary soil disturbance.

**NOTE** Cocoa pod husks, prunings, leaf litter and other cocoa by-products can contribute to soil organic matter where they are safely managed and do not create pest, disease or contamination risks.

### **6.4 Soil testing and contamination risk**

**6.4.1** Soil testing should be carried out before planting in new production areas, where practicable.

**6.4.2** Testing should include basic fertility parameters and, where risk factors exist, heavy metals and persistent pesticide residues.

**6.4.3** Cadmium testing should be risk-based and should be encouraged for export-oriented cocoa, particularly where cocoa is grown in areas known or suspected to have elevated cadmium levels.

**6.4.4** Where heavy metals or pesticide residues are detected in soil or harvested cocoa beans above permissible limits, further assessment should be carried out. Corrective or remedial action should be implemented in accordance with advice from a competent authority, qualified agronomist or other suitably qualified professional.

### **6.5 Soil conservation and erosion control**

**6.5.1** Cultivation practices that lead to soil degradation should be avoided.

**6.5.2** Farmers should use soil conservation techniques to prevent erosion, reduce nutrient loss and protect drains, waterways and other receiving water bodies. Soil conservation techniques should include:

- a) contour planting;
- b) contour drains;
- c) terracing, where appropriate;
- d) live barriers;
- e) grassed waterways;
- f) mulching;
- g) shade management;
- h) cover crops;
- i) retention of ground cover; and
- j) minimal soil disturbance.

EXAMPLE Vetiver grass, pineapple, banana, plantain, leguminous cover crops or other locally suitable species may be used as live barriers or ground cover to reduce erosion.

## 6.6 Sloping land

**6.6.1** On sloping land, soil conservation measures should be selected according to slope class, soil type, rainfall intensity and erosion risk. The following guidance should be considered:

- a) on gentle slopes of 0 % to 8 % (0° to approximately 4.6°), ground cover, mulching and contour alignment should be used, where appropriate;
- b) on moderate slopes greater than 8 % to 15 % (greater than 4.6° to approximately 8.5°), contour planting, contour drains, live barriers, shade trees and cover crops should be used, where appropriate;
- c) on steep slopes greater than 15 % to 30 % (greater than 8.5° to approximately 16.7°), terracing, reinforced live barriers, permanent ground cover and controlled drainage should be used, where appropriate; and
- d) on very steep or unstable slopes greater than 30 % (greater than approximately 16.7°), cocoa establishment should be avoided unless a competent authority or qualified professional determines that cultivation can be carried out safely and without unacceptable environmental risk.

**6.6.2** Where cocoa is grown on sloping land, soil conservation measures should be implemented to reduce erosion, landslides, sediment movement and silt deposition in drains, waterways and other receiving water bodies.

## 6.7 Burning and residue management

**6.7.1** Open burning of vegetation and crop residues should be avoided, except where required for phytosanitary reasons and permitted by local regulations.

**6.7.2** Vegetation, crop residues and cocoa by-products should be reused, composted or managed safely where appropriate, and in accordance with pest, disease and contamination-control requirements.

## 6.8 Agroforestry contribution to soil stability

Where applicable, cocoa farms should use agroforestry and biodiversity conservation practices to enhance soil stability, improve the microclimate, maintain soil moisture, support ecosystem resilience and promote long-term sustainability.

## 7 Fertilisers and soil additives

### 7.1 General

**7.1.1** Fertilisers and soil additives should be used to maintain soil fertility, replenish essential nutrients and support healthy cocoa growth.

**7.1.2** Fertiliser and soil additive use should be appropriate to the soil condition, crop requirements, production objective, environmental risk and advice from the competent authority or a qualified technical source, where available.

### 7.2 Nutrient management

**7.2.1** Nutrient management should be based on soil analysis, leaf analysis, field observation, local soil knowledge or competent technical advice, where feasible.

**7.2.2** For small farms, a simplified nutrient management approach may be used. This may include field observation, farmer experience, extension advice, local soil knowledge and available test results.

**7.2.3** Fertilisers and soil additives should be selected and applied in a manner that minimises risks to soil, water sources, harvested cocoa, workers and the environment.

### **7.3 Organic amendments and regionally available nutrient sources**

**7.3.1** The use of safe, regionally available and low-input nutrient sources should be encouraged, where appropriate, to support soil health, circular resource use and long-term productivity. Organic amendments and soil additives may include, where appropriate:

- a) composted cocoa pod husks;
- b) composted leaf litter;
- c) composted prunings;
- d) composted animal manure;
- e) composted organic farm by-products;
- f) biochar, where suitable and permitted;
- g) lime, based on soil test results; and
- h) gypsum, based on soil test results.

**7.3.2** Raw manure and human waste should not be applied in cocoa production.

### **7.4 Safe reuse of cocoa by-products**

**7.4.1** Cocoa pod husks and other cocoa by-products should be composted or otherwise treated before application to reduce the risk of pest and disease carry-over.

**7.4.2** Disease-free organic farm by-products should be used for compost or organic fertiliser, where appropriate.

**7.4.3** Organic farm by-products should be shredded or otherwise prepared, where practicable, to support effective composting.

NOTE Cocoa pod husks may carry pathogens associated with black pod disease and other diseases. Reuse of cocoa pod husks should consider disease status, composting conditions, field hygiene and advice from the competent authority or a qualified agronomist.

### **7.5 Heavy metal and contamination risks**

**7.5.1** Fertilisers and soil additives should be selected and used with consideration of heavy metal risks, including cadmium.

**7.5.2** Phosphate fertilisers, lime, gypsum, manure, compost, biochar and other soil amendments should be assessed for cadmium risk, where relevant. This is particularly important for export-oriented cocoa or farms located in areas known or suspected to have elevated cadmium levels.

**7.5.3** Heavy metal analysis should be conducted and results retained where required by the competent authority, certification scheme, buyer requirement or intended export market.

### **7.6 Application**

**7.6.1** Fertilisers and soil additives should be applied in accordance with recommended application rates and methods, product instructions and applicable national requirements.

**7.6.2** Application should be carried out in a manner that reduces the risk of nutrient runoff, leaching, contamination of water sources, damage to cocoa trees and harm to workers.

**7.6.3** Fertilisers and soil additives should not be applied directly into drains, streams, springs, wetlands or other water sources.

7.6.4 Application should be avoided during heavy rainfall or where runoff into water sources is likely.

## 7.7 Storage and handling

7.7.1 Fertilisers and soil additives should be stored in designated areas that are secure, dry, well ventilated and protected from rain, flooding, pests and contamination.

7.7.2 Used and unused fertilisers and soil additives should be stored separately from food products, harvested cocoa, packaging materials, pesticides and living areas.

7.7.3 Fertilisers and soil additives should be kept out of the reach of children and unauthorised persons.

7.7.4 Expiry dates, best-before dates or use-by dates should be observed, where provided.

7.7.5 Equipment used to apply fertilisers and soil additives should be stored separately from harvested cocoa, packaging materials, food products and plant protection products.

## 7.8 Worker safety and spill response

7.8.1 Farmers and agricultural workers who handle or apply fertilisers and soil additives should be trained, as appropriate, in safe handling, application, storage and spill response procedures.

7.8.2 Emergency response procedures for spills of fertilisers and soil additives should be established and communicated to relevant workers. The procedures should include:

- a) containing and cleaning up spills safely;
- b) preventing contamination of soil, water sources, harvested cocoa and the environment;
- c) using appropriate spill response materials and personal protective equipment; and
- d) disposing of contaminated materials safely and in accordance with applicable requirements.

## 7.9 Records

7.9.1 Records of fertilisers and soil additives used should be maintained in accordance with Clause 15. Records should include, where applicable:

- a) type or name of fertiliser or soil additive;
- b) source or supplier;
- c) origin and composition of organic fertilisers, where known;
- d) date and frequency of application;
- e) location of application;
- f) method of application;
- g) quantity or application rate;
- h) name of person applying the material; and
- i) relevant test results or certificates, where available.

7.9.2 Small farms may use simplified records, including field books, farmer group records, receipts, extension officer reports or other practical forms of documentation.

# 8 Water management

## 8.1 General

8.1.1 Water management in cocoa production should be based on a risk-based approach that reflects the production system, site conditions, farm size, water source, post-harvest practices and climate-related risks.

8.1.2 For small farms, the level of assessment, testing, documentation and infrastructure should be proportionate to the scale of production, intended use of water, level of risk and available technical support.

**8.1.3** Water management should support crop health, food safety, worker health, soil conservation, water-source protection, climate resilience and environmental protection.

## **8.2 Water-source protection**

**8.2.1** Water sources used on the farm should be identified and protected from contamination, overuse and degradation.

**8.2.2** Water sources should include, where applicable, streams, springs, rivers, wells, ponds, wetlands, rainwater harvesting systems and other surface or groundwater sources.

**8.2.3** Water should be obtained from sustainable sources and should be of a quality suitable for its intended use.

**8.2.4** Agrochemicals, fertilisers, fuels, oils, wastewater, animal waste and other potential contaminants should be stored, mixed, applied and disposed of in a manner that prevents contamination of water sources.

**8.2.5** Water-source protection should take account of farm activities, neighbouring activities, slope, drainage patterns, flooding risk, livestock access, waste storage and agrochemical handling areas.

## **8.3 Rainfed water management, drainage and drought resilience**

**8.3.1** Rainfed cocoa production should be managed to conserve soil moisture, reduce runoff, prevent erosion and maintain adequate drainage.

**8.3.2** Water conservation and drought-resilience measures should be implemented, where appropriate.

**8.3.3** Water conservation and drought-resilience measures should include, where applicable:

- a) mulching;
- b) shade management;
- c) ground cover;
- d) soil organic matter management;
- e) rainwater harvesting;
- f) efficient water storage;
- g) contour drains;
- h) grassed waterways; and
- i) silt traps.

**8.3.4** Drainage and runoff should be managed to reduce waterlogging, soil erosion, contamination of water sources, landslide risk and damage from intense rainfall or hurricanes.

**8.3.5** Drainage systems should be maintained to prevent blockage, uncontrolled runoff, sediment movement and damage to cocoa production areas, roads, drains and neighbouring land.

## **8.4 Water quality and testing**

**8.4.1** Water used for irrigation, spraying, washing, cleaning of equipment, post-harvest activities or any activity where water can contact harvested cocoa, equipment, drying surfaces or storage areas should be suitable for the intended use.

**8.4.2** Water testing should be based on risk.

**8.4.3** Water testing should be considered where water is obtained from high-risk sources, where flooding has occurred, where water contacts harvested cocoa or post-harvest surfaces, or where contamination is suspected.

**8.4.4** Water quality should comply with applicable national requirements for public health, food safety and environmental protection.

**8.4.5** Untreated wastewater should not be used in cocoa production, where it can contaminate cocoa plants, harvested cocoa, equipment, water sources, soil or post-harvest areas.

NOTE 1 For small farms, visual inspection, source protection, basic sanitation controls and records of contamination incidents can be appropriate where water does not contact harvested cocoa, equipment or post-harvest surfaces.

NOTE 2 Guidance on the safe use of wastewater, excreta and greywater in agriculture is provided by the World Health Organization.

## **8.5 Irrigation, where used**

**8.5.1** Irrigation, where used, should be applied according to the water requirements of the cocoa crop, soil moisture conditions and potential environmental impacts.

**8.5.2** Irrigation systems should be designed, operated and maintained to support efficient water and nutrient use, protect water sources and prevent pollution.

**8.5.3** Measures should be implemented to prevent backflow from irrigation, mixing or application systems into water sources.

**8.5.4** Irrigation should be managed to prevent waterlogging, soil erosion, nutrient runoff, salinity risk, disease pressure and unnecessary water use.

**8.5.5** Irrigation water should not be applied in a manner that increases contamination risks to harvested cocoa, fermentation areas, drying areas, storage areas or neighbouring water sources.

## **8.6 Riparian buffers and sensitive water-related areas**

**8.6.1** Vegetative buffer strips consisting of native vegetation or suitable protective plants should be maintained along watercourses, springs, wetlands and around water sources, where practicable.

