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Organization of the
United Nations

Terminal evaluation
of the project “Disposal
of Persistent Organic
Pollutants and Obsolete
Pesticides and
Strengthening of the
Sound Management of
Pesticides in Cameroon”



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Terminal evaluation of the project
“Disposal of Persistent Organic Pollutants
and Obsolete Pesticides and
Strengthening of the Sound
Management of Pesticides in Cameroon”

Project code: GCP/CMR/031/GFF
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Abstract

This report concerns the terminal evaluation of the project “Disposal of Persistent Organic Pollutants and Obsolete Pesticides and Strengthening the Sound Management of Pesticides in Cameroon” (GCP/CMR/031/GFF) implemented by the Food and Agriculture Organization of the United Nations (FAO) in partnership with the Government of Cameroon from March 2015 to December 2023. The project had a planned budget of USD 11 million (including a Global Environment Facility [GEF] grant of USD 1.7 million and expected co-financing of USD 9.3 million). The project aimed to reduce releases of persistent organic pollutants (POPs) from obsolete pesticide stockpiles and contaminated sites, and to strengthen capacities for the sound management of pesticides. The evaluation covered the entire duration and all components of the project. It applied a qualitative methodology based on the theory of change (TOC) approach and used tools such as the evaluation matrix, document review, field visits and interviews with stakeholders.

The terminal evaluation found that, despite shortcomings in the budget and project design (such as the absence of activities to support public–private partnerships, the Farmer Field School (FFS) approach and the Participatory Guarantee System [PGS]), the project effectively targeted one of the major risks to agrifood and environmental systems in Cameroon and proposed a coherent response approach. The project made good progress towards its objective, although most of the outcome targets were not achieved. It identified an additional 47.6 tonnes of obsolete pesticides, bringing the total stock to 92.7 tonnes, but only 35.7 tonnes were disposed of. It assessed the contaminated sites in Dschang and Lagdo but was unable to carry out their decontamination. It proposed improvements to the institutional and regulatory framework, and piloted models for the sustainable management of empty pesticide containers (EPCs) and alternatives to highly hazardous chemical pesticides but was unable to finalize or secure the adoption of these models. However, a notable achievement of the project in terms of efficiency was the strengthening of the capacities of the National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs (LNAD). In contrast, the project’s efficiency was low compared to two similar projects implemented during the same period. FAO and its partners fulfilled their roles but were unable to anticipate the complexity of processes and procedures, budgetary constraints and the COVID-19 pandemic. The project also failed to adequately address the needs of vulnerable groups (women, children and persons with visual impairments), while the sustainability and impact of its outcomes are at risk due to difficulties in finalizing initiated actions and mobilizing the private sector.

In the short term, the evaluation recommends that FAO supports the government in mobilizing the necessary partnerships and funding to complete the activities initiated, carry out a vulnerability analysis of social and professional groups, and support capacity building for regional or national private sector actors involved or concerned with the management of pesticides, POPs, obsolete pesticides and EPCs. FAO should also support the government’s efforts to identify, in the medium term, ways to control the costs associated with the management of POPs, obsolete pesticides, and EPCs throughout the pesticide life cycle and to develop a project or more substantial interventions in this area.

Among the lessons learned that may inform similar projects, the evaluation highlights the importance of verifying the internal coherence of projects at the time of launch, particularly in times of crisis or challenging circumstances and of supporting the awareness and communication strategy with concrete, factual technical and scientific data.

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Abbreviations

CREFISAC	Cameroon Centre for the Rehabilitation, Training and Social Integration for the Blind
EPC	empty pesticide container
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Field School
GEF	Global Environment Facility
LNAD	National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs Products and Inputs
PGS	Participatory Guarantee System
POP	persistent organic Pollutant
PSC	Project Steering Committee
TOC	theory of change

Map of Cameroon



Note: Please refer to the disclaimer on page ii regarding the names and boundaries shown on this map.

Source: UN Geospatial. 2020 Cameroon map New York, United States of America
<https://www.un.org/geospatial/content/cameroon> [accessed on 17 January 2025]

Executive summary

Introduction

1. This terminal evaluation, conducted for purposes of accountability and learning, concerns project GCP/CMR/031/GFF, funded by the Global Environment Facility (GEF) and implemented by the Food and Agriculture Organization of the United Nations (FAO), in partnership with the Government of Cameroon, from 1 March 2015 to 31 December 2023. The project aimed to reduce releases of persistent organic pollutants (POPs) from obsolete pesticide stockpiles and contaminated sites, and to strengthen capacities for the sound management of pesticides. This terminal evaluation report provides GEF, FAO, the Government of Cameroon, and other stakeholders and interested parties with information on the project's outcomes and lessons learned, which they may use to inform future decisions regarding the consolidation of achievements, support for sustainability and impact, and design and implementation of similar future projects.
2. The terminal evaluation was managed and conducted by the FAO Office of Evaluation and covered the entire implementation period, as well as all project components, intervention areas and stakeholders. It was guided by three main evaluation questions (EQs): (EQ 1) To what extent did the project effectively contribute to reducing POPs releases from obsolete pesticide stocks and contaminated sites in Cameroon, and to strengthening national capacities for sound and sustainable pesticide management? (EQ 2) What factors positively or negatively affected the project's performance? (EQ 3) What good practices applied, opportunities seized or missed, and lessons learned from the project should be capitalized on in the design and implementation of future interventions, from a sustainability and impact perspective? These main questions were broken down into subquestions structured around the GEF evaluation criteria.
3. The evaluation design was non-experimental, and the methodology, primarily qualitative, was based on the theory of change (TOC) approach. The document review generated information that was subsequently used to clarify the project's TOC, develop the evaluation matrix, and guide the sampling of sites and informants. In total, 17 sites were visited out of the 33 that hosted project activities. Data collection was carried out primarily through face-to-face interviews with key informants during the field mission and, in exceptional cases, virtually with others. Data analysis was conducted in a way that generated information and evidence to inform or support the findings related to the evaluation criteria or subquestions. Based on the findings and the level of achievement of expected outcomes and target indicators, a rating was assigned to each evaluation criterion, as required by the GEF. The findings then served to formulate and support the evaluation's conclusions.

Main findings

Relevance

Finding 1. The project was well aligned with Cameroon's strategic sustainable development priorities for the horizon 2035.

Finding 2. The project was strongly aligned with the Sustainable Development Goals (SDGs), international conventions, and the priorities of FAO and GEF.

Finding 3. The project addressed one of the major environmental and public health issues in Cameroon. Its objectives remain relevant, and the needs are still immense.¹

Coherence

Finding 4. The project followed a previous initiative (the CleanFarms project funded and implemented by CropLife International) which secured 44.9 tonnes of obsolete pesticides and POPs in a central warehouse in 2013. But its TOC, although coherent, did not sufficiently take into account the risks related to the failure to respect the sequence and timing of planned activities, the project's limited capacity to diligently manage certain activities under the sovereign authority of the State (such as law revision), and finally the institutional context marked by administrative delays and difficulties in collaboration between several institutions.

Finding 5. The project failed to capitalize on certain proven approaches (such as the Farmer Field School [FFS]) or emerging ones (such as the Participatory Guarantee System [PGS]) that could have enhanced its impact potential. Yet, PGS are currently being piloted by stakeholders along agricultural value chains in Cameroon, and the government has initiated consultations to recognize PGS as a certification system for animal production and to incorporate it into the draft law on organic agriculture under preparation in the country. Some of the project's intervention strategies and activities also lacked the capacity to sustainably address the priority needs for health and environmental protection, while others, focused on finding concrete solutions, were overly ambitious given the time frame and the well-known operational and structural constraints in the context. For example, priority was given solely to "the elimination of the available stock of obsolete pesticides through export and destruction abroad", which is merely a palliative solution. The action-research approach proposed to develop alternatives to highly hazardous pesticides also has little chance of producing the desired impact on beneficiaries, given the short duration of the project.

Effectiveness, additionality and progress towards impact

Finding 6. The project inventoried an additional 47.6 tonnes of obsolete pesticides, bringing the total amount of obsolete pesticides available in Cameroon to 92.7 tonnes. However, due to budgetary constraints, only 35.7 tonnes were disposed of, representing a completion rate of 38 percent compared to the target.

Finding 7. The project did carry out a detailed environmental assessment of two polluted sites considered priorities among the 11 identified, but it failed to rehabilitate them due to the reallocation by the Project Steering Committee (PSC) of the funds originally planned for this purpose to the activity of disposing of obsolete pesticides. The Committee judged that the option of excavating the polluted area for treatment or disposal abroad would be too costly compared to the available budget and did not explore other decontamination methods. However, the polluted site in Dschang, contaminated with endosulfan and dichlorodiphenyldichloroethylene (DDT), is used by visually impaired people for farming and livestock, while the site in Lagdo, contaminated by unknown chemicals, is now polluted by obsolete chemical pesticides following the deterioration of the roof of a storage warehouse.

Finding 8. The project designed and implemented two microprojects for the management of empty pesticide containers at two sites, which generated interest and engagement from the targeted actors and farmers during the operation period. However, the adoption of good practices

¹ As specified in sections 1.2.2 and 1.2.3 related to the context, the problems are numerous and the needs immense, while the response approaches are very often fragmented and the achievements poorly consolidated and scaled up.

and the proposed management model remained very limited, for several reasons including limited access to water in the northern part of the country; poor understanding/application of the triple rinsing concept; significant shortcomings in the logistics of collection, storage, shredding, transport and recycling of empty pesticide containers (EPCs); the buyback price of EPC from producers considered low compared to the resale price on the market; the short duration of the collection activity; the absence of coercive tools to encourage positive behaviour and attitude changes; and the cessation of the activity without any “exit strategy”.

Finding 9. The project developed a relevant national strategy for the management of empty pesticide containers, accompanied by an action plan that was validated by the stakeholder. However, it was not approved by the partners (FAO and the Government of Cameroon) for publication and implementation by all stakeholders.

Finding 10. The project revised the existing regulatory texts to cover the entire life cycle of pesticides in Cameroon. However, at the time of its closure, the “improved regulations” developed under the project were still in the process of being finalized prior to their validation and adoption by the government.

Finding 11. The national capacity for registration, inspection and post-registration control of pesticides has been significantly improved with the contribution of the project. However, several links in the post-registration pesticide management chain still need to be strengthened before an effective reduction of risks to health and the environment can be expected.

Finding 12. The project evaluated the capacities of the National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs (LNAD) and made concrete recommendations that received the support of the government and its partners. The implementation of some of these recommendations has significantly improved its operation and performance.

Finding 13. The project prompted the government to increase the number of pesticides approved for use on cotton and stored products, while withdrawing highly hazardous pesticides (Class Ib) and extremely hazardous pesticides (Class Ia).

Finding 14. The project successfully tested the effectiveness of powder from six aromatic plants as alternatives to extremely hazardous pesticides, including two against the maize weevil and four against banana pests, thereby opening promising prospects for further research or their registration.

Finding 15. The participatory action research implemented to promote alternatives to extremely hazardous pesticides against nematodes and the black weevil (*Cosmopolites sordidus*) of plantain banana did not produce the expected outcome. The reasons include several factors such as the inadequate selection or lack of involvement of certain beneficiaries and agricultural extension agents, as well as insufficient logistical resources.

Finding 16. The project strengthened national capacities for pesticide management and associated risks, and opened avenues for innovation and impact, but was unable to fully realize these due to budgetary constraints (inadequate budgeting and the onset of the COVID-19 pandemic) and questionable strategic choices. These factors did not allow for the collection and safeguarding of newly inventoried pesticides nor the effective decontamination of polluted sites.

Finding 17. Unfinished actions related to inventoried pesticides, site decontamination, the national action plan for managing EPCs, revised regulations, national capacities for post-registration inspection and control, research on biopesticides, and proven innovation approaches deserve to be integrated into the project exit strategy and implemented in the short term to consolidate achievements, support progress towards impact, and ensure sustainability.

Efficiency

Finding 18. Despite an extended implementation period (eight years and ten months instead of the initially planned four years) and a major budget revision at no additional cost, the project only partially achieved the target set under its Component 1, which was nonetheless one of the priorities repeatedly emphasized by both FAO and the government. Indeed, the implementing and executing partners of the project were unable to effectively and promptly manage the project's design flaws, delays in the recruitment of consultants and procurement processes, the project's budget shortfall, the constraints imposed by the COVID-19 pandemic, and other operational challenges.

Sustainability

Finding 19. Financial risks related to difficulties in mobilizing government resources, and institutional risks stemming from challenges in establishing and operationalizing interministerial and public-private partnerships for the cause, exist and are likely to significantly hinder the consolidation of outcomes and their sustainability. These significant risks should be addressed and managed immediately by FAO and the government.

Implementation and execution of the project

Finding 20. FAO, as the GEF implementing agency, and the executing partners generally fulfilled their respective roles, despite some shortcomings, including FAO's lack of anticipation regarding certain internal procedures known to be complex and time-consuming, and its agreement with the PSC's decision to reallocate the funds intended for the decontamination of polluted sites in Dschang and Lagdo to another activity.

Design and implementation of monitoring and evaluation

Finding 21. The implementation of the planned monitoring and evaluation plan generated information that was used for activity planning and decision-making.

Co-financing

Finding 22. The co-financing, initially estimated at USD 9 307 374 at project approval, was 90 percent achieved by project closure. However, the absence of co-financing reports made it impossible to clearly understand the processes of mobilization, utilization and valorization of these co-financing resources, or to draw lessons for future interventions.

Application of GEF policies and guidelines

Finding 23. Given its objective, the project had a strong potential positive impact on the environment and human health, but it also entailed significant risks related to the operations of inventory, packaging and export of obsolete pesticides, the environmental assessment of contaminated sites and the management of empty pesticide containers. These risks were all successfully managed.

Finding 24. Although recognized in the project document, the vulnerability of women and other vulnerable groups (children, transhumant herders and visually impaired persons) to the hazards of pesticides was not adequately addressed during implementation. Efforts initiated in this regard were limited and neither consolidated nor systematically implemented.

Finding 25. Beyond its direct implementing partners, including service providers, the project consulted civil society and the private sector but did not engage them in a broad awareness-raising campaign or in a sustainable partnership with the government.

Knowledge management and learning

Finding 26. The project generated good practices and lessons that are well documented in the various reports. However, it remains necessary to consolidate them into a single document and disseminate them through appropriate channels and media to facilitate their adoption.

Human rights and Indigenous People

Finding 27. The project did not involve any factors likely to result in discrimination or increase the vulnerability of children, women, the elderly or Indigenous Peoples. However, the opportunity was missed to develop a strategy to support vulnerable and Indigenous Peoples in addressing pesticide-related risks, or to implement concrete actions targeting these groups.

Conclusions and recommendations

Conclusions.

Conclusion 1. Despite a limited budget and some shortcomings in the project's TOC, FAO, in partnership with the government and with GEF funding, successfully targeted one of the major – yet often overlooked – issues threatening agrifood systems, public health and the environment in Cameroon, and proposed a coherent response strategy. However, integrating activities related to public–private partnership development and proven (FFS) or emerging (PGS) approaches into the project could have enhanced or increased its potential impact.

Conclusion 2. The project made progress towards the safe disposal of inventoried obsolete pesticide stocks in Cameroon, the decontamination of classified high-risk contaminated sites, the strengthening of regulatory and institutional capacities for the rational management of pesticides throughout their life cycle, and the testing and promotion of alternatives to extremely hazardous chemical pesticides. The improvement of the diagnostic capacities of the National Laboratory for the Analysis of Agricultural Products and Inputs stands out as a notable success of the project. However, most of the targets for the outcome indicators were not achieved: the newly inventoried pesticides were not retrieved and stored in a secure location; the contaminated sites of Dschang and Lagdo, whose environmental risk was confirmed through the detailed environmental assessment conducted by the project, were ultimately not decontaminated; only 35.7 tonnes of obsolete pesticides and associated waste were disposed of, out of the 92.7 tonnes inventoried; the sustainable management models for empty pesticide containers, although developed and available, have not yet been adopted – nor have the alternatives to highly hazardous chemical pesticides, which were piloted and promoted.

Conclusion 3. The sustainability of the outcomes and the project's progress towards impact are threatened by several risks, including the government's difficulty in mobilizing additional resources at very short notice to finalize or complete priority actions that have not yet been initiated or remain pending. Another significant threat concerns the limited capacity or insufficient commitment of government decision-makers to implement concrete incentive measures aimed at engaging, involving and holding the private sector more accountable in the safe and sustainable management of pesticides and associated waste in Cameroon. Indeed, aside from the positive dynamics observed in the operations of the National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs, no operational strategy or concrete measures were developed to manage these risks, consolidate achievements and promote the realization and continuity of the project's benefits for the environment and the target population.

Conclusion 4. The project's supervisory, implementation and execution bodies fulfilled their roles, but were unable to effectively anticipate or address the weaknesses related to FAO's processes and

procedures, particularly within a context further complicated by the COVID-19 pandemic. The adaptation strategies implemented (project extensions, efforts to mobilize additional funding, and revisions to activities and budget) did not yield the expected outcomes, thereby contributing to the project's low efficiency compared to similar projects implemented during the same period.

Conclusion 5. The project successfully engaged stakeholders in pursuing its environmental objective while managing significant risks associated with the activities, yet it did not adequately address the specific concerns of the most vulnerable groups, notably women, children, Bororo herders, and visually impaired persons.

Recommendations

Recommendation 1. It is strongly recommended that FAO, in the short term, supports the Government of Cameroon in mobilizing partnerships and funding to finalize the remaining priority activities. (See Conclusions 2 and 3)

Recommendation 2. To achieve sustainable pesticide management, it is imperative for the Government of Cameroon and its partners to strengthen the capacities of national and regional private sector actors involved or interested in the pesticide management chain, including obsolete pesticides and associated waste, and to hold them accountable so they can fully assume their roles in collection, treatment and recycling. To this end, FAO should engage in dialogue with the government and support its efforts to find ways to reduce the costs of managing POPs, obsolete pesticides and associated waste, and to ensure sound management of the entire pesticide life cycle, by contracting or supporting the services of national or regional service providers. (See Conclusion 3)

Recommendation 3. FAO, in partnership with the Government of Cameroon and with the support of the GEF, must, in the short term, carry out a vulnerability analysis of social and professional groups to the risks and hazards associated with chemical pesticides, as well as a capacity assessment of national stakeholders in the pesticide waste management value chain, in order to identify their specific needs and response areas. (See Conclusion 5)

Recommendation 4. Building on the interest generated among stakeholders, the outcomes achieved and the lessons learned from its implementation, FAO should, in the medium term, support the Government of Cameroon in developing a more ambitious and sufficiently robust project – or more significant interventions – to enable the elimination of all currently identified POPs and to reduce health and environmental risks associated with the use of pesticides and related waste and residues. (See Conclusion 1)

Lessons Learned

Lesson 1. Due to potential changes in the context and risks associated with design or budgeting errors, it is essential, at the time of project launch, to verify its internal coherence, particularly the relevance of the activities and the realism of the budget and implementation timelines in relation to the intended objective.

Lesson 2. To be convincing, the awareness-raising and communication strategy on the risks and hazards of pesticides, as well as on prevention or mitigation measures, must be based on concrete and factual technical and scientific data.

Executive summary table 1. GEF rating table

GEF Criteria and dimensions	Rating ¹	Summary comments
A. OUTCOMES	MS	
A1. Relevance	HS	See Finding 1, Finding 2 and Finding 3
A2. Coherence	S	See finding 4 and finding 5
A3. Effectiveness and progress towards impact	MU	Outcome 1 [MU]: see Finding 6 and Finding 7, Outcome 2 [MS]: see Finding 8 and Finding 9 Outcome 3 [MS]: see Finding 10, finding 11 and Finding 12 Outcome 4 [MS]: see Finding 13, Finding 14 and Finding 15 Additionality and progress towards impact [MU]: see Finding 16 and Finding 17
A4. Efficiency	MU	See Finding 18
B. SUSTAINABILITY	MU	See Finding 19
C. IMPLEMENTATION	S	See Finding 20
D. EXECUTION	S	See Finding 20
E. MONITORING AND EVALUATION DESIGN	MS	See Finding 21
F. MONITORING AND EVALUATION IMPLEMENTATION	MS	See Finding 21
Project general rating	MS	

Note: ¹ Rating legend

OUTCOMES, IMPLEMENTATION, EXECUTION, DESIGN and IMPLEMENTATION OF MONITORING AND EVALUATION: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU); Unable to Evaluate (UA).

SUSTAINABILITY: Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Unable to Assess (UA)

The rating system is described in more detail in Appendix 6.

1. Introduction

1.1 Purpose and intended recipients of the evaluation

1. This is the terminal evaluation of the project “Disposal of Persistent Organic Pollutants and Obsolete Pesticides and Strengthening of the Sound Management of Pesticides in Cameroon.” The project was funded by the Global Environment Facility (GEF) and implemented by the Food and Agriculture Organization of the United Nations (FAO) in partnership with the Government of the Republic of Cameroon. Initially planned for four years (from 1 March 2015, to 28 February 2019), the project was ultimately implemented over eight years and ten months (see Box 1).
2. This terminal evaluation is conducted for accountability and learning purposes, in accordance with GEF requirements. The outcomes will inform the GEF, FAO, the Government of Cameroon, the implementing, executing and co-financing partners, civil society organizations, private sector operators, beneficiaries and other stakeholders about the project’s performance (including the outcomes achieved, benefits and impacts generated, opportunities created) and the lessons learned. Project stakeholders will use the outcomes to guide future decisions regarding the consolidation of achievements, the conditions to be put in place to support the sustainability of outcomes and progress towards impact, and the design and implementation of similar future projects.

Box 1. Project essential information

- GEF project identification code: 4641
- Recipient country: Cameroon
- Implementing agency: FAO
- Executing entity: Ministry of Environment, Nature Protection and Sustainable Development and Ministry of Agriculture and Rural Development
- Project budget: USD 11 017 374, including USD 1 710 000 (GEF grant) and USD 9 307 374 (co-financing)
- Project start date: 1 March 2015
- Initial project completion date: 28 February 2019
- Revised project completion dates: 28 February 2020; 28 February 2021; 28 February 2022; 31 March 2023; 31 December 2023
- Mid-term evaluation date: Published in November 2018
- Letters of agreement

Partner	Signature	Amendment
Black Smith Institute/Pure Earth	31 October 2018	N/A
Ministry of Agriculture and Rural Development Veolia	18 July 2018	N/A
ES Field Services (Contract)	14 December 2016	12 June 2017
Ministry of Environment, Nature Protection and Sustainable Development.	14 November 2017	N/A
Centre for Research and Education for Development	20 December 2016	11 January 2019
Association of Upright African Women for Research and Development	20 December 2016	27 November 2018
Green Cross Switzerland	2 July 2018	N/A
University of Ngaoundéré	5 July 2019	24 March 2020
African Centre for Research on Bananas and Plantains	4 June 2019	25 June 2020
The National Confederation of Cotton Producers of Cameroon	25 July 2019	30 March 2020
Cooperative of Honest Planters of Cameroon	15 July 2019	April 2020

1.2 Country context

1.2.1 An economy dependent on the rural sector

3. Cameroon, located in Central Africa at the bottom of the Gulf of Guinea, covers a total area of 475 442 km² and is administratively divided into ten regions (see Map of Cameroon). As of 1 July 2019, Cameroon's population was estimated at 24 348 251, composed of 50.6 percent women, 42.5 percent youth under the age of 15, and only 3.6 percent aged 65 and above (National Institute of Statistics, 2019). In 2021, the country ranked 151st on the Human Development Index (0.576 in 2020), according to the United Nations Development Programme (UNDP, 2022).
4. In Cameroon, the rural sector² is the main driver of economic development (Ministry of Economy, Planning and Regional Development, 2016). It employs approximately 60 percent of the active population, primarily within family farms,³ not including indirect contributions; particularly jobs created upstream and downstream in the informal sector (Ministry of Economy, Planning and Regional Development, 2016). Agricultural production also relies on non-family farms,⁴ including agro-industrial operations (oil palm, bananas, rubber and tea), large-scale forestry enterprises, and industrial poultry and pig farms.
5. Agriculture is a key component of the structural transformation of Cameroon's economy, as reaffirmed by the government in its National Development Strategy 2020–2030 (NDS30). The government has opted for an agricultural revolution aimed at modernizing the sector and increasing productivity through the intensification of agro-industrial activities and the modernization of farms, driven by the demand of agrifood industries. The objective is to create jobs, improve living standards and reduce rural poverty (Ministry of Economy, Planning and Regional Development, 2020a).
6. Production systems are based on five agroecological zones (see Appendix 8). The Sudano-Sahelian zone (North and Far North regions) is characterized by cotton cultivation in rotation with millet/sorghum/maize, cowpea and groundnut, as well as extensive cattle and small ruminant livestock farming. The High Guinean Savannah zone (Adamawa region) is suitable for maize cultivation, often associated with roots and tubers, and for semi-intensive cattle farming. The Western Highlands zone (West and North-West regions) is characterized by a very high population density (137 inhabitants/km²) and is dominated by maize intercropped with tubers, plantains, legumes, fruits and vegetables for both subsistence and commercial purposes, as well as arabica coffee cultivation. The Monomodal Rainforest zone (Littoral and South-West regions) is home primarily to industrial plantations (oil palm, rubber, banana and pineapple) and smallholder farming systems based on cassava and plantains intercropped with cocoa and coffee. The Bimodal Rainforest zone (Centre, East and South regions), which is generally sparsely populated

² The rural sector encompasses all activities contributing to crop, livestock, fishery and forestry production, the provision of environmental and social services in rural areas, and the sustainable management of rural spaces, natural resources and the primary environment.

³ They are composed of one or more members bound by kinship ties or customary norms and are managed by one member designated as the head of the holding.

⁴ They are operated either individually or as companies and employ exclusively salaried labour in accordance with the labour legislation in force.

(around 50 inhabitants/km²), is characterized by food crop farming (maize/cassava, groundnut and plantain) and cash crop production (cocoa / robusta coffee / oil palm).

1.2.2 A quest for agricultural productivity associated with pesticide-related risks

7. In its National Agricultural Investment Plan (Rural Sector Development Strategy [RSDS]/NAIP 2020–2030), Cameroon emphasized the sustainable increase of agro-sylvo-pastoral and fisheries production as well as the productivity of priority value chains (Ministry of Economy, Planning and Regional Development, 2020b). The targeted yield increases between 2019 and 2030 for various crops are significant: cocoa (150 percent), paddy rice (100 percent), millet/sorghum (100 percent), cashew (100 percent), maize (75 percent), coffee (67 percent), seed cotton (58 percent), rubber (36 percent), plantain (33 percent), potato (33 percent), palm oil (27 percent), soya beans (25 percent), cassava (25 percent), pineapple (10 percent) and banana (8 percent). Cameroon also aims to increase its meat production by 86.42 percent between 2016 (estimated at 386 696 tonnes) and 2030, broken down as follows: pigs (222.60 percent), sheep (98.94 percent), cattle (73.84 percent), poultry (51.96 percent) and goats (31.23 percent). It also plans to increase its fishery production from 293 175 tonnes in 2018 to 377 500 tonnes by 2030, in order to meet the estimated needs of 450 000 tonnes in 2018 and 400 000 tonnes in 2030. In the field of non-wood forest products, the government's objective is to increase, in the long term, the current contribution of non-wood forest products to the national economy by at least 10 percent.
8. The targeted growth promoted by the government relies on the improvement of production systems, particularly through better use of inputs, strengthened phytosanitary and veterinary monitoring and protection, enhanced control of major emerging plant pests, improved animal health coverage and zoonotic disease control, as well as the development of standards, labels and certification for inputs, equipment, and agricultural, livestock, fisheries and aquaculture products (Ministry of Economy, Planning and Regional Development, 2020b). To reduce pre- and post-harvest losses – estimated at 40 percent and primarily caused by pests and diseases (FAO and GEF, 2014) – the government intends to facilitate and promote the increased use of plant protection and veterinary products. This intensification model, which relies on increased use of chemical inputs, entails significant risks that warrant greater attention from the government (Platform for Agricultural Risk Management, 2017).
9. In 2023, the country officially imported 26 522 tonnes of pesticides at a cost of XAF 82.1 billion, compared to 7 824 tonnes in 2007 at a cost of XAF 17.5 billion (statistical data: National Institute of Statistics, 2023; see Appendix 12). As of 11 October 2023, Cameroon had 892 registered pesticides (Ministry of Agriculture and Sustainable Development, 2023). According to the World Health Organization (WHO) classification criteria for pesticide toxicity (see Appendix 9), 5.9 percent of registered pesticides fall under Class U (unlikely to present acute hazard), 65.4 percent under Class III (slightly hazardous), 26.5 percent under Class II (moderately hazardous), 1 percent under Class Ib (highly hazardous), and 1 percent under Class Ia (extremely hazardous).
10. Moreover, pesticides are not adequately inspected and controlled in accordance with FAO and WHO guidelines for pesticide registration (FAO and WHO, 2010). They are used and handled by various stakeholders without appropriate training or awareness-raising. The use of pesticides based on persistent organic pollutants (POPs) is either prohibited or

strictly restricted under the Stockholm Convention.⁵ However, it has been reported that certain POPs, including dichlorodiphenyltrichloroethane (DDT),⁶ endosulfan and lindane, are subject to illegal trade and continue to be used in agriculture and public health applications (FAO and GEF, 2014). These illegal practices threaten the integrity of agrifood systems, public health, and the quality of both surface and groundwater.

11. The weak life cycle management of obsolete pesticides and empty pesticide containers (EPCs) increases risks to the environment as well as to human and animal health. Indeed, although certain agro-industrial enterprises implement a pre-disposal protocol, empty pesticide containers are not properly managed by smallholder farms, which often reuse them inappropriately, including for storing or preserving food and beverages. The legislation in force (Article 2 of Law No. 89/027 of 29 December 1989 on toxic and hazardous waste, Republic of Cameroon, 1989) classifies EPCs as hazardous waste, which must be managed under a system designed to ensure they are decontaminated through triple rinsing shortly after use and prior to any form of disposal.
12. More generally, although the regulatory and institutional framework for pesticide management in Cameroon is relatively comprehensive, it displays weaknesses and inconsistencies that hinder its effective implementation (FAO and GEF, 2014). The country has fragmented legislative texts but lacks a specific law governing pesticides (see details in appendix 10). Synergies among government institutions involved in pesticide management also need to be further developed and operationalized, as do public-private partnerships (see Appendix 10).

1.2.3 Numerous cases of improper pesticide use in Cameroon

13. In the Sudano-Sahelian zone, due to insufficient knowledge and lack of proper oversight, farmers unlawfully and improperly use highly toxic and persistent pesticides intended for cotton protection on food and vegetable crops. Indeed, according to a study by Pabamé-Sougnabé *et al.* (2010), Decis 12.5 or 25 EC and Cypercal 360 EC, which belong to the pyrethroid family – less toxic and rapidly degradable in the environment – were the only insecticides registered for use on vegetable crops. However, most pesticide formulations used on vegetable crops in the Central African subregion originated from insecticides intended for cotton protection and belonged to the organophosphate, carbamate, chloroacetamide and organochlorine families, all known to be highly toxic and persistent. Although rotary disc sprayers (Ulva) were predominantly used (85 percent) for the treatment of vegetable crops, watering cans (6 percent), tree branches (4 percent) and brooms (5 percent) were also employed. These alternative methods contributed to pesticide poisoning in vegetable production systems due to incorrect dosing and uneven distribution of products on the target (Pabamé-Sougnabé *et al.*, 2010). It was also noted that 48 percent of producers took no safety precautions, either due to the high cost of personal protective equipment (PPE) or simply as a result of poor practices.

⁵ This Convention recognizes that persistent organic pollutants have toxic properties, resist degradation, accumulate in living organisms, and are transported through air, water and migratory species across international boundaries, where they are deposited far from their original source and accumulate in terrestrial and aquatic ecosystems.

⁶ DDT is a persistent organic pollutant. It has been used as an insecticide to prevent the spread of diseases and to protect crops.

14. Another study conducted during the same period (Tourneux, 2010) indicated that vegetables (leafy greens, lettuce, tomatoes) sold in markets in the Far North of Cameroon during the hot dry season were heavily soaked with pesticides intended for cotton cultivation, and that no monitoring system was in place to regulate this practice. Pesticides are also used by poachers to poison watering holes where birds and certain mammals come to drink. These poisoned animals are then plucked or skinned and gutted, and subsequently sold to consumers who are unaware of how they were killed. Pesticides are also used to poison fishing ponds, and the fish are then collected and sold either fresh or after drying or smoking. The study also reports that during the smoking or drying process in the rainy season the eviscerated fish are split open and pre-soaked in a pesticide-based solution.⁷
15. In the highlands of the West region, the risks and hazards associated with the improper use of pesticides have also been identified. According to a survey conducted in Balessing (Ngameni Tchamadeu *et al.*, 2017), pyrethroids are the most commonly used pesticides, but organochlorine pesticides, despite being banned, are also still in use. EPCs were also left exposed in the fields (37.96 percent), incinerated (37.04 percent), buried in the soil (8.33 percent), sold to retailers (2.78 percent), or used in households (13.89 percent). A study conducted among 129 vegetable farmers in the Ndé Division found that all participants had experienced at least one sign or symptom of pesticide exposure (Chuisseu *et al.*, 2020). Itching, eye irritation, breathing difficulties, headaches and dizziness were the most commonly reported symptoms among participants.
16. In the Centre Region, the use of synthetic pesticides is also considered alarming in the lowland agriculture of Yaoundé (Fangue-Yapseu *et al.*, 2023). Pre-harvest intervals are not observed, and approximately 44 percent of producers reported having harvested crops just two days after spraying. A significant proportion of producers reported having experienced symptoms of pesticide poisoning, such as nasal tingling (22 percent), fatigue (18 percent), eye watering (16 percent) and nausea (11 percent).
17. Pesticide-related risks are also a major concern in the agro-industrial sector. A study conducted in and around the operational areas of the company Plantations du Haut Penja (PHP) ("Fadenah Study" cited in the Cash Investigation programme broadcast by France Télévisions, 2014), along with the investigations carried out for this documentary, concluded that there are significant risks and real negative impacts on human health, as well as on the quality of soil, water and air, due to the use of pesticides by this agro-industrial company. Ground and aerial spraying techniques have been singled out as contributing factors. Several cases of vision disorders and loss have been reported among local populations and agro-industry workers and are believed to be linked to pesticide exposure. In these plantations, hazardous products banned in Europe (such as Bravo 720 SC, Dithane M-45, Manzate 75, Siganex) – products still authorized in Cameroon⁸ – were reportedly still in use in 2014. Since then, PHP has been certified ISO 14,001.

⁷ According to Tourneux (2010), this practice is justified by the fact that "during the rainy season, the number of pests likely to attack dried and smoked fish is very high, and fishers fear that their products may lose value due to the presence of large numbers of larvae".

⁸ They were included in the list of pesticides registered in Cameroon as of 4 March 2021 (Ministry of Agriculture and Rural Development, 2021).

1.3 Project description

1.3.1 Project objective and expected outcomes

18. The project aimed to reduce releases of persistent organic pollutants from obsolete pesticide stockpiles and contaminated sites, and to strengthen capacities for the sound management of pesticides. The project was structured into five components, including four operational ones and one dedicated to monitoring and evaluation. It pursued four operational outcomes, namely: i) Outcome 1: Existing POPs and obsolete pesticide stocks are disposed of in an environmentally sound manner and contaminated sites are remediated; ii) Outcome 2: Risks to human health and the environment from empty pesticide containers are reduced through the establishment and improvement of national EPC management systems; iii) Outcome 3: The regulatory framework and institutional capacity are strengthened for sound pesticide management throughout their life cycle; and iv) Outcome 4: Alternatives to conventional pesticides, based on integrated pest management, are successfully promoted and the use of chemical pesticides and highly hazardous pesticides is reduced. The fifth component was dedicated to "Monitoring and Evaluation".

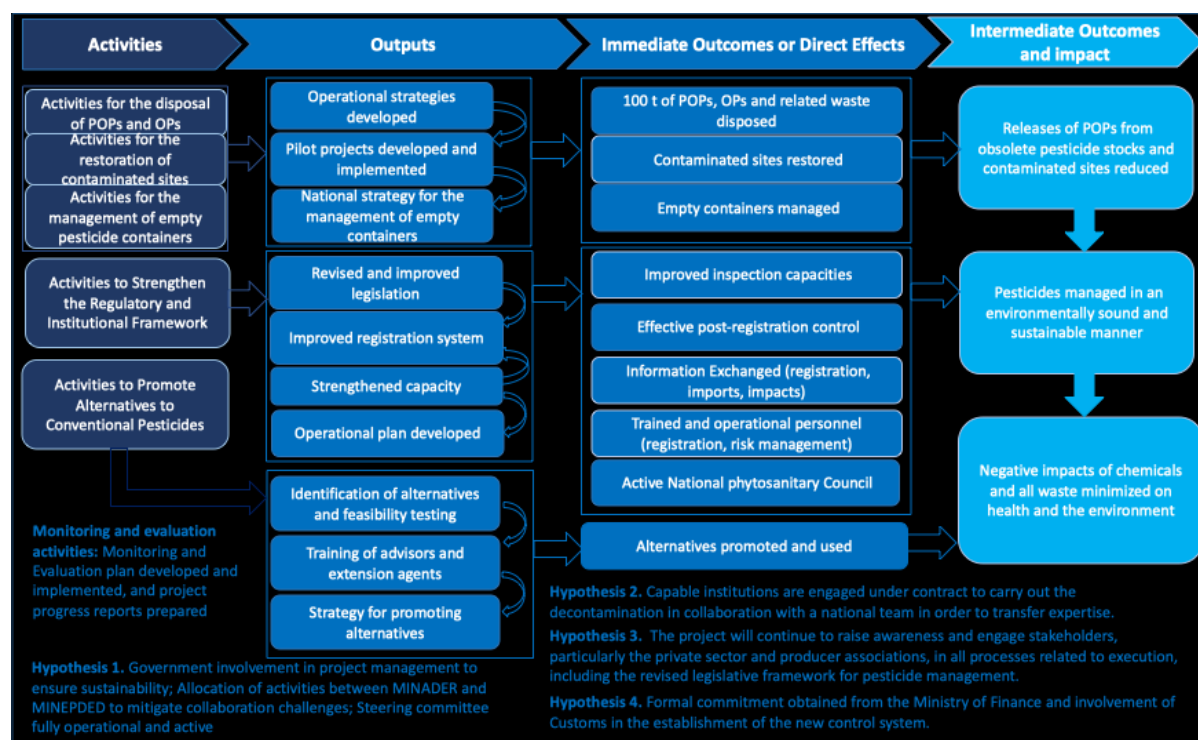
1.3.2 Project stakeholders and beneficiaries

19. The project was implemented by FAO in partnership with the Government of Cameroon. As the GEF implementing agency, FAO was responsible for project oversight, technical support, and operational, administrative and financial management, relying on the following bodies: the Project Steering Committee (PSC); the project management team comprising a National Project Coordinator, a National Technical Coordinator, and national focal points from the Ministry of Agriculture and Rural Development, the Ministry of Environment, Nature Protection and Sustainable Development, and the Ministry of Public Health; the FAO project taskforce; the FAO Pesticide Risk Reduction Group of the Plant Production and Protection Division (lead technical unit for the project); and the GEF Coordination Unit at FAO. The PSC included representatives from the ministries, as well as from FAO, CropLife International, national non-governmental organizations (NGOs), and other interested and affected stakeholders. Among other responsibilities, it was tasked with reviewing and approving any proposed revisions to the project, including those related to the outcomes framework and implementation structures, as well as reviewing, amending (if necessary) and approving all annual work plans and budgets.
20. The executing partners included the Ministry of Environment, Nature Protection and Sustainable Development, responsible for coordinating Components 1 and 2; the Ministry of Agriculture and Rural Development, responsible for coordinating Components 3 and 4; and the Ministry of Public Health, which was invited to take part in the finalization of the revision of pesticide-related legislation and in the monitoring of the impacts of pesticides and POPs on human health. Other executing partners identified during the project design phase and engaged through letters of agreement or contracts included: the Centre for Research and Education for Development (CREPD); the Association of Integral African Women for Research and Development (AFAIRD); the African Centre for Research on Bananas and Plantains (CARBAP); the University of Ngaoundéré; Blacksmith Institute/Pure Earth; Veolia ES Field Services (Contract); Green Cross Switzerland; the National Confederation of Cotton Producers of Cameroon (CNPCC); and the Cooperative of Honest Planters of Cameroon (COOPHOC).

21. The co-financing partners included CropLife International, which had conducted the previous inventory of obsolete pesticides and secured 45 tonnes of obsolete pesticides in the Edéa warehouse, along with six other organizations: FAO, the Ministry of Environment, Nature Protection and Sustainable Development, the Ministry of Agriculture and Rural Development, the Centre for Research and Education for Development, the African Centre for Research on Banana and Plantain, and the University of Ngaoundéré. The Agricultural Research Institute for Development (IRAD) of Cameroon, as well as pesticide unions, distributors, and users – including CropLife Cameroon – were also consulted by the project.
22. The final beneficiaries of the project include members of agricultural and rural communities in Cameroon, as well as actors in the agrifood value chains targeted by the project (see Appendix 1 and Appendix 2). The indirect beneficiaries include decision-makers and government officials from the project's partner ministries, importers and distributors of chemical pesticides, and representatives of producer organizations.

1.4 Theory of change

Figure 1. Project theory of change



Source: Authors' own elaboration.

23. The project's theory of change (TOC), which was not explicitly articulated in the project document, was reconstructed based on the analysis of the context, stakeholders, internal and external risks, the outcomes framework, and the views of project stakeholders. Thus, the project processes, causal chain and underlying assumptions were identified and subsequently used as the analytical framework for the evaluation (see section 2 on methodology).

2. Methodology

2.1 Scope and objective of the evaluation

24. The terminal evaluation covered the project implementation period in its entirety, including all components, intervention areas and stakeholders (see Appendix 1). It also examined the outcomes of the mid-term evaluation (FAO, 2018), the follow-up actions taken by FAO management and the resulting impacts on the second phase of project implementation.
25. The objective of the terminal evaluation is to assess the project's performance by highlighting the outcomes achieved, transformational changes, and good practices observed, as well as the internal and external factors that enabled or limited them. It also aims to formulate recommendations for stakeholders, including FAO and the Government of Cameroon, to inform future interventions.
26. The evaluation will contribute to answering the three main evaluation questions (EQs), which are based on the evaluation questions detailed in the evaluation matrix (Appendix 4) in accordance with the terms of reference of the evaluation.
- i. *EQ 1: To what extent did the project effectively contribute to reducing POPs releases from obsolete pesticide stocks and contaminated sites in Cameroon, and to strengthening national capacities for sound and sustainable pesticide management?*

This question aims to assess the project's performance according to the criteria of relevance, coherence, effectiveness, additionality and progress towards impact, efficiency and sustainability.
 - ii. *EQ 2: What were the factors that positively or negatively affected the performance of the project?*

This question aims to highlight the operational factors related to implementation, execution, monitoring and evaluation, as well as co-financing that influenced the sustainability of the project's outcome.
 - iii. *EQ 3: What good practices were applied, what opportunities were seized or missed, and what lessons were learned from the project that should be capitalized on in the design and implementation of future interventions with a view to impact and sustainability?*

This question focuses on the application of GEF policies and guidelines (environmental protection, gender, partnership and stakeholder engagement), knowledge management and learning, as well as respect for human rights and Indigenous Peoples.

2.2 Methodological design

27. The terminal evaluation adhered to the standards and norms of the United Nations Evaluation Group (2016) and complied with the methodological manuals, procedures and guidelines of FAO, the Organisation for Economic Co-operation and Development (OECD), and the GEF regarding terminal project evaluations (see FAO, 2019a; FAO, 2019b; UNEG, 2016; OECD, 2019; GEF, 2023). The process followed a collaborative and transparent approach with regard to both internal and external stakeholders. The terminal evaluation

was managed by a Senior Evaluation Specialist from the FAO Office of Evaluation, who oversaw the entire evaluation process and led the field mission as team leader, supported by three national consultants (Evaluation Team members), each with experience in at least one of the project's technical areas.

28. The evaluation design was non-experimental and the methodology was primarily qualitative, based on the TOC approach. However, a quantitative approach was used whenever possible to quantify the diversity of opinions on a specific issue.
29. The TOC approach was used to analyse the project's outcomes chain by highlighting the cause-and-effect relationships between related processes, as well as the internal and external factors that influenced the project's performance. It was based on assumptions and stakeholders' experience regarding how this type of project should function, while also taking into account findings from previous evaluation research. Thus, the project TOC was used to examine whether, how and why the project did or did not generate the expected or observed outcomes for each evaluation criterion. Data collection was based on a desk review, interviews with key informants and focus group discussions.
30. Project performance measurement was based on addressing each evaluation question in relation to the evaluation criteria of the OECD Development Assistance Committee and the GEF adopted for this evaluation. In line with GEF requirements and expectations, this measurement covered project outcomes (based on the criteria of relevance, coherence, effectiveness, progress towards impact and efficiency), sustainability, implementation, execution, monitoring and evaluation, co-financing, the application of GEF policies and guidelines – including on gender – knowledge management and learning, and respect for human rights and Indigenous Peoples. The evaluation matrix (Appendix 4) outlines the subquestions and indicators used in the evaluation, as well as the methods for data collection and analysis.

2.3 Sampling and data collection

2.3.1 Sampling

31. The sampling strategy was designed to capture the diversity of issues, ensure variation in site observations and stakeholder and beneficiary perspectives, and to cover all project components and expected outputs. A total of 17 sites were visited out of the 33 where project activities took place (see Appendix 2). The sites visited cover all five agroecological zones of Cameroon and accurately reflect the diversity of agrifood systems, and consequently, the variety of issues and practices related to pest and pesticide management and associated risks in the country (see Appendix 2, Appendix 3, and Appendix 8; see also subsection 1.2.3). The sites visited are spread across six of Cameroon's ten administrative regions and provide a sufficiently representative picture of the country's administrative, socioeconomic and cultural realities. For reasons of efficiency, the East region, which had only a single activity that was also implemented in other regions, and the Far North region, which did not benefit from the project, were not visited. The North-West and South-West regions, currently experiencing a sociopolitical crisis, were also not visited for security reasons; however, input from the project's focal points in these regions was gathered during the workshop held in Yaoundé on 11 January 2024.

32. Evaluation informants were purposively selected from the list provided by the project or drawn from project reports (see Appendix 2), in a manner that ensured the representativeness of all project stakeholders and promoted the inclusion of women's perspectives. The ability to effectively contribute to the evaluation process and to address the specific needs and questions of the evaluation was also considered in the selection of informants.

2.3.2 Document review

33. The information gathered from the document review was used to further elaborate the evaluation matrix by completing certain subquestions of the evaluation. It also made it possible to provide preliminary answers to some questions and identify issues to be explored further during interviews and field visits, in order to complement and triangulate the information and improve/verify its reliability and accuracy. They were also used to refine the selection of project sites to be visited, stakeholders and organizations to be involved in the evaluation, as well as the individuals to be interviewed.
34. The internal project documents used for the mission included: design and approval documents, the project document, the inception report, FAO semi-annual and annual implementation reports, the project's mid-term review, annual work plans and budgets (including budget revisions), project review reports (budget and components), the stakeholder list, the list of project sites, the project's monitoring and evaluation plan, partnership documents and letters of agreement for activity implementation, technical, support and supervision mission reports, and minutes of meetings of the PSC, the FAO project taskforce and other relevant meetings.
35. External documents were also reviewed (see Bibliography section). These include scientific, technical, strategic and policy reports from the government, national or international NGOs, and technical and financial partners concerning the sustainable management of chemical pesticides and associated packaging and waste, the prevention and mitigation of pesticide-related risks, and the promotion of alternatives to chemical pesticides.

2.3.3 Interviews, focus group discussions and surveys

36. Data collection was conducted primarily through direct face-to-face interviews during the field mission, and secondarily through virtual means for key stakeholders who were either unavailable at the time or located far from the sites visited. The direct method was used to collect data from stakeholders encountered during the field missions conducted at the project sites (see Appendix 2 and Appendix 3). The first round of field data collection was carried out under the supervision of the Evaluation Team leader, simultaneously by two production system specialists (members of the Evaluation Team) in the Sudano-Sahelian and High Guinea Savannah zones, and in the forest zones (see map of Cameroon's agroecological zones in Appendix 8). To this end, field missions were carried out from 5 to 9 September 2023 in succession in Ngaoundéré (Adamawa Region) and then in Lagdo, Padermé and Pitoa (North Region), and from 6 to 10 September 2023 in Eséka and Yaoundé (Centre Region), Ebolowa (South Region), and Loum and Njombe (Littoral Region). This first round of data collection focused on the project's three expected outcomes, namely: i) Outcome 1: Existing stocks of POPs and obsolete pesticides are disposed of in an environmentally sound manner, and sites contaminated with POPs and pesticides are remediated; ii) Outcome 2: Risks to human health and the environment related to empty pesticide containers are reduced through the establishment and

improvement of national container management systems; and iii) Outcome 4: Alternatives to conventional pesticides based on integrated pest management are successfully promoted, and the use of chemical pesticides and highly hazardous pesticides is reduced. The second round of field missions took place from 3 to 13 January, covering Douala (Cameroon's economic capital and the base of the country's private sector operators), as well as Loum and Penja in the Littoral Region, in succession, then in Dschang and Bafoussam in the West Region, and finally in Yaoundé (Cameroon's political capital, home to government institutions and their partners). This second series of field missions, conducted by the Evaluation Team leader assisted by two production systems specialists, an environmental and social protection specialist, and a facilitator, enabled the completion of the assessment of expected Outcomes 1, 2, and 4 of the project, and focused on the evaluation of Outcome 3: "The regulatory framework and institutional capacity are strengthened for the rational management of pesticides throughout their life cycle". An essential step in this second phase of the assessment was the organization of a stakeholder workshop to present the preliminary evaluation findings, held in Yaoundé on 11 January 2024. The workshop provided an opportunity to gather additional information from stakeholders, and to discuss, amend and validate the preliminary findings, while also opening up new avenues for reflection and further analysis. Following the completion of the field mission, a remote approach was used to conduct additional interviews in order to complement, triangulate and clarify the information emerging from the stakeholder workshop and the initial analyses.

37. Individual and group interviews were conducted using specific semistructured questionnaires tailored to the informants. A total of 108 individuals were interviewed, either individually or in small groups of two to three people. These included five from FAO, 29 from the Ministry of Agriculture and Rural Development, eight from the Ministry of Environment, Nature Protection and Sustainable Development, seven from the Ministry of Public Health, ten from NGOs and cooperatives, and two from the Interstate Committee on Pesticides in Central Africa (CPAC), 13 producers, six from research institutes, 17 from private sector organizations and 11 from the university. Group discussions were held with direct and indirect project beneficiaries organized at each project site visited, in order to address specific topics using tailored interview guides. The data collected were recorded and compiled throughout the assessment process.

2.4 Data analysis

38. The data collected were triangulated to verify their plausibility, consistency, complementarity and validity. The TOC, the project outcomes framework, and the evaluation matrix served as the analytical framework for data analysis. Qualitative data were analysed in a way that informed the evaluation indicators and were then structured to address the evaluation questions. Descriptive statistics (means, frequencies) were used to express the diversity of opinions on a given criterion or indicator and to support certain findings. Information was disaggregated by gender whenever possible. Based on the findings and their supporting indicators, a score was assigned to each evaluation criterion as required by the GEF (see Appendix 6). The findings were then used to formulate and support the evaluation conclusions.

2.5 Limitations

39. Due to the limited duration of the evaluation and prevailing security risks in the North-West and South-West regions, the evaluation mission was able to visit only six of

Cameroon's ten regions. However, the sites visited were selected to cover the full diversity of production systems and the issues related to pests, pesticide and associated waste management in Cameroon. Remote communication tools were also used to gather the opinions of geographically distant stakeholders.

2.6 Structure of the report

40. Following this introduction, section 2 introduces the methodology, followed by project performance in section 3. Lastly, conclusions, recommendations and lessons learned are presented in section 4.
41. The report includes twelve appendices.

3. Project performance

3.1 Relevance [HS: Highly Satisfactory]

Finding 1. The project was well aligned with Cameroon's strategic sustainable development priorities for the horizon 2035.

42. The project contributed to the operationalization of Cameroon's National Development Strategy 2030 (NDS 30, Ministry of Economy, Planning and Regional Development, 2020a), particularly its "Structural Transformation" pillar, which aims to increase agricultural production to meet strong national and subregional demand. The NDS 30 indeed foresees the establishment of agricultural input manufacturing plants (seeds, chemical fertilizers, plant protection products and veterinary products), while prioritizing input certification and quality control, proper enforcement of relevant regulations, development of intensive production systems, and promotion of the most efficient technologies. The "Human Capital Development and Well-being" pillar of the NDS 30 also prescribes the rational use of soils through responsible farming practices, including the rational use of fertilizers and pesticides, as well as modern techniques for soil restoration and sustainable management.
43. The project's objectives were well aligned with the priorities of the Rural Sector Development Strategy 2015–2020 (RSDS 2015–2020: Ministry of Economy, Planning and Regional Development, 2016), notably its Pillar 1, which aims to widely promote intensive and sustainable farming systems, develop integrated pest and disease management methods for crop production, strengthen livestock health protection and zoonosis control, and take measures for the development of environmental services. The project also contributes to Pillar 2, which aims to accelerate the establishment of quality control laboratories for agroforestry, livestock and fishery inputs, facilitate the creation of distribution networks for machinery, tools and inputs including plant protection products, and to Pillar 3, which focuses on improving water resource management, soil conservation and restoration, and biodiversity preservation.
44. The project was well aligned with the Rural Sector Development Strategy coupled with the National Agricultural Investment Plan for the period 2020–2030 (RSDS/NAIP 2020–2030: Ministry of Economy, Planning and Regional Development, 2020), particularly with Strategic Objective 1, which focuses on supporting access to inputs, equipment, tools and productive infrastructure, as well as strengthening phytosanitary surveillance, protection and control of major emerging plant pests.
45. The project was well aligned with the priorities of the 2020–2030 Health Sector Strategy (HSS) (Ministry of Public Health, 2020), which aim to improve living conditions, including better management of collective liquid, solid and gaseous waste; educating the population on hygiene and sanitation; sanitation of food sales and consumption sites; health promotion; and prevention of non-communicable diseases in the workplace.

Finding 2. The project was strongly aligned with the Sustainable Development Goals (SDGs), international conventions, and the priorities of FAO and GEF.

46. The project was fully aligned with SDG 12, particularly Target 12.4, which aimed by 2020 to achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on

human health and the environment. It was well aligned with SDG 3, particularly Target 3.9: "By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination".