**8.6.2** Buffer strips should be managed to reduce soil erosion, agrochemical movement, fertiliser runoff, sediment entry into water sources and damage to wildlife habitats.

**8.6.3** Vegetative buffer strips of at least 5 m should be established where practicable.

**8.6.4** The width and design of buffer strips should take account of farm size, slope, soil type, rainfall intensity, existing land use, legal requirements and the sensitivity of the watercourse or wetland.

**8.6.5** Wider buffer strips should be used where necessary on steep slopes, erosion-prone soils, riparian zones or areas exposed to flooding.

**8.6.6** Cultivation, agrochemical application, fertiliser handling, waste disposal and uncontrolled livestock access should be avoided within riparian buffer areas.

## **8.7 Post-harvest water use**

**8.7.1** Water used in post-harvest activities should be suitable for the intended use and should not create a food safety risk.

**8.7.2** Post-harvest water use should include, where applicable, washing equipment, cleaning fermentation facilities, cleaning drying surfaces or any activity where water can contact harvested cocoa.

**8.7.3** Clean water flows should be separated from contaminated runoff, including runoff from livestock areas, composting areas, agrochemical storage areas, equipment-washing areas and waste-disposal areas.

**8.7.4** Stored water should be protected from contamination by animals, agrochemicals, fertilisers, sediment, wastewater, fuel, oil and other hazardous substances.

**8.7.5** Water storage containers, tanks and systems used for post-harvest activities should be kept clean, covered where practicable, and maintained in good condition.

## **8.8 Extreme weather and corrective action**

**8.8.1** Climate change and extreme weather events, including drought, intense rainfall, flooding, hurricanes, stormwater runoff and landslides, should be considered when planning water management, drainage and water-source protection measures.

**8.8.2** Water sources, drainage channels, culverts, water storage systems and buffer strips should be inspected after flooding, hurricanes, landslides, chemical spills or other extreme events.

**8.8.3** Corrective action should be implemented where contamination, erosion, blockage, structural damage or other water-related risks are identified.

**8.8.4** Corrective action should include, where applicable, cleaning blocked drains, repairing damaged water storage systems, restoring buffer strips, isolating contaminated water sources, preventing further runoff and recording significant incidents.

## **8.9 Training and records**

**8.9.1** Farm workers responsible for irrigation, water harvesting, drainage maintenance, agrochemical mixing or other water-related activities should be trained in appropriate techniques, water conservation, pollution prevention and emergency response measures.

**8.9.2** Records, appropriate to the scale and risk level of the farm, should be maintained for water-source assessments, water-quality testing where conducted, flooding events, contamination incidents, drainage maintenance, corrective actions and worker training.

**8.9.3** Records should include, where applicable:

- a) water source used;
- b) intended use of water;
- c) water-quality test result, where testing is conducted;
- d) drainage maintenance carried out;
- e) flooding, drought, spill or contamination incident;
- f) corrective action taken;
- g) date of inspection, testing, maintenance or corrective action; and
- h) person or group responsible.

## **9 Integrated pest and disease management**

### **9.1 General**

**9.1.1** An integrated pest and disease management approach should be used to prevent, monitor and manage pests and diseases in cocoa production.

**9.1.2** Integrated pest and disease management should prioritise prevention, monitoring, cultural control, biological control, mechanical control and the conservation of beneficial organisms before chemical control is used.

**9.1.3** Pest and disease management should protect cocoa yield, food safety, cocoa bean quality, flavour potential, worker health, beneficial organisms, water sources and the environment.

**9.1.4** Pest and disease management should be appropriate to the production system, pest or disease pressure, rainfall pattern, shade level, farm size, labour availability and market requirement.

## **9.2 Monitoring and decision-making**

**9.2.1** Cocoa production areas should be monitored regularly to identify pest and disease incidence, severity and spread.

**9.2.2** Monitoring should consider, where applicable:

- a) black pod disease and other pod diseases;
- b) witches' broom and other branch, flower or shoot diseases, where present;
- c) insect pests;
- d) rodents and other vertebrate pests;
- e) pest and disease pressure during rainy periods;
- f) effects of shade, humidity and poor air movement;
- g) risks associated with movement of infected planting material, pods, soil, tools or equipment; and
- h) effects of farm sanitation, pruning, drainage and tree spacing.

**9.2.3** Pest and disease control measures should be applied only where monitoring, threshold levels, field conditions, competent authority advice or buyer requirements indicate that action is needed.

**9.2.4** Pest and disease decisions should take account of the potential effect of control measures on food safety, pesticide residues, flavour integrity, beneficial organisms, worker health and the environment.

## **9.3 Preventive and cultural controls**

**9.3.1** Preventive and cultural control measures should be used to reduce pest and disease pressure. Preventive and cultural control measures should include, where applicable:

- a) using locally adapted resistant or tolerant planting material, where available and appropriate;
- b) maintaining appropriate spacing and pruning to improve air movement and light penetration;
- c) managing shade to reduce excessive humidity;
- d) maintaining ground cover and soil health;
- e) removing diseased, infested, damaged, overripe or mummified pods;
- f) removing diseased or infested branches and other affected plant material;
- g) increasing sanitation during periods of high rainfall or high disease pressure;
- h) avoiding unnecessary movement of infected pods, branches, soil, tools or planting material between farms or production areas;
- i) cleaning or disinfecting tools used on diseased or infested plant material before reuse;
- j) using dedicated tools for diseased material, where practicable;
- k) managing rodents and other vertebrate pests using safe, legal and environmentally responsible methods; and
- l) rehabilitating old or less productive cocoa trees by side-grafting, bark-grafting or other appropriate methods, where applicable.

**9.3.2** Scions or budwood used for rehabilitation should be obtained from known, registered or otherwise verified sources with suitable productivity, genetic identity, flavour potential and resistance or tolerance to major pests and diseases.

**9.3.3** Rehabilitation practices should be managed to prevent the spread of pests and diseases through tools, planting material, soil, plant residues or infected plant parts.

#### **9.4 Disease sanitation and disposal**

**9.4.1** Diseased or infested pods and plant material should be removed and disposed of in a manner that reduces the risk of pest and disease spread.

**9.4.2** Disposal methods should be selected based on the pest or disease concerned, farm conditions and advice from the competent authority, extension service or qualified agronomist.

**9.4.3** Disposal methods should include, where applicable, deep burial, controlled composting, solarisation, containment or other locally approved methods.

**9.4.4** Diseased cocoa pod husks should not be moved or reused as mulch or compost unless treated in a manner that reduces pathogen survival.

**9.4.5** Diseased or infested plant material should not be transported to other farms, nurseries, fermentation centres or production areas unless appropriate containment measures are applied.

#### **9.5 Biological and non-chemical controls**

**9.5.1** Biological, mechanical and other non-chemical control methods should be used where they are effective, practicable and permitted by the competent authority.

**9.5.2** Biological, mechanical and non-chemical control methods should include, where applicable:

- a) habitat management to conserve beneficial organisms;
- b) removal of pest breeding sites;
- c) traps or barriers;
- d) biological control agents, where legally approved;
- e) pruning and canopy management;
- f) sanitation harvesting;
- g) resistant or tolerant planting material; and
- h) physical removal or destruction of affected pods or plant material.

**9.5.3** Biological control agents and biopesticides should be used in accordance with competent authority requirements, product instructions and applicable national legislation.

#### **9.6 Chemical control as part of integrated management**

**9.6.1** Chemical control should be used only where necessary and as part of an integrated pest and disease management approach.

**9.6.2** Where crop protection products are used, they should be selected, handled, applied, stored and disposed of in accordance with Clause 10.

**9.6.3** For fine flavour, origin-specific, heritage, estate, clone-specific or speciality cocoa, pest and disease control should not create unacceptable pesticide residue risks, taints, off-flavours or contamination of harvested cocoa.

**9.6.4** Chemical control should be selected and applied to minimise harm to beneficial organisms, pollinators, water sources, workers, neighbouring farms and the environment.

**9.6.5** Chemical control should take account of pre-harvest intervals, restricted-entry intervals, maximum residue limits and buyer or export market requirements.

## **9.7 Records**

**9.7.1** Records of significant pest and disease observations, control measures and corrective actions should be maintained, where practicable, in accordance with Clause 15.

**9.7.2** Records should include, where applicable:

- a) date of observation;
- b) farm, plot, block or production area affected;
- c) pest or disease observed;
- d) severity or extent of infestation or infection;
- e) control measure applied;
- f) date of control action;
- g) person or group responsible;
- h) pesticide, biopesticide or biological control agent used, where applicable;
- i) lot, batch or alphanumeric identification code for affected cocoa lots, where applicable; and
- j) corrective action taken.

**9.7.3** Small farms should use simplified records, where practicable.

**9.7.4** Simplified records should include, where applicable, field books, farmer group records, extension officer reports, photographs or other practical forms of documentation.

## **10 Pesticides, biopesticides and botanical preparations**

### **10.1 General**

**10.1.1** Pesticides, biopesticides and botanical preparations should be used only where necessary and as part of the integrated pest and disease management approach specified in Clause 9.

**10.1.2** Their use should protect worker health, food safety, cocoa quality, flavour integrity, beneficial organisms, water sources and the environment.

**10.1.3** Pesticides, biopesticides and botanical preparations should be selected and used in a manner that prevents unacceptable residues, taints, off-flavours, contamination and market rejection.

### **10.2 Sourcing and approval**

**10.2.1** Pesticides should be purchased from authorised dealers or other approved sources, where applicable.

**10.2.2** Pesticides should be registered, approved or otherwise permitted for use on cocoa under applicable national legislation.

**10.2.3** Pesticides that are banned, restricted or not accepted in the intended importing country or target market should not be used.

**10.2.4** The producer should consider applicable maximum residue limits before selecting or applying pesticides.

**10.2.5** Where cocoa is intended for organic, fine flavour, speciality, low-residue, certified or export markets, the producer should verify any additional pesticide-use restrictions before application.

**10.2.6** Biopesticides, biological control agents and botanical preparations should be legally approved or permitted, safe for the intended use and applied in accordance with competent authority recommendations and product instructions.

NOTE Target market requirements can include national, regional or importing-country maximum residue limits and restrictions.

### **10.3 Application**

**10.3.1** Pesticides should be applied in accordance with product labels, permit conditions, competent authority recommendations and applicable national legislation.

**10.3.2** Pesticides should be selected and applied in a manner that minimises residue risks, taints, off-flavours and contamination of harvested cocoa.

**10.3.3** Recommended application rates, pre-harvest intervals, restricted-entry intervals and other safety instructions should be observed.

**10.3.4** Pesticides should be mixed using the correct dosage and only in quantities required for the intended application.

**10.3.5** Surplus spray mixtures or tank washings should be managed in a manner that does not contaminate harvested cocoa, soil, water sources, workers or the environment.

**10.3.6** Mixing of more than two agrochemicals should be avoided unless recommended by the competent authority or permitted by the product label.

**10.3.7** Warning signs should be used, where appropriate, to identify areas where pesticides have been applied and to indicate restricted-entry periods.

**10.3.8** A pesticide rotation or anti-resistance strategy should be used, where practicable, to reduce the risk of pest resistance and pest resurgence.

**10.3.9** Pesticides should not be applied in a manner that allows spray drift, runoff or leakage to contaminate cocoa beans, fermentation areas, drying areas, storage areas, water sources, neighbouring farms or sensitive habitats.

### **10.4 Application equipment**

**10.4.1** Equipment used for pesticide application should be suitable for cocoa production, maintained in good working condition, cleaned after use and securely stored.

**10.4.2** Sprayers should be calibrated, where feasible, to support accurate application rates and reduce risks to workers, harvested cocoa and the environment.

**10.4.3** Equipment used for pesticide application should not be used for harvesting, post-harvest handling, food preparation, animal feed, fertiliser application or potable water storage, unless it has been properly cleaned and its use is permitted.