47. The project was relatively well aligned with SDG 12, whose Target 2.3 aims to double agricultural productivity and incomes of small producers by 2030, especially women, Indigenous Peoples, family farmers, livestock herders and fishers. It therefore provides to ensure equal access to land, other productive resources and inputs, including pesticides. Indeed, due to a lack of resources, information or adequate training, small producers have limited access to quality plant protection products and still do not manage those they have access to properly. The project's development of alternatives to chemical pesticides based on local knowledge was an opportunity to reduce inequalities in access and use.
48. The project's objectives are well aligned with the GEF-5 Strategy on chemicals, particularly with the CHEM-1 focal area on the management, prevention and elimination of POPs waste and the environmentally sound management of contaminated sites.
49. The project represented a significant contribution to the implementation of measures to reduce or eliminate the release, production, use, import and export of POPs listed in Cameroon's National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (Ministry of Environment, Nature Protection and Sustainable Development, 2016). Its activities were well aligned with the priorities of the implementation action plan validated during the November 2015 workshop, namely i) strengthening the institutional and legal framework; ii) raising public awareness and all stakeholders' knowledge about the dangers of POPs and the programmes for their reduction and eradication; iii) eliminating pesticides listed in Annexe A of the Convention; iv) collecting, storing and final disposal of equipment, articles and waste containing polybrominated biphenyl ethers⁹ and other POP flame retardants) reducing dioxin and furan emissions from the six main identified sources, including savannah and forest fires, open-air and landfill burning of household waste and incineration of healthcare waste.
50. The project was well aligned with three of the four betters of the FAO Strategic Framework 2022–2031, and particularly with five of the 20 Programme Priority Areas, namely BP 1 (innovation for sustainable agriculture production) and BP 3 (One Health) under the better production pillar; BN 1 (healthy diets for all) and BN 3 (safe food for everyone) under the better nutrition pillar; BE 3 (biodiversity and ecosystem services for food and agriculture) under the better environment pillar.
51. The project remains aligned with Outcome 4 of the FAO Country Programming Framework for Cameroon for the period 2022–2026, namely: by 2026, populations, including youth, women and socially vulnerable groups from different agroecological systems live in a healthier environment, sustainably manage environmental resources including biodiversity, and are more resilient to disaster- and climate-related shocks.

⁹ Polybrominated biphenyl ethers (PBDEs) are a group of brominated chemical substances with flame-retardant properties.

Finding 3. The project addressed one of the major environmental and public health issues in Cameroon. Its objectives remain relevant, and the needs are still immense.¹⁰

52. The project aimed to strengthen Cameroon's capacity for pesticide management at three levels: individual, organizational and enabling environment. However, to generate tangible outcomes at the national level, these processes require a relatively long timeframe – beyond the three years initially planned for this project – as well as increased investment and commitment from the national authorities, particularly the government, which must fulfil its sovereign role and mobilize other necessary partnerships.
53. The issue of environmental contamination by obsolete pesticides, other hazardous chemicals and their empty containers remains a serious concern for Cameroon. This is further exacerbated by the influx of smuggled products, facilitated by porous borders, corruption and limited public awareness of associated risks and hazards. The spraying of insecticides to preserve or repel pests (such as flies and worms) from widely consumed products – such as fresh or smoked meat and fish, fruits and vegetables, and kola nuts – illustrates the urgent need for a well-documented “health awareness” approach. These observations made during the field mission corroborate the information from the literature review presented in the context section (see sections 1.2.2 and 1.2.3).
54. Suspicions regarding the use of formalin to preserve or artificially ripen certain fruits and vegetables have recently made headlines in Cameroon. Investigations conducted by the Evaluation Team with qualified resource persons revealed that the substance in question was actually Ethrel (a growth regulator approved in Cameroon for stimulating pineapple ripening), but it was being misused by vendors on several other crops. However, the Evaluation Team learned that formaldehyde¹¹ or formol was being illicitly used in Cameroon for the preservation of meat products, despite the fact that the International Agency for Research on Cancer (IARC) has classified it as a probable human carcinogen through inhalation (French Food Safety Agency, 2004). These two examples of illicit use of chemicals in the food chain once again demonstrate the extent of the risks associated with the use of hazardous chemicals in Cameroon's agrifood systems, thus highlighting the necessity and urgency of providing a comprehensive, holistic and sustainable response.
55. The implementation of the project brought back to the forefront the broader issue of sustainable management of the living environment and the improvement of hygiene and health for the population. For example, alongside the issue of managing empty pesticide containers targeted by the project, there is the broader issue of managing empty plastic containers from various sources, which accumulate, pollute and create hygiene and health problems in the main living environments in Cameroon. These issues were reiterated by stakeholders consulted during the evaluation as being among their main concerns. Stakeholders involved in the evaluation also agreed that chemicals act as “silent killers”, but emphasized the lack of concrete and factual data needed to support decision-making and awareness-raising efforts. These broader issues, as well as the tools, methods and

¹⁰ As specified in sections 1.2.2 and 1.2.3 related to the context, the problems are numerous and the needs immense, while the response approaches are very often fragmented and the achievements poorly consolidated and scaled up.

¹¹ Formaldehyde is a colourless gas with a pungent odour, highly soluble in water, and which slowly polymerizes. Aqueous solutions, with formaldehyde concentrations varying between 30 and 50 percent, are known as formalin or formaldehyde solution.

strategies tested or developed by the project, represent opportunities and avenues for Cameroon and its partners to explore in future projects aimed at sustainable environmental management and pollution and risk prevention.

3.2 Coherence [S: Satisfactory]

Finding 4. The project followed a previous initiative (the CleanFarms project funded and implemented by CropLife International) which secured 44.9 tonnes of obsolete pesticides and POPs in a central warehouse in 2013. But its TOC, although coherent, did not sufficiently take into account the risks related to the failure to respect the sequence and timing of planned activities, the project's limited capacity to diligently manage certain activities under the sovereign authority of the State (such as law revision), and finally the institutional context marked by administrative delays and difficulties in collaboration between several institutions.

56. The project follows the CleanFarms project funded by CropLife International, which made it possible to inventory 330 tonnes of obsolete and POP pesticides held by stakeholders (government agencies, agricultural product retailers, farmers and other users) between 2009 and 2010. A large portion of these obsolete or soon-to-be obsolete pesticides inventoried had been resold and used during the interim period from 2010 to 2013, that is, between the time of the inventory and the secure storage. In total, 44.9 tonnes were collected, packaged, transported and stored at the central warehouse in Edéa, awaiting disposal.
57. The project was intended to complement and support Cameroon's institutional capacity-building activities in sustainable pesticide management (see section 1.3.1). The project also planned, quite pertinently, to promote the use of affordable, low-cost and already available alternatives to chemical pesticides, starting by testing their effectiveness and ensuring they were accessible to farmers.
58. Although the project components were complementary and well structured, the activities planned within each component were insufficient or insufficiently coordinated to reduce or minimize the risks related to obsolete pesticides, POPs, and associated waste on the environment and human and animal health.
59. In Component 1, "Safe disposal of POPs and obsolete pesticides and restoration of contaminated sites", it was very appropriately planned to first develop operational strategies, then implement them to eliminate obsolete pesticides and associated waste and ensure the restoration of contaminated sites. The evaluation notes that this logical chain could only produce outcomes if its various links were carried out in the proper sequence and within appropriate timeframes. The project should have, in its design, included preventive and mitigation measures for these major risk factors that are recurrent in the Cameroonian context, including measures enabling their monitoring and proactive management by the project team.
60. The same applies to Component 2, which planned to develop and implement pilot projects for the management of EPCs (triple rinsing, collection, transport, storage and recycling), and to capitalize on the lessons learned to develop and promote the national strategy for managing EPCs. Success factors also involved respecting implementation deadlines, as products developed at the last minute do not leave enough time for the target groups to appropriate and adopt them.

61. In its Component 3, the project planned to review, improve, strengthen and make more operational the laws, bodies and systems that are essential for the management of pesticides throughout their life cycle. Such improvements, however, require a long time and the involvement of various stakeholders, as these activities fall within the sovereign domain. Given the short duration of the project, its design should have more clearly delineated its scope of action and area of contribution and explicitly defined the responsibilities of the government as *sine qua non* conditions for achieving the intended outcomes.
62. Under Component 4, "Promotion of alternatives to conventional pesticides and communication strategy", the project aimed to identify, test and promote alternatives to POPs and other hazardous pesticides that are both technically and economically viable. The timeframe for carrying out all the planned activities was not realistic, and there was a risk of a domino effect, as delays in the initial activities impacted those that followed.
63. Given the poor pesticide use practices outlined in section 1.2 on country context and the population's limited awareness of the health risks posed by pesticides, there is a significant need in Cameroon for a broad, well-documented awareness campaign. The project should have included specific activities aimed at documenting the actual risks of pesticides and associated waste to public health and the environment, and using this information to support and strengthen the communication and awareness campaign targeting the intended population.

Finding 5. The project failed to capitalize on certain proven approaches (such as the Farmer Field School [FFS]) or emerging ones (such as the Participatory Guarantee System [PGS]) that could have enhanced its impact potential. Yet, PGS are currently being piloted by stakeholders along agricultural value chains in Cameroon, and the government has initiated consultations to recognize PGS as a certification system for animal production and to incorporate it into the draft law on organic agriculture under preparation in the country. Some of the project's intervention strategies and activities also lacked the capacity to sustainably address the priority needs for health and environmental protection, while others, focused on finding concrete solutions, were overly ambitious given the time frame and the well-known operational and structural constraints in the context. For example, priority was given solely to "the elimination of the available stock of obsolete pesticides through export and destruction abroad", which is merely a palliative solution. The action-research approach proposed to develop alternatives to highly hazardous pesticides also has little chance of producing the desired impact on beneficiaries, given the short duration of the project.

64. As part of Component 1, the project prioritized the disposal of POPs and obsolete pesticides through their secure export for destruction abroad. By doing so, it missed the opportunity to truly strengthen Cameroon's capacities in this process. Cameroon has several companies operating in the treatment and/or recycling of hazardous or environmentally and human health harmful waste. The project did not formally conduct an assessment of these organizations' capacities or their needs for strengthening in the elimination of hazardous pesticides and associated waste. Prioritizing only the disposal of the available stock of obsolete pesticides through their export and destruction abroad was merely a palliative solution, as stocks will continue to accumulate due to illegal pesticide trafficking – many of which are seized during inspections – and poor planning of registered pesticide imports. The project should have strengthened national capacities both for stock management and for their disposal and/or recycling. This view is supported by the testimony of a government official: "As long as Cameroon uses pesticides, there will be

obsolete stocks. We cannot rely indefinitely on projects to dispose of them". In the long term, Cameroon needs to have national capacities for the management and disposal of obsolete pesticides, as does Africa as a whole. Priority should be given to national or regional service providers and efforts should focus on strengthening them, rather than merely funding the treatment of these products in Europe, as was the case in this project.

65. Within the framework of Component 4, the project did not carry out a broad and in-depth assessment of the risks to human health and the environment linked to the use of chemical pesticides in production basins, some of which are located in water catchment areas. However, the evaluation stakeholders, well aware of the realities on the ground, agree on the regular pollution of water points used by the populations and the high contamination of farmers and residents near the agricultural production basins. Although this project did not have the means to plan and carry out certain activities with high potential for positive effects/impacts that were not included in its design, it is necessary to include them in future projects. For example, this involves quantifying/measuring the actual risks, harms and pesticide residues affecting the population and the environment to support awareness-raising, increased understanding, and the engagement of communities and decision-makers against these risks and dangers. Regarding the promotion of alternatives to chemical pesticides, the approaches most likely to create effect and impact were lacking: FFS and PGS (see Finding 15 and Finding 16).
66. The FFS approach was missing, which would have better ensured the mobilization, participation and learning of beneficiaries, and promoted the adoption of alternatives to chemical pesticides. The project also did not capitalize on recent experiences in the field of pesticide reduction in agriculture: the case of the "Green Innovation Centres for the Agri-food Sector" project (ProCISA) of the German Agency for International Cooperation (GIZ) (see Oberson *et al.*, 2018), in partnership with the International Potato Centre. According to the stakeholders interviewed, the ProCISA approach, similar to FAO's FFS approach, was one of the factors behind its success.
67. Experiences based on PGS to prevent and mitigate risks related to the misuse of chemical pesticides exist in Cameroon and deserved the project's attention, either by supporting their dynamics or by capitalizing on their achievements and lessons learned. The PGS aim to support progress towards a more ecologically and socially coherent agricultural model. They are locally oriented quality assurance systems for production processes and products that certify producers based on active participation from the stakeholders involved, built on a foundation of trust, networks and knowledge sharing. Cameroon has a draft law on organic agriculture, initiated since 2006, but it has still not been integrated into public policies. In 2023, the government held discussions with non-governmental organizations and several stakeholders in the organic agriculture and agroecology value chain to incorporate into the body of this law and its implementing texts the recognition of PGS as a certification system for agricultural productions (see Knowledge Hub for Organic Agriculture and Agroecology in Central Africa, 2023). The project therefore missed the opportunity to integrate PGS among its activities for exploring, experimenting with, and promoting agrifood systems that are free from or minimally dependent on hazardous chemical pesticides.

Box 2. Emergence of the Participatory Guarantee System in the West region

In the West region of Cameroon, for example, there is a growing interest among the population in products from organic agriculture and sustainable farming systems, as well as those that use very few chemical inputs. However, the cultivated areas using these alternative systems to conventional ones remain relatively modest, and production costs are burdened by the workload. Its sustainable development requires fair compensation for farmers involved in this value chain and a quality guarantee for consumers who pay a significantly higher price for these products. The Mbouo Multipurpose Training Centre in Bandjoun supports the development of the PGS in Western Cameroon. This centre hosts a large monthly market whose stakeholders are connected through a WhatsApp group with about 500 participants. The day before each market, the producers communicate their availability for various crops. The system works well and meets a real market demand that is constantly increasing. The sustainable growth of PGS and the quantities of products produced and marketed requires strengthening the technical and organizational capacities of the actors and the supporting environment. The project missed the opportunity to explore and capitalize on lessons learned, as well as to adopt or even replicate the best practices developed through this system.

Source: Authors' own elaboration.

68. Moreover, the project did not plan activities that would allow for the generation, updating or dissemination of broader and specific data on the direct, short- and long-term effects of pesticide misuse or pollution on human health and the environment. A prevention-centred approach—based on well-documented and effective awareness-raising and communication, improved management of collective liquid, solid and gaseous waste, public education on hygiene and environmental sanitation, sanitation of food sales and consumption sites, health promotion and prevention of non-communicable diseases—deserves to be considered in future interventions.

3.3 Effectiveness [MU: Moderately Unsatisfactory]

Outcome 1. Existing stocks of POPs and obsolete pesticides are disposed of in an environmentally sound manner, and sites contaminated by POPs and pesticides are remediated. [Moderately Unsatisfactory]

Finding 6. The project inventoried an additional 47.6 tonnes of obsolete pesticides, bringing the total amount of obsolete pesticides available in Cameroon to 92.7 tonnes. However, due to budgetary constraints, only 35.7 tonnes were disposed of, representing a completion rate of 38 percent compared to the target.

69. In 2018, Cameroon had a total of 92.7 tonnes of obsolete pesticides to be disposed of. This total consisted of 45 tonnes previously inventoried and secured in the Edéa warehouse by the CleanFarms project in 2013, and 47.6 tonnes newly inventoried in 2016 and 2018 through the project. Indeed, the new inventory carried out in nine regions in August 2016 led to the identification of 30.06 tonnes of obsolete pesticides and 2 tonnes of empty pesticide containers. This stock increased to 58.6 tonnes in July 2018 following an additional inventory of 583 containers and 11 037 tonnes of obsolete pesticides in the "Magzi Douala" industrial area—comprising 10.5 tonnes of methyl bromide at Arysta LifeScience and 0.537 tonnes of aluminium phosphide at Horizon Phyto Plus.
70. The agreed strategy for the disposal of obsolete pesticides at the start of the project was to first dispose of the 45 tonnes already stored in the Edéa warehouse (Phase 1), and then proceed with the disposal of 55 tonnes of pesticides identified during the new inventory (Phase 2). Thus, under Phase 1, a contract was signed in December 2016 between FAO and Veolia ES Field Services Limited to carry out the safeguarding, transport and disposal of 44.9 tonnes of obsolete pesticides from the Edéa warehouse. This contract, initially scheduled to end on 30 June 2017, had to be extended until 23 November 2017, due to

delays in obtaining the notification and movement documents required by the Basel Convention from the Cameroonian authorities. Finally, 35.7 tonnes of obsolete pesticides and empty pesticide containers found in the Edéa warehouse were securely handled by VEOLIA (see FAO and GEF, 2017b), then shipped and disposed of in France in March/April 2018. The missing quantity (9.2 tonnes) is believed to be due to a burglary at the Edéa warehouse in the meantime.

71. In the context of Phase 2, an environmental assessment was carried out in 2019 for the disposal of 47.6 tonnes of obsolete pesticides inventoried between 2016 and 2018 (FAO and GEF, 2019a), then updated in 2020 to include the stock of 10.5 tonnes of methyl bromide recorded at Arysta LifeScience in 2018 (FAO and GEF, 2020a). However, the tender published for this purpose between December 2021 and February 2022 received only one technical bid that met the criteria, but its cost exceeded the available budget. Therefore, the PSC meeting on 24 February 2022 recommended that the stock of POPs and obsolete pesticides inventoried by the project (58.1 tonnes) be collected, packaged and stored in an appropriate warehouse. The government, through the Ministry of Environment, Nature Protection and Sustainable Development, shifted its priority to the disposal of methyl bromide¹² (10.5 tonnes), but faced budgetary constraints. Finally, neither of the two options was carried out.

Finding 7. The project did carry out a detailed environmental assessment of two polluted sites considered priorities among the 11 identified, but it failed to rehabilitate them due to the reallocation by the PSC of the funds originally planned for this purpose to the activity of disposing of obsolete pesticides. The Committee judged that the option of excavating the polluted area for treatment or disposal abroad would be too costly compared to the available budget and did not explore other decontamination methods. However, the polluted site in Dschang, contaminated with endosulfan and DDT, is used by visually impaired people for farming and livestock, while the site in Lagdo, contaminated by unknown chemicals, is now polluted by obsolete chemical pesticides following the deterioration of the roof of a storage warehouse.

72. The project conducted a rapid environmental assessment in May and June 2016 on 12 sites potentially contaminated by POPs and obsolete chemical pesticides, and classified six sites as priorities: Lagdo, Abong Mbang, Nkolbisson, Dschang, Nkongsamba and Mbouda (FAO and GEF, 2016c). Among these six priority sites, the PSC, considering the available budget, recommended a detailed environmental assessment (DEA) of two sites deemed most urgent: the Dschang site (former Quinquina Farm), which currently houses the Cameroon Centre for the Rehabilitation, Training and Social Integration for the Blind (CREFISAC), and the Lagdo site (known as the Camp Chinois). This DEA carried out in 2017 (FAO and GEF, 2018c) made it possible to determine the levels of pollution, thereby confirming the hazardous nature of these sites and the urgent need for their remediation. An environmental management plan (EMP) was developed for this purpose (FAO and GEF, 2018d).
73. It is, however, surprising to note that the remediation of these two sites was ultimately not carried out. Indeed, during its fourth meeting held in November 2020, the PSC proposed

¹² Methyl bromide is one of the substances targeted by the Montreal Protocol and Regulation (European Community) No. 2037/2000 of the European Parliament and of the Council concerning substances that deplete the ozone layer. Its production and marketing have been prohibited since 2005, except for exemptions for strictly regulated uses.

reallocating the funds initially earmarked for site decontamination to activities related to the disposal of obsolete pesticides, justifying this decision by the fact that the remediation strategy proposed in the EMP was too costly, as it required the excavation and export of contaminated soil abroad for disposal. By doing so, the PSC overlooked the initial option based on secure burial (a less costly technique) that was proposed in the EMP. The export option was based on the idea that Cameroon would not have sufficient capacity to carry out this operation, as asserted without evidence in the environmental assessment report and the EMP conducted in 2019 (FAO and GEF, 2019a). However, several organizations met in Cameroon disagreed, indicating that their capacities for the disposal of obsolete pesticides and/or associated waste had never been properly assessed, even though they were willing to collaborate with the project or to identify areas where they needed strengthening or improvement. The Evaluation Team did not receive any report detailing the strengths, weaknesses and capacity-building needs of the national organizations working in the hazardous waste treatment sector. This was a missed opportunity, as support to national companies could have promoted the project's sustainability and prepared the way for future interventions.

Box 3. Issues and challenges of the contaminated sites in Dschang

The contaminated site in Dschang (Figure 2), which dates back to the colonial era, was home to the Quinquina farm that used pesticides for quinine production. It currently hosts the Centre for Rehabilitation, Training and Social Integration for the Blind in Cameroon, established in 2006, which continues to carry out training activities for the visually impaired in agriculture, livestock and crafts. The site also includes a pigsty, a large part of whose floor was concreted when the site was allocated to the Centre. Following the project's detailed environmental assessment of the site, endosulfan, DDT, alpha and beta levels exceeding the recommended thresholds for residents and workers were found in the earthen floor of the building (FAO and GEF, 2018c). The DEA recommended: i) excavation of layers of exposed soil; ii) use of a chlordane-based soil analysis kit to determine the required removal limits; iii) pouring concrete over the remaining bare soil areas to further reduce the risk; iv) removal of a limited quantity of soil from the north-west outer corner of the pigsty to reduce associated risks in that area and treat the soil safely, either by sending it to a secure landfill if available, or by storing it in a secure facility for potential chemical destruction alongside the expired pesticide stocks.

In the second building, which is used for storing artworks, the Evaluation Team witnessed strong chemical odours, posing a real health risk. CREFISAC does not receive any government subsidies, and its resources, drawn from the sale of its products, are modest and insufficient to effectively carry out its activities or meet the training demand from visually impaired individuals. Its current enrolment includes 13 boarding trainees and seven non-boarding trainees, while it has the capacity to accommodate 32 individuals. It is one of the few institutions offering this type of training in Cameroon and is in high demand.

Given the mission of this centre, FAO and the government must urgently implement actions to at least secure and, ideally, improve the centre's training facilities. The centre practises organic farming on an adjacent plot that has never undergone toxicity testing.

Source: Authors' own elaboration.

Figure 2. Contaminated site of Dschang with a view of the agricultural activities of the Rehabilitation, Training and Social Integration Centre for the Blind in Cameroon



Box 4. Issues and challenges of the contaminated sites in Lagdo

The contaminated site of Lagdo (see Figure 3), known as the “Camp Chinois” locality, was formerly the living quarters of the Chinese company that built the Lagdo hydroelectric dam in the early 1980s. Exposure to chemicals caused the death of a child in 2009. On this site, it is possible that two contaminated sites, rather than just one, exist to this day. Indeed, the Evaluation Team observed that opposite the large warehouse (known as the MEADEN warehouse), which holds the stock of obsolete pesticides, there is another warehouse whose roof was torn off by the wind after the 2016 inventory, causing the degradation and dispersion of the pesticide stock stored there. On this soil, there are all kinds of unidentified waste, as well as abandoned containers and treatment equipment. A little further away is the contaminated site identified in the 2016 inventory, located near the city’s technical high school. At this location, there are still barrels of unknown chemical products, rusted and degraded, abandoned here and there in the brush nearly 40 years ago by the Chinese company. Given the risks involved, FAO and the government must also urgently undertake decontamination measures or at least secure this site.

Source: Authors’ own elaboration.

Figure 3. Contaminated site in Lagdo

Note: From left to right: pesticide waste and empty containers scattered in the Lagdo Camp Chinois warehouse without a roof; obsolete pesticides in the large MEADEN warehouse; drums of unknown chemicals abandoned in the wild.

Outcome 2. Risks to human health and the environment related to empty pesticide containers are reduced through the establishment and improvement of packaging management systems at the national level. [MU: Moderately Unsatisfactory]

Finding 8. The project designed and implemented two microprojects for the management of empty pesticide containers at two sites, which generated interest and engagement from the targeted actors and farmers during the operation period. However, the adoption of good practices and the proposed management model remained very limited, for several reasons including limited access to water in the northern part of the country; poor understanding/application of the triple rinsing concept; significant shortcomings in the logistics of collection, storage, shredding, transport and recycling of EPC; the buyback price of EPC from producers considered low compared to the resale price on the market; the short duration of the collection activity; the absence of coercive tools to encourage positive behaviour and attitude changes; and the cessation of the activity without any “exit strategy”.

74. The project developed two microprojects for the management of empty pesticide containers at the sites of Garoua in the North and Loum in the Littoral region (FAO and GEF, 2019f). Each microproject is essentially a model or system for the safe management of EPC designed and proposed by the project for each of the two targeted regions. The model is based on raising awareness and training on the triple rinsing of empty pesticide containers, their collection, pre-destruction, storage and transport to an authorized organization for destruction or recycling, as well as the promotion of good practices among beneficiaries.
75. The implementation of the microprojects was coordinated by the National Confederation of Cotton Producers of Cameroon under the supervision of Sodécoton in the North, and by the Cooperative of Honest Planters of Cameroon under the supervision of the Loum municipal council in the Littoral region. The holders of EPCs in the North are cotton farmers and food crop producers, almost all affiliated with the National Confederation of Cotton

Producers of Cameroon, whereas those in the Littoral region are cocoa, coffee, vegetable and food crop producers, as well as an agroindustry (PHP).

76. The awareness and communication strategy was successfully implemented at the project sites in Garoua¹³ and Loum by two partners (AFAIRD in Garoua and CREPD in Loum) (FAO and GEF, 2017c; FAO and GEF, 2018e). The supervisory staff of the National Confederation of Cotton Producers of Cameroon and the cotton and vegetable crop producers from the localities within the Garoua site, as well as the supervisory agents of the Cooperative of Honest Planters of Cameroon and the coffee, cocoa and food crop producers from Loum and surrounding areas, were trained. Regional and local media outlets (Cameroon Radio Television Garoua, Radio Bonne Semence in Baboudji, Radio Salaaman, Radio FM DEMSA, and a radio station based in Nkongsamba) broadcasted spots and announcements on the management of EPCs.
77. Awareness-raising activities involved a total of 476 people in the Loum area, including 383 men (80 percent) and 93 women (20 percent), and 200 people in the Garoua area, including 60 women, 90 men, 35 girls and 15 boys. The approaches used included educational talks through discussion groups, radio broadcasts and spots, as well as banners, posters and brochures to illustrate the triple rinsing and draining of EPCs. Key messages were disseminated in both French and local languages, and the triple rinsing method was widely promoted.
78. The implementation of the microprojects helped build the capacity of 791 producers (186 women and 605 men) in managing EPC, through training on triple rinsing immediately after use. A total of 2 000 posters illustrating the triple rinsing process and the dangers of using empty pesticide containers for domestic purposes were produced and distributed/displayed by the project. Six media outlets promoted the pilot projects. All these support actions led to the collection of 2.7 tonnes (2.0 tonnes and 0.7 tonnes) of empty pesticide containers at the two pilot sites.
79. In general, the collection of EPC took place throughout the implementation period of the two microprojects without encountering significant difficulties, as long as the producers were compensated for the EPCs returned. However, several factors limited or reduced the adoption of the proposed sustainable EPC management model in Loum and Garoua.
80. The application of the proposed model was indeed weakened by several constraints such as unavailability or limited access to water; poor interpretation/understanding of the triple rinsing concept; insufficient logistical organization to maximize collection; refusal to collect EPC without labels referring to the pesticides; lack of storage space since these containers were not crushed as initially planned; and the buyback price of the EPC considered too low¹⁴ compared to the market resale price. A 5-litre container was bought back at XAF 300 while it could be resold on the Loum market for XAF 1 000; the 20-litre container was bought back at XAF 500 compared to a resale price of XAF 2 000 on the market. During the evaluation mission in September 2023, some EPC collected from the Garoua site were

¹³ Garoua site (localities of Dolla, Waffango, Baboudji, Hamaladé) in the North and Loum site in the Littoral region.

¹⁴ Twenty-litre container: XAF 500; 5-litre container: XAF 300, 1-litre container: XAF 50; 0.5-litre container: XAF 25, smaller size from 500 ml to several doses: XAF 25; empty vials from 50 to 100 ml: XAF 10; 1-kg batch of sachets: XAF 200.

still found in villages, stored in warehouses or in the yards of collectors (Figure 4). Moreover, in September 2023, those stored in the large warehouse in Pitoa had still not been transported or recycled. The same applies to the EPC (approximately 2 tonnes) collected by the Cooperative of Honest Planters of Cameroon in Loum, which remained for a long time in these cramped storage facilities before being transferred to Nkongsamba.

Figure 4. Empty pesticide containers bags



Note: From left to right: in a secured storage facility in Dolla and in the open air in Wafango.

81. The project did not contribute to the development and adoption of laws on the management of EPCs in Cameroon, as initially planned under the activities of Output 2.1. As a result, it missed the opportunity to strengthen coercive tools that could encourage positive changes in behaviour and attitudes regarding the management and recycling of EPCs. No exit strategy was implemented to ensure the continuity and sustainability of EPC management in the targeted sites.
82. These factors, which limited the adoption of the proposed model, should be taken into account in the short and medium term when considering the design, replication or continuation of such microprojects, and in operationalizing the national strategy for EPC management developed by the project.

Box 5. Insights, benefits and lessons from the implementation of the model in Loum

The collection operation for empty pesticide containers lasted two months (October and November), during which producers could return the EPCs to the Cooperative of Honest Planters of Cameroon in exchange for payment. Seventy percent of farmers in the locality were reached. Farmers are now better informed than in the past about the dangers of reusing EPCs. Aside from the low collection of 5-litre drums, which are highly valued and widely used by producers, the enthusiasm for returning EPCs was so remarkable that the farmers kept urging the project managers and Cooperative of Honest Planters of Cameroon to come and collect the EPCs. Currently, triple rinsing (or at least rinsing) continues among many farmers. However, the puncturing of containers no longer takes place because these empty pesticide containers are no longer bought back by the project, and old habits are reestablishing. The collection period (two months) was also considered too short. To generate greater impact, it is recommended to introduce training and awareness on the technique called "triple rinsing and perforation" at the beginning of the main agricultural season rather than at the end. Beyond the pilot phase based on two zones, the project should also have targeted at least two-thirds of the concerned population to achieve a more significant impact, involving cooperatives, common initiative groups and agro-industries. In the future, it is necessary to establish a proper recycling structure based on a public-private partnership. Collection and recycling companies exist (for example, NAME, which collects waste from Socapalm, and REDPLAST, which handles waste from Horizon Plus), and their capacities deserved to be assessed and strengthened.

Source: Authors' own elaboration.

Finding 9. The project developed a relevant national strategy for the management of empty pesticide containers, accompanied by an action plan that was validated by the stakeholder. However, it was not approved by the partners (FAO and the Government of Cameroon) for publication and implementation by all stakeholders.

83. The project developed an EPC management strategy for Cameroon covering 2020–2030 (FAO and GEF, 2020d), equipped with an action plan including four Strategic Objectives (FAO and GEF, 2020e): Strategic Objective 1 – Strengthen the national regulatory framework related to EPC management; Strategic Objective 2 – Establish a dedicated system for the collection and treatment of EPCs; Strategic Objective 3 – Communicate, inform, and raise public awareness about the dangers associated with EPC use; and Strategic Objective 4 – Establish a treatment value chain for EPCs.
84. Building on the lessons learned from the implementation of the microprojects, the EPC management strategy proposes, within the framework of Strategic Objective 2, to entrust the management of EPCs to an entity with cooperative status that does not pursue solely economic objectives, benefits from public utility status, but whose business model does not rely solely on subsidies. Such a cooperative would be responsible for coordinating awareness-raising, collection, destruction and repurposing activities related to EPCs, as well as for mobilizing the resources needed for its operations.
85. The proposed EPC management entity will serve pesticide importing companies, as they are responsible for removing their EPCs from the Cameroonian environment, in accordance with Articles 3, 5 and 6 of Joint Order No. 004 issued by the Ministry of Environment, Nature Protection and Sustainable Development and the Ministry of Trade on October 24, 2012 (Ministry of Environment, Nature Protection and Sustainable Development and Ministry of Trade, 2012) regulating the manufacture, import and marketing of non-biodegradable packaging.
86. The EPC management model proposed in the strategy recommends that its financing be ensured by importing companies through a contribution/fee proportional to the volume of packaging they respectively generate. Once this structure is established, the issuance of the environmental permit to an importing company will be conditional upon the presentation of a contract or membership agreement stating the company's commitment to entrust it with the collection of its EPCs.

Outcome 3. The regulatory framework and institutional capacity are strengthened for the sound management of pesticides throughout their life cycle. [MS: Moderately Satisfactory]

Finding 10. The project revised the existing regulatory texts to cover the entire life cycle of pesticides in Cameroon. However, at the time of its closure, the "improved regulations" developed under the project were still in the process of being finalized prior to their validation and adoption by the government.

87. The project reviewed the national pesticide legislation and identified the provisions that needed to be revised and completed. However, the revision process experienced significant delays due to the slow pace and challenges encountered in setting up the interministerial working group responsible for carrying out the revisions. Ultimately, the regulatory framework for pesticide management was updated by a national consultant under the supervision of an international consultant, through the amendment and completion of certain provisions of Phytosanitary Law No. 2003/003 of 21 April 2003 (Republic of

Cameroon, 2003) and its implementing decrees (Republic of Cameroon, 2005a, 2005b, 2005c). According to the latest annual project implementation report (FAO and GEF, 2023), the revised texts were submitted to the Development Law Service at FAO for review, including an assessment of their compliance with the requirements of the International Code of Conduct on the Distribution and Use of Pesticides (FAO and WHO, 2008 and 2010). At the time of drafting this evaluation report in April 2024, the proposed bill was still awaiting validation prior to its adoption. Once validated, its implementing decrees will be developed, which will also require working meetings on the draft decrees and various consultation processes with the relevant administrations, including arbitration by the Prime Minister.

88. The project supported the assessment of the factors hindering the functioning of the National Phytosanitary Council. This entity, established in 2005 (Republic of Cameroon, 2005a), is mandated to advise the government and provide opinions on draft legislative or regulatory texts, the implementation of phytosanitary policy, and issues related to plant protection. The first and second sessions of the National Phytosanitary Council were organized with the support of the project in collaboration with the Ministry of Agriculture and Rural Development, and a three-year action plan for 2019–2021 was approved. Unfortunately, its implementation could not be carried out due to the unavailability of budgetary resources. However, the Secretariat worked on implementing the recommendations made during these sessions, particularly Recommendation No. 4, which aimed at exploring sustainable financing for the activities of the National Phytosanitary Council, and significant progress was made in this regard. Consultations were held between the Ministry of Agriculture and Rural Development, the Ministry of Finance, and other stakeholders to identify a sustainable financing mechanism for phytosanitary activities. These consultations are ongoing and are expected to lead to a session that will decide on the draft joint decree setting the phytosanitary certification fees. So far, three sessions of the National Phytosanitary Council have taken place, with the most recent session held on 25 November 2020. The last council session, scheduled for December 2023, was postponed to a later date. The last renewal of the members of the said council took place on 31 July 2023, by Ministerial Order No. 00000193/Minader dated 31 July 2023.

Finding 11. The national capacity for registration, inspection and post-registration control of pesticides has been significantly improved with the contribution of the project. However, several links in the post-registration pesticide management chain still need to be strengthened before an effective reduction of risks to health and the environment can be expected.

89. The project identified training needs related to pesticide registration, inspections, information exchange on registration, and post-registration control. The project, in collaboration with the Ministry of Agriculture and Rural Development, organized training for 14 people (four women, ten men), including members of the national pesticide registration committee and staff from the Ministry's secretariat and the Interstate Committee on Pesticides in Central Africa, on the FAO pesticide registration toolbox. Two staff members from the two ministries (Ministry of Agriculture and Rural Development and Ministry of Environment, Nature Protection and Sustainable Development) underwent a two-year training programme and obtained a postgraduate diploma in pesticide risk management at the University of Cape Town in South Africa.
90. The project analysed how information on pesticides was exchanged and made recommendations. The project subsequently supported the integration, into two newly

created online platforms (www.drcq-minader.org; www.intranet.drcq-minader.org), of information on the quantities and characteristics of imported, registered, reregistered or banned pesticides, as well as relevant stakeholders. However, these platforms were not functional during the evaluation and at the time of the finalization of the report in October 2024. Indeed, they were hosted abroad on a temporary basis, pending the availability of the Ministry of Agriculture and Rural Development's official website (www.minader.cm). Subdomains were then created in 2023, and the site www.drcq.minader.cm operated for over a year before being damaged due to mishandling by the IT unit of the Ministry of Agriculture and Rural Development.

91. In addition, post-registration pesticide data are not systematically collected or made available to the registration committee and other interested parties. Data on pesticide exposure incidents are generally not available. Information on inspections conducted, seizures carried out and sanctions imposed on offenders is also lacking, although it is necessary to better inform stakeholders and the general public. These shortcomings should be addressed in the very short term to strengthen transparency in pesticide management.
92. In 2017, the project supported training on pesticide inspections and post-registration control for the benefit of 40 participants (ten women and 30 men), including phytosanitary inspectors and controllers from the Ministry of Agriculture and Rural Development, as well as customs officers and staff from the Ministry of Health and the Ministry of Agriculture and Rural Development. Based on the situation analysis conducted in 2018, 118 inspectors were trained, appointed and sworn in. In addition, 20 new inspectors were designated in 2019, bringing the total number of inspectors to 138. According to the project's annual implementation report (FAO and GEF, 2021a), 25 000 to 30 000 inspections were carried out annually between 2018 and 2020 at border points and within the national territory. However, due to a lack of detailed supplementary information on these inspections, the evaluation was unable to establish the project's actual contribution to improving the quality and effectiveness of these inspections.
93. Post-registration monitoring missions are provided for by Decree No. 2005/118 of 15 April 2005 on the organization of the Ministry of Agriculture and Rural Development (Republic of Cameroon, 2005d) and fall under the responsibility not only of the Department for Regulation and Quality Control of Agricultural Inputs and Products (DRCQ), but also of the Department for Agricultural Development. They are complemented by the provisions of Decree No. 2005/0772/PM of 6 April 2005 establishing the conditions for approval and control of phytosanitary products (Republic of Cameroon, 2005b).
94. In general, two to three control missions are planned each year at the regional level, targeting departments and districts. Recently, the Minister requested the regions to increase the number of planned inspections to at least four per year, demonstrating the government's commitment to intensifying the fight against illicit pesticides. However, despite an increase in personnel, logistical shortcomings and certain context-specific realities are among the reasons leading each regional delegation to adjust its inspection strategy and objectives. Planned missions are complemented by unannounced missions carried out in response to alerts, complaints or well-founded suspicions. An alert may arise from the observation of the distribution or use of an unregistered product in a given locality. The deployment of planned inspections is carried out with the approval of the Governor of the region, under the supervision of the Regional Delegate, with the support of the concerned Senior Divisional Officers and law enforcement authorities. Due to

inadequate logistical resources, some planned missions are often jeopardized or postponed, and certain remote or isolated localities are never inspected or are inspected only very rarely. For the same reasons, many alerts are not followed up with control missions. Indeed, slow, delayed, poorly synchronized, or leaked deployment significantly limits the effectiveness and impact of the mission.

95. In the West region, for example, 75 to 80 percent of the inspections planned at the district level were carried out during the year 2023. Some subdivisions could not be inspected. In other larger regions, the greater distances between subdivisions and the regional capital significantly limit the number of inspections, especially in a context where the regional delegations of the Ministry of Agriculture and Rural Development lack dedicated vehicles for control missions and quality assurance of inputs and agricultural products, as well as appropriate and secure storage facilities for large quantities of seized products. The majority of stakeholders encountered in the field agree that it is difficult to seize more illicit and hazardous products without adequate transport and storage logistics. Furthermore, delays observed in the decision-making processes regarding the handling of seized illicit products and the sanctioning of offenders are likely to demotivate inspectors.
96. In the West region, for example, although the distances between divisions are shorter compared to other regions, logistical means remain insufficient given the high intensity of agricultural activity and the border position with Nigeria, which facilitates the entry of unregistered illicit products. Paraquat continues to enter Cameroonian territory from Nigeria, despite being banned for the past three years. In 2023, for example, the Inputs Control and Quality Service conducted five inspection missions in the locality of Foubot. The first inspection mission failed because the information leaked, and the targeted traders kept their shops closed. Following this failure, the Head of the Quality Control Service developed strategies to limit information leaks about planned missions.
97. Logistics, particularly transportation and storage facilities, remain critical to improving the effectiveness of inspections. For greater effectiveness, it is necessary to synchronize field inspections and deploy inspection teams simultaneously across all targeted areas. The more smugglers are apprehended and brought before the courts, the greater the likelihood of observing a decrease in the importation, trade and use of illicit, unregistered and hazardous pesticides. At the end of phytosanitary control missions, a mission report, to which copies of the minutes of infraction findings are attached, is prepared and transmitted to the phytosanitary protection authority, through the hierarchical chain, as soon as possible. However, it is clear that the Ministry of Agriculture and Rural Development lacks a mechanism and dedicated personnel to monitor the sanctioning processes of offenders. Consequently, indicators on the number of smugglers actually apprehended and convicted are not tracked, which remains a weakness of the system in a context plagued by corruption, where the illicit pesticide sector is described by a government official as a "mafia". According to another government official: "Seizures have a deterrent effect that temporarily limits the importation of illicit products. Unfortunately, this deterrent effect is limited by the leniency of the sanctions provided under the phytosanitary law". Indeed, Article 33 of Law No. 2003/003 (Republic of Cameroon, 2003) provides that: "Any person committing the following offences shall be punished with a fine of 50 000 francs (XAF¹⁵): failure to present phytosanitary efficacy; failure to declare plants, plant products and

¹⁵ Equivalent to approximately USD 80.

phytosanitary products; failure to declare obsolete phytosanitary products". Similarly, Article 35 punishes with imprisonment from one to three months and/or a fine ranging from XAF 100 000 to XAF 1 000 000¹⁶ anyone who violates the provisions of Articles 20 to 26 relating to the conditions of importation, possession, marketing and use of phytosanitary products. It is also necessary to have a network of independent collaborators in the field, capable of providing reliable alerts on illicit pesticides.

98. Another risk factor identified during the inspection missions of the Ministry of Environment, Nature Protection and Sustainable Development concerns the inability of shop managers and pesticide vendors at the grassroots level to provide initial advice on good usage practices to producers. Indeed, the majority, if not almost all, of the individuals who sell or distribute pesticides at the end of the chain to producers lack the training or qualifications required by regulations. The Ministry of Agriculture and Rural Development says "For example, Mancozeb is found in many tomatoes." However, its main component (ethylene thiourea) is responsible for thyroid toxicity in mammals. Since 2021, Mancozeb has no longer been authorized as an active phytosanitary substance (Mancozeb, Toxicological Data Sheet No. 277, National Institute for Research and Safety for the Prevention of Occupational Accidents and Diseases [INRS], 2023).
99. Although real efforts have been made by the project and the government to strengthen the post-registration control system for pesticides, much remains to be done. In addition to strengthening the logistical resources already highlighted, it is necessary to document inspections to support decision-making. Monitoring judicial procedures and the penalties and sanctions imposed on importers and traders of illicit products is necessary. Such monitoring can be initiated by first incorporating the follow-up procedures into a decree implementing the revised phytosanitary law, and by appointing a responsible officer. This role could be assigned to the Legal Affairs Division, whose mission includes defending the interests of the State in court whenever the Ministry is involved in a case.

Finding 12. The project evaluated the capacities of the National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs (LNAD) and made concrete recommendations that received the support of the government and its partners. The implementation of some of these recommendations has significantly improved its operation and performance.

100. The missions of LNAD are defined by Decree No. 2005/118 of 15 April 2005 on the organization of the Ministry of Agriculture and Rural Development (Republic of Cameroon, 2005d). Its Phytosanitary Products Department is, in principle, responsible for the analysis of phytosanitary product formulations, pest analysis in crops, analysis of biological efficacy and behaviour tests of new phytosanitary product formulations and analysis of toxic residues in agricultural and food products. However, at the time of the project design (FAO and GEF, 2014), the Laboratory did not have all the required capacities to fully carry out its missions in the pre- and post-registration control process of pesticides. Consequently, the competent Cameroonian authority responsible for the regulation and control of pesticides and residues in the environment and food chain was heavily dependent on foreign laboratories for sample analysis.
101. With the support of the project, the capacities of LNAD and three other partner national laboratories were assessed, and several recommendations were made. Their

¹⁶ Equivalent to approximately USD 165 to USD 1 652.

implementation has significantly strengthened its operation and performance in several aspects (FAO and GEF, 2017d).

3.3.1 Technical and organizational capacity building

102. Advocacy at the strategic and operational levels has been initiated. Technical cooperation with the International Atomic Energy Agency (IAEA) has initiated the strengthening of equipment. Additional partnerships have been established with other donors, including the Cocoa and Coffee Sector Development Fund (FODECC), to progressively strengthen equipment and materials. The Sherifian Phosphates Office Foundation donated UV-Vis spectrometers, flame photometers, titrimetry devices and Kjeldahl distillers, giving LNAD the capacity to process over 2 000 soil samples per year.
103. LNAD has acquired various sample processing equipment, enabling it to handle a wide range of food samples, as well as additional refrigerators for storing samples, standards and others. An automatic sampler was acquired and commissioned in 2018 for the LNAD's gas chromatography – mass spectrometry system. Issues related to manual injection have now been resolved. A high-performance liquid chromatography (HPLC) was provided to the LNAD by the IAEA in 2022 as part of a technical cooperation project. A centrifuge operating at 18 000 rpm was acquired in 2018 and enables the application of the quick, easy, cheap, effective, rugged and safe (QuEChERS) method. Around 30 residues have been detectable at the LNAD since 2018.
104. The physical layout of the LNAD was reorganized to separate activities and facilitate compliance with good practices, safety and quality standards. The instruments are now installed in rooms separate from those used for sample preparation. A room has been set up and dedicated to pesticide analysis in the new building. Once fully equipped with materials and equipment already acquired under the IAEA CRM 5025 project, the sample preparation area will be divided.
105. A quality management system has been implemented. Laboratory procedures are now documented. Internal quality assurance procedures have been introduced for all LNAD analytical methods. For certain parameters, LNAD participates in proficiency testing with other accredited laboratories. LNAD has joined laboratory networks and participates in proficiency testing for certain parameters, achieving satisfactory outcomes (over 90 percent). Standard operating procedures (SOP) are routinely developed at LNAD, averaging ten SOPs per year for various analytical methods. LNAD contributes to the development of standard operating procedures for the Global Soil Laboratory Network.
106. Regarding the laboratory's analytical standards, LNAD has adopted the QuEChERS/ Association of Official Analytical Chemists method for pesticide residue analysis since 2017 and has identified reliable suppliers from whom reagents and consumables are now procured, enabling satisfactory outcomes. Partnerships have been established with several local laboratories, including the Institute of Medical Research and Studies of Medicinal Plants and the National Cocoa and Coffee Board. An annual equipment maintenance plan has been established and is operational, ensuring that the equipment continues to deliver reliable outcomes year after year.
107. Advocacy continues with the Cameroonian authorities to equip LNAD with a liquid chromatography – mass spectrometry system required for the analysis of non-volatile pesticides. The equipment is very costly (over XAF 250 million), which explains the difficulty

of including it in the budget of the Ministry of Agriculture and Rural Development. The acquisition process for two chemical fume hoods is underway, supported by a partner who provided the budgetary resources for the 2024 fiscal year.

108. To address the human resource shortage identified in 2017, the LNAD staff was strengthened with the addition of chemists and biochemists. The LNAD staff benefited from the equivalent of 12 months of training across various analytical fields, averaging about one month of training per person. Training in preventive maintenance has enabled the staff to carry out routine maintenance tasks. The following specialists were recruited and assigned to the LNAD between 2019 and 2021: two master's degree holders in chemistry, one bachelor's degree holder in biochemistry and one laboratory technician. The LNAD has developed staff motivation strategies that help encourage its analysts. It now has at least two experts specialized in gas chromatography coupled with mass spectrometry and high-performance liquid chromatography, trained both locally and internationally (Egypt, France, Kenya, Morocco).

3.3.2 Outcomes achieved and observed changes

109. Resources were mobilized to cover the maintenance and repair of the atomic absorption spectroscopy. It is operational since 2018. Upgrade work was undertaken with Agilent technicians (nitrous oxide burner), and new lamps were acquired, increasing the instrument's capacity to analyse 15 elements and improving its analytical resolution. Since 2017, LNAD has been working with Capital Scientific, a provider of preventive and corrective maintenance services for Agilent equipment based in Egypt. Similarly, the ultra-high performance liquid chromatography instrument is maintained by a company based in Morocco.
110. Reagents and consumables are regularly purchased to enable high-quality analyses. The LNAD has begun analyses of pesticide formulations as well as certain residues of volatile active substances that can be analysed by gas chromatography - mass spectrometry. To date, 90 percent of the pesticide formulations submitted to the LNAD for formulation analyses are processed on-site. Operators in the sector have been sensitized to provide pesticide standards, which has enabled the LNAD to perform certain analyses so that today the majority of pesticide samples submitted to the LNAD are analysed on-site. The range of pesticide formulations analysed by the LNAD has been significantly expanded since then. This is also true for pesticide residues, with a wide range of active substances being analysed at the LNAD. The LNAD has developed and validated about 50 analytical methods using gas chromatography, liquid chromatography and atomic absorption spectrometry for the analysis of active substances contained in pesticides. A specialized supplier is primarily used to procure the laboratory's reagents and consumables. Since 2018, high-purity analytical pesticide standards have been procured from reputable suppliers. Residue analyses have been carried out at LNAD on about 50 active substances. Several master's theses and dissertations have been completed by interns, and articles have been published following the analysis of pesticide residues in various agricultural products at LNAD.

3.3.3 Opportunities created

111. LNAD now offers services to other national institutions and supports academic training in laboratory analysis at the national level, providing an average of 20 internships per year to university students. Its revenues have gradually increased, enabling it to invest in reagents to develop more and more analytical methods. Its analytical service has the capacity to

meet the needs of its partners. Since then, it has been working with several other laboratories, including the Agricultural Research Institute for Development, the International Institute of Tropical Agriculture for soil analysis; the National Veterinary Laboratory (LANAVET) for mycotoxin analysis using HPLC; the Institute of Medical Research and Medicinal Plant Studies; and the National Cocoa and Coffee Board for food analysis.

112. LNAD is now a member of the Global Soil Laboratory Network and has participated in two proficiency tests (2022 and 2023). It participated in the IAEA project "Improving Laboratory Testing Capacities to Enhance the Safety and Competitiveness of Agricultural Products (CMR5025)", through which it benefited from staff capacity building and the provision of a liquid chromatograph, enabling the analysis of a wide range of active substances. Thanks to the outcomes achieved, LNAD is strengthening its presence within national institutions such as the "One Health" platform and the "antimicrobial resistance" platform. It is involved at the national level in the development of regulatory texts on pesticide residues and contaminants in the food chain. In 2022, he led the development of a National Market-Health Guide addressing hygiene standards in food markets across Cameroon, with technical and financial support from WHO. It is working to secure its integration into technical partnerships on mycotoxins in coffee starting in 2024.
113. The LNAD serves as the national focal point for the Codex Committee on Pesticide Residues. It participated in three in-person sessions and three online sessions. It participates in the work of the National Codex Alimentarius Committee. It also participates in the work of the Codex Committee on Contaminants in Foods and the Codex Committee on Methods of Analysis and Sampling.

3.3.4 Perspectives

114. The LNAD continues to develop analytical methods and to advocate with partners for the strengthening of analytical infrastructure. The issue of a business plan has always been considered irrelevant for LNAD, as it is a public service entity without legal personality. The methods used to determine service costs are now based on the breakdown of factor costs and consensus with private operators. The established rates are recorded in regulatory texts issued by the Minister of Finance. The resources collected are reinvested in the procurement of reagents and consumables, equipment maintenance and capacity development.

Outcome 4. Alternatives to conventional pesticides based on integrated pest management are successfully promoted, leading to a reduction in the use of chemical pesticides and highly hazardous pesticides. [MU: Moderately Satisfactory]

Finding 13. The project prompted the government to increase the number of pesticides approved for use on cotton and stored products, while withdrawing highly hazardous pesticides (Class Ib) and extremely hazardous pesticides (Class Ia).

115. In Cameroon, due to the lack of approved and accessible biopesticides, industrial chemical pesticides remain the primary option used by farmers to protect crops and reduce losses.
116. With the support of the project, the government has made efforts to increase the availability of approved pesticides for cotton and stored products. As of 11 October 2023 (see Appendix 9), among the 149 plant protection products approved in Cameroon for use on cotton: none belonged to WHO hazard Class Ib (highly hazardous) or Class Ia (extremely hazardous); 5 percent were classified as Class U (unlikely to present acute hazard),

62 percent as Class III (slightly hazardous), and 33 percent as Class II (moderately hazardous). This represents a significant improvement compared to the pre-project situation, in which Cameroon had only 27 approved herbicide formulations, seven fungicides and 44 insecticides for use on cotton (see FAO and GEF, 2014). Furthermore, among the 89 insecticides and insecticide-fungicides approved in 2023 for cotton, none belonged to Class I; only three insecticides (3.37 percent) were Class U (unlikely to present acute hazard), 44 (49.43 percent) were Class III (slightly hazardous) and 42 (47.19 percent) were Class II (moderately hazardous). This stands in stark contrast to the pre-project situation (FAO and GEF, 2014), according to which, among the 44 insecticides approved for cotton cultivation, 28 were Class I (highly to extremely hazardous) and Class II (moderately hazardous).

117. Notable efforts have also been made for the protection of stored products. In 2023 (see Appendix 9), 16 insecticides were approved in Cameroon for the treatment of stored products, including one insecticide (6.25 percent) classified as U (unlikely to present an acute hazard); 11 (68.75 percent) as Class III (slightly hazardous); and four (25 percent) classified as Ib (highly hazardous) based on magnesium phosphide and Ia (extremely hazardous) based on aluminium phosphide. This represents a clear improvement compared to the situation in 2019, when five commercial formulations based on aluminium phosphide were approved and freely sold in Cameroon, all belonging to Class Ia (extremely hazardous pesticides). These products were found alongside four other smuggled products on the market, locally known as "PIA-PIA" (a POP based on dichlorvos and therefore an extremely hazardous pesticide), which at that time were widely used for the protection of food products (FAO and GEF, 2021b).
118. Although improvements are still needed, these figures—for both cotton and stored products including maize—indicate that the government has indeed made remarkable progress in reducing the use of highly hazardous and extremely hazardous pesticides in Cameroon, with the contribution of the project. The increase in the number of registered insecticides is a factor likely to improve their availability on the market and to limit the circulation of unregistered plant protection products and farmers' reliance on them. Indeed, the project baseline situation (FAO and GEF, 2014) indicated that 28 out of the 44 insecticides registered in Cameroon at that time, or 63.63 percent, belonged to Classes I and II.
119. However, it should be noted that the project did not measure the indicator "annual quantity of chemical pesticides and plant protection products used in the project's demonstration areas" under Output 4.3. The activities intended to contribute to the measurement of this indicator were cancelled by decision of the PSC to prioritize the safeguarding of obsolete pesticide stocks (fifth PSC meeting).

Finding 14. The project successfully tested the effectiveness of powder from six aromatic plants as alternatives to extremely hazardous pesticides, including two against the maize weevil and four against banana pests, thereby opening promising prospects for further research or their registration.

3.3.5 Test of alternatives against maize weevils

120. The powder of two aromatic plants (*Hyptis spicigera* and *Ocimum canum*) was formulated and tested as an alternative to two extremely hazardous pesticides, namely PHOSTOXIN aluminium phosphide (Class Ia) and "PIA PIA" dichlorvos (Class Ib), against the maize weevil

pest in stored maize (FAO and GEF, 2020h). The effectiveness of these two preparations has been demonstrated. However, in accordance with the International Code of Conduct on Pesticide Management, their registration requires toxicity testing and ecotoxicity testing, residue studies and environmental impact assessment. These research efforts supported by the project needed to be continued before achieving a biopesticide compliant with regulations.

121. The project raised awareness among stakeholders (farmers, extension workers and agricultural advisers) in the Adamawa region about the priority phytosanitary issues that justify the use of extremely hazardous pesticides, the risks associated with their use and alternative treatment approaches based on local knowledge that deserve to be explored or have been tested (FAO and GEF, 2020i; FAO and GEF, 2021j).