**10.4.4** Damaged, leaking or poorly functioning application equipment should not be used until repaired or replaced.

### **10.5 Storage**

**10.5.1** Only pesticides registered, approved or otherwise permitted for use on cocoa should be stored on the cocoa farm.

**10.5.2** Pesticides should be stored in accordance with product instructions and competent authority requirements.

**10.5.3** Storage areas should be secure, water-resistant, well ventilated, well lit, clearly labelled and protected from flooding, children, unauthorised persons, pests and contamination.

**10.5.4** Pesticides should be stored separately from food, animal feed, fertilisers, soil additives, harvested cocoa, packaging materials, living areas and water sources.

**10.5.5** The storage area should contain, where practicable:

- a) shelves or containers made of non-absorbent material;
- b) suitable spill response materials;
- c) appropriate personal protective equipment; and
- d) arrangements to prevent leakage or runoff into water sources.

**10.5.6** Liquid pesticides should be stored in a manner that reduces the risk of leakage onto other products, containers or materials.

**10.5.7** Pesticide labels should remain legible and containers should remain closed when not in use.

## **10.6 Disposal**

**10.6.1** Empty pesticide containers should not be reused.

**10.6.2** Empty pesticide containers should be triple-rinsed, punctured where appropriate, secured and disposed of in accordance with label instructions and competent authority requirements.

**10.6.3** Obsolete, expired, banned or unwanted pesticides should not be used.

**10.6.4** Obsolete pesticides, contaminated materials and pesticide waste should be disposed of through approved channels or in accordance with competent authority requirements.

**10.6.5** Where approved disposal services are not readily available, obsolete pesticides, empty containers and contaminated materials should be securely contained, clearly labelled and managed in accordance with competent authority advice until safe disposal is available.

**10.6.6** Pesticides, empty containers and contaminated materials should not be disposed of in waterways, drains, fields, household waste, open dumps or by uncontrolled burning.

**10.6.7** Containers used for pesticides should not be reused for food, water, animal feed, cocoa beans, planting material, household storage or any other purpose that can create contamination or poisoning risks.

## **10.7 Chemical handling training and safety**

**10.7.1** Farm owners and workers who handle, mix, apply, store, transport or may be exposed to pesticides should be trained in safe pesticide management.

**10.7.2** Training should include, where applicable:

- a) safe handling, storage, mixing and application;
- b) use, cleaning, maintenance and storage of personal protective equipment;
- c) spill response and emergency procedures;
- d) pre-harvest intervals;
- e) restricted entry interval;
- f) measures to prevent contamination of harvested cocoa;
- g) measures to prevent contamination of water sources and the environment; and
- h) maximum residue limit implications for intended markets.

**10.7.3** Workers handling or applying pesticides, or entering recently treated areas, should be provided with appropriate protective clothing and personal protective equipment.

**10.7.4** Personal protective equipment should be appropriate to the pesticide used, the application method and local working conditions.

**10.7.5** Emergency procedures for pesticide spills, exposure and other incidents should be established, communicated and understood by workers and other persons who can be affected.

**10.7.6** Workers should have access to a first aid kit and emergency contact information.

**10.7.7** Pesticide application should be planned to reduce worker exposure, heat stress and unnecessary contact with treated areas.

NOTE In tropical conditions, personal protective equipment selection and work planning should consider heat stress, hydration, rest periods and the time of day when pesticide application is carried out.

## **10.8 Records**

**10.8.1** Records should be maintained for pesticides purchased, stored, applied and disposed of, in accordance with Clause 15.

**10.8.2** Records should include, where applicable:

- a) pesticide name;
- b) active ingredient;
- c) supplier;
- d) date obtained;
- e) quantity obtained;
- f) expiry date or date of manufacture, where provided;
- g) registration or approval status, where available;
- h) target pest or disease;
- i) reason for application;
- j) date and location of application;
- k) dosage and method of application;
- l) name of the applicator;
- m) pre-harvest interval;
- n) restricted-entry interval;
- o) lot, batch or alphanumeric identification code for affected cocoa lots, where applicable; and
- p) disposal method for empty containers, obsolete pesticides or contaminated materials.

**10.8.3** Small farms should use simplified records, where practicable.

**10.8.4** Simplified records should include, where applicable, field books, farmer group records, receipts, extension officer reports, photographs or other practical forms of documentation.

## **11 Harvesting and post-harvest handling**

### **11.1 Pod harvesting and breaking**

**11.1.1** Cocoa pods should be harvested at the correct stage of maturity to support cocoa bean quality, flavour development and food safety.

**11.1.2** Pod maturity should be assessed according to the variety, clone or local planting material, where known.

**11.1.3** Only healthy, mature cocoa pods should be used for fine flavour, origin-specific, heritage, estate, clone-specific or speciality cocoa lots.

**11.1.4** Diseased, damaged, germinated, unripe or overripe pods should not be included in fine flavour, origin-specific, heritage, estate, clone-specific or speciality cocoa lots.

**11.1.5** Where cocoa is produced for special origin, clone, estate, heritage or speciality markets, separate handling should be used, where practicable, to preserve lot identity and quality.

**11.1.6** Separate handling should include, where applicable, separate harvesting, pod storage, pod breaking, fermentation, drying, storage and records.

**11.1.7** Care should be taken to avoid damaging cocoa trees when pods are removed.

**11.1.8** Overripe, diseased or infested pods should be removed and disposed of appropriately to reduce the spread of pests and diseases.

**11.1.9** Pod breaking should be carried out using clean tools and hygienic practices to prevent bean damage and contamination.

**11.1.10** Wet beans should not be placed directly on soil, dirty surfaces, contaminated containers, fertiliser bags, pesticide bags or other unsuitable materials.

**11.1.11** Wet beans should be transferred to fermentation as soon as practicable after pod breaking, in accordance with the intended fermentation method and quality objective.

**11.1.12** Records should be maintained, where practicable, for fine flavour, origin-specific, heritage, estate, clone-specific, speciality or export-oriented lots.

**11.1.13** Harvesting and pod-breaking records should include, where applicable:

- a) date of harvest;
- b) farm, plot or estate identification;
- c) variety, clone or planting material, where known;
- d) pod maturity or harvest selection criteria;
- e) lot, batch or alphanumeric identification code;
- f) date and time of pod breaking;
- g) fermentation unit or batch identification; and
- h) person or group responsible for harvesting and pod breaking.

NOTE Pod colour at maturity can vary by variety, clone and agroecological conditions. Farmers should be guided by local knowledge, competent authority guidance, buyer requirements or documented farm experience.

## **11.2 Hygiene and sanitation**

**11.2.1** Workers handling harvested cocoa pods, wet beans, fermented beans or dried cocoa beans should receive appropriate training in basic hygiene, food safety and safe handling practices.

**11.2.2** Workers should have access to clean toilets and handwashing facilities, where practicable.

**11.2.3** Farms, farmer groups and community fermentation centres should provide practical hygiene measures appropriate to the scale of operation.

**11.2.4** Hygiene measures should include, where applicable:

- a) access to clean water for handwashing and cleaning;
- b) suitable handwashing arrangements;
- c) clean tools for pod breaking and bean handling;

- d) clean containers for wet beans and dried beans;
- e) clean fermentation boxes, baskets or other fermentation units;
- f) clean drying mats, trays, tarpaulins, platforms or solar dryers;
- g) exclusion of domestic animals and livestock from fermentation, drying and storage areas; and
- h) protection of cocoa beans from soil contact, pests, smoke, fuel, chemicals and other sources of contamination.

**11.2.5** Workers with infectious diseases, open wounds or other conditions that can compromise food safety should not handle cocoa beans unless appropriate protective measures are used.

**11.2.6** Equipment, containers, drying mats, tarpaulins, tools and other materials that contact cocoa beans should be suitable for their intended use, maintained in good condition and cleaned before and after use, where practicable.

**11.2.7** Documented cleaning and sanitation procedures should be established where appropriate to the size and nature of the operation.

**11.2.8** For small farms, simplified cleaning procedures should be used, where appropriate.

**11.2.9** Simplified cleaning procedures should include, where applicable, routine cleaning schedules, farmer group instructions, pictorial guidance, verbal instructions supported by training, or records maintained by a community fermentation centre.

### **11.3 Fermentation**

**11.3.1** Wet beans should be fermented in accordance with practices recommended by the relevant competent authority, buyer requirement, documented local quality protocol or applicable cocoa bean quality standard.

**11.3.2** Fermentation should be managed to support food safety, flavour development and consistency of cocoa bean quality.

**11.3.3** Fermentation duration should be appropriate to the genotype, batch size, fermentation system, pulp condition, temperature profile, turning regime, weather conditions and buyer or quality requirements.

**11.3.4** Beans from unripe, diseased, germinated or overripe pods should not be included with wet beans intended for fine flavour, origin-specific, heritage, estate, clone-specific or speciality cocoa lots.

**11.3.5** Where cocoa is produced for fine flavour, origin-specific, heritage, estate, clone-specific or speciality markets, fermentation lots should be identified and handled separately, where practicable.

**11.3.6** Fermentation records should be maintained, where practicable.

**11.3.7** Fermentation records should include, where applicable:

- a) lot, batch or alphanumeric identification code;
- b) pod source, farm, plot, estate or farmer group;
- c) variety, clone or planting material, where known;
- d) start and end date of fermentation;
- e) wet bean weight;
- f) fermentation system used;
- g) turning schedule;
- h) temperature readings, where feasible;
- i) operator or person responsible; and
- j) buyer or quality requirements, where applicable.

## 11.4 Drying

**11.4.1** Drying of cocoa beans should commence upon completion of fermentation and should be carried out in accordance with competent authority guidance, buyer requirements, documented local quality protocols or applicable cocoa bean quality standards.

**11.4.2** Drying should be managed to achieve a safe moisture content, generally around 6.5 % to 7.5 %, or the moisture content specified by the competent authority, buyer or applicable cocoa bean quality specification.

**11.4.3** Drying rate should be managed to support flavour quality and reduce the risk of defects.

**11.4.4** During drying, cocoa beans should be turned at appropriate intervals to support uniform drying and reduce the risk of mould, uneven moisture distribution and quality deterioration. During drying, cocoa beans should be protected from:

- a) rain;
- b) re-wetting;
- c) smoke;
- d) fuel contamination;
- e) chemicals;
- f) domestic animals;
- g) pests;
- h) musty or foreign odours;
- i) direct contact with soil; and
- j) contaminated surfaces.

**11.4.6** Cocoa beans should not be dried in areas exposed to smoke, exhaust fumes, fuel storage, chemical storage, waste disposal areas or other sources of contamination or taint.

**11.4.7** Drying records should be maintained, where practicable, for fine flavour, origin-specific, heritage, estate, clone-specific, speciality or export-oriented cocoa lots.

**11.4.8** Drying records should include, where applicable:

- a) lot, batch or alphanumeric identification code;
- b) drying start and end date;
- c) drying method used;
- d) turning practices;
- e) final moisture content, where measured;
- f) drying location;
- g) weather-related interruptions, where significant;
- h) corrective action taken, where applicable; and
- i) person or group responsible for drying.

NOTE Excessively rapid, uneven or poorly controlled drying can contribute to case hardening, mould growth, excessive acidity, poor flavour development or inconsistent cocoa bean quality.

## 11.5 Grading and quality control

**11.5.1** After drying, cocoa beans should be inspected, sorted and graded to remove defective beans and foreign matter.

**11.5.2** Defective beans should include, where applicable:

- a) mouldy beans;
- b) slaty beans;
- c) germinated beans;
- d) insect-damaged beans;

- e) flat or shrivelled beans;
- f) smoky beans;
- g) broken beans; and
- h) beans affected by foreign odour, contamination or re-wetting.

**11.5.3** Cocoa beans should be graded in accordance with the minimum requirements determined by the relevant competent authority, buyer requirement, applicable national standard or applicable cocoa bean quality specification.

**11.5.4** Quality control should be carried out to verify cocoa bean quality, food safety, sensory quality and flavour integrity, particularly for fine flavour, origin-specific, heritage, estate, clone-specific, speciality or export-oriented cocoa lots.