Figure 5. Damage observed 90 days after maize infestation by five pairs of weevils without any insecticide treatment (left) and maize grains protected by *Ocimum canum* powder observed 90 days after infestation by five pairs of weevils (right)



3.3.6 Test of alternatives against banana pests

122. Nematodes and the black weevil (*Cosmopolites sordidus*) constitute a major biotic constraint for banana and plantain production in Cameroon, causing significant economic damage, especially for small-scale producers (FAO and GEF, 2019d; FAO and GEF, 2020g).
123. With a view to providing a sustainable response to this problem, the project tested under controlled conditions the effects of powdered leaves from four plants (*Chromolaena odorata*, *Tithonia diversifolia*, *Azadirachta indica* [neem] and *Asystasia gangetica*) to control the penetration of phytoparasitic nematodes into the roots of young plantain banana plants (FAO and GEF, 2019d). Although the trial outcomes did not conclusively demonstrate the expected effects, the general trends observed allowed for considering the use of

extracts from these plants to control phytoparasitic nematodes. It was recommended to repeat this experiment using an improved methodology as follows: increasing the number of plants per treatment; increasing the duration of the experiment (for example, from three to six months); evaluating the effect of these extracts against the black weevil.

124. Continuing the search for solutions, the project tested in the field the technique of coating plantain banana suckers with kitchen ash and powder made from the leaves of *Chromolaena odorata*, to evaluate its effect on the level of the bulb and root attack by the black weevil and nematodes, as well as on yield at two sites: Eseka (Song-Matip village, Centre region) and Ebolowa 1 (Eves village, South region). At Ebolowa, the outcomes are satisfactory, with good banana plant growth and a relatively low level of infestation observed in the plots treated against nematodes and the black weevil. In Eseka, on the other hand, the outcomes are less satisfactory due to the delayed growth and development of the banana plants observed in the plot 11 months after establishment. It was highly unlikely to consider harvesting the plantain bunches in the experimental plots before the end of 2020. The outcomes of this research were compromised by constraints encountered during the establishment and monitoring of the pilot demonstration plots. The monitoring and maintenance of the plots after their establishment only began in December 2019, that is, with a three-month delay. This negatively affected the growth of the banana plants at both sites, but particularly in Eseka where the pilot farmer was very unresponsive. This delay in monitoring was caused by the late disbursement of funds (second and third instalments) by FAO. The poor growth of the banana plants, especially in Eseka, was further impacted by a prolonged dry season in the area following the establishment of the plot.

Finding 15. The participatory action research implemented to promote alternatives to extremely hazardous pesticides against nematodes and the black weevil (*Cosmopolites sordidus*) of plantain banana did not produce the expected outcome. The reasons include several factors such as the inadequate selection or lack of involvement of certain beneficiaries and agricultural extension agents, as well as insufficient logistical resources.

125. Before conducting the participatory experimental demonstration on alternatives to extremely hazardous pesticides against nematodes and the black weevil (*Cosmopolites sordidus*) of plantain banana, two workshops were organized to raise awareness and build the capacity of producers. These workshops covered the damage caused by these pests, symptom recognition, pest identification, control methods and existing alternatives to chemical control (FAO and GEF, 2019e).
126. Subsequently, the two groups of previously sensitized producers participated in the participatory experimental demonstration conducted at the two sites. However, their engagement in the learning activities was very low throughout the experimental process. After the planting operation, which saw a relatively reasonable participation rate (ten participants out of an initial group of 22 in Eseka, and ten out of 18 initially in Ebolowa), the follow-up and maintenance activities for the pilot plots, as well as the collection and measurement of parameters, were almost entirely abandoned; only two to four participants attended these activities out of the 22 trained in Eseka and four to seven out of 18 trained in Ebolowa. This low attendance is explained by the farmers as due to transportation difficulties encountered in reaching the experimental site, but also because they were expecting financial incentives to attend each time. Other informants explained the lack of interest of some participants by the fact that they were not "true banana producers" and

that their main reason for participating was the hope of receiving potential resources or subsidies from the project.

127. The outcomes of these experiments were compiled in a technical factsheet (FAO and GEF, 2020k), which was distributed to participants of the training and awareness-raising workshop for extension agents and agricultural advisers on the alternatives to highly hazardous pesticides that had been identified and tested, held on 14–15 July 2021 (FAO and GEF, 2021c). However, inappropriate practices affected stakeholder participation in this workshop, which brought together 29 participants – including nine women and 20 men – from the two regions (Centre and South) targeted by this project activity. Indeed, participants in this training and awareness-raising workshop for extension workers and agricultural advisers received a participation fee of XAF 200 000 per person. However, the selection criteria for these participants were criticized by several stakeholders met in the field, who stated that “many of the individuals invited to this workshop were not the most suitable to take part in such an event, which was a key starting point for disseminating the outcomes in the two targeted divisions”. Indeed, the Divisional Delegate of Agriculture and Rural Development of Eseka attended the workshop accompanied by only one Subdivisional Delegate of Agriculture and Rural Development (DAADER), namely the one from Eseka. The other DAADERS who were not invited subsequently refused to engage in the dissemination of the proposed alternative technique. In contrast, in the Mvilla Division (Ebolowa site), the DAADERS did participate in this workshop and continued to work on raising awareness and promoting the alternative technique. However, due to a lack of resources (notably fuel), they were unable to effectively carry out the outreach missions to disseminate these alternative techniques to the various producer groups in their subdivision.
128. At the Ebolowa site, the evaluation mission identified around ten farmers who had fully or partially adopted the components of the alternative technique for controlling the banana weevil. The chief of Eves village (Ebolowa site) reported having a good command of the alternative technique. In contrast, at the Eseka site, the field mission did not identify any farmer who had adopted the alternative technique. More surprisingly, neither the DAADER nor the Divisional Delegate of Agriculture and Rural Development of Eseka knew the location of the experimental plot. Indeed, in Eseka, the former DAADER (the project focal point), who retired, did not inform his successor about the project during the handover.

3.4 Effectiveness, additionality and progress towards impact [MU: Moderately Unsatisfactory]

Finding 16. The project strengthened national capacities for pesticide management and associated risks, and opened avenues for innovation and impact, but was unable to fully realize these due to budgetary constraints (inadequate budgeting and the onset of the COVID-19 pandemic) and questionable strategic choices. These factors did not allow for the collection and safeguarding of newly inventoried pesticides nor the effective decontamination of polluted sites.

129. The project has undoubtedly contributed to organizational strengthening (FAO, 2015) as well as to the institutional and regulatory framework, along with the design and testing of models, mechanisms, methods and tools that can enable rational and sustainable management of pesticides and associated risks, thereby opening promising prospects for innovation. However, as highlighted in the section on effectiveness, most of the conditions necessary to translate the project’s achievements and the opportunities created into

concrete effects or impacts were not met, which should be taken into account in future interventions.

130. At the Outcome 1 level (see Finding 6 and Finding 7), the project strengthened the obsolete pesticide inventory capacities in Cameroon and identified new stocks, although their centralization was not prioritized by the PSC. The remediation of the contaminated sites in Dschang and Lagdo was also not prioritized, due to the cancellation of the site cleanup activity by the PSC, thereby missing the opportunity to effectively reduce the risks faced by vulnerable populations at these sites (the visually impaired in Dschang; young school children in Lagdo).
131. Within the framework of Outcome 2 (see Finding 8 and Finding 9), the project successfully designed and tested two on-site microprojects and developed a national strategy for the management of EPC. In doing so, it highlighted the structures and conditions necessary for operating EPC management models at both local and national levels.
132. In pursuit of Outcome 3 (see Finding 10, Finding 11 and Finding 12), the project contributed to the improvement of the legal and institutional framework for pesticide and associated waste management in Cameroon by supporting the revision of existing regulatory texts to cover the entire pesticide life cycle. It strengthened the national registration capacity in accordance with FAO and WHO guidelines, as well as the national capacity for inspection and post-registration control of pesticides. One of the project's notable contributions was strengthening the organization and functioning of the National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs, resulting in direct and lasting improvements in its performance regarding the quality control of inputs and food products.
133. Within the framework of Outcome 4 (see Finding 13, Finding 14 and Finding 15), the project contributed to the reduction of the use of extremely hazardous pesticides, whether authorized or illicit, by making less hazardous pesticides available and successfully testing the efficacy of biopesticides both in the laboratory and in the field, although it did not succeed in registering them. The approach used would have had a greater impact if it had integrated the FFS method and support for PGS emerging among actors in more ecological and sustainable agricultural value chains.

Finding 17. Unfinished actions related to inventoried pesticides, site decontamination, the national action plan for managing EPCs, revised regulations, national capacities for post-registration inspection and control, research on biopesticides, and proven innovation approaches deserve to be integrated into the project exit strategy and implemented in the short term to consolidate achievements, support progress towards impact and ensure sustainability.

134. As already presented in the previous sections, the project has produced interesting outcomes, several of which deserve to be finalized or consolidated to ensure their sustainability, namely:
 - i. Repackage, transport and securely store the 47.7 tonnes of obsolete pesticides inventoried in 2016 and 2018, along with all EPCs collected from the sites.
 - ii. Clean up the contaminated sites of Dschang-CREFISAC and Lagdo.
 - iii. Implement the action plan of the national strategy for EPCs management and strengthen the regulations on EPCs management.

- iv. Support the completion, validation, adoption and implementation by the government of the texts revised by the project and support actions likely to promote better exchange of post-registration information to better inform decision-making.
 - v. Continue efforts to strengthen national capacities for post-registration inspection and control of pesticides initiated by the project, as well as the capacities of the LNAB to enable it to better fulfil its core missions.
 - vi. Strengthen national capacities for the management of obsolete pesticides and EPCs through the development of public-private partnerships based on capacity and needs assessments, support for the development of business plans for managing specific links in this value chain and the delegation of tasks to private operators or civil society organizations accompanied by adequate resources.
 - vii. Support the completion of research on promising biopesticides and assist with the necessary processes for their registration and dissemination.
 - viii. Promote proven innovative approaches such as Producer Field Schools or emerging ones like PGS.
135. Other factors that could help transform the project's achievements and promising outcomes into tangible impact involve strengthening the project's TOC, notably by selecting more relevant strategies and activities that incorporate the objective of addressing the priority needs of the population regarding pesticide risks and hazards, as well as food safety.
136. The sustainable management capacities of pesticides and EPCs for all actors in this value chain, especially the end users, must also be strengthened through more objective and pragmatic communication aimed at changing perceptions, attitudes and behaviours, based on facts and evidence. This communication approach must be systemic, continuous and based on factual and contextualized data regarding health and the environment. Messages should be disseminated through communication platforms easily accessible to the majority of the target audiences (policymakers, importers, distributors and end users of pesticides, agents involved in the management and control chain before and after pesticide registration, and consumers of agricultural products) such as WhatsApp, Facebook, popular radio stations and television channels.

3.5 Efficiency [MU: Moderately Unsatisfactory]

Finding 18. Despite an extended implementation period (eight years and ten months instead of the initially planned four years) and a major budget revision at no additional cost, the project only partially achieved the target set under its Component 1, which was nonetheless one of the priorities repeatedly emphasized by both FAO and the government. Indeed, the implementing and executing partners of the project were unable to effectively and promptly manage the project's design flaws, delays in the recruitment of consultants and procurement processes, the project's budget shortfall, the constraints imposed by the COVID-19 pandemic and other operational challenges.

137. The project started on 1 March 2015 with an initial duration of four years, but it underwent five no-cost extensions, bringing its total implementation period to eight years and ten months, which is considerable. The project was only able to eliminate 35.7 tonnes of obsolete pesticides and associated waste (shipped on 28 February 2018 to SEDIBEX in France) out of the 200 tonnes initially targeted (see Finding 6) and did not succeed in

decontaminating the two contaminated sites classified as priority among the 12 identified contaminated sites (see Finding 7). The COVID-19 pandemic, whose strict prevention measures were implemented in Cameroon in March 2020, severely disrupted the project, leading to the suspension of activities for approximately one year, increased prices for various services and created difficulty in finding service providers.

138. However, the situation related to the COVID-19 pandemic does not fully explain the project's shortcomings, as two other similar projects implemented during the same period performed better – namely, project GCP/BEN/056/GFF ¹⁷ in Benin and project GCP/MLW/052/GFF in Malawi (FAO, 2024).
139. Project GCP/BEN/056/GFF, which started on 22 March 2015 and ended on 31 August 2022 in Benin, successfully exported and eliminated 215.9 tonnes of obsolete pesticides and associated waste – representing a completion rate of 101.36 percent compared to the initial target of 213 tonnes (FAO, 2021; FAO and GEF, 2022). The GCP/BEN/056/GFF project also successfully decontaminated four sites polluted with POPs and obsolete pesticides, thereby exceeding the initial target of two sites planned for decontamination among the 11 identified contaminated sites (FAO and GEF, 2022). At the financial level, the GCP/BEN/056/GFF project effectively spent USD 563 891 under its Component 1, with USD 492 086 allocated to Subcomponent 1.1. "Safe disposal of POPs and other obsolete pesticides" and USD 71 805 for Component 1.2. "Remediation of heavily contaminated sites" (data provided by the FAO Office in Benin in 2024). In contrast, the GCP/CMR/031/GFF project spent a total of USD 408 567 for its similar Component 1, allocated as follows: USD 46 859 for Output 1.1 "Development of a strategy for the disposal of up to 100 metric tonnes of obsolete pesticides and associated waste", USD 281 049 for Output 1.2 "Disposal of approximately 100 tonnes of obsolete pesticides and associated waste," and USD 80,659 for Output 1.3 "Priority pilot projects for the restoration of contaminated sites" (see Appendix 11).
140. The GCP/MLW/052/GFF project was implemented from 25 November 2015 to 31 August 2023, and successfully disposed of 256 tonnes of obsolete pesticides, representing 66 percent of the 390 tonnes inventoried at the project's start (FAO, 2024). The evaluation of the GCP/MLW/052/GFF project noted during its field mission in Malawi in 2022 that a contract had already been signed with the company Veolia to finalize the remediation of the planned contaminated site (Agricola farm), and that the excavation and export of the contaminated soil to South Africa for confinement were scheduled to take place after the 2022–2023 rainy season (FAO, 2024). The analysis of the financial data for Component 1, "Safe disposal of POPs and other obsolete pesticides and remediation of contaminated sites", of the GCP/MLW/052/GFF and GCP/CMR/031/GFF projects (see excerpts in Appendix 11) shows that these two projects respectively spent USD 1 144 098 and USD 408 567 on their activities. These amounts, which do not include the costs of the "5011 Salaries Professional" line, show that the GCP/MLW/052/GFF project spent 2.8 times more resources than the GCP/CMR/031/GFF project and disposed 6.8 times more obsolete pesticides and POPs (256 tonnes) than the latter (37.5 tonnes disposed). The GCP/MLW/052/GFF project also completed the decontamination of the planned priority polluted site, which is not the case for the two priority polluted sites planned by the

¹⁷ Disposal of persistent organic pollutants and obsolete pesticides and strengthening the management of the pesticide life cycle in Benin.

GCP/CMR/031/GFF project. Moreover, a thorough review of the costs of disposal of obsolete pesticides and POPs abroad by multinational companies (see Appendix 11) show that projects GCP/MLW/052/GFF and GCP/CMR/031/GFF respectively spent USD 816 512 (see line "5014 Contracts") and USD 131 662 (see line "5028 General Operating Expenses") for this purpose, corresponding to USD 3 189 and USD 3 510 respectively spent by these two projects per tonne of product packaged, shipped and destroyed abroad. These figures provide an idea of the opportunity cost of disposing of obsolete pesticides and POPs abroad, and they provide decision-makers and their partners with information for strategic reflections and choices to be made, as well as the efforts to be undertaken regarding the option of nationalizing or regionalizing these processes.

141. Apart from the COVID-19 pandemic, the late start of field activities caused by delays in the recruitment processes of consultants and contract awards, as well as the government's difficulties in timely mobilizing the necessary funds to cover the project's budget shortfall, negatively affected the implementation of the project, notably its Component 1: "Safe elimination of POPs and other obsolete pesticides and restoration of contaminated sites". From an adaptive management perspective, the PSC successively recommended five no-cost extensions of the project and one budget revision, all requested by the Ministry of Environment, Nature Protection and Sustainable Development and granted by the GEF Coordination Unit to FAO.
142. The third PSC held in September 2018, having noted a low implementation rate (57 percent of activities and 47 percent of the budget executed), approved the first project extension as recommended by the mid-term evaluation (FAO, 2018). The project, which was initially scheduled to end on 28 February 2019, was extended until 28 February 2020, and then again until 28 February 2021 on the recommendation of its fourth PSC. This fourth PSC, held in November 2019, noted that despite improved activity implementation rates (75.20 percent) and budget execution (63.72 percent), the tender for the securing and disposal of obsolete pesticides inventoried between 2016 and 2018 was still ongoing, as no suitable bids had been received. This fourth PSC also proposed suspending the activities for the remediation of contaminated soils and reallocating its budget to the disposal of obsolete pesticides. The project was then extended until 28 February 2022, with the objective of disposing of the 10.5 tonnes of methyl bromide identified in 2018 (see Finding 6). However, the tender prepared and published in the United Nations procurement system received only one bid, which did not meet the required minimum safety standards. The project was extended for the fourth time following the recommendation of the fifth PSC (meeting held on 24 February 2022) until 31 March 2023, with the following objectives: i) update the inventory of obsolete pesticide stocks present in Cameroon and collect and centralize them; ii) study the possibility of locally disposing of empty pesticide containers through industrial incinerators; iii) seek additional funding from the government and potential donors for the disposal of methyl bromide and other obsolete pesticides that will be collected and centralized; and iv) engage in discussions with Arysta LifeScience,¹⁸ the holder of the methyl bromide stock, to encourage them to increase their contribution to the budget for the disposal of this POP. All these last-resort options were explored but proved unsuccessful. Additional funds requested from the government were not obtained. The sixth PSC meeting (held on 17–18 April 2023) noted

¹⁸ The initial contribution made by Arysta LifeScience amounted to XAF 25 million.

these shortcomings and recommended a final extension until 31 December 2023 to allow for the project's terminal evaluation.

143. The sixth PSC also recommended: i) that FAO and the government seek additional funding to dispose of the identified stock of obsolete pesticides and associated waste, disseminate the national strategy for the management of empty pesticide containers and promote and disseminate non-chemical alternatives to highly hazardous pesticides; and ii) that the government and pesticide importers establish a collection system and an environmentally friendly recycling unit for EPCs, and set up a phytosanitary inter-branch organization bringing together actors along the value chain. However, the evaluation found that these recommendations, which served as the project's "exit strategy", were not implemented.

3.6 Sustainability [MU: Moderately Unlikely]

Finding 19. Financial risks related to difficulties in mobilizing government resources, and institutional risks stemming from challenges in establishing and operationalizing interministerial and public-private partnerships for the cause, exist and are likely to significantly hinder the consolidation of outcomes and their sustainability. These significant risks should be addressed and managed immediately by FAO and the government.

144. The financial risk is significant because the project failed to secure the government funding requested by the Ministry of Environment, Nature Protection and Sustainable Development to supplement the resources needed for the disposal of 11 tonnes of methyl bromide stored in the Arysta LifeScience warehouse in the Douala industrial zone. This suggests that FAO should support the government in mobilizing external funding to further consolidate the gains achieved.
145. A second risk is institutional in nature. Cameroon faces challenges in ensuring the effective functioning of interministerial collaboration and in making public-private partnerships operational and sustainable. FAO should support the government in identifying and addressing constraints that may hinder the collaboration needed to consolidate the gains achieved, and in fostering future public-private partnerships to promote the sound management and rational use of pesticides, as well as the sustainable and safe disposal of obsolete pesticides and EPCs.
146. In addition, security risks related to the sociopolitical crisis in the North-West and South-West regions, and to incursions by terrorist groups in the Far-North region, are likely to limit the adoption of the good practices promoted by the project in these areas. Specific strategies should be developed to ensure that the project's outcomes reach the populations of these three regions.

3.7 Implementation, execution and monitoring and evaluation [S: Satisfactory]

Finding 20. FAO, as the GEF implementing agency, and the executing partners generally fulfilled their respective roles, despite some shortcomings, including FAO's lack of anticipation regarding certain internal procedures known to be complex and time-consuming, and its agreement with the PSC's decision to reallocate the funds intended for the decontamination of polluted sites in Dschang and Lagdo to another activity.

3.7.1 Implementation [S: Satisfactory]

147. FAO monitored the implementation of the project and the management of GEF resources in accordance with its own and GEF procedures and policies and provided limited technical support (only two missions) in a context marked by the COVID-19 pandemic. It managed the procurement of goods and contracting of services, facilitated the project's mid-term evaluation, and prepared project progress reports and financial reports for submission to the GEF. It signed 11 letters of agreement with the executing partners, in addition to contracts with consultants for the implementation of activities. These implementing partners participated in the meetings of the PSC and the project coordination meetings. It took part in the various PSC meetings, where it influenced decisions related to budget revision, the project's no-cost extension, and the priority actions for the post-extension period. Although FAO does not hold decision-making power within the PSC, it is nonetheless associated with certain decisions of this body which later proved ineffective in light of the outcomes achieved. This includes the reallocation – by the PSC at its fourth meeting in November 2020 – of funds initially intended for the decontamination of polluted sites to the disposal of obsolete pesticides (as previously explained in Finding 7); it also includes cases where inventoried pesticides were not secured, as well as several missed opportunities in the given context.

3.7.2 Execution [S: Satisfactory]

148. The executing partners generally carried out the activities satisfactorily and delivered the expected reports (see also Finding 25). In pursuit of Outcome 1, the inventory of obsolete pesticides (FAO and GEF, 2018f) was completed, government staff were trained on the pesticide stock management system and the entry of inventory data (FAO and GEF, 2016a; 2016b), and the population of Edéa was sensitized on the removal of pesticide stocks from the Edea warehouse (FAO and GEF, 2017a). Veolia ES Field Services Ltd developed a Health, Safety and Environmental Management Plan (FAO and GEF, 2017b), carried out the activities leading to the disposal of obsolete pesticides (FAO and GEF, 2018a), and rehabilitated the warehouse after the operation (FAO and GEF, 2018b). Green Cross Switzerland conducted the environmental assessment for the disposal of obsolete pesticides (FAO and GEF, 2019a; 2020a). Pure Earth carried out the prioritization of contaminated sites (FAO and GEF, 2016c) and the detailed assessment of the polluted sites of Dschang CREFISAC and Lagdo (FAO and GEF, 2018c), accompanied by an environmental management plan for these two sites (FAO and GEF, 2018d).
149. In pursuit of Outcome 2, the project conducted awareness-raising activities on EPC management in targeted villages (FAO and GEF, 2017c; 2018e), delivered training on EPC management (FAO and GEF, 2019b; 2019c), implemented micro-projects for EPC management (FAO and GEF, 2020b; 2020c), and developed a national EPC management strategy, which was validated during a national workshop (FAO and GEF, 2020d; 2020e). Regarding Outcome 3, the project successfully carried out the assessment of LNAD's capacities and proposed strengthening measures (FAO and GEF, 2017d; 2017e). In addition, a consultant facilitated the revision of existing regulatory texts to cover the entire pesticide life cycle in Cameroon. However, their finalization and validation prior to government adoption were still ongoing as of April 2024. In pursuit of Outcome 4, the University of Ngaoundéré and African Centre for Research on Banana and Plantain carried out efficacy tests and training on alternatives to highly hazardous chemical pesticides (FAO and GEF, 2019d; 2019e; 2020g; 2020h; 2020i; 2020j; 2020k; 2021c; 2021d). This highly promising work

offers good prospects for the development of alternatives to highly hazardous pesticides for the benefit of the population.

150. Aside from the constraints related to the COVID-19 pandemic and delays associated with compliance with FAO procedures, the missions or activities entrusted to the partners were, overall, successfully carried out. A communication strategy was developed (FAO and GEF, 2020f). Some weaknesses or shortcomings were identified, including the insufficient involvement of NGOs and local residents in the process, and the project's failure to pay the full mission expenses of the surveyors. The executing partners, namely the Ministry of Environment, Nature Protection and Sustainable Development, consider FAO's procedures to be overly complex and rigid. Moreover, the Subdivisional Delegates of Agriculture, who were responsible for disseminating the tested technologies to contribute to Outcome 4, were not sufficiently involved in the project. Some expenses incurred for COVID-19 pandemic prevention measures were not reimbursed to the partners (as in the case of the University of Ngaoundéré).

Finding 21. The implementation of the planned monitoring and evaluation plan generated information that was used for activity planning and decision-making.

3.7.3 Monitoring and evaluation design [MS: Moderately Satisfactory]

151. The project document included a monitoring and evaluation plan that was sufficiently relevant and practical to track and collect information on the project's TOC and the indicators in the project outcomes framework. The plan clearly outlined the monitoring and evaluation activities to be carried out, the responsible parties, as well as the timelines and frequency for their implementation. The project outcomes framework included baseline information, which was supplemented by the activities of the project components. However, the project did not provide information on the measurement methodology for the indicators specified to monitor environmental, gender and socioeconomic outcomes. The total budget for monitoring and evaluation planned at project inception was USD 112 000, which included the costs of the mid-term and terminal evaluations, and was later revised upward during implementation to reach USD 285 777.

3.7.4 Monitoring and evaluation implementation [MS: Moderately Satisfactory]

152. The implementation of monitoring and evaluation was moderately satisfactory, and 71 percent of the monitoring and evaluation budget – equivalent to USD 203 906 – was spent before project closure. The project inception workshop was organized and the report prepared (FAO and GEF, 2015). An information system was designed for monitoring purposes. However, the project did not succeed in monitoring and collecting indicators on its field-level impacts due to insufficient resources. Instead, with the support of the implementing partners, it collected information on the participation of beneficiaries and stakeholders in the various activities.
153. The project's semi-annual and annual progress reports were regularly prepared in line with FAO and GEF requirements. The project organized PSC meetings, and technical reports were submitted by the various executing partners and service providers. The project's final report was prepared, as was this terminal evaluation report.

3.8 Co-financing

Finding 22. The co-financing, initially estimated at USD 9 307 374 at project approval, was 90 percent achieved by project closure. However, the absence of co-financing reports made it impossible to clearly understand the processes of mobilization, utilization and valorization of these co-financing resources, or to draw lessons for future interventions.

154. As of 30 June 2023, the project had recorded a total of USD 8 362 666 in co-financing mobilized, representing 90 percent of the amount planned at project approval (Annex 7). The gap is due to the low mobilization of co-financing by the Centre for Research and Education for Development and the University of Ngaoundéré, which mobilized USD 163 900 and USD 91 756 respectively, corresponding to 16 percent and 6 percent, respectively, of the amounts planned at project approval.
155. The co-financing from CropLife International, estimated at USD 1 721 162, was recorded in the project document as having been used for the safeguarding of 45 metric tonnes of pesticides stored in the Edéa warehouse prior to the start of the project. This co-financing proved useful, as part of this stock of previously safeguarded pesticides was eventually exported and disposed of.
156. The co-financing contributions from FAO (USD 170 000), the government (USD 545 636 from the Ministry of Environment, Nature Protection and Sustainable Development and USD 5 350 212 from the Ministry of Agriculture and Rural Development), the University of Ngaoundéré (USD 91 756), the Association of Integral African Women for Research and Development (USD 320 000) and the Centre for Research and Education for Development (USD 163 900) correspond to the costs of infrastructure and equipment, awareness-raising and capacity-building activities, and staff expenses mobilized by these institutions to implement activities funded through the GEF grant. These contributions were accounted for by the Project Technical Coordinator based on the estimates provided in the project document and on statements from the project focal points within these institutions.
157. The evaluation found no co-financing reports and was therefore unable to use such reports to examine the processes for mobilizing and leveraging these co-financing contributions or to draw useful lessons. Yet, their preparation by the Project Technical Coordinator was recommended in the project document.

3.9 Application of GEF policies and guidelines

3.9.1 Environmental and social safeguards

Finding 23. Given its objective, the project had a strong potential positive impact on the environment and human health, but it also entailed significant risks related to the operations of inventory, packaging and export of obsolete pesticides, the environmental assessment of contaminated sites and the management of empty pesticide containers. These risks were all successfully managed.

158. The processes involved in implementing the activities contributing to project Outcome 1 and 2 posed significant risks to operators, nearby residents and the environment. To mitigate these risks, the project conducted awareness campaigns on the hazards and dangers of pesticides and empty pesticide containers, selected qualified companies, and developed and implemented an environmental and social management plan for high-risk operations. Consequently, the companies and organizations involved in the processes of

inventorying, securing and disposing of obsolete pesticides and associated waste, as well as in soil decontamination, used environmentally sound methods in accordance with national and regional regulatory provisions, relevant international standards and pertinent multilateral environmental agreements. However, there is some dissatisfaction in the fact that the planned decontamination of two polluted sites were ultimately not carried out, thereby reducing the intended positive environmental impact of the project.

159. The activities contributing to Outcomes 3 and 4 of the project did not present any significant risks but were instead likely to generate potential positive effects. The strengthening of organizational capacities, as well as the institutional and legal framework, has significant potential to contribute to the prevention, mitigation and reduction of risks to the environment and to human and animal health. This is also the case for the alternatives to chemical pesticides that were successfully tested through the project, whose adoption will help reduce the risks posed by pesticides to human health (both pesticide users and consumers of treated products) and to the environment.

3.9.2 Gender equality and vulnerable groups mainstreaming

Finding 24. Although recognized in the project document, the vulnerability of women and other vulnerable groups (children, transhumant herders and visually impaired persons) to the hazards of pesticides was not adequately addressed during implementation. Efforts initiated in this regard were limited and neither consolidated nor systematically implemented.

160. In its design, the project duly emphasized the greater vulnerability of women to the adverse effects of pesticides, as they constitute the majority of the workforce in fruit and agricultural farms as well as in production units. It is, however, surprising to note that no specific activity or indicator was integrated into the project to better address and reduce women's vulnerability to chemical pesticides, nor their overall vulnerability across the different links of the agricultural value chains in which they play a pivotal role.
161. No gender analysis was conducted at the time of project formulation, and no study was carried out at project inception to determine the specific differences in the roles of women and men in the crop cycle in Cameroon and in the related uses of pesticides, as suggested in the project document. The specific needs were therefore neither understood nor taken into account in the training on alternatives to chemical pesticides (Component 4 of the project) or in the broader contribution to women's empowerment in the project intervention sites. The only point of satisfaction lies in the involvement of the NGOs AFAIRD and CREPD, which ensured better representation and participation of women in awareness-raising activities on the management of EPCs. The evaluation, however, found no evidence demonstrating the strong involvement of women in promoting alternatives to hazardous pesticides.
162. Efforts were made to involve women in all project activities, but their participation remained very limited. Women were members of the project management team. A woman served as the Project Technical Coordinator, and another was the Coordinator of the NGO Association of Integral African Women for Research and Development, responsible for awareness-raising activities. Two women (civil servants from the Ministry of Agriculture and Rural Development and the Ministry of Environment, Nature Protection and Sustainable Development) completed the online postgraduate course on pesticide risk management at the University of Cape Town, South Africa. Of the 791 people trained in EPC management, with a focus on triple rinsing of containers immediately after use, 186 were

women. They also took part in testing the EPC collection system established at the project's pilot sites in the Littoral and North regions. Women participated in the capacity-building workshop for banana producers on alternative methods for controlling banana pests, which involved 40 farmers (12 women and 28 men), and in the demonstration workshop organized for 30 maize producers (six women and 24 men) on the production and formulation of biological alternatives to hazardous pesticides used against maize weevils.

163. No effort was made by the project to prevent and mitigate the risks associated with the misuse of chemical pesticides and empty pesticide containers among vulnerable groups such as children, transhumant herders and visually impaired persons. Children, like transhumant herders, have considerable freedom of movement in these areas and make various uses of EPCs abandoned in the environment. They use them as toys, as materials for making toys, or for storing food. Transhumant herders, for their part, are increasingly engaging in agriculture and also use pesticides without understanding the rules and associated risks. The decontamination activities for the polluted sites in Lagdo were not completed, even though, in addition to soil pollution, they pose a danger to young people attending nearby schools. The same concern applies to the polluted site in Dschang, which houses the CREFISAC, where agropastoral activities are carried out by and for visually impaired persons as a means of socioprofessional integration.

3.9.3 Project partnerships and stakeholder engagement

Finding 25. Beyond its direct implementing partners, including service providers, the project consulted civil society and the private sector but did not engage them in a broad awareness-raising campaign or in a sustainable partnership with the government.

164. Government organizations (Ministry of Agriculture and Rural Development, Ministry of Environment, Nature Protection and Sustainable Development, Ministry of Public Health), non-governmental organizations (AFAIRD, CREPD, COOPHOC, CNCC), private operators (Veolia ES Field Services Ltd, Green Cross Switzerland, Pure Earth, CropLife International), and academic or research institutions (University of Ngaoundéré, CARBAP) actively participated in the implementation of the project as executing partners (as already described in Finding 20) and strengthened their organizational capacity and/or that of the personnel involved, and/or created new opportunities.
165. The beneficiary communities of the project and some agricultural advisers benefited from activities that offered them a direct advantage, including training on the triple-rinsing method, the collection and return of empty pesticide containers to collection points, and training on alternatives to highly hazardous pesticides. However, the engagement of these stakeholders was highly unsatisfactory with regard to the testing and promotion of alternatives to chemical pesticides at the Eséka site, for the reasons already outlined in Finding 15. Holders of obsolete pesticides, as well as users or residents living near polluted sites, were left dissatisfied. Producers involved in the collection of EPCs considered the intervention period to be very short and also hoped for the continuation of the process and the associated financial compensation. Unfortunately, none of these hopes materialized.
166. The project did not sufficiently involve other relevant actors in the value chains for pesticide and associated waste management, as well as in agrifood systems. Thus, actors (producers, traders, consumers) in alternative agrifood systems were not consulted, while private sector actors specializing in the collection and recycling of used plastic packaging were only

occasionally consulted to obtain information, without genuinely exploring opportunities for improvement or capacity strengthening within the framework of a public-private partnership.

3.10 Knowledge management and learning

Finding 26. The project generated good practices and lessons that are well documented in the various reports. However, it remains necessary to consolidate them into a single document and disseminate them through appropriate channels and media to facilitate their adoption.

167. All implemented activities were documented in technical reports validated by FAO (see Finding 20), which present the outcomes achieved while highlighting the knowledge generated or capitalized, the constraints encountered, and the good practices and lessons learned. Several pieces of knowledge and tools generated or used within the framework of the project contributed to learning. These include the triple rinsing technique for EPCs, rapid and detailed environmental assessment methods for polluted sites, obsolete pesticide inventory techniques and the use of the FAO pesticide registration toolkit. The lessons learned from project implementation are presented in detail in section 4.

3.11 Human rights and Indigenous Peoples

Finding 27. The project did not involve any factors likely to result in discrimination or increase the vulnerability of children, women, the elderly or Indigenous Peoples. However, the opportunity was missed to develop a strategy to support vulnerable and Indigenous Peoples in addressing pesticide-related risks, or to implement concrete actions targeting these groups.

168. As children, women, the elderly and Indigenous Peoples are among the most vulnerable social groups, the project should have planned activities to address and reduce the factors contributing to their vulnerability, or to respond to their specific concerns, as stated in Finding 24.

4. Conclusions, recommendations and lessons learned

4.1 Conclusions

Conclusion 1. Despite a limited budget and some shortcomings in the project's TOC, FAO, in partnership with the government and with GEF funding, successfully targeted one of the major – yet often overlooked – issues threatening agrifood systems, public health and the environment in Cameroon, and proposed a coherent response strategy. However, integrating activities related to public–private partnership development and proven (FFS) or emerging (PGS) approaches into the project could have enhanced or increased its potential impact.

169. In Cameroon, the limited capacity for pesticide and waste management, along with the associated risks, is well documented and negatively affects the quality of agrifood systems, public health and the environment. One of the major achievements of the project was to bring these concerns to the forefront and place them among Cameroon's sustainable development priorities. The project also serves as an advocacy effort targeting the government, urging it to complement its agricultural intensification efforts (based on heavy use of chemical inputs) with proportionate attention to risk prevention and management, as well as the promotion of more environmentally friendly alternatives.
170. The project successfully built on the achievements of the previous CleanFarms project to pursue an environmental objective that is well aligned with the strategic priorities of the Government, FAO and GEF, as well as SDG 3 (good health and well-being) and SDG 12 (responsible consumption and production). It also effectively addressed the need to strengthen the technical and organizational capacities of stakeholders, as well as the institutional and regulatory framework.
171. However, the project failed to integrate certain factors that could have supported a more comprehensive and sustainable response to the identified issues, likely due to FAO and GEF programming priorities and budgetary constraints. Activities related to public–private partnership development and research and development directly addressing health issues linked to pesticides were surprisingly absent. Under Components 1, 2 and 3, project support for capacity needs assessment and the development of business plans for national private entities concerned with or interested in the management of obsolete pesticides and related waste could have provided greater visibility on the opportunities in this market and encouraged their engagement. In Component 4, the use of the FFS approach and the PGS approach – which stimulate value chains in organic or low-input agriculture in similar African contexts – would have further supported learning and innovation dynamics.

Conclusion 2. The project made progress towards the safe disposal of inventoried obsolete pesticide stocks in Cameroon, the decontamination of classified high-risk contaminated sites, the strengthening of regulatory and institutional capacities for the rational management of pesticides throughout their life cycle, and the testing and promotion of alternatives to extremely hazardous chemical pesticides. The improvement of the diagnostic capacities of the National Laboratory for the Analysis of Agricultural Products and Inputs stands out as a notable success of the project. However, most of the targets for the outcome indicators were not achieved: the newly inventoried pesticides were not retrieved and stored in a secure location; the contaminated sites of Dschang and Lagdo, whose environmental risk was confirmed through the detailed environmental assessment conducted by the project, were ultimately not decontaminated; only 35.7 tonnes of obsolete pesticides and associated waste were disposed of, out of the 92.7 tonnes inventoried; the

sustainable management models for empty pesticide containers, although developed and available, have not yet been adopted – nor have the alternatives to highly hazardous chemical pesticides, which were piloted and promoted.

172. Several processes along the outcomes chain were not completed or finalized, which limited the achievement of the objectives. Nonetheless, the project enabled the government to identify the nature and quantity of newly inventoried stocks of obsolete pesticides in Cameroon, as well as their holders, even though it was not able to retrieve and secure them in a safe storage facility. The DEA of the two contaminated sites in Dschang and Lagdo confirmed their hazardous nature and provided the government with information on the decontamination and environmental protection options and actions to be undertaken. Furthermore, the implementation of the two pilot microprojects on EPC management generated enthusiasm among the target populations and yielded lessons to be considered for future EPC management initiatives. The national strategy for EPC management, which was aptly developed in 2020, is still awaiting operationalization to give rise to and implement a national EPC management programme.
173. Another source of satisfaction regarding the project concerns the activities aimed at improving the regulatory and institutional framework undertaken by the government with the project's support, which have opened promising prospects for pesticide management throughout their life cycle. The improved functioning of the LNAD is a good illustration of this. The efficacy tests of alternatives to highly hazardous chemical pesticides have also opened promising prospects for their consolidation, registration, development and dissemination.

Conclusion 3. The sustainability of the outcomes and the project's progress towards impact are threatened by several risks, including the government's difficulty in mobilizing additional resources at very short notice to finalize or complete priority actions that have not yet been initiated or remain pending. Another significant threat concerns the limited capacity or insufficient commitment of government decision-makers to implement concrete incentive measures aimed at engaging, involving and holding the private sector more accountable in the safe and sustainable management of pesticides and associated waste in Cameroon. Indeed, aside from the positive dynamics observed in the operations of the National Laboratory for Diagnostic Analysis of Agricultural Products and Inputs, no operational strategy or concrete measures were developed to manage these risks, consolidate achievements and promote the realization and continuity of the project's benefits for the environment and the target population.

174. One positive aspect regarding sustainability relates to the LNAD, which, based on sound reasoning, continues to advocate with the government and partners for the strengthening of its analytical infrastructure and methods in order to fully carry out its mandate. In contrast, the difficulties encountered by the project in mobilizing the additional funding needed to properly implement certain essential or priority activities highlight the risks threatening the consolidation of project outcomes and underscore the financial, political and institutional challenges that remain to be addressed. Indeed, although there is political will in Cameroon to develop public–private partnerships, private actors operating in one or more segments of the chemical pesticide and associated waste management chain have not benefited from the capacity-building support that could have enabled them to play a significant role during or after the project and to seize existing or emerging business opportunities in this field in Cameroon and the subregion. Another cause for dissatisfaction is the lack of an operational strategy to ensure or facilitate the implementation or completion in the short term of the priority actions left pending or not initiated, namely

the centralized, secure storage and disposal of pesticides inventoried in 2016 and 2018; the operationalization of the national strategy for the management of empty pesticide containers and the establishment of a national system for their treatment in Cameroon; the decontamination or at least the effective securing of identified contaminated sites; the validation and adoption of the revised draft law to cover the entire pesticide life cycle in Cameroon; the exchange of post-registration information; continued progress in reducing the proportion of highly hazardous (Class Ib) and extremely hazardous (Class Ia) pesticides among those registered in Cameroon; the consolidation of research on alternatives to chemical pesticides; and progress towards the registration of biopesticides.

Conclusion 4. The project's supervisory, implementation and execution bodies fulfilled their roles, but were unable to effectively anticipate or address the weaknesses related to FAO's processes and procedures, particularly within a context further complicated by the COVID-19 pandemic. The adaptation strategies implemented (project extensions, efforts to mobilize additional funding, and revisions to activities and budget) did not yield the expected outcomes, thereby contributing to the project's low efficiency compared to similar projects implemented during the same period.

175. The project benefited from adequate technical, administrative and financial support from FAO bodies. It also regularly received guidance from the decisions made during the six Steering Committee meetings, and the activities entrusted to partners (11 partnership agreements implemented) and consultants were generally well executed. Delays and lack of communication regarding FAO procedures (notably the procedures for the disposal of the pesticide stocks inventoried in 2016 and the review and approval/validation of activity reports submitted by consultants) also limited the achievement of the project's objectives.
176. The COVID-19 pandemic, which interrupted activities, restricted the mobility of stakeholders and service providers, and increased the costs of products and services, compounded the project's internal weaknesses related to delayed start-up, slow recruitment processes for consultants and procurement procedures, thereby reducing the project's performance in achieving its indicator targets. The sociopolitical crisis in the North-West and South-West regions may also have limited the enthusiasm or interest of some companies to fully participate in the pesticide disposal tender process. However, two similar projects implemented in Benin (project GCP/BEN/056/GFF) and Malawi (project GCP/MLW/052/GFF) during the same period achieved significantly better performance.

Conclusion 5. The project successfully engaged stakeholders in pursuing its environmental objective while managing significant risks associated with the activities, yet it did not adequately address the specific concerns of the most vulnerable groups, notably women, children, Bororo herders, and visually impaired persons.

177. The project rightly highlighted the heightened vulnerability of women to the harmful effects of pesticides compared to men. However, no gender analysis was conducted to identify their specific needs, as well as those of other vulnerable groups in the project area, nor to propose appropriate prevention and mitigation measures.
178. Another source of dissatisfaction lies in the fact that relevant actors in the agrifood value chains (producers, local communities, traders, consumers) were not consulted. Private sector actors specialized in the importation and distribution of pesticides, as well as in the collection and recycling of used plastic packaging – who have an important role to play in raising awareness and preventing risks related to pesticides and associated waste among vulnerable groups – were only consulted by the project to provide information, and not

genuinely engaged in establishing concrete public-private partnerships as indicated in Conclusion 1. Only the intermediate and final beneficiaries involved in the project's execution (most of whom as contractors) were effectively engaged, each according to the real or expected benefits anticipated from the project. Some even disengaged as soon as the anticipated short-term benefits failed to materialize. This was the case for participants in the action-research activities on alternatives to extremely hazardous pesticides against nematodes and the banana weevil (*Cosmopolites sordidus*) in plantain fields in Eséka and Ebolowa (see Finding 15).

4.2 Recommendations

Recommendation 1. It is strongly recommended that FAO, in the short term, supports the Government of Cameroon in mobilizing partnerships and funding to finalize the remaining priority activities. (See Conclusions 2 and 3)

179. The priority activities to be completed include the secure packaging, transport and storage of new pesticide stocks in a central warehouse; the disposal of the methyl bromide stock stored at the Arysta LifeScience warehouse; the remediation of the high-risk sites in Lagdo and Dschang (CREFISAC); the operationalization of the national strategy for managing empty pesticide containers; the continuation of additional studies necessary for the registration of biopesticides successfully tested by the project; and high-level advocacy for the development and promotion of alternative solutions to the extremely hazardous pesticides currently used in Cameroon's agrifood systems.

Recommendation 2. To achieve sustainable pesticide management, it is imperative for the Government of Cameroon and its partners to strengthen the capacities of national and regional private sector actors involved or interested in the pesticide management chain, including obsolete pesticides and associated waste, and to hold them accountable so they can fully assume their roles in collection, treatment and recycling. To this end, FAO should engage in dialogue with the government and support its efforts to find ways to reduce the costs of managing POPs, obsolete pesticides and associated waste, and to ensure sound management of the entire pesticide life cycle, by contracting or supporting the services of national or regional service providers. (See Conclusion 3)

180. Indeed, although the project prioritized the option of exporting and disposing of obsolete pesticides abroad (due to insufficient national capacity), this solution only offers a palliative response to the problem. The sustainability and impact of similar projects require strengthening national or subregional capacities of stakeholders across the pesticide management value chain. In the current context, obsolete pesticides, empty pesticide containers, and illicit pesticide stocks seized by phytosanitary inspectors, will continue to accumulate, and Cameroon will not always have the resources to export and destroy them abroad. Moreover, the safeguarding and disposal of newly inventoried obsolete pesticides left with their holders must be carried out within a short time frame to prevent their reduction or disappearance. The storage facilities for obsolete pesticides must be monitored and secured to prevent break-ins resulting in the theft of obsolete pesticides, as was the case at the Edéa warehouse.
181. The sustainable management of POPs should therefore no longer rely on the export of pesticides to other territories. Any sustainable obsolete pesticide management project should focus on developing the capacities of local actors (upgrading facilities, training,

contract models, etc.). Preferred soil remediation options should also include bioremediation and mycoremediation.

Recommendation 3. FAO, in partnership with the Government of Cameroon and with the support of the GEF, must, in the short term, carry out a vulnerability analysis of social and professional groups to the risks and hazards associated with chemical pesticides, as well as a capacity assessment of national stakeholders in the pesticide waste management value chain, in order to identify their specific needs and response areas. (See Conclusion 5)

182. Chemical pesticides, along with the resulting waste and associated risks, pose a threat to the environment and vulnerable groups. A precise understanding of capacities, vulnerabilities and needs is essential to propose appropriate responses. These responses must strongly rely on national capacities.

Recommendation 4. Building on the interest generated among stakeholders, the outcomes achieved and the lessons learned from its implementation, FAO should, in the medium term, support the Government of Cameroon in developing a more ambitious and sufficiently robust project – or more significant interventions – to enable the elimination of all currently identified POPs and to reduce health and environmental risks associated with the use of pesticides and related waste and residues. (See Conclusion 1)

183. The project activities were all relevant and produced outcomes and achievements that deserve to be consolidated through future interventions. These interventions can be considered within the framework of a future project that would build on the strengths and seize the missed opportunities of the previous project. In this perspective, the development of public-private partnerships must be the flagship approach to prioritize in pursuing Outcome 1, concerning the disposal of stocks of POPs and obsolete pesticides and the restoration of contaminated sites, as well as Outcome 2, related to the sustainable management of empty pesticide containers. It is not a question of relying on private operators to finance the project, but rather of using part of the funds from a potential future project to encourage these private operators to seize the business opportunities that exist in the various links of the management chain of pesticide-related waste or hazards (obsolete pesticides, contaminated sites, empty pesticide containers).
184. The incentive approach could include, among others: i) supporting the assessment of the capacities of these private operators and identifying the necessary capacity-building needs to make them more operational and effective in their segment of activity (collection, packaging, storage, treatment, recycling of obsolete pesticides and/or empty pesticide containers, restoration of polluted soils); ii) supporting the development of business plans to compare the investments required by private operators with the expected market shares and profit margins; and iii) mobilizing state mechanisms and resources to subsidize or remunerate the services of private operators involved in the less profitable segments of the management chain of obsolete pesticides and associated waste. These actions will truly help strengthen national capacities and ensure more sustainable management of pesticide-related waste and risks.
185. Always in pursuit of Outcome 1 and 2, advocacy and information campaigns based on available data, including those concerning the impacts of pesticides on health, should also be planned, integrated and conducted targeting policymakers, pesticide importers and distributors, pesticide users, residents of polluted sites and consumers of agricultural products. In pursuit of Outcome 3, the future project should include activities aimed at

developing the mechanisms and tools necessary to operationalize the public-private partnership for the elimination of obsolete pesticides, pollution remediation, management of empty pesticide containers, and support for alternative agrifood systems (value chains of organic agriculture, sustainable agriculture or precision farming). Capacity-building for inspections should also be envisaged (including the provision of logistical means for inspection missions and the establishment of a framework for legal follow-up against smugglers). In pursuit of Outcome 4, it is relevant to integrate pragmatic and transformational approaches and tools such as the FFS approach and the PGS.

186. A new outcome should be created and pursued, specifically targeting the change of attitudes, behaviours and practices. This would be achieved through communication that highlights and leverages all the data, information and evidence generated by the project to conduct genuine mass awareness campaigns. These campaigns must be continuous, tailored to various target audiences, and utilize channels and tools capable of reaching all social categories.

4.3 Lessons learned

Lesson 1. Due to potential changes in the context and risks associated with design or budgeting errors, it is essential, at the time of project launch, to verify its internal coherence, particularly the relevance of the activities and the realism of the budget and implementation timelines in relation to the intended objective.

187. Such a review, which should be followed by an appropriate revision of the budget and activities, could be carried out during the project planning phase or during meetings of the PSC. This would help prevent or limit the series of no-cost extensions of the project.

Lesson 2. To be convincing, the awareness-raising and communication strategy on the risks and hazards of pesticides, as well as on prevention or mitigation measures, must be based on concrete and factual technical and scientific data.

188. The communication and innovation promotion strategies developed and implemented under this project, as in many other similar projects, lacked sufficient elements and data to effectively raise awareness and bring about lasting changes in attitudes or behaviours among the targeted individuals. Moreover, having a large amount of data or information and multiple dissemination channels is not enough to ensure effective communication. In a communication programme or approach aiming at responsible environmental behaviour change, it is necessary not only to have relevant, credible, and persuasive data and information, but also to integrate factors inspired by key theories from social and cognitive psychology and their associated models. It is also necessary to support or nurture the programme or approach through the design and implementation of educational systems adapted to the intended objective and context (the FFS approach, which was needed in this project), as well as through incentive measures (subsidy policies, mutually beneficial partnerships, etc.) or coercive measures (regulatory or legal obligations, standards and procedures, etc.).

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Appendix 1. People interviewed

Name	Surname	Position	Organization/Location
Agbor	Theresia	Farmer	Loum
Aoudou	Joswa	Project coordinator	Ministry of Environment, Nature Protection and Sustainable Development
Apala Mafouasson	Hortense	Member of the committee for the Registration of Pesticide and Application Equipment	Agricultural Research Institute for Development
Atou'ou	Bruno	Farmer	Ebolowa
Atouba	Jean Pierre	Senior Officer at the Department of Regulation, Quality Control of Agricultural Products and Inputs	Ministry of Agriculture and Rural Development
Baleguel	Pierre Didier	Pesticide management expert	Yaoundé, Initiative Foundation-Cameroon
Ballo	Babbadé	Warehouse manager	AFCOT Warehouse, Ngaoundéré
Belinga Mongue	Régine	Project focal point	Ministry of Environment, Nature Protection and Sustainable Development
Beyegue	Honoré	Head of Department for Agriculture in the Faculty of Agronomy and Agricultural Sciences	University of Dschang
Bidima	Luc	Farmer	Ebolowa
Bitom	Dieudonné Lucien	Deen of the Faculty of Agronomy and Agricultural Sciences	University of Dschang
Biya	Paul	Agricultural Post Head	Delegation, Ministry of Agriculture and Rural Development, Ebolowa
Chaaba	Ali	General Director	Source du pays (Ecogreen)
Chimi	Noelle	Manager	BOCAM
Chueng	Patrice	Chief Accountant	Source du pays (Ecogreen)
Deuto	Alexis B.	General Director Phyto 2050 Sarl, Ngaoundéré	Phyto 2050 Sarl
Djeugap	Joseph	Plant Protection Laboratory Head	University of Dschang
Djomaha	Edwige	Department of Plant Protection, Faculty of Agronomy and Agricultural Sciences	University of Dschang
Djoukeng	Griseur	Vice-Head of the Department for Rural Engineering	University of Dschang
Dongmo	Alain Bertrand	Head of the Laboratory of Biology and Animal Organism	University of Douala
Dupond	Samuel Yves	Farmer	Eséka
Ekoumelong	Clément	Former subdivisional delegate of Agriculture and Rural Development, Loum	Ministry of Agriculture and Rural Development
Ela	Ela	Subdivisional delegate of Agriculture and Rural Development	Delegation, Ministry of Agriculture and Rural Development, Eséka
Elom		Farmer	Ebolowa
Elong	Paul Aimé	Research and Development Manager	Arysta/UPL Limited
Essama	Isabelle	Farmer	Eséka
Essola Etoa	Louis	Former senior officer at the Department of Regulation, Quality	Ministry of Agriculture and Rural Development