**11.5.5** Quality control should include, where applicable:

- a) confirming proper fermentation and drying;
- b) conducting a cut test;
- c) determining moisture content;
- d) determining bean count;
- e) assessing defects;
- f) confirming the absence of foreign matter;
- g) assessing odour;
- h) assessing compliance with quality grades and buyer specifications; and
- i) conducting sensory evaluation, where feasible, for fine flavour, speciality or export-oriented lots.

**11.5.6** Quality control records should be maintained, where practicable.

**11.5.7** Quality control records should include, where applicable:

- a) lot, batch or alphanumeric identification code;
- b) assessment date;
- c) moisture content;
- d) bean count;
- e) cut test result;
- f) defect assessment;
- g) odour assessment;
- h) sensory result, where conducted;
- i) assessor; and
- j) corrective action taken.

NOTE Sensory evaluation can support verification of flavour quality, identification of defects, lot differentiation and market positioning.

## **11.6 Packaging and storage**

**11.6.1** Graded cocoa beans should be packed in clean, strong, dry and breathable bags that are properly sewn or sealed.

**11.6.2** Bags used for cocoa beans should be suitable for food contact, where applicable, and should not introduce foreign odours, fibres, chemicals or other contaminants.

**11.6.3** Reusable bags should be cleaned before use to ensure that they are free from foreign matter, pests, odours and other contaminants.

**11.6.4** Bags, containers or storage units should be clearly identified, where required, using a lot, batch or alphanumeric identification code.

**11.6.5** Bags of cocoa beans should be stored in sheds or storage areas that are:

- a) waterproof;
- b) dry;
- c) well ventilated;
- d) protected from damp conditions;
- e) protected from re-wetting;
- f) protected from insects, rodents, birds and other animals;
- g) protected from smoke, fuel, chemicals, musty odours and other sources of contamination; and
- h) managed to reduce the risk of mould growth and quality deterioration.

**11.6.6** Cocoa beans should be stored off the floor and away from walls, where practicable, using pallets, racks or other suitable arrangements that allow air circulation and reduce moisture uptake.

**11.6.7** Storage conditions should be managed to reduce exposure to high relative humidity, condensation, leaks, flooding and other conditions that can increase moisture content or promote mould growth.

**11.6.8** Any infestation, contamination, mould growth, re-wetting or quality deterioration found in stored cocoa beans should be managed in accordance with competent authority guidance, buyer requirements or applicable cocoa bean quality specifications.

### **11.7 Consignment treatment of dried cocoa beans**

**11.7.1** Preventive storage management should be the preferred approach for controlling infestation and contamination in dried cocoa beans.

**11.7.2** Preventive storage management should include, where applicable:

- a) drying cocoa beans to the required moisture content before storage;
- b) storing cocoa beans in clean, dry, well-ventilated and pest-resistant areas;
- c) storing cocoa beans off the floor and away from walls;
- d) preventing re-wetting, condensation and high relative humidity;
- e) excluding rodents, birds, insects and domestic animals;
- f) maintaining good housekeeping and waste control; and
- g) inspecting stored cocoa beans regularly.

**11.7.3** Physical or non-chemical control methods should be used where appropriate and effective.

**11.7.4** Chemical consignment treatment of dried cocoa beans should be avoided for fine flavour, origin-specific, heritage, estate, clone-specific or speciality cocoa, unless treatment is required to meet legal, phytosanitary or buyer requirements.

**11.7.5** Chemical consignment treatment should not be carried out unless prior approval has been obtained from the buyer, where applicable.

**11.7.6** Where chemicals are used for consignment treatment, they should be registered or approved under applicable pesticide legislation and used in accordance with competent authority requirements.

**11.7.7** Consignment treatments should be carried out only by trained and authorised personnel.

**11.7.8** Chemical consignment treatment should not result in pesticide residues, foreign odours, taints or other conditions that can compromise food safety, flavour integrity or market acceptance.

**11.7.9** Records of consignment treatments should be maintained in accordance with Clause 15.

**11.7.10** Consignment treatment records should include, where applicable:

- a) lot, batch, consignment or alphanumeric identification code;
- b) treatment date;

- c) reason for treatment;
- d) treatment method;
- e) chemical used, where applicable;
- f) name of trained or authorised person;
- g) buyer approval, where applicable;
- h) competent authority approval, where applicable; and
- i) release decision or final disposition.

NOTE Physical or non-chemical control methods can include hermetic storage, improved storage hygiene, segregation of affected lots, temperature control, sieving, cleaning or other methods accepted by the competent authority or buyer.

## **12 Cocoa-related by-products, waste and resource efficiency**

### **12.1 General**

**12.1.1** Cocoa by-products and waste should be identified, managed and, where appropriate, reused, recycled or recovered in a manner that protects food safety, plant health, worker health and the environment.

**12.1.2** By-product and waste management should be appropriate to the scale, complexity and risk level of the farm, cooperative, fermentation centre, processor or other cocoa operation.

**12.1.3** By-products and waste should be managed to prevent contamination of cocoa beans, planting material, soil, water sources, workers, animals and neighbouring areas.

### **12.2 Identification of by-products and waste**

**12.2.1** Cocoa producers, cooperatives and post-harvest facilities should identify by-products and waste generated during cocoa production, harvesting and post-harvest handling.

**12.2.2** Cocoa-related by-products and waste should include, where applicable:

- a) cocoa pod husks;
- b) cocoa pulp residues;
- c) prunings, leaves and other plant residues;
- d) defective or rejected beans;
- e) used bags, liners, tarpaulins and packaging materials;
- f) wastewater and wash water;
- g) obsolete or empty agrochemical containers;
- h) waste oils, fuels, lubricants and contaminated materials; and
- i) general farm or facility waste.

### **12.3 Safe reuse of cocoa by-products**

**12.3.1** Cocoa by-products should be reused, recycled or recovered where this is safe, technically feasible and legally permitted.

**12.3.2** Safe reuse should include, where applicable, composting, mulching, soil amendment, biochar production, animal feed use, food ingredient use, energy recovery or other value-added applications, subject to competent authority guidance and applicable national requirements.

**12.3.3** Cocoa pod husks and other plant residues should not be reused in a manner that spreads pests, diseases or contaminants.

**12.3.4** By-products affected by disease, mould, chemical contamination, fuel contamination, heavy metals or other hazards should be assessed before reuse.

**12.3.5** By-products that present a food safety, plant health, worker health or environmental risk should be segregated and managed in accordance with competent authority guidance or applicable national requirements.

NOTE Detailed examples of value-added uses for cocoa by-products can be provided in an informative annex.

#### **12.4 Disease and phytosanitary controls**

**12.4.1** Cocoa pod husks and other cocoa by-products intended for composting, mulching or field application should be managed to reduce the risk of pest and disease carry-over.

**12.4.2** Diseased pod husks, diseased plant material or residues from affected lots should not be spread across healthy plots unless treated in a manner that reduces pathogen survival.

**12.4.3** Treatment methods should include, where applicable, composting, containment, solarisation, burial or other methods accepted by the competent authority or a qualified technical source.

**12.4.4** Diseased by-products should be handled, transported and stored in a manner that prevents further spread of pests and diseases.

#### **12.5 Chemical, heavy metal and feed-safety risks**

**12.5.1** By-products intended for food, feed, compost, soil amendment or other beneficial use should be managed to prevent chemical contamination, biological contamination and physical contamination.

**12.5.2** Where relevant, risks from cadmium, lead, pesticide residues, mycotoxins, theobromine, pathogens, foreign matter and previous contamination should be considered.

**12.5.3** Cocoa by-products should be used for animal feed only where permitted by national feed requirements and competent authority guidance.

**12.5.4** By-products intended for food, feed or other value-added use should be assessed for suitability before use, processing, sale or distribution.

#### **12.6 Waste segregation, storage and disposal**

**12.6.1** Waste that is not reused, recycled or recovered should be segregated, stored and disposed of in designated areas or in accordance with national and local waste management requirements.

**12.6.2** Waste storage areas should be managed to prevent contamination of cocoa beans, planting material, water sources, soil, workers, animals and neighbouring areas.

**12.6.3** Waste should not be allowed to accumulate in a manner that attracts pests, creates odours, causes drainage problems or contaminates cocoa production and post-harvest areas.

**12.6.4** Waste should be separated, where applicable, into organic waste, recyclable material, general waste and hazardous waste.

**12.6.5** Waste containers, storage points or disposal areas should be clearly identified and maintained in a clean and orderly condition.

#### **12.7 Hazardous waste**

**12.7.1** Hazardous waste should be identified, segregated, labelled, securely stored and disposed of through authorised channels or in accordance with competent authority requirements.

**12.7.2** Hazardous waste should include, where applicable:

- a) expired or unused pesticides;
- b) empty pesticide containers;
- c) waste oils, fuels and lubricants;
- d) machinery batteries;
- e) empty fuel containers;
- f) contaminated absorbent materials; and
- g) materials contaminated by chemical spills.

**12.7.3** Hazardous waste should not be disposed of in waterways, drains, fields, household waste, open dumps or by uncontrolled burning.

**12.7.4** Empty pesticide containers should not be reused for food, water, animal feed, cocoa beans, planting material or domestic purposes.

**12.7.5** Spills involving fuels, oils, pesticides, fertilisers, or other hazardous substances should be contained and managed promptly to prevent contamination of cocoa beans, soil, water sources, workers, animals and the environment.

## **12.8 Burning**

**12.8.1** Open burning of agricultural, packaging or structural waste should be avoided, except where required for phytosanitary reasons and permitted by the competent authority.

**12.8.2** Burning should not be carried out near cocoa drying, storage, fermentation or handling areas where smoke can contaminate cocoa beans.

**12.8.3** Where burning is permitted for phytosanitary reasons, it should be controlled to prevent fire spread, smoke contamination, worker exposure and damage to neighbouring farms, habitats or communities.

## **12.9 Resource and energy efficiency**

**12.9.1** Cocoa producers, cooperatives and post-harvest facilities should use resources efficiently and reduce waste where practicable.

**12.9.2** Resource and energy efficiency measures should include, where applicable:

- a) reuse of safe organic material as compost or mulch;
- b) recovery or recycling of suitable packaging and non-organic materials;
- c) efficient use of water and energy;
- d) maintenance of equipment to reduce leaks, spills and waste;
- e) improved drying practices to reduce fuel use and smoke contamination;
- f) use of renewable or lower-impact energy sources, where feasible; and
- g) planning of harvesting, fermentation, drying and transport to reduce unnecessary losses and waste.

**12.9.3** Resource efficiency measures should not compromise food safety, plant health, worker health or environmental protection.

## **12.10 Records**

**12.10.1** Records of by-product reuse, waste disposal, hazardous waste management and significant contamination incidents should be maintained, where applicable, in accordance with Clause 15.

**12.10.2** Records should include, where applicable:

- a) type of by-product or waste;
- b) quantity or approximate quantity;
- c) source or location;

- d) method of reuse, recycling, recovery, treatment or disposal;
- e) date of action;
- f) person, facility or service provider responsible;
- g) lot, batch or alphanumeric identification code, where linked to a rejected, contaminated or affected cocoa lot;
- h) approval, receipt or disposal record, where available; and
- i) corrective action taken after contamination, spill or improper disposal.

**12.10.3** Small farms should use simplified records, where practicable.

**12.10.4** Simplified records should include, where applicable, field books, receipts, cooperative records, photographs, extension officer reports or other practical forms of documentation.

## **13 Biodiversity, agroforestry and ecosystem services**

### **13.1 General**

**13.1.1** Biodiversity management in cocoa production should support the protection of natural habitats, conservation of cocoa genetic diversity, climate resilience, soil health, pollinator habitats and ecosystem services.

**13.1.2** Biodiversity practices should be appropriate to the scale of the farm, the production system, the surrounding landscape, national legal requirements and the level of environmental risk.

**13.1.3** Biodiversity, agroforestry and ecosystem service practices should be integrated with soil conservation, water management, climate resilience, pest management and traceability practices, where applicable.