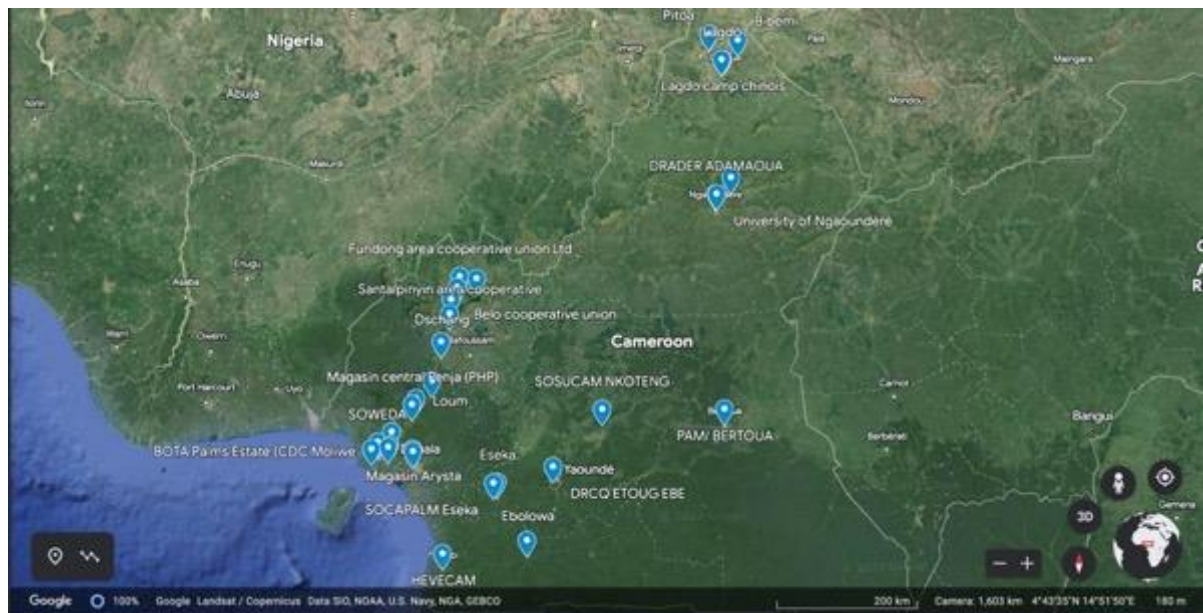
Name	Surname	Position	Organization/Location
		Control of Agricultural Products and Inputs	
Fokou	David	Head of Service for Quality Control at the Ministry of Agriculture and Rural Development, West	Ministry of Agriculture and Rural Development
Folefack	Denis	Station Head, Njombé	Agricultural Research Institute for Development
Fomepao	/	Subdivisional delegate of Agriculture and Rural Development	Delegation, Ministry of Agriculture and Rural Development, Loum
Fosso	Christian	Chief Executive Officer	FIMEX INTERNATIONAL
Fotio	Daniel	Head of the Service for Alternatives to Hazardous Pesticides	The Interstate Pesticide Committee of Central Africa
Hamani	Anatole	Programme Officer	Research and Education Centre for Development, Yaoundé
Happi	Isaac	Farmer	Loum
Kamba	Roseline	Farmer	Eséka
Kenfack	Augustave	Vice-Deen, Faculty of Agronomy and Agricultural Sciences	University of Dschang
Keudou	Nathalie	President	Association Honest African Women for Research and Development (AFAIRD)
Keudou	Charles	Empty Pesticide container (EPC) collector	Yara distribution, Loum
Kitio Ngouadjio	Romeo	Development Manager	SOLEVO
Konde	Jean Claude	Regional Delegate	Ministry of Agriculture and Rural Development, Littoral
Kouayep	Emmanuel	EPC collector	Emma Phyto, Loum
Kuate	Jean	Member of the Scientific Committee	The Interstate Pesticide Committee of Central Africa
Lemnyuy	A. William	Wouri Divisional Delegate (Littoral region)	Ministry of Environment, Nature Protection and Sustainable Development
Loga Lam	Léonard	Subdirector for the Regulation of Pesticide, Fertilizer and Treatment Equipment	Ministry of Agriculture and Rural Development
Mafouo ngandjou	Honoré	PADER Subdelegate, Regional delegation of Agriculture and Rural Development, West	Ministry of Agriculture and Rural Development
Mangova	Zaihad	Projects' activities implementation officer for Padermé and Pitoa	National Confederation for Cotton Producers of Cameroon
Mba Meffe	Jean Hervé	Farmer	Ebolowa
Mbappe	Stéphane	Executive Assistant	FIMEX
Mbella	Gustave Abel	Chief of Health Control Brigade	Ministry of Public Health, Littoral
Mbeng Mbog	Paul Fils	Divisional Delegate, Ministry of Environment, Nature Protection and Sustainable Development, Moundou	Ministry of Environment, Nature Protection and Sustainable Development
Mbiandoun	Mathurin	Member of the Evaluation Team	FAO, Evaluation Bureau
Mbongo	Francklin	Nematologist	Carbap, Jombe
Meka	/	Director	Central Hospital, Eséka
Metomo		Deputy Director	Saint Jean de Malte Hospital, Njombe

Name	Surname	Position	Organization/Location
Meutchieyé	Felix	Head of the Department for Animal Production, Faculty of Agronomy and Agricultural Sciences	University of Dschang
Minka	Christian	Head of Office	Ministry of Agriculture and Rural Development
Minyem	Dieudonné	Former Subdivisional Delegate of Agriculture and Rural Development, former focal point	Delegation, Ministry of Agriculture and Rural Development
Mohamadou	Moctar	Lagdo site manager	Study Mission for the Planning and Development of the North Region
Morebotsane	Kuena	Liaison Officer for Project financing	FAO, Office of biodiversity, climate change and environment
Mvele	Thomas	Farmer	Ebolowa
Mvondo	Awono	Deen of the Faculty of Agriculture and Veterinary Sciences	University of Buea
Nana	Fagnol	Farmer	Loum
Nana	Simplice	EPC collector	Loum
Nanfack	Franky Vincent	General Director	Centre for Rehabilitation, Training and Social Integration for the Blind in Cameroon
Ndang	Olga	Agricultural Post Head	Delegation, Ministry of Agriculture and Rural Development, Loum
Nde	Marcel	North-West Base Seed Production Region	Ministry of Agriculture and Rural Development
Ndikontar	Alice	Project Technical Coordinator	FAO, Cameroun
Ndongho	Eric	-	Ministry of Environment, Nature Protection and Sustainable Development
Ndzana Abanda	Raphael F-X	Researcher	Agricultural Research Institute for Development
Ndzana Letsina	Marcelin	Subdivisional delegate of Agriculture and Rural Development, focal point	Delegation, Ministry of Agriculture and Rural Development, Ebolowa
Ngambi	Laurent	Agricultural Post Head	Delegation, Ministry of Agriculture and Rural Development, Eséka
Ngando	Ebongue	Head of the Cooperation Unit	Agricultural Research Institute for Development
Ngo Gombi	Elisabeth	Agricultural extension officer	Delegation, Ministry of Agriculture and Rural Development, Eséka
Ngo Mbanbgoua	Fortune	Farmer	Eséka
Ngonde	Rodrigue	General Director	REDPLAST
Ngoulou	Jean	Project consultant, Country manager Rainbow Agrosiences Ltd Cameroon	Rainbow Agrosiences Ltd Cameroon
Nkono	Pierre	Project section head	Delegation, Ministry of Agriculture and Rural Development, Eséka
Nkouankwi	Diane	Technical and Commercial Director	Horizon Phyto

Name	Surname	Position	Organization/Location
Nouokaghueu	Robert	Ministry of Public Health Representative	Ministry of Public Health, Yaoundé
Ntyame	Eliette	Deputy Director	Ebolowa Regional Hospital
Nya	Edouard	Head of the National Laboratory for Analysis and Diagnostics	Department of Regulation, Quality Control of Agricultural Products and Inputs, Ministry of Agriculture and Rural Development
Nya	Amélie	Subdivisional delegate, Bafoussam 1	Ministry of Agriculture and Rural Development
Nyasse	Salomon,	National Commission for Pesticide Registration	Agricultural Research Institute for Development
Nying Shey	Charles	Director for Regulation and Quality Control of Agricultural Products and Inputs	Ministry of Agriculture and Rural Development
Olomo		Head of the Communication Unit	HYSACAM
Ouattara	Lassina	Team Leader Emergency Centre for Transboundary Animal Diseases (ECTAD), Public servant officer	FAO Cameroun
Owoudou	François	HSE manager	SOCAPALM Eséka
Perminova	Oxana	Senior technical officer of the project, Division of Crop production and Plant Protection	FAO
S.M Seba Mvom	Etienne	Farmer	Ebolowa
Sonkoue	Jean Fanny	Head of the service for Sustainable Development	Ministry of Environment, Nature Protection and Sustainable Development, West
Sonna	Christophe	Executive Secretary	CROPLIFE CAMEROUN
Sop	Jean Marie	Delegate	GIC (Common Initiative Group) UNAPAC, Loum
Sop Ngoyap	Edy	Focal Point, General Director	Honest Planters' cooperative of Cameroon
Soppi	Rosette	Head of commercial Service	BOCAM
Sounoussi	Mohaman	Head Office for Pesticide Control, Regional Delegation of Agricultural and Rural Development, Adamawa	Ministry of Agriculture and Rural Development
Takoudjou	Lém	Head of Menoua Health District	Ministry of Public Health
Tankou	Christopher	Vice-Deen Faculty of Agronomy and Agricultural Sciences	University of Dschang
Tchokoteu	Augustin	Vice-president	Honest Planters' cooperative of Cameroon
Tchuimaleu	Hervé	Head of the Service for Quality Control of Inputs	Ministry of Agriculture and Rural Development, South-West

Name	Surname	Position	Organization/Location
Tombin Aziawung	Valentin	Representative	Ministry of Agriculture and Rural Development, Yaoundé
Toula Ngono		Divisional Delegate	Delegation Ministry of Agriculture and Rural Development, Ebolowa
Tsafack Nanfosso	Roger	Rector	University of Dschang
Unusa	Haman	GEF operational focal point	Ministry of Environment, Nature Protection and Sustainable Development
Wade	Abel	Director	LANAVET, Garoua
Wafilssa	Todou	Former Head of the Service for Quality Control at the Regional Delegation of Agricultural and Rural Development, Adamawa	Ministry of Agriculture and Rural Development

Appendix 2. Geographical distribution of project sites and stakeholders



Note: Please refer to the disclaimer on page ii regarding the names and boundaries shown on this map.

Source: Google, S. d. Screenshot from the instrument earth.google.com.

Appendix 3. Project sites and related activities

N°	Sites	Field visit (Yes/No)	Region
Component 1: Safe disposal of persistent organic pollutants and obsolete pesticides and restoration of contaminated sites (activities related to inventorying obsolete pesticide stocks)			
1	Regional Delegation of Agriculture and Rural Development, Adamawa	Yes	Adamawa
2	SOPROICAM AGRICOL	Yes	Adamawa
3	SOSUCAM Nkoteng	No	Centre
4	Department of Regulation and Quality Control of Agricultural Inputs and Products, Etoug-Ebe	Yes	Centre
5	SOCAPALM Eséka	Yes	Centre
6	World Food Programme, Bertoua	No	East
7	Central warehouse Penja (Haut Penja Plantations)	Yes	Littoral
8	Magzi Industrial Zone, Douala: HPP-Horizon Phyto Plus	Yes	Littoral
9	Magzi Industrial Zone, Douala: Arysta Warehouse	Yes	Littoral
10	Nkongsamba Phytosanitary Base	No	Littoral
11	Lagdo, camp chinois	Yes	North
12	MEADEN Lagdo	Yes	North
13	SODECOTON	Yes	North
14	Belo cooperative union	No	North-West
15	Fundong area cooperative union Ltd	No	North-West
16	Santa/pinyin area cooperative	No	North-West
17	OKU central marketing society Ltd	No	North-West
18	Main warehouse, Phytosanitary base, North-West	No	North-West
19	BOTA Palms Estate (CDC Moliwe)	No	South-West
20	CDC Rubber Group	No	South-West
21	Central Warehouse Camp 7 (BANANA Group) CDC	No	South-West
22	Subdivisional Delegation, Ministry of Agriculture and Rural Development, Muyuka	No	South-West
23	Regional Delegation of Agriculture and Rural Development, South-West (Buea)	No	South-West
24	South-West Development Authority	No	South-West
25	HEVECAM	No	South
Component 1: Contaminated sites (rapid and detailed environmental assessment activities)			
26	Dschang	Yes	West
27	Lagdo	Yes	North
Component 2: Management of empty pesticide containers (implementation activities of pilot projects for empty pesticide container management)			
28	Loum	Yes	Littoral
29	Pitoa (District)	Yes	North
30	Bibemi (Subdivision)		North
Component 4: Promotion of alternatives to conventional pesticides and communication strategy (activities of formulation, efficacy testing, and training of stakeholders)			
31	Eséka	Yes	Centre
32	Ebolowa	Yes	South
33	University of Ngaoundéré	Yes	Adamawa

Appendix 4. Evaluation matrix

Evaluation questions	Subquestions/Indicators	Methods/Informants
1. Outcomes		
<i>Relevance</i> Question 1.1: To what extent were the project objectives aligned with the strategic priorities of Cameroon Government, the Organization for Food and Agriculture of the United Nation, GEF and answer to the need of sustainable management of chemical pesticide and risk reduction for environment and health?	To what extent were the project objectives aligned with the strategic priorities of the Government of Cameroon Government, FAO, GEF, and address the need of sustainable management of chemical pesticide and risk reduction for environment and health?	Review of Cameroon, FAO and strategic documents; Review of project's documents; Individual or group interviews with stakeholders and beneficiaries of the project.
	To what extent did the project address the needs of stakeholders (decision-makers, implementers, intermediate and final beneficiaries) in the pesticide value chain in Cameroon?	
	Was the project design appropriate for delivering the expected results?	
	Have significant changes occurred in the overall project context or in the pesticide management value chain? If applicable, what adjustments were made by the project in response to the evolving context?	
	Do the project objectives and outcomes remain relevant at project completion?	
	In retrospect, what could have been done differently regarding the project's design and implementation strategy?	
<i>Coherence</i> Question 1.2: To what extent is the project internally coherent and compatible, complementary, or coordinated with other interventions implemented by the government, FAO, GEF, or other partners?	To what extent did the project build on or complement past interventions?	
	To what extent did the project collaborate or create synergies with other FAO interventions or with other partners in the agricultural, environment and health sectors in Cameroon or at its sites?	
	To what extent was the project coordinated with other actors and projects to ensure added value while avoiding duplication of activities?	
	Was the project design appropriate to achieve the expected outcomes?	
<i>Effectiveness and Progress Towards Impact</i> Question 1.3: To what extent was the project objective of reducing emissions of persistent organic	To what extent was the project objective of reducing releases from obsolete pesticide stocks and contaminated sites, and strengthening capacity for sound pesticide management achieved?	Review of project documents, semi-annual and annual reports, letters of agreement and contracts, partners' technical reports; Surveys and interviews with stakeholders.
	To what extent were existing stocks of POPs and obsolete pesticides (100 tonnes) disposed of in an environmentally sound manner, and were the sites contaminated by POPs and pesticides restored?	
	To what extent have the human health and environmental risks associated with empty pesticide containers been reduced through the establishment and improvement of national container management systems?	

Evaluation questions	Subquestions/Indicators	Methods/Informants
pollutants (POPs) from obsolete pesticide stocks and and contaminated sites, and of strengthening capacity for sound pesticide management in Cameroon, achieved?	To what extent have the regulatory framework and institutional capacity been strengthened for sound pesticide management throughout their life cycle?	
	To what extent have alternatives to chemical pesticides and the communication strategy been promoted?	
	(Progress towards impact) To what extent has the project produced, or is expected to produce, significant and wide-reaching effects, whether positive or negative, intended or unintended?	
<i>Additionality</i> Question 1.4: To what extent has GEF support to the project contributed to environmental, socioeconomic, legal, institutional, and financial outcomes, including socioeconomic benefits, learning, and innovation?	What is the actual contribution of GEF financing to the achievement of outcomes?	Review of project documents, semi-annual and annual reports, letters of agreements, contracts and partners’ technical reports; Surveys and interviews with stakeholders.
	What are the additional environmental or socioeconomic effects directly associated with project implementation?	
	What are the project’s effects on strengthening the legal, institutional and financial frameworks related to the issues or beneficiaries targeted by the project?	
	What are the project’s effects on socioeconomic benefits, learning and innovation?	
<i>Capacity Development</i> Question 1.5: To what extent has the project strengthened capacities across the three dimensions, enabling Cameroon to ensure sound and sustainable pesticide management?	To what extent has the project addressed the specific needs identified in each of the three dimensions of capacity development?	Review of project documents and country, FAO and GEF strategic frameworks; Interviews with stakeholders, survey of project beneficiaries.
	How has the project built on existing capacities?	
<i>Efficiency</i> Question 1.6: To what extent have inputs been converted into outcomes efficiently and on schedule?	What is the efficiency of converting inputs (funds, expertise, personnel, equipment, etc.) into outcomes compared to feasible alternatives?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners’ technical reports; Surveys and interviews with stakeholders.
	What are the unit production costs compared to applicable benchmarks and standards and/or similar projects?	
	What is the project’s cost-benefit ratio?	
	What are the areas of efficiency and inefficiency, and how have they affected the project’s costs?	
	Which project activities were initiated and completed within a reasonable time frame?	
	Did the project use approaches that reduced costs and avoided duplication of efforts?	

Evaluation questions	Subquestions/Indicators	Methods/Informants
<i>Sustainability</i> Question 1.7: To what extent have the necessary conditions been established to prevent/mitigate risks and to ensure the continuity of the project's benefits after its closure?	To what extent did the benefits generated by the project improve resilience capacities?	Review of project document, bi-annual and annual reports, letters of agreement, contracts and partners' technical reports; Interviews with stakeholders.
	To what extent have the financial risks that could affect the continuation of the project's net benefits been identified and managed?	
	To what extent have the sociopolitical risks that could affect the continuation of the project's net benefits been identified and managed?	
	To what extent have the institutional risks that could affect the continuation of the project's net benefits been identified and managed?	
	To what extent do environmental risks that could affect the continuation of the project's net benefits exist, and how have they been managed?	
	To what extent do other risks (social, economic, health and technical) that could threaten the continuity of the project's net benefits exist, and how have they been addressed?	
2. Operational factors affecting project performance		
Implementation and execution of the project		
Question 2.1: To what extent FAO effectively fulfil its responsibilities as a GEF implementing agency, from project identification to evaluation, including activities related to approval, start-up, and project implementation?	To what extent did FAO contribute to the identification, concept development, appraisal, preparation, approval and start-up, as well as the monitoring and supervision of the project?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners' technical reports; Process quality audit; Interviews with stakeholders.
	To what extent was the implementation process and the challenges encountered at various stages (efficient use of resources and inputs, delivery of outputs, etc.) effectively managed?	
	To what extent were the information and data from project monitoring used for decision-making, adaptive management and learning?	
	To what extent were the recommendations from the mid-term review implemented?	
Question 2.2: To what extent did the implementing partners effectively and efficiently fulfil their roles and responsibilities in managing and administering the project's day-to-day activities under FAO's supervision and oversight?	To what extent did the implementing partners effectively and efficiently fulfil their roles and responsibilities in managing and administering the project's day-to-day activities under FAO supervision?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners' reports; Interviews with stakeholders.
	Have the executing entities properly fulfilled their responsibilities regarding the appropriate use of funds, including the procurement and contracting of goods and services in accordance with FAO regulations?	
	To what extent will these executing entities facilitate the monitoring of the project?	

Evaluation questions	Subquestions/Indicators	Methods/Informants
Design and implementation of monitoring and evaluation		
Question 2.3: To what extent was a relevant and practical monitoring and evaluation plan in place at project approval or immediately after project start-up?	To what extent did the monitoring and evaluation framework align with the project’s TOC, meet the GEF monitoring and evaluation requirements, incorporate the applicable core indicators (institutional outcome indicators) and provide baseline information (reference data)?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners’ technical reports; Interviews with stakeholders.
	Were the objectives clear, and were the indicators appropriate (specific, measurable, achievable, relevant and time-bound [SMART]) to track the project’s environmental, gender-related and socioeconomic outcomes?	
	Was the proposed methodological approach clear and appropriate?	
	Was the practical organization and logistics of the monitoring and evaluation activities, including the schedule and responsibilities for data collection, clearly specified and adequate?	
	Were the funds available for monitoring and evaluation activities sufficient?	
Question 2.4: Did the monitoring and evaluation plan function according to the planned or revised plan?	Were any changes made to the monitoring and evaluation plan? If yes, why? Were they necessary and timely?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners’ technical reports; Interviews with stakeholders.
	Were the information on the specified indicators and the monitoring tools for the relevant GEF intervention areas collected/used systematically?	
	Were appropriate methodological approaches used to analyse the data?	
	Were the resources for monitoring and evaluation sufficient?	
	How was the monitoring and evaluation system’s information used during project implementation?	
Co-financing		
Question 2.5: To what extent did the expected co-financing materialize, and what impact did it have on the project’s outcomes?	What are the amount and the types of co-financing actually mobilized for the project compared to the commitments?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners’ technical reports; Surveys and interviews with stakeholders.
	To what extent did the expected co-financing materialize, and was it timely?	
	What were the financing mobilization and management challenges faced by the project? What factors facilitated the realization of co-financing, or conversely, limited the fulfilment of commitments (delayed or insufficient)?	
	What effects did the levels of co-financing mobilization have on the implementation and outcomes of the project?	

Evaluation questions	Subquestions/Indicators	Methods/Informants	
3 Application of good practices, opportunities seized or missed, and lessons learned			
Application of GEF policies and guidelines			
Environmental and Social Safeguards Question 3.1: To what extent were appropriate environmental and social safeguard measures taken into account in the design and implementation of the project?	Was the GEF Policy on Environmental and Social Safeguards applied during project preparation and implementation? Was the project likely to cause, or did it cause, any harm to the environment or to any stakeholder, including surrounding communities or beneficiaries? Where applicable, were measures put in place or implemented to prevent and/or mitigate negative impacts? How have the project activities effectively affected local populations and riparian communities?	Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners' technical reports; Interviews with stakeholders.	
Gender and Vulnerable Group Mainstreaming Question 3.2: To what extent were gender considerations taken into account in the design implementation of the project?	To what extent was the project implemented in a way that ensured equitable participation and benefits between genders? Was a gender analysis conducted? Were sex-disaggregated data on beneficiaries collected and reported? Did the project provide opportunities or rather pose constraints for women and youth? To what extent were relevant gender-related concerns monitored?		
Project Partnerships and Stakeholder Engagement Question 3.3: To what extent did the project engage the appropriate stakeholders at different levels of implementation?	Have the relevant actors (civil society, private sector, professional organizations, governmental and non-governmental organizations, beneficiary communities) been adequately involved? What lessons were learned from the involvement or non-involvement of certain stakeholders?		
Knowledge Management and Learning			
Communication, Knowledge Management and Knowledge Products Question 3.4: To what extent was the planned knowledge management approach	Has the project developed and implemented a communication strategy? What are the outcomes in terms of knowledge and learning products developed (websites/platforms, knowledge creation and sharing events, lessons learned, good practices, and adaptive management actions generated)?		Review of project documents, bi-annual and annual reports, letters of agreement and contracts and partners' technical reports; Interviews with stakeholders.

Evaluation questions	Subquestions/Indicators	Methods/Informants
appropriate and effective?		
<i>Lessons learned</i> Question 3.5: Has the project generated knowledge on good practices, successes, challenges encountered, and mistakes to be avoided in the design and implementation of future interventions?	To improve future actions, did the project conduct a reflection on its experience to generate knowledge on identified good practices and successes (that could be replicated or used more widely) or on problems encountered and mistakes made (that should be avoided in the future)?	
	What are the main knowledge products generated and lessons learned?	
<i>Human rights and Indigenous people</i>		
<i>Human rights</i> Question 3.6. Was the project likely to (or did it) negatively affect human rights?	Did the project include factors that could lead to discrimination and its impacts on vulnerable population groups such as children, women and the elderly, or the reduction of livelihood opportunities for young people?	Analysis of compliance with applicable standards, procedures and rules; Interview with stakeholders.
	To what extent did the project implement measures to prevent, mitigate or eliminate the risks of human rights violations?	
<i>Indigenous people</i> Question 3.7: To what extent were indigenous peoples and/or other minority groups included in the project?	To what extent were specific concerns related to Indigenous Peoples or other minority groups integrated into the project?	
	To what extent were these groups positively or negatively affected by the project’s outcomes?	

Appendix 5. GEF evaluation criteria rating table

GEF Criteria and dimensions	Rating ¹	Summary comments
A. OUTCOMES	MS	
A1. Relevance	HS	See Finding 1, Finding 2 and Finding 3
A2. Coherence	S	See Finding 4, Finding 5
A3. Effectiveness and progress towards impact	MU	Outcome 1[MU]: see Finding 6, Finding 7 Outcome 2 [MU]: see Finding 8, Finding 9 Outcome 3 [MS]: see Finding 10, Finding 11 and Finding 12 Outcome 4 [MS]: see Finding 13, Finding 14 and, Finding 15 Additionality and progress towards impact [MU]: see Finding 16 and Finding 17
A4. Efficiency	MU	See Finding 18
B. SUSTAINABILITY	MU	See Finding 19
C. IMPLEMENTATION	S	See Finding 20
D. EXECUTION	S	See Finding 20
E. MONITORING AND EVALUATION DESIGN	MS	See Finding 21
F. MONITORING AND EVALUATION IMPLEMENTATION	MS	See Finding 21
Project general rating	MS	

Note: ¹ Rating legend:

OUTCOMES, IMPLEMENTATION, EXECUTION, DESIGN, and MONITORING & EVALUATION IMPLEMENTATION

HS: Highly satisfactory

S: Satisfactory

MS: Moderately Satisfactory

MU: Moderately Unsatisfactory

U: Unsatisfactory

HU: Highly Unsatisfactory

UA: Unable to Assess

SUSTAINABILITY Likely (L); Moderately Likely (ML); Moderately Unlikely (MU); Unlikely (U); Unable to Assess (UA)

The rating system is described in more detail in Appendix 6.

Appendix 6. GEF rating scale and descriptors

Outcomes ratings

Ratings	Description
Highly Satisfactory (HS)	<i>The outcomes exceed targets, and they are highly relevant and cost effective.</i>
Satisfactory (S)	<i>Level of outcomes achieved meets targets. The outcomes are relevant and cost effective.</i>
Moderately Satisfactory (MS)	<i>Level of outcomes achieved was generally close to the targets. Majority of the targets were met or almost met but some were not. The outcomes are generally relevant and cost effective.</i>
Moderately Unsatisfactory (MU)	<i>Overall, the level of outcomes achieved is lower than targets, although some outcomes were substantially achieved. The outcomes are generally relevant but not sufficient given the costs or alternatively generally cost-effective but not adequately relevant.</i>
Unsatisfactory (U)	<i>The expected outcomes were not achieved, or achievement was substantially lower than expected, and/or the achieved outcomes are not relevant. Alternatively, the outcome was cost ineffective compared to alternatives.</i>
Highly Unsatisfactory (HU)	<i>Negligible level of outcomes were achieved and/or the project had substantial negative consequences, that outweigh its benefits.</i>
Unable to Assess (UA)	<i>The available information does not allow an assessment of the level of outcome achievement</i>

Sustainability ratings

Rating	Description
Likely (L)	<i>Either there is negligible risk to continuation of benefits or there are some risks, but the magnitude of their effect is too small and/or the probability that they will materialize is too small. Overall, it is likely that the net benefits of the project will continue.</i>
Moderately Likely (ML)	<i>There are some risks to sustainability, and they may have some effect on the continuation of benefits if they materialize. However, the probability of materialization of these risks is low. Net benefits are more likely to continue than abate.</i>
Moderately Unlikely (MU)	<i>There are significant risks to sustainability. The effect on continuation of benefits would be substantial if these risks materialize and the probability of materialization of these risks is significant. Overall, net benefits of the project are likely to abate.</i>
Unlikely (U)	<i>There are severe risks to sustainability. These risks have either already materialized and halted accrual of net benefits or have a high probability of materialization and will halt accrual of net benefits when they materialize. Therefore, overall, it is unlikely that net benefits will continue to accrue, and the long-term intended impacts of the project will be achieved.</i>
Unable to Assess (UA)	<i>Unable to assess the expected incidence and magnitude of risks to sustainability.</i>

Implementation and execution ratings

Ratings	Implementation	Execution
Highly Satisfactory (HS)	Performance of the GEF Agency was exemplary. Project preparation and implementation were robust. The Agency ensured that the relevant GEF policies were applied in project preparation and implementation. Project supervision was strong – the Agency identified and addressed emerging concerns in a timely manner. The GEF Agency ensured that project implementation stayed on track and was completed in time.	Performance of the executing agency/agencies was exemplary. The execution of project activities was timely and of high quality. Relevant GEF policies and requirements were adhered to. Guidance from the GEF Agency was followed and corrective actions, if required, were taken promptly. The executing agency also undertook measures to mitigate risks to sustainability and is taking steps to support the follow-up to the project. Completed project activities in time.
Satisfactory (S)	Performance of the GEF Agency met expectations and did not have any salient weakness. Project preparation and implementation were robust, and relevant GEF policies were applied. The GEF Agency supervised the project well – it identified and addressed emerging concerns in a timely manner. The GEF Agency ensured that project implementation was on track.	Performance of the executing agency met the expectations and was without any salient weakness. The execution of project activities was timely and of good quality. Relevant GEF policies and requirements were applied. Guidance from the GEF Agency was followed. The executing agency also undertook measures to mitigate risks to sustainability of project outcomes.
Moderately Satisfactory (MS)	Overall, the performance of the GEF Agency met expectations. Project preparation and implementation were adequate and relevant GEF policies were applied although there are some weak areas. The GEF Agency supervised the project adequately – it identified and addressed emerging concerns although some concerns may be inadequately addressed. Project implementation had minor delays and may have had a few dropped activities.	Performance of the executing agency had some weaknesses but, overall, it met the expectations. The execution of project activities was generally timely but with some instances of delay. Relevant GEF policies and requirements were applied although some minor slip-ups may also have been observed. Guidance from the GEF Agency was followed and problems were fixed. There are some areas where the performance of the executing agency was below par, although overall the executing agency's performance was adequate.
Moderately Unsatisfactory (MU)	Overall, the GEF Agency did not meet expectations although there were some areas of solid performance. Project preparation and implementation had weaknesses although these were not too severe. Project supervision was somewhat weak. Although most emerging concerns were identified, many remained unaddressed or inadequately addressed. Project implementation was delayed, and a few activities were dropped or reduced in scale because of issues that were largely under the control of the GEF Agency.	While there were some areas of solid performance, the overall performance of the executing agency did not meet expectations. The execution of project activities was delayed. The observed capacities of the executing agency were a limitation of project execution. Several slip-ups in application of GEF policies and requirements were observed. Guidance from the GEF Agency was generally followed and problems were fixed but usually such actions were not timely. There are several areas for improvement in execution.
Unsatisfactory (U)	The GEF Agency did not meet the expected level of performance. Project preparation and implementation were weak. Emerging concerns were not identified by the GEF Agency in time and remained unaddressed or inadequately addressed. M&E implementation was weak – activities were not implemented in time or were	The executing agency did not meet expectations. Execution of project activities was delayed and at least some activities were dropped due to factors largely under the control of the executing agency. Many slip-ups were observed in application of GEF policies and requirements. Guidance from the GEF

Ratings	Implementation	Execution
	not undertaken. Project implementation was delayed, and several activities were dropped or were reduced in scale.	Agency was not put into practice or was applied with considerable delay.
Highly Unsatisfactory (HU)	There were severe shortcomings in the quality of implementation. The GEF Agency mismanaged project implementation and its supervision was poor. Emerging concerns were not identified in time, including those that should have been obvious. Although instances of mismanagement were discovered, corrective actions were not undertaken. Project activities were poorly implemented and several had to be dropped.	There were severe shortcomings in project execution. There were several instances of mismanagement. Emerging concerns were not addressed in time, including those that should have been obvious. Most activities were very poorly executed, experienced delays, and activities dropped. GEF policies and requirements were not applied.
Unable to Assess (UA)	The available information is not sufficient to allow rating of performance.	The available information is not sufficient to allow rating of performance.