### **13.2 Protection of species and habitats**

**13.2.1** Farming activities should comply with applicable Member State regulations relating to protected plant and animal species, protected areas, watercourses, wetlands, forest reserves and other sensitive habitats.

**13.2.2** Cocoa production should be planned and managed to prevent harm to protected species and their habitats.

**13.2.3** Cocoa production should not be expanded through the clearing of primary forest, protected forest, high-conservation-value areas, legally designated wildlife reserves, wetlands or other environmentally sensitive areas.

**13.2.4** Existing natural vegetation, wildlife corridors, riparian areas and sensitive habitats should be protected, where practicable.

### **13.3 Biodiversity management**

**13.3.1** Cocoa producers should identify practical measures to conserve, enhance or increase biodiversity on the farm.

**13.3.2** Large farms, estates, cooperatives and organised producer groups should develop and implement a biodiversity or environmental action plan, where appropriate.

**13.3.3** Small farms should demonstrate biodiversity management through simple farm-level actions rather than formal written action plans, where appropriate.

**13.3.4** Biodiversity actions should include, where applicable:

- a) retaining shade trees;
- b) protecting river and stream buffers;
- c) maintaining leaf litter and organic mulch;
- d) reducing blanket herbicide use;
- e) planting mixed shade species;
- f) protecting pollinator habitats;
- g) maintaining hedgerows, living fences or uncultivated border areas; and
- h) avoiding unnecessary clearing of natural vegetation.

### **13.4 Agroforestry and shade diversity**

**13.4.1** Cocoa production should, where practicable, be managed within a diversified agroforestry system rather than as a monoculture system.

**13.4.2** Agroforestry systems should include a suitable mix of shade trees, food crops, fruit trees, nitrogen-fixing species, timber species and native or non-invasive naturalised species, where appropriate.

**13.4.3** Shade species should be selected and managed to:

- a) regulate the farm microclimate;
- b) reduce heat and water stress;
- c) protect soil moisture;
- d) reduce erosion;
- e) support pollinators and beneficial organisms;
- f) contribute to farm income diversification;
- g) support climate resilience; and
- h) maintain the flavour, origin and heritage value of cocoa, where applicable.

**13.4.4** Shade management should consider disease pressure, air circulation, light penetration, hurricane risk, excessive humidity, slope, soil condition and farm safety.

NOTE Agroforestry systems can contribute to fine flavour and origin-specific positioning by supporting terroir, biodiversity, environmental stewardship and sustainability claims.

### **13.5 Native and invasive species**

**13.5.1** Producers should give preference to native species, locally adapted species or non-invasive naturalised species when selecting shade trees, windbreaks, hedgerows or plants for biodiversity enhancement.

**13.5.2** Species known to be invasive, aggressive or difficult to control should not be intentionally introduced.

**13.5.3** Invasive species should be managed to prevent damage to cocoa production areas, natural habitats, watercourses or neighbouring farms.

### **13.6 Pollinator habitats and beneficial organisms**

**13.6.1** Cocoa producers should protect and enhance habitats for cocoa pollinators and beneficial organisms.

**13.6.2** Pollinator and beneficial organism protection should include, where applicable:

- a) retaining leaf litter and decomposing organic material in suitable areas;
- b) retaining rotting logs, pruned branches or moist shaded microhabitats where these do not create pest, disease or safety risks;
- c) reducing unnecessary removal of organic matter;
- d) avoiding blanket application of broad-spectrum pesticides;
- e) using integrated pest management practices; and
- f) maintaining mixed shade, hedgerows, border vegetation and uncultivated areas.

NOTE Cocoa pollination is supported by small insects, including midges. Suitable moist and shaded habitats can help support pollinator populations.

### **13.7 Riparian buffers and water-related habitats**

**13.7.1** Natural vegetation should be maintained or restored along rivers, streams, springs, wetlands, drainage channels and other water-related habitats, where practicable.

**13.7.2** Riparian buffers should be managed to:

- a) reduce soil erosion;
- b) reduce sediment movement into water sources;
- c) reduce agrochemical and fertiliser runoff;
- d) protect aquatic biodiversity;
- e) maintain water quality;
- f) support wildlife movement; and
- g) reduce flood and stormwater impacts.

**13.7.3** Cultivation, agrochemical application, fertiliser handling, waste disposal and uncontrolled livestock access should be avoided within riparian buffer areas.

**13.7.4** Buffer width and design should take into account farm size, slope, rainfall intensity, soil type, existing land use, national legal requirements and the sensitivity of the watercourse or wetland.

### **13.8 Soil biodiversity and soil health**

**13.8.1** Cocoa producers should maintain or improve soil biodiversity and soil health through suitable soil conservation practices.

**13.8.2** Soil biodiversity and soil health practices should include, where applicable:

- a) maintaining organic mulch;
- b) retaining leaf litter, where appropriate;
- c) minimising soil disturbance;
- d) using cover crops or ground cover;
- e) applying compost or other suitable organic soil amendments;
- f) preventing erosion and compaction;
- g) avoiding unnecessary chemical drenching; and
- h) maintaining shade and moisture conditions that support soil organisms.

NOTE Soil biodiversity includes earthworms, decomposers, fungi, bacteria and other organisms that support nutrient cycling, soil structure and cocoa tree health.

### **13.9 Conservation of cocoa genetic diversity**

**13.9.1** Cocoa producers, nurseries, estates, cooperatives and regional repositories should support the conservation and responsible use of locally adapted, traditional and regionally important cocoa genetic material.

**13.9.2** Regionally important cocoa material should include, where applicable, Criollo, Trinitario, Imperial College Selection (ICS), Trinidad Selected Hybrids (TSH), Georland Selection (GS), local landraces, heritage cocoa trees and other nationally or regionally recognised varieties, clones or hybrids.

**13.9.3** Measures to conserve cocoa genetic diversity should include, where applicable:

- a) maintaining records of varieties, clones, accessions or seed sources;
- b) avoiding unnecessary replacement of heritage material with unsuitable generic bulk cocoa varieties;
- c) protecting old or historically important cocoa trees, where feasible;
- d) sourcing planting material from recognised nurseries, competent authorities, research institutions, trained nursery holders, trained smallholder farmers or other recognised sources;

- e) maintaining traceability of planting material; and
- f) participating in national or regional conservation programmes, where available.

### **13.10 Ecosystem services and market value**

**13.10.1** Agroforestry and biodiversity practices should be recognised as part of the environmental and market value of Caribbean cocoa.

**13.10.2** Producers, cooperatives and value-chain actors should use documented agroforestry, biodiversity and conservation practices, where appropriate, to support fine flavour positioning, origin claims, sustainability claims, climate-resilience messaging, watershed protection and premium market access.

**13.10.3** Environmental, sustainability, carbon or biodiversity claims should be accurate, verifiable and supported by appropriate records or evidence.

### **13.11 Small-farm application**

**13.11.1** Small farms should implement simple biodiversity actions that are practical, low-cost and appropriate to the farm context.

**13.11.2** Simple biodiversity actions should include, where applicable:

- a) retaining native or locally adapted shade trees during pruning;
- b) maintaining mixed shade rather than single-species shade;
- c) intercropping with suitable food, fruit or timber species;
- d) maintaining uncultivated border strips, hedgerows or living fences;
- e) protecting streams, springs, wetlands and drainage areas;
- f) maintaining leaf litter and organic mulch;
- g) reducing blanket herbicide application;
- h) using targeted pest management practices;
- i) protecting old or heritage cocoa trees, where feasible; and
- j) keeping simple records or photographs of biodiversity actions, where practicable.

### **13.12 Monitoring and improvement**

**13.12.1** Cocoa producers should periodically review biodiversity and agroforestry practices and make improvements where needed.

**13.12.2** The review should consider, where applicable:

- a) shade diversity;
- b) riparian buffers;
- c) soil cover;
- d) erosion risk;
- e) invasive species;
- f) pollinator habitat;
- g) shade-tree survival;
- h) heritage cocoa material;
- i) impacts from drought, hurricanes, flooding, pests and diseases; and
- j) opportunities to improve climate resilience, soil health, water protection and market value.

## 14 Transportation

### 14.1 General

**14.1.1** Transportation should be managed to prevent contamination, deterioration, re-wetting, loss of traceability and damage to cocoa beans, planting material, farm inputs, tools and equipment.

**14.1.2** Transport arrangements should be appropriate to the product or material being transported.

**14.1.3** Transported products or materials should include, where applicable:

- a) wet cocoa beans;
- b) fermented or dried cocoa beans;
- c) cocoa bags and packaging materials;
- d) farm implements, tools and equipment;
- e) soil, compost, manure and organic soil amendments;
- f) fertilisers and agrochemicals; and
- g) fuel, oil, lubricants and other hazardous substances.

**14.1.4** Wet cocoa beans, fermented or dried cocoa beans, farm inputs, livestock, fuels, chemicals and other potential sources of contamination should be transported separately or adequately segregated.

### 14.2 Vehicles, containers and transport equipment

**14.2.1** Vehicles, containers, trailers, crates, tarpaulins and other transport equipment used for cocoa should be clean, dry, in good condition, free from foreign odours and protected from sources of contamination.

**14.2.2** Vehicles and containers previously used for farm implements, soil, compost, manure, fertilisers, pesticides, fuels, oils or other potential contaminants should be cleaned before use for cocoa beans, cocoa bags, fermentation materials, drying equipment or other post-harvest materials.

**14.2.3** Vehicles and transport equipment should be cleaned, sanitised, or decontaminated before and after use, where necessary.

**14.2.4** Transport equipment used for wet cocoa beans, fermented cocoa beans, dried cocoa beans, cocoa bags or post-harvest materials should not be used for chemicals, fuels, livestock waste, animal feed or other contaminating materials unless effective cleaning and segregation controls are applied.

### 14.3 Transport of wet cocoa beans

**14.3.1** Wet cocoa beans should be transported to the fermentation site, individual fermentation facility or community fermentation centre as soon as practicable after pod opening and bean extraction.

**14.3.2** Wet cocoa beans should preferably be delivered within 12 h of bean extraction, where practicable, to support controlled fermentation and reduce quality deterioration, uncontrolled fermentation and off-flavour development.

**14.3.3** Wet cocoa beans should be transported in clean, non-corrosive containers suitable for contact with cocoa beans.

**14.3.4** Containers used for wet cocoa beans should be cleaned before and after use.

**14.3.5** Containers used for wet cocoa beans should not be used for chemicals, fuels, fertilisers, livestock waste, animal feed or other materials that can contaminate cocoa.

**14.3.6** Wet cocoa beans should be protected during transport from dust, mud, rain, bird droppings, animal contamination, smoke, exhaust fumes, chemical contamination and other foreign matter.

**14.3.7** Wet cocoa beans from different farms, plots, harvest dates, varieties, clones, fermentation batches or quality categories should be kept separate where required for traceability, fine flavour identity, fermentation control or buyer requirements.

**14.3.8** Transport records for wet cocoa beans should be maintained, where practicable.

**14.3.9** Transport records should include, where applicable:

- a) batch, lot or alphanumeric identification code;
- b) source farm, producer, cooperative or collection point;
- c) harvest date or pod opening date;
- d) dispatch time and receipt time;
- e) quantity or weight transported; and
- f) transporter or receiving facility.

#### **14.4 Transport of fermented or dried cocoa beans**

**14.4.1** Fermented or dried cocoa beans should be transported in a manner that maintains dryness, prevents re-wetting and protects bean safety and quality.

**14.4.2** Vehicles used to transport fermented or dried cocoa beans should be clean, dry, covered, free from foreign odours and protected from rain, spray, standing water, excessive humidity and condensation.

**14.4.3** Dried cocoa beans should not be transported in the same compartment as:

- a) petroleum products, fuels, oils or lubricants;
- b) pesticides, herbicides or other agrochemicals;
- c) chemical fertilisers;
- d) animal manure, compost or waste;
- e) livestock, domestic animals or animal feed;
- f) strong-smelling products;
- g) waste materials; or
- h) any other material that can contaminate cocoa or affect odour, flavour, safety or quality.