M&E ratings

Ratings	M&E plan	M&E implementation
Highly Satisfactory (HS)	The project M&E plan is a good practice and did not have any weaknesses – its alignment with the project TOC is robust. Complete baseline data has been provided. The specified indicators were appropriate, and arrangements for the M&E plan implementation were adequate. Overall, the M&E plan exceeds expectations and is exemplary.	The M&E plan implementation was excellent. Weaknesses in the M&E plan, if present, were addressed promptly. M&E activities were conducted in a timely manner, and data from M&E was used to improve project implementation. Overall, M&E implementation exceeded expectations and was exemplary.
Satisfactory (S)	The project M&E plan was robust and did not have any or had only minor weaknesses – the alignment with the project TOC is robust. Baseline data provided or its collection is planned at project start. The specified indicators were appropriate, and arrangements for M&E plan implementation were adequate. The plan meets expectations.	The M&E plan implementation was generally as per the plan. Weaknesses in M&E were addressed in a timely manner. M&E activities were conducted in a timely manner, and data from M&E was used in improving project implementation. Overall, M&E implementation meets expectations.
Moderately Satisfactory (MS)	On balance, the project M&E plan was solid. The specified indicators were generally appropriate, and arrangements for M&E plan implementation were adequate. The alignment of the M&E plan with the project TOC is solid. There were areas where the M&E plan could be strengthened but, overall, the plan was adequate.	The M&E plan implementation was generally as per the plan. Weaknesses in M&E were generally addressed although some remained. Some M&E activities were delayed. M&E data was used for reporting but had little use in improving project implementation. Overall, M&E implementation meets expectations with some areas of low performance.
Moderately Unsatisfactory (MU)	Overall, the GEF Agency did not meet expectations although there were some areas of solid performance. Project preparation and implementation had weaknesses although these were not too severe. Project supervision was somewhat weak. Although most emerging concerns were identified, many remained unaddressed or inadequately addressed. Project	While there were some areas of solid performance, the overall performance of the executing agency did not meet expectations. The execution of project activities was delayed. The observed capacities of the executing agency were a limitation of project execution. Several slip-ups in application of GEF policies and requirements were observed. Guidance from the GEF Agency

Appendix 6. GEF rating scale and descriptors

Ratings	M&E plan	M&E implementation
	implementation was delayed, and a few activities were dropped or reduced in scale because of issues that were largely under the control of the GEF Agency.	was generally followed and problems were fixed but usually such actions were not timely. There are several areas for improvement in execution.
Unsatisfactory (U)	The M&E plan had severe shortcomings. The alignment with the project TOC is weak. No baseline data was provided nor any indication that it would be collected at project start. Indicators do not adequately address project outcomes and other results; for several results, relevant indicators have not been specified. There are gaps in arrangements for M&E plan implementation – no budget or an inadequate budget was provided for M&E.	The M&E plan implementation was flawed and/or did not address severe weaknesses of the M&E plan. Several M&E activities were either dropped or were incomplete. The data collection methodology was not sound. M&E data was not reported in a timely manner – there is little evidence to suggest that the data was used to improve project implementation. M&E implementation does not meet expectations.
Highly Unsatisfactory (HU)	No M&E plan was prepared.	No, or negligible, M&E activity was implemented other than conduct of the project evaluation.
Unable to Assess (UA)	Unable to assess because project documents are not available.	Unable to assess as the terminal evaluation does not cover M&E implementation adequately.

Appendix 7. the GEF co-financing table

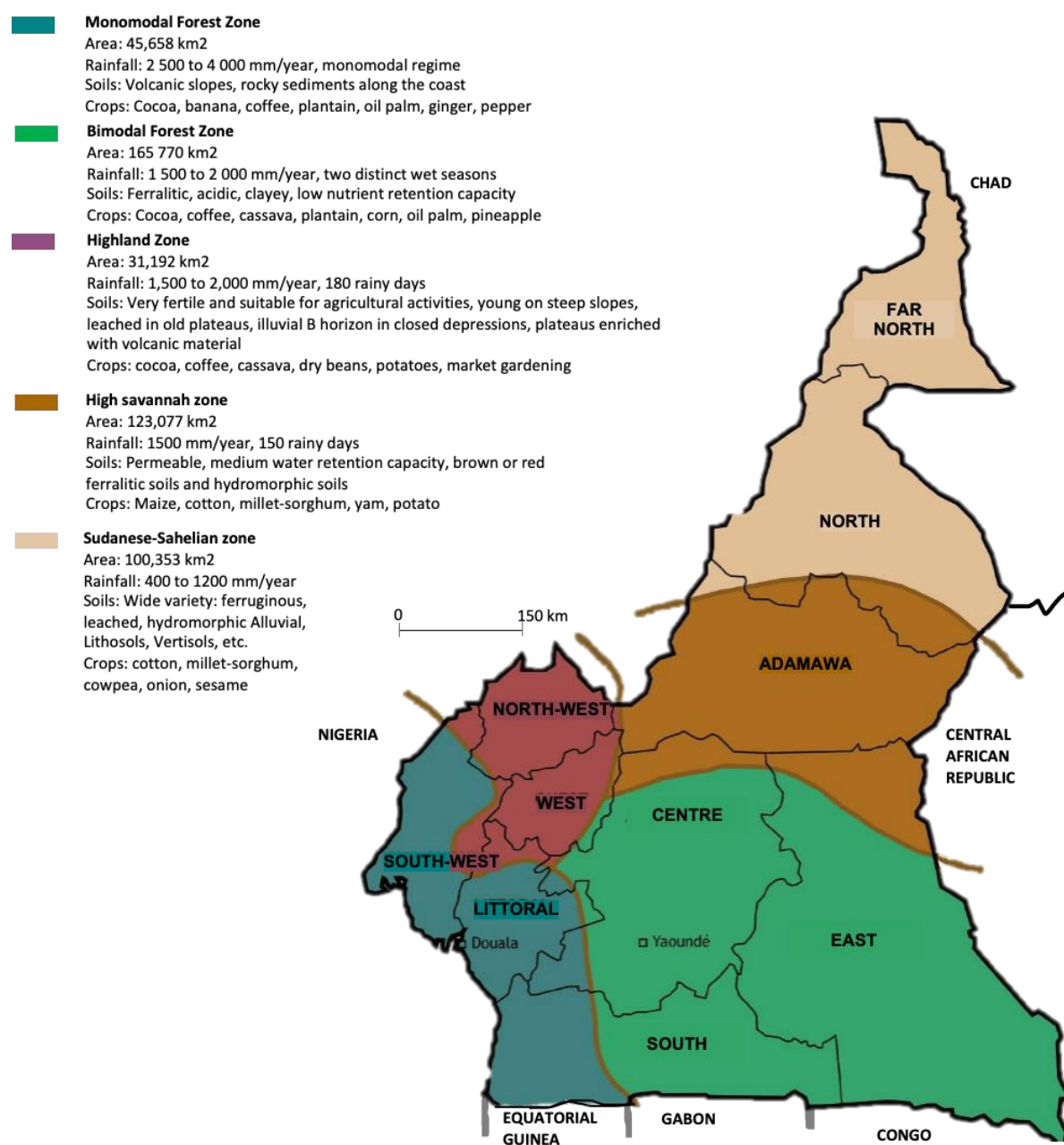
Source of co-financing ¹	Name of co-financier	Type of co-financing ²	Amount confirmed on the date of approval by GEF CEO (USD)	Actual amount materialized as of 30 June 2023 (USD)	Actual amount materialized at project closure (USD)
GEF agency	FAO	In-kind	170 000	170 000	170 000
National government	Ministry of Environment, Nature Protection and Sustainable Development	In-kind	480 000	545 636	545 636
National government	Ministry of Agriculture and Rural Development	In-kind	4 311 212	5 350 212	5 350 212
Civil society organization	AFAIRD	In-kind	300 000	320 000	320 000
Civil society organization	CropLife International	In-kind	1 721 162	1 721 162	1 721 162
Civil society organization	CropLife International	Subsidies			
Civil society organization	Research and Education Centre for Development	In-kind	1 000 000	163 900	163 900
Autonomous semi-governmental institutions	University of Ngaoundéré	in-kind	1 325 000	91 756	91 756
		Total	9 307 374	8 362 666	8 362 666

Notes: ¹ For example local, regional or national government; autonomous semi-governmental institutions; private sector; multilateral or bilateral organizations; training and research institutions; non-governmental organizations; civil society organizations; foundations; beneficiaries; GEF agencies; others (please provide an explanation).

² Scholarships, loans, equity participation of beneficiaries (individuals) in the form of cash, guarantees, in-kind or material contributions, and others (please provide an explanation).

Source: Authors' own elaboration.

Appendix 8. Map of agroecological zones of Cameroon and agricultural potential



Note: Please refer to the disclaimer on page ii regarding the names and boundaries shown on this map.

Source: Ministry of Environment, Nature Protection and Sustainable Development. 2015. National Adaptation Plan to Climate Change of Cameroon Yaoundé. <https://faolex.fao.org/docs/pdf/Cmr192040.pdf>

Appendix 9. Registered pesticides in 2023 by crop and distribution by toxicological class

Crop:	Type of pesticide	Quantity by toxicological class ¹				
		U	III	II	Ia	Ib
Pineapple	Fungicide (1)		1			
	Herbicide (13)		13			
	Growth regulator		4			
	Herbicide (1)	1				
Peanut (1)	acaricide (1)			1		
Banana and Plantain plants (73)	Adjuvants (2)		1	1		
	Fungicide (31)	4	22	5		
	Herbicide (3)		3			
	Insecticide (12)	2	5	5		
	Insecticide-Nematicide (8)			5	1	2
	Molluscicide (3)		1	2		
	Nematicide (11)		3	4	1	3
	Growth regulator	1	2			
Wood (9)	Insecticide-Fungicide (9)		8			1
Cocoa tree (133)	Fungicide (67)	2	57	8		
	Insecticide (66)		27	39		
Coffee tree (6)	Fungicide (4)		4			
	Insecticide (2)		1	1		
Sugarcane (52)	Fungicide (3)	1	1	1		
	Herbicide (47)	2	35	10		
	Insecticide (1)			1		
	Growth regulator		1			
Carrot (3)	Herbicide (1)		1			
	Insecticide (2)		1	1		
Cotton crop	Herbicide (56)	5	46	5		
	Insecticide (75)	3	37	35		
	Insecticide-Fungicide (14)		7	7		
	Growth regulator (7)		2	2		
Various crops (21)	Herbicide (21)		17	4		
Vegetable crops (3)	Insecticide (1)		1			
	Molluscicide (1)		1			
	Insecticide (1)		1			
Stored commodities (16)	Insecticide (16)	1	11		3	1
Bean (1)	Fungicide (1)		1			
Hevea (12)	Fungicide (5)	2	3			
	Growth regulator (7)	1	6			
Public hygiene (41)	Insecticide (37)	2	20	15		
	Rodenticide (4)				4	
Corn (87)	Herbicide (64)	3	61			
	Fungicide (1)		1			
	Insecticide (22)	6	8	8		
Cassava (2)	Herbicide (2)		1	1		
Onion (1)	Herbicide (1)		1			
Oil palm (80)	Herbicide (76)		56	20		

	Insecticide (1)			1		
	Fungicide (3)	1	2			
Potatoes (3)	Fungicide (3)	1	2			
Rice (14)	Herbicide (14)	1	9	4		
Soya bean (4)	Herbicide (4)		4			
Sorghum (2)	Herbicide (1)		1			
	Fungicide (1)		1			
Tobacco (1)	Fungicide (1)		1			
Tomato (159)	Fungicide (82)	10	71	1		
	Herbicide (1)		1			
	Insecticide (70)	4	19	45		2
	Insecticide-Fungicide (1)		1			
	Insecticide-Nematicide (8)			4		1
Total (892)	Quantity	53	584	236	9	10
	Percentage	5.9%	65.4%	26.5%	1.0%	1.1%

Notes: Legend of the different classes:

U: Unlikely to present acute hazard

III: Slightly hazardous

II: Moderately hazardous

Ia: Extremely hazardous

Ib: Highly hazardous

Source: Ministry of Agriculture and Rural Development. 2023.

Appendix 10. A fairly broad but flawed legal, policy and institutional framework for pesticide management

Pesticide management is governed by several laws: Law No. 2003/03 on Phytosanitary Protection (Republic of Cameroon, 2003); Law No. 96-12, the Framework Law on Environmental Management of 5 August 1996 (Republic of Cameroon, 1996); Law No. 89/27 of December 29, 1989, on Toxic and Hazardous Waste (Republic of Cameroon, 1989); Law No. 2021/014 of 9 July 2021, governing access to genetic resources, their derivatives, associated traditional knowledge, and the fair and equitable sharing of benefits arising from their use (Republic of Cameroon, 2021); Law No. 2018-020 of 11 December 2018, the Framework Law on Food Safety (Republic of Cameroon, 2018); and Law No. 2000/018 regulating Veterinary Pharmacy (Republic of Cameroon, 2000). The enforcement of these laws involves various ministries whose mandates and areas of action overlap and are not always clearly defined regarding responsibilities in certain domains. For example, the responsibility for preventing the use of hazardous chemical products lies with the Ministry of Public Health regarding public health, the Ministry of Agriculture and Rural Development concerning agriculture, and the Ministry of Livestock, Fisheries, and Animal Industries for matters related to fishing, livestock and animal products. Moreover, several adopted legal texts are not accompanied by implementation measures or regulations to help the various ministries and departments rigorously enforce the laws in force.

Several decrees also regulate pesticide management: Decree No. 2005/0770/PM establishing phytosanitary control procedures (Republic of Cameroon, 2005e); Decree No. 2005/0769/PM organizing the National Phytosanitary Council (Republic of Cameroon, 2005a); Decree No. 2005/0771/PM setting the implementation modalities for plant quarantine operations (Republic of Cameroon, 2005c); Decree No. 2005/0772/PM of 6 April 2005, establishing the conditions for the approval and control of phytosanitary products (Republic of Cameroon, 2005b); Decree No. 2011/2581/PM of 23 August 2011, regulating harmful and/or dangerous chemical substances (Republic of Cameroon, 2011a); Decree No. 2011/2585/PM of 23 August 2011, listing harmful or dangerous substances and the regime for their discharge into inland waters (Republic of Cameroon, 2011b); Decree No. 2012/2809/PM of 26 September 2012, establishing conditions for sorting, collecting, transporting, recovering, recycling, treating, and final disposal of waste (Republic of Cameroon, 2012a); and Order No. 001/Ministry of Environment, Nature Protection and Sustainable Development of 15 October 2012, establishing conditions for obtaining an environmental permit for waste management (Ministry of Environment, Nature Protection and Sustainable Development, 2012). A draft law on the management EPCs in Cameroon was under preparation, and Decree No. 0004 of 24 October 2012 (Ministry of Environment and Nature Protection and Ministry of Trade, 2012) concerning non-biodegradable plastic packaging requires producers, importers and distributors to establish a collection and treatment system, but does not cover pesticide packaging.

At the supranational level, the International Code of Conduct on the Distribution and Use of Pesticides, Guidelines for Pesticide Registration (FAO and WHO, 2010) stipulates that various sectors of the community bear varying degrees of responsibility in the pesticide registration process as well as in related post-registration activities. In this context, the National Commission for the Registration of Phytosanitary Products and the Certification of Treatment Equipment (Republic of Cameroon, 2025b), established in 2005 under the Ministry of Agriculture and Rural Development, regularly deliberates on dossiers concerning the registration of phytosanitary products as well as their renewal. During its thirty-fifth session held on 13 April 2023, the deliberations focused on 95 cases, including 5 for reconsideration, 10 for renewal of registration,

69 for registration, 5 for extension of registration, 2 for addition of formulator/origin, 2 for change of local representative, 1 for transfer of competence, and 1 for transfer of certification. However, although a system for exchanging information on imported, registered or banned pesticides and the relevant stakeholders has been developed, documented and made available to the public, access to this information remains difficult. However, in line with Article 6.1.13 of the International Code of Conduct on Pesticide Management, governments must: “detect and prevent illegal trade and counterfeiting of pesticides through information sharing and cooperation, both at the national level among public administrations and at the intergovernmental level”.

At the institutional level, pesticide management involves multiple stakeholders, with the Ministry of Agriculture and Rural Development serving as the lead agency in accordance with its mandates outlined in Decree No. 2005/118 of 15 April 2005 (Republic of Cameroon, 2005d). The Ministry of Agriculture and Rural Development oversees two interministerial bodies specialized in pesticide management, namely the National Commission for the Approval of Plant Protection Products and Certification of Treatment Equipment (Republic of Cameroon, 2005b), established in 2005, and the National Phytosanitary Council (Republic of Cameroon, 2005a), also established in 2005. This Council was not yet operational and had never met, according to the Project Document (FAO and GEF, 2014). The Ministry of Environment, Nature Protection and Sustainable Development (see Republic of Cameroon, 2012b, Decree No. 2012/431 of 1 October 2012 on the organization of the Ministry of Environment, Nature Protection and Sustainable Development) is responsible for developing and implementing the national waste management strategy, which aims to improve the living conditions of the population. Finally, the Ministry of Public Health (see Republic of Cameroon, 2013, Decree 2013/93 of 3 April 2013 on the organization of the Ministry of Public Health) is involved in the management of pesticides, waste and associated risks through its Subdirectorate for Hygiene and Sanitation. The Ministry of Public Health is also represented on the aforementioned National Commission for the Registration of Pesticides Used in Public Health.

Another key stakeholder in pesticide management in Cameroon and across the subregion is the Interstate Committee on Pesticides in Central Africa. The CPAC, whose secretariat is based in Yaoundé, is the executive body of Regulation No. 09/06-UEAC-114-CM-15 adopting the common regulation on pesticide registration within the Economic and Monetary Community of Central Africa (CEMAC) area, and Regulation No. 10/12-UEAC-CPAC-CM-23 of 22 July 2012 laying down specific provisions for the application of the common pesticide regulation in Central Africa. This is a common regional pesticide registration system for the six CEMAC member states, intended to replace the national registration systems. For the time being, each country applies its own registration system, and Cameroon stands out as a leader in the subregion, given the operational status of its registration system and the number of registered products (see Finding 13). However, it is stipulated that any national registration activity must take into account the requirements of the common regulation. CEMAC countries imported 169 305 tonnes of pesticides between 2017 and 2020, an average of 42 325 tonnes per year (CPAC cited by De La Paix Bayiha *et al.*, 2024). Half (50.6 percent) of these imports are made by Cameroon (Appendix 12).

Another weakness of the institutional framework concerns the mobilization and operationalization of the public–private partnership. Yet, pesticide importers and other stakeholders in the value chains for managing empty containers and household waste in Cameroon are genuinely willing to play an active role in the process of collecting and recycling empty pesticide containers (according to interviews conducted by the Evaluation Team). The process should ideally be led by the government and built on a public–private partnership that grants operational responsibility to the private sector, supported by an enabling and functional framework as well as adequate resources derived from taxes collected for this purpose. The existing regulatory framework is sufficiently stringent but difficult to enforce under current conditions. This framework (Order No. 001 of the

Ministry of Environment, Nature Protection and Sustainable Development of 15 October 2012 establishing the conditions for obtaining an environmental permit for waste management, and Joint Order No. 004 of the Ministry of Environment, Nature Protection and Sustainable Development and the Ministry of Trade of 24 October 2012 regulating the manufacture, import and marketing of non-biodegradable packaging) requires the holder of an environmental waste management permit to submit, at the end of each semester, to the competent authority, a report containing a summary of the information from the various manifests. They must also establish a system for the recovery, collection, reuse and recycling of at least 80 percent of the packaging waste they produce or import, in an environmentally sound manner and in compliance with the applicable regulations. These requirements are sine qua non conditions for the renewal of their environmental permit every three to five years. In practice, the provision requiring at least 80 percent recycling is not being complied with.

It should be recalled that the issue of waste sorting and management in general relies on at least two levers: one upstream (policy) and the other downstream (market). Using household waste as an example, the cost of processing (collection, transport, incineration) urban waste paid by the Government in Cameroon is XAF 2 000 per tonne compared to XAF 37 000 in Gabon. This brings back to the forefront the issue of state support to encourage waste recycling.

Regarding the management of pesticide containers, importers interviewed felt that "FAO is trying to shift onto the private sector a responsibility that belongs to the State. The government collects the phytosanitary tax and excise duties from importers and should use them". CropLife Kenya has established a partnership with the Government of Kenya, enabling it to manage EPCs using a fund provided from taxes collected by the government. A sustainable solution for Cameroon could lie in establishing a public-private action platform, as the private sector alone does not appear capable of addressing this issue, which primarily falls within the remit of the state. Initiatives have been undertaken by CropLife Cameroon, which had an incinerator built with an estimated capacity of 1 200 °C, but according to them, the real issue lies in the profitability of such incinerators. The context is favourable for negotiating and establishing this public-private partnership.

Value chain actors deploy different collection strategies, some of which prove to be ineffective, while others are neither equitable nor sustainable. For example, the company REDPLAST is mandated by certain importers to collect EPCs from users. The collection mechanism from agro-industries works fairly well. The main challenge concerns EPCs used by smallholder farmers. Some distributors use a deposit or eco-bonus system. The method works, but yields just under 20 percent returns.

Appendix 11. Excerpts of financial data for Component 1 of projects GCP/MLW/052/GFF and GCP/CMR/031/GFF, showing expenditures at project completion

Cameroon	GCP/CMR/031/GFF	
Component 1	Budget account	Total expenditure at project end (USD)
Output 1.1. Strategy for the disposal of up to 100 tonnes of obsolete pesticides and associated wastes developed.		
	5011 Salaries of Professionals	0
	5013 Consultants	15 677
	5014 Contracts	15 025
	5020 Locally Contracted Labour	0
	5021 Travel	0
	5023 Training	0
	5024 Expendable Procurement	736
	5025 Non-Expendable Procurement	15 420
	5027 Technical Support Services	
	5028 General Operating Expenses	
	Total Output 1.1	46 859
Output 1.2. Disposal of approximately 100 tonnes of obsolete pesticides and associated wastes.		
	5013 Consultants	20 700
	5014 Contracts	27 650
	5020 Locally Contracted Labour	0
	5021 Travel	35 285
	5023 Training	12 964
	5024 Expendable Procurement	1 930
	5025 Non-Expendable Procurement	0
	5027 Technical Support Services	0
	5028 General Operating Expenses (*see the share for VEOLIA below)	182 520
	Total Output 1.2	281 049
Output 1.3. High-priority contaminated sites remediated		
	5011 Salaries of Professionals	0
	5013 Consultants	0
	5014 Contracts	72 465
	5020 Locally Contracted Labour	0

Cameroon	GCP/CMR/031/GFF	
	5021 Travel	6 181
	5023 Training	2 013
	5024 Expendable Procurement	0
	5025 Non-Expendable Procurement	0
	5027 Technical Support Services	0
	5028 General Operating Expenses	0
	Total Output 1.3	80 659
Total Component 1		408 567
*VEOLIA	5028 General Operating Expenses	131 662

Malawi	GCP/MLW/052/GFF	
Detailed Budget Line Component 1	FAO Budget Code	Total expenditure (USD)
Obsolete Pesticides	5013 Consultants	27 310
Obsolete Pesticides	5011 Salaries of Professionals	14 690
Safeguarding and disposal	5013 Consultants	0
Safeguarding and disposal	5011 Salaries of Professionals	3213
Contaminated site assessment	5013 Consultants	10 645
CTA	5013 Consultants	32 486
CTA	5011 Salaries of Professionals	132 215
National Project Coordinator	5013 Consultants	32 177
National Project Coordinator	5013 Consultants	0
Contaminated Sites	5013 Consultants	1 633
International	5021 Travel	13 734
CTA	5021 Travel	13 305
National + national teams	5021 Travel	11 203
Training	5023 Training	71 227
Disposal	5014 Contracts	816 512
Disposal	5023 Training	2 755
Soil analysis	5024 Expendable Procurement	51 164
Soil analysis	5014 Contracts	3 317
Contaminated sites remediation	5014 Contracts	0
Contaminated sites remediation	5024 Expendable Procurement	6 358
Contaminated sites remediation	5025 Non-Expendable Procurement	0
Contaminated sites remediation	5023 Training	612
Personal Protective Equipment	5024 Expendable Procurement	0
IT (consumables)	5023 Training	62

Appendix 11. Excerpts of financial data for Component 1 of projects GCP/MLW/052/GFF and GCP/CMR/031/GFF, showing expenditures at project completion

Malawi	GCP/MLW/052/GFF	
IT (consumables)	5024 Expendable Procurement	18 013
IT (consumables)	5025 Non-Expendable Procurement	1 917
IT (consumables)	5028 General Operating Expenses	227
Soil sampling equipment	5023 Training	646
Soil sampling equipment	5025 Non-Expendable Procurement	0
Car hire + other GOE	5028 General Operating Expenses	28 793
Grand Total Component 1		1 294 215
Total (without 5011 Salaries of Professionals)		1 144 098
Disposal	5014 Contracts	816 512

Appendix 12. Pesticide imports in Cameroon from 2007 to 2023

Year	Quantity (tonnes)	Value (XAF billion)
2007	7 824	17.48
2008	7 230	19.18
2009	6 445	17.46
2010	9 641	19.22
2011	11 019	25.50
2012	11 142	27.20
2013	12 669	31.52
2014	15 304	37.15
2015	16 582	46.57
2016	13 422	35.29
2017	19 604	45.18
2018	20 338	50.30
2019	19 265	47.94
2020	26 491	62.29
2021	22 278	56.12
2022	17 915	62.84
2023	26 522	82.14

Source: National Institute for Statistics 2023. Statistic data: Pesticide imports in Cameroon from 2007 to 2023

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