**14.4.4** Cocoa bags and packaging materials should be handled carefully during loading, transport and unloading to prevent tearing, puncturing, exposure to moisture, contamination and deterioration in quality.

**14.4.5** Cocoa bags should not be placed directly on dirty, wet, oil-stained or chemically contaminated vehicle floors.

**14.4.6** Clean pallets, liners, mats, tarpaulins or other protective barriers should be used where needed.

**14.4.7** Fermented or dried cocoa beans from different farms, plots, varieties, clones, fermentation batches, drying batches, quality grades or market categories should be kept separate where required for traceability, identity preservation, buyer requirements or certification requirements.

#### **14.5 Inter-island and export shipment**

**14.5.1** Dried cocoa beans intended for inter-island transport or export shipment should be protected from re-wetting during loading, transit, unloading and storage.

**14.5.2** Measures should be taken to protect dried cocoa beans from rain, sea spray, condensation, container leakage, wet pallets or floors, high humidity, damaged packaging and contact with wet or contaminated cargo.

**14.5.3** Shipping containers, holds, vessels, pallets and transport units used for dried cocoa beans should be inspected before loading.

**14.5.4** Inspection should verify that shipping containers, holds, vessels, pallets and transport units are clean, dry, structurally sound, free from leaks and free from chemical, fuel, mould or pest odours.

**14.5.5** Moisture-control measures should be used where appropriate.

**14.5.6** Moisture-control measures should include, where applicable:

- a) container liners;
- b) desiccants;
- c) adequate ventilation;
- d) moisture barriers;
- e) clean and dry pallets;
- f) container inspection;
- g) avoidance of loading during rain; and
- h) proper sealing of transport units.

NOTE Re-wetting of fermented or dried cocoa beans can increase the risk of mould growth, loss of quality, off-odours and food safety concerns.

## **14.6 Transport of agrochemicals, fertilisers, fuel and farm inputs**

**14.6.1** Agrochemicals, fertilisers, fuels, oils, lubricants and other hazardous farm inputs should be transported in a manner that prevents leakage, spillage, cross-contamination and exposure to cocoa beans, planting material, food, animal feed, workers and the environment.

**14.6.2** Agrochemicals, fertilisers, fuels, oils and other hazardous substances should not be transported together with wet cocoa beans, fermented cocoa beans, dried cocoa beans, cocoa bags, fermentation materials, drying equipment or other post-harvest materials, unless fully segregated and protected.

**14.6.3** Containers of agrochemicals, fertilisers, fuels, oils and other hazardous substances should be securely closed, upright where applicable, clearly labelled and protected from damage during transport.

**14.6.4** Any spill, leakage or contamination incident during transport should be managed promptly.

**14.6.5** Affected cocoa beans, bags, planting material or other materials should be isolated and assessed before use, sale, fermentation, drying, storage or shipment.

## **14.7 Transport records and traceability**

**14.7.1** Transport records should be maintained where required by the competent authority, buyer, certification scheme or farm management system.

**14.7.2** Transport records should be appropriate to the scale and risk level of the operation.

**14.7.3** Transport records should include, where applicable:

- a) date of transport;
- b) type of material transported;
- c) source and destination;
- d) batch, lot, consignment or alphanumeric identification code;
- e) vehicle or transporter identification;
- f) cleaning, inspection or decontamination records, where applicable;
- g) evidence of segregation from chemicals, fuel, livestock or other contaminants; and
- h) incidents, corrective actions or rejected lots.

## 15 Recordkeeping

### 15.1 General

**15.1.1** Records should be maintained and updated to support traceability, food safety, quality management, market access, complaint handling, control of nonconforming lots and continual improvement.

**15.1.2** Recordkeeping should be appropriate to the scale, complexity and risk level of the farm, nursery, cooperative, fermentation centre, post-harvest facility, processor or exporter.

**15.1.3** Small farms should not be required to maintain complex administrative systems where simple records are sufficient to demonstrate conformity.

**15.1.4** Records should be accurate, legible, identifiable, retrievable and protected from loss, damage, unauthorised alteration or unauthorised access.

### 15.2 Recordkeeping formats

**15.2.1** Records should be maintained in a format that is accessible, secure and capable of being retrieved when required.

**15.2.2** Recordkeeping formats should include, where applicable:

- a) paper-based logbooks, notebooks, farm diaries or forms;
- b) cooperative, farmer group or community fermentation centre records;
- c) delivery notes, receipts, invoices or buyer records;
- d) mobile applications, digital farm-management tools or SMS-based reporting systems;
- e) buyer-managed traceability platforms;
- f) processor or exporter records; and
- g) other records accepted by the competent authority, buyer or certification scheme.

**15.2.3** Where records are maintained by a cooperative, buyer, processor or exporter on behalf of farmers, the farmer should have access to relevant information relating to the farmer's own production, delivery, quality results and payment records.

### 15.3 Minimum records for small farms

**15.3.1** Small farms should maintain, or have access to, minimum records appropriate to their scale and level of risk.

**15.3.2** Minimum records should include, where applicable:

- a) farm identification, including producer name, farm location, plot identification or community location;
- b) approximate farm size or cocoa production area;
- c) source of planting material, including variety, clone, hybrid, accession or seed source, where known;
- d) date of planting or approximate age of cocoa trees, where known;
- e) production inputs used, including fertilisers, pesticides, herbicides, soil amendments and other agrochemicals;
- f) name, quantity, source, date of acquisition and date of use of production inputs, where applicable;
- g) harvest date or approximate harvest period;
- h) estimated quantity or weight of harvested cocoa pods, wet beans or dried beans;
- i) place of sale, delivery point, cooperative, fermentation centre, processor or first buyer;
- j) date of sale or delivery;
- k) weight delivered or sold;
- l) lot, batch or alphanumeric identification code, where used; and
- m) complaints, rejected lots, quality concerns, contamination incidents and remedial action taken.

## **15.4 Additional records for certified, export and fine flavour lots**

**15.4.1** Additional records should be maintained for cocoa intended for certified, export, fine flavour, origin-specific, heritage, traceable, identity-preserved or premium markets.

**15.4.2** Additional records should include, where applicable:

- a) farm, plot, block, estate or farmer group identification;
- b) variety, clone, hybrid, accession, landrace, planting material source or seed garden source, where known;
- c) harvest date, harvest lot, wet bean weight and delivery time to the fermentation facility;
- d) fermentation batch identification;
- e) fermentation start and end date;
- f) turning schedule or fermentation method used;
- g) drying batch identification;
- h) drying start and end date;
- i) final moisture content, where measured;
- j) storage location and storage period;
- k) lot, batch, consignment or alphanumeric identification code;
- l) quality results, including cut test, bean count, moisture, defects, mould, slaty beans, insect damage or other agreed quality criteria;
- m) sensory, liquor or flavour assessment results, where conducted;
- n) buyer specification, buyer approval or certification requirement, where applicable;
- o) market destination, including local market, inter-island trade, export market or buyer destination;
- p) transport and shipment information, where applicable; and
- q) complaints, rejections, downgrades, corrective actions and preventive actions.

## **15.5 Records for shared fermentation and drying facilities**

**15.5.1** Where cocoa is fermented or dried by a cooperative, estate, processor, community fermentation centre or other shared facility, records should be maintained to link incoming cocoa to the relevant producer, farmer group, plot, batch or lot, where practicable.

**15.5.2** Records should enable traceability from wet bean receipt to dried bean storage, sale or shipment.

**15.5.3** Records should include, where applicable:

- a) producer, farm, estate, cooperative or farmer group identification;
- b) date and time of wet bean receipt;
- c) wet bean weight;
- d) batch, lot or alphanumeric identification code;
- e) fermentation start and end date;
- f) drying start and end date;
- g) dried bean weight;
- h) storage location; and
- i) dispatch, sale or shipment details.

## **15.6 Complaints and corrective actions**

**15.6.1** Complaints, rejected lots, quality failures, contamination incidents and buyer feedback should be recorded, where applicable.

**15.6.2** Records should include, where applicable:

- a) date of complaint, rejection or incident;
- b) lot, batch or alphanumeric identification code;
- c) nature of the complaint, rejection, nonconformity or contamination incident;
- d) quantity affected;
- e) suspected or confirmed cause;

- f) corrective action taken;
- g) preventive action taken, where applicable; and
- h) final disposition of the affected lot.

## **15.7 Retention and access to records**

**15.7.1** Records should be retained for a period appropriate to national requirements, buyer requirements, certification requirements, product shelf life and the marketing period of the cocoa product.

**15.7.2** Records should be protected from loss, damage, unauthorised alteration and unauthorised access.

**15.7.3** Records should be made available to the competent authority, buyer, certification body or other authorised party, where required.

NOTE Record templates and examples can be provided in an informative annex.

## **16 Traceability**

### **16.1 General**

**16.1.1** A traceability system should be implemented to enable cocoa beans and cocoa products to be traced from the farm or production site to the point of sale, processing, export or final delivery.

**16.1.2** The traceability system should be appropriate to the size, structure, complexity and risk level of the operation.

**16.1.3** Records to support traceability should be maintained in accordance with Clause 15.

**16.1.4** Traceability should support food safety, quality management, identity preservation, origin verification, market access, complaint investigation and the control of nonconforming lots.

### **16.2 Traceability information**

**16.2.1** Traceability records should include, where applicable:

- a) farm, plot, production site, estate, cooperative or farmer group identification;
- b) producer, processor or facility identification;
- c) harvest date and harvest lot;
- d) quantity or weight of cocoa harvested, received, processed, sold or dispatched;
- e) batch, lot, consignment or alphanumeric identification code;
- f) fermentation batch identification, where applicable;
- g) drying batch identification, where applicable;
- h) storage location and storage period, where applicable;
- i) quality assessment results, where conducted;
- j) buyer, processor, cooperative, exporter or final delivery point;
- k) transportation, sale or shipment details, where applicable; and
- l) movement of cocoa beans or cocoa products through the value chain.

**16.2.2** Where beans from different farms, plots, varieties, clones, harvest dates, fermentation batches or drying batches are combined, traceability records should identify the source lots and the resulting combined lot, where practicable.

**16.2.3** Where a combined lot is created, the combined lot should be assigned a batch, lot, consignment or alphanumeric identification code.

**16.2.4** Records for combined lots should include, where practicable, the source lots, quantities combined, date of combining, reason for combining and person or facility responsible.

### **16.3 Identity preservation for fine flavour cocoa**

**16.3.1** For fine flavour, origin-specific, heritage, estate, clone-specific, speciality, certified or export-oriented cocoa, producers, cooperatives and post-harvest facilities should maintain identity preservation systems, where applicable.

**16.3.2** Identity preservation systems should preserve the traceability of:

- a) origin;
- b) production area, farm, plot, estate or community;
- c) producer or producer group;
- d) variety, clone, hybrid, accession, family or planting material source, where known;
- e) harvest lot;
- f) fermentation batch;
- g) drying batch;
- h) storage location;
- i) quality attributes;
- j) certification status, where applicable;
- k) buyer or market destination; and
- l) batch, lot, consignment or alphanumeric identification code.

**16.3.3** Fine flavour, origin-specific, heritage, estate, clone-specific, speciality, certified or export-oriented cocoa lots should be kept identifiable throughout harvesting, collection, pod breaking, fermentation, drying, grading, bagging, storage, sale, transport, shipment and export, where practicable.

**16.3.4** Lots with different origins, varieties, clones, fermentation batches, drying batches, quality grades, certification status or market claims should be kept separate, where required by the buyer, certification scheme, competent authority or market requirement.

### **16.4 Traceability methods**

**16.4.1** Traceability should be maintained using methods appropriate to the scale, complexity and risk level of the operation.

**16.4.2** Traceability methods should include, where applicable:

- a) paper-based records;
- b) logbooks;
- c) cooperative records;
- d) delivery notes or receipts;
- e) bag, batch, lot or consignment labels;
- f) alphanumeric identification codes;
- g) electronic databases;
- h) buyer-managed systems;
- i) QR-code-enabled systems;
- j) barcode systems;
- k) georeferenced farm records;
- l) electronic quality certificates;
- m) batch tracking tools; or
- n) other recognized traceability platforms accepted by the competent authority, buyer or certification scheme.

**16.4.3** Digital traceability systems that use unique identifiers should be used, where feasible, to strengthen transparency, support quality management, enable origin verification and improve market access.

NOTE 1 Unique identifiers can include alphanumeric codes, QR codes, barcodes, georeferenced farm records, electronic quality certificates and batch tracking tools.

NOTE 2 Traceability systems can support food safety, sustainability verification, fine flavour cocoa authentication, geographical indication programmes, food fraud prevention and compliance with buyer, certification or importing-country requirements.

## 17 Legal requirements

### 17.1 General

**17.1.1** Cocoa producers, nurseries, cooperatives, processors, post-harvest facilities and exporters should identify and comply with applicable national and local laws and regulations relevant to their activities.

**17.1.2** Legal and regulatory requirements should include, where applicable:

- a) agriculture;
- b) land use, land tenure and zoning;
- c) forest conservation, protected areas and biodiversity;
- d) environmental protection;
- e) water use and water-source protection;
- f) pesticide, fertiliser, and agrochemical use;
- g) food safety and hygiene;
- h) labour and employment;
- i) child labour, forced labour and other prohibited labour practices;
- j) worker health and safety;
- k) transport, storage and handling of agricultural produce;
- l) waste management; and
- m) business registration, permits, licences or approvals.

### 17.2 Export market requirements

**17.2.1** Where cocoa beans or cocoa products are intended for export, the relevant producer, cooperative, processor, exporter or other value-chain actor should identify and comply with applicable requirements of the importing country and the buyer.

**17.2.2** Export-related requirements should include, where applicable:

- a) maximum residue limits for pesticides, herbicides, fumigants and other regulated substances;
- b) maximum limits for heavy metals, including cadmium and lead;
- c) phytosanitary requirements, including inspection and certification for quarantine pests, insect infestation, storage pests and mould risks;
- d) food safety, hygiene and contamination-control requirements;
- e) traceability, alphanumeric lot identification and origin-verification requirements;
- f) deforestation-related requirements, including geolocation, farm mapping or evidence that cocoa was not produced on land subject to prohibited deforestation or forest degradation;
- g) labour, human rights and social compliance requirements;
- h) organic, fair trade, sustainability, ethical trading or other certification requirements, where the cocoa is marketed under such claims;
- i) packaging, labelling, storage and transport requirements; and
- j) documentation required by customs, competent authorities, buyers, certification bodies or importing-country regulators.

NOTE: Export requirements can vary by destination market, buyer specification and product form. Producers and exporters should verify applicable requirements before shipment.

### **17.3 Domestic and local market requirements**

**17.3.1** Cocoa intended for domestic processing, local artisanal chocolate production or traditional local markets should comply with applicable national requirements for legality, food safety, hygiene, pesticide use, worker health and safety, and environmental protection.

**17.3.2** Domestic and local market specifications should be identified, where applicable.

**17.3.3** Such specifications should include, where applicable, bean size, grading, cosmetic quality, buyer preference, product use, moisture content, defect limits and delivery requirements.

**17.3.4** Cocoa should not be sold or delivered where it is known, or reasonably suspected, to be contaminated by unauthorised pesticides, harmful chemical residues, heavy mould contamination, unsafe foreign matter or other hazards that can affect public health or product safety.

### **17.4 Permits, licences and legal documentation**

**17.4.1** Records, permits, licences, certificates, approvals and other legal documentation required by competent authorities should be maintained and made available upon request.

**17.4.2** Legal documentation should include, where applicable:

- a) farm registration, producer registration or business registration;
- b) land tenure, lease, occupancy or permission-to-use records;
- c) pesticide applicator permits or agrochemical purchase records;
- d) organic, sustainability, fair trade or other certification records;
- e) phytosanitary certificates;
- f) export permits or customs documentation;
- g) environmental permits or approvals;
- h) water abstraction or water-use permits;
- i) labour, social compliance or worker health and safety records; and
- j) records required by buyers, cooperatives, processors or certification schemes.

### **17.5 Availability of legal documentation**

**17.5.1** Records, permits, licences and other legal documentation relevant to the sale, delivery, certification, export or regulatory compliance of cocoa beans or cocoa products should be made available to first buyers, cooperatives, processors, exporters, competent authorities or certification bodies, where required.

**17.5.2** The level of documentation requested should be appropriate to the scale of the operation, the destination market, the buyer requirement and the level of risk.

## **18 Food authenticity, integrity and food fraud prevention**

### **18.1 General**

**18.1.1** Cocoa producers, cooperatives, post-harvest facilities, processors and exporters should take appropriate measures to protect the authenticity and integrity of cocoa beans and cocoa products.

**18.1.2** Controls should be appropriate to the scale, complexity and risk level of the operation.

**18.1.3** Controls should be strengthened where cocoa is marketed as fine flavour, origin-specific, estate-specific, community-specific, clone-specific, organic, fair trade, geographical indication, heritage, speciality, certified, export or premium cocoa.

## 18.2 Food fraud risks

**18.2.1** Food fraud risks should be identified and managed where there is a risk of deliberate substitution, dilution, mislabelling, adulteration or false claims.

**18.2.2** Food fraud risks should include, where applicable:

- a) mixing lower-value or bulk cocoa with fine flavour, origin-specific, heritage, speciality or premium cocoa;
- b) substitution or misrepresentation of varieties, clones, hybrids, landraces or planting material sources;
- c) mislabelling of geographical origin, farm, estate, community, country or region;
- d) false geographical indication, organic, fair trade, sustainability, ethical trading, certified or other premium claims;
- e) misrepresentation of fermentation status, quality grade, sensory profile, defect level, moisture level, bean count or other quality attributes;
- f) adulteration with foreign matter, non-cocoa material or other unauthorised material;
- g) alteration, removal or replacement of batch, lot, bag, consignment, shipment or alphanumeric identification codes; and
- h) falsification or alteration of farm, processing, quality, certification, transaction, transport or shipment records.

## 18.3 Segregation and identity preservation

**18.3.1** Where a specific origin, variety, clone, estate, community, geographical indication, fine flavour, organic, fair trade, sustainability, certified or other premium claim is made, the relevant cocoa lot should be segregated or otherwise controlled to prevent accidental or intentional mixing.

**18.3.2** Segregation or identity preservation should be maintained, where applicable, during harvesting, pod breaking, wet bean collection, transport, fermentation, drying, grading, bagging, storage, sale, shipment and export.

**18.3.3** Lots with different origins, varieties, clones, fermentation status, quality grades, certification status or market claims should not be combined unless the resulting lot is clearly identified and the change is documented.

**18.3.4** Where lots are combined, records should identify the source lots, the resulting combined lot, the quantity involved, the reason for combining and the person or facility responsible.

## 18.4 Identification, documentation and verification

**18.4.1** Food fraud prevention should be linked to the traceability system specified in Clause 16 and the recordkeeping requirements specified in Clause 15.

**18.4.2** Where authenticity claims are made, supporting records should be maintained and verified, where applicable.

**18.4.3** Supporting records should include, where applicable:

- a) farm, plot, estate, community, country or regional origin;
- b) variety, clone, hybrid, accession, landrace or planting material source, where known;
- c) harvest lot;
- d) fermentation batch;
- e) drying batch;
- f) storage location;
- g) quality results;
- h) sensory, liquor or flavour assessment results, where conducted;
- i) certification status, where applicable;
- j) buyer, processor, exporter or market destination; and
- k) batch, lot, bag, consignment, shipment or alphanumeric identification code.

**18.4.4** Verification should include, where applicable:

- a) checking source records against batch, lot, consignment or shipment records;
- b) comparing quantities received, processed, stored, sold and exported;
- c) reviewing quality records and certification documents;
- d) confirming that labels, invoices, delivery notes and shipment documents are consistent; and
- e) allowing access to relevant records for authorised buyers, competent authorities or certification bodies, where required.

## **18.5 Review and corrective action**

**18.5.1** Food fraud controls should be reviewed periodically and updated when significant changes occur in suppliers, varieties, sourcing areas, certification claims, post-harvest handling, buyer requirements, market destinations or regulatory requirements.

**18.5.2** Cocoa lots suspected of being mislabelled, adulterated, substituted, contaminated or falsely represented should be isolated and assessed before sale, processing, export or further distribution.

**18.5.3** Corrective action should be taken where food fraud, mislabelling, substitution, adulteration or loss of identity is confirmed.

**18.5.4** Corrective action should include, where applicable:

- a) correction of records or labels;
- b) notification of the buyer, cooperative, processor, exporter, certification body or competent authority;
- c) segregation or re-identification of the affected lot;
- d) withdrawal, rejection, downgrading or disposal of the affected lot, where required;
- e) investigation of the cause; and
- f) action to prevent recurrence.

## **18.6 Small-farm application**

**18.6.1** For small farms, food authenticity, integrity and food fraud controls should be implemented through simple, practical measures appropriate to the scale and risk level of the operation.

**18.6.2** Practical measures should include, where applicable:

- a) clear labelling of bags, containers or batches;
- b) use of lot, batch or alphanumeric identification codes;
- c) separation of lots by farm, harvest date, variety, clone, quality category or buyer requirement;
- d) retention of buyer, cooperative or delivery records;
- e) reporting of suspected mislabelling, substitution or unauthorised mixing; and
- f) protection of records from alteration, loss or misuse.

## **19 General training**

### **19.1 General**

**19.1.1** The producer, cooperative, post-harvest facility or other relevant operator should ensure that workers have the knowledge, training and competence needed for their assigned responsibilities.

**19.1.2** Training should be appropriate to the scale, complexity and risk level of the operation.

**19.1.3** Training should address activities that can affect cocoa safety, quality, traceability, worker welfare, environmental management and market requirements.

## 19.2 Training areas

**19.2.1** Training should include, where applicable:

- a) personal hygiene, sanitation, food safety, biosecurity and contamination prevention;
- b) cocoa site management and good agricultural practices;
- c) occupational health and safety, including safe use of vehicles, equipment, tools and harvesting implements;
- d) safe handling of cocoa during harvesting, pod breaking, transport, fermentation, drying, storage and bagging;
- e) accident and emergency procedures, including first aid;
- f) worker welfare, labour requirements and respectful workplace practices;
- g) traceability, batch identification, alphanumeric lot identification and recordkeeping;
- h) climate-smart cocoa management, including shade, soil, water, drainage and biodiversity management;
- i) smallholder business skills, including basic cost recording, delivery records, buyer requirements and payment records; and
- j) any other area relevant to the worker's assigned responsibilities.

**19.2.2** Where cocoa is intended for fine flavour, origin-specific, heritage, estate, clone-specific, speciality, certified or export markets, training should include, where applicable:

- a) mature pod selection;
- b) identification of overripe, underripe, diseased or damaged pods;
- c) harvesting and post-harvest handling practices that protect flavour potential;
- d) separation of cocoa by farm, plot, harvest date, variety, clone, fermentation batch, drying batch, quality category or market requirement;
- e) fermentation management, including batch control, box loading, turning practices, time and temperature monitoring;
- f) drying management, including drying rates, moisture control and protection from smoke, rain, re-wetting and contamination;
- g) defect identification;
- h) cut test procedures and interpretation of results;
- i) basic sensory awareness, including recognition of off-odours, taints and quality defects;
- j) buyer specifications, quality requirements and certification requirements; and
- k) handling of rejected, downgraded or nonconforming lots.

## 19.3 Chemical safety

**19.3.1** Workers who handle, mix, apply, store, transport or may be exposed to pesticides, fertilisers, or other hazardous chemicals should receive specific training and safety information in accordance with 10.7.

**19.3.2** Chemical safety training should include, where applicable:

- a) safe handling, mixing, application, storage and transport of pesticides, fertilisers, and other hazardous chemicals;
- b) understanding and following label instructions;
- c) use, cleaning, storage and disposal of personal protective equipment;
- d) pre-harvest intervals, withholding periods and re-entry periods;
- e) maximum residue limit implications for domestic, certified and export markets;
- f) safe disposal of empty containers, obsolete chemicals and contaminated materials;
- g) spill prevention, spill response and emergency procedures; and
- h) measures to prevent contamination of cocoa beans, planting material, water sources, workers, animals and the environment.

## 19.4 Training delivery and frequency

**19.4.1** Training should be provided before a worker undertakes an assigned activity.

**19.4.2** Training should be refreshed periodically, based on the level of risk, changes in duties, new equipment, new chemicals, buyer requirements, certification requirements, regulatory changes, identified nonconformities or repeated quality defects.

**19.4.3** For small farms, training should be delivered through appropriate mechanisms, where practicable.

**19.4.4** Training delivery mechanisms should include, where applicable:

- a) group sessions;
- b) field demonstrations;
- c) farmer field schools;
- d) cooperative meetings;
- e) extension visits;
- f) buyer programmes;
- g) training provided by competent authorities;
- h) training provided by agricultural extension services;
- i) training provided by research institutions; and
- j) training provided by recognised cocoa specialists.

NOTE Formal annual individual training might not be practical for all smallholder systems. Group training and practical field-based training can be used where suitable for the scale and risk level of the operation.

## **19.5 Training records**

**19.5.1** Training records should be maintained, where practicable, by the producer, cooperative, post-harvest facility, buyer, training provider or other relevant organisation.

**19.5.2** Training records should include, where applicable:

- a) name of the participant, worker or farmer group;
- b) training topic;
- c) date of training;
- d) name of the trainer or training organisation;
- e) training method used;
- f) evidence of participation; and
- g) follow-up action required, where applicable.

**19.5.3** Evidence of training should include, where applicable, paper attendance sheets, cooperative records, certificates, photographs, mobile application records, extension officer reports or other appropriate evidence.

## **20 Control of nonconforming cocoa lots**

### **20.1 General**

**20.1.1** Procedures should be established to identify, segregate, assess and manage cocoa lots that do not meet applicable food safety, quality, buyer, certification or regulatory requirements. See Annex for a simple checklist.

**20.1.2** The procedures should be appropriate to the scale, complexity and risk level of the operation.

### **20.2 Identification and segregation**

**20.2.1** Nonconforming cocoa lots should be clearly identified using a lot, batch or other alphanumeric identification code.

**20.2.2** Nonconforming cocoa lots should be kept separate from conforming lots.

**20.2.3** Where cocoa is intended for fine flavour, origin-specific, heritage, estate, clone-specific, certified or export markets, nonconforming lots should be managed to prevent unintended mixing with higher-value or identity-preserved lots.

### **20.3 Assessment and disposition**

**20.3.1** Nonconforming cocoa lots should be assessed to determine the appropriate disposition.

**20.3.2** Disposition may include:

- a) reconditioning, where the defect can be safely corrected;
- b) downgrading to a lower commercial grade, where food safety is not affected;
- c) diversion to an appropriate alternative market or use, where permitted;
- d) rejection, where the lot does not meet buyer, certification or regulatory requirements; or
- e) disposal, where the lot presents a food safety, biosecurity or contamination risk.

**20.3.3** Cocoa lots affected by chemical contamination, illegal pesticide residues, severe mould, rodent contamination, fuel contamination or other serious hazards should not be used for human consumption unless assessed and released by the competent authority or other authorised body.

### **20.4 Corrective action and records**

**20.4.1** The cause of significant nonconformities should be investigated, where practicable.

**20.4.2** Corrective action should be taken to prevent recurrence.

Records should be maintained, where applicable, of:

- a) lot, batch or alphanumeric identification code;
- b) nature of the nonconformity;
- c) quantity affected;
- d) assessment carried out;
- e) final disposition;
- f) corrective action taken; and
- g) buyer, competent authority or certification-body decision, where applicable.

## **Annex A** **(informative)** **Guidance on shade management, microclimate establishment and climate resilience**

### **A.1 General**

Shade management is an important component of good agricultural practice in cocoa production. Appropriate shade can support seedling establishment, reduce heat and water stress, improve soil moisture retention, enhance biodiversity and improve climate resilience.

In CARICOM Member States, shade systems should also support protection against drought, strong winds, hurricanes, soil erosion and excessive heat. Shade management should be balanced with adequate air circulation and light penetration to reduce fungal disease pressure.

### **A.2 Phased shade establishment**

Where cocoa is established on open, exposed, degraded or previously cleared land, a phased shade system should be considered before or during cocoa establishment.

A phased shade system may include:

- a) temporary shade, to provide early protection from solar radiation and reduce soil moisture loss; and
- b) permanent shade, to provide long-term canopy cover, biodiversity value and microclimate regulation.

Temporary shade should, where practicable, be established before cocoa transplanting. Permanent shade trees should be established early enough to support a stable multi-tier canopy as cocoa matures.

### **A.3 Examples of shade and intercropping species**

Temporary shade species may include:

- a) banana and plantain, including *Musa* spp.;
- b) pigeon pea, *Cajanus cajan*;
- c) cassava, *Manihot esculenta*; and
- d) *Sesbania* spp.

Permanent shade and multipurpose species may include, where locally suitable:

- a) immortal, including *Erythrina poeppigiana* and *Erythrina fusca*;
- b) gliricidia, *Gliricidia sepium*;
- c) wild chataigne, *Pachira insignis*;
- d) West Indian cedar, *Cedrela odorata*;
- e) mahogany, *Swietenia macrophylla*;
- f) avocado;
- g) citrus;
- h) breadfruit; and
- i) mango.

The selection of shade and intercropping species should consider local suitability, legal requirements, invasive-species controls, pest and disease risk, rooting habit, canopy structure, pruning requirements and farmer income needs.

### **A.4 Invasive species**

Species known to be invasive, aggressive or difficult to control should not be intentionally introduced as shade trees, windbreaks or hedgerows.

Examples of species that may require avoidance or strict control include African tulip tree, *Spathodea campanulata*, and unmanaged bamboo species or strains that can spread aggressively.

### **A.5 Windbreaks and storm resilience**

Windbreaks should be considered in areas exposed to trade winds, strong winds, storms or hurricanes.

Windbreaks should preferably use dense, multi-row plantings of deep-rooted and wind-firm species. These may include suitable native trees, palms, gliricidia, timber species or other locally appropriate species.

Windbreaks can help to:

- a) reduce wind speed;
- b) reduce leaf stripping and mechanical damage;
- c) protect young cocoa plants;
- d) reduce drying effects during the dry season; and
- e) maintain a more stable farm microclimate.

#### **A.6 Shade level and disease management**

Mature cocoa fields may generally be managed within an approximate shade range of 30 % to 40 %, subject to local conditions.

Higher shade levels may be appropriate in hot, dry or exposed areas. Lower shade levels may be appropriate in areas with high rainfall, high humidity or severe fungal disease pressure.

Shade management should allow adequate air movement and filtered sunlight. Excessive shade can increase humidity and create conditions favourable to fungal diseases.

#### **A.7 Drought and soil protection**

Shade trees, windbreaks, mulch and ground cover can reduce heat stress and moisture loss during dry periods.

Farmers should maintain an organic mulch layer where appropriate. Mulching can help to:

- a) conserve soil moisture;
- b) reduce soil temperature;
- c) limit erosion;
- d) improve soil organic matter; and
- e) protect young cocoa plants from drought stress.

Mulch should be managed to avoid direct contact with cocoa stems and to reduce pest and disease risks.

## **Annex B (informative) Smallholder implementation checklist**

### **B.1 General**

This annex provides examples of simple actions that small farms may use to demonstrate good agricultural practice. The checklist may be adapted by competent authorities, cooperatives, extension officers, buyers or farmer groups.

### **B.2 Site history and farm planning**

Small farms may demonstrate site history and farm planning by:

- a) identifying the farmer, farm location and production area;
- b) keeping a simple sketch map or GPS location;
- c) recording previous land use, where known;
- d) confirming that cocoa was not planted on recently deforested natural forest land;
- e) identifying watercourses, steep slopes, wetlands or sensitive areas;
- f) identifying possible contamination risks; and
- g) keeping photographs, farmer declarations or extension officer records.

### **B.3 Planting material**

Small farms may demonstrate control of planting material by:

- a) recording the nursery, seed source or supplier;
- b) recording variety, clone, hybrid or seed source, where known;
- c) using locally adapted planting material, where available;
- d) checking planting material for visible pests and diseases;
- e) keeping receipts, labels or farmer group records; and
- f) seeking guidance from extension services or competent authorities.

### **B.4 Soil, water and biodiversity**

Small farms may apply practical measures such as:

- a) maintaining mulch and leaf litter;
- b) using shade trees and ground cover;
- c) avoiding cultivation on unstable slopes;
- d) protecting streams, springs and wetlands;
- e) maintaining simple drains or grassed waterways;
- f) avoiding agrochemical mixing near water sources;
- g) retaining native or locally adapted shade trees;
- h) avoiding invasive species; and
- i) maintaining uncultivated border strips where practicable.

### **B.5 Pest and disease management**

Small farms may demonstrate pest and disease management by:

- a) checking fields regularly;
- b) removing diseased pods and branches;
- c) pruning to improve airflow;
- d) managing shade to reduce excessive humidity;
- e) cleaning tools after use on diseased material;
- f) avoiding movement of infected pods or planting material; and
- g) keeping simple notes or photographs of major pest or disease problems.

### **B.6 Pesticide use**

Small farms using pesticides should:

- a) use only approved products;
- b) follow label instructions;
- c) observe pre-harvest intervals;
- d) use appropriate protective equipment;

- e) avoid spraying near water sources;
- f) store pesticides away from cocoa, food and children;
- g) avoid reuse of pesticide containers; and
- h) keep simple purchase and application records.

### **B.7 Harvesting and post-harvest handling**

Small farms may demonstrate good post-harvest practice by:

- a) harvesting mature, healthy pods;
- b) excluding diseased, unripe and overripe pods from fine flavour lots;
- c) breaking pods on clean surfaces;
- d) keeping wet beans off the soil;
- e) transporting wet beans quickly to fermentation;
- f) protecting drying beans from rain, smoke, animals and chemicals;
- g) storing dried beans off the floor and away from walls; and
- h) keeping simple delivery, drying or buyer records.

### **B.8 Records and traceability**

Small farms may keep records through:

- a) notebooks or farm diaries;
- b) cooperative ledgers;
- c) buyer receipts;
- d) mobile applications;
- e) photographs;
- f) extension officer reports; or
- g) farmer group records.

Minimum records may include farm identity, planting material source, input use, harvest date, quantity sold, buyer, complaints and corrective actions.

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## **CARICOM REGIONAL ORGANISATION FOR STANDARDS AND QUALITY**

The CARICOM Regional Organisation for Standards and Quality (CROSQ) was established as an Inter-Governmental Organisation through an agreement signed by fourteen Member States of the Caribbean Community (CARICOM). CROSQ is the regional centre for promoting efficiency and competitive production in goods and services, through the process of standardisation and the verification of quality. It is the successor to the Caribbean Common Market Standards Council (CCMSC) and supports the CARICOM mandate in the expansion of intra-regional and extra-regional trade in goods and services.

CROSQ is mandated to represent the interests of the region in international and hemispheric standards work, to promote the harmonisation of metrology systems and standards, and to increase the pace of development of regional standards for the sustainable production of goods and services in the CARICOM Single Market and Economy (CSME), and the enhancement of social and economic development.

### **CROSQ VISION:**

A global leader transforming lives through an innovative and sustainable Quality Infrastructure.

### **CROSQ MISSION:**

To transform lives by delivering fit-for-purpose standards, metrology, accreditation and reliable conformity assessment solutions that promote collaboration, enhance trust-in-trade, foster reliability and consistency thereby improving the quality of CARICOM's products and services.

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